



414 Nicollet Mall
Minneapolis, MN 55401

December 1, 2017

—Via Electronic Filing—

Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101

RE: PETITION
2019-2021 TRIENNIAL NUCLEAR PLANT DECOMMISSIONING STUDY &
ASSUMPTIONS
DOCKET NO. E002/M-17-828

Dear Dr. Haar:

Northern States Power Company, doing business as Xcel Energy, submits a Petition for approval of our 2019-2021 Triennial Nuclear Decommissioning Study & Assumptions, along with supporting materials.

We have electronically filed this Petition and supporting materials with the Minnesota Public Utilities Commission, and copies have been served on the parties on the attached service list. In addition, a one page summary of the filing has been provided to persons on the attached service list. The one-page summary provided also contains directions on how to access an electronic copy of the full filing via the Commission's website. Please contact me at (612) 215-4663 or aakash.chandarana@xcelenergy.com or Lisa Perkett at (612) 330-6950 or lisa.h.perkett@xcelenergy.com if you have any questions regarding this filing.

Sincerely,

/s/

AAKASH H. CHANDARANA
REGIONAL VICE PRESIDENT
RATES AND REGULATORY AFFAIRS

Enclosures
c: Service List

STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

Nancy Lange	Chair
Dan Lipschultz	Commissioner
Matthew Schuerger	Commissioner
Katie J. Sieben	Commissioner
John A. Tuma	Commissioner

IN THE MATTER OF THE PETITION OF
NORTHERN STATES POWER COMPANY
FOR APPROVAL OF THE 2019-2021
TRIENNIAL NUCLEAR DECOMMISSIONING
STUDY & ASSUMPTIONS

DOCKET NO. E002/M-17-828

PETITION

OVERVIEW

Pursuant to Minn. Stat. § 216B.11 and § 216B.2445 and Minn. R. 7825.0500 through 7825.0800, and prior Minnesota Public Utilities Commission (Commission) Orders, Northern States Power Company, doing business as Xcel Energy, submits our Petition for approval of the 2019-2021 Nuclear Decommissioning Study and Assumptions.

The objective of a decommissioning docket is to arrive at a reasonable cost estimate for decontamination and removal of nuclear facilities at the end of their operating lives and to set an accrual to accumulate funds sufficient to pay those decommissioning costs. This triennial filing is unique in that it closely precedes our 2019 Integrated Resource Plan (2019 IRP), in which we—along with the Commission, the Department, and other stakeholders—will consider the long-term future of our nuclear plants because, among other things, all three of our units will reach the end of their respective license life during the fifteen-year planning period.¹ We anticipate discussions in the upcoming 2019 IRP related to several alternatives for our nuclear fleet, including the continued operation of the units through the end of their licensed lives, possible early retirements of one or more units, and/or possible life extensions. In this way, decisions coming out of the 2019 IRP are likely to have a substantial impact on our decommissioning analysis and accrual calculation.

¹ *In the Matter of Xcel Energy's 2016–2030 Integrated Resource Plan*, Docket No. E002/RP-15-21, ORDER APPROVING PLAN WITH MODIFICATIONS AND ESTABLISHING REQUIREMENTS FOR FUTURE RESOURCE PLAN FILINGS (January 11, 2017)

The order of these two dockets—with the 2019 IRP coming approximately a year after our triennial—makes planning for decommissioning in this docket a challenge. It also has the potential of introducing substantial swings in the accrual calculation, as any accrual set in this docket could soon be inaccurate as a result of decisions made in the 2019 IRP. For these reasons, we recommend (1) using the information provided in this docket to inform upcoming discussions in the 2019 IRP; (2) maintaining the accrual set in the 2014 Triennial Nuclear Decommissioning filing (2014 Filing), Docket No. E002/M-14-761 until a decision is reached in the 2019 IRP; and (3) allowing the Company to file its next decommissioning petition shortly following a decision in the 2019 IRP. This will allow the Company, Commission, and stakeholders to make decisions regarding the future of our nuclear fleet first (and with the benefit of updated decommissioning data provided in this filing) and then turn to a discussion regarding decommission planning and accrual setting in light of decisions made in the 2019 IRP.

To that end and in compliance with the Commission's Order in the 2014 Filing, we have analyzed a number of decommissioning scenarios and calculated a number of different accruals as part of this filing. The resulting accrual calculations range from negative \$16.0 million (meaning we are over-funded today) for scenarios involving life extensions of our plants to positive \$115.9 million (meaning we are under-funded today) for scenarios involving the early retirement of our plants by five years. In general, when compared to the 2014 Filing and using of the same assumptions regarding decommissioning alternatives and operating lives, accrual calculations have risen. For example, if we assume that immediate decommissioning will occur following the end of each plant license (consistent with our 2014 Filing), the accrual for 2019 would be approximately \$45 million.

These increases in some of the accrual calculations are driven almost entirely by forward-looking expected returns, which in turn are largely driven by the lower current treasury interest rate relative to the interest rate expected from the 2014 Filing valuation. In other words, because the long-term treasury rate is a fundamental building block for our forward-looking return forecast and because that rate is lower today than it was in 2014, we now anticipate lower long-term investment growth in the future than we did in the 2014 Filing. This change in our projections is consistent with the investment industry as a whole. And given the very long duration of the Nuclear Decommissioning Trust (NDT) and decommissioning, even modest changes in forward looking expected return assumptions can have a substantial effect on the accrual. More detail can be found in Schedule D.

That said, some accrual calculations provided in this filing are substantially lower than \$45 million. Changing from immediate decommissioning to SAFSTOR alone cuts the accrual nearly in half, resulting in an accrual of \$24.9 million. And as already discussed, if we were to extend one or more of the plant licenses, the accruals decrease considerably and become negative in scenarios involving extensions at both plants. In light of this, our recommendation is to hold the accrual at the present \$14.0 million until our 2019 IRP is resolved.

We recognize that this request deviates from the normal triennial procedure, but we believe it will allow for a complete and thorough review of this Petition while also ensuring that the 2019 accrual year remains consistent with what was included in the currently effective 2015 Multi Year Rate Plan (MYRP) filed under Docket No. E002/GR-15-826. In addition, it will provide an opportunity to reassess the accrual on the basis of updated assumptions from the 2019 IRP.

To be sure, if our previous assumption of running the plants through the end of their licensed lives is affirmed in the 2019 IRP, the decision to hold the accrual constant in this docket will result in a greater increase in the accrual post-2019 IRP. To mitigate these effects, we propose that Department of Energy (DOE) settlement funds be held for potential allocation to the NDT, which is consistent with some previous applications of these funds and is consistent with the Commission's Order in Docket No. E002/M-11-939, dated December 4, 2012. In combination with the current \$14.0 million accrual, we believe these funds would allow the Commission to see the 2019 IRP process through before finalizing plans with respect to decommissioning and changing the accrual to reflect those plans.

For these reasons, the Company respectfully requests the Commission:

- Approve our decommissioning study and assumptions as compliant with the Company's obligations under Minnesota statutes, Commission rules, and prior precedent;
- Continue the current approved annual accrual of \$14.0 million, to meet the needs of the Company's 60-year spent fuel scenario with no re-casking of the fuel, continuing for 2019 through 2021 while strategic decisions about the future of our nuclear units are decided in our 2019 IRP;
- Approve an annual accrual of \$2.0 million for end-of-life (EOL) nuclear fuel for the calendar year 2019 through 2021; and
- Permit the Company to hold settlement payments received from the DOE in an interest-bearing account until the 2019 IRP is resolved, at which time the Commission can decide whether to apply those funds to the NDT or refund them to customers.

Additionally, and consistent with prior triennial filings, the Company is requesting Commission approval of changes in investment assumptions and targets. Specifically, the Company requests Commission approval of the following two changes in order to improve the expected earnings of the investment portfolio and ensure that decommissioning funding needs are met without excess costs to customers:

- Transitioning investments to bonds five years before decommissioning cash flows rather than the six years as previously assumed; and
- Changing the investment mix to reduce allocations to certain alternative asset classes and increase allocations to fixed income investments, as described later in this Petition.

I. SUMMARY OF FILING

A one-paragraph summary of the filing accompanies this Petition pursuant to Minn. R. 7829.1300, subp. 1.

II. SERVICE ON OTHER PARTIES

Pursuant to Minn. Stat. § 216.17, subd.3, Xcel Energy has electronically filed this document. A summary of the filing has been served on all parties on the attached service list

III. GENERAL FILING INFORMATION

Pursuant to Minn. R. 7825.3200, 7825.3500, and 7829.1300, subp. 3. Xcel Energy provides the following required information:

A. Name, Address, and Telephone Number of Utility

Northern States Power Company
Xcel Energy
414 Nicollet Mall
Minneapolis, MN 55401
(612) 330-5500

B. Name, Address, and Telephone Number of Utility Attorney

Ryan J. Long
Principal Attorney

Xcel Energy
414 Nicollet Mall, 401 – 8th Floor
Minneapolis, MN 55401
(612) 215-4659

C. Date of Filing

This Petition is being filed December 1, 2017.

D. Statute Controlling Schedule for Processing the Filing

Under Minn. R. 7829.0100, subp. 11, this request for approval of decommissioning accrual is a “miscellaneous” filing because no determination of the Xcel Energy general revenue requirements is necessary. There is no specific statute that prescribes the amount of time the Commission has to rule on this Petition.

E. Utility Employee Responsible for the Filing

Aakash H. Chandarana
Regional V. P., Rates and Regulatory Affairs
Xcel Energy
414 Nicollet Mall, 401 – 7th Floor
Minneapolis, MN 55401
(612) 215-4663

IV. COMPANY PROPOSAL

As already discussed, this filing differs from past triennial dockets in a couple of significant ways. First, it comes shortly before our 2019 IRP, in which we and our stakeholders will consider the long-term future of our nuclear fleet because all three of our nuclear units will reach the end of their respective license life during the fifteen-year IRP planning period. Moreover, the Commission specifically ordered that the Company describe in its next IRP “its plans and possible scenarios for cost-effective and orderly retirement of its aging baseload fleet, including Sherco, King, Monticello, and Prairie Island.”²

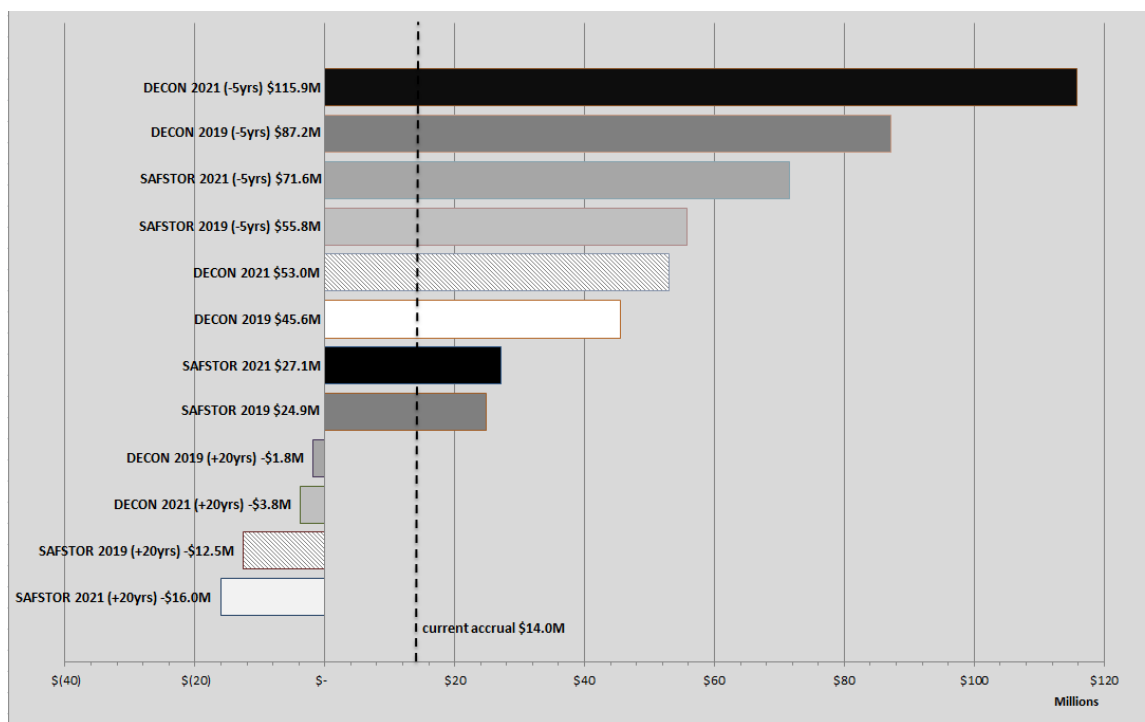
We therefore anticipate discussions in the upcoming 2019 IRP related to several alternatives for our nuclear fleet, including the continued operation of the units through the end of their licensed lives, possible early retirements of one or more units,

² Dkt. No. E002/RP-15-21 (January 11, 2017 Order at 12.)

and/or possible life extensions. In connection with these scenarios, we also expect to discuss alternative decommissioning scenarios, including both immediate decommissioning (DECON³) as well as the SAFSTOR⁴ alternative. In fact, the Department raised SAFSTOR as an alternative in our 2015 IRP, noting that it would allow the decommissioning funds to accrue interest following retirement of the plants.⁵

These two decision points—how long to run the plants and how to decommission them—could have a dramatic impact on the accrual calculation for the NDT. The following table shows the potential 60-year accrual calculations using a variety of assumptions related to operating lives and decommissioning alternatives. It also shows accrual calculations for changes occurring in 2019 versus 2021 to reflect the potential impact of waiting to change the accrual until after the 2019 IRP.

**Table 1 – Nuclear Decommissioning Triennial Accrual Alternatives
(60 Year, No Recasking)**



³ DECON is defined by the NRC as, “[a] method of decommissioning in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed and safely buried in a low-level radioactive waste landfill or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations.”

⁴ SAFSTOR is defined by the NRC as, “[a] method of decommissioning in which a nuclear facility is placed and maintained in a condition that allows the facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use.”

⁵ Dkt. No. E002/RP-15-21 (Department’s July 8, 2016 Comments at 37-38).

This table shows the wide range of potential accrual outcomes that could result from decisions that will need to be made in the 2019 IRP. The accrual could range from negative \$16 million to positive \$115 million depending on decisions about possible life extensions and/or early retirements. This is not inconsistent with the previous life extensions for our nuclear plants, which also had a significant impact on the accrual. Looking back to 2005, the accrual was approximately \$61 million; then from 2006-2008, it was approximately \$32 million; and once the licenses were extended, it dropped to \$0 from 2009-2012.

This triennial is also unique because it is the first one to have been made during the term of the MYRP. Typically in the past, triennial filings and rate cases proceeded either in tandem or in quick succession so that base rates could be modified to reflect any changes that are necessary to the accrual to fully fund the NDT. Here, by contrast, the Company recently entered into a four-year MYRP that prevents it from filing another case until 2019, which would then not affect rates until 2020. As a result, any changes made to the accrual in this docket could not be reflected in base rates in 2019 consistent with past practice.

The overall goal of the decommissioning accrual schedule is designed to ensure that the customers who benefit from nuclear power pay the costs associated with that power at the time it is generated. We believe our proposal to maintain the current accrual level while the future of our nuclear units is decided in the 2019 IRP is reasonable due to the wide range of scenarios (and therefore, accrual levels) that could result from the 2019 IRP. Our proposal is also in the public interest as it does not collect speculative costs from customers in advance of a 2019 IRP decision, nor does it penalize the Company for the timing of the 2019 IRP by changing the accrual during the MYRP. Once the 2019 IRP is resolved, we propose to file an updated decommissioning petition, so that an accrual could be set based on the decisions that were made in the 2019 IRP as well as updated cost, inflation, escalation, and investment growth assumptions.⁶

Although we do not recommend a change to the accrual in this petition, we do want the Commission and our stakeholders to be fully informed with respect to our current assumptions related to our decommissioning cost estimate, inflation, escalation, and investment growth. We believe this information is important both for purposes of evaluating this petition and also to inform discussions in the upcoming 2019 IRP. We

⁶ While these financial assumptions will not necessarily change as a result of any decision made in the 2019 IRP, they may change due to the passage of time and changes in market conditions.

have therefore analyzed a number of decommissioning scenarios and calculated a number of different accruals for the Commission. We also walk through all of the information that is required by the relevant statutes, Commission rules, and past Commission Orders in Section V below.

To be clear, if the 2019 IRP does not lead to any changes with respect to operational lives or decommissioning plans for the nuclear units, the decision to hold the accrual constant in this docket will result in a greater increase in the accrual after the 2019 IRP. That is why we are proposing to hold the DOE settlement funds in order to potentially mitigate these effects. More specifically, we propose to hold the DOE funds in an interest bearing account until the 2019 IRP is resolved, at which time the Commission can decide whether to add the funds to the NDT or refund them to customers in light of the 2019 IRP outcome in our next triennial filing with updated decommissioning assumptions. And while we cannot be certain as to the amounts we will receive as part of our settlement with the DOE in future years, we note that our 2017 payment was approximately \$15 million (on a total company basis) and will continue to be significant over the coming years.⁷ This use of the DOE funds is also consistent with some previous applications of these funds and with the Commission's Order in Docket No. E002/M-11-939, dated December 4, 2012.

We believe this proposal is reasonable and represents the best path forward in light of the unique circumstances at play in this triennial for all of the reasons discussed above. In the balance of this Petition, we present the information and analyses that are required by statute, Commission rules, and past Commission Orders for triennial filings.

V. REQUIRED DECOMMISSIONING INFORMATION

A. Scenarios Evaluated

Consistent with previous filings, the Company examines the impact of assumptions in (1) the engineering cost estimate; (2) costs associated with spent fuel storage following plant shutdown; (3) inflation and escalation; (4) earnings rates; (5) fund investment structure; and (6) recovery period.

As required by Minn. Stat. § 216B.2445, the Company provides scenarios assuming spent fuel will be stored in the State for 60 years, 100 years, and 200 years following cessation of operations at the plant. We include a 60-year scenario without recasking of the dry cask storage units as our base case because the Nuclear Regulatory

⁷ We will soon make a filing with the Commission addressing the 2017 payment.

Commission (NRC) assumes that casks can be used for 100 years. We discuss this assumption further in Part C.1.b.iii below. However, pursuant to the Commission's Order in our previous Triennial Nuclear Decommissioning Accrual filing, we have also provided 60-year, 100-year, and 200-year scenarios that include the cost of switching out the dry cask storage units every 50 years.⁸ In addition, we are including a scenario that assumes spent fuel will be stored in the state for only 32 years. This scenario is based on the Blue Ribbon Commission on America's Nuclear Future (BRC) report recommendations for the prompt development of centralized interim storage. The scenarios discussed above have been provided using the prompt removal and dismantling (*i.e.*, DECON) scenario for decommissioning, which is consistent with what was provided in the 2014 Filing. In addition to these five DECON scenarios, the Company has provided 32-year and 60-year (with no recasking) delayed removal and dismantling (*i.e.*, SAFSTOR) scenarios. These two alternatives are discussed in Schedule A, which lays out the annual cash flows, as well as the cost estimate report provided by TLG Services, Inc. (TLG) in Schedule L for Monticello and Schedule M for Prairie Island.

The decommissioning accrual is an annuity calculation based on the yearly expenditures, in nominal dollars, provided for each cost estimate scenario. The cost estimate is jurisdictionalized for Minnesota retail customers using 73.4886 percent as presented in the current Minnesota rate case.⁹ The escalation rate is used to inflate the jurisdictional cost estimate to future years and the earnings rate is used to present value those future dollars back to the start of decommissioning. Then an annuity payment is calculated such that when added to the current fund balance and grown at the forward looking after tax expected return, will result in this present value required at decommissioning.

In total, the Company has presented 20 accrual scenarios. Fourteen are based on the DECON assumption. Six are based on the SAFSTOR assumption. They include various scenarios for a 32-year, 60-year (with and without re-casking), 100-year, and 200-year dry cask storage operational period. Some of the scenarios assume the accrual change starts in 2019 and the remaining scenarios assume a change in 2021. While most scenarios assume the current license shutdown, several alter the license termination date to be either 5 years before the current license date or 20 years after. The accrual scenarios are presented in Schedule F.

⁸ *In the Matter of Northern States Power Company's for Approval of the 2016-2018 Triennial Nuclear Plant Decommissioning Accrual*, Docket No. E002/M-14-761, ORDER APPROVING NUCLEAR DECOMMISSIONING STUDY, ASSUMPTIONS, AND ANNUAL ACCRUAL, AND SETTING FILING REQUIREMENTS (October 5, 2015).

⁹ Minnesota Electric Retail Rate Case, filed November 4, 2013, Docket No. E002/GR-15-826.

B. Primary Factors Changed Since 2014 Filing

The decommissioning analysis is comprised of three discrete steps. The first is to determine a decommissioning cost estimate for a chosen scenario.¹⁰ The second is to determine the forward looking expected return estimate for the Nuclear Decommissioning Trust based on the investment mix over the relevant period of time. This includes an analysis of the expected returns on various asset classes and changing investment strategies based on when liquidity would be needed to cover decommissioning costs. The third step is to calculate an annual accrual necessary to fully fund the costs of decommissioning for each site based on the earnings estimates developed for the chosen scenario.

This Section of the Petition examines the three primary drivers that contribute to changes in the amounts needed for decommissioning at the expiration of the plants' current operating licenses:

- *Changes to the engineering and other cost estimates.* We revised the engineering cost estimates, using multiple dismantling and fuel storage duration scenarios. The DECON decommissioning scenario was prepared with five fuel storage scenarios. Two of the fuel storage scenarios assume no re-casking of the fuel and three fuel storage scenarios assume replacement of spent fuel storage dry casks every 50 years. The SAFSTOR scenario was prepared with two fuel storage scenarios with no re-casking assumed for either scenario.
- *Changes in assumptions about escalation/inflation of costs over time.* We utilized two escalation/inflation rates: one for the labor cash flows and one for the non-labor cash flows;
- *Revisions to the forward looking expected returns.* We applied multiple earnings rates. For each scenario, we applied one earnings rate for the operation period and another for the post shutdown period.

A detailed discussion of each of these primary drivers is provided below.

1. Engineering and Other Cost Estimates

Our consultant, TLG Services, Inc. (TLG), performed site-specific cost estimates for the 20 scenarios noted above (14 fuel scenarios for DECON and six fuel scenarios for SAFSTOR for each of the two sites). Schedules A.1-A14 show TLG's schedules of annual expenditures for each of the scenarios individually. A more complete

¹⁰ In all scenarios, it is assumed that the site is fully dismantled, radiologically decontaminated, and restored.

comparison between the cost estimates from the previous filing to this one is provided in Schedule A.

In addition to the cost estimates from TLG, the Company also has provided a calculation of the NRC minimum funding amount applicable to Xcel Energy's facilities in Schedule A. The NRC minimum is a calculation of a generic cost to decommission based on the output of a unit and is calculated using a formula specified by the NRC. It is not intended to be a site-specific estimate of decommissioning, as it does not address specific site issues. The NRC uses this as a gauge of the minimum level of funding a licensee must have to meet the NRC's funding assurance requirements of future decommissioning. Consistent with prior filings, the Company does not use the NRC minimum when analyzing the need for future decommissioning funding, but it provides it as an additional data point for analysis. All the cost estimates from TLG in total are greater than the NRC minimum calculations, thus we are funding for more than the NRC minimum.

The decommissioning cost estimate is driven by two primary factors: the choice of decommissioning alternative for the radiological removal of the plant and the duration of fuel storage on site after operations. We discuss each in turn below.

a. Decommissioning Alternatives for Radiological Removal

The alternative chosen for the removal and decontamination of the radiological components of the nuclear plant can vary the timing of when the costs are incurred from early in the decommissioning timeframe for DECON to almost 50 years after operations cease for SAFSTOR. The annual costs associated with the radiological decommissioning alternative are similar across all the different spent fuel storage scenarios that are provided. For example, with the DECON method, the radiological removal costs are the same for the 32-year, the two 60-year, the 100-year, and the 200-year spent fuel storage scenarios. Thus, the duration for storing spent fuel remaining on site does not affect the annual costs for the radiological decommissioning.

The Company has decided to evaluate and provide SAFSTOR scenarios—in addition to DECON scenarios—in light of a growing number of plants using this method. Indeed, the industry is currently in the midst of change with respect to decommissioning, as a majority of plants shutting down in recent years are electing to use SAFSTOR. Of the 20 nuclear plants currently in decommissioning across the United States, 14 are utilizing SAFSTOR. Many of these plants have stated, however, they do not intend to take the full 60 years, but will finish decommissioning when economically viable.

The primary driver of this shift to SAFSTOR is the increased earnings in the fund when a large majority of the expenditures are pushed further out into the future. This allows for smaller annual accruals during operation. That is, to the extent that the after-tax return of the fund outpaces the sum of the annual escalation and costs to maintain the facility during dormancy, the required contributions by customers will decrease relative to a DECON method.

Regardless of decommissioning option, we anticipate the plant will put all of the used fuel into dry storage containers and move it to the Independent Spent Fuel Storage Installation (ISFSI) within the first five years following shutdown. This could occur even faster as technology continues to evolve, and we note that the Kewaunee plant recently completed moving all fuel to ISFSI within two years of shut down.

With either method, once the fuel has been moved to dry casks, the spent fuel pool and supporting systems can be dismantled, meaning that the pool can be drained and supporting equipment can be de-energized and secured. For SAFSTOR, the plant is then left intact during the dormancy period. During this time, there is a 24-hour security force, and maintenance of security systems along with lighting, building maintenance, ventilation and radiation monitoring programs. This dormancy period allows for an eventual reduction in worker dose rates during decommissioning as systems are allowed to decay before full dismantlement. It also results in a reduction in radioactive waste volumes at time of full dismantlement, which results in cost savings.

b. Period that Spent Fuel Could Potentially Remain On Site

The second issue that influences the overall cost estimate is the duration of fuel storage after shutdown and the procedures in place for the handling of spent fuel. These include the period spent fuel remains in the pool, the period the fuel is stored onsite, and whether the fuel has to be moved to a second cask while stored onsite.¹¹

As with all decommissioning cost estimates, the dismantlement and removal of contaminated structures cannot be completed until all spent fuel has been removed from the reactors and storage pools and placed in dry storage containers in the ISFSI. Final release of the site from all licenses will occur once all the fuel is removed from

¹¹ In our last triennial nuclear decommissioning filing, the Commission ordered that the Company provide a more detailed break out of “spent fuel management” costs in future decommissioning filings. In reference to this request the Company first notes that the engineering cost estimate provided in this filing contains tables 3.1-3.7 containing the costs assigned to spent fuel management by cost category and year for all seven scenarios. The cost estimates also provide a narrative discussion regarding what these costs include in section 2.1.4.

the onsite storage facility and the storage facility itself has been removed. The differences between the 32-year, the two 60-year, the 100-year, and the 200-year scenarios are all related to the storage facility operational period and whether the fuel storage scenario included costs to replace spent fuel dry storage casks every 50 years (*i.e.*, recasking). In our spent fuel scenarios, the 32-year and one of the 60-year scenarios do not include recasking. The second 60-year scenario as well as the 100-year and 200-year scenarios include recasking every 50 years.¹² Our recasking assumptions are discussed further in Part c below.

As part of the engineering cost estimate in the 2014 Filing, it was assumed that a federal off-site storage or disposal facility would be available in 2025 allowing spent fuel to be removed from Xcel Energy's nuclear plant sites by 2065 at Prairie Island and 2066 at Monticello. It was also assumed that all spent fuel would be removed from the storage pools at both plants after approximately 15 years to meet cool down requirements before being placed in dry storage. In the current engineering cost study, the assumptions for the removal of the fuel from the storage pools were changed to account for emerging cask technology that will allow spent fuel to be removed from the storage pools within the first five years of decommissioning. However, while the fuel can be placed into the ISFSI much earlier in the decommissioning timeframe compared to the 2014 engineering cost estimate, the ISFSI operating durations were not altered by this change.

Consistent with our 2014 Filing, we have evaluated a scenario that assumes a centralized interim storage facility will begin operation in 2025, allowing shipments from the Prairie Island and Monticello sites to begin in 2027 with all spent fuel being removed from Minnesota by 2064.¹³ Based on the current status support for centralized interim storage (discussed further below), we believe this 32-year scenario may represent a realistic length of time for all spent fuel to be shipped off-site to a federal facility following the shutdown of Monticello and Prairie Island, assuming that

¹² The Commission's Order from the 2014 Filing directed the Company to "develop a 60, 100 and 200-year plan for the City of Red Wing to enable Xcel to build, improve, communicate, and share an understanding of the long-term safety-related costs of spent fuel storage on host communities." We provide this information in Schedule B.

¹³ The NRC has resumed work on its review of the proposed Yucca Mountain repository as directed by the U.S. Court of Appeals. In October 2014, the NRC issued its Safety Evaluation Report Related to Disposal of High-Level Radioactive Wastes in a Geologic Repository at Yucca Mountain, Nevada: Repository Safety after Permanent Closure (NUREG-1949, Volume 3). Since the last filing, the Yucca Mountain supplemental Environmental Impact Statement (EIS) was issued in May, 2016. A final licensing decision could come after hearings, and full NRC adjudicatory review of contentions filed by project opponents.

the federal facility will be capable of receiving 3,000 metric-tons heavy metal each year from all nuclear power plants nationwide.¹⁴

In developing the strategy for spent fuel shipping for the 60-year, 100-year, and 200-year scenarios, a key assumption is that all fuel would be shipped from one site first (Prairie Island) followed by the second site (Monticello). Allocations of space for shipping to a federal facility are provided on a company-wide basis, and Xcel Energy has the discretion to ship spent fuel from either site first, or both sites at the same time. If spent fuel were shipped from both sites at the same time, both ISFSIs would have to operate for the entire time period following shutdown, *i.e.* 60 years, 100 years, or 200 years. By completing shipping from one site first, overall costs would be lowered because the costs of operating and securing the first site's ISFSI are eliminated approximately 13 years earlier.

However, the 32-year scenario assumes shipping from both sites simultaneously, resulting in the Prairie Island ISFSI operating until 2064 (31 years after plant shutdown) and the Monticello ISFSI operating until 2062 (32 years after plant shutdown). This is due to a need to cool the spent fuel following discharge from the reactor for a minimum of 30 years prior to shipping. Table 1 below depicts the years that spent fuel shipping will begin and finish for the 32-year, 60-year, 100-year, and 200-year scenarios. The fuel shipping commencement and completion dates do not change because of the decommissioning alternative chosen or whether recasking is performed.

¹⁴ For more information pertaining to the DOE's progress toward its removal of spent nuclear fuel from Minnesota's nuclear plants, see the Company's most recent Annual Nuclear Waste Management Report at Docket No. E002/CN-09-36 filed on August 10, 2017.

Table 2 – Spent Fuel Shipping Schedules

Plant	Year Shipping Begins	Year Shipping Finishes
32-year Scenario		
Prairie Island	2027	2064
Monticello	2042	2062
60-year Scenario (recasking or no recasking)		
Prairie Island	2053	2077
Monticello	2078	2090
100-year Scenario		
Prairie Island	2093	2117
Monticello	2118	2130
200-year Scenario		
Prairie Island	2193	2217
Monticello	2218	2230

These shipping schedules are informed by two sets of activities that are occurring at the national level. The first is the DOE’s Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste published in January 2013, and the second is the NRC’s Continued Storage of Spent Nuclear Fuel rule which went into effect on October 20, 2014.¹⁵ Each is discussed in greater detail below.

i. BRC Report and DOE’s Implementation Strategy

The BRC issued its report, entitled “Report to the Secretary of Energy” on January 26, 2012.¹⁶ The report recommended, “Prompt efforts to develop a New Geologic Disposal Facility,” in order to provide the needed facilities to safely dispose of spent fuel permanently.¹⁷ In tandem with the development of a geologic disposal facility, the report also recommended, “Prompt efforts to develop one or more consolidated storage facilities,” which, “would allow the federal government to begin the orderly transfer of spent fuel from reactor sites to safe and secure centralized facilities independent of the schedule for operating a permanent repository.”¹⁸

On January 11, 2013, in response to the BRC report, then-Secretary Chu issued the DOE’s “Strategy for the Management and Disposal of Used Nuclear Fuel and High-

¹⁵ A copy of the Federal Register Notice which published the final NRC rule entitled, “Continued Storage of Spent Nuclear Fuel” dated September 19, 2014 can be found at the following web location: <http://www.gpo.gov/fdsys/pkg/FR-2014-09-19/pdf/2014-22215.pdf>

¹⁶ “Blue Ribbon Commission on America’s Nuclear Future, Report to the Secretary of Energy”, http://cybercemetery.unt.edu/archive/brc/20120620220235/http://brc.gov/sites/default/files/document/s/brc_finalreport_jan2012.pdf, January 26, 2012

¹⁷ Ibid, Pg. xi

¹⁸ Ibid, Pg. xii

Level Radioactive Waste.”¹⁹ The Strategy is intended to serve as a statement of Administration policy on nuclear waste and represents an initial basis for discussions among the Administration, Congress and other stakeholders. As the DOE report summarizes, “The Administration currently plans to implement a program over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.”²⁰

Full implementation of this program will require legislation to enable the timely deployment of the system elements noted above. In the meantime, the DOE is undertaking activities within its existing authorization to plan for the eventual transportation, storage, and disposal of used nuclear fuel. Activities range from examining waste management system design concepts, to developing plans for consent-based siting processes, to conducting research and development on the suitability of various geologies for a repository.

Based on these two reports, it is feasible that some facility, whether a centralized interim storage facility or permanent geologic disposal facility, could reasonably be sited, constructed and begin receiving fuel by 2025. The projected 2025 timeframe allows time for Congress to enact any required legislative changes, and for the facility to be sited, licensed and constructed. Transportation planning to the centralized interim facility would be accomplished in parallel with the siting and construction activities. The year 2025 is the earliest that spent fuel might be moved from Minnesota nuclear power plants.

Below we provide further details regarding the status of federal storage initiatives.

¹⁹ *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste*, United States Department of Energy, <http://www.energy.gov/sites/prod/files/Strategy%20for%20the%20Management%20and%20Disposal%20of%20Used%20Nuclear%20Fuel%20and%20High%20Level%20Radioactive%20Waste.pdf>, January 11, 2013

²⁰ Ibid, Pg. 2

- ii. Status of Federal Storage Initiatives, Permanent or Temporary.

Licensing of Yucca Mountain. Public hearings before the NRC Atomic Safety and Licensing Boards were underway in May 2010 when the DOE sought to withdraw the Yucca Mountain application. An Atomic Safety and Licensing Board denied DOE's motion in June 2010 and the NRC Commission ruled that it was evenly divided on whether to overturn or uphold the Licensing Board decision.

In August 2013, the U.S. Court of Appeals for the District of Columbia Circuit ordered the NRC to continue with the licensing process unless or until Congress ruled otherwise or the NRC exhausted its appropriated funds. Subsequent to that decision, the NRC Staff completed its technical and environmental reviews of the Yucca Mountain application. As of May, 2016, the NRC has completed both the technical and environmental reviews of DOE's application for the proposed Yucca Mountain facility. The public hearings have not, however, been restarted.

In March 2017, the Administration's Office of Management and Budget published its Budget Blueprint for Fiscal Year 2018 which proposed \$120 million in appropriations "to restart licensing activities for the Yucca Mountain nuclear waste repository and initiate a robust interim storage program." The DOE budget request submitted to Congress on May 23, 2017, included \$120 million for Yucca Mountain and interim storage. The NRC budget request, also submitted on May 23, 2017, sought \$30 million for Yucca Mountain licensing. The House on July 27, 2017 passed the Fiscal Year 2018 appropriations for DOE and NRC, providing \$120 million intended for DOE's Yucca Mountain licensing, and \$30 million for NRC Yucca Mountain licensing costs. On August 8, 2017, the NRC announced that it would use \$110,000 in existing Nuclear Waste Fund appropriations for information gathering activities relating to potential venues for a restarted Yucca Mountain hearing and the Yucca Mountain electronic database.

Consolidated Interim Storage. There are currently two private initiatives to develop away-from-reactor dry storage facilities. One project, Waste Control Specialists (WCS), is a proposed Consolidated Interim Storage Facility (CISF) at a site in Andrews County, Texas, adjacent to WCS's existing low-level radioactive waste and hazardous waste storage and disposal facilities. In April 2016, WCS filed an application with the NRC for the CISF. In April 2017, WCS asked the NRC to suspend the review of this application. Since that time, a federal judge ruled against the EnergySolutions \$367 million acquisition of WCS, saying it would create a monopoly in nuclear waste disposal. It is unknown if another company will purchase WCS or if WCS will choose to move forward with licensing. Holtec

International has proposed a similar facility for a site in Eddy and Lea Counties in southeastern New Mexico. Holtec filed an application with the NRC for this facility on March 30, 2017. Both companies are reportedly considering how their projects could be used to meet the DOE obligation to accept spent nuclear fuel under the Standard Contracts.

It is feasible that some facility, whether it is a centralized interim storage facility or permanent geologic disposal facility, could reasonably be sited, constructed, and begins receiving fuel by 2025. The projected 2025 timeframe allows time for Congress to enact any required legislative changes, and for the facility to be sited, licensed and constructed. The year 2025 is the earliest that spent fuel might be moved from Minnesota nuclear power plants.

iii. Continued Storage of Spent Nuclear Fuel Rule

Historically, Waste Confidence has been the NRC's generic determination regarding the environmental impacts of storing spent nuclear fuel beyond the licensed life for operation of a nuclear power plant. This generic analysis has been incorporated into the NRC's reviews under the National Environmental Policy Act for new reactor licenses, license renewals, and ISFSI licenses through the Waste Confidence Rule. On June 8, 2012, the U.S. Court of Appeals for the DC Circuit found that some aspects of the Waste Confidence Rule did not satisfy the NRC's National Environmental Policy Act obligations and vacated the rulemaking.²¹ The court indicated that in making either a Finding of No Significant Impact based on an Environmental Assessment or in an Environmental Impact Statement, the NRC needed to add additional discussions concerning the impacts of failing to secure permanent disposal for spent nuclear fuel, and concerning the impacts of certain aspects of potential spent fuel pool leaks and spent fuel pool fires.

In response to the court's decision, the NRC suspended final licensing decisions on new reactors, reactor license renewals, and spent fuel storage facility renewals. The NRC subsequently directed its staff to develop a new rule within 24 months.

On Sept. 6, 2012, the NRC Commission directed NRC staff to proceed with a Generic Environmental Impact Statement (GEIS) to analyze the environmental impacts of continued storage, address the issues raised in the Court's decision, and update the rule in accordance with the analysis in the GEIS. The final rule and GEIS was renamed from "waste confidence" to "continued storage of spent nuclear fuel" in response to public comment to more accurately reflect the nature and content of the

²¹ *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012)

rule. The GEIS and final rule effective October 20, 2014, implemented the Commission's direction.

The rule does not authorize, license or otherwise permit nuclear power plant licensees to store spent fuel for any length of time. Rather, the continued storage rule adopts the findings of the GEIS regarding the environmental impacts of storing spent fuel at any reactor site after the reactor's licensed period of operations. As a result, those generic impacts do not need to be re-analyzed in the environmental reviews for individual licenses. The GEIS analyzes the environmental impact of storing spent fuel beyond the licensed operating life of reactors over three timeframes: for 60 years (short-term), 100 years after the short-term scenario (long-term) and indefinitely. However, availability of a deep geologic repository within 60 years is commented on by the NRC in the Federal Register Notice of the Rule where it states on page 56254:

The United States national policy remains disposal of spent fuel in a geologic repository, and, as stated in the GEIS, the NRC believes that the most likely scenario is that a repository will become available by the end of the short-term timeframe (60 years beyond the licensed life for operation of a reactor).

The possibility of even longer service times is supported by the evaluations performed in the NRCs NUREG-2157, Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel. Under the renewed ISFSI licenses, cask monitoring and maintenance activities are reviewed and approved by the NRC and provide reasonable assurance the casks will continue to store used nuclear fuel safely for a minimum of 60 years.

In NUREG- 2157, "The NRC assumes the replacement of dry casks after 100 years of service life, however, replacement times will depend on actual degradation observed during continued regulatory oversight for maintain safety during continued storage."

c. Recasking Assumptions

The Commission Order in the 2014 Filing required the Company to "re-examine its 50-year model recasking cost assumption and analysis, by providing two scenarios—one based on the same recasking assumptions used in this filing, and one assuming the need to replace all casks prior to being turned over to the custody of the federal government."²² In compliance with that Order, the Company is providing two 60-

²² Order Point 12(e). Additionally, we note that Order Point 12(g) directed the Company to "provide a detailed discussion of the status of Nuclear Regulatory Commission relicensing of casks, on the anticipated

year fuel storage scenarios—one that includes recasking after 50 years and one that does not. Additionally, both the 100-year and 200-year scenarios include recasking costs. Under all recasking scenarios, the first spent fuel canister would be replaced in 2045 at Prairie Island and 2058 at Monticello.

We believe it is reasonable and appropriate to assume that no recasking will be necessary for either the 32-year or 60-year scenarios. Recent activities by the NRC indicate that cask life is at least 60 years and might be 100 years, or longer. This is supported by the NRC's recent actions to process the renewal of the licenses of multiple ISFSIs,²³ including for Prairie Island, a total operation period of 60 years (a 20-year initial license plus a 40-year renewal) of operation. Under the renewed ISFSI licenses, cask monitoring and maintenance activities are reviewed and approved by the NRC and provide reasonable assurance that the casks will continue to store used nuclear fuel safely for a minimum of 60 years.

In addition, in the Generic Environmental Impact Statement for Continued Storage of Spent Fuel published in NUREG-2157 in September 2014, the NRC states, "The NRC assumes replacement of dry casks after 100 years of service life; however, replacement times will depend on actual degradation observed during continued regulatory oversight for maintaining safety during continued storage." Taken together, we believe these findings support our assumption that no recasking will be necessary under the 60-year scenario. We further note that the large step up in the accrual for any scenarios with recasking is primarily due to the recasking assumption that is included in the cost estimate.

The Prairie Island site specific ISFSI license (SNM-2506), which permits storage of the TN-40 casks, was issued in 1993 for a 20-year period. The associated Safety Analysis Report (SAR) described a minimum design life of 25 years. Xcel Energy subsequently applied for, and the NRC granted, a renewal of license SNM-2506 for an additional 40 years through 2053. As part of the license renewal process, a review of Time-Limited Aging Analyses (TLAA) and the Aging Management Review (AMR) of the ISFSI systems, structures, and components were conducted. TLAA reviews identified analyses that were required to be performed to demonstrate intended functions would be maintained during the period of extended operation. AMRs identified aging effects/mechanisms that could adversely affect the ability of the systems, structures, and components to perform their safety functions during the

life of the casks used by Xcel, manufacturer and contractor warranties and liability obligations for the casks, the technical and regulatory barriers associated with transporting the casks used and the status of any federal storage initiatives whether permanent or temporary.

period of extended operation and the application identifies an acceptable aging management program to be implemented prior to the period of extended operation at the site. The NRC Staff reviewed the AMRs and the Aging Management Programs proposed by Xcel Energy and added additional license conditions reflecting the Aging Management Programs.

The Monticello ISFSI casks are authorized by Certificate of Compliance 72-1004 which permits the use of each cask for 20 years from the date it is placed into service. The associated SAR described a service life of 50 years. The general license holder (TN Americas LLC) has subsequently applied for a renewal of Certificate of Compliance 1004 for an additional 40 years. This application is pending NRC approval. As part of the license renewal process, a review of Time-Limited Aging Analyses (TLAA) and the AMR of the ISFSI systems, structures, and components was conducted. TLAA reviews identified analyses that were required to be performed to demonstrate intended functions would be maintained during the period of extended operation. AMRs identified aging effects/mechanisms that could adversely affect the ability of the systems, structures, and components to perform their safety functions during the period of extended operation and the application identifies an acceptable aging management program to be implemented prior to the period of extended operation at the site. The application included SAR markups to modify the service life to 60 years.²⁴

Based on TLAA and AMRs that have been performed, experience to date and continuation of approved aging management programs to ensure that monitoring and maintenance are adequately performed, Xcel Energy believes it is reasonable to assume the licenses and Certificates of Compliance may eventually be renewed for an additional 40 years, or longer.

d. Technical and Regulatory Barriers to Transporting Spent Fuel

There are no technical or regulatory barriers to transporting spent fuel. The NRC regulates the transportation of commercial spent nuclear fuel in accordance with 10 CFR Part 71 – Packaging and Transport of Radioactive Material. Over the past 30 years, the DOE, NRC and the nuclear industry have safely completed approximately 3,000 shipments of spent nuclear fuel and high-level waste. There is also extensive worldwide experience with spent nuclear fuel transportation: more than 70,000 metric tons of uranium of spent nuclear fuel has been safely shipped in the past 25 years.

²⁴ The manufacture warranty states the design of the casks shall conform and comply with the applicable NRC requirements for 20 years. The warranty on the material and services typically applies for 2- 5 years from the date of services or material delivery.

This is equal to the amount the DOE will ship to a permanent repository as authorized in the Nuclear Waste Policy Act. Barriers at this time are largely political and at a state level along the proposed transportation routes. DOE continues to provide funding to work on the potential transportation barriers such as public education and emergency planning along the transportation routes.

Under contract with DOE, nuclear plant operators are required to prepare spent fuel for shipment to DOE. To ship spent fuel the nuclear plant operators are required to place the fuel in NRC approved containers for transportation. The casks used for storage at Monticello and Prairie Island also will be used for transportation and there will not be a need to move spent fuel from their current storage container prior to transport. The actual transportation will be the responsibility of DOE. To accomplish this title and liability for the spent fuel will be transferred to DOE when the spent fuel transportation container crosses the nuclear plant site boundary and is in the possession of DOE.

2. Escalation/Inflation Rate

The second primary driver of the decommissioning estimate is an updated set of assumptions regarding escalation and inflation. Goldman Sachs Asset Management (GSAM), our investment advisor for the NDT, provided the forecast analysis for the escalation/inflation rates used in this filing's accrual calculations. A more comprehensive narrative of this analysis and accompanying graphs are included in Schedule C, which includes a discussion of the economic and inflation factors, including gross national product growth, labor productivity, and other considerations utilized in estimating long-term inflation rates.

The Company recommends a 4.05 percent escalation rate for the labor component of decommissioning and a 2.85 percent escalation rate for the non-labor components. The 1.2 percent difference in this escalation rate for non-labor reflects the fact that increases in labor productivity will not have an impact on escalation of non-labor costs. These two rates were factored into the calculation of the future costs of nuclear decommissioning. However, the Prairie Island Indian Community payments were not escalated as they remain constant each year until the fuel is removed from the site.

3. Forecast Earnings Rate

GSAM also provided the analysis for the forecasted earnings rate, which was reviewed internally for reasonableness. A more comprehensive narrative of this analysis and accompanying graphs are included in Schedule D, which includes a discussion of the analytical framework used by GSAM to arrive at the forward looking expected

returns. It also includes a discussion regarding our investment strategy, investment and economic assumptions, and the expected returns for the various classes of investments that are currently a part of the fund.

While there is inherent uncertainty in any forward looking expected return and escalation/inflation forecasts, the longer it takes to complete the decommissioning, the more time the fund has to compound earnings on the amounts contributed. At the same time, however, a longer decommissioning period also subjects the fund to more risk that the estimated earnings will not be realized as expected.

Consistent with our past triennial filings, the Company recommends a stratification of the earnings rate between the operational period and the decommissioning period. We also recommend two earnings rates for each facility to better match the earnings rates with the individual cost estimates and to better replicate the separation in the Qualified Trusts within the NDT. Each unit has its own set of earnings rates due to the difference in the timing of cash flows and different decommissioning start dates. Table 2 below shows the expected after-tax returns that are representative of the analysis detailed in Schedule D.

Table 3 – Earnings Rates Forecast

Nuclear Unit	<u>60-Year Scenario</u>			
	<u>2014 Rates</u>		<u>2017 Rates</u>	
	Operations	Decom.	Operations	Decom.
Monticello	6.20%	5.51%	5.00%	4.43%
Prairie Island Unit 1	6.24%	5.35%	4.99%	4.15%
Prairie Island Unit 2	6.30%	5.23%	5.04%	4.09%

The decrease in the expected after-tax returns is largely the result of lower forward looking expected returns for multiple asset classes.

C. Trust Structure & Investment Strategy

Per the Commission's October 5th, 2015 Order in Docket E002/M-14-761, the NDT investments are contained in three Qualified Trusts, which are a standard decommissioning fund that cannot be refunded to customers until all decommissioning activities are completed. The Company has established an individual Qualified Trust for each nuclear operating unit to hold the decommissioning funds required by the NRC.

Below we discuss our investment strategy for the NDT as well as changes to our liquidity assumptions for the trust.

1. Investment Strategy

As discussed in previous triennial dockets, the Company's NDT Committee routinely evaluates both the NDT's performance and the overall investment strategy for the fund (including its asset allocation), and it revises both the strategy and allocation as necessary. Following a hearing on the Company's 2016 Annual Informational Report, the Commission issued an order in February 2017 requiring Xcel Energy to re-evaluate the investment mix for the NDT with the purpose of reducing the NDT's investment management fees and increasing the annual return on its investment portfolio.

As part of this Triennial Nuclear Decommissioning Accrual filing, the Company undertook a comprehensive review of our investment allocations to evaluate portfolio changes that would be effective over the next triennial period. The process of determining the portfolio's asset mix is called asset allocation optimization. Different mixes of assets can produce hundreds, or even thousands, of alternative combinations of risk and returns. As a result, asset allocation techniques are used in practice to evaluate the various possible asset mixes and determine those combinations that are likely to deliver optimal performance in terms of risk and return.

We have used this process to perform a long-term optimization of the asset allocation for the NDT's investments. With any investment, there is always a trade-off between risk and the expected rate of return on that investment. Typically, strategies with higher expected returns also come with higher risk and vice versa. The goal is to optimize the trade-off between risk and return over the long term. If on one hand too little risk is taken, then there is a significant chance that the trust remains underfunded, necessitating very large contributions into the trust in later years. If on the other hand too much risk is taken, there is a risk of significant underfunding of the trust in the future, or of overfunding of the trust, which because of the difficulty of removing assets from the Qualified Trust is also undesirable.

In addition to this analysis, the Company also considered portfolio options that shifted fund objectives slightly from liability matching characteristics such as inflation sensitivity to instead focus on lower cost, more traditional investments. To that end, the NDT's investment in commodities was removed from the portfolio. The Company also re-evaluated the diversifying assets included in the portfolio, such as the hedge fund investments. Consistent with the objective of reducing investment manager fees and simplifying the portfolio, hedge funds were also removed.

Following the Company's full analysis of multiple investment portfolios, we recommend the following investment mix shown in Table 3 below. We note that the

development of this recommendation followed a process deemed prudent by the independent investment review required by the Commission’s February 27, 2017 Order in Docket No. E002/M-14-761. That review also concluded that the Company “has found an appropriate balance to achieving a reasonable risk adjusted return” and that its asset allocation is “properly diversified amongst a reasonable amount of non-correlated assets classes.”

Table 4 – Recommended Investment Mix

Portfolio Line Item	2016 Target	Updated 2017 Target
Total Equity	60.0%	60.0%
Private Equity	10.0%	10.0%
Public Equity	50.0%	50.0%
US All Cap Equity	26.0%	25.8%
Non-US Developed Equity	14.0%	14.1%
Emerging Markets Equity	10.0%	10.1%
Fixed Income	17.5%	30.0%
Investment Grade Fixed Income	5.0%	12.1%
High Yield Fixed Income	8.5%	10.0%
Emerging Market Debt	4.0%	7.9%
Hedge Funds	7.5%	0.0%
Private Real Estate	10.0%	10.0%
Real Assets (Commodities)	5.0%	0.0%
Cash	0.0%	0.0%
Total	100.0%	100.0%

Consistent with prior triennial filings, we request that the Commission approve this asset allocation, which we believe results in an optimized trade-off between risk and return over the long term on a forward looking basis. That said, the Company will continue to analyze the portfolio asset mix and make updates and changes as necessary. In other words, the portfolio mix identified in this filing is a snapshot of a point in time and could change between now and the next triennial filing.

A more detailed discussion of the recommended target asset mix for the decommissioning fund, along with an analysis of the forward looking expected returns is included in Schedule D.

a. Change in Liquidity Assumptions

The Company’s 2014 analysis of forward looking expected returns assumed a reallocation of investments equivalent to the respective cash outflow to bonds six

years before that cash flow was needed for decommissioning. This was done to follow a principal called “the Two-Fund Separation Theorem,” which states that an efficient portfolio can be constructed of both a growth portfolio and efficient low-risk portfolio. For 2017, the Company’s analysis is continuing to use this Two-Fund Separation Theorem as a guide when making future investment assumptions. However, the Company is proposing a change from reallocation six years before cash flows to five years before cash flows.

Our analysis assumes that the funds are invested in bonds as a cash outlay is approached. For each expected annual outgoing cash flow, assets are converted to bonds ahead of time to give more certainty to the ability to make the payment. Not all funds are converted to bonds – only enough to cover each annual cash outflow. For example, if the conversion is at a five year period, the first outflows expected in 2030 are converted to bonds in 2025; then in 2026, enough cash is converted to bonds to match the 2031 expected outflow.

Since expected bond returns are lower than the expected growth portfolio returns, the earlier the transition to bonds, the greater the certainty (lower the risk) but also the lower expected return. And because a later conversion to bonds for each cash flow increases the overall expected return, the assumed conversion period has been reduced from six years to five years as indicated above. We believe any risk of the shorter period is mitigated by the transfer to bonds each year for the associated cash flow (rather than all at once), so cycles have a chance to ‘average out.’

In short, the Company believes that making this change will provide greater returns without adding significant additional risk. Additional details regarding this change are provided in Schedule D.

D. Current Fund Balances

Annually, the Company reports the balances in the various funds in either this petition or a separate letter. The balances for both the Qualified Trust for the MN Jurisdiction are discussed below. The Escrow Fund was transferred to the Qualified Trust after the last decommissioning filing and thus, Escrow Fund no longer exists.

1. Qualified Trust

As of June 30, 2017, the Qualified Trust book value balance for all three operating units was a total of \$1,151 million for the MN Jurisdiction, with a total market value of \$1,467 million. The difference between the book value and the market value is the

unrealized gains and losses. Table 4 below shows the book and market values by unit. A detailed presentation of each unit's balances is presented in Schedule E.

Table 5 – Qualified Trust Balance as of June 30, 2017

Unit	Book Value	Market Value
Monticello	\$514,771,426	\$641,884,228
Prairie Island Unit 1	298,347,569	388,313,263
Prairie Island Unit 2	337,452,778	436,807,122
Total	\$1,150,571,773	\$1,467,004,613

The Qualified Trust is maintained by retail and wholesale jurisdictions. The retail jurisdictions are Minnesota, North Dakota, South Dakota, and Wisconsin. The wholesale jurisdictions are Minnesota and Wisconsin. Since 2014, there are no longer any full requirements wholesale customers; the Company contacted the FERC for the possibility of redistributing the two wholesale jurisdictional balances to the four retail jurisdictions. Before we can do this transfer within the Qualified Trust, we must first file with the FERC for their approval.

While we cannot physically transfer the funds with in the Qualified Trust, and regardless of whether the FERC grants us approval to do so, the amount of funds assigned to these two wholesale jurisdictions need to be factored into the Minnesota retail accrual calculation. The reason we believe that we have to factor a portion of the wholesale balance into the accrual calculation relates to the allocation of the cost estimate to each jurisdiction. One hundred percent of the cost estimate is allocated to the retail jurisdictions as these customers carry the burden of funding the remaining amount for decommissioning. If we did not include a portion of the wholesale balance in the accrual calculation, the accrual calculations for each retail jurisdiction will over recover the amount needed by the wholesale balance. Thus, for the accrual calculation we must account for the Minnesota jurisdictional amount of the Minnesota and Wisconsin wholesale balance when calculating the accrual.

The book value balance for the Minnesota and Wisconsin wholesale jurisdictions in total was \$45.3 million and for the market value is was \$56.7 million at June 30, 2017. The proposed distribution of these balances using the rate case demand allocators, assigned 73.4886 percent of the total to the Minnesota Retail jurisdiction, or \$33.3 million additional book value balance and \$41.7 million in market value balance. The allocation of the wholesale jurisdiction balances is included in Schedule E. Including the Minnesota Retail portion of the wholesale jurisdiction balances to the June 30, 2017 balances, results in the adjusted balances used in this filing as follows in Table 5:

Table 6 – Adjusted Qualified Trust Balance as of June 30, 2017

Unit	Book Value	Market Value
Monticello	\$529,148,381	\$660,140,345
Prairie Island Unit 1	308,078,761	399,941,696
Prairie Island Unit 2	346,627,064	448,597,551
Total	\$1,183,854,206	\$1,508,679,592

2. Beginning Fund Balance for Annuity Calculation

The 2014 Filing was submitted using the fund's market values, per the Commission order, and the 2017 filing continues to use the market value as a basis for the accrual. Using the adjusted market value is consistent with forward looking market conditions and will provide the most justifiable and proper accrual estimate at this time. The adjusted funds currently have a \$324.8 million unrealized net gain. However, not all of this unrealized gain is available to fund decommissioning costs because taxes will have to be paid on the gains when they are realized. Therefore, the June 30, 2017 adjusted market value was dampened by \$90.4 million for the estimated tax that can be expected be paid when the unrealized gain is realized. The Company calculated the tax effect on the June 30, 2017 adjusted market value based on the unrealized gains and losses in the portfolio. This tax effect calculation is shown with each accrual calculation in Schedule F.

3. Escrow Fund

In the 2014 Filing, the Commission approved the discontinuance of the Escrow Fund and approved the transfer (pour-over) to the Qualified Trust. The Company completed this pour-over in 2016 and reported a zero balance in the Escrow Fund with the 2017 compliance filing to 2014 Filing.

VI. EFFECT OF CHANGE UPON XCEL ENERGY REVENUE

Subdivision 1 (b) of Minn. Stat. §216B.2445 requires the inclusion of an estimated customer impact for each of the assumed periods. For this petition we calculated the rate impact to each of the customer classes on a \$/kWh increase. This was done by allocating the estimated accruals for the various scenarios presented in Schedule F to the customer classes using the most recent Class Cost of Service Study.

The class allocation process used the same stratification methodology approved by the Commission in Docket No. E002/M-11-807 to return the DOE Settlement dollars to customers. This included an approximate 19.3 percent weight to capacity and an 80.7

percent weight to energy usage from Docket No E002/GR-15-826. The accrual was then divided by the energy each class forecasted to be used over a 12-month period ending December 31, 2017, also from Docket No. E002/GR-15-826, to determine a \$/kWh that would be required for that class to collect its portion of the accrual. Schedule G provides the result of this calculation for all accruals provided in Schedule F.

VII. EOL NUCLEAR FUEL

At the time each nuclear unit is shutdown, there will be nuclear fuel remaining in the reactor that has not been fully utilized. We refer to this unused fuel as end-of-life (EOL) nuclear fuel. The unused fuel cannot be transferred to another facility, and the amortization expense for said fuel would have to be taken at the end of operations at each unit. To avoid this spike in amortization at the end of the useful life of each unit, the Company estimates the expected cost of unused fuel at the end of operations and amortizes the expense over the remaining life of each unit. This is done using a sinking fund method.

The Company recommends a decrease to the annual internal accrual for EOL nuclear fuel for this triennial filing. The Company is proposing to change the 2019 accrual based on the new EOL nuclear fuel factors discussed in Schedule H. The Minnesota jurisdictional annual accrual for 2019 is requested to be \$2,040,887. This is a decrease of \$372,402 over the accrual based on the factors approved in the 2014 Filing.

This recommended decrease stems mainly from an update in the estimates of the cost of the final fuel at shutdown. The estimated amount to be recovered decreased approximately \$4 million from the estimate used in the 2014 Filing. The decrease was primarily the result of lower projected nuclear fuel commodity prices in the future, and the enrichment assumptions used in the estimate for Monticello. The 2021 accrual worksheet detailing the calculation is included in Schedule H. We have included the 2019 and 2020 data as well, for comparison purposes. The internal rate of return has been revised for the 2021 accrual to coincide with the new authorized rate of return from the MYRP.

VIII. PREMATURE RISK INVESTIGATION

In previous Orders, the Commission has directed that the Company to provide an investigation of premature risk in its Triennial Nuclear Decommissioning Accrual

filings.²⁵ Consistent with the Commission's prior orders, our investigation included the following aspects of the risks of premature decommissioning:

- The availability of commercial insurance.
- The availability of electric industry co-insurance.
- Any programs, which may be proposed, mandated, or administered by the NRC or any other United States Government agency.
- Specific detailed information pertaining to any steps Xcel Energy has taken to minimize any possible loss, which may occur as a result of premature decommissioning.
- Xcel Energy's ability to withstand possible economic and financial trauma, which may be associated with premature decommissioning.

Schedule I contains the regular response to that request. It addresses accident and non-accident related premature decommissioning of nuclear generating facilities. Presently, insurance is unavailable for non-accident related premature decommissioning such as those caused by regulatory directives. Therefore, the insurance analysis deals with accidents.

Xcel Energy property insurance coverage of \$2.25 billion would largely offset the potential impact of an accident-related decommissioning. Although accident-related decommissioning expenses are significant, the length of time involved in a clean-up process, insurance payments, tax deductibility of expenses, and related rate relief would affect the yearly expense. Although accident related premature decommissioning would affect both the Company and its customers, it is anticipated that, with acceptable regulatory decisions, the financial integrity of the Company would be maintained.

IX. ASSET RETIREMENT OBLIGATION

The implementation of the Statement of Financial Accounting Standards No. 143 (SFAS 143), *Accounting for Asset Retirement Obligations* (ARO) in January of 2003 brought some changes to the accrual accounting for decommissioning. Financial Accounting Standards Board (FASB) Interpretation No. 47 (FIN 47), *Accounting for Conditional Asset Retirement Obligations* was released in March 2005. These statements are both included within the FASB Accounting Standards Codification (ASC) 410 *Asset Retirement and Environmental Obligations*. This Interpretation of the conditionality of an ARO has resulted in some additional accounting analysis for many of the fixed assets

²⁵ *In the Matter of the Petition of Northern States Power Company d/b/a Xcel Energy for Approval of the 2012-2014 Triennial Nuclear Plant Decommissioning Accrual*, Docket No. E002/M-11-939, Order Approving Decommissioning Plan and Modifying Refund Plan, (Dec. 4, 2012).

at Xcel Energy. Nuclear decommissioning was never assumed to be conditional in nature, thus the ARO accounting for nuclear decommissioning established in 2003 is unaffected by this Interpretation. Nonetheless, a summary of the ARO accounting for nuclear decommissioning is included in Schedule J for reference. This section is provided in response to the Commission's Order Point 12.a. from the 2014 Filing.

X. COMPLIANCE MATRIX AND REQUESTED AUTHORIZATION

The Company has provided Schedule K, a Compliance Matrix, to assist in referencing specific order points from the Commission Order from the 2014 Filing to the discussion in this petition.

XI. MISCELLANEOUS INFORMATION

Pursuant to Minn. R. 7829.0700, subpt. 2, Xcel Energy requests that the following persons be placed on the Commission's official service list for this matter:

Ryan J. Long
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Any information requests in this proceeding should be submitted to Mr. Cronin at the Regulatory Records email address above.

XII. SUPPORTING DOCUMENTS

The following supporting schedules and studies have been included for filing requirement purposes and consistent with past practice:

Supporting Schedules

A	Cost Estimate Summary
B	Red Wing Plan
C	Escalation Analysis
D	Portfolio Analysis
E	Qualified Trust Statements

Supporting Schedules

F	Decommissioning Accrual Analysis
G	Customer Rate Impact Calculation
H	EOL Accrual
I	Premature Risk Investigation
J	Asset Retirement Obligation
K	Compliance Matrix
L	Decommissioning Cost Analysis for the Monticello Nuclear Generating Plant
M	Decommissioning Cost Analysis for the Prairie Island Nuclear Generating Plant

CONCLUSION

Xcel Energy respectfully requests the Commission approve our Petition for Approval of the 2019-2021 Nuclear Decommissioning Accrual. As described in this filing, we specifically request Commission approval of:

- Approve our decommissioning study and assumptions as compliant with the Company's obligations under Minnesota statutes, Commission rules, and prior precedent;
- Continue the current approved annual accrual of \$14.0 million, to meet the needs of the Company's 60-year spent fuel scenario with no re-casking of the fuel, continuing for 2019 through 2021 while strategic decisions about the future of our nuclear units are decided in our 2019 IRP;
- Approve an annual accrual of \$2.0 million for EOL nuclear fuel for the calendar year 2019 through 2021; and
- Permit the Company to hold settlement payments received from the DOE in an interest-bearing account until the 2019 IRP is resolved, at which time the Commission can decide whether to apply those funds to the NDT or refund them to customers.

Additionally, and consistent with prior triennial filings, the Company is requesting Commission approval of changes in investment transition assumption and investment mix targets. Specifically, the Company requests Commission approval of the following two changes in order to improve the expected earnings of the investment portfolio and ensure that decommissioning funding needs are met without excess costs to customers:

- Transitioning investments to bonds five years before decommissioning cash flows rather than the six years as previously assumed; and
- Changing the investment mix to reduce allocations to certain alternative asset classes and increase allocations to fixed income investments, thereby reducing the expected fees and increasing the forward looking expected return.

The next decommissioning filing would be for the calendar years 2022 through 2024 with the submittal due December 1, 2020.

Dated: December 1, 2017

Northern States Power Company

STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

Nancy Lange	Chair
Dan Lipschultz	Commissioner
Matthew Schuerger	Commissioner
Katie J. Sieben	Commissioner
John A. Tuma	Commissioner

IN THE MATTER OF THE PETITION OF
NORTHERN STATES POWER COMPANY
FOR APPROVAL OF THE 2019-2021
TRIENNIAL NUCLEAR DECOMMISSIONING
STUDY & ASSUMPTIONS

DOCKET NO. E002/M-17-828

SUMMARY

SUMMARY OF FILING

Please take notice that on December 1, 2017, Northern States Power Company, doing business as Xcel Energy, filed with the Minnesota Public Utilities Commission its Petition for approval of its Triennial Nuclear Decommissioning Study and Assumptions. In this Petition the Company analyzed a number of decommissioning scenarios and calculated a number of different accruals. The resulting accrual calculations range from negative \$16.0 million (meaning we are over-funded today) for scenarios involving life extensions of our plants to positive \$115.9 million (meaning we are under-funded today) for scenarios involving the early retirement of our plants by five years.

The full version of this filing can be found via the Commission's website at <http://mn.gov/puc/>. Select "Search eDockets," enter the year (17) and the docket number (828), then select "Search."

The cost estimates developed and presented in this decommissioning filing are based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. Thus, there are seven cost estimates for each facility provided with this filing. There are five fuel storage options and two dismantling options presented.

As required by Minnesota statutes, a variety of cost studies were created, in order to address the possibility of delays in the DOE acceptance of spent fuel. The Company is required by statute to submit at least three cost scenarios, 60-year, 100-year, and 200-year scenarios. The length of these scenarios is the longest period of time measured from the start of shutdown until all spent fuel is removed from the locations, for all scenarios that is for the Monticello plant. The 60-year scenario has been provided with a no-re-casking assumption as well as one that assumes that spent fuel storage dry casks will be replaced every 50 years. The 100-year and the 200-year dry cask operational period scenarios assume that the fuel will be re-casked every 50-years. The Company has provided Schedule P in order to clarify its position and the basis for disagreement with the need to recask the spent fuel every 50 years.

In the 2014 Filing, the Company provided all scenarios using the DECON decommissioning alternative. This alternative is discussed below, and also elaborated on in TLG's executive summary to the cost estimate. In addition to the standard DECON scenarios presented, this filing also provides two SAFSTOR alternative scenarios for consideration. Over the last several years SAFSTOR has become a more popular decommissioning alternative as nuclear facilities have begun shutting down. The Company last presented a SAFSTOR its 2002 filing, as well as the 2003 update to reflect license extension at Priarie Island. Both of these decommissioning alternatives are discussed below.

For this filing, the Company assumed approximately five years of wet storage based on a conservative estimate of the capabilities of casks currently on the market. For the remainder of this period, the fuel will be stored in dry storage and the pool will no longer be required. This results in a significant decrease in the amount of security staff required at the site.

As a basis for these cost estimates, TLG uses a systems and structural inventory database, which in 1999, was revised for both nuclear facilities. The Company has reviewed and made minor changes to this inventory in the current filing. Other items provided as input are property and sales tax assumptions, insurance levels, burial rates, recycling practices, license termination dates, department budgets,

purchased power and oil costs, incidental costs and meteorological data. These are all input to a process that will estimate the total dollar amount for decontaminating, removing, packaging, shipping, and disposing of the two nuclear sites. These cost estimates include labor rates for both salaried staff and union craft people. All labor is provided with loadings such as pension, unemployment, workers compensation, and medical where applicable. An estimate for employee retention costs also was included in the estimate to account for the additional expense the Company expects to incur in order to insure it retains the staffing required for the plant in the early post shutdown stage while fuel remains in the pool. Xcel Energy also reviewed the organizational structure and numbers of employees for the salaried staff input.

Briefly, the decommissioning process is broken down into several main categories of work that are performed in various periods throughout the decommissioning depending on the dismantling method and the fuel storage assumptions, as follows:

Preparation – Site preparation, engineering and planning of detailed procedures, performing various surveys, implementing the staffing transition plan, organizing the staff required to manage the intended decommissioning activities from available plant staff and outside resources, and submitting filings to regulatory entities.

Fuel Storage – Packaging the fuel in dry cask canisters, loading the canisters to the storage pad, building a fuel transfer facility, re-casking every 50 years for some cost estimates

Dormancy – For SAFSTOR only, this is the period following unit shutdown where structures and systems not necessary for the operation or support of spent fuel pool and site security and surveillance are drained, de-energized, and secured. Minimal maintenance, sanitation, and sealing is performed to allow the facility to be maintained in an inactive state until delayed decommissioning activities commence. Only inspection, maintenance and security/surveillance activities are occurring during this period.

Decommissioning operations – a constructing additional facilities for cask storage, transferring all spent fuel to dry casks, modifications to site structures and facilities, decontamination, removal, packaging, shipping, and burial of all contaminated and activated components and structures. By the end of this work all radioactive or

contaminated material from the plant has been removed, but the fuel may still be onsite.

Site Restoration – The demolition of remaining structures, site restoration, and license termination.

All cost estimate numbers are provided in instant dollars, which means that costs for the same activity from one year to the next do not increase due to inflation. For example, the salary for an engineer is the same in the first year and all subsequent years. The time value impact of inflation is brought into the equation in the accrual calculation worksheet.

In Summary, the Company has computed various decommissioning accruals using the DECON scenario assuming a 32-year, 60-year (no re-casking), 60-year (recasking), 100-year (with re-casking), and 200-year (with re-casking) dry cask storage operational period. Additional decommissioning accruals have been computed using the SAFSTOR scenario with the 32-year and 60-year (no re-casking) dry cask storage operational period.

SAFSTOR Method of Decommissioning

SAFSTOR is defined in the U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70, and 72, as “the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use.” Under this cost estimate decommissioning activities will commence about 50 years after the cessation of operations and will be completed within 60 years. Many plants entering SAFSTOR have stated they do not intend to take the full 60 years but will finish decommissioning when economically viable.

SAFSTOR has begun to be pursued by a number of plant operators as they have entered shutdown. The primary reason for this shift is the increased earnings in the fund when a large majority of the expenditures are pushed further out into the future, which allows for smaller annual accruals during operation. To the extent that the after-tax return of the fund out paces the sum of the annual escalation and costs to tend the facility during dormancy, the required contributions by rate payers will be decreased over a DECON method. Over a 50 year dormancy period, this impact becomes substantial based upon current estimates.

The salaried staff presented in the cost estimate is not necessarily assumed to be the staff of Xcel Energy. This assumption is due to the length of the wait period, now being 50 years, and the fact that the employees with nuclear experience currently employed within Xcel Energy will be enjoying retirement and not available for decommissioning work. Thus, the cost estimate assumes a Decommissioning Operations Contractor (DOC), which is an independent entity that oversees the decommissioning work and provides the required salaried employees.

A more detailed description of the cost estimation process is included in the accompanying two volumes. TLG has provided a written outline of the procedures as well as worksheets that delineate the costs per activity, per period. The 2017 cost estimate results from TLG for SAFSTOR are provided for the 32 year and 60 year no-recasking scenarios.

DECON Method of Decommissioning

DECON is defined in the U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70, and 72, as “the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations.”

Under this cost estimate decommissioning activities will commence as soon as possible after the cessation of operations. The last fuel assemblies will be sufficiently cooled and can be removed from the spent fuel pool and placed in dry casks after about five years.

DECON has been the preferred method of decommissioning for most situations. It is generally favorable because it eliminates the costs for caretaking, other than those related to the ISFSI. The cost estimate places most of the major expenditures more towards the front end of the decommissioning schedule. This is a major advantage because the individuals familiar with the operation of the facility are available to support the dismantling effort, plant systems and services are fully functional, structural integrity is intact, and licensee has a comprehensive management organization available to oversee and conduct the orderly decommissioning and decontamination.

The 2017 cost estimate results from TLG Services for DECON are provided for the 32-year, 60-year (no re-casking), 60-year (recasking), 100-year, and 200-year

spent fuel removal scenarios. The 100-year and the 200-year spent fuel scenarios also assume a 50 year recasking schedule.

Comparison to 2014 Filing

An extended time period of spent fuel management has multiple impacts including a significant increase in labor costs and extends the period of cost escalation, which creates a higher risk over time. The Company has escalated the 60-year cost estimate from the 2014 Filing in the Table 1 below and compared it to the 2017 cost estimate simply to show that the cost estimates were similar and in line with the changes expected from inflation. The comparison table inflates the 2014 Filing cost estimate using the last approved escalation rate for radiological activities of 4.36 percent along with the 3.36 percent approved for the ISFSI operating periods.

Table 1
Comparison of Current No-Recasking Cost Estimate to Previous Filing
60-Year Scenario

	2014 Study in 2017 Dollars	2017 Cost Estimate
Monticello	\$1,478,122,368	\$1,515,849,676
Prairie Island Unit 1	891,516,617	997,041,305
Prairie Island Unit 2	1,038,396,636	998,642,807
	\$3,408,035,641	\$3,511,533,789

There have been a number of differences in the cost estimate assumptions that factor into the comparison of the cash flows. One of the largest increases was in the security staffing levels for the plants. This is the first filing where the Company has provided a detailed site specific estimate of security staffing levels rather than using generic estimates that did not fully incorporate current NRC requirements of 10CFR73.55. This was substantially offset by a decrease in the amount of time the Company anticipates needing to operate the spent fuel pool after shutdown from 15 years to 5 years. This was driven by the emergence of new cask technology capable of storing hotter fuel, which allows the Company to empty the pool somewhat faster than prior estimates. This results in decreased operating and security costs for the plant. Also new to this cost estimate was the inclusion of certain retention payments, removal of all structures below grade in compliance

with Minnesota Pollution Control Agency (MPCA) rules¹, and the continuation of PIIC payments throughout the decommissioning period as long as fuel remains on the Prairie Island site. Given the increases and decreases, the current estimate is slightly increased, but remains approximately in line with the inflated 2014 Filing cost estimate.

Table 2 shows the attachments that provide the yearly cost estimate detail for the seven cost estimates for each facility. Theses summaries show the costs for the radiological decommissioning, the spent fuel management costs, site restoration, and the ISFSI decommissioning. The entire TLG cost estimate documentation is provided in Schedule L for Monticello and Schedule M for Prairie Island.

Table 2
Cost Estimate Cash Flow Summary Schedules

A.1	Monticello Schedule of Annual Expenditures – DECON 32-Year Schedule
A.2	Monticello Schedule of Annual Expenditures – DECON 60-Year No-Recasking Schedule
A.3	Monticello Schedule of Annual Expenditures – DECON 60-Year with Recasking Schedule
A.4	Monticello Schedule of Annual Expenditures – DECON 100-Year Schedule
A.5	Monticello Schedule of Annual Expenditures – DECON 200-Year Schedule
A.6	Monticello Schedule of Annual Expenditures – SAFSTOR 32-Year Schedule
A.7	Monticello Schedule of Annual Expenditures – SAFSTOR 60-Year No-Recasking Schedule
A.8	Prairie Island Schedule of Annual Expenditures – DECON 32-Year Schedule

¹ MPCA interpretation and clarification of rule 7035.0400

A.9	Prairie Island Schedule of Annual Expenditures – DECON 60-Year Schedule
A.10	Prairie Island Schedule of Annual Expenditures – DECON 60-Year with Recasking Schedule
A.11	Prairie Island Schedule of Annual Expenditures – DECON 100-Year Schedule
A.12	Prairie Island Schedule of Annual Expenditures – DECON 200-Year Schedule
A.13	Prairie Island Schedule of Annual Expenditures – SAFSTOR 32-Year Schedule
A.14	Prairie Island Schedule of Annual Expenditures – SAFSTOR 60-Year No-Recasking Schedule

NRC Minimum

The NRC minimum required funding amounts, based upon the new information from NUREG-1307, Revision 16, and the most recent statistics for comparison to the new cost estimates have been calculated. Under the NRC minimum calculation requirements, the Company must show that it will meet the minimum cost calculated under at least one of the two burial options allowed: Direct Burial and Blended Burial. Both of the NRC minimum calculations are less than all scenarios of our 2017 cost estimates in total. Table 3 shows lists the support schedules for the information for the calculation of the NRC minimum.

Table 3
NRC Minimum Calculation Supporting Schedules

A.15	NRC Minimum Historical Escalation
A.16	NRC Minimum Calculation

Property Taxes Included in Cost Estimates

Taxation of utility property is fundamentally different than taxation of the property owned by any other business. Like other businesses, we pay property taxes on the value of the land we own, the buildings attached thereto, and rights-of-way. This property is all assessed at the local level. Unlike other businesses, however, we are also assessed property taxes on personal property. Specifically, we are required to pay property taxes on Operating Property, which is defined as “any tangible property that is owned or leased, except land, which is directly associated with the generation, transmission, or distribution of electricity [or] natural gas...” Minn. R. 8100.0100, subp. 11.

In Minnesota, the Department of Revenue (DOR) values all of the Company’s operating property in Minnesota, as well as its gas and electric operating property that extends into North Dakota and South Dakota. Each type of property is valued as one integrated system, or unit. When the system value for each type (electric or natural gas) is determined, an allocation is then made to reflect how much of the system value is attributable to Minnesota. Allocation is based on a combination of original cost of the property in Minnesota to total system cost, as well as gross revenue in Minnesota to total system revenue.

Deductions are then made to subtract property locally assessed (land and some buildings) and exemptions (e.g., sliding scale exemption for generation efficiency, pollution control, etc.). The resulting value is then apportioned to the various taxing districts based on the original cost of the property located in those districts.

Local taxing districts then combine the market value apportioned to them with the value of the Company’s locally assessed property to arrive at our tax base within the taxing district’s jurisdiction. Finally, each jurisdiction then applies its own individual property tax rate to our tax base to determine our property tax liability in that jurisdiction.

As we make new investments in personal property throughout our integrated system, the market value upon which property taxes are assessed increases. This increased market value is then apportioned to the local jurisdictions that host our Monticello and Prairie Island plants. In 2012, the Company paid \$8.9 million in real and personal property taxes related to Monticello and \$11.9 million for Prairie Island. In 2013, the Company paid \$13.1 million in property taxes related to Monticello and \$13.9 million for Prairie Island. When operations at these nuclear plants cease, the operating property will be removed from the sites and will no longer be included in the DOR’s market valuation. This will result in a reduction

in property taxes paid when operations cease, but the property for the ISFSI will continue to be locally assessed. For the decommissioning cost estimates, the land, structures, and the dry cask portion of the operating property taxes were assumed to continue with the structures component lasting until the structures are decommissioned and removed.

The property tax amounts for Monticello and Prairie Island provided in the decommissioning cost estimate were based on the actual liabilities for 2014 paid in 2016. The Company's consultant developed the future property tax estimates for after plant shut down based on the actual 2014 accruals for the Prairie Island (\$21.4 million) and Monticello (\$17.5 million) locations as reflected on the property tax statements received and paid in 2016. Table 3 shows the change in property taxes from operations to decommissioning.

Table 4
Property Tax Estimates

	During Operations	Plant Shutdown	Plant Structures Removed
Prairie Island			
Land	\$212,258	\$212,258	\$212,258
Structure	4,552,444	4,552,444	0
Substation	345,235	0	0
ISFSI	1,885,006	1,885,006	1,885,006
Generation Machinery	14,378,986	0	0
Total	\$21,373,930	\$6,649,708	\$2,097,264
Monticello			
Land	\$535,724	\$535,724	\$535,724
Structure	2,524,272	2,524,272	0
Substation	287,654	0	0
ISFSI	149,311	149,311	149,311
Generation Machinery	13,959,453	0	0
Total	\$17,456,414	\$3,209,307	\$685,035

The process used in the current property tax cost estimates is the same as the method used in our 2014 Filing. In addition, we note that there is no double recovery of property taxes between the decommissioning accrual and those included in current rates. The collection of funds from customers today for the payment of future tax obligations does not relate to the current year property tax expense.

Spent Fuel Management Costs

The cost estimates include the operating and maintenance of the ISFSI from shutdown through when all the fuel has been removed from the site. Schedules A.1 through A.14 show the annual costs in total spent fuel management costs by unit. Schedule A.17 breaks the spent fuel management costs down into its cost components such as utility staff, property taxes, and operating costs.

Table 5
Cost Breakdown Schedule

A.17	Spent Fuel Management Cost Breakdown – 60-year DECON

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2030	\$27,622,702	\$9,158,323	\$158,156	\$0	\$36,939,181
2031	109,411,318	5,290,419	609,481	0	115,311,218
2032	175,717,482	4,766,180	189,516	0	180,673,177
2033	151,858,587	24,566,464	27,458	0	176,452,509
2034	101,337,190	3,866,462	5,028	0	105,208,680
2035	95,996,598	103,960,455	3,444	0	199,960,497
2036	63,844,950	7,084,520	0	0	70,929,470
2037	9,093,107	8,146,118	31,514,417	0	48,753,642
2038	112,108	8,637,491	35,879,589	0	44,629,189
2039	0	8,242,615	0	0	8,242,615
2040	0	8,265,197	0	0	8,265,197
2041	0	8,242,615	0	0	8,242,615
2042	0	8,625,360	0	0	8,625,360
2043	0	9,390,851	0	0	9,390,851
2044	0	9,030,688	0	0	9,030,688
2045	0	9,008,105	0	0	9,008,105
2046	0	10,539,088	0	0	10,539,088
2047	0	10,156,343	0	0	10,156,343
2048	0	12,833,504	0	0	12,833,504
2049	0	10,156,343	0	0	10,156,343
2050	0	9,390,851	0	0	9,390,851
2051	0	9,008,105	0	0	9,008,105
2052	0	9,413,433	0	0	9,413,433
2053	0	9,008,105	0	0	9,008,105
2054	0	9,008,105	0	0	9,008,105
2055	0	9,390,851	0	0	9,390,851
2056	0	9,030,688	0	0	9,030,688
2057	0	9,008,105	0	0	9,008,105
2058	0	9,390,851	0	0	9,390,851
2059	0	9,773,597	0	0	9,773,597
2060	0	9,030,688	0	0	9,030,688
2061	0	9,773,597	0	0	9,773,597
2062	0	9,773,597	0	0	9,773,597
2063	9,484,743	15,411	2,888,351	14,814,819	27,203,324
	\$744,478,784	\$400,983,117	\$71,275,439		\$1,231,552,159

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2030	\$27,622,702	\$2,258,324	\$158,156	\$0	\$30,039,182
2031	109,411,318	5,356,796	609,481	0	115,377,595
2032	175,717,487	4,832,543	189,516	0	180,739,546
2033	151,858,609	26,932,825	27,458	0	178,818,892
2034	101,337,239	3,932,827	5,028	0	105,275,094
2035	95,996,631	104,026,819	3,444	0	200,026,894
2036	63,844,950	7,150,891	0	0	70,995,841
2037	9,093,107	8,212,486	31,514,417	0	48,820,010
2038	112,108	8,688,760	35,879,589	0	44,680,457
2039	0	8,112,178	0	0	8,112,178
2040	0	8,134,221	0	0	8,134,221
2041	0	8,112,178	0	0	8,112,178
2042	0	8,112,178	0	0	8,112,178
2043	0	8,112,178	0	0	8,112,178
2044	0	8,134,221	0	0	8,134,221
2045	0	8,112,178	0	0	8,112,178
2046	0	8,112,178	0	0	8,112,178
2047	0	8,112,178	0	0	8,112,178
2048	0	10,788,801	0	0	10,788,801
2049	0	8,112,178	0	0	8,112,178
2050	0	14,084,983	0	0	14,084,983
2051	0	14,084,983	0	0	14,084,983
2052	0	17,557,026	0	0	17,557,026
2053	0	20,122,483	0	0	20,122,483
2054	0	14,947,483	0	0	14,947,483
2055	0	19,259,983	0	0	19,259,983
2056	0	21,007,026	0	0	21,007,026
2057	0	8,045,814	0	0	8,045,814
2058	0	8,045,814	0	0	8,045,814
2059	0	8,045,814	0	0	8,045,814
2060	0	8,067,857	0	0	8,067,857
2061	0	8,045,814	0	0	8,045,814
2062	0	8,045,814	0	0	8,045,814
2063	0	8,045,814	0	0	8,045,814
2064	0	8,067,857	0	0	8,067,857
2065	0	8,045,814	0	0	8,045,814
2066	0	8,045,814	0	0	8,045,814
2067	0	8,045,814	0	0	8,045,814
2068	0	8,067,857	0	0	8,067,857
2069	0	8,045,814	0	0	8,045,814
2070	0	8,045,814	0	0	8,045,814
2071	0	8,045,814	0	0	8,045,814

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2072	0	8,067,857	0	0	8,067,857
2073	0	8,045,814	0	0	8,045,814
2074	0	8,045,814	0	0	8,045,814
2075	0	8,045,814	0	0	8,045,814
2076	0	8,067,857	0	0	8,067,857
2077	0	8,045,814	0	0	8,045,814
2078	0	9,944,210	0	0	9,944,210
2079	0	10,326,955	0	0	10,326,955
2080	0	9,966,212	0	0	9,966,212
2081	0	9,944,210	0	0	9,944,210
2082	0	9,944,210	0	0	9,944,210
2083	0	10,326,955	0	0	10,326,955
2084	0	9,966,212	0	0	9,966,212
2085	0	9,944,210	0	0	9,944,210
2086	0	9,944,210	0	0	9,944,210
2087	0	10,326,955	0	0	10,326,955
2088	0	12,620,790	0	0	12,620,790
2089	0	9,944,210	0	0	9,944,210
2090	0	8,795,973	0	0	8,795,973
2091	9,198,906	0	2,936,846	14,854,149	26,989,900
	\$744,193,057	\$685,478,537	\$71,323,933	\$14,854,149	\$1,515,849,676

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2030	\$27,622,702	\$2,258,324	\$158,156	\$0	\$30,039,182
2031	109,411,312	5,356,786	609,481	0	115,377,579
2032	175,717,484	18,411,741	189,516	0	194,318,741
2033	151,858,609	26,932,825	27,458	0	178,818,892
2034	101,337,239	3,932,827	5,028	0	105,275,094
2035	95,996,631	104,026,819	3,444	0	200,026,894
2036	63,844,950	7,150,891	0	0	70,995,841
2037	9,093,107	8,212,486	31,514,417	0	48,820,010
2038	112,108	8,688,760	35,879,589	0	44,680,457
2039	0	8,112,179	0	0	8,112,179
2040	0	8,134,222	0	0	8,134,222
2041	0	8,112,179	0	0	8,112,179
2042	0	8,112,179	0	0	8,112,179
2043	0	8,112,179	0	0	8,112,179
2044	0	8,134,222	0	0	8,134,222
2045	0	8,112,179	0	0	8,112,179
2046	0	8,112,179	0	0	8,112,179
2047	0	8,112,179	0	0	8,112,179
2048	0	10,788,804	0	0	10,788,804
2049	0	8,112,176	0	0	8,112,176
2050	0	14,084,983	0	0	14,084,983
2051	0	14,084,983	0	0	14,084,983
2052	0	17,557,026	0	0	17,557,026
2053	0	20,122,483	0	0	20,122,483
2054	0	14,947,483	0	0	14,947,483
2055	0	19,259,983	0	0	19,259,983
2056	0	21,007,026	0	0	21,007,026
2057	0	8,045,815	0	0	8,045,815
2058	0	32,431,354	0	0	32,431,354
2059	0	8,045,815	0	0	8,045,815
2060	0	8,067,858	0	0	8,067,858
2061	0	8,045,815	0	0	8,045,815
2062	0	8,045,815	0	0	8,045,815
2063	0	8,045,815	0	0	8,045,815
2064	0	8,067,858	0	0	8,067,858
2065	0	8,045,815	0	0	8,045,815
2066	0	22,677,139	0	0	22,677,139
2067	0	8,045,815	0	0	8,045,815
2068	0	42,207,613	0	0	42,207,613
2069	0	8,045,815	0	0	8,045,815
2070	0	8,045,815	0	0	8,045,815
2071	0	8,045,815	0	0	8,045,815

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2072	0	8,067,858	0	0	8,067,858
2073	0	8,045,815	0	0	8,045,815
2074	0	8,045,815	0	0	8,045,815
2075	0	8,045,815	0	0	8,045,815
2076	0	8,067,858	0	0	8,067,858
2077	0	8,045,815	0	0	8,045,815
2078	0	9,944,210	0	0	9,944,210
2079	0	10,326,955	0	0	10,326,955
2080	0	9,966,212	0	0	9,966,212
2081	0	9,944,210	0	0	9,944,210
2082	0	9,944,210	0	0	9,944,210
2083	0	10,326,955	0	0	10,326,955
2084	0	9,966,212	0	0	9,966,212
2085	0	9,944,210	0	0	9,944,210
2086	0	9,944,210	0	0	9,944,210
2087	0	10,326,955	0	0	10,326,955
2088	0	12,620,790	0	0	12,620,790
2089	0	9,944,210	0	0	9,944,210
2090	9,198,906	8,795,973	0	0	17,994,879
2091	0	0	2,937,361	14,928,557	17,865,917
	\$744,193,049	\$772,214,374	\$71,324,448	\$14,928,557	\$1,602,660,427

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2030	\$27,622,702	\$2,258,324	\$158,156	\$0	\$30,039,182
2031	109,411,312	5,356,786	609,481	0	115,377,579
2032	175,717,484	18,411,741	189,516	0	194,318,741
2033	151,858,609	26,932,825	27,458	0	178,818,892
2034	101,337,239	3,932,827	5,028	0	105,275,094
2035	95,996,631	104,026,819	3,444	0	200,026,894
2036	63,844,950	7,150,891	0	0	70,995,841
2037	9,093,107	8,247,094	31,612,405	0	48,952,606
2038	112,108	8,818,492	35,991,150	0	44,921,751
2039	0	9,289,712	0	0	9,289,712
2040	0	9,314,982	0	0	9,314,982
2041	0	9,289,712	0	0	9,289,712
2042	0	9,289,712	0	0	9,289,712
2043	0	9,289,712	0	0	9,289,712
2044	0	9,314,982	0	0	9,314,982
2045	0	9,289,712	0	0	9,289,712
2046	0	9,289,712	0	0	9,289,712
2047	0	9,289,712	0	0	9,289,712
2048	0	11,969,561	0	0	11,969,561
2049	0	9,289,712	0	0	9,289,712
2050	0	15,262,516	0	0	15,262,516
2051	0	15,262,516	0	0	15,262,516
2052	0	15,287,786	0	0	15,287,786
2053	0	15,262,516	0	0	15,262,516
2054	0	15,262,516	0	0	15,262,516
2055	0	15,262,516	0	0	15,262,516
2056	0	15,287,786	0	0	15,287,786
2057	0	15,262,516	0	0	15,262,516
2058	0	39,648,055	0	0	39,648,055
2059	0	15,262,516	0	0	15,262,516
2060	0	15,287,786	0	0	15,287,786
2061	0	15,262,516	0	0	15,262,516
2062	0	15,262,516	0	0	15,262,516
2063	0	15,262,516	0	0	15,262,516
2064	0	15,287,786	0	0	15,287,786
2065	0	15,262,516	0	0	15,262,516
2066	0	29,893,840	0	0	29,893,840
2067	0	15,262,516	0	0	15,262,516
2068	0	49,427,541	0	0	49,427,541
2069	0	15,262,516	0	0	15,262,516
2070	0	15,262,516	0	0	15,262,516
2071	0	15,262,516	0	0	15,262,516

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2072	0	15,287,786	0	0	15,287,786
2073	0	15,262,516	0	0	15,262,516
2074	0	15,262,516	0	0	15,262,516
2075	0	15,262,516	0	0	15,262,516
2076	0	15,287,786	0	0	15,287,786
2077	0	15,262,516	0	0	15,262,516
2078	0	15,262,516	0	0	15,262,516
2079	0	15,262,516	0	0	15,262,516
2080	0	15,287,786	0	0	15,287,786
2081	0	15,262,516	0	0	15,262,516
2082	0	15,262,516	0	0	15,262,516
2083	0	15,262,516	0	0	15,262,516
2084	0	15,287,786	0	0	15,287,786
2085	0	15,262,516	0	0	15,262,516
2086	0	15,262,516	0	0	15,262,516
2087	0	15,262,516	0	0	15,262,516
2088	0	17,942,366	0	0	17,942,366
2089	0	15,262,516	0	0	15,262,516
2090	0	15,262,516	0	0	15,262,516
2091	0	15,262,516	0	0	15,262,516
2092	0	18,737,786	0	0	18,737,786
2093	0	21,300,016	0	0	21,300,016
2094	0	16,125,016	0	0	16,125,016
2095	0	114,858,721	0	0	114,858,721
2096	0	22,187,786	0	0	22,187,786
2097	0	9,223,347	0	0	9,223,347
2098	0	9,223,347	0	0	9,223,347
2099	0	9,223,347	0	0	9,223,347
2100	0	9,223,347	0	0	9,223,347
2101	0	9,223,347	0	0	9,223,347
2102	0	9,223,347	0	0	9,223,347
2103	0	9,223,347	0	0	9,223,347
2104	0	9,248,617	0	0	9,248,617
2105	0	9,223,347	0	0	9,223,347
2106	0	9,223,347	0	0	9,223,347
2107	0	9,223,347	0	0	9,223,347
2108	0	33,634,157	0	0	33,634,157
2109	0	9,223,347	0	0	9,223,347
2110	0	9,223,347	0	0	9,223,347
2111	0	9,223,347	0	0	9,223,347
2112	0	9,248,617	0	0	9,248,617
2113	9,198,906	9,223,347	0	0	18,422,253

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2114	0	9,223,347	0	0	9,223,347
2115	0	9,223,347	0	0	9,223,347
2116	0	23,879,941	0	0	23,879,941
2117	0	9,223,347	0	0	9,223,347
2118	0	44,083,965	0	0	44,083,965
2119	0	10,326,955	0	0	10,326,955
2120	0	9,966,212	0	0	9,966,212
2121	0	9,944,210	0	0	9,944,210
2122	0	9,944,210	0	0	9,944,210
2123	0	10,326,955	0	0	10,326,955
2124	0	9,966,212	0	0	9,966,212
2125	0	9,944,210	0	0	9,944,210
2126	0	9,944,210	0	0	9,944,210
2127	0	10,326,955	0	0	10,326,955
2128	0	12,620,790	0	0	12,620,790
2129	0	9,944,210	0	0	9,944,210
2130	0	8,795,973	0	0	8,795,973
2131	0	0	3,088,487	3,962,165	7,050,652
	\$744,193,048	\$1,599,295,243	\$71,685,125	\$3,962,165	\$2,419,135,581

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2030	\$27,622,702	\$2,258,324	\$158,156	\$0	\$30,039,182
2031	109,411,312	5,356,786	609,481	0	115,377,579
2032	175,717,484	18,411,740	189,516	0	194,318,740
2033	151,858,609	26,932,822	27,458	0	178,818,889
2034	101,337,239	3,932,823	5,028	0	105,275,090
2035	95,996,631	104,026,817	3,444	0	200,026,892
2036	63,844,950	7,150,892	0	0	70,995,842
2037	9,093,107	8,247,092	31,612,405	0	48,952,604
2038	112,108	8,815,549	35,991,150	0	44,918,808
2039	0	9,251,355	0	0	9,251,355
2040	0	9,276,526	0	0	9,276,526
2041	0	9,251,355	0	0	9,251,355
2042	0	9,251,355	0	0	9,251,355
2043	0	9,251,355	0	0	9,251,355
2044	0	9,276,526	0	0	9,276,526
2045	0	9,251,355	0	0	9,251,355
2046	0	9,251,355	0	0	9,251,355
2047	0	9,251,355	0	0	9,251,355
2048	0	11,931,106	0	0	11,931,106
2049	0	9,251,355	0	0	9,251,355
2050	0	15,224,175	0	0	15,224,175
2051	0	15,224,175	0	0	15,224,175
2052	0	15,249,336	0	0	15,249,336
2053	0	15,224,175	0	0	15,224,175
2054	0	15,224,175	0	0	15,224,175
2055	0	15,224,175	0	0	15,224,175
2056	0	15,249,336	0	0	15,249,336
2057	0	15,224,175	0	0	15,224,175
2058	0	39,609,705	0	0	39,609,705
2059	0	15,224,175	0	0	15,224,175
2060	0	15,249,336	0	0	15,249,336
2061	0	15,224,175	0	0	15,224,175
2062	0	15,224,175	0	0	15,224,175
2063	0	15,224,175	0	0	15,224,175
2064	0	15,249,336	0	0	15,249,336
2065	0	15,224,175	0	0	15,224,175
2066	0	29,855,495	0	0	29,855,495
2067	0	15,224,175	0	0	15,224,175
2068	0	49,389,086	0	0	49,389,086
2069	0	15,224,175	0	0	15,224,175
2070	0	15,224,175	0	0	15,224,175
2071	0	15,224,175	0	0	15,224,175

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2072	0	15,249,336	0	0	15,249,336
2073	0	15,224,175	0	0	15,224,175
2074	0	15,224,175	0	0	15,224,175
2075	0	15,224,175	0	0	15,224,175
2076	0	15,249,336	0	0	15,249,336
2077	0	15,224,175	0	0	15,224,175
2078	0	15,224,175	0	0	15,224,175
2079	0	15,224,175	0	0	15,224,175
2080	0	15,249,336	0	0	15,249,336
2081	0	15,224,175	0	0	15,224,175
2082	0	15,224,175	0	0	15,224,175
2083	0	15,224,175	0	0	15,224,175
2084	0	15,249,336	0	0	15,249,336
2085	0	15,224,175	0	0	15,224,175
2086	0	15,224,175	0	0	15,224,175
2087	0	15,224,175	0	0	15,224,175
2088	0	17,903,906	0	0	17,903,906
2089	0	15,224,175	0	0	15,224,175
2090	0	15,224,175	0	0	15,224,175
2091	0	15,224,175	0	0	15,224,175
2092	0	15,249,336	0	0	15,249,336
2093	0	15,224,175	0	0	15,224,175
2094	0	15,224,175	0	0	15,224,175
2095	0	109,645,371	0	0	109,645,371
2096	0	15,249,336	0	0	15,249,336
2097	0	15,224,175	0	0	15,224,175
2098	0	15,224,175	0	0	15,224,175
2099	0	15,224,175	0	0	15,224,175
2100	0	15,224,175	0	0	15,224,175
2101	0	15,224,175	0	0	15,224,175
2102	0	15,224,175	0	0	15,224,175
2103	0	15,224,175	0	0	15,224,175
2104	0	15,249,336	0	0	15,249,336
2105	0	15,224,175	0	0	15,224,175
2106	0	15,224,175	0	0	15,224,175
2107	0	15,224,175	0	0	15,224,175
2108	0	39,634,866	0	0	39,634,866
2109	0	15,224,175	0	0	15,224,175
2110	0	15,224,175	0	0	15,224,175
2111	0	15,224,175	0	0	15,224,175
2112	0	15,249,336	0	0	15,249,336
2113	0	15,224,175	0	0	15,224,175

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2114	0	15,224,175	0	0	15,224,175
2115	0	15,224,175	0	0	15,224,175
2116	0	29,880,656	0	0	29,880,656
2117	0	15,224,175	0	0	15,224,175
2118	0	49,363,915	0	0	49,363,915
2119	0	15,224,175	0	0	15,224,175
2120	0	15,249,336	0	0	15,249,336
2121	0	15,224,175	0	0	15,224,175
2122	0	15,224,175	0	0	15,224,175
2123	0	15,224,175	0	0	15,224,175
2124	0	15,249,336	0	0	15,249,336
2125	0	15,224,175	0	0	15,224,175
2126	0	15,224,175	0	0	15,224,175
2127	0	15,224,175	0	0	15,224,175
2128	0	17,903,906	0	0	17,903,906
2129	0	15,224,175	0	0	15,224,175
2130	0	15,224,175	0	0	15,224,175
2131	0	15,224,175	0	0	15,224,175
2132	0	15,249,336	0	0	15,249,336
2133	0	15,224,175	0	0	15,224,175
2134	0	15,224,175	0	0	15,224,175
2135	0	15,224,175	0	0	15,224,175
2136	0	15,249,336	0	0	15,249,336
2137	0	15,224,175	0	0	15,224,175
2138	0	15,224,175	0	0	15,224,175
2139	0	15,224,175	0	0	15,224,175
2140	0	15,249,336	0	0	15,249,336
2141	0	15,224,175	0	0	15,224,175
2142	0	15,224,175	0	0	15,224,175
2143	0	15,224,175	0	0	15,224,175
2144	0	15,249,336	0	0	15,249,336
2145	0	100,573,555	0	0	100,573,555
2146	0	15,224,175	0	0	15,224,175
2147	0	15,224,175	0	0	15,224,175
2148	0	15,249,336	0	0	15,249,336
2149	0	15,224,175	0	0	15,224,175
2150	0	15,224,175	0	0	15,224,175
2151	0	15,224,175	0	0	15,224,175
2152	0	15,249,336	0	0	15,249,336
2153	0	15,224,175	0	0	15,224,175
2154	0	15,224,175	0	0	15,224,175
2155	0	15,224,175	0	0	15,224,175

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2156	0	15,249,336	0	0	15,249,336
2157	0	15,224,175	0	0	15,224,175
2158	0	39,609,705	0	0	39,609,705
2159	0	15,224,175	0	0	15,224,175
2160	0	15,249,336	0	0	15,249,336
2161	0	15,224,175	0	0	15,224,175
2162	0	15,224,175	0	0	15,224,175
2163	0	15,224,175	0	0	15,224,175
2164	0	15,249,336	0	0	15,249,336
2165	0	15,224,175	0	0	15,224,175
2166	0	29,855,495	0	0	29,855,495
2167	0	15,224,175	0	0	15,224,175
2168	0	52,043,666	0	0	52,043,666
2169	0	15,224,175	0	0	15,224,175
2170	0	15,224,175	0	0	15,224,175
2171	0	15,224,175	0	0	15,224,175
2172	0	15,249,336	0	0	15,249,336
2173	0	15,224,175	0	0	15,224,175
2174	0	15,224,175	0	0	15,224,175
2175	0	15,224,175	0	0	15,224,175
2176	0	15,249,336	0	0	15,249,336
2177	0	15,224,175	0	0	15,224,175
2178	0	15,224,175	0	0	15,224,175
2179	0	15,224,175	0	0	15,224,175
2180	0	15,249,336	0	0	15,249,336
2181	0	15,224,175	0	0	15,224,175
2182	0	15,224,175	0	0	15,224,175
2183	0	15,224,175	0	0	15,224,175
2184	0	15,249,336	0	0	15,249,336
2185	0	15,224,175	0	0	15,224,175
2186	0	15,224,175	0	0	15,224,175
2187	0	15,224,175	0	0	15,224,175
2188	0	15,249,336	0	0	15,249,336
2189	0	15,224,175	0	0	15,224,175
2190	0	15,224,175	0	0	15,224,175
2191	0	15,224,175	0	0	15,224,175
2192	0	18,699,336	0	0	18,699,336
2193	0	21,261,665	0	0	21,261,665
2194	0	16,086,665	0	0	16,086,665
2195	0	105,748,555	0	0	105,748,555
2196	0	22,149,336	0	0	22,149,336
2197	0	9,184,995	0	0	9,184,995

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2198	0	9,184,995	0	0	9,184,995
2199	0	9,184,995	0	0	9,184,995
2200	0	9,184,995	0	0	9,184,995
2201	0	9,184,995	0	0	9,184,995
2202	0	9,184,995	0	0	9,184,995
2203	0	9,184,995	0	0	9,184,995
2204	0	9,210,166	0	0	9,210,166
2205	0	9,184,995	0	0	9,184,995
2206	0	9,184,995	0	0	9,184,995
2207	0	9,184,995	0	0	9,184,995
2208	0	36,250,286	0	0	36,250,286
2209	0	9,184,995	0	0	9,184,995
2210	0	9,184,995	0	0	9,184,995
2211	0	9,184,995	0	0	9,184,995
2212	0	9,210,166	0	0	9,210,166
2213	9,198,904	9,184,995	0	0	18,383,899
2214	0	9,184,995	0	0	9,184,995
2215	0	9,184,995	0	0	9,184,995
2216	0	23,841,486	0	0	23,841,486
2217	0	9,184,995	0	0	9,184,995
2218	0	44,083,968	0	0	44,083,968
2219	0	10,326,948	0	0	10,326,948
2220	0	9,966,221	0	0	9,966,221
2221	0	9,944,218	0	0	9,944,218
2222	0	9,944,218	0	0	9,944,218
2223	0	10,326,948	0	0	10,326,948
2224	0	9,966,221	0	0	9,966,221
2225	0	9,944,218	0	0	9,944,218
2226	0	9,944,218	0	0	9,944,218
2227	0	10,326,948	0	0	10,326,948
2228	0	9,966,221	0	0	9,966,221
2229	0	9,944,218	0	0	9,944,218
2230	0	8,795,978	0	0	8,795,978
2231	0	0	3,088,487	3,962,165	7,050,652
	\$744,193,046	\$3,441,603,346	\$71,685,125	\$3,962,165	\$4,261,443,682

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2030	\$24,264,597	\$9,158,323	\$0	\$0	\$33,422,920
2031	104,697,554	5,290,416	0	0	109,987,970
2032	42,642,743	9,353,482	0	0	51,996,225
2033	33,328,022	30,185,144	0	0	63,513,166
2034	33,328,022	9,485,139	0	0	42,813,161
2035	25,036,146	106,966,023	0	0	132,002,168
2036	7,029,533	5,909,632	0	0	12,939,165
2037	7,010,327	5,893,486	0	0	12,903,813
2038	7,010,327	5,893,486	0	0	12,903,813
2039	7,010,327	5,893,486	0	0	12,903,813
2040	7,029,533	5,909,632	0	0	12,939,165
2041	7,010,327	5,893,486	0	0	12,903,813
2042	7,010,327	6,276,232	0	0	13,286,559
2043	7,010,327	7,041,722	0	0	14,052,049
2044	7,029,533	6,675,123	0	0	13,704,656
2045	7,010,327	6,658,977	0	0	13,669,304
2046	7,010,327	8,189,959	0	0	15,200,286
2047	7,010,327	7,807,214	0	0	14,817,541
2048	7,029,533	10,477,939	0	0	17,507,472
2049	7,010,327	7,807,218	0	0	14,817,545
2050	7,010,327	7,041,722	0	0	14,052,049
2051	7,010,327	6,658,977	0	0	13,669,304
2052	7,029,533	7,057,868	0	0	14,087,401
2053	7,010,327	6,658,977	0	0	13,669,304
2054	7,010,327	6,658,977	0	0	13,669,304
2055	7,010,327	7,041,722	0	0	14,052,049
2056	7,029,533	6,675,123	0	0	13,704,656
2057	7,010,327	6,658,977	0	0	13,669,304
2058	7,010,327	7,041,722	0	0	14,052,049
2059	7,010,327	7,424,469	0	0	14,434,796
2060	7,029,533	6,675,123	0	0	13,704,656
2061	7,010,327	7,424,469	0	0	14,434,796
2062	7,010,327	7,424,469	0	0	14,434,796
2063	5,756,546	269,160	0	0	6,025,706
2064	5,772,318	269,898	0	0	6,042,215
2065	5,756,546	269,160	0	0	6,025,706
2066	5,756,546	269,160	0	0	6,025,706
2067	5,756,546	269,160	0	0	6,025,706
2068	5,772,318	269,898	0	0	6,042,215
2069	5,756,546	269,160	0	0	6,025,706
2070	5,756,546	269,160	0	0	6,025,706
2071	5,756,546	269,160	0	0	6,025,706

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2072	5,772,318	269,898	0	0	6,042,215
2073	5,756,546	269,160	0	0	6,025,706
2074	5,756,546	269,160	0	0	6,025,706
2075	5,756,546	269,160	0	0	6,025,706
2076	5,772,318	269,898	0	0	6,042,215
2077	5,756,546	269,160	0	0	6,025,706
2078	5,756,546	269,160	0	0	6,025,706
2079	5,756,546	269,160	0	0	6,025,706
2080	5,772,318	269,898	0	0	6,042,215
2081	5,756,546	269,160	0	0	6,025,706
2082	5,756,546	269,160	0	0	6,025,706
2083	5,756,546	269,160	0	0	6,025,706
2084	5,772,318	269,898	0	0	6,042,215
2085	50,934,209	269,160	514,522	0	51,717,891
2086	93,208,075	269,160	459,492	0	93,936,727
2087	129,612,126	269,160	31,860	756,671	130,669,817
2088	68,997,281	269,898	4,638	7,287,935	76,559,751
2089	68,037,066	269,160	4,308	6,770,213	75,080,747
2090	39,517,410	184,356	11,609,433	0	51,311,199
2091	333,567	0	36,847,332	0	37,180,900
2092	139,824	0	15,445,594	0	15,585,418
	\$1,030,228,552	\$364,665,558	\$64,917,180	\$14,814,818	\$1,474,626,109

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2030	\$24,264,597	\$2,258,324	\$0	\$0	\$26,522,921
2031	104,697,554	5,356,786	0	0	110,054,340
2032	42,642,743	9,419,837	0	0	52,062,580
2033	33,328,022	32,551,504	0	0	65,879,526
2034	33,328,022	9,551,500	0	0	42,879,522
2035	25,036,130	107,032,385	0	0	132,068,514
2036	7,029,482	5,975,998	0	0	13,005,479
2037	7,010,276	5,959,851	0	0	12,970,127
2038	7,010,276	5,959,851	0	0	12,970,127
2039	7,010,276	5,959,851	0	0	12,970,127
2040	7,029,482	5,975,998	0	0	13,005,479
2041	7,010,276	5,959,851	0	0	12,970,127
2042	7,010,276	5,959,851	0	0	12,970,127
2043	7,010,276	5,959,851	0	0	12,970,127
2044	7,029,482	5,975,998	0	0	13,005,479
2045	7,010,276	5,959,851	0	0	12,970,127
2046	7,010,276	5,959,851	0	0	12,970,127
2047	7,010,276	5,959,851	0	0	12,970,127
2048	7,029,482	8,630,580	0	0	15,660,061
2049	7,010,276	5,959,848	0	0	12,970,124
2050	7,010,276	11,932,656	0	0	18,942,932
2051	7,010,276	11,932,656	0	0	18,942,932
2052	7,029,482	15,398,803	0	0	22,428,284
2053	7,010,276	17,970,156	0	0	24,980,432
2054	7,010,276	12,795,156	0	0	19,805,432
2055	7,010,276	17,107,656	0	0	24,117,932
2056	7,029,482	18,848,803	0	0	25,878,284
2057	7,010,276	5,893,486	0	0	12,903,762
2058	7,010,276	5,893,486	0	0	12,903,762
2059	7,010,276	5,893,486	0	0	12,903,762
2060	7,029,482	5,909,634	0	0	12,939,115
2061	7,010,276	5,893,486	0	0	12,903,762
2062	7,010,276	5,893,486	0	0	12,903,762
2063	7,010,276	5,893,486	0	0	12,903,762
2064	7,029,482	5,909,634	0	0	12,939,115
2065	7,010,276	5,893,486	0	0	12,903,762
2066	7,010,276	5,893,486	0	0	12,903,762
2067	7,010,276	5,893,486	0	0	12,903,762
2068	7,029,482	5,909,634	0	0	12,939,115
2069	7,010,276	5,893,486	0	0	12,903,762
2070	7,010,276	5,893,486	0	0	12,903,762
2071	7,010,276	5,893,486	0	0	12,903,762

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Monticello Nuclear Generating Plant

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2072	7,029,482	5,909,634	0	0	12,939,115
2073	7,010,276	5,893,486	0	0	12,903,762
2074	7,010,276	5,893,486	0	0	12,903,762
2075	7,010,276	5,893,486	0	0	12,903,762
2076	7,029,482	5,909,634	0	0	12,939,115
2077	7,010,276	5,893,486	0	0	12,903,762
2078	7,010,276	7,807,214	0	0	14,817,490
2079	7,010,276	8,189,960	0	0	15,200,236
2080	7,029,482	7,823,361	0	0	14,852,842
2081	7,010,276	7,807,214	0	0	14,817,490
2082	7,010,276	7,807,214	0	0	14,817,490
2083	7,010,276	8,189,960	0	0	15,200,236
2084	7,029,482	7,823,361	0	0	14,852,842
2085	55,527,077	2,398,613	514,522	0	58,440,212
2086	97,934,142	2,182,890	459,492	0	100,576,524
2087	134,336,182	2,565,634	31,860	758,680	137,692,356
2088	73,716,944	4,838,206	4,638	7,307,283	85,867,070
2089	72,779,970	2,182,889	4,308	6,788,186	81,755,354
2090	43,102,581	949,842	11,616,490	0	55,668,913
2091	333,568	0	36,869,728	0	37,203,297
2092	139,825	0	15,454,982	0	15,594,807
	\$1,084,920,548	\$552,723,605	\$64,956,020	\$14,854,148	\$1,717,454,322

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2033	\$31,076,470	\$1,703,879	\$242,314	\$0	\$33,022,663
2034	92,781,597	3,989,771	1,032,687	0	97,804,055
2035	141,808,053	5,695,988	1,628,670	0	149,132,711
2036	119,073,013	4,339,400	1,957,412	0	125,369,825
2037	71,373,222	3,984,135	1,467,374	0	76,824,731
2038	19,230,849	3,487,240	0	0	22,718,089
2039	24,730,499	88,498,905	0	0	113,229,405
2040	43,794,068	3,337,688	0	0	47,131,756
2041	11,680,880	5,934,875	13,436,852	0	31,052,607
2042	99,306	7,481,318	20,693,886	0	28,274,510
2043	46,796	6,977,384	9,751,640	0	16,775,820
2044	0	6,716,138	0	0	6,716,138
2045	0	6,698,833	0	0	6,698,833
2046	0	6,316,088	0	0	6,316,088
2047	0	6,316,088	0	0	6,316,088
2048	0	6,333,392	0	0	6,333,392
2049	0	6,316,088	0	0	6,316,088
2050	0	6,698,833	0	0	6,698,833
2051	0	6,698,833	0	0	6,698,833
2052	0	6,716,138	0	0	6,716,138
2053	0	6,698,833	0	0	6,698,833
2054	0	6,698,833	0	0	6,698,833
2055	0	6,698,833	0	0	6,698,833
2056	0	6,716,138	0	0	6,716,138
2057	0	6,698,833	0	0	6,698,833
2058	0	6,698,833	0	0	6,698,833
2059	0	6,698,833	0	0	6,698,833
2060	0	6,716,138	0	0	6,716,138
2061	0	6,698,833	0	0	6,698,833
2062	0	6,698,833	0	0	6,698,833
2063	0	6,698,833	0	0	6,698,833
2064	11,829,180	6,516,025	0	0	18,345,206
2065	0	0	850,564	4,455,736	5,306,300
	\$567,523,934	\$274,478,813	\$51,061,399	\$4,455,736	\$897,519,882

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 2

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2034	\$12,643,372	\$800,696	\$45,733	\$0	\$13,489,801
2035	77,326,219	6,861,449	340,602	0	84,528,271
2036	149,360,187	4,454,324	2,013,863	0	155,828,374
2037	136,609,791	4,139,962	2,528,578	0	143,278,331
2038	74,882,873	3,727,465	1,290,832	0	79,901,170
2039	30,330,603	88,498,906	0	0	118,829,509
2040	50,102,437	3,337,688	0	0	53,440,125
2041	14,229,327	5,934,875	18,268,894	0	38,433,096
2042	42,463	7,481,318	28,135,639	0	35,659,420
2043	20,010	6,977,384	13,258,438	0	20,255,832
2044	0	6,716,138	0	0	6,716,138
2045	0	6,698,833	0	0	6,698,833
2046	0	6,316,088	0	0	6,316,088
2047	0	6,316,088	0	0	6,316,088
2048	0	6,333,392	0	0	6,333,392
2049	0	6,316,088	0	0	6,316,088
2050	0	6,698,833	0	0	6,698,833
2051	0	6,698,833	0	0	6,698,833
2052	0	6,716,138	0	0	6,716,138
2053	0	6,698,833	0	0	6,698,833
2054	0	6,698,833	0	0	6,698,833
2055	0	6,698,833	0	0	6,698,833
2056	0	6,716,138	0	0	6,716,138
2057	0	6,698,833	0	0	6,698,833
2058	0	6,698,833	0	0	6,698,833
2059	0	6,698,833	0	0	6,698,833
2060	0	6,716,138	0	0	6,716,138
2061	0	6,698,833	0	0	6,698,833
2062	0	6,698,833	0	0	6,698,833
2063	0	6,698,833	0	0	6,698,833
2064	11,829,180	6,516,025	0	0	18,345,206
2065	0	0	850,564	4,455,736	5,306,300
	\$557,376,463	\$271,262,295	\$66,733,143	\$4,455,736	\$899,827,638

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site	ISFSI	Yearly Total
			Restoration	Radiological	
2033	\$31,357,118	\$1,703,879	\$242,314	\$0	\$33,303,311
2034	93,207,409	3,989,769	1,032,687	0	98,229,866
2035	141,808,060	4,930,496	1,628,670	0	148,367,226
2036	119,073,016	3,573,906	1,957,412	0	124,604,334
2037	71,373,223	3,410,020	1,467,374	0	76,250,618
2038	19,230,853	14,221,752	0	0	33,452,605
2039	24,738,914	89,023,669	0	0	113,762,582
2040	43,775,251	2,759,911	0	0	46,535,162
2041	11,590,520	5,183,123	13,493,548	0	30,267,191
2042	99,306	6,907,459	20,693,886	0	27,700,652
2043	46,524	6,545,657	9,694,944	0	16,287,125
2044	0	6,243,809	0	0	6,243,809
2045	0	6,226,749	0	0	6,226,749
2046	0	6,226,749	0	0	6,226,749
2047	0	6,226,749	0	0	6,226,749
2048	0	6,243,809	0	0	6,243,809
2049	0	6,226,749	0	0	6,226,749
2050	0	6,226,749	0	0	6,226,749
2051	0	6,226,749	0	0	6,226,749
2052	0	6,243,809	0	0	6,243,809
2053	0	6,609,495	0	0	6,609,495
2054	0	6,992,240	0	0	6,992,240
2055	0	6,992,240	0	0	6,992,240
2056	0	7,200,673	0	0	7,200,673
2057	0	6,800,868	0	0	6,800,868
2058	0	7,374,985	0	0	7,374,985
2059	0	6,800,868	0	0	6,800,868
2060	0	6,626,554	0	0	6,626,554
2061	0	6,992,240	0	0	6,992,240
2062	0	6,992,240	0	0	6,992,240
2063	0	6,800,868	0	0	6,800,868
2064	0	7,009,299	0	0	7,009,299
2065	0	6,992,240	0	0	6,992,240
2066	0	6,800,868	0	0	6,800,868
2067	0	6,992,240	0	0	6,992,240
2068	0	7,009,299	0	0	7,009,299
2069	0	6,800,868	0	0	6,800,868
2070	0	6,992,240	0	0	6,992,240
2071	0	6,992,240	0	0	6,992,240
2072	0	7,009,299	0	0	7,009,299
2073	0	6,992,240	0	0	6,992,240
2074	0	6,992,240	0	0	6,992,240
2075	0	8,319,530	0	0	8,319,530
2076	0	7,009,299	0	0	7,009,299
2077	11,827,000	6,813,749	0	0	18,640,749
2078	0	0	962,042	4,490,764	5,452,806
	\$568,127,196	\$373,250,469	\$51,172,876	\$4,490,764	\$997,041,305

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 2

Year	Radiological	Spent Fuel	Site Restoration	Site Restoration	Yearly Total
2034	\$12,643,370	\$800,696	\$45,733	\$0	\$13,489,800
2035	77,326,211	6,095,954	340,602	0	83,762,768
2036	149,360,181	3,688,831	2,013,863	0	155,062,875
2037	136,609,788	3,565,838	2,528,578	0	142,704,204
2038	74,882,873	14,461,972	1,290,832	0	90,635,677
2039	30,342,574	89,023,668	0	0	119,366,242
2040	50,100,768	2,759,911	0	0	52,860,679
2041	14,118,612	5,183,123	18,345,978	0	37,647,713
2042	42,462	6,907,459	28,135,639	0	35,085,561
2043	19,893	6,545,657	13,181,354	0	19,746,904
2044	0	6,243,809	0	0	6,243,809
2045	0	6,226,749	0	0	6,226,749
2046	0	6,226,749	0	0	6,226,749
2047	0	6,226,749	0	0	6,226,749
2048	0	6,243,809	0	0	6,243,809
2049	0	6,226,749	0	0	6,226,749
2050	0	6,226,749	0	0	6,226,749
2051	0	6,226,749	0	0	6,226,749
2052	0	6,243,809	0	0	6,243,809
2053	0	6,609,496	0	0	6,609,496
2054	0	6,992,240	0	0	6,992,240
2055	0	6,992,240	0	0	6,992,240
2056	0	7,200,673	0	0	7,200,673
2057	0	6,800,868	0	0	6,800,868
2058	0	7,374,985	0	0	7,374,985
2059	0	6,800,868	0	0	6,800,868
2060	0	6,626,554	0	0	6,626,554
2061	0	6,992,240	0	0	6,992,240
2062	0	6,992,240	0	0	6,992,240
2063	0	6,800,868	0	0	6,800,868
2064	0	7,009,299	0	0	7,009,299
2065	0	6,992,240	0	0	6,992,240
2066	0	6,800,868	0	0	6,800,868
2067	0	6,992,240	0	0	6,992,240
2068	0	7,009,299	0	0	7,009,299
2069	0	6,800,868	0	0	6,800,868
2070	0	6,992,240	0	0	6,992,240
2071	0	6,992,240	0	0	6,992,240
2072	0	7,009,299	0	0	7,009,299
2073	0	6,992,240	0	0	6,992,240
2074	0	6,992,240	0	0	6,992,240
2075	0	8,319,530	0	0	8,319,530
2076	0	7,009,299	0	0	7,009,299
2077	11,826,750	6,813,749	0	0	18,640,498
2078	0	0	962,042	4,490,764	5,452,806
	\$557,273,484	\$370,033,938	\$66,844,621	\$4,490,764	\$998,642,807

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site	ISFSI	Yearly Total
			Restoration	Radiological	
2033	\$31,076,470	\$1,703,879	\$242,314	\$0	\$33,022,663
2034	92,781,598	3,989,769	1,032,687	0	97,804,054
2035	141,808,060	4,930,496	1,628,670	0	148,367,226
2036	119,073,016	3,573,905	1,957,412	0	124,604,333
2037	71,373,222	10,199,620	1,467,374	0	83,040,216
2038	19,230,849	14,221,751	0	0	33,452,600
2039	24,738,910	89,023,669	0	0	113,762,578
2040	43,775,251	2,759,911	0	0	46,535,162
2041	11,594,057	5,183,123	13,490,012	0	30,267,191
2042	104,729	6,907,459	20,688,463	0	27,700,652
2043	49,065	6,545,657	9,692,403	0	16,287,125
2044	0	6,243,809	0	0	6,243,809
2045	0	15,454,214	0	0	15,454,214
2046	0	12,378,392	0	0	12,378,392
2047	0	12,378,392	0	0	12,378,392
2048	0	6,243,809	0	0	6,243,809
2049	0	12,378,392	0	0	12,378,392
2050	0	15,454,214	0	0	15,454,214
2051	0	14,678,390	0	0	14,678,390
2052	0	15,471,275	0	0	15,471,275
2053	0	6,609,495	0	0	6,609,495
2054	0	6,992,240	0	0	6,992,240
2055	0	16,219,704	0	0	16,219,704
2056	0	13,352,316	0	0	13,352,316
2057	0	15,252,511	0	0	15,252,511
2058	0	7,374,986	0	0	7,374,986
2059	0	6,800,868	0	0	6,800,868
2060	0	6,626,554	0	0	6,626,554
2061	0	6,992,240	0	0	6,992,240
2062	0	6,992,240	0	0	6,992,240
2063	0	6,800,868	0	0	6,800,868
2064	0	7,009,300	0	0	7,009,300
2065	0	6,992,240	0	0	6,992,240
2066	0	6,800,868	0	0	6,800,868
2067	0	6,992,240	0	0	6,992,240
2068	0	7,009,300	0	0	7,009,300
2069	0	6,800,868	0	0	6,800,868
2070	0	6,992,240	0	0	6,992,240
2071	0	6,992,240	0	0	6,992,240
2072	0	7,009,300	0	0	7,009,300
2073	0	6,992,240	0	0	6,992,240
2074	0	6,992,240	0	0	6,992,240
2075	0	8,319,531	0	0	8,319,531
2076	0	7,009,300	0	0	7,009,300
2077	11,829,300	6,811,206	0	0	18,640,505
2078	0	0	1,243,387	4,888,392	6,131,779
	\$567,434,526	\$458,457,246	\$51,442,722	\$4,888,392	\$1,082,222,885

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 2

Year	Radiological	Spent Fuel	Site Restoration	Site Restoration	Yearly Total
2034	\$12,643,370	\$800,696	\$45,733	\$0	\$13,489,800
2035	77,326,211	6,095,954	340,602	0	83,762,768
2036	149,360,181	3,688,802	2,013,863	0	155,062,846
2037	136,609,788	10,355,441	2,528,578	0	149,493,807
2038	74,882,873	14,461,973	1,290,832	0	90,635,678
2039	30,342,574	89,023,668	0	0	119,366,242
2040	50,100,768	2,759,911	0	0	52,860,679
2041	14,118,612	5,183,123	18,345,978	0	37,647,713
2042	42,462	6,907,459	28,135,639	0	35,085,561
2043	19,893	6,545,657	13,181,354	0	19,746,904
2044	0	6,243,809	0	0	6,243,809
2045	0	15,454,214	0	0	15,454,214
2046	0	12,378,392	0	0	12,378,392
2047	0	12,378,392	0	0	12,378,392
2048	0	6,243,809	0	0	6,243,809
2049	0	12,378,392	0	0	12,378,392
2050	0	15,454,214	0	0	15,454,214
2051	0	14,678,392	0	0	14,678,392
2052	0	15,471,273	0	0	15,471,273
2053	0	6,609,495	0	0	6,609,495
2054	0	6,992,240	0	0	6,992,240
2055	0	16,219,704	0	0	16,219,704
2056	0	13,352,316	0	0	13,352,316
2057	0	15,252,511	0	0	15,252,511
2058	0	7,374,986	0	0	7,374,986
2059	0	6,800,868	0	0	6,800,868
2060	0	6,626,554	0	0	6,626,554
2061	0	6,992,240	0	0	6,992,240
2062	0	6,992,240	0	0	6,992,240
2063	0	6,800,868	0	0	6,800,868
2064	0	7,009,300	0	0	7,009,300
2065	0	6,992,240	0	0	6,992,240
2066	0	6,800,868	0	0	6,800,868
2067	0	6,992,240	0	0	6,992,240
2068	0	7,009,300	0	0	7,009,300
2069	0	6,800,868	0	0	6,800,868
2070	0	6,992,240	0	0	6,992,240
2071	0	6,992,240	0	0	6,992,240
2072	0	7,009,300	0	0	7,009,300
2073	0	6,992,240	0	0	6,992,240
2074	0	6,992,240	0	0	6,992,240
2075	0	8,319,531	0	0	8,319,531
2076	0	7,009,300	0	0	7,009,300
2077	11,829,300	6,811,206	0	0	18,640,505
2078	0	0	1,243,387	4,888,392	6,131,779
	\$557,276,034	\$455,240,691	\$67,125,966	\$4,888,392	\$1,084,531,083

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 2

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2034	\$12,643,370	\$800,696	\$45,733	\$0	\$13,489,800
2035	77,326,211	6,095,954	340,602	0	83,762,768
2036	149,360,181	3,688,830	2,013,863	0	155,062,874
2037	136,609,788	10,355,438	2,528,578	0	149,493,804
2038	74,882,873	14,461,970	1,290,832	0	90,635,675
2039	30,251,654	87,824,337	0	0	118,075,990
2040	49,584,357	3,276,321	0	0	52,860,678
2041	13,941,273	5,691,564	18,068,179	0	37,701,016
2042	42,463	7,415,243	27,709,603	0	35,167,309
2043	19,894	7,090,649	12,981,759	0	20,092,302
2044	0	6,823,180	0	0	6,823,180
2045	0	16,032,001	0	0	16,032,001
2046	0	12,956,180	0	0	12,956,180
2047	0	12,956,180	0	0	12,956,180
2048	0	6,823,180	0	0	6,823,180
2049	0	12,956,180	0	0	12,956,180
2050	0	16,032,001	0	0	16,032,001
2051	0	15,256,180	0	0	15,256,180
2052	0	16,050,644	0	0	16,050,644
2053	0	6,804,537	0	0	6,804,537
2054	0	6,804,537	0	0	6,804,537
2055	0	16,032,001	0	0	16,032,001
2056	0	12,974,822	0	0	12,974,822
2057	0	12,956,180	0	0	12,956,180
2058	0	6,804,537	0	0	6,804,537
2059	0	12,180,358	0	0	12,180,358
2060	0	12,974,822	0	0	12,974,822
2061	0	12,956,180	0	0	12,956,180
2062	0	6,804,537	0	0	6,804,537
2063	0	25,259,465	0	0	25,259,465
2064	0	18,350,644	0	0	18,350,644
2065	0	12,956,180	0	0	12,956,180
2066	0	6,804,537	0	0	6,804,537
2067	0	6,804,537	0	0	6,804,537
2068	0	19,126,465	0	0	19,126,465
2069	0	16,032,001	0	0	16,032,001
2070	0	6,804,537	0	0	6,804,537
2071	0	6,804,537	0	0	6,804,537
2072	0	21,426,465	0	0	21,426,465
2073	0	6,804,537	0	0	6,804,537
2074	0	6,804,537	0	0	6,804,537
2075	0	23,510,934	0	0	23,510,934
2076	0	6,823,180	0	0	6,823,180

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 2

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2077	0	6,804,537	0	0	6,804,537
2078	0	22,183,644	0	0	22,183,644
2079	0	6,804,537	0	0	6,804,537
2080	0	6,823,180	0	0	6,823,180
2081	0	6,804,537	0	0	6,804,537
2082	0	20,632,001	0	0	20,632,001
2083	0	6,804,537	0	0	6,804,537
2084	0	6,823,180	0	0	6,823,180
2085	0	6,804,537	0	0	6,804,537
2086	0	6,804,537	0	0	6,804,537
2087	0	6,804,537	0	0	6,804,537
2088	0	6,823,180	0	0	6,823,180
2089	0	99,402,533	0	0	99,402,533
2090	0	8,738,968	0	0	8,738,968
2091	0	6,804,537	0	0	6,804,537
2092	0	6,823,180	0	0	6,823,180
2093	0	6,270,663	0	0	6,270,663
2094	0	6,653,405	0	0	6,653,405
2095	0	15,880,869	0	0	15,880,869
2096	0	13,012,552	0	0	13,012,552
2097	0	12,613,676	0	0	12,613,676
2098	0	7,036,150	0	0	7,036,150
2099	0	6,462,033	0	0	6,462,033
2100	0	15,498,124	0	0	15,498,124
2101	0	15,880,869	0	0	15,880,869
2102	0	15,880,869	0	0	15,880,869
2103	0	6,462,033	0	0	6,462,033
2104	0	6,669,536	0	0	6,669,536
2105	0	15,880,869	0	0	15,880,869
2106	0	12,613,676	0	0	12,613,676
2107	0	12,805,048	0	0	12,805,048
2108	0	6,669,536	0	0	6,669,536
2109	0	12,613,676	0	0	12,613,676
2110	0	12,776,342	0	0	12,776,342
2111	0	12,747,636	0	0	12,747,636
2112	0	6,612,124	0	0	6,612,124
2113	0	25,050,921	0	0	25,050,921
2114	0	18,899,278	0	0	18,899,278
2115	0	14,074,926	0	0	14,074,926
2116	11,656,078	6,612,124	0	0	18,268,202
2117	0	6,581,641	0	0	6,581,641
2118	0	0	1,547,368	1,795,353	3,342,721
	\$556,318,142	\$1,079,136,533	\$66,526,518	\$1,795,353	\$1,703,776,546

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2033	\$31,076,470	\$1,703,879	\$242,314	\$0	\$33,022,663
2034	92,781,598	3,989,769	1,032,687	0	97,804,054
2035	141,808,060	4,930,504	1,628,670	0	148,367,234
2036	119,073,016	3,573,906	1,957,412	0	124,604,334
2037	71,373,222	10,199,623	1,467,374	0	83,040,219
2038	19,230,849	14,221,750	0	0	33,452,599
2039	24,647,989	87,824,337	0	0	112,472,326
2040	43,258,846	3,276,324	0	0	46,535,170
2041	11,413,185	5,691,565	13,215,752	0	30,320,501
2042	99,305	7,415,240	20,267,855	0	27,782,400
2043	46,524	7,052,463	9,495,351	0	16,594,338
2044	0	6,751,147	0	0	6,751,147
2045	0	15,960,165	0	0	15,960,165
2046	0	12,884,335	0	0	12,884,335
2047	0	12,884,335	0	0	12,884,335
2048	0	6,751,147	0	0	6,751,147
2049	0	12,884,335	0	0	12,884,335
2050	0	15,960,165	0	0	15,960,165
2051	0	15,184,335	0	0	15,184,335
2052	0	15,978,607	0	0	15,978,607
2053	0	6,732,695	0	0	6,732,695
2054	0	6,732,695	0	0	6,732,695
2055	0	15,960,165	0	0	15,960,165
2056	0	12,902,787	0	0	12,902,787
2057	0	12,884,335	0	0	12,884,335
2058	0	6,732,695	0	0	6,732,695
2059	0	12,108,525	0	0	12,108,525
2060	0	12,902,787	0	0	12,902,787
2061	0	12,884,335	0	0	12,884,335
2062	0	6,732,695	0	0	6,732,695
2063	0	25,187,635	0	0	25,187,635
2064	0	18,278,607	0	0	18,278,607
2065	0	12,884,335	0	0	12,884,335
2066	0	6,732,695	0	0	6,732,695
2067	0	6,732,695	0	0	6,732,695
2068	0	19,054,427	0	0	19,054,427
2069	0	15,960,165	0	0	15,960,165
2070	0	6,732,695	0	0	6,732,695
2071	0	6,732,695	0	0	6,732,695
2072	0	21,354,427	0	0	21,354,427
2073	0	6,732,695	0	0	6,732,695
2074	0	6,732,695	0	0	6,732,695

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2075	0	23,439,095	0	0	23,439,095
2076	0	6,751,147	0	0	6,751,147
2077	0	6,732,695	0	0	6,732,695
2078	0	22,111,805	0	0	22,111,805
2079	0	6,732,695	0	0	6,732,695
2080	0	6,751,147	0	0	6,751,147
2081	0	6,732,695	0	0	6,732,695
2082	0	20,560,165	0	0	20,560,165
2083	0	6,732,695	0	0	6,732,695
2084	0	6,751,147	0	0	6,751,147
2085	0	6,732,695	0	0	6,732,695
2086	0	6,732,695	0	0	6,732,695
2087	0	6,732,695	0	0	6,732,695
2088	0	6,751,147	0	0	6,751,147
2089	0	101,230,098	0	0	101,230,098
2090	0	6,732,695	0	0	6,732,695
2091	0	6,732,695	0	0	6,732,695
2092	0	6,751,147	0	0	6,751,147
2093	0	6,732,695	0	0	6,732,695
2094	0	6,732,695	0	0	6,732,695
2095	0	15,960,165	0	0	15,960,165
2096	0	12,902,787	0	0	12,902,787
2097	0	12,884,335	0	0	12,884,335
2098	0	6,732,695	0	0	6,732,695
2099	0	6,732,695	0	0	6,732,695
2100	0	15,960,165	0	0	15,960,165
2101	0	15,960,165	0	0	15,960,165
2102	0	15,960,165	0	0	15,960,165
2103	0	6,732,695	0	0	6,732,695
2104	0	6,751,147	0	0	6,751,147
2105	0	15,960,165	0	0	15,960,165
2106	0	12,884,335	0	0	12,884,335
2107	0	12,884,335	0	0	12,884,335
2108	0	6,751,147	0	0	6,751,147
2109	0	12,884,335	0	0	12,884,335
2110	0	12,884,335	0	0	12,884,335
2111	0	12,884,335	0	0	12,884,335
2112	0	6,751,147	0	0	6,751,147
2113	0	25,187,635	0	0	25,187,635
2114	0	19,035,985	0	0	19,035,985
2115	0	14,211,635	0	0	14,211,635
2116	0	6,751,147	0	0	6,751,147

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2117	0	6,732,695	0	0	6,732,695
2118	0	19,035,985	0	0	19,035,985
2119	0	15,960,165	0	0	15,960,165
2120	0	6,751,147	0	0	6,751,147
2121	0	6,732,695	0	0	6,732,695
2122	0	22,111,805	0	0	22,111,805
2123	0	6,732,695	0	0	6,732,695
2124	0	6,751,147	0	0	6,751,147
2125	0	22,111,805	0	0	22,111,805
2126	0	6,732,695	0	0	6,732,695
2127	0	6,732,695	0	0	6,732,695
2128	0	22,130,257	0	0	22,130,257
2129	0	6,732,695	0	0	6,732,695
2130	0	6,732,695	0	0	6,732,695
2131	0	6,732,695	0	0	6,732,695
2132	0	22,130,257	0	0	22,130,257
2133	0	6,732,695	0	0	6,732,695
2134	0	6,732,695	0	0	6,732,695
2135	0	6,732,695	0	0	6,732,695
2136	0	6,751,147	0	0	6,751,147
2137	0	6,732,695	0	0	6,732,695
2138	0	6,732,695	0	0	6,732,695
2139	0	99,190,825	0	0	99,190,825
2140	0	6,751,147	0	0	6,751,147
2141	0	6,732,695	0	0	6,732,695
2142	0	6,732,695	0	0	6,732,695
2143	0	6,732,695	0	0	6,732,695
2144	0	6,751,147	0	0	6,751,147
2145	0	15,960,165	0	0	15,960,165
2146	0	12,884,335	0	0	12,884,335
2147	0	12,884,335	0	0	12,884,335
2148	0	6,751,147	0	0	6,751,147
2149	0	6,732,695	0	0	6,732,695
2150	0	15,960,165	0	0	15,960,165
2151	0	15,960,165	0	0	15,960,165
2152	0	15,978,607	0	0	15,978,607
2153	0	6,732,695	0	0	6,732,695
2154	0	6,732,695	0	0	6,732,695
2155	0	17,287,455	0	0	17,287,455
2156	0	12,902,787	0	0	12,902,787
2157	0	12,884,335	0	0	12,884,335
2158	0	6,732,695	0	0	6,732,695

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2159	0	12,884,335	0	0	12,884,335
2160	0	12,902,787	0	0	12,902,787
2161	0	12,884,335	0	0	12,884,335
2162	0	6,732,695	0	0	6,732,695
2163	0	25,187,635	0	0	25,187,635
2164	0	19,054,427	0	0	19,054,427
2165	0	12,884,335	0	0	12,884,335
2166	0	6,732,695	0	0	6,732,695
2167	0	6,732,695	0	0	6,732,695
2168	0	19,054,427	0	0	19,054,427
2169	0	15,960,165	0	0	15,960,165
2170	0	6,732,695	0	0	6,732,695
2171	0	6,732,695	0	0	6,732,695
2172	0	22,130,257	0	0	22,130,257
2173	0	6,732,695	0	0	6,732,695
2174	0	6,732,695	0	0	6,732,695
2175	0	22,111,805	0	0	22,111,805
2176	0	6,751,147	0	0	6,751,147
2177	0	6,732,695	0	0	6,732,695
2178	0	22,111,805	0	0	22,111,805
2179	0	6,732,695	0	0	6,732,695
2180	0	6,751,147	0	0	6,751,147
2181	0	6,732,695	0	0	6,732,695
2182	0	22,111,805	0	0	22,111,805
2183	0	6,732,695	0	0	6,732,695
2184	0	6,751,147	0	0	6,751,147
2185	0	6,732,695	0	0	6,732,695
2186	0	6,732,695	0	0	6,732,695
2187	0	6,732,695	0	0	6,732,695
2188	0	6,751,147	0	0	6,751,147
2189	0	99,190,825	0	0	99,190,825
2190	0	6,732,695	0	0	6,732,695
2191	0	6,732,695	0	0	6,732,695
2192	0	6,751,147	0	0	6,751,147
2193	0	6,270,658	0	0	6,270,658
2194	0	6,653,408	0	0	6,653,408
2195	0	17,208,158	0	0	17,208,158
2196	0	13,012,555	0	0	13,012,555
2197	0	12,613,678	0	0	12,613,678
2198	0	7,036,158	0	0	7,036,158
2199	0	6,462,038	0	0	6,462,038
2200	0	15,498,128	0	0	15,498,128

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2201	0	15,880,878	0	0	15,880,878
2202	0	15,880,878	0	0	15,880,878
2203	0	6,462,038	0	0	6,462,038
2204	0	6,669,535	0	0	6,669,535
2205	0	15,880,878	0	0	15,880,878
2206	0	12,613,678	0	0	12,613,678
2207	0	12,805,048	0	0	12,805,048
2208	0	6,669,535	0	0	6,669,535
2209	0	12,613,678	0	0	12,613,678
2210	0	12,776,338	0	0	12,776,338
2211	0	12,747,638	0	0	12,747,638
2212	0	6,612,125	0	0	6,612,125
2213	0	25,050,928	0	0	25,050,928
2214	0	18,899,278	0	0	18,899,278
2215	0	12,747,638	0	0	12,747,638
2216	11,656,078	6,612,125	0	0	18,268,203
2217	0	6,653,408	0	0	6,653,408
2218	0	0	1,547,368	1,794,290	3,341,659
	\$566,465,141	\$2,358,423,972	\$50,854,783	\$1,794,290	\$2,977,538,186

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2033	\$22,183,884	\$1,703,879	\$0	\$0	\$23,887,764
2034	72,565,018	3,989,769	0	0	76,554,787
2035	25,421,983	8,484,170	0	0	33,906,153
2036	20,980,032	7,469,933	0	0	28,449,965
2037	20,922,710	7,261,286	0	0	28,183,995
2038	20,922,710	7,069,325	0	0	27,992,034
2039	18,301,770	91,623,229	0	0	109,924,999
2040	5,991,531	4,840,930	0	0	10,832,462
2041	5,975,161	5,020,645	0	0	10,995,806
2042	5,975,161	4,829,273	0	0	10,804,434
2043	5,975,161	4,637,900	0	0	10,613,061
2044	5,991,531	4,649,557	0	0	10,641,089
2045	5,975,161	4,637,900	0	0	10,613,061
2046	5,975,161	4,255,154	0	0	10,230,315
2047	5,975,161	4,255,154	0	0	10,230,315
2048	5,991,531	4,266,811	0	0	10,258,343
2049	5,975,161	4,255,154	0	0	10,230,315
2050	5,975,161	4,637,900	0	0	10,613,061
2051	5,975,161	4,637,901	0	0	10,613,062
2052	5,991,531	4,649,558	0	0	10,641,090
2053	5,975,161	4,637,900	0	0	10,613,061
2054	5,975,161	4,637,900	0	0	10,613,061
2055	5,975,161	4,637,900	0	0	10,613,061
2056	5,991,531	4,649,557	0	0	10,641,089
2057	5,975,161	4,637,900	0	0	10,613,061
2058	5,975,161	4,637,900	0	0	10,613,061
2059	5,975,161	4,637,900	0	0	10,613,061
2060	5,991,531	4,649,557	0	0	10,641,089
2061	5,975,161	4,637,900	0	0	10,613,061
2062	5,975,161	4,637,900	0	0	10,613,061
2063	5,975,161	4,637,900	0	0	10,613,061
2064	5,991,531	4,634,041	0	0	10,625,573
2065	7,667,573	0	0	0	7,667,573
2066	7,667,573	0	0	0	7,667,573
2067	7,667,573	0	0	0	7,667,573
2068	7,688,580	0	0	0	7,688,580
2069	7,667,573	0	0	0	7,667,573
2070	7,667,573	0	0	0	7,667,573
2071	7,667,573	0	0	0	7,667,573
2072	7,688,580	0	0	0	7,688,580
2073	7,667,573	0	0	0	7,667,573
2074	7,667,573	0	0	0	7,667,573

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2075	7,667,573	0	0	0	7,667,573
2076	7,688,580	0	0	0	7,688,580
2077	7,667,573	0	0	0	7,667,573
2078	7,667,573	0	0	0	7,667,573
2079	7,667,573	0	0	0	7,667,573
2080	7,688,580	0	0	0	7,688,580
2081	7,667,573	0	0	0	7,667,573
2082	7,667,573	0	0	0	7,667,573
2083	7,667,573	0	0	0	7,667,573
2084	7,688,580	0	0	0	7,688,580
2085	7,667,573	0	0	0	7,667,573
2086	7,667,573	0	0	0	7,667,573
2087	25,556,875	0	239,596	0	25,796,471
2088	56,305,869	0	1,038,690	0	57,344,559
2089	123,949,539	0	1,781,065	0	125,730,604
2090	85,816,173	0	2,393,961	1,672,615	89,882,749
2091	62,232,939	0	2,691,718	2,502,067	67,426,725
2092	14,477,672	0	302,357	281,054	15,061,084
2093	15,676,967	0	8,640,412	0	24,317,379
2094	99,305	0	21,750,002	0	21,849,307
2095	71,826	0	15,731,509	0	15,803,334
	\$903,770,535	\$242,849,678	\$54,569,310	\$4,455,737	\$1,205,645,260

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 2

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2034	\$10,524,583	\$800,696	\$0	\$0	\$11,325,279
2035	72,246,891	6,861,663	0	0	79,108,554
2036	38,795,945	6,185,160	0	0	44,981,105
2037	18,267,426	6,706,743	0	0	24,974,169
2038	18,267,426	6,514,781	0	0	24,782,207
2039	16,135,984	91,165,921	0	0	107,301,905
2040	6,128,292	4,840,930	0	0	10,969,223
2041	6,111,548	5,020,645	0	0	11,132,193
2042	6,111,548	4,829,273	0	0	10,940,821
2043	6,111,548	4,637,900	0	0	10,749,448
2044	6,128,292	4,649,557	0	0	10,777,850
2045	6,111,548	4,637,900	0	0	10,749,448
2046	6,111,548	4,255,154	0	0	10,366,702
2047	6,111,548	4,255,154	0	0	10,366,702
2048	6,128,292	4,266,811	0	0	10,395,104
2049	6,111,548	4,255,154	0	0	10,366,702
2050	6,111,548	4,637,900	0	0	10,749,448
2051	6,111,548	4,637,900	0	0	10,749,448
2052	6,128,292	4,649,558	0	0	10,777,851
2053	6,111,548	4,637,901	0	0	10,749,449
2054	6,111,548	4,637,900	0	0	10,749,448
2055	6,111,548	4,637,900	0	0	10,749,448
2056	6,128,292	4,649,557	0	0	10,777,850
2057	6,111,548	4,637,900	0	0	10,749,448
2058	6,111,548	4,637,900	0	0	10,749,448
2059	6,111,548	4,637,900	0	0	10,749,448
2060	6,128,292	4,649,557	0	0	10,777,850
2061	6,111,548	4,637,900	0	0	10,749,448
2062	6,111,548	4,637,900	0	0	10,749,448
2063	6,111,548	4,637,900	0	0	10,749,448
2064	6,128,292	4,634,041	0	0	10,762,334
2065	4,670,342	0	0	0	4,670,342
2066	4,670,342	0	0	0	4,670,342
2067	4,670,342	0	0	0	4,670,342
2068	4,683,138	0	0	0	4,683,138
2069	4,670,342	0	0	0	4,670,342
2070	4,670,342	0	0	0	4,670,342
2071	4,670,342	0	0	0	4,670,342
2072	4,683,138	0	0	0	4,683,138
2073	4,670,342	0	0	0	4,670,342
2074	4,670,342	0	0	0	4,670,342
2075	4,670,342	0	0	0	4,670,342
2076	4,683,138	0	0	0	4,683,138

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 2

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2077	4,670,342	0	0	0	4,670,342
2078	4,670,342	0	0	0	4,670,342
2079	4,670,342	0	0	0	4,670,342
2080	4,683,138	0	0	0	4,683,138
2081	4,670,342	0	0	0	4,670,342
2082	4,670,342	0	0	0	4,670,342
2083	4,670,342	0	0	0	4,670,342
2084	4,683,138	0	0	0	4,683,138
2085	4,670,342	0	0	0	4,670,342
2086	4,670,342	0	0	0	4,670,342
2087	4,670,342	0	0	0	4,670,342
2088	23,631,880	0	152,170	0	23,784,050
2089	45,175,615	0	608,816	0	45,784,431
2090	142,637,422	0	2,284,320	0	144,921,742
2091	91,138,868	0	2,818,773	2,310,128	96,267,770
2092	79,323,192	0	2,455,274	2,145,608	83,924,074
2093	20,097,964	0	11,363,655	0	31,461,619
2094	42,462	0	28,605,062	0	28,647,524
2095	30,712	0	20,689,688	0	20,720,401
2096	0	0	0	0	0
	\$836,704,137	\$233,483,052	\$68,977,759	\$4,455,737	\$1,143,620,684

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2033	\$22,183,884	\$1,703,879	\$0	\$0	\$23,887,764
2034	72,565,018	3,989,769	0	0	76,554,787
2035	25,421,983	7,718,682	0	0	33,140,665
2036	20,980,032	6,704,435	0	0	27,684,467
2037	20,922,710	6,687,168	0	0	27,609,877
2038	20,922,710	17,803,834	0	0	38,726,543
2039	18,314,517	92,148,002	0	0	110,462,519
2040	6,064,432	4,266,867	0	0	10,331,299
2041	6,047,862	4,255,208	0	0	10,303,071
2042	6,047,862	4,255,208	0	0	10,303,071
2043	6,047,862	4,255,208	0	0	10,303,071
2044	6,064,432	4,266,867	0	0	10,331,299
2045	6,047,862	4,255,208	0	0	10,303,071
2046	6,047,862	4,255,208	0	0	10,303,071
2047	6,047,862	4,255,208	0	0	10,303,071
2048	6,064,432	4,266,867	0	0	10,331,299
2049	6,047,862	4,255,208	0	0	10,303,071
2050	6,047,862	4,255,208	0	0	10,303,071
2051	6,047,862	4,255,208	0	0	10,303,071
2052	6,064,432	4,266,867	0	0	10,331,299
2053	6,047,862	4,637,954	0	0	10,685,817
2054	6,047,862	5,020,699	0	0	11,068,562
2055	6,047,862	5,020,699	0	0	11,068,562
2056	6,064,432	5,223,731	0	0	11,288,163
2057	6,047,862	4,829,327	0	0	10,877,190
2058	6,047,862	5,403,445	0	0	11,451,308
2059	6,047,862	4,829,327	0	0	10,877,190
2060	6,064,432	4,649,612	0	0	10,714,044
2061	6,047,862	5,020,699	0	0	11,068,562
2062	6,047,862	5,020,699	0	0	11,068,562
2063	6,047,862	4,829,327	0	0	10,877,190
2064	6,064,432	5,032,357	0	0	11,096,789
2065	6,047,862	5,020,699	0	0	11,068,562
2066	6,047,862	4,829,327	0	0	10,877,190
2067	6,047,862	5,020,699	0	0	11,068,562
2068	6,064,432	5,032,357	0	0	11,096,789
2069	6,047,862	4,829,327	0	0	10,877,190
2070	6,047,862	5,020,699	0	0	11,068,562
2071	6,047,862	5,020,699	0	0	11,068,562
2072	6,064,432	5,032,357	0	0	11,096,789
2073	6,047,862	5,020,699	0	0	11,068,562
2074	6,047,862	5,020,699	0	0	11,068,562

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 1

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2075	6,047,862	6,347,990	0	0	12,395,853
2076	6,064,432	5,032,357	0	0	11,096,789
2077	6,047,862	5,020,699	0	0	11,068,562
2078	7,198,929	0	0	0	7,198,929
2079	7,198,929	0	0	0	7,198,929
2080	7,218,652	0	0	0	7,218,652
2081	7,198,929	0	0	0	7,198,929
2082	7,198,929	0	0	0	7,198,929
2083	7,198,929	0	0	0	7,198,929
2084	7,218,652	0	0	0	7,218,652
2085	7,198,929	0	0	0	7,198,929
2086	7,198,929	0	0	0	7,198,929
2087	16,629,177	0	125,083	0	16,754,260
2088	56,064,486	0	851,806	0	56,916,291
2089	112,295,157	0	1,801,126	0	114,096,283
2090	97,291,550	0	2,324,556	1,326,502	100,942,608
2091	62,226,832	0	2,753,951	2,521,736	67,502,519
2092	22,631,021	0	701,692	642,525	23,975,237
2093	15,676,967	0	8,640,412	0	24,317,379
2094	99,305	0	21,750,002	0	21,849,307
2095	71,826	0	15,731,509	0	15,803,334
	\$879,111,451	\$317,886,609	\$54,680,136	\$4,490,764	\$1,256,168,959

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 2

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2034	\$10,524,583	\$800,696	\$0	\$0	\$11,325,279
2035	72,246,891	6,096,163	0	0	78,343,054
2036	38,795,944	5,419,660	0	0	44,215,603
2037	18,267,423	6,132,624	0	0	24,400,047
2038	18,267,423	17,249,290	0	0	35,516,713
2039	16,136,004	91,690,693	0	0	107,826,698
2040	6,128,422	4,266,867	0	0	10,395,289
2041	6,111,677	4,255,208	0	0	10,366,886
2042	6,111,677	4,255,208	0	0	10,366,886
2043	6,111,677	4,255,208	0	0	10,366,886
2044	6,128,422	4,266,867	0	0	10,395,289
2045	6,111,677	4,255,208	0	0	10,366,886
2046	6,111,677	4,255,208	0	0	10,366,886
2047	6,111,677	4,255,208	0	0	10,366,886
2048	6,128,422	4,266,867	0	0	10,395,289
2049	6,111,677	4,255,208	0	0	10,366,886
2050	6,111,677	4,255,208	0	0	10,366,886
2051	6,111,677	4,255,208	0	0	10,366,886
2052	6,128,422	4,266,867	0	0	10,395,289
2053	6,111,677	4,637,955	0	0	10,749,633
2054	6,111,677	5,020,699	0	0	11,132,377
2055	6,111,677	5,020,699	0	0	11,132,377
2056	6,128,422	5,223,731	0	0	11,352,153
2057	6,111,677	4,829,327	0	0	10,941,005
2058	6,111,677	5,403,445	0	0	11,515,123
2059	6,111,677	4,829,327	0	0	10,941,005
2060	6,128,422	4,649,612	0	0	10,778,034
2061	6,111,677	5,020,699	0	0	11,132,377
2062	6,111,677	5,020,699	0	0	11,132,377
2063	6,111,677	4,829,327	0	0	10,941,005
2064	6,128,422	5,032,357	0	0	11,160,779
2065	6,111,677	5,020,699	0	0	11,132,377
2066	6,111,677	4,829,327	0	0	10,941,005
2067	6,111,677	5,020,699	0	0	11,132,377
2068	6,128,422	5,032,357	0	0	11,160,779
2069	6,111,677	4,829,327	0	0	10,941,005
2070	6,111,677	5,020,699	0	0	11,132,377
2071	6,111,677	5,020,699	0	0	11,132,377
2072	6,128,422	5,032,357	0	0	11,160,779
2073	6,111,677	5,020,699	0	0	11,132,377
2074	6,111,677	5,020,699	0	0	11,132,377
2075	6,111,677	6,347,990	0	0	12,459,668
2076	6,128,422	5,032,357	0	0	11,160,779

SCHEDULE OF TOTAL ANNUAL EXPENDITURES
Prairie Island Nuclear Generating Plant Unit 2

Year	Radiological	Spent Fuel	Site Restoration	ISFSI Radiological	Yearly Total
2077	6,111,677	5,020,699	0	0	11,132,377
2078	4,095,838	0	0	0	4,095,838
2079	4,095,838	0	0	0	4,095,838
2080	4,107,059	0	0	0	4,107,059
2081	4,095,838	0	0	0	4,095,838
2082	4,095,838	0	0	0	4,095,838
2083	4,095,838	0	0	0	4,095,838
2084	4,107,059	0	0	0	4,107,059
2085	4,095,838	0	0	0	4,095,838
2086	4,095,838	0	0	0	4,095,838
2087	4,095,838	0	0	0	4,095,838
2088	17,159,142	0	103,205	0	17,262,347
2089	39,319,995	0	443,390	0	39,763,385
2090	145,727,354	0	2,465,981	0	148,193,335
2091	92,518,134	0	2,908,964	2,328,288	97,755,386
2092	79,325,447	0	2,508,642	2,162,475	83,996,564
2093	20,097,964	0	11,363,655	0	31,461,619
2094	42,462	0	28,605,062	0	28,647,524
2095	30,712	0	20,689,688	0	20,720,401
	\$841,851,473	\$308,519,969	\$69,088,586	\$4,490,764	\$1,223,950,792

January 1986 to June 2014

1. Determine Most Recent Escalation Component

	Base Conversion 1986	Value (2005 base)	4Q - 16 (Dec '05 Base)	Base Labor Adjustment Factor	Current Labor Adjustment Factor
	(1)	(2)	(3)	(4)	(5)
Labor (L)	48.1	100.00	125.7	2.08	2.61

Dept of Labor, Bureau of Labor Statistics, Employment Cost Index (NAICS), 4th Qtr 2016 (Retrieved July 2017), Private industry, Midwest region

Industrial Power (P)	114.2			211.7	1.854
Light Fuel Oil (F)	82.0			153.3	1.870

Department of Labor, Bureau of Labor Statistics, Producer Price Index Data for December 2016 (Retrieved July 2017); Industrial Power from Commodity code 0543, 500 kw demand, Midwest Region; Light Fuel Oils from Commodity code 0573

Burial (B)					
PWR - Blended					10.971
PWR - Direct					30.061
BWR - Blended					12.111
BWR - Direct					26.329

NUREG 1307, Report on Waste Burial, Revision 16 (Table 2.1 in November 2016)

2. Calculate Energy Component (E)

	Equation	Industrial Power	Light Oil	Fuel Oil	Energy Component
Energy (PWR)	= .58(P) + .42(F)	1.854		1.870	1.860
Energy (BWR)	= .54(P) + .46(F)	1.854		1.870	1.861

3. Calculate NRC Escalation Factor as of June 2017

	Labor	Energy	Burial	NRC Escalation Factor
	(L)	(E)	(B)	(6)
PWR - Blended	2.613	1.860	10.971	4.3541
PWR - Direct	2.613	1.860	30.061	8.5539
BWR - Blended	2.613	1.861	12.111	4.6050
BWR - Direct	2.613	1.861	26.329	7.7330

Notes:

- (1) = Base values from NRC Proposed Guidelines
- (2) = Conversion factor to convert from 1986 base to 2005 base.
- (3) = The most recent published value:
- (4) = (3) / (1), Labor only
- (5) = (4) * (3) for Labor, Industrial Power, and Light Fuel Oil
- (6) = (.65 x L) + (.13 x E) + (.22 x B)

January 1986 to June 2014

1. NRC Minimum Calculation in 1986 Dollars

	Equation	MWt	1986 Minimum Calculation
Monticello (BWR)	= \$104 million + (0.009 * MWt)	2004	122,036,000
Prairie Island (PWR), Unit 1	= \$75 million + (0.0088 * MWt)	1677	89,757,600
Prairie Island (PWR), Unit 2	= \$75 million + (0.0088 * MWt)	1677	89,757,600

2. NRC Minimum Calculation in 2017 Dollars - Combination of Facilities

	1986 Minimum Calculation	Escalation Rate	2017 Minimum Calculation (Blended)
Monticello (BWR)	122,036,000	4.6050	561,975,756
Prairie Island (PWR), Unit 1	89,757,600	4.3541	390,815,175
Prairie Island (PWR), Unit 2	89,757,600	4.3541	390,815,175

3. NRC Minimum Calculation in 2017 Dollars - Compact-Affiliated Facilities Only

	1986 Minimum Calculation	Escalation Rate	2017 Minimum Calculation (Direct)
Monticello (BWR)	122,036,000	7.7330	943,699,483
Prairie Island (PWR), Unit 1	89,757,600	8.5539	767,779,143
Prairie Island (PWR), Unit 2	89,757,600	8.5539	767,779,143

Xcel Energy
Spent Fuel Management Costs
60-year Decommissioning Period
DECON Method

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Schedule A.17
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(\$s in 000's)

	Monticello												
	Emergency Planning Fees	Spent Fuel Pool O&M	Spent Fuel Casks & Transfer	ISFSI Operating Costs	PHIC Payments	Security Staff Cost	Utility Staff Cost	Insurance	Property taxes	NRC ISFSI Fees	Fixed Overhead	Railroad Track Maintenance	Total
2030	1,088	288	845	37	0	0	0	0	0	0	0	0	2,258
2031	3,482	923	832	119	0	0	0	0	0	0	0	0	5,357
2032	2,957	925	831	119	0	0	0	0	0	0	0	0	4,833
2033	2,825	923	23,066	119	0	0	0	0	0	0	0	0	26,933
2034	2,825	923	66	119	0	0	0	0	0	0	0	0	3,933
2035	2,825	635	98,692	119	0	1,402	355	0	0	0	0	0	104,027
2036	1,330	0	60	118	0	4,500	1,143	0	0	0	0	0	7,151
2037	150	0	74	119	0	4,487	1,140	641	1,403	198	0	0	8,212
2038	150	0	65	119	0	4,487	1,139	793	1,659	244	21	10	8,689
2039	150	0	66	119	0	4,485	1,137	793	698	245	286	133	8,112
2040	151	0	66	119	0	4,497	1,140	796	699	245	287	133	8,134
2041	150	0	66	119	0	4,485	1,137	793	698	245	286	133	8,112
2042	150	0	66	119	0	4,485	1,137	793	698	245	286	133	8,112
2043	150	0	66	119	0	4,485	1,137	793	698	245	286	133	8,112
2044	151	0	66	119	0	4,497	1,140	796	699	245	287	133	8,134
2045	150	0	66	119	0	4,485	1,137	793	698	245	286	133	8,112
2046	150	0	66	119	0	4,485	1,137	793	698	245	286	133	8,112
2047	150	0	66	119	0	4,485	1,137	793	698	245	286	133	8,112
2048	151	0	2,721	119	0	4,497	1,140	796	699	245	287	133	10,789
2049	150	0	66	119	0	4,485	1,137	793	698	245	286	133	8,112
2050	150	0	6,039	119	0	4,485	1,137	793	698	245	286	133	14,085
2051	150	0	6,039	119	0	4,485	1,137	793	698	245	286	133	14,085
2052	151	0	9,489	119	0	4,497	1,140	796	699	245	287	133	17,557
2053	150	0	12,077	119	0	4,485	1,137	793	698	245	286	133	20,122
2054	150	0	6,902	119	0	4,485	1,137	793	698	245	286	133	14,947
2055	150	0	11,214	119	0	4,485	1,137	793	698	245	286	133	19,260
2056	151	0	12,939	119	0	4,497	1,140	796	699	245	287	133	21,007
2057	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2058	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046

Xcel Energy
Spent Fuel Management Costs
60-year Decommissioning Period
DECON Method

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(\$s in 000's)

Monticello													
	Emergency Planning Fees	Spent Fuel Pool O&M	Spent Fuel Casks & Transfer	ISFSI Operating Costs	PIIC Payments	Security Staff Cost	Utility Staff Cost	Insurance	Property taxes	NRC ISFSI Fees	Fixed Overhead	Railroad Track Maintenance	Total
2059	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2060	151	0	(0)	119	0	4,497	1,140	796	699	245	287	133	8,068
2061	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2062	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2063	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2064	151	0	(0)	119	0	4,497	1,140	796	699	245	287	133	8,068
2065	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2066	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2067	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2068	151	0	(0)	119	0	4,497	1,140	796	699	245	287	133	8,068
2069	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2070	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2071	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2072	151	0	(0)	119	0	4,497	1,140	796	699	245	287	133	8,068
2073	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2074	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2075	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2076	151	0	(0)	119	0	4,497	1,140	796	699	245	287	133	8,068
2077	150	0	0	119	0	4,485	1,137	793	698	245	286	133	8,046
2078	150	0	1,912	119	0	4,486	1,138	794	567	360	286	133	9,944
2079	150	0	2,295	119	0	4,486	1,138	794	567	360	286	133	10,327
2080	151	0	1,912	119	0	4,498	1,141	796	569	361	287	133	9,966
2081	150	0	1,912	119	0	4,486	1,138	794	567	360	286	133	9,944
2082	150	0	1,912	119	0	4,486	1,138	794	567	360	286	133	9,944
2083	150	0	2,295	119	0	4,486	1,138	794	567	360	286	133	10,327
2084	151	0	1,912	119	0	4,498	1,141	796	569	361	287	133	9,966
2085	150	0	1,912	119	0	4,486	1,138	794	567	360	286	133	9,944
2086	150	0	1,912	119	0	4,486	1,138	794	567	360	286	133	9,944
2087	150	0	2,295	119	0	4,486	1,138	794	567	360	286	133	10,327
2088	151	0	4,567	119	0	4,498	1,141	796	569	361	287	133	12,621
2089	150	0	1,912	119	0	4,486	1,138	794	567	360	286	133	9,944
2090	150	0	764	119	0	4,486	1,138	794	567	360	286	133	8,796
2091	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	25,461	4,617	220,127	7,166	0	248,276	62,963	42,723	37,661	14,674	14,898	6,912	685,479

From Schedule A.02_Monticello 60-year for DECON Spent Fuel Cash Flows 685,479

Prairie Island Unit 1												
Emergency Planning Fees	Spent Fuel Pool O&M	Spent Fuel Casks & Transfer	ISFSI Operating Costs	PIIC Payments	Security Staff Cost	Utility Staff Cost	Insurance	Property taxes	NRC ISFSI Fees	Fixed Overhead	Railroad Track Maintenance	Total
2030	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	696	182	0	23	802	0	0	0	0	0	0	1,704
2034	1,765	461	6	59	1,698	0	0	0	0	0	0	3,990
2035	1,451	462	1,709	59	1,250	0	0	0	0	0	0	4,930
2036	1,416	463	385	60	1,250	0	0	0	0	0	0	3,574
2037	1,412	307	381	60	1,250	0	0	0	0	0	0	3,410
2038	1,412	0	11,500	59	1,250	0	0	0	0	0	0	14,222
2039	1,412	0	86,205	59	1,250	0	97	0	0	0	0	89,024
2040	885	0	(2)	59	1,250	0	568	0	0	0	0	2,760
2041	75	0	13	59	1,250	1,495	569	182	1,460	79	0	5,183
2042	75	0	0	59	1,250	2,302	569	281	2,248	122	0	6,907
2043	75	0	(2)	59	1,250	2,302	569	281	1,730	153	93	6,546
2044	75	0	3	60	1,250	2,309	570	282	1,273	180	176	6,244
2045	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2046	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2047	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2048	75	0	3	60	1,250	2,309	570	282	1,273	180	176	6,244
2049	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2050	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2051	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2052	75	0	3	60	1,250	2,309	570	282	1,273	180	176	6,244
2053	75	0	382	59	1,250	2,302	569	281	1,269	180	175	6,609
2054	75	0	765	59	1,250	2,302	569	281	1,269	180	175	6,992
2055	75	0	765	59	1,250	2,302	569	281	1,269	180	175	6,992
2056	75	0	959	60	1,250	2,309	570	282	1,273	180	176	7,201
2057	75	0	573	59	1,250	2,302	569	281	1,269	180	175	6,801
2058	75	0	1,147	59	1,250	2,302	569	281	1,269	180	175	7,375

Prairie Island Unit 1													
	Emergency Planning Fees	Spent Fuel Pool O&M	Spent Fuel Casks & Transfer	ISFSI Operating Costs	PIIC Payments	Security Staff Cost	Utility Staff Cost	Insurance	Property taxes	NRC ISFSI Fees	Fixed Overhead	Railroad Track Maintenance	Total
2059	75	0	573	59	1,250	2,302	569	281	1,269	180	175	66	6,801
2060	75	0	385	60	1,250	2,309	570	282	1,273	180	176	66	6,627
2061	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2062	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2063	75	0	573	59	1,250	2,302	569	281	1,269	180	175	66	6,801
2064	75	0	768	60	1,250	2,309	570	282	1,273	180	176	66	7,009
2065	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2066	75	0	573	59	1,250	2,302	569	281	1,269	180	175	66	6,801
2067	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2068	75	0	768	60	1,250	2,309	570	282	1,273	180	176	66	7,009
2069	75	0	573	59	1,250	2,302	569	281	1,269	180	175	66	6,801
2070	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2071	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2072	75	0	768	60	1,250	2,309	570	282	1,273	180	176	66	7,009
2073	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2074	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2075	75	0	2,092	59	1,250	2,302	569	281	1,269	180	175	66	8,320
2076	75	0	768	60	1,250	2,309	570	282	1,273	180	176	66	7,009
2077	76	0	750	59	1,250	2,220	548	271	1,224	179	169	67	6,814
2078	0	0	0	0	0	0	0	0	0	0	0	0	0
2079	0	0	0	0	0	0	0	0	0	0	0	0	0
2080	0	0	0	0	0	0	0	0	0	0	0	0	0
2081	0	0	0	0	0	0	0	0	0	0	0	0	0
2082	0	0	0	0	0	0	0	0	0	0	0	0	0
2083	0	0	0	0	0	0	0	0	0	0	0	0	0
2084	0	0	0	0	0	0	0	0	0	0	0	0	0
2085	0	0	0	0	0	0	0	0	0	0	0	0	0
2086	0	0	0	0	0	0	0	0	0	0	0	0	0
2087	0	0	0	0	0	0	0	0	0	0	0	0	0
2088	0	0	0	0	0	0	0	0	0	0	0	0	0
2089	0	0	0	0	0	0	0	0	0	0	0	0	0
2090	0	0	0	0	0	0	0	0	0	0	0	0	0
2091	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	13,235	1,875	119,500	2,636	56,249	84,353	21,701	10,296	48,579	6,477	6,057	2,292	373,250

Prairie Island Unit 2												
Emergency Planning Fees	Spent Fuel Pool O&M	Spent Fuel Casks & Transfer	ISFSI Operating Costs	PIIC Payments	Security Staff Cost	Utility Staff Cost	Insurance	Property taxes	NRC ISFSI Fees	Fixed Overhead	Railroad Track Maintenance	Total
2030	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	305	80	0	10	406	0	0	0	0	0	0	801
2035	1,765	461	1,717	59	2,094	0	0	0	0	0	0	6,096
2036	1,533	463	383	59	1,250	0	0	0	0	0	0	3,689
2037	1,412	462	383	59	1,250	0	0	0	0	0	0	3,566
2038	1,412	241	11,499	59	1,250	0	0	0	0	0	0	14,462
2039	1,412	0	86,205	59	1,250	0	97	0	0	0	0	89,024
2040	885	0	(2)	59	1,250	0	568	0	0	0	0	2,760
2041	75	0	13	59	1,250	1,495	569	182	1,460	79	0	5,183
2042	75	0	0	59	1,250	2,302	569	281	2,248	122	0	6,907
2043	75	0	(2)	59	1,250	2,302	569	281	1,730	153	93	6,546
2044	75	0	3	60	1,250	2,309	570	282	1,273	180	176	6,244
2045	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2046	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2047	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2048	75	0	3	60	1,250	2,309	570	282	1,273	180	176	6,244
2049	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2050	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2051	75	0	(1)	59	1,250	2,302	569	281	1,269	180	175	6,227
2052	75	0	3	60	1,250	2,309	570	282	1,273	180	176	6,244
2053	75	0	382	59	1,250	2,302	569	281	1,269	180	175	6,609
2054	75	0	765	59	1,250	2,302	569	281	1,269	180	175	6,992
2055	75	0	765	59	1,250	2,302	569	281	1,269	180	175	6,992
2056	75	0	959	60	1,250	2,309	570	282	1,273	180	176	7,201
2057	75	0	573	59	1,250	2,302	569	281	1,269	180	175	6,801
2058	75	0	1,147	59	1,250	2,302	569	281	1,269	180	175	7,375

Prairie Island Unit 2													
	Emergency Planning Fees	Spent Fuel Pool O&M	Spent Fuel Casks & Transfer	ISFSI Operating Costs	PIIC Payments	Security Staff Cost	Utility Staff Cost	Insurance	Property taxes	NRC ISFSI Fees	Fixed Overhead	Railroad Track Maintenance	Total
2059	75	0	573	59	1,250	2,302	569	281	1,269	180	175	66	6,801
2060	75	0	385	60	1,250	2,309	570	282	1,273	180	176	66	6,627
2061	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2062	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2063	75	0	573	59	1,250	2,302	569	281	1,269	180	175	66	6,801
2064	75	0	768	60	1,250	2,309	570	282	1,273	180	176	66	7,009
2065	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2066	75	0	573	59	1,250	2,302	569	281	1,269	180	175	66	6,801
2067	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2068	75	0	768	60	1,250	2,309	570	282	1,273	180	176	66	7,009
2069	75	0	573	59	1,250	2,302	569	281	1,269	180	175	66	6,801
2070	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2071	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2072	75	0	768	60	1,250	2,309	570	282	1,273	180	176	66	7,009
2073	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2074	75	0	765	59	1,250	2,302	569	281	1,269	180	175	66	6,992
2075	75	0	2,092	59	1,250	2,302	569	281	1,269	180	175	66	8,320
2076	75	0	768	60	1,250	2,309	570	282	1,273	180	176	66	7,009
2077	76	0	750	59	1,250	2,220	548	271	1,224	179	169	67	6,814
2078	0	0	0	0	0	0	0	0	0	0	0	0	0
2079	0	0	0	0	0	0	0	0	0	0	0	0	0
2080	0	0	0	0	0	0	0	0	0	0	0	0	0
2081	0	0	0	0	0	0	0	0	0	0	0	0	0
2082	0	0	0	0	0	0	0	0	0	0	0	0	0
2083	0	0	0	0	0	0	0	0	0	0	0	0	0
2084	0	0	0	0	0	0	0	0	0	0	0	0	0
2085	0	0	0	0	0	0	0	0	0	0	0	0	0
2086	0	0	0	0	0	0	0	0	0	0	0	0	0
2087	0	0	0	0	0	0	0	0	0	0	0	0	0
2088	0	0	0	0	0	0	0	0	0	0	0	0	0
2089	0	0	0	0	0	0	0	0	0	0	0	0	0
2090	0	0	0	0	0	0	0	0	0	0	0	0	0
2091	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	11,509	1,707	119,500	2,563	55,000	84,353	21,701	10,296	48,579	6,477	6,057	2,292	370,034

The Commission's Order from the last triennial directed the Company to "develop a 60, 100 and 200-year plan for the City of Red Wing to enable Xcel to build, improve, communicate, and share an understanding of the long-term safety-related costs of spent fuel storage on host communities."

We value our relationship with our host communities and meet with a subset of the city council each quarter to keep them informed of operations as well as long term plans including eventual decommissioning. Consistent with our past practice, we have continued to have discussions with our host communities regarding potential costs and other concerns arising from the storage of used nuclear fuel following the cessation of operations at our nuclear facilities. We understand from these discussions and from the City of Red Wing's comments in our last triennial that it continues to have concerns regarding the need for public safety services in connection with the long-term storage of spent fuel after the plant's retirement. As discussed in our last triennial, we will continue to have appropriate on-site radiological emergency plans in place during the ISFSI management and decommissioning period. And while we certainly appreciate the emergency response support we receive from our local communities during plant operations, current NRC guidance indicates that off-site radiological emergency support will not be required after the plants cease operations and nuclear fuel is moved to dry storage.¹

Additionally—with the exception of radiological issues—the Prairie Island Plant and ISFSI are no different from any other industrial facility when it comes to public and emergency services. Nearly all special costs incurred by the City for radiological emergency preparedness—such as costs for emergency planning, training, and equipment—are reimbursed by the state under the Minnesota Emergency Management Act (MEMA). Under MEMA, Xcel Energy pays quarterly assessments

¹ In late 2014, the NRC granted Kewaunee Nuclear Plant an exemption from the emergency planning requirements for an operating nuclear facility. As part of that exemption, Kewaunee will no longer be required to maintain offsite radiological emergency preparedness plans for the 10-mile emergency planning zone. The exemption package for Kewaunee was issued October 27, 2014 and is available in the NRC's ADAMS database under accession number ML14261A223. In addition, the NRC held a meeting on April 23, 2015 with members of the NEI Emergency Preparedness Decommissioning Task Force to discuss issues related to potential changes to a licensee's emergency plan, based on the requirements of Section 50.47(b) of Title 10 of the Code of Federal Regulations and Appendix E to Part 50, following a decision to permanently cease operation and permanently remove fuel from the reactor vessel in accordance with 10 CFR 50.82(a).

to the Minnesota Division of Emergency Management to cover emergency response preparedness costs in the event of a radiological incident for the Prairie Island and Monticello nuclear facilities. Thus, Red Wing receives—and will continue to receive—funding for radiological emergency preparedness, including expenses for planning, training, drills/exercises, and equipment. The ISFSI will continue to be monitored and regulated per federal and state requirements.

That said, we do want to foster a shared understanding between the Company and Red Wing regarding any long-term safety-related issues in connection with the ISFSI following closure of the plant. Under current federal rules, after permanent shut down, the plant must submit written certification of permanent cessation of operations to NRC within 30 days. Within 2 years after certification of permanent closure, Xcel Energy will submit a post shut down decommissioning activities report (PSDAR) including things that describe activities and schedules during decommissioning. That report is available for public review and comments along with public hearings. As part of that process, three years prior to plant shutdown, we propose to work with the city to develop a safety plan that would outline responsibilities and coordinated efforts for response once we get to ISFSI only.

We believe we can learn best practices and insight from the plants and host communities currently going through decommissioning. To that end, we are proposing to facilitate an ongoing dialogue between the City of Red Wing and host communities in other parts of the country to assist the City in developing a better understanding of the issues facing communities near standalone ISFSI's after plant shutdown and decommissioning. We have discussed this plan with the City of Red Wing and provided contacts to other city officials who host shut down plants.

We look forward to continued dialogue with our host communities throughout plant operations and into decommissioning.

Introduction

The escalation rate for decommissioning costs is an important element in determining the appropriate investment strategy, funding contributions, and the computation of the annual nuclear decommissioning external sinking fund accrual. This rate is used to inflate the 2017 decommissioning cost estimate out to the time that expenditures are predicted to occur. Since the decommissioning costs were provided by TLG in 2017 dollars (i.e., they are real costs), the escalation rate considers only the projected increases in costs from 2017 out to the estimated years of the final decommissioning expenditures. To arrive at these projections, long-range inflation and escalation assumptions are independently provided by Goldman Sachs Asset Management (GSAM).

Economic Forecast

The trend projection used for escalation is a baseline scenario based on a steady long-term real Gross Domestic Product (GDP) growth of 2.0 percent. The projection assumes that the economy suffers no major long-term mishaps, but grows smoothly, in the sense that actual output follows potential output relatively closely. This projection is best described as depicting the assumed mean of all possible paths that the economy could follow in the absence of major long-term disruptions. Such disruptions include large oil price shocks, untoward and persistent swings in macroeconomic policy, or excessively rapid increases in demand. The trend projection can be considered an unbiased reflection of the future performance of the economy. The real GDP forecast of 2.0 percent is slightly below the 3.2 percent average since 1947.

For the 60-Year Scenario, the 2017 decommissioning cost for Monticello and Prairie Island generating plants depict an overall expenditure period from 2033 to 2078 for the Prairie Island plant and from 2030 to 2091 for the Monticello plant. The expenditure pattern for this scenario requires the estimation of an escalation rate to 2091.

Inflation Factors

Inflation is the decrease in the purchasing power of money or the increase in the prices of goods and services. However, decommissioning is a unique combination of functions with many operations that are not performed often in

industry, and it may be more consistent to use a decommissioning-specific inflation factor rather than a general rate of inflation.

GSAM has refined the analysis surrounding the calculation of the escalation rate and believes its methodology provides an appropriate estimate. TLG provides a detailed decommissioning cost estimate that is site specific for the units at Monticello and Prairie Island. These site-specific decommissioning cost components need only be linked with appropriate escalation.

Escalation is broken down into two components: inflation and non-inflation escalation. Non-inflation escalation reflects idiosyncratic costs for decommissioning nuclear power plants, above and beyond the escalation associated with inflation.

The long-term escalation rates used in this analysis are as follows

Escalation Component	Trend Projection
Inflation	1.85%
Non-inflation escalation (Non-labor costs)	1.00%
Total escalation (Non-labor costs)	2.85%
Non-inflation escalation (Labor costs)	2.20%
Total escalation (Labor costs)	4.05%

Long-term expected inflation is assumed to be 1.85 percent, which is estimated from the expected inflation implied in long-term US treasury rates. The long-term risk-free (treasury) rate is observed to be 2.84 percent and the observed long-term Treasury Inflation Protected Securities (TIPS) yield (proxy for assuming the long-term real rate of interest) is 0.99 percent. This implies expected inflation of 1.85 percent. Non-inflation escalation is assumed to be 1.00 percent for non-labor costs, but 2.20% for labor costs.

The overall escalation rates in the above table should be compared with the 4.36 percent escalation rate in the 2014 analysis, 3.63 percent escalation rate in the 2011 analysis and the escalation rate of 2.89 percent from the 2008 analysis.

Decommissioning Cost Breakdown and Escalation

GSAM related the calculation of the escalation rate to the detailed cost categories provided by TLG. The TLG cost estimates are divided into five components or categories: labor, equipment & materials, energy, LLRW

disposal, and other. GSAM began its forecast by separating labor from the other four categories of costs.

Inflation is the general increase in all prices across the economy. If all costs in every industry were analyzed, in aggregate they must increase by inflation. Therefore, an assumption of costs growing by more than inflation requires that other costs somewhere are growing less. We assume that the non-labor parts of the costs grow at one percent more than inflation. In general, this increase would constitute a conservative assumption. However, given regulatory uncertainty and the complexities of forecasting technical change, the assumption that other costs grow faster than inflation seems reasonable. Historically, the escalation of nuclear decommissioning costs based on NRC filings and on engineer reports as reported in the Callan study¹ appears to have been substantially greater than inflation, by perhaps 4% - 5%.

According to economic theory, labor costs increase by inflation plus productivity (merit). We have assumed merit increases are 1.2 percent per year, consistent with a 2.00 percent long-term real GDP growth and an assumption that labor productivity accounts for 60 percent of GDP growth. Labor productivity has varied since 1950 between 60 and 66 percent.

In the 2014 triennial filing, an average escalation rate was calculated and used to escalate all costs based on the percentage of costs coming from labor. In the 2017 triennial filing, the two different escalation rates are being applied to labor and non-labor costs separately, which should be more precise than the previous approach. The 2017 triennial filing contains an additional third category for the Prairie Island Indian Community (PIIC) payments because they are determined by a settlement agreement that does not contain a provision for escalation beyond their current nominal amounts. These Labor, Non-Labor, and PIIC groups of cash flows are shown separately on Schedule F for the 2017 filing based upon the respective escalation rate applied.

Application of the Escalation Rate

A critical aspect of the valuation procedure is to ensure that assumptions are consistent between asset and liability growth. The analysis assumes that:

$$\text{Expected cost (liability) growth} = \text{inflation} + \text{non-inflation escalation}$$

¹ Callan 2017 Nuclear Decommissioning Funding Study

$$\text{Expected pre-tax asset returns} = \text{inflation} + \text{real interest rate} + \text{risk premium}$$

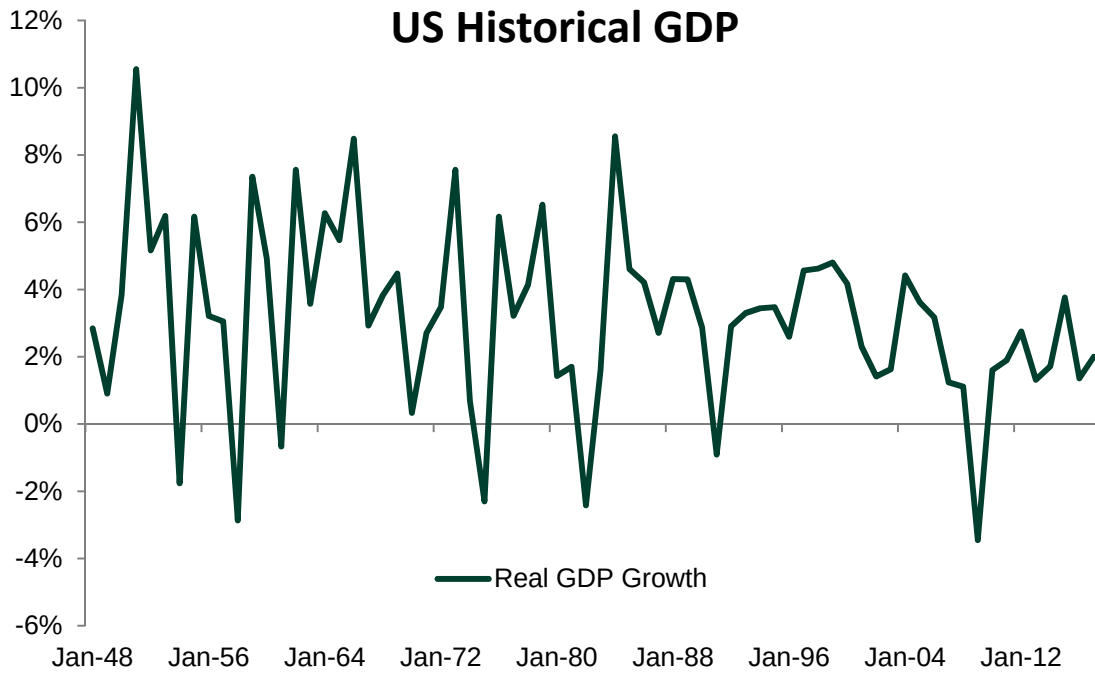
Note that inflation increases both pre-tax asset returns and decommissioning costs (i.e., the liability) equally. Thus, in the absence of taxes, inflation would be neutral to the valuation, which is consistent with economic theory based on real liability cash flows. The introduction of taxes, however, changes the analysis somewhat. Taxation means that lower inflation helps improve funded status, as the reduction in liability escalation will exceed the reduction in the after-tax asset return.

The other variables, however, have major implications for the analysis, since they are not offset in the same way as inflation. In general, the most important variables are non-inflation escalation, the real rate of interest, and the risk premium associated with the growth portfolio assets.

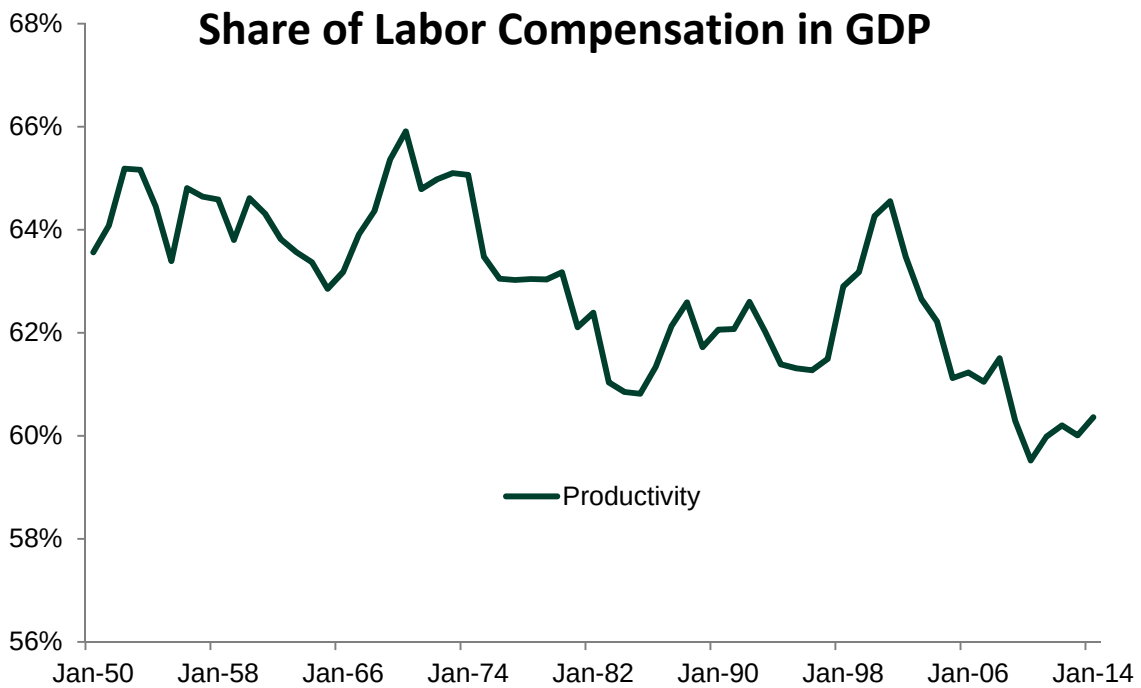
Historical Real GDP and Labor Productivity

In order to provide some context for the escalation assumptions presented above, below we present charts of historical real GDP and labor productivity for the US economy.

Analysis indicates that the real GDP growth assumption of 2.0 percent and labor productivity assumption of 60% are reasonable long-term forecasts.



Source: St. Louis Fed



Source: St. Louis Fed

Background

Per Commission Orders, beginning with Docket No. E002/D-86-604 and through subsequent dockets, the Company is required to review the financial parameters, the funding methodology, and cost estimate every three years. In between triennial filings, the Company submits an Informational Letter annually discussing NDT performance.

Since the nuclear power plants deliver power across state lines, each state is responsible for its share of the plants' ownership/use, and as such, its share of decommissioning cost. Based upon the demand of Minnesota Retail customers, Xcel Energy estimates that Minnesota's usage of the plants is 73.4886 percent. However, the engineering reports and asset-liability analysis, which use the engineering reports, do not distinguish between jurisdictions. Likewise, the analyses referred to in this schedule are performed on a total plant basis, and the figures (assets, liabilities, funded status, and expected contributions) are allocated to Minnesota by multiplying figures by 73.4886 percent.

There are references in this schedule to both the total across all jurisdictions (Total Company) and the MN Jurisdiction for various figures. References to the MN jurisdiction generally correspond to the Total Company multiplied by 73.4886 percent.

Recent Portfolio Updates

As discussed in previous triennial dockets, the Company's NDT Committee routinely evaluates both the NDT's performance and the overall investment strategy for the NDT (including its asset allocation), and it revises both the strategy and allocation as necessary. Following a hearing on the Company's 2016 Annual Informational Report, the Commission's issued an order in February 2017 requiring Xcel Energy to re-evaluate the investment mix for the NDT with the purpose of reducing the NDT's investment management fees and increasing the annual return on its investment portfolio.

With this Order in mind, the NDT Committee's most recent investment strategy review focused on the following objectives:

1. The desire for higher expected portfolio returns
2. The desire for lower investment manager fees
3. The desire for a simplified portfolio with fewer asset classes

As part of the investment strategy review, the company considered portfolio options that shifted NDT objectives slightly from liability matching characteristics such as inflation sensitivity to instead focus on lower cost, more traditional investments. To this end, the NDT's investment in commodities was removed from the portfolio.

The company also re-evaluated the diversifying assets included in the portfolio, such as the hedge fund investments. Consistent with the objective of reducing investment manager fees and simplifying the portfolio, hedge funds were removed.

We believe these updates to the asset mix achieve the objectives established by the Commission. The expected portfolio return increases; expected manager fees decline; and there are two fewer line items in the portfolio, all at a similar risk profile. The tradeoff is that the portfolio has a larger allocation to fixed income investments, and will likely be more closely tied to movements in interest rates. That said, we believe this tradeoff is reasonable and in the best interests of our customers.

The 2016 and updated 2017 target asset allocations are included below for comparison:

Portfolio Line Item	2016 Target	Updated 2017 Target
Total Equity	60.0%	60.0%
Private Equity	10.0%	10.0%
Public Equity	50.0%	50.0%
US All Cap Equity	26.0%	25.8%
Non-US Developed Equity	14.0%	14.1%
Emerging Markets Equity	10.0%	10.1%
Fixed Income	17.5%	30.0%
Investment Grade Fixed Income	5.0%	12.1%
High Yield Fixed Income	8.5%	10.0%
Emerging Market Debt	4.0%	7.9%
Hedge Funds	7.5%	0.0%
Private Real Estate	10.0%	10.0%
Real Assets (Commodities)	5.0%	0.0%
Cash	0.0%	0.0%
Total	100.0%	100.0%

Trustee

BNY Mellon is the trustee for Xcel Energy's three external nuclear decommissioning Qualified Trusts (in aggregate the NDT). The primary duty of the trustee is the safe custody of its assets including handling the settlement of all purchases and sales, whether placed by the trustee or by an independent investment manager. The trustee has limited investment duties other than the responsibility for keeping cash balances temporarily invested. Other duties include paying income taxes on the earnings of the Qualified Trusts, paying invoices for services for the trust and investment managers, conducting investment performance reporting, and keeping accurate records of all of its activities with respect to the Qualified Trusts.

Investment Managers

Following regulatory approval of the life extension of the Monticello and Prairie Island nuclear generating plants, the Xcel Energy's NDT portfolio was updated to reflect a longer time horizon and a more diversified, higher risk, long-term investment strategy.

Following the investment strategy review conducted ahead of the 2017 triennial filing, three investment managers were selected for removal from the portfolio by 2017 year-end, at which point the target allocation will include eight investment managers covering eight asset categories. Those asset managers and mandates include:

1. StepStone Group manages the private equity component of the portfolio.
2. Parametric Portfolio Advisors, a subsidiary of Eaton Vance Management, manages the U.S. equity component of the portfolio, a portion of the non-U.S. developed market equity component of the portfolio, and the emerging markets equity component of the portfolio (distributed through Eaton Vance Management). Parametric utilizes tax-efficient strategies with respect to the whole trust.
3. Marathon International manages a portion of the non-U.S. developed market equity component of the portfolio
4. First Principles Capital Management manages the domestic investment grade fixed income component of the portfolio.
5. Eaton Vance Management manages the high yield fixed income component of the portfolio.

6. Wellington Management Company manages a portion of the emerging markets fixed income component of the portfolio.
7. Marathon Asset Management manages a portion of the emerging markets fixed income component of the portfolio.
8. The Townsend Group manages the private real estate component of the portfolio.

Although the trusts are not subject to the Employee Retirement Income Security Act (ERISA), the company uses fiduciary standards similar to those imposed by ERISA for the management of the Trusts. A fiduciary as defined by the ERISA is any person who:

1. Exercises any discretionary control over the management of a plan or the management or disposition of its assets;
2. Renders investment advice for a fee with respect to the funds or property of a plan or has the authority to do so; or
3. Has any discretionary authority or responsibility in the administration of a plan.

Although Xcel Energy has established the general guidelines in the investment advisory contracts, the Company does not direct the purchase of individual investments. The investment managers, however, being fiduciaries to the NDT, must act in the best interests of the NDT.

Earnings Evaluation

When making comparisons between market value and book value (original cost), the current market value of the Qualified Trusts less an allowance for assumed taxes is used because it represents the value of the securities if they were sold today. For accounting purposes, Xcel Energy records the actual purchase price of the investments. Quarterly, a market value adjustment journal entry is made to book any unrealized gains or losses to special regulatory accounts per SFAS No. 115, *Accounting for Certain Investments in Debt and Equity Securities* (ASC 320 *Investments-Debt and Equity Securities*). The difference between market and book values represents the unrealized gains or losses. In addition it should be noted that trustee fees, investment management fees, and income taxes also are paid from the Qualified Trusts, thereby impacting overall fund performance.

The trustee statements for the Qualified Trusts are a part of Schedule E and show the current holdings for the Qualified Trusts by operating unit and investment manager.

Benchmark Portfolio Performance

It is standard practice in the investment industry to measure the performance of a diversified portfolio, like the NDT, by identifying benchmarks that are representative of each asset class comprising the portfolio, and then to benchmark the total portfolio to the weighted sum of the individual benchmarks.

The updated 2017 target asset allocation and associated benchmarks are included below:

Portfolio Line Item	Updated 2017 Target	Benchmark (BM)
Total Equity	60.0%	Weighted average of equity BMs:
Private Equity	10.0%	Cambridge PE (1Q lagged)
US All Cap Equity	25.8%	Russell 3000
Non-US Developed Equity	14.1%	MSCI EAFE ND
Emerging Markets Equity	10.1%	MSCI EM ND
Fixed Income	30.0%	Weighted average of fixed income BMs:
		75% Barclays Investment Grade Corporate Index, 25% Barclays U.S. TIPS 10+ year Index, 50% Bloomberg 20yr ZC Inflation Swap Overlay
Investment Grade Fixed Income	12.1%	
High Yield Fixed Income	10.0%	BofA ML US High Yield
Emerging Market Debt	7.9%	JPM EM Bond Index GD
Private Real Estate	10.0%	NCREIF - ODCE (1Q lagged)
Cash	0.0%	Fed funds effective
Overall fund benchmark:	100.0%	Weighted average of all portfolio BMs

The focus of performance evaluation for the NDT should be at the overall fund benchmark level, given the portfolio is composed of several investment managers and assets classes that are designed to work together on the whole. The overall fund benchmark is comprised of the actual weights of each individual asset class benchmark as shown in the table above.

Both the performance of Xcel Energy's NDT asset portfolio and the performance of the weighted average overall fund benchmark are calculated by the trustee - an independent third party. Since benchmarks will be changed or updated over time,

Xcel Energy will update the Commission with respect to future modifications as they become necessary.

Analytical Method

There are two principal components to determining the overall strategy for the NDT:

1. Investment strategy (*i.e.*, the composition of the investment portfolio); and
2. Contributions strategy, (*i.e.*, the annual annuity payment amount required to fund the decommissioning costs).

First, the liability is calculated based on the projected decommissioning costs and the projected escalation of these costs through time. The valuation of the liability involves the following steps:

- i. obtaining the current decommissioning costs from TLG in real dollars;
- ii. escalation of the real decommissioning cash flows to account for realized and expected future inflation and non-inflation escalation; and
- iii. calculation of the present value of the escalated cash flows back to the valuation date, using the expected return on assets as the discount rate. For this analysis, the valuation date is June 30, 2017.

Second, the projected liability is compared to the projected value of the assets (investments) net of an allowance for taxes of the NDT.

Method – Determining Investment Strategy

In light of the benefits of the Energy Policy Act of 1992 for nuclear decommissioning trust investment management, the Company has established a nuclear decommissioning investment policy with the goal to maximize after-tax portfolio returns and minimize aggregate portfolio risk for external fund investing. This policy was approved in the 1993 filing. Accomplishing this goal requires finding the combination of assets that optimizes the after-tax risk/return characteristics of the fund which leads to full funding in the expected case without an increase in contributions.

GSAM was engaged by the Company to recommend an appropriate investment strategy for trust assets intended for the eventual decommissioning of the Prairie Island and Monticello nuclear generating plants.

This process is called asset allocation optimization. Different mixes of assets can produce hundreds, or even thousands, of alternative combinations of risk and returns. As a result, asset allocation techniques have been developed to evaluate the various possible asset mixes and determine those combinations that are likely to deliver optimal performance in terms of risk and return.

This process has been used to perform a long-term optimization of the asset allocation for the Company's investments. In any investment there is always a trade-off between risk and the expected rate of return on that investment. Typically, strategies with higher expected returns also come with higher risk and vice versa. The goal is to optimize the trade-off between risk and return over the long term. If on the one hand too little risk is taken, then there is a significant chance that the trust remains underfunded, necessitating very large contributions into the trust in later years. If on the other hand too much risk is taken, there is a risk of significant underfunding of the NDT in the future, or of overfunding of the NDT, which because of the difficulty of removing assets from the Qualified Trust is also undesirable.

Method – Determining Contributions

Contributions are calculated in terms of the annual annuity payment amounts required to fund the difference between liabilities (the present value of decommissioning cash flows) and the projected asset level at the start of decommissioning.

The projected asset level in the future is calculated by applying the expected asset returns at any point in time to the pool of assets.

In the analysis, the liabilities are calculated as the present value of all the decommissioning costs. The present value is calculated in a two-stage process by:

1. Escalating the real decommissioning cash flows by the escalation factors discussed in Schedule C.

2. Discounting the escalated cash flows using the expected after-tax return on the asset portfolio.

As a result, the present value of the liabilities will depend on the escalation of the decommissioning costs and the expected return of the chosen investment portfolio. Because inflation impacts both the escalation of cash flows and the pre-tax discount rate, it only has a small impact on the value of the liabilities from the tax effects of changed inflation assumptions.

A measure of the degree to which assets will be able to meet the decommissioning cost liabilities is the funded status which is the ratio of the value of assets net of assumed taxes to the value of liabilities, expressed as a percentage.

Assumptions – Overview

The assumption set that goes into the process involves three different types of assumptions which are developed in a consistent manner:

- *Investment assumptions.* These include long-term expected returns, volatilities (standard deviations of returns) and correlations for different types of assets.
- *Other economic assumptions.* These include assumptions for the long-term inflation rate and the long-term escalation of decommissioning costs.
- *Tax assumptions.* These include assumptions for state and federal tax rates and deductibility.

Investment and Economic Assumptions

The development of consistent investment assumptions goes hand-in-hand with the development of other economic assumptions about inflation, interest rates, GDP growth, etc.

The return assumptions for each type of asset represent expected market returns for that asset class on a forward-looking basis. The assumptions reflect a blend of rigorous analysis of historical performance and the forward looking views of the financial markets, as revealed through the yields on long term bonds, the price-earnings ratios of the major stock market indices, implied inflation expectations in TIPS, etc.

This methodology will produce more conservative expected rates of return than an analysis that looks simply at historical averages. The important distinction is that, in using this methodology, the expected asset return is tied to the inflation rate and overall risk-free rates, so at lower inflation and interest rates investors require lower rates of return. Current markets indicate much lower expected inflation over even long-term horizons than historical averages.

The inflation rate used for expected returns is matched to the inflation rate used for liability growth, enforcing the consistency of asset and liability assumptions.

Expected asset returns (on a pre-tax basis) are developed via a building-block approach that starts with the expected long-term real interest rate and expected long-term inflation. Together these two define the expected long-term nominal risk-free interest rate. Expected returns for different assets are then determined by adding appropriate risk premiums to this. In other words, we have the following relationship:

$$\begin{array}{lcl} \text{Expected net-of-fee, pre-tax} & = & \text{inflation} + \text{real interest rate} \\ \text{asset return} & & + \text{risk premium} - \text{fees} \end{array}$$

The next step in the assumption setting process involves an analysis of historical risks and correlations of asset class returns to which subjective judgment is applied. The result of this analysis is incorporated into a risk matrix from which expected long-term risk premiums are estimated for each asset class.

The long-term nominal return expectations are then determined by combining the asset class risk premiums with expected inflation and real risk-free rate assumptions. As a final consideration, the nominal return assumptions are blended with current market conditions to develop long-term equilibrium expectations. The return and risk expectations for each asset class incorporate assumptions about historical return relationships, current financial market conditions and the degree of global capital market integration.

The assumptions pertaining to the volatility of investment returns are based on observed experience and calculated in terms of the standard deviation of historical asset returns.

The following table shows the expected return and volatility assumption inputs:

Long-term Investment Assumptions for 2017

Asset class	Expected pre-tax		Expected after-tax	
	Arithmetic return	Volatility	Arithmetic return	Volatility
US Large Cap Equity (Passive)	7.23%	14.62%	5.22%	10.55%
US Small Cap Equity (Passive)	8.53%	18.64%	6.16%	13.45%
EAFE Equity (Passive)	8.06%	15.90%	5.82%	11.47%
EAFE Equity (Active)	8.24%	16.27%	5.94%	11.74%
EM Equity	11.90%	21.38%	8.59%	15.43%
IG Fixed Income (10+ yr TIPS constant maturity)	5.32%	10.62%	4.25%	8.49%
High Yield Debt	6.13%	8.85%	4.43%	6.38%
EM Debt	6.21%	9.64%	4.48%	6.96%
Private Equity	10.03%	20.99%	7.24%	15.15%
Private Real Estate	6.44%	11.71%	4.65%	8.45%

These expected return assumptions are based on an assumed long-term risk-free rate of 2.84 percent, consisting of a 0.99 percent real asset return and expected inflation of 1.85 percent, based on market bond rates.

The correlations between the investment returns of different asset classes are important characteristics, in addition to the expected returns and the volatility of returns. Recent and long-term histories are used as a guide to setting these parameters. The table below shows the correlations between asset returns used in the analysis.

Long-Term Investment Return Correlations for 2017

Asset class	1	2	3	4	5	6	7	8	9	10
1 US Large Cap Equity (Passive)	1.00	0.89	0.85	0.83	0.73	0.42	0.65	0.44	0.65	0.06
2 US Small Cap Equity (Passive)	0.89	1.00	0.75	0.73	0.67	0.36	0.61	0.46	0.61	0.01
3 EAFE Equity (Passive)	0.85	0.75	1.00	0.98	0.82	0.48	0.67	0.43	0.56	0.13
4 EAFE Equity (Active)	0.83	0.73	0.98	1.00	0.81	0.47	0.66	0.42	0.54	0.13
5 EM Equity	0.73	0.67	0.82	0.81	1.00	0.50	0.65	0.40	0.49	0.20
6 IG Fixed Income (10+ yr TIPS constant maturity)	0.42	0.36	0.48	0.47	0.50	1.00	0.65	0.33	0.30	0.49
7 High Yield Debt	0.65	0.61	0.67	0.66	0.65	0.65	1.00	0.48	0.36	0.26
8 EM Debt	0.44	0.46	0.43	0.42	0.40	0.33	0.48	1.00	0.35	0.25
9 Private Equity	0.65	0.61	0.56	0.54	0.49	0.30	0.36	0.35	1.00	0.12
10 Private Real Estate	0.06	0.01	0.13	0.13	0.20	0.49	0.26	0.25	0.12	1.00

Taxation Assumptions

The taxation assumptions, along with the investment and other economic assumptions are important inputs for both the asset allocation portion, and the overall analysis performed. The following table shows the applicable tax rates for the Qualified Trust.

Municipal bonds are assumed to be free of federal taxes. Therefore, only state taxes are imposed. In practice, some municipal bonds will be exempt from state taxes also, specifically municipal bonds issued by Minnesota, but these are assumed to be a small percentage of the portfolio.

Treasury bonds are exempt from state taxes. Therefore, treasuries are taxed only at the federal rate and not at the state tax rate.

The Company's view is that US stocks in the Qualified Trust do not earn a dividends' received deduction, therefore stock returns are assumed to be fully taxed.

Tax Element	Tax Rate
Federal tax rate for the qualified trust	20%
State tax on both the qualified trust and escrow account <i>Note: State taxes are deductible from federal taxes.</i>	9.8%

As a result, the total tax rates are (assuming that investments are fully taxed – this is modified for municipal bonds and treasuries):

Portfolio	Composite Tax Rate
Qualified Trust	27.84%*

*Calculation: 20% + 9.8% (1-20%)

These tax assumptions are incorporated into the after-tax expected returns in the table of investment assumptions above.

Results – Investment Strategy

The investment strategy is based on the use of an efficient risk-seeking portfolio (Growth Portfolio) for the majority of the investment period before decommissioning, and an efficient low-risk portfolio for the period just before decommissioning. The mix is determined by the following rule:

Five years prior to each decommissioning cash flow, the portion of the growth assets that are required to make that payment is reallocated into bonds.

This strategy is efficient from an asset-liability management perspective in order to reduce the risk that market volatility significantly reduces the value of this portion of the assets just when they are needed to make payments.

A period of five years is needed for assets to earn their long-term rate of return with some degree of confidence. As discussed above, year to year variation can be very large for high returning assets, and five years is needed to justify long-term assumptions. Therefore, as decommissioning payments come due at less than five years, the assumption is that the funds are switched to bonds. Further details related to the selection of a five year bond conversion period are described below.

Analysis of Bond Holding Period

Our analysis assumes that the funds are invested in bonds as a cash outlay is approached. For each expected annual outflow cash flow, assets are converted to bonds ahead of time to give more certainty to the ability to make the payment. It is important to recognize that not all funds are converted to bonds – only enough to cover each annual cash outflow. For example, if the conversion is at a 5 year period, the first outflows expected in 2030 are converted to bonds in 2025; then in 2026, enough cash is converted to bonds to match the 2031 expected outflow.

In the 2014 Filing, we assumed that funds would be converted to bonds six years ahead of each annual cash outflow. This is roughly consistent with converting to bonds in time to cover the length of a business cycle, which helps to ensure the appropriateness of our long-term growth assumptions. That said, we have modified our assumption in this Triennial to convert funds to bonds five years ahead of each annual cash outflow. Since expected bond returns are lower than the expected Growth Portfolio returns, a later transition to bonds results in higher expected returns, and therefore a lower accrual. And while a later conversion can lead to additional risk, we believe any additional risk of the shorter period is mitigated by the iterative transfer to bonds each year rather than converting the entire portfolio simultaneously. That is because even if a single year conversion does not match the business cycle and growth assumptions exactly, it is reasonable to expect that—over the multi-year conversion—average returns will be achieved.

Rates of Return

Note that the portion of the portfolio assigned to growth assets changes over time based on how large expected decommissioning payments will be over the next five years. The updated target asset allocation for the growth assets are shown in the table below:

Portfolio Line Item	Updated 2017 Target	Benchmark (BM)
Total Equity	60.0%	Weighted average of equity BMs:
Private Equity	10.0%	Cambridge PE (1Q lagged)
US All Cap Equity	25.8%	Russell 3000
Non-US Developed Equity	14.1%	MSCI EAFE ND
Emerging Markets Equity	10.1%	MSCI EM ND
Fixed Income	30.0%	Weighted average of fixed income BMs:
		75% Barclays Investment Grade Corporate Index, 25% Barclays U.S. TIPS 10+ year Index, 50% Bloomberg 20yr ZC Inflation Swap Overlay
Investment Grade Fixed Income	12.1%	
High Yield Fixed Income	10.0%	BofA ML US High Yield
Emerging Market Debt	7.9%	JPM EM Bond Index GD
Private Real Estate	10.0%	NCREIF - ODCE (1Q lagged)
Cash	0.0%	Fed funds effective
Overall fund benchmark:	100.0%	Weighted average of all portfolio BMs

Potential Growth Portfolios are the portfolios of assets that earn an expected rate of return with the lowest risk and the actual choice of the growth portfolio is based on setting the level of risk or return desired. Please note even the growth portion of the portfolio includes some bonds to provide diversification and efficiency. The 'growth portion' is not the same as the investment in equities.

The overall expected portfolio returns and volatilities for each plant's Qualified Trust are given in the table below:

Expected Returns for the Updated Strategy

Nuclear Unit	60-Year Scenario	
	Operations	Decom.
Monticello	5.00%	4.43%
Prairie Island Unit 1	4.99%	4.15%
Prairie Island Unit 2	5.04%	4.09%

To arrive at the rates of return listed in the table above, the analysis uses different rates of return for bonds and the NDT Growth Portfolio; and the weights assigned to these portfolios change through time. Therefore, expected combined rates of return vary through time; the expected rates included are Single Effective Rates, which are weighted average rates. This expected rate leads to the same final funding level if applied to each of these components that would be obtained by using the actual expected rates.

Conclusion

The analysis presented in this Schedule addresses the decisions relating to investment strategy, and contribution strategy.

In terms of investment strategy, GSAM's analysis has led to a recommended asset allocation for the growth portion of the assets that involves equities, fixed income and alternative assets. The portion of the assets required to meet each decommissioning payment is switched from growth assets into bonds five years prior to that payment.

Schedule E contains the documents required by the Commission to be filed with every submittal. Annually, the Company submits a compliance filing in April. These compliance filings include the Qualified Trust fund activity for the prior year. For example the 2017 compliance filing made under the docket number for the 2014 Filing included the Qualified Trust fund activity for 2016. Therefore, this filing only includes the activity for the Qualified Trust since the last compliance filing. The 2017 activity documents the roll forward of the Qualified Trust balances from January 1, 2017 through June 30, 2017.

The June 30, 2017 Qualified Trust balances for the two wholesale jurisdictions have been included in Schedule E.8 as these balances were used to assign 73.4886 percent to the beginning balance used in the accrual calculations. In addition, the Escrow Fund had a zero balance in 2016, thus no activity is shown for the Escrow Fund. Below is a list of the schedules included.

Qualified Trust Analysis, Statements and Balances Supporting Schedules

- E.1 Analysis of Qualified Trust Balances –January - June 2017
- E.2 Trustee Statements – Qualified Trust, Monticello (All Managers, MN Jurisdiction)
- E.3 Trustee Statements – Qualified Trust, Monticello (By Manager, Total Company)
- E.4 Trustee Statements – Qualified Trust, Prairie Island Unit 1 (All Managers, MN Jurisdiction)
- E.5 Trustee Statements – Qualified Trust, Prairie Island Unit 1 (By Manager, Total Company)
- E.6 Trustee Statements – Qualified Trust, Prairie Island Unit 2 (All Managers, MN Jurisdiction)
- E.7 Trustee Statements – Qualified Trust, Prairie Island Unit 2 (By Manager, Total Company)
- E.8 June 30, 2017 Trustee Statements – Qualified Trust, MN and WI Wholesale, All Units

Xcel Energy
Qualified Trust Analysis, Statements and Balances
2017 Minnesota Jurisdiction Balance

Docket No. E002/M-17-828
Schedule E.1
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	Beginning Balance	Accruals	Gains & Losses	Dividends & Interest	Commissions, Taxes & Fees	Transfers & Adjustments	Ending Book Balance Jun. 30, 2017	Unrealized Gain/(Loss) Jun. 30, 2017	Ending Market Balance Jun. 30, 2017
Qualified Trust									
Prairie Island Unit 1	292,599,639	24,632	4,826,268	3,188,250	(2,291,220)	-	298,347,569	89,965,695	388,313,263
Prairie Island Unit 2	331,992,382	294,670	4,911,143	3,501,861	(3,247,279)	-	337,452,778	99,354,345	436,807,122
Monticello	504,432,968	6,696,114	4,991,034	5,098,587	(6,447,278)	-	514,771,426	127,112,802	641,884,228
Total	1,129,024,989	7,015,416	14,728,445	11,788,699	(11,985,777)	-	1,150,571,773	316,432,842	1,467,004,613

MN Jurisdiction Qualified Trust	<u>316,432,842</u>
Wlse Qualified Trust Allocated to MN Jurisdiction	<u>324,825,386</u>

	Beginning Balance	Accruals	Gains & Losses	Dividends & Interest	Commissions, Taxes & Fees	Transfers & Adjustments	Ending Balance Jun. 30, 2017	Unrealized Gain/(Loss) Jun. 30, 2017	Ending Market Balance Jun. 30, 2017
Qualified Trust									
Prairie Island Unit 1	302,159,442	24,632	4,970,780	3,283,738	(2,359,831)	-	308,078,761	91,862,935	399,941,696
Prairie Island Unit 2	341,027,161	294,670	5,043,746	3,596,425	(3,334,939)	-	346,627,064	101,970,487	448,597,551
Monticello	518,704,882	6,696,114	5,134,052	5,244,468	(6,631,135)	-	529,148,381	130,991,964	660,140,345
Total	1,161,891,485	7,015,416	15,148,579	12,124,631	(12,325,905)	-	1,183,854,206	324,825,386	1,508,679,592



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
INVESTMENTS UNIT OF PARTICIPATION					
49,311,021.3740	MONTICELLO QUALIFIED MTU	514,771,425.73	13.0170	641,884,228.02	127,112,802.29
TOTAL INVESTMENTS UNIT OF PARTICIPATION		514,771,425.73		641,884,228.02	127,112,802.29
TOTAL INVESTMENT		514,771,425.73		641,884,228.02	127,112,802.29



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
<u>INVESTMENTS CASH EQUIVALENTS</u>					
594,528.8700	BLACKROCK LIQ T FUND INSTL FUND 60	594,528.87	100.0000	594,528.87	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		594,528.87		594,528.87	0.00
TOTAL INVESTMENT		594,528.87		594,528.87	0.00



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
<u>INVESTMENTS CASH EQUIVALENTS</u>					
388,188.9900	BLACKROCK LIQ T FUND INSTL FUND 60	388,188.99	100.0000	388,188.99	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		388,188.99		388,188.99	0.00
<u>INVESTMENTS EQUITY</u>					
902.0000	ADIENT PLC	42,394.00	65.3800	58,972.76	16,578.76
461.0000	AIRCASTLE LTD	5,628.81	21.7500	10,026.75	4,397.94
881.0000	ALLEGION PLC	19,534.23	81.1200	71,466.72	51,932.49
1,278.0000	ALKERMES PLC	22,433.80	57.9700	74,085.66	51,651.86
3,042.0000	ALLERGAN PLC	756,990.69	243.0900	739,479.78	17,510.91-
1,779.0000	AMDOCS LTD	52,712.09	64.4600	114,674.34	61,962.25
2,883.0000	AON PLC	161,003.23	132.9500	383,294.85	222,291.62
288.0000	ARGO GROUP INTERNATIONAL HOLDI	6,147.32	60.6000	17,452.80	11,305.48
562.0000	ASPEN INSURANCE HOLDINGS LTD	13,965.70	49.8500	28,015.70	14,050.00
984.0000	ARRIS INTERNATIONAL PLC	10,784.64	28.0200	27,571.68	16,787.04
1,966.0000	ASSURED GUARANTY LTD	26,934.20	41.7400	82,060.84	55,126.64



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
1,028.0000	AXIS CAPITAL HOLDINGS LTD	32,054.41	64.6600	66,470.48	34,416.07
1,452.0000	AXALTA COATING SYSTEMS LTD	41,715.96	32.0400	46,522.08	4,806.12
5,934.0000	ACCENTURE PLC	323,644.02	123.6800	733,917.12	410,273.10
757.0000	BELMOND LTD	7,607.85	13.3000	10,068.10	2,460.25
1,134.0000	BUNGE LTD	70,153.81	74.6000	84,596.40	14,442.59
1,966.0000	DELPHI AUTOMOTIVE PLC	92,096.86	87.6500	172,319.90	80,223.04
4,344.0000	EATON CORP PLC	229,960.72	77.8300	338,093.52	108,132.80
50.0000	ENSTAR GROUP LTD	5,024.00	198.6500	9,932.50	4,908.50
189.0000	FRESH DEL MONTE PRODUCE INC	4,887.54	50.9100	9,621.99	4,734.45
3,425.0000	FRUIT OF THE LOOM INC CL A	29,060.51	8.4848	29,060.51	0.00
1,414.0000	GENPACT LTD	35,067.20	27.8300	39,351.62	4,284.42
222.0000	GREENLIGHT CAPITAL RE LTD	5,692.08	20.9000	4,639.80	1,052.28-
245.0000	HELEN OF TROY LTD	7,935.55	94.1000	23,054.50	15,118.95
866.0000	HERBALIFE LTD	20,641.11	71.3300	61,771.78	41,130.67
0.6710	JANUS HENDERSON GROUP PLC	10.61	33.1100	22.22	11.61
4,386.0000	HORIZON PHARMA PLC	10,570.26	11.8700	52,061.82	41,491.56
2,642.0000	INGERSOLL-RAND PLC	77,252.11	91.3900	241,452.38	164,200.27



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8,304.0000	WEATHERFORD INTERNATIONAL PLC	43,891.64	3.8700	32,136.48	11,755.16-
4,244.0000	INVESCO LTD	109,748.51	35.1900	149,346.36	39,597.85
7,422.0000	JOHNSON CONTROLS INTERNATIONAL	285,387.55	43.3600	321,817.92	36,430.37
1,065.0000	MALLINCKRODT PLC	52,331.98	44.8100	47,722.65	4,609.33-
3,111.0000	MARVELL TECHNOLOGY GROUP LTD	30,137.64	16.5200	51,393.72	21,256.08
13,504.0000	MEDTRONIC PLC	1,020,256.11	88.7500	1,198,480.00	178,223.89
1,989.0000	MICHAEL KORS HOLDINGS LTD	86,518.79	36.2500	72,101.25	14,417.54-
615.0000	ALPHA & OMEGA SEMICONDUCTOR LT	5,024.55	16.6700	10,252.05	5,227.50
3,269.0000	NABORS INDUSTRIES LTD	44,971.11	8.1400	26,609.66	18,361.45-
3,712.0000	NIELSEN HOLDINGS PLC	150,817.58	38.6600	143,505.92	7,311.66-
954.0000	NORWEGIAN CRUISE LINE HOLDINGS	44,694.90	54.2900	51,792.66	7,097.76
1,951.0000	ONEBEACON INSURANCE GROUP LTD	28,536.88	18.2300	35,566.73	7,029.85
1,880.0000	PENTAIR PLC	69,393.10	66.5400	125,095.20	55,702.10
883.0000	PROTHENA CORP PLC	47,019.75	54.1200	47,787.96	768.21
479.0000	RENAISSANCERE HOLDINGS LTD	27,264.68	139.0500	66,604.95	39,340.27
454.0000	SIGNET JEWELERS LTD	37,214.23	63.2400	28,710.96	8,503.27-
455.0000	THERAVANCE BIOPHARMA INC	12,875.34	39.8400	18,127.20	5,251.86



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
2,967.0000	THIRD POINT REINSURANCE LTD	42,279.75	13.9000	41,241.30	1,038.45-
823.0000	VALIDUS HOLDINGS LTD	20,525.62	51.9700	42,771.31	22,245.69
54.0000	WHITE MOUNTAINS INSURANCE GROU	21,762.54	868.6300	46,906.02	25,143.48
1,295.0000	PERRIGO CO PLC	115,384.55	75.5200	97,798.40	17,586.15-
2,738.0000	XL GROUP LTD	75,376.06	43.8000	119,924.40	44,548.34
777.0000	ALLIED WORLD ASSURANCE CO HOLD	21,991.69	52.9000	41,103.30	19,111.61
4,226.0000	CHUBB LTD	329,645.17	145.3800	614,375.88	284,730.71
989.0000	GARMIN LTD	36,249.24	51.0300	50,468.67	14,219.43
2,976.0000	TRANSOCEAN LTD	44,421.80	8.2300	24,492.48	19,929.32-
444.0000	CIMPRESS NV	36,350.28	94.5300	41,971.32	5,621.04
2,996.0000	LYONDELLBASELL INDUSTRIES NV	165,331.69	84.3900	252,832.44	87,500.75
3,367.0000	MYLAN NV	154,166.80	38.8200	130,706.94	23,459.86-
2,679.0000	QIAGEN NV	49,107.62	33.5300	89,826.87	40,719.25
351.0000	WRIGHT MEDICAL GROUP NV	7,427.16	27.4900	9,648.99	2,221.83
1,227.0000	BANCO LATINOAMERICANO DE COMER	20,822.19	27.3800	33,595.26	12,773.07
273.0000	COPA HOLDINGS SA	21,153.92	117.0000	31,941.00	10,787.08
1,180.0000	ROYAL CARIBBEAN CRUISES LTD	57,416.82	109.2300	128,891.40	71,474.58



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
3,901.0000	BROADCOM LTD	407,099.40	233.0500	909,128.05	502,028.65
422.0000	ABM INDUSTRIES INC	9,646.92	41.5200	17,521.44	7,874.52
4,034.0000	AFLAC INC	229,312.36	77.6800	313,361.12	84,048.76
762.0000	AGCO CORP	30,154.04	67.3900	51,351.18	21,197.14
2,489.0000	AGNC INVESTMENT CORP	45,710.07	21.2900	52,990.81	7,280.74
6,454.0000	AES CORP/VA	68,961.39	11.1100	71,703.94	2,742.55
299.0000	AMAG PHARMACEUTICALS INC	5,142.80	18.4000	5,501.60	358.80
474.0000	AMC NETWORKS INC	25,745.48	53.4100	25,316.34	429.14-
55,171.0000	AT&T INC	1,741,910.45	37.7300	2,081,601.83	339,691.38
98.0000	AZZ INC	2,131.50	55.8000	5,468.40	3,336.90
636.0000	AARON'S INC	17,178.36	38.9000	24,740.40	7,562.04
14,595.0000	ABBOTT LABORATORIES	399,436.31	48.6100	709,462.95	310,026.64
15,568.0000	ABBVIE INC	496,845.38	72.5100	1,128,835.68	631,990.30
391.0000	ABIOMED INC	15,260.54	143.3000	56,030.30	40,769.76
1,458.0000	ACADIA HEALTHCARE CO INC	45,232.10	49.3800	71,996.04	26,763.94
1,051.0000	ACADIA PHARMACEUTICALS INC	39,328.42	27.8900	29,312.39	10,016.03-
321.0000	ACADIA REALTY TRUST	6,480.99	27.8000	8,923.80	2,442.81



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
1,185.0000	ACI WORLDWIDE INC	15,102.21	22.3700	26,508.45	11,406.24
407.0000	ACORDA THERAPEUTICS INC	9,995.92	19.7000	8,017.90	1,978.02-
5,057.0000	ACTIVISION BLIZZARD INC	103,646.11	57.5700	291,131.49	187,485.38
1,703.0000	ACTUANT CORP	41,502.11	24.6000	41,893.80	391.69
345.0000	ACUITY BRANDS INC	18,864.60	203.2800	70,131.60	51,267.00
645.0000	ACXIOM CORP	7,759.35	25.9800	16,757.10	8,997.75
4,652.0000	ADOBE SYSTEMS INC	214,309.58	141.4400	657,978.88	443,669.30
1,775.0000	ADTALEM GLOBAL EDUCATION INC	42,493.50	37.9500	67,361.25	24,867.75
774.0000	ADVANCE AUTO PARTS INC	53,045.04	116.5900	90,240.66	37,195.62
1,384.0000	AECOM	33,552.93	32.3300	44,744.72	11,191.79
264.0000	AEGION CORP	5,084.64	21.8800	5,776.32	691.68
290.0000	ADVANSIX INC	1,983.74	31.2400	9,059.60	7,075.86
13,652.0000	ADVANCED MICRO DEVICES INC	32,082.20	12.4800	170,376.96	138,294.76
3,246.0000	AETNA INC	133,712.56	151.8300	492,840.18	359,127.62
583.0000	AFFILIATED MANAGERS GROUP INC	76,157.81	165.8600	96,696.38	20,538.57
2,763.0000	AGILENT TECHNOLOGIES INC	61,868.11	59.3100	163,873.53	102,005.42
1,257.0000	AGREE REALTY CORP	42,536.88	45.8700	57,658.59	15,121.71



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1,691.0000	AIR LEASE CORP	53,461.02	37.3600	63,175.76	9,714.74
1,842.0000	AIR PRODUCTS & CHEMICALS INC	118,594.24	143.0600	263,516.52	144,922.28
1,986.0000	AKAMAI TECHNOLOGIES INC	83,529.14	49.8100	98,922.66	15,393.52
756.0000	AKORN INC	9,880.92	33.5400	25,356.24	15,475.32
1,288.0000	ALASKA AIR GROUP INC	21,574.00	89.7600	115,610.88	94,036.88
220.0000	ALBANY INTERNATIONAL CORP	5,442.80	53.4000	11,748.00	6,305.20
747.0000	ALBEMARLE CORP	40,082.23	105.5400	78,838.38	38,756.15
1,603.0000	ALCOA CORP	32,792.35	32.6500	52,337.95	19,545.60
761.0000	ALERE INC	36,193.48	50.1900	38,194.59	2,001.11
331.0000	ALEXANDER & BALDWIN INC	6,971.79	41.3800	13,696.78	6,724.99
47.0000	ALEXANDER'S INC	15,373.73	421.4600	19,808.62	4,434.89
585.0000	ALEXANDRIA REAL ESTATE EQUITIE	40,491.22	120.4700	70,474.95	29,983.73
2,006.0000	ALEXION PHARMACEUTICALS INC	243,711.70	121.6700	244,070.02	358.32
626.0000	ALIGN TECHNOLOGY INC	19,945.24	150.1200	93,975.12	74,029.88
95.0000	ALLEGHANY CORP	26,568.30	594.8000	56,506.00	29,937.70
243.0000	ALLETE INC	9,907.11	71.6800	17,418.24	7,511.13
483.0000	ALLIANCE DATA SYSTEMS CORP	84,507.22	256.6900	123,981.27	39,474.05



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2,636.0000	ALLIANT ENERGY CORP	70,702.73	40.1700	105,888.12	35,185.39
1,221.0000	ALLISON TRANSMISSION HOLDINGS	35,763.09	37.5100	45,799.71	10,036.62
2,546.0000	ALLSCRIPTS HEALTHCARE SOLUTION	35,898.60	12.7600	32,486.96	3,411.64-
3,932.0000	ALLSTATE CORP/THE	144,374.78	88.4400	347,746.08	203,371.30
5,739.0000	ALLY FINANCIAL INC	118,236.90	20.9000	119,945.10	1,708.20
795.0000	ALNYLAM PHARMACEUTICALS INC	68,229.54	79.7600	63,409.20	4,820.34-
1,815.0000	ALPHABET INC-CL C	384,754.87	908.7300	1,649,344.95	1,264,590.08
3,665.0000	ALPHABET INC-CL A	1,992,263.75	929.6800	3,407,277.20	1,415,013.45
3,375.0000	ALTISOURCE RESIDENTIAL CORP	38,643.75	12.9400	43,672.50	5,028.75
1,312.0000	ALTRA INDUSTRIAL MOTION CORP	36,329.28	39.8000	52,217.60	15,888.32
17,274.0000	ALTRIA GROUP INC	496,395.32	74.4700	1,286,394.78	789,999.46
3,604.0000	AMAZON.COM INC	1,125,215.20	968.0000	3,488,672.00	2,363,456.80
69.0000	AMERCO	6,606.06	366.0600	25,258.14	18,652.08
1,767.0000	AMEREN CORP	59,630.12	54.6700	96,601.89	36,971.77
4,221.0000	AMERICAN AIRLINES GROUP INC	156,667.95	50.3200	212,400.72	55,732.77
227.0000	AMERICAN ASSETS TRUST INC	5,077.99	39.3900	8,941.53	3,863.54
545.0000	AMERICAN AXLE & MANUFACTURING	6,058.20	15.6000	8,502.00	2,443.80



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540.0000	AMERICAN CAMPUS COMMUNITIES IN	18,694.80	47.3000	25,542.00	6,847.20
2,707.0000	AMERICAN EAGLE OUTFITTERS INC	42,716.46	12.0500	32,619.35	10,097.11-
4,550.0000	AMERICAN ELECTRIC POWER CO INC	181,998.44	69.4700	316,088.50	134,090.06
473.0000	AMERICAN EQUITY INVESTMENT LIF	5,832.09	26.2800	12,430.44	6,598.35
8,036.0000	AMERICAN EXPRESS CO	517,648.94	84.2400	676,952.64	159,303.70
846.0000	AMERICAN FINANCIAL GROUP INC/O	24,968.34	99.3700	84,067.02	59,098.68
4,525.0000	AMERICAN HOMES 4 RENT	71,030.84	22.5700	102,129.25	31,098.41
10,700.0000	AMERICAN INTERNATIONAL GROUP I	400,281.77	62.5200	668,964.00	268,682.23
187.0000	AMERICAN RAILCAR INDUSTRIES IN	5,864.32	38.3000	7,162.10	1,297.78
860.0000	AMERICAN STATES WATER CO	34,907.40	47.4100	40,772.60	5,865.20
3,934.0000	AMERICAN TOWER CORP	219,192.46	132.3200	520,546.88	301,354.42
1,093.0000	AMERICAN WATER WORKS CO INC	38,661.76	77.9500	85,199.35	46,537.59
19.0000	AMERISAFE INC	421.80	56.9500	1,082.05	660.25
1,847.0000	AMERISOURCEBERGEN CORP	108,873.53	94.5300	174,596.91	65,723.38
1,716.0000	AMERIPRISE FINANCIAL INC	80,214.18	127.2900	218,429.64	138,215.46
2,223.0000	AMETEK INC	65,340.74	60.5700	134,647.11	69,306.37
7,209.0000	AMGEN INC	573,076.12	172.2300	1,241,606.07	668,529.95



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3,123.0000	AMPHENOL CORP	135,257.16	73.8200	230,539.86	95,282.70
544.0000	AMTRUST FINANCIAL SERVICES INC	4,958.94	15.1400	8,236.16	3,277.22
4,922.0000	ANADARKO PETROLEUM CORP	248,721.56	45.3400	223,163.48	25,558.08-
2,150.0000	ANALOG DEVICES INC	82,451.20	77.8000	167,270.00	84,818.80
187.0000	ANDERSONS INC/THE	4,965.47	34.1500	6,386.05	1,420.58
231.0000	ANIXTER INTERNATIONAL INC	14,125.65	78.2000	18,064.20	3,938.55
5,521.0000	ANNALY CAPITAL MANAGEMENT INC	55,403.88	12.0500	66,528.05	11,124.17
730.0000	ANSYS INC	34,079.88	121.6800	88,826.40	54,746.52
1,992.0000	ANTERO RESOURCES CORP	45,647.41	21.6100	43,047.12	2,600.29-
2,449.0000	ANTHEM INC	226,910.81	188.1300	460,730.37	233,819.56
3,367.0000	APACHE CORP	187,862.35	47.9300	161,380.31	26,482.04-
1,011.0000	APARTMENT INVESTMENT & MANAGEM	25,289.01	42.9700	43,442.67	18,153.66
839.0000	APOGEE ENTERPRISES INC	42,403.06	56.8400	47,688.76	5,285.70
924.0000	APOLLO COMMERCIAL REAL ESTATE	15,073.27	18.5500	17,140.20	2,066.93
48,441.0000	APPLE INC	1,650,714.53	144.0200	6,976,472.82	5,325,758.29
1,778.0000	APPLE HOSPITALITY REIT INC	35,560.00	18.7100	33,266.38	2,293.62-
337.0000	APPLIED INDUSTRIAL TECHNOLOGIE	11,522.03	59.0500	19,899.85	8,377.82



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11,981.0000	APPLIED MATERIALS INC	181,133.38	41.3100	494,935.11	313,801.73
535.0000	APTARGROUP INC	27,081.70	86.8600	46,470.10	19,388.40
3,633.0000	AQUA AMERICA INC	53,303.37	33.3000	120,978.90	67,675.53
1,155.0000	ARAMARK	35,077.35	40.9800	47,331.90	12,254.55
519.0000	ARCBEST CORP	10,037.46	20.6000	10,691.40	653.94
5,777.0000	ARCHER-DANIELS-MIDLAND CO	180,903.91	41.3800	239,052.26	58,148.35
4,810.0000	ARCONIC INC	97,918.03	22.6500	108,946.50	11,028.47
573.0000	ARISTA NETWORKS INC	42,579.63	149.7900	85,829.67	43,250.04
3,264.0000	ARMADA HOFFLER PROPERTIES INC	35,457.81	12.9500	42,268.80	6,810.99
84.0000	ARMSTRONG FLOORING INC	947.93	17.9700	1,509.48	561.55
168.0000	ARMSTRONG WORLD INDUSTRIES INC	6,445.75	46.0000	7,728.00	1,282.25
1,053.0000	ARROW ELECTRONICS INC	35,296.56	78.4200	82,576.26	47,279.70
463.0000	ARROW FINANCIAL CORP	9,761.14	31.6500	14,653.95	4,892.81
1,317.0000	ARTESIAN RESOURCES CORP	40,051.95	37.6400	49,571.88	9,519.93
7,668.0000	ASHFORD HOSPITALITY TRUST INC	42,557.40	6.0800	46,621.44	4,064.04
683.0000	ASHLAND GLOBAL HOLDINGS INC	18,811.39	65.9100	45,016.53	26,205.14
1,040.0000	ASPEN TECHNOLOGY INC	20,317.25	55.2600	57,470.40	37,153.15



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963.0000	ASSOCIATED BANC-CORP	10,275.21	25.2000	24,267.60	13,992.39
109.0000	ASSOCIATED CAPITAL GROUP INC	2,270.59	34.0000	3,706.00	1,435.41
444.0000	ASSURANT INC	18,131.88	103.6900	46,038.36	27,906.48
142.0000	ASTEC INDUSTRIES INC	4,979.94	55.5100	7,882.42	2,902.48
299.0000	ATHENAHEALTH INC	33,858.65	140.5500	42,024.45	8,165.80
778.0000	ATMOS ENERGY CORP	24,258.04	82.9500	64,535.10	40,277.06
51.0000	ATRION CORP	10,220.40	643.3000	32,808.30	22,587.90
1,824.0000	AUTODESK INC	63,004.24	100.8200	183,895.68	120,891.44
4,478.0000	AUTOMATIC DATA PROCESSING INC	282,240.78	102.4600	458,815.88	176,575.10
292.0000	AUTOZONE INC	221,157.07	570.4600	166,574.32	54,582.75-
1,195.0000	AVALONBAY COMMUNITIES INC	212,974.92	192.1700	229,643.15	16,668.23
629.0000	AVANGRID INC	23,279.17	44.1500	27,770.35	4,491.18
545.0000	AVERY DENNISON CORP	23,535.68	88.3700	48,161.65	24,625.97
835.0000	AVIS BUDGET GROUP INC	13,201.35	27.2700	22,770.45	9,569.10
944.0000	AVNET INC	30,089.27	38.8800	36,702.72	6,613.45
7,403.0000	BB&T CORP	255,802.83	45.4100	336,170.23	80,367.40
224.0000	B&G FOODS INC	4,650.24	35.6000	7,974.40	3,324.16



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4,640.0000	BGC PARTNERS INC	43,662.40	12.6400	58,649.60	14,987.20
672.0000	BOK FINANCIAL CORP	35,207.42	84.1300	56,535.36	21,327.94
1,707.0240	B. RILEY FINANCIAL INC	40,797.87	18.5500	31,665.30	9,132.57-
1,005.0000	BWX TECHNOLOGIES INC	18,989.84	48.7500	48,993.75	30,003.91
502.0000	BABCOCK & WILCOX ENTERPRISES I	6,987.57	11.7600	5,903.52	1,084.05-
270.0000	BADGER METER INC	4,965.30	39.8500	10,759.50	5,794.20
4,110.0000	BAKER HUGHES INC	211,748.67	54.5100	224,036.10	12,287.43
123.0000	BALCHEM CORP	5,078.67	77.7100	9,558.33	4,479.66
2,852.0000	BALL CORP	87,824.99	42.2100	120,382.92	32,557.93
132.0000	BANCFIRST CORP	5,043.72	96.6000	12,751.20	7,707.48
657.0000	BANCORPSOUTH INC	6,878.79	30.5000	20,038.50	13,159.71
2,106.0000	BANC OF CALIFORNIA INC	29,273.40	21.5000	45,279.00	16,005.60
81,970.0000	BANK OF AMERICA CORP	1,103,836.47	24.2600	1,988,592.20	884,755.73
876.0000	BANK OF HAWAII CORP	40,008.36	82.9700	72,681.72	32,673.36
1,382.0000	BANK MUTUAL CORP	4,906.10	9.1500	12,645.30	7,739.20
448.0000	BANK OF THE OZARKS INC	5,622.40	46.8700	20,997.76	15,375.36
8,699.0000	BANK OF NEW YORK MELLON CORP/T	306,939.97	51.0200	443,822.98	136,883.01



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266.0000	BANKUNITED INC	7,097.57	33.7100	8,966.86	1,869.29
678.0000	CR BARD INC	50,908.17	316.1100	214,322.58	163,414.41
433.0000	BARNES GROUP INC	10,158.18	58.5300	25,343.49	15,185.31
5,636.0000	BAXTER INTERNATIONAL INC	152,124.64	60.5400	341,203.44	189,078.80
366.0000	BEACON ROOFING SUPPLY INC	8,132.52	49.0000	17,934.00	9,801.48
1,941.0000	BECTON DICKINSON AND CO	135,800.51	195.1100	378,708.51	242,908.00
1,977.0000	BED BATH & BEYOND INC	76,367.16	30.4000	60,100.80	16,266.36-
377.0000	BELDEN INC	12,226.11	75.4300	28,437.11	16,211.00
838.0000	BEMIS CO INC	27,718.44	46.2500	38,757.50	11,039.06
483.0000	BENCHMARK ELECTRONICS INC	7,515.48	32.3000	15,600.90	8,085.42
675.0000	BENEFICIAL BANCORP INC	5,001.59	15.0000	10,125.00	5,123.41
924.0000	WR BERKLEY CORP	25,017.89	69.1700	63,913.08	38,895.19
17,708.0000	BERKSHIRE HATHAWAY INC	1,805,666.76	169.3700	2,999,203.96	1,193,537.20
233.0000	BERKSHIRE HILLS BANCORP INC	5,063.09	35.1500	8,189.95	3,126.86
1,200.0000	BERRY GLOBAL GROUP INC	40,213.74	57.0100	68,412.00	28,198.26
2,712.0000	BEST BUY CO INC	61,649.26	57.3300	155,478.96	93,829.70
692.0000	BIG LOTS INC	13,930.52	48.3000	33,423.60	19,493.08



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251.0000	BIO-RAD LABORATORIES INC	35,554.15	226.3100	56,803.81	21,249.66
1,431.0000	BIOMARIN PHARMACEUTICAL INC	122,315.97	90.8200	129,963.42	7,647.45
2,112.0000	BIOGEN INC	399,448.61	271.3600	573,112.32	173,663.71
398.0000	BIO-TECHNE CORP	31,893.88	117.5000	46,765.00	14,871.12
1,056.0000	BIOVERATIV INC	33,846.61	60.1700	63,539.52	29,692.91
1,098.0000	BLACK HILLS CORP	45,137.58	67.4700	74,082.06	28,944.48
835.0000	BLACKBAUD INC	45,190.56	85.7500	71,601.25	26,410.69
194.0000	BLACKHAWK NETWORK HOLDINGS INC	4,588.10	43.6000	8,458.40	3,870.30
896.0000	BLACKROCK INC	172,961.94	422.4100	378,479.36	205,517.42
1,963.0000	H&R BLOCK INC	48,252.75	30.9100	60,676.33	12,423.58
2,435.0000	BLOOMIN' BRANDS INC	42,198.55	21.2300	51,695.05	9,496.50
984.0000	BLUEBIRD BIO INC	39,143.52	105.0500	103,369.20	64,225.68
5,209.0000	BOEING CO/THE	517,366.67	197.7500	1,030,079.75	512,713.08
1,189.0000	BOOZ ALLEN HAMILTON HOLDING CO	35,384.64	32.5400	38,690.06	3,305.42
2,039.0000	BORGWARNER INC	64,042.61	42.3600	86,372.04	22,329.43
1,249.0000	BOSTON PROPERTIES INC	128,808.21	123.0200	153,651.98	24,843.77
12,588.0000	BOSTON SCIENTIFIC CORP	123,717.70	27.7200	348,939.36	225,221.66



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216.0000	BOTTOMLINE TECHNOLOGIES DE INC	5,080.32	25.6900	5,549.04	468.72
1,945.0000	BOYD GAMING CORP	30,183.90	24.8100	48,255.45	18,071.55
1,597.0000	BRADY CORP	42,160.80	33.9000	54,138.30	11,977.50
1,639.0000	BRANDYWINE REALTY TRUST	20,192.48	17.5300	28,731.67	8,539.19
674.0000	BRINKER INTERNATIONAL INC	16,560.18	38.1000	25,679.40	9,119.22
1,310.0000	BRINK'S CO/THE	42,064.10	67.0000	87,770.00	45,705.90
15,388.0000	BRISTOL-MYERS SQUIBB CO	487,296.91	55.7200	857,419.36	370,122.45
1,678.0000	BRIXMOR PROPERTY GROUP INC	42,872.90	17.8800	30,002.64	12,870.26-
914.0000	BROADRIDGE FINANCIAL SOLUTIONS	19,651.00	75.5600	69,061.84	49,410.84
3,503.0000	BROCADE COMMUNICATIONS SYSTEMS	20,317.40	12.6100	44,172.83	23,855.43
1,676.0000	BROOKDALE SENIOR LIVING INC	35,571.57	14.7100	24,653.96	10,917.61-
925.0000	BROWN & BROWN INC	23,300.75	43.0700	39,839.75	16,539.00
2,621.0000	BROWN-FORMAN CORP	59,008.54	48.6000	127,380.60	68,372.06
1,908.0000	BRUKER CORP	35,736.84	28.8400	55,026.72	19,289.88
68.0000	BRUNOS INC NEW	680.00	10.0000	680.00	0.00
1,071.0000	BRUNSWICK CORP/DE	23,452.29	62.7300	67,183.83	43,731.54
1,204.0000	BRYN MAWR BANK CORP	35,710.64	42.5000	51,170.00	15,459.36



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337.0000	BUFFALO WILD WINGS INC	23,482.25	126.7000	42,697.90	19,215.65
736.0000	BURLINGTON STORES INC	34,793.91	91.9900	67,704.64	32,910.73
4,702.0000	CBS CORP	133,308.29	63.7800	299,893.56	166,585.27
676.0000	CBOE HOLDINGS INC	27,108.50	91.4000	61,786.40	34,677.90
2,246.0000	CBRE GROUP INC	44,178.82	36.4000	81,754.40	37,575.58
1,269.0000	CDK GLOBAL INC	38,612.21	62.0600	78,754.14	40,141.93
1,023.0000	CDW CORP/DE	45,676.95	62.5300	63,968.19	18,291.24
2,650.0000	CF INDUSTRIES HOLDINGS INC	74,583.45	27.9600	74,094.00	489.45-
923.0000	CH ROBINSON WORLDWIDE INC	58,139.77	68.6800	63,391.64	5,251.87
2,366.0000	CIGNA CORP	99,153.48	167.3900	396,044.74	296,891.26
1,557.0000	CIT GROUP INC	55,680.02	48.7000	75,825.90	20,145.88
2,981.0000	CME GROUP INC	250,255.47	125.2400	373,340.44	123,084.97
2,574.0000	CMS ENERGY CORP	91,725.52	46.2500	119,047.50	27,321.98
216.0000	CSS INDUSTRIES INC	4,965.84	26.1600	5,650.56	684.72
749.0000	CNA FINANCIAL CORP	20,432.72	48.7500	36,513.75	16,081.03
1,763.0000	CNO FINANCIAL GROUP INC	12,781.75	20.8800	36,811.44	24,029.69
278.0000	CSG SYSTEMS INTERNATIONAL INC	5,017.90	40.5800	11,281.24	6,263.34



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9,648.0000	CSX CORP	129,147.47	54.5600	526,394.88	397,247.41
1,164.0000	CSRA INC	28,569.57	31.7500	36,957.00	8,387.43
551.0000	CTS CORP	4,959.00	21.6000	11,901.60	6,942.60
710.0000	CVB FINANCIAL CORP	6,248.00	22.4300	15,925.30	9,677.30
10,492.0000	CVS HEALTH CORP	406,608.67	80.4600	844,186.32	437,577.65
8,723.0000	CYS INVESTMENTS INC	77,390.36	8.4100	73,360.43	4,029.93-
2,848.0000	CA INC	67,399.06	34.4700	98,170.56	30,771.50
587.0000	CABELA'S INC	18,853.89	59.4200	34,879.54	16,025.65
12.0000	CABLE ONE INC	1,902.67	710.9000	8,530.80	6,628.13
522.0000	CABOT CORP	20,065.68	53.4300	27,890.46	7,824.78
4,199.0000	CABOT OIL & GAS CORP	75,590.36	25.0800	105,310.92	29,720.56
361.0000	CACI INTERNATIONAL INC	36,219.13	125.0500	45,143.05	8,923.92
2,138.0000	CADENCE DESIGN SYSTEMS INC	21,828.98	33.4900	71,601.62	49,772.64
508.0000	CALATLANTIC GROUP INC	20,079.87	35.3500	17,957.80	2,122.07-
449.0000	CALGON CARBON CORP	7,835.05	15.1000	6,779.90	1,055.15-
1,871.0000	CALIFORNIA WATER SERVICE GROUP	42,284.60	36.8000	68,852.80	26,568.20
781.0000	CALLAWAY GOLF CO	4,810.96	12.7800	9,981.18	5,170.22



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4,723.0000	CALLON PETROLEUM CO	48,911.66	10.6100	50,111.03	1,199.37
4,559.0000	CALPINE CORP	57,718.95	13.5300	61,683.27	3,964.32
786.0000	CAMBREX CORP	41,642.28	59.7500	46,963.50	5,321.22
558.0000	CAMDEN PROPERTY TRUST	35,583.66	85.5100	47,714.58	12,130.92
1,434.0000	CAMPBELL SOUP CO	52,825.19	52.1500	74,783.10	21,957.91
349.9490	CANADIAN IMPERIAL BANK OF COMM	21,944.77	81.1600	28,401.86	6,457.09
591.0000	CANTEL MEDICAL CORP	35,879.61	77.9100	46,044.81	10,165.20
117.0000	CAPELLA EDUCATION CO	4,999.41	85.6000	10,015.20	5,015.79
4,824.0000	CAPITAL ONE FINANCIAL CORP	346,013.23	82.6200	398,558.88	52,545.65
550.0000	CAPITAL SENIOR LIVING CORP	10,114.50	15.2100	8,365.50	1,749.00-
3,112.0000	CARDINAL HEALTH INC	166,696.01	77.9200	242,487.04	75,791.03
1,064.0000	CARE CAPITAL PROPERTIES INC	33,941.22	26.7000	28,408.80	5,532.42-
487.0000	CARLISLE COS INC	23,103.28	95.4000	46,459.80	23,356.52
1,937.0000	CARMAX INC	50,536.33	63.0600	122,147.22	71,610.89
4,086.0000	CARNIVAL CORP	215,807.58	65.5700	267,919.02	52,111.44
1,173.0000	CARPENTER TECHNOLOGY CORP	42,920.07	37.4300	43,905.39	985.32
640.0000	CARS.COM INC	7,624.87	26.6300	17,043.20	9,418.33



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727.0000	CARTER'S INC	29,892.09	88.9500	64,666.65	34,774.56
331.0000	CASEY'S GENERAL STORES INC	14,247.60	107.1100	35,453.41	21,205.81
5,613.0000	CATERPILLAR INC	358,506.75	107.4600	603,172.98	244,666.23
160.0000	CATHAY GENERAL BANCORP	2,235.20	37.9500	6,072.00	3,836.80
211.0000	CAVCO INDUSTRIES INC	9,826.27	129.6500	27,356.15	17,529.88
1,139.0000	CAVIUM INC	63,429.59	62.1300	70,766.07	7,336.48
969.0000	CEDAR REALTY TRUST INC	4,903.14	4.8500	4,699.65	203.49-
1,375.0000	CELANESE CORP	44,646.25	94.9400	130,542.50	85,896.25
7,475.0000	CELGENE CORP	253,338.36	129.8700	970,778.25	717,439.89
1,112.0000	CELLDEX THERAPEUTICS INC	7,261.36	2.4700	2,746.64	4,514.72-
1,519.0000	CENTENE CORP	48,533.25	79.8800	121,337.72	72,804.47
5,131.0000	CENTERPOINT ENERGY INC	74,714.02	27.3800	140,486.78	65,772.76
196.0000	CENTERSTATE BANKS INC	1,250.48	24.8600	4,872.56	3,622.08
1,929.0000	CENTRAL GARDEN & PET CO	40,373.97	30.0200	57,908.58	17,534.61
371.0000	CENTRAL PACIFIC FINANCIAL CORP	4,889.59	31.4700	11,675.37	6,785.78
2,991.0000	CERNER CORP	102,696.69	66.4700	198,811.77	96,115.08
411.0000	CHARLES RIVER LABORATORIES INT	16,152.30	101.1500	41,572.65	25,420.35



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1,938.0000	CHARTER COMMUNICATIONS INC	150,416.94	336.8500	652,815.30	502,398.36
2,957.0000	CHATHAM LODGING TRUST	66,118.52	20.0900	59,406.13	6,712.39-
470.0000	CHEESECAKE FACTORY INC/THE	15,113.04	50.3000	23,641.00	8,527.96
77.0000	CHEMED CORP	4,924.15	204.5300	15,748.81	10,824.66
272.0000	CHEMICAL FINANCIAL CORP	4,972.16	48.4100	13,167.52	8,195.36
2,360.0000	CHENIERE ENERGY INC	69,389.86	48.7100	114,955.60	45,565.74
8,384.0000	CHESAPEAKE ENERGY CORP	40,997.76	4.9700	41,668.48	670.72
1,552.0000	CHESAPEAKE LODGING TRUST	42,835.20	24.4700	37,977.44	4,857.76-
17,581.0000	CHEVRON CORP	1,259,429.03	104.3300	1,834,225.73	574,796.70
832.0000	CHICAGO BRIDGE & IRON CO NV	28,427.57	19.7300	16,415.36	12,012.21-
1,879.0000	CHICO'S FAS INC	23,908.69	9.4200	17,700.18	6,208.51-
208.0000	CHILDREN'S PLACE INC/THE	9,191.52	102.1000	21,236.80	12,045.28
2,834.0000	CHIMERA INVESTMENT CORP	38,259.00	18.6300	52,797.42	14,538.42
22,248.0000	CHIMERIX INC	103,039.39	5.4500	121,251.60	18,212.21
238.0000	CHIPOTLE MEXICAN GRILL INC	52,913.86	416.1000	99,031.80	46,117.94
2,268.0000	CHURCH & DWIGHT CO INC	42,312.59	51.8800	117,663.84	75,351.25
115.0000	CHURCHILL DOWNS INC	4,940.40	183.3000	21,079.50	16,139.10



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1,857.0000	CIENA CORP	31,006.71	25.0200	46,462.14	15,455.43
1,058.0000	CIMAREX ENERGY CO	87,064.62	94.0100	99,462.58	12,397.96
270.0000	CINCINNATI BELL INC	4,468.50	19.5500	5,278.50	810.00
1,274.0000	CINCINNATI FINANCIAL CORP	71,415.10	72.4500	92,301.30	20,886.20
739.0000	CINEMARK HOLDINGS INC	14,809.56	38.8500	28,710.15	13,900.59
124.0000	CIRCOR INTERNATIONAL INC	4,977.36	59.3800	7,363.12	2,385.76
47,291.0000	CISCO SYSTEMS INC	1,230,272.04	31.3000	1,480,208.30	249,936.26
523.0000	CIRRUS LOGIC INC	8,969.45	62.7200	32,802.56	23,833.11
885.0000	CINTAS CORP	31,602.30	126.0400	111,545.40	79,943.10
26,496.0000	CITIGROUP INC	1,210,327.36	66.8800	1,772,052.48	561,725.12
1,852.0000	CITIZENS FINANCIAL GROUP INC	50,146.57	35.6800	66,079.36	15,932.79
1,793.0000	CITRIX SYSTEMS INC	69,885.01	79.5800	142,686.94	72,801.93
733.0000	CITY HOLDING CO	32,880.72	65.8700	48,282.71	15,401.99
3,415.0000	CITY OFFICE REIT INC	40,334.57	12.7000	43,370.50	3,035.93
974.0000	CLEAN HARBORS INC	42,690.42	55.8300	54,378.42	11,688.00
6,186.0000	CLEAN ENERGY FUELS CORP	26,785.38	2.5400	15,712.44	11,072.94-
160.0000	CLEARWATER PAPER CORP	5,031.20	46.7500	7,480.00	2,448.80



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939.0000	CLOROX CO/THE	76,502.46	133.2400	125,112.36	48,609.90
2,437.0000	COACH INC	78,036.50	47.3400	115,367.58	37,331.08
795.0000	COBIZ FINANCIAL INC	4,984.65	17.4000	13,833.00	8,848.35
166.0000	COCA-COLA BOTTLING CO CONSOLID	10,121.02	228.8700	37,992.42	27,871.40
32,228.0000	COCA-COLA CO/THE	902,893.83	44.8500	1,445,425.80	542,531.97
320.0000	COGENT COMMUNICATIONS HOLDINGS	5,020.80	40.1000	12,832.00	7,811.20
660.0000	COGNEX CORP	11,121.00	84.9000	56,034.00	44,913.00
5,395.0000	COGNIZANT TECHNOLOGY SOLUTIONS	163,444.52	66.4000	358,228.00	194,783.48
157.0000	COHEN & STEERS INC	4,953.35	40.5400	6,364.78	1,411.43
200.0000	COHERENT INC	10,368.00	224.9900	44,998.00	34,630.00
1,300.0000	COLFAX CORP	36,634.00	39.3700	51,181.00	14,547.00
8,411.0000	COLGATE-PALMOLIVE CO	292,935.66	74.1300	623,507.43	330,571.77
5,182.0000	COLONY NORTHSTAR INC	63,510.51	14.0900	73,014.38	9,503.87
314.0000	COLUMBIA BANKING SYSTEM INC	5,221.82	39.8500	12,512.90	7,291.08
45,958.0000	COMCAST CORP	921,168.57	38.9200	1,788,685.36	867,516.79
1,603.0000	COMERICA INC	43,855.14	73.2400	117,403.72	73,548.58
1,460.0000	COMMERCE BANCSHARES INC/MO	42,823.36	56.8300	82,971.80	40,148.44



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108.0000	COMMERCEHUB INC	405.18	17.4200	1,881.36	1,476.18
217.0000	COMMERCEHUB INC	820.45	17.4400	3,784.48	2,964.03
902.0000	COMMERCIAL METALS CO	12,934.68	19.4300	17,525.86	4,591.18
1,081.0000	COMMSCOPE HOLDING CO INC	35,467.61	38.0300	41,110.43	5,642.82
2,401.0000	COMMUNITY BANK SYSTEM INC	77,074.14	55.7700	133,903.77	56,829.63
739.0000	COMMUNITY TRUST BANCORP INC	18,132.37	43.7500	32,331.25	14,198.88
350.0000	COMMVAULT SYSTEMS INC	14,434.00	56.4500	19,757.50	5,323.50
501.0000	COMPASS MINERALS INTERNATIONAL	42,334.50	65.3000	32,715.30	9,619.20-
3,669.0000	CONAGRA BRANDS INC	69,683.38	35.7600	131,203.44	61,520.06
1,367.0000	CONCHO RESOURCES INC	106,630.83	121.5300	166,131.51	59,500.68
2,471.0000	CONDUENT INC	31,989.90	15.9400	39,387.74	7,397.84
161.0000	CONMED CORP	4,929.82	50.9400	8,201.34	3,271.52
5,764.0000	CONNECTONE BANCORP INC	103,651.71	22.5500	129,978.20	26,326.49
11,464.0000	CONOCOPHILLIPS	542,013.16	43.9600	503,957.44	38,055.72-
5,714.0000	CONSOL ENERGY INC	38,340.94	14.9400	85,367.16	47,026.22
1,218.0000	CONSOLIDATED COMMUNICATIONS HO	28,708.26	21.4700	26,150.46	2,557.80-
2,681.0000	CONSOLIDATED EDISON INC	125,152.03	80.8200	216,678.42	91,526.39



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1,547.0000	CONSTELLATION BRANDS INC	68,188.84	193.7300	299,700.31	231,511.47
1,051.0000	CONTINENTAL RESOURCES INC/OK	27,224.23	32.3300	33,978.83	6,754.60
1,515.0000	CONVERGYS CORP	19,967.70	23.7800	36,026.70	16,059.00
356.0000	COOPER COS INC/THE	26,659.02	239.4200	85,233.52	58,574.50
494.0000	COOPER TIRE & RUBBER CO	9,835.54	36.1000	17,833.40	7,997.86
1,936.0000	COPART INC	22,347.69	31.7900	61,545.44	39,197.75
988.0000	CORE-MARK HOLDING CO INC	42,187.60	33.0600	32,663.28	9,524.32-
900.0000	CORELOGIC INC/UNITED STATES	32,673.36	43.3800	39,042.00	6,368.64
1,482.0000	CORECIVIC INC	39,643.50	27.5800	40,873.56	1,230.06
815.0000	CORNERSTONE ONDEMAND INC	23,040.05	35.7500	29,136.25	6,096.20
11,899.0000	CORNING INC	224,058.17	30.0500	357,564.95	133,506.78
568.0000	CORPORATE OFFICE PROPERTIES TR	12,342.64	35.0300	19,897.04	7,554.40
3,228.0000	COSTCO WHOLESALE CORP	228,487.85	159.9300	516,254.04	287,766.19
315.0000	COSTAR GROUP INC	21,128.49	263.6000	83,034.00	61,905.51
4,350.0000	COTY INC	77,408.81	18.7600	81,606.00	4,197.19
3,841.0000	COUSINS PROPERTIES INC	25,461.02	8.7900	33,762.39	8,301.37
1,244.0000	COVANTA HOLDING CORP	20,165.24	13.2000	16,420.80	3,744.44-



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1,170.0000	COWEN INC	15,139.17	16.2500	19,012.50	3,873.33
32.0000	CRACKER BARREL OLD COUNTRY STO	1,555.52	167.2500	5,352.00	3,796.48
388.0000	CRANE CO	18,197.20	79.3800	30,799.44	12,602.24
1,251.0000	CRAY INC	25,167.27	18.4000	23,018.40	2,148.87-
210.0000	CREDIT ACCEPTANCE CORP	45,091.20	257.1400	53,999.40	8,908.20
875.0000	CREE INC	20,825.00	24.6500	21,568.75	743.75
3,055.0000	CROWN CASTLE INTERNATIONAL COR	170,125.86	100.1800	306,049.90	135,924.04
1,988.0000	CROWN HOLDINGS INC	71,685.29	59.6600	118,604.08	46,918.79
1,115.0000	CUBESMART	15,017.41	24.0400	26,804.60	11,787.19
358.0000	CULLEN/FROST BANKERS INC	20,037.26	93.9100	33,619.78	13,582.52
1,804.0000	CUMMINS INC	187,042.38	162.2200	292,644.88	105,602.50
434.0000	CURTISS-WRIGHT CORP	14,975.69	91.7800	39,832.52	24,856.83
5,784.0000	CYPRESS SEMICONDUCTOR CORP	67,792.23	13.6500	78,951.60	11,159.37
1,166.0000	CYRUSONE INC	42,663.94	55.7500	65,004.50	22,340.56
1,304.0000	DCT INDUSTRIAL TRUST INC	36,919.11	53.4400	69,685.76	32,766.65
2,602.0000	DDR CORP	33,588.36	9.0700	23,600.14	9,988.22-
2,742.0000	DR HORTON INC	48,784.05	34.5700	94,790.94	46,006.89



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560.0000	DST SYSTEMS INC	14,316.40	61.7000	34,552.00	20,235.60
1,244.0000	DTE ENERGY CO	51,903.91	105.7900	131,602.76	79,698.85
344.0000	DSW INC	8,514.00	17.7000	6,088.80	2,425.20-
2,444.0000	DXC TECHNOLOGY CO	78,606.50	76.7200	187,503.68	108,897.18
4,707.0000	DANAHER CORP	130,394.65	84.3900	397,223.73	266,829.08
1,359.0000	DARDEN RESTAURANTS INC	76,337.63	90.4400	122,907.96	46,570.33
3,850.0000	DARLING INGREDIENTS INC	42,350.00	15.7400	60,599.00	18,249.00
1,324.0000	DAVITA INC	62,018.56	64.7600	85,742.24	23,723.68
2,046.0000	DEAN FOODS CO	34,758.44	17.0000	34,782.00	23.56
108.0000	DECKERS OUTDOOR CORP	5,114.88	68.2600	7,372.08	2,257.20
3,265.0000	DEERE & CO	190,351.72	123.5900	403,521.35	213,169.63
7,112.0000	DELTA AIR LINES INC	90,228.93	53.7400	382,198.88	291,969.95
409.0000	DELUXE CORP	9,627.86	69.2200	28,310.98	18,683.12
2,074.0000	DENTSPLY SIRONA INC	59,528.63	64.8400	134,478.16	74,949.53
3,862.0000	DEVON ENERGY CORP	162,761.59	31.9700	123,468.14	39,293.45-
769.0000	DEXCOM INC	57,947.92	73.1500	56,252.35	1,695.57-
1,044.0000	DIAMONDBACK ENERGY INC	84,601.60	88.8100	92,717.64	8,116.04



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2,441.0000	DIAMONDROCK HOSPITALITY CO	23,699.60	10.9500	26,728.95	3,029.35
787.0000	DICK'S SPORTING GOODS INC	35,045.11	39.8300	31,346.21	3,698.90-
519.0000	DIEBOLD NIXDORF INC	15,564.81	28.0000	14,532.00	1,032.81-
1,338.0000	DIGITAL REALTY TRUST INC	80,581.95	112.9500	151,127.10	70,545.15
357.0000	DIME COMMUNITY BANCSHARES INC	5,083.68	19.6000	6,997.20	1,913.52
327.0000	DILLARD'S INC	18,357.87	57.6900	18,864.63	506.76
123.0000	DINEEQUITY INC	6,157.38	44.0500	5,418.15	739.23-
12,794.0000	WALT DISNEY CO/THE	400,490.97	106.2500	1,359,362.50	958,871.53
2,681.0000	DISCOVERY COMMUNICATIONS INC	69,770.67	25.8300	69,250.23	520.44-
919.0000	DISCOVERY COMMUNICATIONS INC	18,239.40	25.2100	23,167.99	4,928.59
1,723.0000	DISH NETWORK CORP	50,429.77	62.7600	108,135.48	57,705.71
4,200.0000	DISCOVER FINANCIAL SERVICES	101,117.46	62.1900	261,198.00	160,080.54
1,219.0000	DOLBY LABORATORIES INC	42,713.76	48.9600	59,682.24	16,968.48
2,824.0000	DOLLAR GENERAL CORP	151,528.16	72.0900	203,582.16	52,054.00
2,060.0000	DOLLAR TREE INC	60,408.58	69.9200	144,035.20	83,626.62
5,750.0000	DOMINION ENERGY INC	263,993.35	76.6300	440,622.50	176,629.15
658.0000	DOMINO'S PIZZA INC	28,175.56	211.5300	139,186.74	111,011.18



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530.0000	DOMTAR CORP	19,629.76	38.4200	20,362.60	732.84
875.0000	DONALDSON CO INC	19,936.87	45.5400	39,847.50	19,910.63
35.0000	DONEGAL GROUP INC	442.05	15.9000	556.50	114.45
351.6670	RR DONNELLEY & SONS CO	5,285.72	12.5400	4,409.90	875.82-
531.8750	DONNELLEY FINANCIAL SOLUTIONS	11,907.84	22.9600	12,211.85	304.01
753.0000	DORMAN PRODUCTS INC	36,708.75	82.7700	62,325.81	25,617.06
1,302.0000	DOUGLAS EMMETT INC	20,154.96	38.2100	49,749.42	29,594.46
1,480.0000	DOVER CORP	58,873.43	80.2200	118,725.60	59,852.17
10,403.0000	DOW CHEMICAL CO/THE	463,635.84	63.0700	656,117.21	192,481.37
1,437.0000	DR PEPPER SNAPPLE GROUP INC	129,098.70	91.1100	130,925.07	1,826.37
409.0000	DRIL-QUIP INC	27,298.09	48.8000	19,959.20	7,338.89-
8,418.0000	EI DU PONT DE NEMOURS & CO	379,810.74	80.7100	679,416.78	299,606.04
6,617.0000	DUKE ENERGY CORP	372,281.57	83.5900	553,115.03	180,833.46
2,180.0000	DUKE REALTY CORP	25,549.60	27.9500	60,931.00	35,381.40
429.0000	DUN & BRADSTREET CORP/THE	32,948.78	108.1500	46,396.35	13,447.57
1,071.0000	DUNKIN' BRANDS GROUP INC	34,657.56	55.1200	59,033.52	24,375.96
1,273.0000	CONTRA DYAX CORPORATION	0.00	0.0000	0.00	0.00



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321.0000	DYCOM INDUSTRIES INC	4,798.95	89.5200	28,735.92	23,936.97
5,287.0000	DYNEX CAPITAL INC	35,792.99	7.1000	37,537.70	1,744.71
3,210.0000	DYNEGY INC	39,322.50	8.2700	26,546.70	12,775.80-
397.0000	EMC INSURANCE GROUP INC	4,999.55	27.7800	11,028.66	6,029.11
5,558.0000	EOG RESOURCES INC	313,134.65	90.5200	503,110.16	189,975.51
1,525.0000	EQT CORP	90,400.72	58.5900	89,349.75	1,050.97-
371.0000	EPR PROPERTIES	17,058.58	71.8700	26,663.77	9,605.19
3,295.0000	E*TRADE FINANCIAL CORP	29,391.40	38.0300	125,308.85	95,917.45
531.0000	EAGLE MATERIALS INC	36,464.92	92.4200	49,075.02	12,610.10
2,079.0000	EAST WEST BANCORP INC	36,100.19	58.5800	121,787.82	85,687.63
2,005.0000	EASTERLY GOVERNMENT PROPERTIES	35,106.55	20.9500	42,004.75	6,898.20
172.0000	EASTGROUP PROPERTIES INC	9,958.80	83.8000	14,413.60	4,454.80
1,153.0000	EASTMAN CHEMICAL CO	80,088.47	83.9900	96,840.47	16,752.00
9,423.0000	EBAY INC	130,932.29	34.9200	329,051.16	198,118.87
133.0000	ECHOSTAR CORP	4,983.51	60.7000	8,073.10	3,089.59
1,891.0000	ECOLAB INC	82,287.55	132.7500	251,030.25	168,742.70
514.0000	EDGEWELL PERSONAL CARE CO	39,703.11	76.0200	39,074.28	628.83-



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3,175.0000	EDISON INTERNATIONAL	134,590.47	78.1900	248,253.25	113,662.78
2,160.0000	EDWARDS LIFESCIENCES CORP	142,293.24	118.2400	255,398.40	113,105.16
906.0000	EL PASO ELECTRIC CO	35,207.16	51.7000	46,840.20	11,633.04
3,258.0000	ELECTRONIC ARTS INC	82,502.94	105.7200	344,435.76	261,932.82
309.0000	ELECTRONICS FOR IMAGING INC	5,101.59	47.3800	14,640.42	9,538.83
660.0000	ELLIE MAE INC	42,893.40	109.9100	72,540.60	29,647.20
532.0000	EMCOR GROUP INC	15,119.44	65.3800	34,782.16	19,662.72
1,119.0000	EMERGENT BIOSOLUTIONS INC	40,214.76	33.9100	37,945.29	2,269.47-
6,214.0000	EMERSON ELECTRIC CO	277,696.51	59.6200	370,478.68	92,782.17
2,292.0000	EMPIRE STATE REALTY TRUST INC	42,493.68	20.7700	47,604.84	5,111.16
220.0000	ENCORE WIRE CORP	5,108.40	42.7000	9,394.00	4,285.60
573.0000	ENERGEN CORP	31,497.81	49.3700	28,289.01	3,208.80-
256.0000	ENERGIZER HOLDINGS INC	5,111.01	48.0200	12,293.12	7,182.11
329.0000	ENERSYS	12,202.61	72.4500	23,836.05	11,633.44
1,772.0000	ENSIGN GROUP INC/THE	42,510.28	21.7700	38,576.44	3,933.84-
1,068.0000	ENTEGRIS INC	10,455.72	21.9500	23,442.60	12,986.88
1,693.0000	ENTERCOM COMMUNICATIONS CORP	10,346.09	10.3500	17,522.55	7,176.46



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1,421.0000	ENTERGY CORP	96,158.89	76.7700	109,090.17	12,931.28
390.0000	ENTERPRISE FINANCIAL SERVICES	5,190.90	40.8000	15,912.00	10,721.10
930.0000	ENVISION HEALTHCARE CORP	66,743.63	62.6700	58,283.10	8,460.53-
830.0000	EPLUS INC	34,930.55	74.1000	61,503.00	26,572.45
1,208.0000	EQUIFAX INC	46,012.32	137.4200	166,003.36	119,991.04
517.0000	EQUINIX INC	108,335.80	429.1600	221,875.72	113,539.92
1,496.0000	EQUITY COMMONWEALTH	29,873.99	31.6000	47,273.60	17,399.61
572.0000	EQUITY LIFESTYLE PROPERTIES IN	30,069.60	86.3400	49,386.48	19,316.88
2,621.0000	EQUITY RESIDENTIAL	133,778.88	65.8300	172,540.43	38,761.55
8,386.0000	ESPERION THERAPEUTICS INC	90,312.19	46.2800	388,104.08	297,791.89
5,159.0000	ESSENDANT INC	104,160.21	14.8300	76,507.97	27,652.24-
651.0000	ESSEX PROPERTY TRUST INC	114,173.46	257.2700	167,482.77	53,309.31
243.0000	ESTERLINE TECHNOLOGIES CORP	17,802.18	94.8000	23,036.40	5,234.22
242.0000	ETHAN ALLEN INTERIORS INC	5,055.38	32.3000	7,816.60	2,761.22
437.0000	EURONET WORLDWIDE INC	22,510.60	87.3700	38,180.69	15,670.09
427.0000	EVERCORE PARTNERS INC	15,145.56	70.5000	30,103.50	14,957.94
3,249.0000	EVERSOURCE ENERGY	147,365.80	60.7100	197,246.79	49,880.99



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625.0000	EXACT SCIENCES CORP	5,131.25	35.3700	22,106.25	16,975.00
8,459.0000	EXELON CORP	242,880.19	36.0700	305,116.13	62,235.94
5,342.0000	EXELIXIS INC	40,652.62	24.6300	131,573.46	90,920.84
902.0000	EXLSERVICE HOLDINGS INC	42,078.30	55.5800	50,133.16	8,054.86
1,106.0000	EXPEDIA INC	61,869.57	148.9500	164,738.70	102,869.13
1,484.0000	EXPEDITORS INTERNATIONAL OF WA	75,402.04	56.4800	83,816.32	8,414.28
5,061.0000	EXPRESS SCRIPTS HOLDING CO	192,985.73	63.8400	323,094.24	130,108.51
1,086.0000	EXTRA SPACE STORAGE INC	86,722.98	78.0000	84,708.00	2,014.98-
39,122.0000	EXXON MOBIL CORP	2,858,207.76	80.7300	3,158,319.06	300,111.30
1,314.0000	FLIR SYSTEMS INC	36,174.42	34.6600	45,543.24	9,368.82
1,036.0000	FMC CORP	42,672.84	73.0500	75,679.80	33,006.96
3,316.0000	FNB CORP/PA	33,524.76	14.1600	46,954.56	13,429.80
165.0000	FTD COS INC	3,787.68	20.0000	3,300.00	487.68-
20,940.0000	FACEBOOK INC	1,338,125.17	150.9800	3,161,521.20	1,823,396.03
333.0000	FACTSET RESEARCH SYSTEMS INC	56,664.90	166.1800	55,337.94	1,326.96-
317.0000	FAIR ISAAC CORP	9,189.83	139.4100	44,192.97	35,003.14
1,000.0000	FAIRPOINT COMMUNICATIONS INC	13,671.10	15.6500	15,650.00	1,978.90



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3,647.0000	FARMLAND PARTNERS INC	40,708.54	8.9400	32,604.18	8,104.36-
123.0000	FARO TECHNOLOGIES INC	5,098.35	37.8000	4,649.40	448.95-
3,266.0000	FASTENAL CO	132,149.78	43.5300	142,168.98	10,019.20
497.0000	FEDERAL REALTY INVESTMENT TRUS	45,818.79	126.3900	62,815.83	16,997.04
208.0000	FEDERATED INVESTORS INC	4,915.04	28.2500	5,876.00	960.96
2,504.0000	FEDEX CORP	263,570.17	217.3300	544,194.32	280,624.15
3,702.0000	FELCOR LODGING TRUST INC	21,175.44	7.2100	26,691.42	5,515.98
1,561.0000	FERRO CORP	8,366.96	18.2900	28,550.69	20,183.73
558.0000	F5 NETWORKS INC	45,982.53	127.0600	70,899.48	24,916.95
2,715.0000	FIDELITY NATIONAL INFORMATION	89,829.67	85.4000	231,861.00	142,031.33
2,176.0000	FNF GROUP	60,692.04	44.8300	97,550.08	36,858.04
376.0000	FNFV GROUP	3,243.61	15.8000	5,940.80	2,697.19
5,969.0000	FIFTH THIRD BANCORP	90,167.87	25.9600	154,955.24	64,787.37
305.0000	FINANCIAL ENGINES INC	7,667.70	36.6000	11,163.00	3,495.30
311.0000	FINANCIAL INSTITUTIONS INC	5,010.21	29.8000	9,267.80	4,257.59
713.0000	FINISAR CORP	11,457.91	25.9800	18,523.74	7,065.83
2,409.0000	FIREEYE INC	40,615.74	15.2100	36,640.89	3,974.85-



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627.0000	FIRST AMERICAN FINANCIAL CORP	9,630.72	44.6900	28,020.63	18,389.91
12,836.0000	FIRST BANCORP/PUERTO RICO	54,821.05	5.7900	74,320.44	19,499.39
37.0000	FIRST CITIZENS BANCSHARES INC/	6,464.27	372.7000	13,789.90	7,325.63
404.0000	FIRST CONNECTICUT BANCORP INC/	5,684.28	25.6500	10,362.60	4,678.32
915.0000	FIRST DEFIANCE FINANCIAL CORP	31,520.22	52.6800	48,202.20	16,681.98
2,850.0000	FIRST DATA CORP	45,134.75	18.2000	51,870.00	6,735.25
1,017.0000	FIRST FINANCIAL BANKSHARES INC	31,004.77	44.2000	44,951.40	13,946.63
3,601.0000	FIRST HAWAIIAN INC	114,102.68	30.6200	110,262.62	3,840.06-
598.0000	FIRST HORIZON NATIONAL CORP	6,003.10	17.4200	10,417.16	4,414.06
1,295.0000	FIRST INDUSTRIAL REALTY TRUST	16,776.50	28.6200	37,062.90	20,286.40
1,236.0000	FIRST INTERSTATE BANCSYSTEM IN	35,473.20	37.2000	45,979.20	10,506.00
593.0000	FIRST MIDWEST BANCORP INC/IL	6,955.89	23.3100	13,822.83	6,866.94
2,750.0000	FIRST POTOMAC REALTY TRUST	29,425.00	11.1100	30,552.50	1,127.50
1,322.0000	FIRST REPUBLIC BANK/CA	75,812.03	100.1000	132,332.20	56,520.17
614.0000	FIRST SOLAR INC	25,486.98	39.8800	24,486.32	1,000.66-
269.0000	1ST SOURCE CORP	4,912.90	47.9400	12,895.86	7,982.96
249.0000	FIRSTCASH INC	9,691.08	58.3000	14,516.70	4,825.62



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2,281.0000	FISERV INC	53,828.75	122.3400	279,057.54	225,228.79
735.0000	FLAGSTAR BANCORP INC	9,929.85	30.8200	22,652.70	12,722.85
3,274.0000	FIRSTENERGY CORP	104,798.10	29.1600	95,469.84	9,328.26-
972.0000	FLEETCOR TECHNOLOGIES INC	112,503.74	144.2100	140,172.12	27,668.38
646.0000	FLOTEK INDUSTRIES INC	4,921.03	8.9400	5,775.24	854.21
1,550.0000	FLUOR CORP	60,413.88	45.7800	70,959.00	10,545.12
1,299.0000	FLOWERS FOODS INC	24,732.81	17.3100	22,485.69	2,247.12-
1,725.0000	FLOWSERVE CORP	80,422.98	46.4300	80,091.75	331.23-
1,691.0000	FOOT LOCKER INC	45,710.75	49.2800	83,332.48	37,621.73
25,737.0000	FORD MOTOR CO	220,936.33	11.1900	287,997.03	67,060.70
1,695.0000	FOREST CITY REALTY TRUST INC	27,545.07	24.1700	40,968.15	13,423.08
305.0000	FORESTAR GROUP INC	4,901.35	17.1500	5,230.75	329.40
1,107.0000	FORTINET INC	29,065.74	37.4400	41,446.08	12,380.34
1,814.0000	FORTUNE BRANDS HOME & SECURITY	47,578.11	65.2400	118,345.36	70,767.25
234.0000	FORWARD AIR CORP	7,607.34	53.2800	12,467.52	4,860.18
230.0000	FRANKLIN ELECTRIC CO INC	5,146.25	41.4000	9,522.00	4,375.75
4,025.0000	FRANKLIN RESOURCES INC	149,581.39	44.7900	180,279.75	30,698.36



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12,097.0000	FREEPORT-MCMORAN INC	63,436.14	12.0100	145,284.97	81,848.83
4,360.0000	FRESHPET INC	40,460.80	16.6000	72,376.00	31,915.20
393.0000	HB FULLER CO	9,211.92	51.1100	20,086.23	10,874.31
3,539.0000	FULTON FINANCIAL CORP	35,391.42	19.0000	67,241.00	31,849.58
902.0000	GAMCO INVESTORS INC	25,237.99	29.6000	26,699.20	1,461.21
369.0000	GATX CORP	13,379.94	64.2700	23,715.63	10,335.69
891.0000	GEO GROUP INC/THE	13,927.34	29.5700	26,346.87	12,419.53
764.0000	GCP APPLIED TECHNOLOGIES INC	7,318.90	30.5000	23,302.00	15,983.10
5,394.0000	GGP INC	99,434.80	23.5600	127,082.64	27,647.84
592.0000	G -III APPAREL GROUP LTD	9,732.48	24.9500	14,770.40	5,037.92
1,470.0000	GTT COMMUNICATIONS INC	47,566.85	31.6500	46,525.50	1,041.35-
1,830.0000	ARTHUR J GALLAGHER & CO	77,958.38	57.2500	104,767.50	26,809.12
2,247.0000	GAMING AND LEISURE PROPERTIES	68,046.49	37.6700	84,644.49	16,598.00
987.0000	GAMESTOP CORP	19,923.30	21.6100	21,329.07	1,405.77
960.0000	GANNETT CO INC	4,849.29	8.7200	8,371.20	3,521.91
2,761.0000	GAP INC/THE	59,432.51	21.9900	60,714.39	1,281.88
1,130.0000	GARTNER INC	50,277.98	123.5100	139,566.30	89,288.32



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1,313.0000	GENERAC HOLDINGS INC	42,725.02	36.1300	47,438.69	4,713.67
1,926.0000	GENERAL COMMUNICATION INC	28,716.66	36.6400	70,568.64	41,851.98
2,111.0000	GENERAL DYNAMICS CORP	151,989.04	198.1000	418,189.10	266,200.06
82,356.0000	GENERAL ELECTRIC CO	2,161,629.94	27.0100	2,224,435.56	62,805.62
5,613.0000	GENERAL MILLS INC	180,432.56	55.4000	310,960.20	130,527.64
14,256.0000	GENERAL MOTORS CO	466,178.97	34.9300	497,962.08	31,783.11
189.0000	GENESCO INC	9,642.78	33.9000	6,407.10	3,235.68-
331.0000	GENESEE & WYOMING INC	23,197.51	68.3900	22,637.09	560.42-
2,362.0000	GENTEX CORP	25,436.59	18.9700	44,807.14	19,370.55
1,248.0000	GENUINE PARTS CO	54,398.94	92.7600	115,764.48	61,365.54
327.0000	GENTHERM INC	5,310.48	38.8000	12,687.60	7,377.12
454.0000	GERBER SCIENTIFIC INC COM ESCROW	0.00	0.0000	0.00	0.00
2,087.0000	GETTY REALTY CORP	35,963.76	25.1000	52,383.70	16,419.94
457.0000	GIBRALTAR INDUSTRIES INC	4,958.45	35.6500	16,292.05	11,333.60
2,499.0000	GIGAMON INC	48,255.69	39.3500	98,335.65	50,079.96
13,238.0000	GILEAD SCIENCES INC	448,317.68	70.7800	936,985.64	488,667.96



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572.0000	GLACIER BANCORP INC	7,424.56	36.6100	20,940.92	13,516.36
2,235.0000	GLADSTONE COMMERCIAL CORP	33,068.33	21.7900	48,700.65	15,632.32
331.0000	PH GLATFELTER CO	4,981.55	19.5400	6,467.74	1,486.19
1,303.0000	GLOBAL PAYMENTS INC	31,314.75	90.3200	117,686.96	86,372.21
1,554.0000	GLOBUS MEDICAL INC	43,107.96	33.1500	51,515.10	8,407.14
8,248.0000	GOLD RESOURCE CORP	30,021.90	4.0800	33,651.84	3,629.94
3,310.0000	GOLDMAN SACHS GROUP INC/THE	562,941.96	221.9000	734,489.00	171,547.04
2,015.0000	GOODYEAR TIRE & RUBBER CO/THE	29,500.61	34.9600	70,444.40	40,943.79
2,490.0000	GOVERNMENT PROPERTIES INCOME T	42,180.60	18.3100	45,591.90	3,411.30
764.0000	WR GRACE & CO	29,746.94	72.0100	55,015.64	25,268.70
450.0000	GRACO INC	22,596.88	109.2800	49,176.00	26,579.12
12.0000	GRAHAM HOLDINGS CO	2,966.21	599.6500	7,195.80	4,229.59
584.0000	WW GRAINGER INC	120,407.38	180.5300	105,429.52	14,977.86-
2,878.0000	GRAMERCY PROPERTY TRUST	52,126.06	29.7100	85,505.38	33,379.32
209.0000	GRAND CANYON EDUCATION INC	4,817.45	78.4100	16,387.69	11,570.24
308.0000	GRANITE CONSTRUCTION INC	7,527.52	48.2400	14,857.92	7,330.40
2,476.0000	GRAPHIC PACKAGING HOLDING CO	23,992.56	13.7800	34,119.28	10,126.72



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1,175.0000	GREAT PLAINS ENERGY INC	22,865.50	29.2800	34,404.00	11,538.50
715.0000	GREEN DOT CORP	9,066.20	38.5300	27,548.95	18,482.75
485.0000	GREEN PLAINS INC	4,951.85	20.5500	9,966.75	5,014.90
249.0000	GREENBRIER COS INC/THE	4,932.69	46.2500	11,516.25	6,583.56
511.0000	GRIFFON CORP	4,997.58	21.9500	11,216.45	6,218.87
111.0000	GROUP 1 AUTOMOTIVE INC	4,362.30	63.3200	7,028.52	2,666.22
4,346.0000	GROUPON INC	23,081.50	3.8400	16,688.64	6,392.86-
1,396.0000	GRUBHUB INC	41,991.68	43.6000	60,865.60	18,873.92
522.0000	GUIDEWIRE SOFTWARE INC	29,613.06	68.7100	35,866.62	6,253.56
1,151.0000	GULFPORT ENERGY CORP	35,172.42	14.7500	16,977.25	18,195.17-
379.0000	H&E EQUIPMENT SERVICES INC	4,839.83	20.4100	7,735.39	2,895.56
3,075.0000	HCA HEALTHCARE INC	215,341.08	87.2000	268,140.00	52,798.92
3,935.0000	HCP INC	129,068.27	31.9600	125,762.60	3,305.67-
1,339.0000	HD SUPPLY HOLDINGS INC	40,677.96	30.6300	41,013.57	335.61
700.0000	HFF INC	9,604.00	34.7700	24,339.00	14,735.00
356.0000	HNI CORP	8,590.28	39.8700	14,193.72	5,603.44
2,171.0000	HRG GROUP INC	29,569.02	17.7100	38,448.41	8,879.39



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15,604.0000	HP INC	183,850.45	17.4800	272,757.92	88,907.47
1,307.0000	HAEMONETICS CORP	42,582.06	39.4900	51,613.43	9,031.37
680.0000	HAIN CELESTIAL GROUP INC/THE	14,843.02	38.8200	26,397.60	11,554.58
8,273.0000	HALLIBURTON CO	249,766.83	42.7100	353,339.83	103,573.00
758.0000	HALOZYME THERAPEUTICS INC	4,972.48	12.8200	9,717.56	4,745.08
352.0000	HALYARD HEALTH INC	7,654.28	39.2800	13,826.56	6,172.28
4,512.0000	HANESBRANDS INC	34,039.20	23.1600	104,497.92	70,458.72
595.0000	HANOVER INSURANCE GROUP INC/TH	24,926.93	88.6300	52,734.85	27,807.92
2,431.0000	HARLEY-DAVIDSON INC	122,339.29	54.0200	131,322.62	8,983.33
1,158.0000	HARRIS CORP	51,076.66	109.0800	126,314.64	75,237.98
4,007.0000	HARTFORD FINANCIAL SERVICES GR	102,705.16	52.5700	210,647.99	107,942.83
1,337.0000	HASBRO INC	57,750.59	111.5100	149,088.87	91,338.28
1,197.0000	HAWAIIAN ELECTRIC INDUSTRIES I	34,868.61	32.3800	38,758.86	3,890.25
879.0000	HAWAIIAN HOLDINGS INC	5,054.25	46.9500	41,269.05	36,214.80
251.0000	HAWAIIAN TELCOM HOLDCO INC	5,022.51	24.9900	6,272.49	1,249.98
941.0000	HEALTHCARE SERVICES GROUP INC	35,014.61	46.8300	44,067.03	9,052.42
756.0000	HEALTHSOUTH CORP	18,711.00	48.4000	36,590.40	17,879.40



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579.0000	HEALTHCARE REALTY TRUST INC	11,857.92	34.1500	19,772.85	7,914.93
435.0000	HEALTHSTREAM INC	9,922.35	26.3200	11,449.20	1,526.85
456.0000	HEALTHCARE TRUST OF AMERICA IN	10,177.92	31.1100	14,186.16	4,008.24
647.0000	HEICO CORP	17,639.81	71.8400	46,480.48	28,840.67
366.0000	HEIDRICK & STRUGGLES INTERNATI	4,933.68	21.7500	7,960.50	3,026.82
1,531.0000	HELMERICH & PAYNE INC	91,013.85	54.3400	83,194.54	7,819.31-
687.0000	JACK HENRY & ASSOCIATES INC	20,129.10	103.8700	71,358.69	51,229.59
209.0000	HERC HOLDINGS INC	8,467.47	39.3200	8,217.88	249.59-
905.0000	HERITAGE FINANCIAL CORP/WA	12,758.94	26.5000	23,982.50	11,223.56
741.0000	HERSHA HOSPITALITY TRUST	16,197.96	18.5100	13,715.91	2,482.05-
1,130.0000	HERSHEY CO/THE	88,700.10	107.3700	121,328.10	32,628.00
2,090.0000	HESS CORP	95,692.49	43.8700	91,688.30	4,004.19-
15,648.0000	HEWLETT PACKARD ENTERPRISE CO	156,720.59	16.5900	259,600.32	102,879.73
779.0000	HEXCEL CORP	16,335.63	52.7900	41,123.41	24,787.78
574.0000	HIGHWOODS PROPERTIES INC	18,620.56	50.7100	29,107.54	10,486.98
939.0000	HILL-ROM HOLDINGS INC	45,222.43	79.6100	74,753.79	29,531.36
268.0000	HILLENBRAND INC	6,362.32	36.1000	9,674.80	3,312.48



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215.0000	HILLTOP HOLDINGS INC	4,321.50	26.2100	5,635.15	1,313.65
1,945.0000	HILTON WORLDWIDE HOLDINGS INC	100,343.88	61.8500	120,298.25	19,954.37
1,499.0000	HOLLYFRONTIER CORP	45,866.90	27.4700	41,177.53	4,689.37-
2,246.0000	HOLOGIC INC	41,710.86	45.3800	101,923.48	60,212.62
1,387.0000	HOME BANCSHARES INC/AR	31,088.89	24.9000	34,536.30	3,447.41
10,016.0000	HOME DEPOT INC/THE	376,014.15	153.4000	1,536,454.40	1,160,440.25
351.0000	HOMESTREET INC	5,101.71	27.6750	9,713.93	4,612.22
1,850.0000	HOMETRUST BANCSHARES INC	34,632.00	24.4000	45,140.00	10,508.00
7,269.0000	HONEYWELL INTERNATIONAL INC	367,483.52	133.2900	968,885.01	601,401.49
331.0000	HORACE MANN EDUCATORS CORP	4,951.76	37.8000	12,511.80	7,560.04
2,267.0000	HORMEL FOODS CORP	65,745.10	34.1100	77,327.37	11,582.27
1,070.0000	HOSPITALITY PROPERTIES TRUST	23,775.40	29.1500	31,190.50	7,415.10
7,920.0000	HOST HOTELS & RESORTS INC	129,359.09	18.2700	144,698.40	15,339.31
308.0000	HOWARD HUGHES CORP/THE	36,144.32	122.8400	37,834.72	1,690.40
293.0000	HUB GROUP INC	10,600.74	38.3500	11,236.55	635.81
659.0000	HUBBELL INC	46,009.66	113.1700	74,579.03	28,569.37
1,470.0000	HUDSON PACIFIC PROPERTIES INC	42,262.50	34.1900	50,259.30	7,996.80



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1,441.0000	HUMANA INC	113,343.03	240.6200	346,733.42	233,390.39
727.0000	JB HUNT TRANSPORT SERVICES INC	33,238.44	91.3800	66,433.26	33,194.82
10,103.0000	HUNTINGTON BANCSHARES INC/OH	67,097.95	13.5200	136,592.56	69,494.61
434.0000	HUNTINGTON INGALLS INDUSTRIES	16,354.58	186.1600	80,793.44	64,438.86
1,660.0000	HUNTSMAN CORP	20,517.60	25.8400	42,894.40	22,376.80
165.0000	HURON CONSULTING GROUP INC	4,851.00	43.2000	7,128.00	2,277.00
352.0000	HYATT HOTELS CORP	13,819.52	56.2100	19,785.92	5,966.40
492.0000	IDT CORP	2,775.15	14.3700	7,070.04	4,294.89
523.0000	IAC/INTERACTIVECORP	31,664.49	103.2400	53,994.52	22,330.03
198.0000	ICF INTERNATIONAL INC	4,950.00	47.1000	9,325.80	4,375.80
1,066.0000	ILG INC	11,830.72	27.4900	29,304.34	17,473.62
202.0000	IPG PHOTONICS CORP	8,580.96	145.1000	29,310.20	20,729.24
2,669.0000	ISTAR INC	20,312.66	12.0400	32,134.76	11,822.10
732.0000	ITT INC	14,239.70	40.1800	29,411.76	15,172.06
174.0000	IBERIABANK CORP	9,824.04	81.5000	14,181.00	4,356.96
388.0000	IDACORP INC	18,620.12	85.3500	33,115.80	14,495.68
659.0000	IDEX CORP	28,666.50	113.0100	74,473.59	45,807.09



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778.0000	IDEXX LABORATORIES INC	30,505.88	161.4200	125,584.76	95,078.88
3,474.0000	ILLINOIS TOOL WORKS INC	156,597.15	143.2500	497,650.50	341,053.35
1,217.0000	ILLUMINA INC	194,451.86	173.5200	211,173.84	16,721.98
1,470.0000	INCYTE CORP	43,020.29	125.9100	185,087.70	142,067.41
2,271.0000	INDEPENDENCE HOLDING CO	36,795.88	20.4500	46,441.95	9,646.07
4,470.0000	INDEPENDENCE REALTY TRUST INC	35,985.74	9.8700	44,118.90	8,133.16
386.0000	INDEPENDENT BANK CORP/ROCKLAND	12,619.40	66.6500	25,726.90	13,107.50
831.0000	INFINERA CORP	5,476.29	10.6700	8,866.77	3,390.48
408.0000	INGEVITY CORP	7,393.99	57.4000	23,419.20	16,025.21
301.0000	INGLES MARKETS INC	4,809.98	33.3000	10,023.30	5,213.32
608.0000	INGREDION INC	29,897.31	119.2100	72,479.68	42,582.37
305.0000	INSIGHT ENTERPRISES INC	5,072.15	39.9900	12,196.95	7,124.80
1,258.0000	INPHI CORP	46,972.43	34.3000	43,149.40	3,823.03-
176.0000	INSPERITY INC	5,026.56	71.0000	12,496.00	7,469.44
245.0000	INSULET CORP	5,049.45	51.3100	12,570.95	7,521.50
1,344.0000	INTEGRA LIFESCIENCES HOLDINGS	42,994.56	54.5100	73,261.44	30,266.88
1,178.0000	INTEGRATED DEVICE TECHNOLOGY I	8,852.67	25.7900	30,380.62	21,527.95



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42,413.0000	INTEL CORP	950,753.06	33.7400	1,431,014.62	480,261.56
883.0000	INTER PARFUMS INC	29,156.66	36.6500	32,361.95	3,205.29
1,471.0000	INTERACTIVE BROKERS GROUP INC	24,094.98	37.4200	55,044.82	30,949.84
5,117.0000	INTERCONTINENTAL EXCHANGE INC	191,459.10	65.9200	337,312.64	145,853.54
800.0000	INTERDIGITAL INC/PA	42,344.00	77.3000	61,840.00	19,496.00
752.0000	INTERNATIONAL BANCSHARES CORP	16,765.34	35.0500	26,357.60	9,592.26
8,444.0000	INTERNATIONAL BUSINESS MACHINE	882,013.16	153.8300	1,298,940.52	416,927.36
555.0000	INTERNATIONAL FLAVORS & FRAGRA	22,017.41	135.0000	74,925.00	52,907.59
3,830.0000	INTERNATIONAL PAPER CO	133,043.07	56.6100	216,816.30	83,773.23
1,185.0000	INTERNATIONAL SPEEDWAY CORP	42,825.90	37.5500	44,496.75	1,670.85
4,603.0000	INTERPUBLIC GROUP OF COS INC/T	46,710.78	24.6000	113,233.80	66,523.02
363.0000	INTUITIVE SURGICAL INC	132,675.17	935.3700	339,539.31	206,864.14
2,564.0000	INTUIT INC	153,339.36	132.8100	340,524.84	187,185.48
4,058.0000	INVESTORS BANCORP INC	45,364.70	13.3600	54,214.88	8,850.18
1,326.0000	IONIS PHARMACEUTICALS INC	29,303.28	50.8700	67,453.62	38,150.34
7,929.0000	IRIDIUM COMMUNICATIONS INC	65,731.41	11.0500	87,615.45	21,884.04
1,274.0000	IROBOT CORP	42,284.06	84.1400	107,194.36	64,910.30



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1,851.0000	IRON MOUNTAIN INC	50,149.99	34.3600	63,600.36	13,450.37
3,455.0000	IRONWOOD PHARMACEUTICALS INC	42,807.45	18.8800	65,230.40	22,422.95
324.0000	ITRON INC	11,877.84	67.7500	21,951.00	10,073.16
64.0000	J ALEXANDER'S HOLDINGS INC	470.68	12.2500	784.00	313.32
34,507.0000	JPMORGAN CHASE & CO	1,593,905.53	91.4000	3,153,939.80	1,560,034.27
1,525.0000	JABIL INC	28,983.55	29.1900	44,514.75	15,531.20
350.0000	JACK IN THE BOX INC	10,024.00	98.5000	34,475.00	24,451.00
872.0000	JACOBS ENGINEERING GROUP INC	35,819.28	54.3900	47,428.08	11,608.80
4,035.0000	JETBLUE AIRWAYS CORP	24,492.45	22.8300	92,119.05	67,626.60
24,840.0000	JOHNSON & JOHNSON	1,965,930.38	132.2900	3,286,083.60	1,320,153.22
414.0000	JONES LANG LASALLE INC	35,541.97	125.0000	51,750.00	16,208.03
507.0000	J2 GLOBAL INC	14,786.94	85.0900	43,140.63	28,353.69
4,430.0000	JUNIPER NETWORKS INC	76,619.79	27.8800	123,508.40	46,888.61
940.0000	JUNO THERAPEUTICS INC	39,865.40	29.8900	28,096.60	11,768.80-
1,967.0000	KAR AUCTION SERVICES INC	75,848.79	41.9700	82,554.99	6,706.20
1,089.0000	KCG HOLDINGS INC	14,107.02	19.9400	21,714.66	7,607.64
1,471.0000	KLA-TENCOR CORP	67,343.46	91.5100	134,611.21	67,267.75



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277.0000	KLX INC	4,587.24	50.0000	13,850.00	9,262.76
130.0000	KAISER ALUMINUM CORP	6,880.90	88.5200	11,507.60	4,626.70
1,050.0000	KAMAN CORP	42,388.50	49.8700	52,363.50	9,975.00
1,350.0000	KANSAS CITY SOUTHERN	87,581.27	104.6500	141,277.50	53,696.23
646.0000	KAPSTONE PAPER AND PACKAGING C	5,151.85	20.6300	13,326.98	8,175.13
1,388.0000	KATE SPADE & CO	29,619.92	18.4900	25,664.12	3,955.80-
2,322.0000	KELLOGG CO	152,981.16	69.4600	161,286.12	8,304.96
302.0000	KELLY SERVICES INC	4,925.62	22.4500	6,779.90	1,854.28
713.0000	KEMPER CORP	20,151.16	38.6000	27,521.80	7,370.64
1,310.0000	KENNAMETAL INC	37,649.40	37.4200	49,020.20	11,370.80
1,430.0000	KENNEDY-WILSON HOLDINGS INC	35,306.70	19.0500	27,241.50	8,065.20-
7,736.0000	KEYCORP	79,449.96	18.7400	144,972.64	65,522.68
1,996.0000	KEYSIGHT TECHNOLOGIES INC	43,300.23	38.9300	77,704.28	34,404.05
465.0000	KILROY REALTY CORP	17,693.25	75.1500	34,944.75	17,251.50
2,901.0000	KIMBERLY-CLARK CORP	238,366.87	129.1100	374,548.11	136,181.24
3,838.0000	KIMCO REALTY CORP	90,020.66	18.3500	70,427.30	19,593.36-
15,420.0000	KINDER MORGAN INC/DE	342,115.30	19.1600	295,447.20	46,668.10-



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274.0000	KIRBY CORP	17,909.37	66.8500	18,316.90	407.53
515.0000	KITE PHARMA INC	37,255.10	103.6700	53,390.05	16,134.95
267.0000	KITE REALTY GROUP TRUST	4,891.44	18.9300	5,054.31	162.87
485.0000	KNIGHT TRANSPORTATION INC	7,827.90	37.0500	17,969.25	10,141.35
741.0000	KNOWLES CORP	11,611.84	16.9200	12,537.72	925.88
1,632.0000	KOHL'S CORP	75,407.50	38.6700	63,109.44	12,298.06-
374.0000	KORN/FERRY INTERNATIONAL	7,954.98	34.5300	12,914.22	4,959.24
5,618.0000	KRAFT HEINZ CO/THE	222,532.21	85.6400	481,125.52	258,593.31
1,748.0000	KRATOS DEFENSE & SECURITY SOLU	10,068.48	11.8700	20,748.76	10,680.28
489.0000	KRATON CORP	9,579.51	34.4400	16,841.16	7,261.65
9,608.0000	KROGER CO/THE	109,909.11	23.3200	224,058.56	114,149.45
2,201.0000	L BRANDS INC	64,442.37	53.8900	118,611.89	54,169.52
2,360.0000	LKQ CORP	70,493.20	32.9500	77,762.00	7,268.80
214.0000	LCI INDUSTRIES	4,981.92	102.4000	21,913.60	16,931.68
634.8750	LSC COMMUNICATIONS INC	15,218.25	21.4000	13,586.33	1,631.92-
777.0000	L3 TECHNOLOGIES INC	56,302.58	167.0800	129,821.16	73,518.58
515.0000	LA-Z-BOY INC	4,830.70	32.5000	16,737.50	11,906.80



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494.0000	LABORATORY CORP OF AMERICA HOL	47,962.80	154.1400	76,145.16	28,182.36
13,723.0000	LADENBURG THALMANN FINANCIAL S	26,465.45	2.4400	33,484.12	7,018.67
968.0000	LAKELAND BANCORP INC	8,630.79	18.8500	18,246.80	9,616.01
1,170.0000	LAKELAND FINANCIAL CORP	30,263.12	45.8800	53,679.60	23,416.48
1,269.0000	LAM RESEARCH CORP	31,132.80	141.4300	179,474.67	148,341.87
837.0000	LAMAR ADVERTISING CO	29,927.49	73.5700	61,578.09	31,650.60
1,223.0000	LAMB WESTON HOLDINGS INC	20,243.81	44.0400	53,860.92	33,617.11
151.0000	LANCASTER COLONY CORP	9,917.68	122.6200	18,515.62	8,597.94
381.0000	LANDSTAR SYSTEM INC	17,145.00	85.6000	32,613.60	15,468.60
3,744.0000	LAS VEGAS SANDS CORP	140,896.31	63.8900	239,204.16	98,307.85
677.0000	LASALLE HOTEL PROPERTIES	17,101.02	29.8000	20,174.60	3,073.58
2,103.0000	ESTEE LAUDER COS INC/THE	181,995.50	95.9800	201,845.94	19,850.44
900.0000	LEAR CORP	44,976.99	142.0800	127,872.00	82,895.01
1,136.0000	LEGGETT & PLATT INC	26,003.04	52.5300	59,674.08	33,671.04
472.0000	LEGACYTEXAS FINANCIAL GROUP IN	9,907.28	38.1300	17,997.36	8,090.08
783.0000	LEGG MASON INC	23,191.49	38.1600	29,879.28	6,687.79
2,055.0000	LEIDOS HOLDINGS INC	71,313.65	51.6900	106,222.95	34,909.30



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8,132.0000	LENDINGCLUB CORP	39,684.16	5.5100	44,807.32	5,123.16
1,519.0000	LENNAR CORP	57,752.38	53.3200	80,993.08	23,240.70
514.0000	LENNOX INTERNATIONAL INC	23,730.67	183.6400	94,390.96	70,660.29
2,549.0000	LEUCADIA NATIONAL CORP	51,969.04	26.1600	66,681.84	14,712.80
2,542.0000	LEVEL 3 COMMUNICATIONS INC	94,674.83	59.3000	150,740.60	56,065.77
2,338.0000	LEXINGTON REALTY TRUST	18,796.68	9.9100	23,169.58	4,372.90
336.0000	LIBBEY INC	4,952.64	8.0600	2,708.16	2,244.48-
744.0000	LIBERTY BROADBAND CORP	40,222.04	86.7500	64,542.00	24,319.96
434.0000	LIBERTY EXPEDIA HOLDINGS INC	5,286.79	54.0200	23,444.68	18,157.89
5,023.0000	LIBERTY INTERACTIVE CORP QVC G	59,266.05	24.5400	123,264.42	63,998.37
651.0000	LIBERTY VENTURES	6,798.82	52.2900	34,040.79	27,241.97
981.0000	LIBERTY PROPERTY TRUST	30,411.00	40.7100	39,936.51	9,525.51
2,305.0000	LIBERTY MEDIA CORP-LIBERTY SIR	68,974.69	41.9800	96,763.90	27,789.21
372.0000	LIBERTY TRIPADVISOR HOLDINGS I	3,403.72	11.6000	4,315.20	911.48
544.0000	LIFEPOINT HEALTH INC	20,410.88	67.1500	36,529.60	16,118.72
393.0000	LIGAND PHARMACEUTICALS INC	42,648.36	121.4000	47,710.20	5,061.84
44.0000	LIFE STORAGE INC	1,738.88	74.1000	3,260.40	1,521.52



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8,496.0000	ELI LILLY & CO	604,033.71	82.3000	699,220.80	95,187.09
622.0000	LINCOLN ELECTRIC HOLDINGS INC	32,375.10	92.0900	57,279.98	24,904.88
1,641.0000	LINCOLN NATIONAL CORP	47,432.78	67.5800	110,898.78	63,466.00
100.0000	LINDSAY CORP	6,217.00	89.2500	8,925.00	2,708.00
750.0000	LIONS GATE ENTERTAINMENT CORP	12,012.71	28.2200	21,165.00	9,152.29
750.0000	LIONS GATE ENTERTAINMENT CORP	11,612.29	26.2800	19,710.00	8,097.71
181.0000	LITTELFUSE INC	9,973.10	165.0000	29,865.00	19,891.90
1,122.0000	LIVE NATION ENTERTAINMENT INC	12,285.90	34.8500	39,101.70	26,815.80
1,936.0000	LOCKHEED MARTIN CORP	414,797.61	277.6100	537,452.96	122,655.35
2,415.0000	LOEWS CORP	90,779.85	46.8100	113,046.15	22,266.30
308.0000	LOGMEIN INC	17,598.68	104.5000	32,186.00	14,587.32
2,122.0000	LOUISIANA-PACIFIC CORP	36,880.36	24.1100	51,161.42	14,281.06
8,935.0000	LOWE'S COS INC	255,551.34	77.5300	692,730.55	437,179.21
1,049.0000	LULULEMON ATHLETICA INC	61,778.15	59.6700	62,593.83	815.68
1,959.0000	LUMINEX CORP	42,960.87	21.1200	41,374.08	1,586.79-
1,103.0000	M&T BANK CORP	98,970.42	161.9500	178,630.85	79,660.43
433.0000	MB FINANCIAL INC	8,227.00	44.0400	19,069.32	10,842.32



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313.0000	MDC HOLDINGS INC	7,607.39	35.3300	11,058.29	3,450.90
1,859.0000	MDU RESOURCES GROUP INC	38,865.53	26.2000	48,705.80	9,840.27
882.0000	MGE ENERGY INC	25,174.38	64.3500	56,756.70	31,582.32
2,020.0000	MGIC INVESTMENT CORP	10,140.40	11.2000	22,624.00	12,483.60
4,995.0000	MGM RESORTS INTERNATIONAL	82,648.50	31.2900	156,293.55	73,645.05
416.0000	MKS INSTRUMENTS INC	10,437.44	67.3000	27,996.80	17,559.36
2,850.0000	MRC GLOBAL INC	43,804.50	16.5200	47,082.00	3,277.50
138.0000	MSA SAFETY INC	4,854.84	81.1700	11,201.46	6,346.62
683.0000	MSC INDUSTRIAL DIRECT CO INC	42,352.83	85.9600	58,710.68	16,357.85
954.0000	MSCI INC	34,965.92	102.9900	98,252.46	63,286.54
215.0000	MYR GROUP INC	5,061.10	31.0200	6,669.30	1,608.20
1,121.0000	MACERICH CO/THE	47,622.50	58.0600	65,085.26	17,462.76
579.0000	MACQUARIE INFRASTRUCTURE CORP	46,209.99	78.4000	45,393.60	816.39-
3,242.0000	MACY'S INC	131,955.45	23.2400	75,344.08	56,611.37-
801.0000	STEVEN MADDEN LTD	20,138.70	39.9500	31,999.95	11,861.25
197.0000	MADISON SQUARE GARDEN CO/THE	35,010.84	196.9000	38,789.30	3,778.46
853.0000	MAGELLAN HEALTH INC	45,699.18	72.9000	62,183.70	16,484.52



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672.0000	MANHATTAN ASSOCIATES INC	9,881.76	48.0600	32,296.32	22,414.56
1,781.0000	MANITOWOC CO INC/THE	5,410.74	6.0100	10,703.81	5,293.07
656.0000	MANPOWERGROUP INC	31,605.26	111.6500	73,242.40	41,637.14
6,124.0000	MARATHON OIL CORP	77,242.88	11.8500	72,569.40	4,673.48-
4,394.0000	MARATHON PETROLEUM CORP	98,020.71	52.3300	229,938.02	131,917.31
513.0000	MARCUS CORP/THE	4,945.32	30.2000	15,492.60	10,547.28
88.0000	MARKEL CORP	41,099.80	975.8600	85,875.68	44,775.88
346.0000	MARKETAXESS HOLDINGS INC	27,960.82	201.1000	69,580.60	41,619.78
603.0000	MARRIOTT VACATIONS WORLDWIDE C	23,263.74	117.7500	71,003.25	47,739.51
4,993.0000	MARSH & MCLENNAN COS INC	169,404.52	77.9600	389,254.28	219,849.76
3,578.0000	MARRIOTT INTERNATIONAL INC/MD	169,300.00	100.3100	358,909.18	189,609.18
357.0000	MARTEN TRANSPORT LTD	4,971.82	27.4000	9,781.80	4,809.98
534.0000	MARTIN MARIETTA MATERIALS INC	56,225.19	222.5800	118,857.72	62,632.53
2,444.0000	MASCO CORP	29,183.68	38.2100	93,385.24	64,201.56
875.0000	MASIMO CORP	36,303.75	91.1800	79,782.50	43,478.75
639.0000	MASONITE INTERNATIONAL CORP	42,908.85	75.5000	48,244.50	5,335.65
450.0000	MASTEC INC	8,212.50	45.1500	20,317.50	12,105.00



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9,295.0000	MASTERCARD INC	384,005.68	121.4500	1,128,877.75	744,872.07
1,388.0000	MATADOR RESOURCES CO	27,801.64	21.3700	29,661.56	1,859.92
4,233.0000	MATTEL INC	97,883.43	21.5300	91,136.49	6,746.94-
2,344.0000	MAXIM INTEGRATED PRODUCTS INC	55,786.19	44.9000	105,245.60	49,459.41
1,228.0000	MAXILINEAR INC	10,794.12	27.8900	34,248.92	23,454.80
866.0000	MAXIMUS INC	20,860.81	62.6300	54,237.58	33,376.77
991.0000	MCCORMICK & CO INC/MD	66,800.36	97.5100	96,632.41	29,832.05
8,058.0000	MCDONALD'S CORP	523,100.41	153.1600	1,234,163.28	711,062.87
507.0000	MCGRATH RENTCORP	14,893.26	34.6300	17,557.41	2,664.15
1,823.0000	MCKESSON CORP	120,219.98	164.5400	299,956.42	179,736.44
1,533.0000	MEDICAL PROPERTIES TRUST INC	16,478.18	12.8700	19,729.71	3,251.53
741.0000	MEDICINES CO/THE	21,335.54	38.0100	28,165.41	6,829.87
340.0000	MEDIFAST INC	8,673.40	41.4700	14,099.80	5,426.40
498.0000	MEDIDATA SOLUTIONS INC	9,800.64	78.2000	38,943.60	29,142.96
1,246.0000	MEDNAX INC	60,891.60	60.3700	75,221.02	14,329.42
26,461.0000	MERCK & CO INC	1,179,784.64	64.0900	1,695,885.49	516,100.85
984.0000	MERIDIAN BANCORP INC	5,120.14	16.9000	16,629.60	11,509.46



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
222.0000	MERITAGE HOMES CORP	5,072.70	42.2000	9,368.40	4,295.70
1,923.0000	MERITOR INC	9,634.23	16.6100	31,941.03	22,306.80
8,710.0000	METLIFE INC	422,514.02	54.9400	478,527.40	56,013.38
324.0000	METTLER-TOLEDO INTERNATIONAL I	59,209.59	588.5400	190,686.96	131,477.37
66,345.0000	MICROSOFT CORP	2,371,900.97	68.9300	4,573,160.85	2,201,259.88
1,592.0000	MICROCHIP TECHNOLOGY INC	57,217.17	77.1800	122,870.56	65,653.39
8,354.0000	MICRON TECHNOLOGY INC	90,927.98	29.8600	249,450.44	158,522.46
799.0000	MICROSEMI CORP	16,941.74	46.8000	37,393.20	20,451.46
910.0000	MID-AMERICA APARTMENT COMMUNIT	57,792.80	105.3800	95,895.80	38,103.00
444.0000	MIDDLEBY CORP/THE	13,485.76	121.5100	53,950.44	40,464.68
255.0000	MIDDLESEX WATER CO	4,924.05	39.6000	10,098.00	5,173.95
1,105.0000	HERMAN MILLER INC	35,415.25	30.4000	33,592.00	1,823.25-
152.0000	MINERALS TECHNOLOGIES INC	4,883.76	73.2000	11,126.40	6,242.64
250.0000	MOBILE MINI INC	5,067.50	29.8500	7,462.50	2,395.00
453.0000	MOHAWK INDUSTRIES INC	25,830.06	241.6900	109,485.57	83,655.51
191.0000	MOLINA HEALTHCARE INC	4,935.44	69.1800	13,213.38	8,277.94
1,485.0000	MOLSON COORS BREWING CO	106,881.89	86.3400	128,214.90	21,333.01



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12,740.0000	MONDELEZ INTERNATIONAL INC	234,767.37	43.1900	550,240.60	315,473.23
3,367.0000	MONMOUTH REAL ESTATE INVESTMEN	35,589.19	15.0500	50,673.35	15,084.16
3,170.0000	MONOGRAM RESIDENTIAL TRUST INC	29,924.80	9.7100	30,780.70	855.90
345.0000	MONOLITHIC POWER SYSTEMS INC	5,226.75	96.4000	33,258.00	28,031.25
366.0000	MONOTYPE IMAGING HOLDINGS INC	5,025.18	18.3000	6,697.80	1,672.62
242.0000	MONRO MUFFLER BRAKE INC	8,252.20	41.7500	10,103.50	1,851.30
4,427.0000	MONSANTO CO	265,626.58	118.3600	523,979.72	258,353.14
4,545.0000	MONSTER BEVERAGE CORP	161,909.39	49.6800	225,795.60	63,886.21
1,919.0000	MOODY'S CORP	139,499.69	121.6800	233,503.92	94,004.23
360.0000	MOOG INC	14,846.40	71.7200	25,819.20	10,972.80
11,891.0000	MORGAN STANLEY	295,631.20	44.5600	529,862.96	234,231.76
3,122.0000	MOSAIC CO/THE	103,043.64	22.8300	71,275.26	31,768.38-
1,371.0000	MOTOROLA SOLUTIONS INC	96,984.54	86.7400	118,920.54	21,936.00
600.0000	MUELLER INDUSTRIES INC	10,908.00	30.4500	18,270.00	7,362.00
1,824.0000	MUELLER WATER PRODUCTS INC	10,086.72	11.6800	21,304.32	11,217.60
2,183.0000	MURPHY OIL CORP	39,839.75	25.6300	55,950.29	16,110.54
399.0000	MURPHY USA INC	11,529.40	74.1100	29,569.89	18,040.49



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273.0000	NBT BANCORP INC	5,978.70	36.9500	10,087.35	4,108.65
449.0000	NCI BUILDING SYSTEMS INC	4,992.88	16.7000	7,498.30	2,505.42
1,929.0000	NCR CORP	40,041.90	40.8400	78,780.36	38,738.46
441.0000	NIC INC	5,538.96	18.9500	8,356.95	2,817.99
3,910.0000	NRG ENERGY INC	38,748.10	17.2200	67,330.20	28,582.10
2,738.0000	NRG YIELD INC	41,042.62	17.6000	48,188.80	7,146.18
43.0000	NVR INC	33,133.78	2,410.6100	103,656.23	70,522.45
849.0000	NASDAQ INC	28,080.68	71.4900	60,695.01	32,614.33
1,204.0000	NATIONAL BANKSHARES INC	41,056.40	40.8000	49,123.20	8,066.80
806.0000	NATIONAL FUEL GAS CO	41,194.66	55.8400	45,007.04	3,812.38
698.0000	NATIONAL HEALTH INVESTORS INC	42,591.96	79.2000	55,281.60	12,689.64
1,150.0000	NATIONAL INSTRUMENTS CORP	35,339.50	40.2200	46,253.00	10,913.50
4,080.0000	NATIONAL OILWELL VARCO INC	144,629.66	32.9400	134,395.20	10,234.46-
675.0000	NATIONAL RETAIL PROPERTIES INC	16,395.75	39.1000	26,392.50	9,996.75
1,979.0000	NATIONAL STORAGE AFFILIATES TR	40,549.71	23.1100	45,734.69	5,184.98
84.0000	NATIONAL WESTERN LIFE GROUP IN	13,623.84	319.6200	26,848.08	13,224.24
398.0000	NAVIGATORS GROUP INC/THE	9,843.61	54.9000	21,850.20	12,006.59



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507.0000	NAVIGANT CONSULTING INC	5,070.00	19.7600	10,018.32	4,948.32
3,438.0000	NAVIENT CORP	35,481.33	16.6500	57,242.70	21,761.37
710.0000	NEENAH PAPER INC	46,746.40	80.2500	56,977.50	10,231.10
1,887.0000	NEKTAR THERAPEUTICS	10,001.10	19.5500	36,890.85	26,889.75
233.0000	NELNET INC	5,039.79	47.0100	10,953.33	5,913.54
325.0000	NEOGEN CORP	9,949.33	69.1100	22,460.75	12,511.42
2,435.0000	NETAPP INC	83,713.01	40.0500	97,521.75	13,808.74
3,692.0000	NETFLIX INC	352,029.76	149.4100	551,621.72	199,591.96
846.0000	NETGEAR INC	35,811.18	43.1000	36,462.60	651.42
1,022.0000	NETSCOUT SYSTEMS INC	30,807.92	34.4000	35,156.80	4,348.88
692.0000	NEUROCRINE BIOSCIENCES INC	5,217.68	46.0000	31,832.00	26,614.32
230.0000	NEW JERSEY RESOURCES CORP	4,991.00	39.7000	9,131.00	4,140.00
3,314.0000	NEW RESIDENTIAL INVESTMENT COR	41,425.00	15.5600	51,565.84	10,140.84
4,462.0000	NEW YORK COMMUNITY BANCORP INC	58,425.80	13.1300	58,586.06	160.26
4,138.0000	NEWELL BRANDS INC	100,476.79	53.6200	221,879.56	121,402.77
1,765.0000	NEWFIELD EXPLORATION CO	65,704.29	28.4600	50,231.90	15,472.39-
89.0000	NEWMARKET CORP	35,158.56	460.4800	40,982.72	5,824.16



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4,311.0000	NEWMONT MINING CORP	87,263.90	32.3900	139,633.29	52,369.39
3,768.0000	NEWS CORP	33,421.54	13.7000	51,621.60	18,200.06
4,096.0000	NEXTERA ENERGY INC	228,858.38	140.1300	573,972.48	345,114.10
3,089.0000	NEXPOINT RESIDENTIAL TRUST INC	38,581.61	24.8900	76,885.21	38,303.60
11,672.0000	NIKE INC	452,324.52	59.0000	688,648.00	236,323.48
2,218.0000	NISOURCE INC	17,902.28	25.3600	56,248.48	38,346.20
4,552.0000	NOBLE ENERGY INC	165,882.50	28.3000	128,821.60	37,060.90-
492.0000	NORDSON CORP	33,197.16	121.3200	59,689.44	26,492.28
1,487.0000	NORDSTROM INC	66,306.19	47.8300	71,123.21	4,817.02
2,804.0000	NORFOLK SOUTHERN CORP	121,256.74	121.7000	341,246.80	219,990.06
1,810.0000	NORTHERN TRUST CORP	122,412.80	97.2100	175,950.10	53,537.30
2,288.0000	NORTHFIELD BANCORP INC	32,710.21	17.1500	39,239.20	6,528.99
2,180.0000	NORTHROP GRUMMAN CORP	134,983.14	256.7100	559,627.80	424,644.66
4,286.0000	NORTHSTAR REALTY EUROPE CORP	43,419.21	12.6800	54,346.48	10,927.27
843.0000	NORTHWEST BANCSHARES INC	10,242.45	15.6100	13,159.23	2,916.78
773.0000	NORTHWESTERN CORP	42,344.94	61.0200	47,168.46	4,823.52
644.0000	NOW INC	11,913.40	16.0800	10,355.52	1,557.88-



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435.0000	NU SKIN ENTERPRISES INC	15,712.20	62.8400	27,335.40	11,623.20
2,066.0000	NUANCE COMMUNICATIONS INC	34,900.60	17.4100	35,969.06	1,068.46
3,441.0000	NUCOR CORP	147,743.77	57.8700	199,130.67	51,386.90
5,434.0000	NVIDIA CORP	161,117.19	144.5600	785,539.04	624,421.85
743.0000	NUVASIVE INC	36,726.49	76.9200	57,151.56	20,425.07
1,725.0000	OGE ENERGY CORP	46,773.84	34.7900	60,012.75	13,238.91
756.0000	O'REILLY AUTOMOTIVE INC	203,904.91	218.7400	165,367.44	38,537.47-
3,668.0000	OASIS PETROLEUM INC	41,668.48	8.0500	29,527.40	12,141.08-
7,142.0000	OCCIDENTAL PETROLEUM CORP	377,118.88	59.8700	427,591.54	50,472.66
652.0000	OCEANFIRST FINANCIAL CORP	8,482.52	27.1200	17,682.24	9,199.72
3,779.0000	OFFICE DEPOT INC	9,919.13	5.6400	21,313.56	11,394.43
585.0000	OIL STATES INTERNATIONAL INC	17,144.57	27.1500	15,882.75	1,261.82-
565.0000	OLD DOMINION FREIGHT LINE INC	13,612.73	95.2400	53,810.60	40,197.87
752.0000	OLD NATIONAL BANCORP/IN	7,753.12	17.2500	12,972.00	5,218.88
2,060.0000	OLD REPUBLIC INTERNATIONAL COR	25,865.97	19.5300	40,231.80	14,365.83
2,470.0000	OLIN CORP	53,287.95	30.2800	74,791.60	21,503.65
2,430.0000	OMNICOM GROUP INC	113,723.75	82.9000	201,447.00	87,723.25



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1,187.0000	OMEGA HEALTHCARE INVESTORS INC	29,493.00	33.0200	39,194.74	9,701.74
974.0000	OMEGA PROTEIN CORP	6,447.88	17.9000	17,434.60	10,986.72
504.0000	ON ASSIGNMENT INC	9,843.12	54.1500	27,291.60	17,448.48
3,187.0000	ON SEMICONDUCTOR CORP	27,862.53	14.0400	44,745.48	16,882.95
488.0000	ONE GAS INC	7,459.70	69.8100	34,067.28	26,607.58
316.0000	ONE LIBERTY PROPERTIES INC	4,964.36	23.4300	7,403.88	2,439.52
1,949.0000	ONEOK INC	52,783.11	52.1600	101,659.84	48,876.73
5,126.0000	OPKO HEALTH INC	45,667.80	6.5800	33,729.08	11,938.72-
29,461.0000	ORACLE CORP	597,146.59	50.1400	1,477,174.54	880,027.95
696.0000	ORBITAL ATK INC	48,344.59	98.3600	68,458.56	20,113.97
446.0000	ORITANI FINANCIAL CORP	5,646.36	17.0500	7,604.30	1,957.94
220.0000	ORMAT TECHNOLOGIES INC	4,802.60	58.6800	12,909.60	8,107.00
1,107.0000	OSHKOSH CORP	23,667.66	68.8800	76,250.16	52,582.50
1,277.0000	OTTER TAIL CORP	35,347.36	39.6000	50,569.20	15,221.84
1,845.0000	OUTFRONT MEDIA INC	42,693.30	23.1200	42,656.40	36.90-
1,446.0000	OWENS CORNING	40,919.94	66.9200	96,766.32	55,846.38
155.0000	OXFORD INDUSTRIES INC	5,068.50	62.4900	9,685.95	4,617.45



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1,031.0000	PBF ENERGY INC	35,538.57	22.2600	22,950.06	12,588.51-
1,272.0000	PDC ENERGY INC	60,614.14	43.1100	54,835.92	5,778.22-
4,482.0000	PG&E CORP	239,585.96	66.3700	297,470.34	57,884.38
3,542.0000	PNC FINANCIAL SERVICES GROUP I	264,818.82	124.8700	442,289.54	177,470.72
1,656.0000	PNM RESOURCES INC	40,561.08	38.2500	63,342.00	22,780.92
2,527.0000	PPG INDUSTRIES INC	168,328.57	109.9600	277,868.92	109,540.35
6,357.0000	PPL CORP	199,381.35	38.6600	245,761.62	46,380.27
1,133.0000	PRA GROUP INC	34,779.63	37.9000	42,940.70	8,161.07
193.0000	PS BUSINESS PARKS INC	9,588.24	132.3900	25,551.27	15,963.03
676.0000	PVH CORP	52,279.52	114.5000	77,402.00	25,122.48
946.0000	PTC INC	21,587.72	55.1200	52,143.52	30,555.80
3,671.0000	PACCAR INC	149,774.67	66.0400	242,432.84	92,658.17
3,921.0000	PACIFIC BIOSCIENCES OF CALIFOR	10,508.28	3.5600	13,958.76	3,450.48
752.0000	PACIRA PHARMACEUTICALS INC/DE	12,791.52	47.7000	35,870.40	23,078.88
863.0000	PACKAGING CORP OF AMERICA	22,248.14	111.3900	96,129.57	73,881.43
981.0000	PACWEST BANCORP	21,041.46	46.7000	45,812.70	24,771.24
885.0000	PALO ALTO NETWORKS INC	112,588.15	133.8100	118,421.85	5,833.70



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3,261.0000	PANDORA MEDIA INC	43,099.11	8.9200	29,088.12	14,010.99-
197.0000	PANERA BREAD CO	31,222.20	314.6400	61,984.08	30,761.88
1,972.0000	PARAMOUNT GROUP INC	36,087.60	16.0000	31,552.00	4,535.60-
801.0000	PAREXEL INTERNATIONAL CORP	20,278.45	86.9100	69,614.91	49,336.46
1,262.0000	PARK HOTELS & RESORTS INC	33,620.25	26.9600	34,023.52	403.27
340.0000	PARK NATIONAL CORP	21,654.60	103.7200	35,264.80	13,610.20
253.0000	PARK-OHIO HOLDINGS CORP	5,039.76	38.1000	9,639.30	4,599.54
3,185.0000	PARK STERLING CORP	14,844.16	11.8800	37,837.80	22,993.64
1,413.0000	PARKER-HANNIFIN CORP	93,345.65	159.8200	225,825.66	132,480.01
480.2110	PARKWAY INC	10,924.80	22.8900	10,992.03	67.23
3,550.0000	PARSLEY ENERGY INC	79,693.32	27.7500	98,512.50	18,819.18
820.0000	PATTERSON COS INC	25,953.00	46.9500	38,499.00	12,546.00
2,199.0000	PATTERSON-UTI ENERGY INC	39,559.41	20.1900	44,397.81	4,838.40
3,206.0000	PAYCHEX INC	111,863.41	56.9400	182,549.64	70,686.23
11,296.0000	PAYPAL HOLDINGS INC	254,660.58	53.6700	606,256.32	351,595.74
432.0000	PEBBLEBROOK HOTEL TRUST	9,789.12	32.2400	13,927.68	4,138.56
539.0000	PENN NATIONAL GAMING INC	4,585.97	21.4000	11,534.60	6,948.63



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5,734.0000	JC PENNEY CO INC	51,026.68	4.6500	26,663.10	24,363.58-
677.0000	PENNSYLVANIA REAL ESTATE INVES	11,923.01	11.3200	7,663.64	4,259.37-
354.0000	PENSKE AUTOMOTIVE GROUP INC	7,625.16	43.9100	15,544.14	7,918.98
1,675.0000	PEOPLE'S UNITED FINANCIAL INC	21,369.72	17.6600	29,580.50	8,210.78
12,635.0000	PEPSICO INC	996,457.91	115.4900	1,459,216.15	462,758.24
773.0000	PERKINELMER INC	26,065.00	68.1400	52,672.22	26,607.22
51,011.0000	PFIZER INC	1,536,417.44	33.5900	1,713,459.49	177,042.05
395.0000	PHARMERICA CORP	5,186.35	26.2500	10,368.75	5,182.40
14,342.0000	PHILIP MORRIS INTERNATIONAL IN	746,386.62	117.4500	1,684,467.90	938,081.28
4,742.0000	PHILLIPS 66	178,349.72	82.6900	392,115.98	213,766.26
2,251.0000	PHYSICIANS REALTY TRUST	47,940.04	20.1400	45,335.14	2,604.90-
2,163.0000	PIEDMONT OFFICE REALTY TRUST I	42,675.99	21.0800	45,596.04	2,920.05
322.0000	PINNACLE FINANCIAL PARTNERS IN	4,842.88	62.8000	20,221.60	15,378.72
795.0000	PINNACLE FOODS INC	34,685.85	59.4000	47,223.00	12,537.15
1,289.0000	PINNACLE ENTERTAINMENT INC	15,486.97	19.7600	25,470.64	9,983.67
1,117.0000	PINNACLE WEST CAPITAL CORP	60,274.75	85.1600	95,123.72	34,848.97
1,435.0000	PIONEER NATURAL RESOURCES CO	189,798.38	159.5800	228,997.30	39,198.92



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172.0000	PIPER JAFFRAY COS	4,819.44	59.9500	10,311.40	5,491.96
1,697.0000	PITNEY BOWES INC	26,804.99	15.1000	25,624.70	1,180.29-
382.0000	PLANTRONICS INC	13,331.80	52.3100	19,982.42	6,650.62
9,708.0000	PLATFORM SPECIALTY PRODUCTS CO	97,113.00	12.6800	123,097.44	25,984.44
298.0000	PLEXUS CORP	9,506.20	52.5700	15,665.86	6,159.66
695.0000	POLARIS INDUSTRIES INC	42,382.78	92.2300	64,099.85	21,717.07
1,242.0000	POLYONE CORP	20,837.56	38.7400	48,115.08	27,277.52
382.0000	POOL CORP	10,948.12	117.5700	44,911.74	33,963.62
645.0000	POPULAR INC	10,042.65	41.7100	26,902.95	16,860.30
1,280.0000	PORTLAND GENERAL ELECTRIC CO	45,493.20	45.6900	58,483.20	12,990.00
545.0000	POST HOLDINGS INC	33,672.94	77.6500	42,319.25	8,646.31
1,123.0000	POTLATCH CORP	36,973.38	45.7000	51,321.10	14,347.72
229.0000	POWER INTEGRATIONS INC	8,408.88	72.9000	16,694.10	8,285.22
2,785.0000	PRAXAIR INC	221,565.89	132.5500	369,151.75	147,585.86
878.0000	PREFERRED BANK/LOS ANGELES CA	26,866.80	53.4700	46,946.66	20,079.86
2,916.0000	PREFERRED APARTMENT COMMUNITIE	32,693.61	15.7500	45,927.00	13,233.39
1,227.0000	PREMIER INC	42,503.28	36.0000	44,172.00	1,668.72



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411.0000	PRESTIGE BRANDS HOLDINGS INC	4,960.77	52.8100	21,704.91	16,744.14
2,501.0000	T ROWE PRICE GROUP INC	119,183.16	74.2100	185,599.21	66,416.05
448.0000	PRICELINE GROUP INC/THE	246,639.12	1,870.5200	837,992.96	591,353.84
107.0000	PRICESMART INC	5,056.82	87.6000	9,373.20	4,316.38
1,826.0000	PRIMORIS SERVICES CORP	43,466.47	24.9400	45,540.44	2,073.97
865.0000	PRIMERICA INC	44,720.50	75.7500	65,523.75	20,803.25
3,766.0000	PRIMO WATER CORP	40,074.01	12.7000	47,828.20	7,754.19
1,646.0000	PRINCIPAL FINANCIAL GROUP INC	51,710.74	64.0700	105,459.22	53,748.48
484.0000	PROASSURANCE CORP	16,845.62	60.8000	29,427.20	12,581.58
24,843.0000	PROCTER & GAMBLE CO/THE	1,718,956.97	87.1500	2,165,067.45	446,110.48
5,850.0000	PROGRESSIVE CORP/THE	173,247.87	44.0900	257,926.50	84,678.63
5,085.0000	PROLOGIS INC	184,797.37	58.6400	298,184.40	113,387.03
544.0000	PROOFPOINT INC	46,560.96	86.8300	47,235.52	674.56
613.0000	PROS HOLDINGS INC	9,814.13	27.3900	16,790.07	6,975.94
372.0000	PROSPERITY BANCSHARES INC	15,791.40	64.2400	23,897.28	8,105.88
480.0000	PROVIDENT FINANCIAL SERVICES I	6,628.80	25.3800	12,182.40	5,553.60
4,212.0000	PRUDENTIAL FINANCIAL INC	333,967.77	108.1400	455,485.68	121,517.91



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4,296.0000	PUBLIC SERVICE ENTERPRISE GROU	132,634.02	43.0100	184,770.96	52,136.94
1,286.0000	PUBLIC STORAGE	155,707.75	208.5300	268,169.58	112,461.83
2,828.0000	PULTEGROUP INC	52,675.64	24.5300	69,370.84	16,695.20
932.0000	PZENA INVESTMENT MANAGEMENT IN	5,070.08	10.1600	9,469.12	4,399.04
122.0000	QUAKER CHEMICAL CORP	4,941.00	145.2300	17,718.06	12,777.06
2,267.0000	QEP RESOURCES INC	36,974.77	10.1000	22,896.70	14,078.07-
912.0000	QTS REALTY TRUST INC	47,889.12	52.3300	47,724.96	164.16-
1,464.0000	QORVO INC	50,842.25	63.3200	92,700.48	41,858.23
3,086.0000	Q2 HOLDINGS INC	110,962.13	36.9500	114,027.70	3,065.57
14,769.0000	QUALCOMM INC	583,618.60	55.2200	815,544.18	231,925.58
787.0000	QUALITY CARE PROPERTIES INC	24,278.95	18.3100	14,409.97	9,868.98-
781.0000	QUALYS INC	28,037.90	40.8000	31,864.80	3,826.90
7,522.0000	QUALITY SYSTEMS INC	114,828.33	17.2100	129,453.62	14,625.29
1,822.0000	QUANTA SERVICES INC	42,147.42	32.9200	59,980.24	17,832.82
1,257.0000	QUEST DIAGNOSTICS INC	87,181.07	111.1600	139,728.12	52,547.05
1,044.2080	QUINTILES IMS HOLDINGS INC	71,802.72	89.5000	93,456.62	21,653.90
576.0000	RLI CORP	35,164.80	54.6200	31,461.12	3,703.68-



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735.0000	RLJ LODGING TRUST	14,928.20	19.8700	14,604.45	323.75-
322.0000	RPC INC	4,840.73	20.2100	6,507.62	1,666.89
77.0000	RMR GROUP INC/THE	1,001.00	48.6500	3,746.05	2,745.05
1,036.0000	RPM INTERNATIONAL INC	23,133.88	54.5500	56,513.80	33,379.92
1,813.0000	RSP PERMIAN INC	51,989.05	32.2700	58,505.51	6,516.46
2,609.0000	RADIAN GROUP INC	38,600.11	16.3500	42,657.15	4,057.04
971.0000	RAMBUS INC	7,360.18	11.4300	11,098.53	3,738.35
465.0000	RALPH LAUREN CORP	38,908.88	73.8000	34,317.00	4,591.88-
1,081.0000	RAMCO-GERSHENSON PROPERTIES TR	14,977.65	12.9000	13,944.90	1,032.75-
2,115.0000	RANGE RESOURCES CORP	76,456.73	23.1700	49,004.55	27,452.18-
1,428.0000	RAYMOND JAMES FINANCIAL INC	60,409.74	80.2200	114,554.16	54,144.42
1,548.0000	RAYONIER INC	36,703.08	28.7700	44,535.96	7,832.88
2,827.0000	RAYTHEON CO	135,852.04	161.4800	456,503.96	320,651.92
130.0000	RBC BEARINGS INC	4,838.60	101.7600	13,228.80	8,390.20
2,167.0000	REALTY INCOME CORP	87,676.21	55.1800	119,575.06	31,898.85
1,914.0000	RED HAT INC	137,284.25	95.7500	183,265.50	45,981.25
307.0000	REGAL BELOIT CORP	19,519.06	81.5500	25,035.85	5,516.79



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643.0000	REGAL ENTERTAINMENT GROUP	7,580.97	20.4600	13,155.78	5,574.81
708.0000	REGENCY CENTERS CORP	29,098.80	62.6400	44,349.12	15,250.32
669.0000	REGENERON PHARMACEUTICALS INC	109,482.60	491.1400	328,572.66	219,090.06
12,655.0000	REGIONS FINANCIAL CORP	96,409.40	14.6400	185,269.20	88,859.80
547.0000	REINSURANCE GROUP OF AMERICA I	29,417.66	128.3900	70,229.33	40,811.67
594.0000	RELIANCE STEEL & ALUMINUM CO	29,736.92	72.8100	43,249.14	13,512.22
415.0000	RENASANT CORP	6,102.92	43.7400	18,152.10	12,049.18
2,681.0000	REPUBLIC SERVICES INC	66,865.64	63.7300	170,860.13	103,994.49
1,215.0000	RESMED INC	37,659.58	77.8700	94,612.05	56,952.47
418.0000	RESOURCES CONNECTION INC	5,082.88	13.7000	5,726.60	643.72
393.0000	RETAIL OPPORTUNITY INVESTMENTS	5,144.37	19.1900	7,541.67	2,397.30
2,342.0000	RETAIL PROPERTIES OF AMERICA I	35,856.02	12.2100	28,595.82	7,260.20-
471.0000	REXNORD CORP	9,989.91	23.2500	10,950.75	960.84
7,088.0000	REYNOLDS AMERICAN INC	223,657.18	65.0400	461,003.52	237,346.34
1,947.0000	RICE ENERGY INC	46,995.84	26.6300	51,848.61	4,852.77
3,861.0000	RIGEL PHARMACEUTICALS INC	9,999.99	2.7300	10,540.53	540.54
2,219.0000	RINGCENTRAL INC	33,418.14	36.5500	81,104.45	47,686.31



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3,977.0000	RING ENERGY INC	47,206.42	13.0000	51,701.00	4,494.58
1,166.0000	ROBERT HALF INTERNATIONAL INC	34,465.11	47.9300	55,886.38	21,421.27
1,153.0000	ROCKWELL AUTOMATION INC	66,115.55	161.9600	186,739.88	120,624.33
1,106.0000	ROCKWELL COLLINS INC	61,106.38	105.0800	116,218.48	55,112.10
110.0000	ROGERS CORP	4,951.10	108.6200	11,948.20	6,997.10
931.0000	ROLLINS INC	22,853.82	40.7100	37,901.01	15,047.19
3,978.0000	ROSS STORES INC	194,450.14	57.7300	229,649.94	35,199.80
631.0000	ROYAL GOLD INC	33,368.94	78.1700	49,325.27	15,956.33
275.0000	RUSH ENTERPRISES INC	5,049.00	37.1800	10,224.50	5,175.50
2,444.0000	RUTH'S HOSPITALITY GROUP INC	41,841.28	21.7500	53,157.00	11,315.72
408.0000	RYDER SYSTEM INC	21,356.64	71.9800	29,367.84	8,011.20
602.0000	RYMAN HOSPITALITY PROPERTIES I	19,685.50	64.0100	38,534.02	18,848.52
281.0000	S&T BANCORP INC	4,979.32	35.8600	10,076.66	5,097.34
2,545.0000	S&P GLOBAL INC	201,216.05	145.9900	371,544.55	170,328.50
1,131.0000	SBA COMMUNICATIONS CORP	50,146.35	134.9000	152,571.90	102,425.55
1,672.0000	SEI INVESTMENTS CO	50,149.42	53.7800	89,920.16	39,770.74
172.0000	SEACOR MARINE HOLDINGS INC	4,355.06	20.3600	3,501.92	853.14-



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987.0000	SL GREEN REALTY CORP	59,076.86	105.8000	104,424.60	45,347.74
3,438.0000	SLM CORP	19,830.04	11.5000	39,537.00	19,706.96
279.0000	SPS COMMERCE INC	10,041.21	63.7600	17,789.04	7,747.83
1,082.0000	SS&C TECHNOLOGIES HOLDINGS INC	25,371.84	38.4100	41,559.62	16,187.78
244.0000	SP PLUS CORP	4,953.20	30.5500	7,454.20	2,501.00
340.0000	SVB FINANCIAL GROUP	19,485.40	175.7900	59,768.60	40,283.20
615.0000	SABRA HEALTH CARE REIT INC	10,239.75	24.1000	14,821.50	4,581.75
1,186.0000	SAFEWAY CASA LEY CVR	1,203.67	1.0100	1,197.86	5.81-
1,186.0000	SAFEWAY PDC LLC CVR	37.72	0.0300	35.58	2.14-
264.0000	SAFEGUARD SCIENTIFICS INC	4,823.28	11.9000	3,141.60	1,681.68-
495.0000	SAFETY INSURANCE GROUP INC	29,328.75	68.3000	33,808.50	4,479.75
571.0000	SAGE THERAPEUTICS INC	46,256.71	79.6400	45,474.44	782.27-
168.0000	SAIA INC	1,733.76	51.3000	8,618.40	6,884.64
6,100.0000	SALESFORCE.COM INC	316,447.64	86.6000	528,260.00	211,812.36
1,779.0000	SALLY BEAUTY HOLDINGS INC	37,236.72	20.2500	36,024.75	1,211.97-
175.0000	SANDERSON FARMS INC	8,447.25	115.6500	20,238.75	11,791.50
276.0000	SANDY SPRING BANCORP INC	4,832.76	40.6600	11,222.16	6,389.40



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639.0000	SANMINA CORP	5,923.53	38.1000	24,345.90	18,422.37
130.0000	SAUL CENTERS INC	4,982.90	57.9800	7,537.40	2,554.50
1,148.0000	SCANA CORP	39,069.76	67.0100	76,927.48	37,857.72
1,016.0000	SCANSOURCE INC	37,662.20	40.3000	40,944.80	3,282.60
730.0000	HENRY SCHEIN INC	48,438.50	183.0200	133,604.60	85,166.10
13,199.0000	SCHLUMBERGER LTD	845,761.50	65.8400	869,022.16	23,260.66
202.0000	A SCHULMAN INC	4,951.02	32.0000	6,464.00	1,512.98
10,451.0000	CHARLES SCHWAB CORP/THE	204,285.43	42.9600	448,974.96	244,689.53
190.0000	SCHWEITZER-MAUDUIT INTERNATIONAL	5,102.45	37.2300	7,073.70	1,971.25
165.0000	SCIENCE APPLICATIONS INTERNATIONAL	4,839.30	69.4200	11,454.30	6,615.00
604.0000	SCOTTS MIRACLE-GRO CO/THE	42,563.88	89.4600	54,033.84	11,469.96
746.0000	SCRIPPS NETWORKS INTERACTIVE INC	33,792.98	68.3100	50,959.26	17,166.28
621.0000	SEACOAST BANKING CORP OF FLORIDA	4,685.76	24.1000	14,966.10	10,280.34
172.0000	SEACOR HOLDINGS INC	6,606.93	34.3000	5,899.60	707.33-
2,328.0000	SEALED AIR CORP	78,723.64	44.7600	104,201.28	25,477.64
1,177.0000	SEATTLE GENETICS INC	25,325.08	51.7400	60,897.98	35,572.90
530.0000	SELECT MEDICAL HOLDINGS CORP	4,754.10	15.3500	8,135.50	3,381.40



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429.0000	SELECTIVE INSURANCE GROUP INC	6,803.94	50.0500	21,471.45	14,667.51
2,097.0000	SEMTECH CORP	42,254.55	35.7500	74,967.75	32,713.20
2,317.0000	SEMPRA ENERGY	117,038.62	112.7500	261,241.75	144,203.13
2,917.0000	SENIOR HOUSING PROPERTIES TRUS	42,559.03	20.4400	59,623.48	17,064.45
397.0000	SENSIENT TECHNOLOGIES CORP	14,434.92	80.5300	31,970.41	17,535.49
1,485.0000	SERVICE CORP INTERNATIONAL/US	13,780.80	33.4500	49,673.25	35,892.45
983.0000	SERVICEMASTER GLOBAL HOLDINGS	35,230.72	39.1900	38,523.77	3,293.05
1,652.0000	SERVICENOW INC	120,310.86	106.0000	175,112.00	54,801.14
1,362.0000	SHENANDOAH TELECOMMUNICATIONS	27,076.56	30.7000	41,813.40	14,736.84
732.0000	SHERWIN-WILLIAMS CO/THE	79,084.32	350.9600	256,902.72	177,818.40
2,217.0000	SHORETEL INC	9,865.65	5.8000	12,858.60	2,992.95
340.0000	SHUTTERFLY INC	10,091.20	47.5000	16,150.00	6,058.80
397.0000	SIGNATURE BANK/NEW YORK NY	28,350.53	143.5300	56,981.41	28,630.88
353.0000	SILICON LABORATORIES INC	13,791.71	68.3500	24,127.55	10,335.84
284.0000	SILGAN HOLDINGS INC	5,689.94	31.7800	9,025.52	3,335.58
633.0000	SIMMONS FIRST NATIONAL CORP	15,451.53	52.9000	33,485.70	18,034.17
3,105.0000	SIMON PROPERTY GROUP INC	354,000.76	161.7600	502,264.80	148,264.04



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487.0000	SINCLAIR BROADCAST GROUP INC	5,084.28	32.9000	16,022.30	10,938.02
20,595.0000	SIRIUS XM HOLDINGS INC	40,984.05	5.4700	112,654.65	71,670.60
812.0000	SIX FLAGS ENTERTAINMENT CORP	42,122.98	59.6100	48,403.32	6,280.34
1,053.0000	SKECHERS U.S.A. INC	4,794.66	29.5000	31,063.50	26,268.84
1,680.0000	SKYWORKS SOLUTIONS INC	40,168.56	95.9500	161,196.00	121,027.44
2,452.0000	AO SMITH CORP	31,556.68	56.3300	138,121.16	106,564.48
928.0000	JM SMUCKER CO/THE	108,975.04	118.3300	109,810.24	835.20
352.0000	SNAP-ON INC	21,144.64	158.0000	55,616.00	34,471.36
229.0000	SNYDER'S-LANCE INC	4,813.58	34.6200	7,927.98	3,114.40
375.0000	SONIC AUTOMOTIVE INC	5,231.25	19.4500	7,293.75	2,062.50
588.0000	SONOCO PRODUCTS CO	19,862.64	51.4200	30,234.96	10,372.32
1,489.0000	SOTHEBY'S	42,570.51	53.6700	79,914.63	37,344.12
1,836.0000	SOUTH JERSEY INDUSTRIES INC	42,962.40	34.1700	62,736.12	19,773.72
8,186.0000	SOUTHERN CO/THE	348,799.49	47.8800	391,945.68	43,146.19
1,263.0000	SOUTHERN COPPER CORP	35,427.15	34.6300	43,737.69	8,310.54
1,107.0000	SOUTHSIDE BANCSHARES INC	16,283.15	34.9400	38,678.58	22,395.43
6,214.0000	SOUTHWEST AIRLINES CO	126,402.78	62.1400	386,137.96	259,735.18



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133.0000	SOUTHWEST GAS HOLDINGS INC	4,984.84	73.0600	9,716.98	4,732.14
6,117.0000	SOUTHWESTERN ENERGY CO	36,396.15	6.0800	37,191.36	795.21
903.0000	SPARTANNASH CO	14,948.21	25.9600	23,441.88	8,493.67
153.0000	SPECTRUM BRANDS HOLDINGS INC	4,984.74	125.0400	19,131.12	14,146.38
363.0000	SPEEDWAY MOTORSPORTS INC	5,027.55	18.2700	6,632.01	1,604.46
246.0000	SPIRE INC	9,972.84	69.7500	17,158.50	7,185.66
982.0000	SPIRIT AEROSYSTEMS HOLDINGS IN	19,698.92	57.9400	56,897.08	37,198.16
945.0000	SPIRIT AIRLINES INC	30,794.08	51.6500	48,809.25	18,015.17
6,368.0000	SPIRIT REALTY CAPITAL INC	55,176.40	7.4100	47,186.88	7,989.52-
437.0000	SPOK HOLDINGS INC	4,959.95	17.7000	7,734.90	2,774.95
1,059.0000	SPLUNK INC	53,613.27	56.8900	60,246.51	6,633.24
11,904.0000	SPRINT CORP	40,235.52	8.2100	97,731.84	57,496.32
1,720.0000	SPROUTS FARMERS MARKET INC	36,016.80	22.6700	38,992.40	2,975.60
1,586.0000	STANLEY BLACK & DECKER INC	99,451.77	140.7300	223,197.78	123,746.01
5,057.0000	STAPLES INC	60,677.50	10.0700	50,923.99	9,753.51-
11,240.0000	STARBUCKS CORP	192,374.29	58.3100	655,404.40	463,030.11
308.0000	STATE AUTO FINANCIAL CORP	4,989.60	25.7300	7,924.84	2,935.24



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2,707.0000	STARWOOD PROPERTY TRUST INC	55,546.50	22.3900	60,609.73	5,063.23
1,638.0000	STATE BANK FINANCIAL CORP	35,266.14	27.1000	44,389.80	9,123.66
3,744.0000	STATE STREET CORP	258,339.97	89.7300	335,949.12	77,609.15
1,897.0000	STEEL DYNAMICS INC	34,526.35	35.8100	67,931.57	33,405.22
632.0000	STEELCASE INC	7,059.44	14.0000	8,848.00	1,788.56
693.0000	STERICYCLE INC	50,538.12	76.3200	52,889.76	2,351.64
2,056.0000	STERLING BANCORP/DE	15,031.20	23.2500	47,802.00	32,770.80
368.0000	STIFEL FINANCIAL CORP	13,141.28	45.9800	16,920.64	3,779.36
1,395.0000	STOCK YARDS BANCORP INC	27,532.50	38.9000	54,265.50	26,733.00
1,775.0000	STRAIGHT PATH COMMUNICATIONS I	35,771.55	179.6500	318,878.75	283,107.20
102.0000	STRAYER EDUCATION INC	4,783.80	93.2200	9,508.44	4,724.64
3,113.0000	STRYKER CORP	175,521.75	138.7800	432,022.14	256,500.39
225.0000	STURM RUGER & CO INC	9,650.25	62.1500	13,983.75	4,333.50
168.0000	SUN COMMUNITIES INC	6,177.36	87.6900	14,731.92	8,554.56
168.0000	SUN HYDRAULICS CORP	4,962.72	42.6700	7,168.56	2,205.84
802.0000	SUNPOWER CORP	5,333.30	9.3400	7,490.68	2,157.38
2,377.0000	SUNSTONE HOTEL INVESTORS INC	19,479.71	16.1200	38,317.24	18,837.53



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4,409.0000	SUNTRUST BANKS INC	123,824.33	56.7200	250,078.48	126,254.15
1,550.0000	SUPERIOR ENERGY SERVICES INC	29,093.50	10.4300	16,166.50	12,927.00-
3,787.0000	SUPERVALU INC	10,111.29	3.2900	12,459.23	2,347.94
629.0000	SWIFT TRANSPORTATION CO	8,060.64	26.5000	16,668.50	8,607.86
6,068.0000	SYMANTEC CORP	123,707.00	28.2500	171,421.00	47,714.00
272.0000	SYNAPTICS INC	6,808.16	51.7100	14,065.12	7,256.96
1,479.0000	SYNOPSIS INC	39,454.24	72.9300	107,863.47	68,409.23
1,269.0000	SYNOVUS FINANCIAL CORP	19,797.96	44.2400	56,140.56	36,342.60
886.0000	SYNTEL INC	19,965.53	16.9600	15,026.56	4,938.97-
199.0000	SYNNEX CORP	6,095.37	119.9600	23,872.04	17,776.67
7,752.0000	SYNCHRONY FINANCIAL	250,089.72	29.8200	231,164.64	18,925.08-
5,579.0000	SYSCO CORP	224,023.10	50.3300	280,791.07	56,767.97
1,270.0000	TCF FINANCIAL CORP	12,954.00	15.9400	20,243.80	7,289.80
2,116.0000	TD AMERITRADE HOLDING CORP	40,079.34	42.9900	90,966.84	50,887.50
6,327.0000	TJX COS INC/THE	377,188.10	72.1700	456,619.59	79,431.49
2,425.0000	T-MOBILE US INC	74,002.99	60.6200	147,003.50	73,000.51
4,723.0000	TAHOE RESOURCES INC	43,338.52	8.6200	40,712.26	2,626.26-



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584.0000	TAKE-TWO INTERACTIVE SOFTWARE	8,649.04	73.3800	42,853.92	34,204.88
646.0000	TANGER FACTORY OUTLET CENTERS	17,241.74	25.9800	16,783.08	458.66-
3,354.0000	TARGET CORP	210,713.43	52.2900	175,380.66	35,332.77-
1,383.0000	TARGA RESOURCES CORP	40,466.58	45.2000	62,511.60	22,045.02
586.0000	TAUBMAN CENTERS INC	43,041.70	59.5500	34,896.30	8,145.40-
183.0000	TEAM INC	5,038.88	23.4500	4,291.35	747.53-
477.0000	TECH DATA CORP	20,119.86	101.0000	48,177.00	28,057.14
1,921.0000	TEGNA INC	13,164.69	14.4100	27,681.61	14,516.92
535.0000	TELEDYNE TECHNOLOGIES INC	45,249.54	127.6500	68,292.75	23,043.21
359.0000	TELEFLEX INC	19,863.47	207.7600	74,585.84	54,722.37
433.0000	TELEPHONE & DATA SYSTEMS INC	10,235.20	27.7500	12,015.75	1,780.55
497.0000	TEMPUR SEALY INTERNATIONAL INC	19,671.26	53.3900	26,534.83	6,863.57
1,090.0000	TENET HEALTHCARE CORP	25,189.03	19.3400	21,080.60	4,108.43-
205.0000	TENNANT CO	9,667.80	73.8000	15,129.00	5,461.20
524.0000	TENNECO INC	20,231.14	57.8300	30,302.92	10,071.78
1,247.0000	TERADATA CORP	36,300.17	29.4900	36,774.03	473.86
1,473.0000	TERADYNE INC	19,592.08	30.0300	44,234.19	24,642.11



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808.0000	TEREX CORP	14,197.98	37.5000	30,300.00	16,102.02
567.0000	TERRENO REALTY CORP	9,769.41	33.6600	19,085.22	9,315.81
334.0000	TESARO INC	46,085.32	139.8600	46,713.24	627.92
1,141.0000	TESLA INC	271,393.62	361.6100	412,597.01	141,203.39
1,488.0000	TESORO CORP	99,053.92	93.6000	139,276.80	40,222.88
224.0000	TETRA TECH INC	5,071.36	45.7500	10,248.00	5,176.64
13,207.0000	TETRAPHASE PHARMACEUTICALS INC	49,987.17	7.1300	94,165.91	44,178.74
9,674.0000	TEXAS INSTRUMENTS INC	353,318.43	76.9300	744,220.82	390,902.39
1,020.0000	TEXAS ROADHOUSE INC	35,720.40	50.9500	51,969.00	16,248.60
2,162.0000	TEXTRON INC	57,065.37	47.1000	101,830.20	44,764.83
3,701.0000	THERMO FISHER SCIENTIFIC INC	249,648.05	174.4700	645,713.47	396,065.42
728.0000	THOR INDUSTRIES INC	44,007.60	104.5200	76,090.56	32,082.96
5,781.0000	3M CO	490,052.68	208.1900	1,203,546.39	713,493.71
876.0000	TIFFANY & CO	72,453.96	93.8700	82,230.12	9,776.16
864.0000	TIME INC	10,402.07	14.3500	12,398.40	1,996.33
7,667.0000	TIME WARNER INC	305,783.09	100.4100	769,843.47	464,060.38
666.0000	TIMKEN CO/THE	14,324.46	46.2500	30,802.50	16,478.04



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188.0000	TIVO CORP	4,192.40	18.6500	3,506.20	686.20-
1,391.0000	TOLL BROTHERS INC	30,679.35	39.5100	54,958.41	24,279.06
354.0000	TOMPKINS FINANCIAL CORP	13,784.76	78.7200	27,866.88	14,082.12
271.0000	TOPBUILD CORP	3,771.58	53.0700	14,381.97	10,610.39
945.0000	TORCHMARK CORP	26,371.81	76.5000	72,292.50	45,920.69
984.0000	TORO CO/THE	14,696.04	69.2900	68,181.36	53,485.32
1,308.0000	TOTAL SYSTEM SERVICES INC	19,999.32	58.2500	76,191.00	56,191.68
1,087.0000	TOWNE BANK/PORTSMOUTH VA	14,036.02	30.8000	33,479.60	19,443.58
1,371.0000	TRACTOR SUPPLY CO	46,974.62	54.2100	74,321.91	27,347.29
436.0000	TRANSDIGM GROUP INC	70,896.04	268.8700	117,227.32	46,331.28
2,898.0000	TRAVELERS COS INC/THE	313,417.52	126.5300	366,683.94	53,266.42
897.0000	TRECORA RESOURCES	11,795.55	11.2500	10,091.25	1,704.30-
282.0000	TREEHOUSE FOODS INC	15,281.58	81.6900	23,036.58	7,755.00
380.0000	TREX CO INC	4,913.40	67.6600	25,710.80	20,797.40
869.0000	TRIBUNE MEDIA CO	35,281.40	40.7700	35,429.13	147.73
422.0000	TRICO BANCSHARES	6,055.70	35.1500	14,833.30	8,777.60
2,230.0000	TRIMBLE INC	52,048.06	35.6700	79,544.10	27,496.04



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1,076.0000	TRIPADVISOR INC	42,489.62	38.2000	41,103.20	1,386.42-
345.0000	TRUEBLUE INC	5,023.20	26.5000	9,142.50	4,119.30
5,626.0000	TRUSTCO BANK CORP NY	34,266.22	7.7500	43,601.50	9,335.28
508.0000	TRUSTMARK CORP	11,536.68	32.1600	16,337.28	4,800.60
547.0000	TUPPERWARE BRANDS CORP	26,086.43	70.2300	38,415.81	12,329.38
262.0000	TUTOR PERINI CORP	4,904.64	28.7500	7,532.50	2,627.86
15,574.0000	TWENTY-FIRST CENTURY FOX INC	307,550.52	28.3400	441,367.16	133,816.64
6,421.0000	TWITTER INC	104,488.37	17.8700	114,743.27	10,254.90
605.0000	TYLER TECHNOLOGIES INC	24,641.80	175.6700	106,280.35	81,638.55
3,168.0000	TYSON FOODS INC	51,073.23	62.6300	198,411.84	147,338.61
1,807.0000	UDR INC	45,305.15	38.9700	70,418.79	25,113.64
1,330.0000	UGI CORP	27,717.20	48.4100	64,385.30	36,668.10
254.0000	UMB FINANCIAL CORP	10,170.16	74.8600	19,014.44	8,844.28
12,967.0000	US BANCORP	489,844.24	51.9200	673,246.64	183,402.40
680.0000	USG CORP	15,660.61	29.0200	19,733.60	4,072.99
504.0000	US SILICA HOLDINGS INC	10,241.28	35.4900	17,886.96	7,645.68
587.0000	UBIQUITI NETWORKS INC	10,114.01	51.9700	30,506.39	20,392.38



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629.0000	ULTA BEAUTY INC	67,430.73	287.3400	180,736.86	113,306.13
369.0000	ULTIMATE SOFTWARE GROUP INC/TH	26,098.55	210.0600	77,512.14	51,413.59
675.0000	ULTRAGENYX PHARMACEUTICAL INC	37,125.00	62.1100	41,924.25	4,799.25
1,390.0000	UMPQUA HOLDINGS CORP	14,640.26	18.3600	25,520.40	10,880.14
1,935.0000	UNDER ARMOUR INC	20,360.69	21.7600	42,105.60	21,744.91
1,948.0000	UNDER ARMOUR INC	19,690.16	20.1600	39,271.68	19,581.52
97.0000	UNIFIRST CORP/MA	4,938.27	140.7000	13,647.90	8,709.63
817.0000	UNION BANKSHARES CORP	9,722.80	33.9000	27,696.30	17,973.50
8,036.0000	UNION PACIFIC CORP	490,431.61	108.9100	875,200.76	384,769.15
1,441.0000	UNITED BANKSHARES INC/WV	43,873.52	39.2000	56,487.20	12,613.68
2,360.0000	UNITED CONTINENTAL HOLDINGS IN	55,272.74	75.2500	177,590.00	122,317.26
2,701.0000	UNITED FINANCIAL BANCORP INC	34,421.13	16.6900	45,079.69	10,658.56
384.0000	UNITED NATURAL FOODS INC	15,970.56	36.7000	14,092.80	1,877.76-
6,333.0000	UNITED PARCEL SERVICE INC	571,184.62	110.5900	700,366.47	129,181.85
783.0000	UNITED RENTALS INC	26,289.74	112.7100	88,251.93	61,962.19
137.0000	UNITED STATES CELLULAR CORP	4,985.43	38.3200	5,249.84	264.41
3,898.0000	UNITED STATES STEEL CORP	26,896.20	22.1400	86,301.72	59,405.52



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7,979.0000	UNITED TECHNOLOGIES CORP	568,731.19	122.1100	974,315.69	405,584.50
453.0000	UNITED THERAPEUTICS CORP	24,890.81	129.7300	58,767.69	33,876.88
8,687.0000	UNITEDHEALTH GROUP INC	526,844.89	185.4200	1,610,743.54	1,083,898.65
434.0000	UNITIL CORP	12,143.23	48.3100	20,966.54	8,823.31
802.0000	UNIVERSAL DISPLAY CORP	42,778.68	109.2500	87,618.50	44,839.82
184.0000	UNIVERSAL FOREST PRODUCTS INC	4,852.08	87.3100	16,065.04	11,212.96
706.0000	UNIVERSAL HEALTH REALTY INCOME	35,504.74	79.5400	56,155.24	20,650.50
993.0000	UNIVERSAL HEALTH SERVICES INC	77,420.65	122.0800	121,225.44	43,804.79
567.0000	UNIVEST CORP OF PENNSYLVANIA	8,686.44	29.9500	16,981.65	8,295.21
2,926.0000	UNUM GROUP	57,333.98	46.6300	136,439.38	79,105.40
577.0000	URBAN EDGE PROPERTIES	8,849.71	23.7300	13,692.21	4,842.50
896.0000	URBAN OUTFITTERS INC	27,625.92	18.5400	16,611.84	11,014.08-
1,744.0000	URSTADT BIDDLE PROPERTIES INC	35,717.12	19.8000	34,531.20	1,185.92-
653.0000	VCA INC	14,947.32	92.3100	60,278.43	45,331.11
3,294.0000	VF CORP	156,951.73	57.6000	189,734.40	32,782.67
442.0000	VSE CORP	4,906.20	44.9800	19,881.16	14,974.96
286.0000	VAIL RESORTS INC	12,644.06	202.8300	58,009.38	45,365.32



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4,730.0000	VALERO ENERGY CORP	273,372.26	67.4600	319,085.80	45,713.54
733.0000	VALLEY NATIONAL BANCORP	5,180.42	11.8100	8,656.73	3,476.31
242.0000	VALMONT INDUSTRIES INC	20,410.28	149.6000	36,203.20	15,792.92
1,875.0000	VALVOLINE INC	18,800.76	23.7200	44,475.00	25,674.24
1,113.0000	VANTIV INC	40,995.58	63.3400	70,497.42	29,501.84
371.0000	VAREX IMAGING CORP	5,354.41	33.8000	12,539.80	7,185.39
928.0000	VARIAN MEDICAL SYSTEMS INC	39,655.34	103.1900	95,760.32	56,104.98
770.0000	VECTREN CORP	31,567.48	58.4400	44,998.80	13,431.32
81.0000	VECTRUS INC	1,152.03	32.3200	2,617.92	1,465.89
1,382.0000	VEEVA SYSTEMS INC	35,627.96	61.3100	84,730.42	49,102.46
2,766.0000	VENTAS INC	142,374.90	69.4800	192,181.68	49,806.78
8,414.0000	VEREIT INC	70,926.73	8.1400	68,489.96	2,436.77-
1,338.0000	VERISIGN INC	31,500.80	92.9600	124,380.48	92,879.68
34,427.0000	VERIZON COMMUNICATIONS INC	1,325,758.58	44.6600	1,537,509.82	211,751.24
1,475.0000	VERISK ANALYTICS INC	74,381.41	84.3700	124,445.75	50,064.34
67.0000	VERITIV CORP	1,699.79	45.0000	3,015.00	1,315.21
2,211.0000	VERTEX PHARMACEUTICALS INC	140,018.70	128.8700	284,931.57	144,912.87



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921.0000	VERSUM MATERIALS INC	9,504.63	32.5000	29,932.50	20,427.87
288.0000	VIASAT INC	12,041.28	66.2000	19,065.60	7,024.32
4,308.0000	VIACOM INC	160,890.88	33.5700	144,619.56	16,271.32-
6,628.0000	VIAVI SOLUTIONS INC	42,419.20	10.5300	69,792.84	27,373.64
18,149.0000	VISA INC	641,077.12	93.7800	1,702,013.22	1,060,936.10
1,153.0000	VISHAY INTERTECHNOLOGY INC	10,884.32	16.6000	19,139.80	8,255.48
460.0000	VISTA OUTDOOR INC	10,301.07	22.5100	10,354.60	53.53
275.0000	VISTEON CORP	18,138.37	102.0600	28,066.50	9,928.13
424.0000	VLASIC FOODS INTL INC COM	4,492.60	10.5957	4,492.60	0.00
840.0000	VMWARE INC	37,371.60	87.4300	73,441.20	36,069.60
14,238.0000	VONAGE HOLDINGS CORP	44,085.50	6.5400	93,116.52	49,031.02
1,748.0000	VORNADO REALTY TRUST	144,155.05	93.9000	164,137.20	19,982.15
1,109.0000	VOYA FINANCIAL INC	44,547.98	36.8900	40,911.01	3,636.97-
1,472.0000	VULCAN MATERIALS CO	107,165.41	126.6800	186,472.96	79,307.55
328.0000	WD-40 CO	23,211.58	110.3500	36,194.80	12,983.22
684.0000	WGL HOLDINGS INC	42,305.40	83.4300	57,066.12	14,760.72
423.0000	WABCO HOLDINGS INC	38,620.86	127.5100	53,936.73	15,315.87



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384.0000	WSFS FINANCIAL CORP	4,825.60	45.3500	17,414.40	12,588.80
2,934.0000	WEC ENERGY GROUP INC	134,307.25	61.3800	180,088.92	45,781.67
1,602.0000	WABASH NATIONAL CORP	14,823.13	21.9800	35,211.96	20,388.83
1,062.0000	WABTEC CORP/DE	44,032.50	91.5000	97,173.00	53,140.50
14,687.0000	WAL-MART STORES INC	781,826.15	75.6800	1,111,512.16	329,686.01
7,994.0000	WALGREENS BOOTS ALLIANCE INC	460,780.49	78.3100	626,010.14	165,229.65
1,272.0000	WASHINGTON FEDERAL INC	19,728.72	33.2000	42,230.40	22,501.68
1,264.0000	WASHINGTON PRIME GROUP INC	14,566.31	8.3700	10,579.68	3,986.63-
526.0000	WASHINGTON TRUST BANCORP INC	11,698.24	51.5500	27,115.30	15,417.06
1,887.0000	WASTE MANAGEMENT INC	74,346.72	73.3500	138,411.45	64,064.73
330.0000	WATERS CORP	39,539.61	183.8400	60,667.20	21,127.59
223.0000	WATSCO INC	14,637.72	154.2000	34,386.60	19,748.88
239.0000	WATTS WATER TECHNOLOGIES INC	7,918.07	63.2000	15,104.80	7,186.73
652.0000	WAYFAIR INC	48,580.52	76.8800	50,125.76	1,545.24
675.0000	WEB.COM GROUP INC	10,071.00	25.3000	17,077.50	7,006.50
722.0000	WEBMD HEALTH CORP	11,169.34	58.6500	42,345.30	31,175.96
572.0000	WEBSTER FINANCIAL CORP	11,422.84	52.2200	29,869.84	18,447.00



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1,041.0000	WEINGARTEN REALTY INVESTORS	24,244.89	30.1000	31,334.10	7,089.21
256.0000	WEIS MARKETS INC	9,799.68	48.7200	12,472.32	2,672.64
1,781.0000	WELBILT INC	17,076.47	18.8500	33,571.85	16,495.38
338.0000	WELLCARE HEALTH PLANS INC	16,592.42	179.5600	60,691.28	44,098.86
41,996.0000	WELLS FARGO & CO	1,653,154.38	55.4100	2,326,998.36	673,843.98
3,277.0000	WELLTOWER INC	170,038.76	74.8500	245,283.45	75,244.69
4,237.0000	WENDY'S CO/THE	19,744.42	15.5100	65,715.87	45,971.45
261.0000	WESBANCO INC	4,909.41	39.5400	10,319.94	5,410.53
716.0000	WESCO INTERNATIONAL INC	36,265.40	57.3000	41,026.80	4,761.40
584.0000	WEST PHARMACEUTICAL SERVICES I	26,357.32	94.5200	55,199.68	28,842.36
1,827.0000	WESTAR ENERGY INC	70,552.37	53.0200	96,867.54	26,315.17
229.0000	WESTAMERICA BANCORPORATION	11,021.77	56.0400	12,833.16	1,811.39
2,369.0000	WESTERN DIGITAL CORP	67,475.04	88.6000	209,893.40	142,418.36
2,781.0000	WESTERN UNION CO/THE	55,805.92	19.0500	52,978.05	2,827.87-
592.0000	WESTLAKE CHEMICAL CORP	19,081.10	66.2100	39,196.32	20,115.22
2,449.0000	WESTROCK CO	69,088.97	56.6600	138,760.34	69,671.37
203.0000	WESTWOOD HOLDINGS GROUP INC	7,346.57	56.6900	11,508.07	4,161.50



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381.0000	WEX INC	20,544.63	104.2700	39,726.87	19,182.24
6,909.0000	WEYERHAEUSER CO	163,992.96	33.5000	231,451.50	67,458.54
822.0000	WHIRLPOOL CORP	91,350.04	191.6200	157,511.64	66,161.60
2,836.0000	WHITESTONE REIT	35,649.36	12.2500	34,741.00	908.36-
3,123.0000	WHOLE FOODS MARKET INC	94,440.02	42.1100	131,509.53	37,069.51
6,829.0000	WILLIAMS COS INC/THE	155,868.78	30.2800	206,782.12	50,913.34
834.0000	WILLIAMS-SONOMA INC	30,118.26	48.5000	40,449.00	10,330.74
277.0000	WINTRUST FINANCIAL CORP	8,670.10	76.4400	21,173.88	12,503.78
788.0000	WOLVERINE WORLD WIDE INC	15,960.94	28.0100	22,071.88	6,110.94
488.0000	WOODWARD INC	15,796.56	67.5800	32,979.04	17,182.48
1,328.0000	WORKDAY INC	95,661.13	97.0000	128,816.00	33,154.87
779.0000	WORLD FUEL SERVICES CORP	29,225.55	38.4500	29,952.55	727.00
456.0000	WORTHINGTON INDUSTRIES INC	8,974.08	50.2200	22,900.32	13,926.24
4,437.0000	WPX ENERGY INC	42,107.13	9.6600	42,861.42	754.29
862.0000	WYNDHAM WORLDWIDE CORP	30,945.19	100.4100	86,553.42	55,608.23
698.0000	WYNN RESORTS LTD	50,449.32	134.1200	93,615.76	43,166.44
2,753.0000	XPO LOGISTICS INC	78,460.50	64.6300	177,926.39	99,465.89



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2,717.0000	XILINX INC	63,931.01	64.3200	174,757.44	110,826.43
2,517.0000	XENIA HOTELS & RESORTS INC	42,839.34	19.3700	48,754.29	5,914.95
3,088.7500	XEROX CORP	75,740.38	28.7300	88,739.79	12,999.41
1,269.0000	XYLEM INC/NY	33,996.51	55.4300	70,340.67	36,344.16
406.0000	XPERI CORP	6,565.02	29.8000	12,098.80	5,533.78
1,507.0000	YELP INC	40,583.51	30.0200	45,240.14	4,656.63
545.0000	YORK WATER CO/THE	10,224.20	34.8500	18,993.25	8,769.05
3,986.0000	YUM! BRANDS INC	145,021.36	73.7600	294,007.36	148,986.00
2,978.0000	YUM CHINA HOLDINGS INC	37,625.57	39.4300	117,422.54	79,796.97
1,321.0000	ZAYO GROUP HOLDINGS INC	35,363.17	30.9000	40,818.90	5,455.73
789.0000	ZEBRA TECHNOLOGIES CORP	30,531.76	100.5200	79,310.28	48,778.52
394.0000	ZILLOW GROUP INC	10,791.43	48.8400	19,242.96	8,451.53
1,067.0000	ZILLOW GROUP INC	31,804.26	49.0100	52,293.67	20,489.41
1,673.0000	ZIMMER BIOMET HOLDINGS INC	113,126.08	128.4000	214,813.20	101,687.12
2,461.0000	ZIONS BANCORPORATION	65,129.76	43.9100	108,062.51	42,932.75
4,735.0000	ZOETIS INC	218,636.72	62.3800	295,369.30	76,732.58
15,998.0000	ZYNGA INC	47,054.75	3.6400	58,232.72	11,177.97



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TOTAL INVESTMENTS EQUITY		133,974,642.63		230,678,772.25	96,704,129.62
TOTAL INVESTMENT		134,362,831.62		231,066,961.24	96,704,129.62



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
1,047,721.5400	BLACKROCK LIQ T FUND INSTL FUND 60	1,047,721.54	100.0000	1,047,721.54	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		1,047,721.54		1,047,721.54	0.00
<u>INVESTMENTS FIXED INCOME SECURITIES</u>					
133,182.4600	ADVANCED DISPOSAL 10/16 COV-LITE TLB	133,182.46	100.3040	133,587.33	404.87
175,000.0000	AES CORP/VA 4.875% 05/15/2023 DD 04/30/13	177,232.85	101.8750	178,281.25	1,048.40
100,000.0000	AES CORP/VA 5.500% 04/15/2025 DD 04/06/15	99,180.21	104.6250	104,625.00	5,444.79
25,000.0000	AK STEEL CORP 7.000% 03/15/2027 DD 03/23/17	25,000.00	103.2500	25,812.50	812.50
150,000.0000	AMC NETWORKS INC 5.000% 04/01/2024 DD 03/30/16	150,000.00	102.3750	153,562.50	3,562.50
50,000.0000	AMN HEALTHCARE INC 144A 5.125% 10/01/2024 DD 10/03/16	50,000.00	101.2500	50,625.00	625.00
25,000.0000	AMERICAN TIRE DISTRIBUTOR 144A 10.250% 03/01/2022 DD 02/25/15	22,931.60	103.5000	25,875.00	2,943.40
150,000.0000	ACADIA HEALTHCARE CO INC 6.500% 03/01/2024 DD 02/16/16	150,253.44	106.7500	160,125.00	9,871.56



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50,000.0000	AECOM 5.750% 10/15/2022 DD 10/15/15	49,947.41	104.6250	52,312.50	2,365.09
75,000.0000	AECOM 5.875% 10/15/2024 DD 10/15/15	74,015.97	108.7500	81,562.50	7,546.53
50,000.0000	AECOM 5.125% 03/15/2027 DD 02/21/17	50,000.00	100.3750	50,187.50	187.50
75,000.0000	ADVANCED DISPOSAL SERVICE 144A 5.625% 11/15/2024 DD 11/10/16	75,000.00	103.0000	77,250.00	2,250.00
150,000.0000	ALBERTSONS COS LLC / SAFE 144A 6.625% 06/15/2024 DD 05/31/16	150,000.00	99.2500	148,875.00	1,125.00-
200,000.0000	ALBERTSONS COS LLC / SAFE 144A 5.750% 03/15/2025 DD 08/09/16	200,000.00	93.0000	186,000.00	14,000.00-
150,000.0000	ALLIANCE DATA SYSTEMS COR 144A 5.250% 12/01/2017 DD 11/20/12	150,682.43	100.7500	151,125.00	442.57
75,000.0000	ALLIANCE DATA SYSTEMS COR 144A 5.875% 11/01/2021 DD 10/27/16	75,000.00	103.5000	77,625.00	2,625.00
100,000.0000	ALLY FINANCIAL INC 4.750% 09/10/2018 DD 09/09/13	102,727.39	102.7500	102,750.00	22.61
100,000.0000	ALLY FINANCIAL INC 4.625% 05/19/2022 DD 05/19/15	99,567.96	104.0000	104,000.00	4,432.04
50,000.0000	ALPHA 3 BV / ALPHA US BID 144A 6.250% 02/01/2025 DD 01/31/17	50,000.00	102.8750	51,437.50	1,437.50



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50,000.0000	ALPINE FINANCE MERGER SUB 144A 6.875% 08/01/2025 DD 07/12/17	50,000.00	101.7500	50,875.00	875.00
250,000.0000	ALTICE FINANCING SA 144A 7.500% 05/15/2026 DD 05/03/16	268,558.46	111.0000	277,500.00	8,941.54
200,000.0000	ALTICE LUXEMBOURG SA 144A 7.750% 05/15/2022 DD 05/08/14	212,324.89	106.1250	212,250.00	74.89-
55,000.0000	AMERICAN AXLE & MANUFACTURING 7.750% 11/15/2019 DD 11/03/11	60,704.69	109.7500	60,362.50	342.19-
50,000.0000	AMERICAN AXLE & MANUFACTU 144A 6.250% 04/01/2025 DD 03/23/17	50,000.00	97.5000	48,750.00	1,250.00-
50,000.0000	AMERICAN AXLE & MANUFACTU 144A 6.500% 04/01/2027 DD 03/23/17	50,000.00	97.2500	48,625.00	1,375.00-
56,000.0000	AMERICAN BUILDERS & CONTR 144A 5.625% 04/15/2021 DD 04/16/13	56,308.63	102.8750	57,610.00	1,301.37
50,000.0000	AMERIGAS PARTNERS LP / AMERIGA 5.750% 05/20/2027 DD 02/13/17	50,000.00	101.2500	50,625.00	625.00
22,500.0000	ANCESTRY.COM 10/16 2ND LIEN COV-LITE TL	22,287.37	102.0830	22,968.68	681.31
29,700.0000	ANCESTRY.COM 2/17 TL	29,565.81	100.3330	29,798.90	233.09
100,000.0000	ANGLO AMERICAN CAPITAL PL 144A 9.375% 04/08/2019 DD 04/08/09	112,520.56	111.8750	111,875.00	645.56-
50,000.0000	ANTERO MIDSTREAM PARTNERS 144A 5.375% 09/15/2024 DD 09/13/16	50,000.00	102.2500	51,125.00	1,125.00



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200,000.0000	ARAMARK SERVICES INC 5.125% 01/15/2024 DD 12/17/15	200,000.00	105.1250	210,250.00	10,250.00
250,000.0000	ARDAGH PACKAGING FINANCE 144A 4.625% 05/15/2023 DD 05/16/16	250,000.00	102.4590	256,147.50	6,147.50
200,000.0000	ARDAGH PACKAGING FINANCE 144A 6.000% 02/15/2025 DD 01/30/17	200,000.00	105.0000	210,000.00	10,000.00
250,000.0000	PETSMART INC 144A 7.125% 03/15/2023 DD 03/04/15	252,350.19	89.0000	222,500.00	29,850.19-
50,000.0000	ASCENT RESOURCES UTICA HO 144A 10.000% 04/01/2022 DD 04/05/17	50,000.00	100.0000	50,000.00	0.00
150,000.0000	BASS PRO SHOPS 11/16 COV-LITE TLB	148,674.07	97.0500	145,575.00	3,099.07-
50,000.0000	BLOCK COMMUNICATIONS INC 144A 6.875% 02/15/2025 DD 02/16/17	50,000.00	107.2500	53,625.00	3,625.00
150,000.0000	BLUE RACER MIDSTREAM LLC 144A 6.125% 11/15/2022 DD 11/13/14	151,728.98	100.7500	151,125.00	603.98-
200,000.0000	BLUESCOPE STEEL FINANCE L 144A 6.500% 05/15/2021 DD 05/05/16	212,007.77	105.5000	211,000.00	1,007.77-
75,000.0000	BOMBARDIER INC 144A 6.125% 01/15/2023 DD 01/14/13	75,000.00	100.2500	75,187.50	187.50
100,000.0000	BOMBARDIER INC 144A 6.000% 10/15/2022 DD 04/03/14	100,242.96	100.0000	100,000.00	242.96-



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150,000.0000	BOYD GAMING CORP 6.875% 05/15/2023 DD 05/21/15	152,807.90	107.0000	160,500.00	7,692.10
60,000.0000	BRAND ENERGY & INFRASTRUC 144A 8.500% 07/15/2025 DD 06/21/17	60,000.00	103.5000	62,100.00	2,100.00
175,000.0000	BWAY HOLDING CO 144A 5.500% 04/15/2024 DD 04/03/17	175,000.00	102.1250	178,718.75	3,718.75
195,000.0000	BWAY HOLDING CO 144A 7.250% 04/15/2025 DD 04/03/17	195,000.00	101.5000	197,925.00	2,925.00
150,000.0000	CCO HOLDINGS LLC / CCO HO 144A 5.875% 04/01/2024 DD 02/19/16	150,000.00	106.7500	160,125.00	10,125.00
210,000.0000	CCO HOLDINGS LLC / CCO HO 144A 5.125% 05/01/2027 DD 02/06/17	210,541.55	102.2500	214,725.00	4,183.45
100,000.0000	CBS RADIO INC 144A 7.250% 11/01/2024 DD 10/17/16	102,998.20	103.0000	103,000.00	1.80
50,000.0000	OUTFRONT MEDIA CAPITAL LLC / O 5.625% 02/15/2024 DD 11/15/14	52,069.46	104.3750	52,187.50	118.04
25,000.0000	CDK GLOBAL INC VAR RT 10/15/2019 DD 04/15/15	25,807.67	103.0000	25,750.00	57.67-
100,000.0000	CDW LLC / CDW FINANCE CORP 5.000% 09/01/2023 DD 03/03/15	100,562.60	104.1250	104,125.00	3,562.40
150,000.0000	CHS/COMMUNITY HEALTH SYSTEMS I 6.250% 03/31/2023 DD 03/16/17	150,859.13	103.2350	154,852.50	3,993.37



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
50,000.0000	CNH INDUSTRIAL CAPITAL LLC 4.375% 04/05/2022 DD 04/10/17	50,000.00	104.6500	52,325.00	2,325.00
100,000.0000	CSC HOLDINGS LLC 6.750% 11/15/2021 DD 11/15/11	101,821.44	110.7500	110,750.00	8,928.56
70,000.0000	CTR PARTNERSHIP LP / CARETRUST 5.250% 06/01/2025 DD 05/24/17	70,000.00	103.0000	72,100.00	2,100.00
250,000.0000	CST BRANDS INC 5.000% 05/01/2023 DD 11/01/13	250,510.50	105.0200	262,550.00	12,039.50
200,000.0000	CABLEVISION SYSTEMS CORP 7.750% 04/15/2018 DD 04/15/10	200,058.15	103.7500	207,500.00	7,441.85
100,000.0000	CABLEVISION SYSTEMS CORP 8.000% 04/15/2020 DD 04/15/10	110,965.35	111.3750	111,375.00	409.65
150,000.0000	CABLEVISION SYSTEMS CORP 5.875% 09/15/2022 DD 09/27/12	128,785.97	105.1250	157,687.50	28,901.53
25,000.0000	CALATLANTIC GROUP INC 5.000% 06/15/2027 DD 06/09/17	25,000.00	100.2500	25,062.50	62.50
200,000.0000	CALPINE CORP 5.375% 01/15/2023 DD 07/22/14	200,000.00	97.5000	195,000.00	5,000.00-
125,000.0000	CALPINE CORP 5.750% 01/15/2025 DD 07/22/14	120,486.23	93.7500	117,187.50	3,298.73-
105,000.0000	CAMELOT FINANCE SA 144A 7.875% 10/15/2024 DD 10/03/16	105,000.00	107.7500	113,137.50	8,137.50



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150,000.0000	CENTENE CORP 6.125% 02/15/2024 DD 02/11/16	150,000.00	108.1180	162,177.00	12,177.00
150,000.0000	CENTENE CORP 4.750% 01/15/2025 DD 11/09/16	150,000.00	102.7500	154,125.00	4,125.00
175,000.0000	CENTURYLINK INC 5.625% 04/01/2025 DD 10/01/15	175,000.00	99.8330	174,707.75	292.25-
50,000.0000	CENTURYLINK INC 7.500% 04/01/2024 DD 04/06/16	50,000.00	109.5000	54,750.00	4,750.00
110,000.0000	CEQUEL COMMUNICATIONS HOL 144A 6.375% 09/15/2020 DD 10/25/12	106,661.30	102.0000	112,200.00	5,538.70
75,000.0000	CHANGE HEALTHCARE HOLDING 144A 5.750% 03/01/2025 DD 02/15/17	75,000.00	102.0000	76,500.00	1,500.00
75,000.0000	CHENIERE CORPUS CHRISTI HOLDIN 5.875% 03/31/2025 DD 12/09/16	75,000.00	106.6250	79,968.75	4,968.75
100,000.0000	CHENIERE CORPUS CHRISTI H 144A 5.125% 06/30/2027 DD 05/19/17	100,000.00	102.5000	102,500.00	2,500.00
61,000.0000	CHESAPEAKE ENERGY CORP 144A 8.000% 12/15/2022 DD 12/23/15	62,521.85	105.7500	64,507.50	1,985.65
200,000.0000	CHURCHILL DOWNS INC 5.375% 12/15/2021 DD 12/16/13	201,538.16	103.7500	207,500.00	5,961.84
150,000.0000	FRONTIER COMMUNICATIONS CORP 7.125% 03/15/2019 DD 03/23/07	154,752.84	104.2500	156,375.00	1,622.16



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100,000.0000	CLEAR CHANNEL WORLDWIDE HOLDIN 7.625% 03/15/2020 DD 03/15/12	103,398.74	99.5000	99,500.00	3,898.74-
100,000.0000	CLEAR CHANNEL WORLDWIDE HOLDIN 6.500% 11/15/2022 DD 05/15/13	103,349.64	102.7700	102,770.00	579.64-
50,000.0000	COGENT COMMUNICATIONS GRO 144A 5.375% 03/01/2022 DD 02/20/15	50,168.50	105.0000	52,500.00	2,331.50
25,000.0000	COMMERCIAL METALS CO 5.375% 07/15/2027 DD 07/11/17	25,000.00	101.8750	25,468.75	468.75
200,000.0000	COMMSCOPE TECHNOLOGIES LL 144A 6.000% 06/15/2025 DD 06/11/15	200,000.00	106.7500	213,500.00	13,500.00
50,000.0000	UNITI GROUP INC / CSL CAP 144A 7.125% 12/15/2024 DD 12/15/16	50,000.00	99.2820	49,641.00	359.00-
150,000.0000	CONSOLIDATED ENERGY FINAN 144A 6.875% 06/15/2025 DD 06/12/17	149,253.74	103.0000	154,500.00	5,246.26
25,000.0000	COVANTA HOLDING CORP 5.875% 07/01/2025 DD 03/16/17	25,000.00	97.0000	24,250.00	750.00-
75,000.0000	CRESTWOOD MIDSTREAM PARTN 144A 5.750% 04/01/2025 DD 03/14/17	75,000.00	99.7500	74,812.50	187.50-
150,000.0000	CROWNROCK LP / CROWNROCK 144A 7.125% 04/15/2021 DD 04/15/13	140,035.47	102.7500	154,125.00	14,089.53
50,000.0000	CROWNROCK LP / CROWNROCK 144A 7.750% 02/15/2023 DD 02/06/15	47,228.20	105.5000	52,750.00	5,521.80



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35,000.0000	CYRUSONE LP / CYRUSONE FI 144A 5.000% 03/15/2024 DD 03/17/17	35,000.00	103.0000	36,050.00	1,050.00
25,000.0000	CYRUSONE LP / CYRUSONE FI 144A 5.375% 03/15/2027 DD 03/17/17	25,000.00	104.1250	26,031.25	1,031.25
150,000.0000	DANA INC 5.375% 09/15/2021 DD 08/02/13	153,617.44	102.8750	154,312.50	695.06
245,000.0000	DAVITA INC 5.750% 08/15/2022 DD 08/28/12	250,168.50	102.7500	251,737.50	1,569.00
100,000.0000	DENBURY RESOURCES INC 144A 9.000% 05/15/2021 DD 05/10/16	104,412.59	95.2500	95,250.00	9,162.59-
250,000.0000	DISH DBS CORP 7.875% 09/01/2019 DD 08/17/09	251,002.13	110.2500	275,625.00	24,622.87
200,000.0000	DISH DBS CORP 5.875% 07/15/2022 DD 05/16/12	203,846.97	107.5000	215,000.00	11,153.03
50,000.0000	DOLE FOOD CO INC 144A 7.250% 06/15/2025 DD 04/06/17	50,000.00	104.0000	52,000.00	2,000.00
200,000.0000	RR DONNELLEY & SONS CO 6.000% 04/01/2024 DD 03/20/14	204,750.15	97.3750	194,750.00	10,000.15-
100,000.0000	DYNEGY INC 5.875% 06/01/2023 DD 12/01/13	98,887.86	93.5000	93,500.00	5,387.86-
100,000.0000	DYNEGY INC 7.375% 11/01/2022 DD 05/01/15	99,442.13	98.7500	98,750.00	692.13-



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100,000.0000	EMC CORP 2.650% 06/01/2020 DD 06/06/13	97,161.35	98.1230	98,123.00	961.65
25,000.0000	ELDORADO RESORTS INC 144A 6.000% 04/01/2025 DD 03/29/17	25,000.00	106.0000	26,500.00	1,500.00
200,000.0000	ENDO FINANCE LLC / ENDO F 144A VAR RT 01/15/2022 DD 05/06/14	202,621.49	95.7500	191,500.00	11,121.49-
50,000.0000	ENPRO INDUSTRIES INC 144A 5.875% 09/15/2022 DD 03/15/17	50,478.35	104.2500	52,125.00	1,646.65
200,000.0000	ENTEGRIS INC 144A 6.000% 04/01/2022 DD 04/01/14	200,000.00	104.6250	209,250.00	9,250.00
75,000.0000	EQUINIX INC 5.375% 05/15/2027 DD 03/22/17	75,000.00	106.6250	79,968.75	4,968.75
200,000.0000	TRONOX FINANCE LLC 144A 7.500% 03/15/2022 DD 03/19/15	177,310.76	103.0000	206,000.00	28,689.24
50,000.0000	EXTRACTION OIL & GAS INC 144A 7.875% 07/15/2021 DD 07/18/16	50,000.00	102.7500	51,375.00	1,375.00
50,000.0000	FMG RESOURCES AUGUST 2006 144A 4.750% 05/15/2022 DD 05/12/17	50,000.00	100.3750	50,187.50	187.50
75,000.0000	FMG RESOURCES AUGUST 2006 144A 5.125% 05/15/2024 DD 05/12/17	75,000.00	100.0000	75,000.00	0.00
200,000.0000	FTI CONSULTING INC 6.000% 11/15/2022 DD 05/15/13	200,000.00	103.7500	207,500.00	7,500.00



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125,000.0000	FELCOR LODGING LP 5.625% 03/01/2023 DD 03/01/13	125,000.00	103.7500	129,687.50	4,687.50
125,000.0000	FERRELLGAS LP / FERRELLGAS FIN VAR RT 06/15/2023 DD 06/15/16	125,000.00	93.2500	116,562.50	8,437.50-
175,000.0000	FIRST DATA CORP 144A 5.375% 08/15/2023 DD 08/11/15	175,000.00	104.5000	182,875.00	7,875.00
25,000.0000	FIRST DATA CORP 144A 5.750% 01/15/2024 DD 11/25/15	24,894.18	103.8750	25,968.75	1,074.57
175,000.0000	FIRST QUALITY FINANCE CO 144A 4.625% 05/15/2021 DD 05/14/13	175,000.00	100.8750	176,531.25	1,531.25
10,000.0000	FIRSTCASH INC 144A 5.375% 06/01/2024 DD 05/30/17	10,000.00	104.3750	10,437.50	437.50
75,000.0000	FLEX ACQUISITION CO INC 144A 6.875% 01/15/2025 DD 01/17/17	75,000.00	104.0000	78,000.00	3,000.00
25,000.0000	FRESENIUS MEDICAL CARE US 144A 5.625% 07/31/2019 DD 01/26/12	26,635.13	105.7500	26,437.50	197.63-
200,000.0000	FRESENIUS US FINANCE II I 144A 4.500% 01/15/2023 DD 09/25/15	200,000.00	105.0000	210,000.00	10,000.00
100,000.0000	FRONTIER COMMUNICATIONS CORP 7.125% 01/15/2023 DD 08/15/12	93,796.60	83.2500	83,250.00	10,546.60-
10,000.0000	FRONTIER COMMUNICATIONS CORP 11.000% 09/15/2025 DD 03/15/16	9,226.22	92.7500	9,275.00	48.78



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125,000.0000	GFL ENVIRONMENTAL INC 144A 5.625% 05/01/2022 DD 05/12/17	125,487.88	102.2500	127,812.50	2,324.62
100,000.0000	TEGNA INC 5.125% 07/15/2020 DD 07/29/13	102,888.85	102.5000	102,500.00	388.85-
300,000.0000	GARDA WORLD SECURITY CORP 144A 7.250% 11/15/2021 DD 11/08/13	307,011.82	101.1250	303,375.00	3,636.82-
200,000.0000	GENESIS ENERGY LP / GENESIS EN 6.000% 05/15/2023 DD 05/21/15	200,000.00	98.0000	196,000.00	4,000.00-
225,000.0000	GIBSON ENERGY INC 144A 6.750% 07/15/2021 DD 06/28/13	223,075.97	103.2500	232,312.50	9,236.53
200,000.0000	GOODYEAR TIRE & RUBBER CO/THE 5.000% 05/31/2026 DD 05/13/16	200,000.00	103.5000	207,000.00	7,000.00
75,000.0000	GOODYEAR TIRE & RUBBER CO/THE 4.875% 03/15/2027 DD 03/07/17	75,000.00	101.5000	76,125.00	1,125.00
93,720.9200	WHEELABRATOR TECHNOLOGIES 10/14 TLB	92,289.68	100.3750	94,072.37	1,782.69
1,372.5800	WHEELABRATOR TECHNOLOGIES 10/14 TLC	1,351.61	100.3750	1,377.73	26.12
50,000.0000	GENESYS TELECOMMUNICATION 144A 10.000% 11/30/2024 DD 12/01/16	50,000.00	112.3750	56,187.50	6,187.50
99,500.0000	GENESYS 1/17 (USD) COV-LT TLB 0.000% 12/01/2023 DD 01/09/17	98,310.48	100.2250	99,723.88	1,413.40



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100,000.0000	GRINDING MEDIA INC / MOLY 144A 7.375% 12/15/2023 DD 12/16/16	100,445.45	108.7500	108,750.00	8,304.55
300,000.0000	GROUP 1 AUTOMOTIVE INC VAR RT 06/01/2022 DD 06/01/15	300,693.59	101.5000	304,500.00	3,806.41
50,000.0000	GULFPORT ENERGY CORP 144A 6.000% 10/15/2024 DD 10/14/16	50,000.00	97.2500	48,625.00	1,375.00-
50,000.0000	GULFPORT ENERGY CORP 144A 6.375% 05/15/2025 DD 12/21/16	50,000.00	98.5000	49,250.00	750.00-
100,000.0000	HCA INC 5.250% 04/15/2025 DD 10/17/14	101,771.86	107.5000	107,500.00	5,728.14
250,000.0000	HCA INC 5.250% 06/15/2026 DD 03/15/16	262,432.44	107.8500	269,625.00	7,192.56
100,000.0000	HCA INC 4.500% 02/15/2027 DD 08/15/16	100,116.62	102.8750	102,875.00	2,758.38
150,000.0000	HCA INC 5.500% 06/15/2047 DD 06/22/17	150,000.00	103.5000	155,250.00	5,250.00
50,000.0000	HCA HEALTHCARE INC 6.250% 02/15/2021 DD 12/06/12	52,011.46	109.2500	54,625.00	2,613.54
175,000.0000	HCA INC 6.500% 02/15/2020 DD 08/01/11	191,253.08	109.1250	190,968.75	284.33-
200,000.0000	HALYARD HEALTH INC 6.250% 10/15/2022 DD 04/15/15	200,000.00	104.2500	208,500.00	8,500.00



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150,000.0000	HERTZ CORP/THE 5.875% 10/15/2020 DD 10/16/12	151,493.51	96.7500	145,125.00	6,368.51-
75,000.0000	HERTZ CORP/THE 144A 7.625% 06/01/2022 DD 06/06/17	75,000.00	99.7600	74,820.00	180.00-
182,000.0000	HERC RENTALS INC 144A 7.500% 06/01/2022 DD 06/09/16	182,000.00	105.5000	192,010.00	10,010.00
50,000.0000	HILL-ROM HOLDINGS INC 144A 5.000% 02/15/2025 DD 02/14/17	50,000.00	102.0000	51,000.00	1,000.00
100,000.0000	HOLLY ENERGY PARTNERS LP 144A 6.000% 08/01/2024 DD 07/19/16	100,000.00	104.0000	104,000.00	4,000.00
180,000.0000	HOLOGIC INC 144A 5.250% 07/15/2022 DD 07/02/15	180,000.00	105.0000	189,000.00	9,000.00
25,000.0000	HUDBAY MINERALS INC 144A 7.625% 01/15/2025 DD 12/12/16	25,000.00	104.7500	26,187.50	1,187.50
250,000.0000	HUGHES SATELLITE SYSTEMS CORP 7.625% 06/15/2021 DD 12/15/11	257,746.92	113.6250	284,062.50	26,315.58
225,000.0000	HUNTSMAN INTERNATIONAL LLC 4.875% 11/15/2020 DD 11/19/12	235,300.08	105.2500	236,812.50	1,512.42
300,000.0000	INFOR US INC 6.500% 05/15/2022 DD 11/15/15	304,010.18	103.5000	310,500.00	6,489.82
400,000.0000	INMARSAT FINANCE PLC 144A 4.875% 05/15/2022 DD 06/04/14	389,115.47	101.5000	406,000.00	16,884.53



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100,000.0000	INTELSAT JACKSON HOLDINGS SA 7.250% 04/01/2019 DD 10/01/11	86,314.23	100.0250	100,025.00	13,710.77
100,000.0000	INTELSAT JACKSON HOLDINGS SA 5.500% 08/01/2023 DD 06/05/13	84,709.74	82.7500	82,750.00	1,959.74-
125,000.0000	INVENTIV GROUP HOLDINGS I 144A 7.500% 10/01/2024 DD 10/14/16	125,000.00	108.5000	135,625.00	10,625.00
200,000.0000	IRON MOUNTAIN INC 6.000% 08/15/2023 DD 08/13/13	204,357.00	106.2500	212,500.00	8,143.00
100,000.0000	PATHEON HOLDINGS I BV 144A 7.500% 02/01/2022 DD 02/05/14	105,822.32	106.2500	106,250.00	427.68
38,000.0000	J2 CLOUD SERVICES LLC / J 144A 6.000% 07/15/2025 DD 06/27/17	38,000.00	103.0000	39,140.00	1,140.00
50,000.0000	RP CROWN PARENT LLC 144A 7.375% 10/15/2024 DD 10/06/16	50,000.00	104.0000	52,000.00	2,000.00
15,000.0000	JONAH ENERGY 5/14 COV-LITE 2ND LIEN TL	14,550.00	95.1670	14,275.05	274.95-
150,000.0000	JUPITER RESOURCES INC 144A 8.500% 10/01/2022 DD 09/18/14	145,435.29	75.0000	112,500.00	32,935.29-
150,000.0000	KFC HOLDING CO/PIZZA HUT 144A 5.000% 06/01/2024 DD 06/16/16	150,000.00	104.2500	156,375.00	6,375.00
25,000.0000	KFC HOLDING CO/PIZZA HUT 144A 4.750% 06/01/2027 DD 06/15/17	25,000.00	102.1250	25,531.25	531.25



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200,000.0000	KLX INC 144A 5.875% 12/01/2022 DD 12/08/14	205,370.08	105.0000	210,000.00	4,629.92
25,000.0000	KINROSS GOLD CORP 144A 4.500% 07/15/2027 DD 07/06/17	25,000.00	99.7500	24,937.50	62.50-
25,000.0000	KOPPERS INC 144A 6.000% 02/15/2025 DD 01/25/17	25,000.00	106.2500	26,562.50	1,562.50
175,000.0000	KRONOS ACQUISITION HOLDIN 144A 9.000% 08/15/2023 DD 08/26/15	178,462.06	99.7500	174,562.50	3,899.56-
150,000.0000	LENNAR CORP VAR RT 12/01/2018 DD 02/04/13	153,331.89	102.2500	153,375.00	43.11
75,000.0000	LENNAR CORP 4.500% 04/30/2024 DD 04/28/17	75,000.00	103.3600	77,520.00	2,520.00
150,000.0000	LIONS GATE ENTERTAINMENT 144A 5.875% 11/01/2024 DD 10/27/16	151,431.47	105.2500	157,875.00	6,443.53
135,000.0000	MDC PARTNERS INC 144A 6.500% 05/01/2024 DD 03/23/16	135,000.00	99.7500	134,662.50	337.50-
100,000.0000	MGM RESORTS INTERNATIONAL 6.625% 12/15/2021 DD 12/20/12	101,952.12	112.2500	112,250.00	10,297.88
300,000.0000	MPH ACQUISITION HOLDINGS 144A 7.125% 06/01/2024 DD 06/07/16	303,269.65	106.6250	319,875.00	16,605.35
175,000.0000	MSCI INC 144A 5.750% 08/15/2025 DD 08/13/15	175,000.00	108.3120	189,546.00	14,546.00



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50,000.0000	MALLINCKRODT INTERNATIONAL 144A 5.500% 04/15/2025 DD 04/15/15	50,000.00	87.5000	43,750.00	6,250.00-
150,000.0000	MEDIACOM BROADBAND LLC / MEDIA 5.500% 04/15/2021 DD 03/17/14	150,000.00	102.2500	153,375.00	3,375.00
100,000.0000	MICRON TECHNOLOGY INC 144A 5.250% 01/15/2024 DD 04/30/15	100,000.00	103.5000	103,500.00	3,500.00
150,000.0000	MIDAS INTERMEDIATE HOLDCO 144A 7.875% 10/01/2022 DD 09/24/14	151,323.11	103.0000	154,500.00	3,176.89
225,000.0000	MIDCONTINENT COMMUNICATIO 144A 6.875% 08/15/2023 DD 08/14/15	226,262.84	107.7500	242,437.50	16,174.66
90,000.0000	MOLINA HEALTHCARE INC VAR RT 11/15/2022 DD 05/15/16	90,000.00	105.8750	95,287.50	5,287.50
50,000.0000	MOLINA HEALTHCARE INC 144A 4.875% 06/15/2025 DD 06/06/17	50,000.00	100.7500	50,375.00	375.00
200,000.0000	NATURE'S BOUNTY CO/THE 144A 7.625% 05/15/2021 DD 05/05/16	200,000.00	106.2500	212,500.00	12,500.00
150,000.0000	NCR CORP 4.625% 02/15/2021 DD 02/15/13	150,189.59	102.0000	153,000.00	2,810.41
100,000.0000	NCR CORP 5.875% 12/15/2021 DD 06/15/14	99,447.08	104.0000	104,000.00	4,552.92
125,000.0000	NGL ENERGY PARTNERS LP / 144A 7.500% 11/01/2023 DD 10/24/16	125,000.00	98.6250	123,281.25	1,718.75-



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100,000.0000	NGL ENERGY PARTNERS LP / 144A 6.125% 03/01/2025 DD 02/22/17	100,000.00	91.5000	91,500.00	8,500.00-
300,000.0000	NRG ENERGY INC 6.625% 03/15/2023 DD 03/15/13	304,562.84	102.7500	308,250.00	3,687.16
100,000.0000	NRG ENERGY INC 6.250% 07/15/2022 DD 07/15/14	102,193.21	102.6250	102,625.00	431.79
300,000.0000	NAVISTAR INTERNATIONAL CORP 8.250% 11/01/2021 DD 10/28/09	302,897.07	101.0000	303,000.00	102.93
35,000.0000	NAVIENT CORP 6.500% 06/15/2022 DD 03/07/17	35,000.00	106.0000	37,100.00	2,100.00
170,000.0000	NFP CORP 144A 6.875% 07/15/2025 DD 07/12/17	170,000.00	101.0000	171,700.00	1,700.00
100,000.0000	NIELSEN FINANCE LLC / NIELSEN 4.500% 10/01/2020 DD 04/01/13	102,140.71	101.5280	101,528.00	612.71-
150,000.0000	NIELSEN FINANCE LLC / NIE 144A 5.000% 04/15/2022 DD 04/11/14	149,710.53	103.7500	155,625.00	5,914.47
200,000.0000	NOVA CHEMICALS CORP 144A 5.000% 05/01/2025 DD 10/28/14	195,642.61	99.5000	199,000.00	3,357.39
75,000.0000	NOVA CHEMICALS CORP 144A 4.875% 06/01/2024 DD 06/09/17	75,000.00	99.6250	74,718.75	281.25-
25,000.0000	NOVA CHEMICALS CORP 144A 5.250% 06/01/2027 DD 06/09/17	25,000.00	99.5000	24,875.00	125.00-



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200,000.0000	NOVELIS CORP 144A 6.250% 08/15/2024 DD 08/29/16	200,000.00	105.0000	210,000.00	10,000.00
10,000.0000	NOVELIS CORP 144A 5.875% 09/30/2026 DD 09/14/16	10,000.00	103.0000	10,300.00	300.00
12,000.0000	NUANCE COMMUNICATIONS INC 144A 5.375% 08/15/2020 DD 08/14/12	11,978.64	101.6250	12,195.00	216.36
50,000.0000	NUANCE COMMUNICATIONS INC 144A 5.625% 12/15/2026 DD 12/22/16	49,549.83	106.7500	53,375.00	3,825.17
200,000.0000	SFR GROUP SA 144A 6.000% 05/15/2022 DD 05/08/14	203,679.25	104.6250	209,250.00	5,570.75
300,000.0000	OASIS PETROLEUM INC 6.500% 11/01/2021 DD 11/10/11	292,164.05	97.0000	291,000.00	1,164.05-
50,000.0000	1011778 BC ULC / NEW RED 144A 4.250% 05/15/2024 DD 05/17/17	50,000.00	99.3690	49,684.50	315.50-
50,000.0000	ORBITAL ATK INC 5.250% 10/01/2021 DD 04/01/15	51,718.39	103.2500	51,625.00	93.39-
150,000.0000	ORBITAL ATK INC 5.500% 10/01/2023 DD 04/01/16	150,000.00	105.2500	157,875.00	7,875.00
50,000.0000	ORCHESTRA BORROWER LLC / 144A 6.750% 06/15/2022 DD 06/16/17	50,000.00	103.0400	51,520.00	1,520.00
50,000.0000	PARK AEROSPACE HOLDINGS L 144A 5.250% 08/15/2022 DD 02/03/17	50,000.00	104.5320	52,266.00	2,266.00



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50,000.0000	PARK AEROSPACE HOLDINGS L 144A 5.500% 02/15/2024 DD 02/03/17	50,000.00	104.4500	52,225.00	2,225.00
25,000.0000	PEABODY ENERGY CORP 144A 6.375% 03/31/2025 DD 02/15/17	25,000.00	98.5000	24,625.00	375.00-
200,000.0000	PENSKE AUTOMOTIVE GROUP INC 5.750% 10/01/2022 DD 04/01/13	200,641.84	103.2500	206,500.00	5,858.16
75,000.0000	PETSMART INC 144A 5.875% 06/01/2025 DD 05/31/17	75,000.00	96.3750	72,281.25	2,718.75-
200,000.0000	PLATFORM SPECIALTY PRODUC 144A 6.500% 02/01/2022 DD 02/02/15	191,595.92	103.2500	206,500.00	14,904.08
200,000.0000	POLYONE CORP 5.250% 03/15/2023 DD 09/15/13	198,795.49	105.0000	210,000.00	11,204.51
25,000.0000	POST HOLDINGS INC 144A 5.500% 03/01/2025 DD 02/14/17	25,000.00	103.1250	25,781.25	781.25
50,000.0000	POST HOLDINGS INC 144A 5.750% 03/01/2027 DD 02/14/17	50,000.00	102.7500	51,375.00	1,375.00
100,000.0000	PRESTIGE BRANDS INC 144A 5.375% 12/15/2021 DD 12/17/13	97,849.62	103.1250	103,125.00	5,275.38
300,000.0000	QEP RESOURCES INC 5.375% 10/01/2022 DD 03/01/12	303,362.05	96.2500	288,750.00	14,612.05-
125,000.0000	QUEBECOR MEDIA INC 5.750% 01/15/2023 DD 12/15/12	125,000.00	105.5000	131,875.00	6,875.00



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175,000.0000	QUICKEN LOANS INC 144A 5.750% 05/01/2025 DD 05/06/15	175,000.00	103.2500	180,687.50	5,687.50
300,000.0000	RHP HOTEL PROPERTIES LP / RHP 5.000% 04/15/2023 DD 04/14/15	300,611.30	102.2500	306,750.00	6,138.70
300,000.0000	RSI HOME PRODUCTS INC 144A 6.500% 03/15/2023 DD 03/16/15	300,000.00	105.2500	315,750.00	15,750.00
100,000.0000	RADIATE HOLDCO LLC / RADI 144A 6.625% 02/15/2025 DD 02/01/17	100,188.50	100.0000	100,000.00	188.50-
150,000.0000	RANGE RESOURCES CORP 4.875% 05/15/2025 DD 11/15/15	135,642.46	95.0000	142,500.00	6,857.54
100,000.0000	RANGE RESOURCES CORP 144A 5.000% 03/15/2023 DD 09/16/16	89,548.13	97.7500	97,750.00	8,201.87
250,000.0000	REALOGY GROUP LLC / REALO 144A 4.500% 04/15/2019 DD 04/07/14	254,361.26	103.2500	258,125.00	3,763.74
150,000.0000	REGIONALCARE HOSPITAL PAR 144A 8.250% 05/01/2023 DD 04/29/16	154,791.06	107.2500	160,875.00	6,083.94
64,813.5500	REYNOLDS GROUP ISSUER INC / RE VAR RT 02/15/2021 DD 02/15/12	66,417.71	102.7500	66,595.92	178.21
100,000.0000	REYNOLDS GROUP ISSUER INC / RE 5.750% 10/15/2020 DD 09/28/12	102,807.25	102.3340	102,334.00	473.25-
175,000.0000	RITE AID CORP 144A 6.125% 04/01/2023 DD 04/02/15	179,751.89	98.1880	171,829.00	7,922.89-



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25,000.0000	ROCKIES EXPRESS PIPELINE 144A 6.000% 01/15/2019 DD 01/17/13	26,232.69	104.2500	26,062.50	170.19-
10,000.0000	SBA COMMUNICATIONS CORP 4.875% 09/01/2024 DD 03/01/17	9,925.36	101.7500	10,175.00	249.64
200,000.0000	SESI LLC 6.375% 05/01/2019 DD 11/01/11	186,512.41	98.7500	197,500.00	10,987.59
250,000.0000	NAVIENT CORP 7.250% 01/25/2022 DD 01/27/12	255,444.79	109.2500	273,125.00	17,680.21
200,000.0000	SM ENERGY CO 6.500% 01/01/2023 DD 06/29/12	194,403.98	95.2500	190,500.00	3,903.98-
50,000.0000	SPX FLOW INC 144A 5.625% 08/15/2024 DD 08/10/16	51,158.97	103.0000	51,500.00	341.03
75,000.0000	SEAGATE HDD CAYMAN 144A 4.875% 03/01/2024 DD 02/03/17	74,520.83	101.9210	76,440.75	1,919.92
75,000.0000	SEMGROUP CORP 144A 6.375% 03/15/2025 DD 03/15/17	73,883.42	96.7500	72,562.50	1,320.92-
150,000.0000	SENSATA TECHNOLOGIES BV 144A 5.000% 10/01/2025 DD 03/26/15	150,000.00	104.5800	156,870.00	6,870.00
125,000.0000	SERVICE CORP INTERNATIONAL/US 7.625% 10/01/2018 DD 10/03/06	125,411.61	106.7500	133,437.50	8,025.89
200,000.0000	SHEA HOMES LP / SHEA HOME 144A 5.875% 04/01/2023 DD 03/23/15	200,000.00	102.9500	205,900.00	5,900.00



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250,000.0000	SIGNODE INDUSTRIAL GROUP 144A 6.375% 05/01/2022 DD 04/29/14	249,271.37	104.5000	261,250.00	11,978.63
300,000.0000	SIRIUS XM RADIO INC 144A 6.000% 07/15/2024 DD 05/06/14	302,489.89	106.2500	318,750.00	16,260.11
50,000.0000	SIRIUS XM RADIO INC 144A 5.000% 08/01/2027 DD 07/05/17	50,000.00	100.7500	50,375.00	375.00
100,000.0000	SIX FLAGS ENTERTAINMENT C 144A 4.875% 07/31/2024 DD 06/16/16	99,024.74	100.6120	100,612.00	1,587.26
50,000.0000	SONIC AUTOMOTIVE INC 144A 6.125% 03/15/2027 DD 03/10/17	50,000.00	99.5000	49,750.00	250.00-
50,000.0000	SPECTRUM BRANDS INC 6.125% 12/15/2024 DD 12/15/15	50,000.00	107.1250	53,562.50	3,562.50
300,000.0000	SPRINGLEAF FINANCE CORP 6.000% 06/01/2020 DD 12/01/13	293,676.56	105.5000	316,500.00	22,823.44
100,000.0000	SPRINT CAPITAL CORP 6.900% 05/01/2019 DD 05/06/99	107,066.88	106.7450	106,745.00	321.88-
100,000.0000	SPRINT COMMUNICATIONS INC 7.000% 08/15/2020 DD 08/14/12	98,258.05	110.0000	110,000.00	11,741.95
200,000.0000	SPRINT COMMUNICATIONS INC 6.000% 11/15/2022 DD 11/14/12	175,323.13	106.0000	212,000.00	36,676.87
100,000.0000	SPRINT CORP 7.250% 09/15/2021 DD 09/15/14	83,503.66	111.1250	111,125.00	27,621.34



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100,000.0000	SPRINT CORP 7.875% 09/15/2023 DD 09/15/14	99,433.30	115.0000	115,000.00	15,566.70
250,000.0000	SPRINT CORP 7.125% 06/15/2024 DD 06/15/14	245,406.25	111.2500	278,125.00	32,718.75
55,000.0000	CALATLANTIC GROUP INC 8.375% 05/15/2018 DD 05/03/10	57,990.84	105.1250	57,818.75	172.09-
25,000.0000	STARWOOD PROPERTY TRUST I 144A 5.000% 12/15/2021 DD 12/16/16	25,000.00	104.0000	26,000.00	1,000.00
75,000.0000	STERIGENICS-NORDION TOPCO 144A 8.125% 11/01/2021 DD 11/01/16	75,000.00	102.5000	76,875.00	1,875.00
150,000.0000	SUBURBAN PROPANE PARTNERS LP/S 5.500% 06/01/2024 DD 05/27/14	151,116.25	99.5000	149,250.00	1,866.25-
100,000.0000	SUMMIT MATERIALS LLC / SUMMIT 6.125% 07/15/2023 DD 07/08/15	99,512.86	104.7500	104,750.00	5,237.14
50,000.0000	SUMMIT MIDSTREAM HOLDINGS LLC 5.750% 04/15/2025 DD 02/15/17	50,000.00	100.5000	50,250.00	250.00
75,000.0000	SUNCOKE ENERGY PARTNERS L 144A 7.500% 06/15/2025 DD 05/24/17	73,895.50	98.7500	74,062.50	167.00
25,000.0000	SYMANTEC CORP 144A 5.000% 04/15/2025 DD 02/09/17	25,000.00	104.6560	26,164.00	1,164.00
80,000.0000	THC ESCROW CORP III 144A 4.625% 07/15/2024 DD 06/14/17	80,000.00	100.2700	80,216.00	216.00



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125,000.0000	THC ESCROW CORP III 144A 5.125% 05/01/2025 DD 06/14/17	125,000.00	100.3750	125,468.75	468.75
75,000.0000	THC ESCROW CORP III 144A 7.000% 08/01/2025 DD 06/14/17	75,000.00	99.6250	74,718.75	281.25-
150,000.0000	T-MOBILE USA INC 6.125% 01/15/2022 DD 11/21/13	158,508.78	105.0940	157,641.00	867.78-
200,000.0000	T-MOBILE USA INC 6.500% 01/15/2026 DD 11/05/15	200,000.00	110.3750	220,750.00	20,750.00
25,000.0000	T-MOBILE USA INC 5.375% 04/15/2027 DD 03/16/17	25,000.00	107.2500	26,812.50	1,812.50
50,000.0000	TRI POINTE GROUP INC 5.250% 06/01/2027 DD 06/08/17	50,000.00	100.2500	50,125.00	125.00
96,250.0000	ALLFLEX 7/13 TL	96,250.00	100.2500	96,490.63	240.63
75,000.0000	TALLGRASS ENERGY PARTNERS 144A 5.500% 09/15/2024 DD 09/01/16	75,000.00	101.2500	75,937.50	937.50
241,000.0000	TECK RESOURCES LTD 4.750% 01/15/2022 DD 07/05/11	220,641.58	103.5000	249,435.00	28,793.42
200,000.0000	TELECOM ITALIA SPA/MILANO 144A 5.303% 05/30/2024 DD 05/30/14	198,502.64	107.2500	214,500.00	15,997.36
100,000.0000	TELESAT CANADA / TELESAT 144A 8.875% 11/15/2024 DD 11/17/16	100,000.00	112.2500	112,250.00	12,250.00
50,000.0000	TEMPO ACQUISITION LLC / T 144A 6.750% 06/01/2025 DD 05/01/17	50,000.00	102.2500	51,125.00	1,125.00



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125,000.0000	TENET HEALTHCARE CORP 8.125% 04/01/2022 DD 09/27/13	129,874.94	106.1250	132,656.25	2,781.31
25,000.0000	TENET HEALTHCARE CORP 144A 7.500% 01/01/2022 DD 12/01/16	25,000.00	108.4800	27,120.00	2,120.00
64,000.0000	TENET HEALTHCARE CORP 144A 4.625% 07/15/2024 DD 06/14/17	64,000.00	100.1250	64,080.00	80.00
175,000.0000	TEAM HEALTH HOLDINGS INC 144A 6.375% 02/01/2025 DD 02/01/17	169,828.09	97.0000	169,750.00	78.09-
50,000.0000	TEREX CORP 144A 5.625% 02/01/2025 DD 01/31/17	50,000.00	102.8750	51,437.50	1,437.50
200,000.0000	TESORO LOGISTICS LP / TESORO L 5.500% 10/15/2019 DD 10/15/15	163,315.11	105.5000	211,000.00	47,684.89
300,000.0000	TOWNSQUARE MEDIA INC 144A 6.500% 04/01/2023 DD 04/01/15	300,000.00	100.5000	301,500.00	1,500.00
200,000.0000	TRANSDIGM INC 6.000% 07/15/2022 DD 06/04/14	207,745.34	103.0000	206,000.00	1,745.34-
75,000.0000	TRANSDIGM INC 6.500% 05/15/2025 DD 11/15/15	76,088.48	101.7500	76,312.50	224.02
50,000.0000	TRINIDAD DRILLING LTD 144A 6.625% 02/15/2025 DD 02/08/17	50,000.00	95.0000	47,500.00	2,500.00-
200,000.0000	UPCB FINANCE IV LTD 144A 5.375% 01/15/2025 DD 04/15/15	203,286.99	104.6250	209,250.00	5,963.01



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50,000.0000	USG CORP 144A 4.875% 06/01/2027 DD 05/15/17	50,000.00	102.8750	51,437.50	1,437.50
25,000.0000	ULTRA RESOURCES INC 144A 6.875% 04/15/2022 DD 04/12/17	25,000.00	99.2500	24,812.50	187.50-
25,000.0000	ULTRA RESOURCES INC 144A 7.125% 04/15/2025 DD 04/12/17	24,634.48	98.6250	24,656.25	21.77
150,000.0000	UNITED RENTALS NORTH AMERICA I 6.125% 06/15/2023 DD 10/30/12	145,275.89	104.1250	156,187.50	10,911.61
25,000.0000	UNITED RENTALS NORTH AMERICA I 5.875% 09/15/2026 DD 05/13/16	26,123.79	106.5000	26,625.00	501.21
50,000.0000	UNITI GROUP INC / UNITI F 144A 7.125% 12/15/2024 DD 12/15/16	50,246.10	99.1250	49,562.50	683.60-
180,000.0000	UNITYMEDIA HESSEN GMBH & 144A 5.500% 01/15/2023 DD 12/14/12	181,087.15	103.7500	186,750.00	5,662.85
200,000.0000	UNIVERSAL HEALTH SERVICES 144A 4.750% 08/01/2022 DD 08/07/14	202,526.73	103.3750	206,750.00	4,223.27
200,000.0000	UNIVISION COMMUNICATIONS 144A 5.125% 05/15/2023 DD 05/21/13	204,486.33	100.9680	201,936.00	2,550.33-
100,000.0000	USIS MERGER SUB INC 144A 6.875% 05/01/2025 DD 04/18/17	100,000.00	101.7500	101,750.00	1,750.00
255,000.0000	VALEANT PHARMACEUTICALS I 144A 5.375% 03/15/2020 DD 03/27/15	241,921.05	96.6250	246,393.75	4,472.70



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50,000.0000	VALEANT PHARMACEUTICALS I 144A 6.500% 03/15/2022 DD 03/21/17	50,000.00	104.8750	52,437.50	2,437.50
55,000.0000	VENATOR FINANCE SARL / VE 144A 5.750% 07/15/2025 DD 07/14/17	55,000.00	101.0000	55,550.00	550.00
40,000.0000	VERISIGN INC 144A 4.750% 07/15/2027 DD 07/05/17	40,000.00	101.1250	40,450.00	450.00
250,000.0000	VIASAT INC 6.875% 06/15/2020 DD 06/15/12	250,954.14	101.9680	254,920.00	3,965.86
50,000.0000	VIDEOTRON LTD 5.000% 07/15/2022 DD 07/15/12	50,506.52	105.7500	52,875.00	2,368.48
200,000.0000	VIKING CRUISES LTD 144A 8.500% 10/15/2022 DD 10/19/12	190,015.08	105.0000	210,000.00	19,984.92
200,000.0000	VISTA OUTDOOR INC 5.875% 10/01/2023 DD 10/01/16	200,000.00	102.7500	205,500.00	5,500.00
225,000.0000	VALEANT PHARMACEUTICALS I 144A 7.500% 07/15/2021 DD 07/12/13	222,843.75	96.8750	217,968.75	4,875.00-
8,000.0000	VALEANT PHARMACEUTICALS I 144A 6.750% 08/15/2018 DD 07/12/13	7,850.91	100.2500	8,020.00	169.09
146,000.0000	WMG ACQUISITION CORP 144A 5.625% 04/15/2022 DD 04/09/14	146,241.39	103.5000	151,110.00	4,868.61
100,000.0000	WAVEDIVISION ESCROW LLC / 144A 8.125% 09/01/2020 DD 08/21/12	103,288.45	103.5800	103,580.00	291.55



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200,000.0000	WEATHERFORD INTERNATIONAL LTD 7.750% 06/15/2021 DD 06/17/16	205,911.84	100.5000	201,000.00	4,911.84-
40,000.0000	WEATHERFORD INTERNATIONAL 144A 9.875% 02/15/2024 DD 11/18/16	40,399.75	104.5000	41,800.00	1,400.25
100,000.0000	WELLCARE HEALTH PLANS INC 5.250% 04/01/2025 DD 03/22/17	100,000.00	104.7500	104,750.00	4,750.00
200,000.0000	WESCO DISTRIBUTION INC 5.375% 06/15/2024 DD 12/15/16	200,000.00	104.3750	208,750.00	8,750.00
150,000.0000	WHITING PETROLEUM CORP 5.750% 03/15/2021 DD 09/12/13	137,382.79	94.0000	141,000.00	3,617.21
175,000.0000	WHITING PETROLEUM CORP 6.250% 04/01/2023 DD 03/27/15	168,407.32	91.7500	160,562.50	7,844.82-
182,000.0000	WIDOPENWEST FINANCE LLC / WID 10.250% 07/15/2019 DD 01/15/13	189,173.02	103.0000	187,460.00	1,713.02-
50,000.0000	WILDHORSE RESOURCE DEVELO 144A 6.875% 02/01/2025 DD 02/01/17	49,636.99	94.0000	47,000.00	2,636.99-
200,000.0000	WIND ACQUISITION FINANCE 144A 4.750% 07/15/2020 DD 07/10/14	202,778.62	101.0500	202,100.00	678.62-
200,000.0000	WPX ENERGY INC 6.000% 01/15/2022 DD 11/14/11	181,295.02	99.0000	198,000.00	16,704.98
100,000.0000	WPX ENERGY INC 5.250% 09/15/2024 DD 09/08/14	89,417.68	95.0000	95,000.00	5,582.32



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75,000.0000	ZAYO GROUP LLC / ZAYO CAP 144A 5.750% 01/15/2027 DD 01/27/17	75,000.00	104.6250	78,468.75	3,468.75
150,000.0000	ZIGGO SECURED FINANCE BV 144A 5.500% 01/15/2027 DD 09/23/16	150,000.00	102.1250	153,187.50	3,187.50
195,000.0000	BRAND ENERGY 6/17 TL 0.000% 06/21/2024 DD 06/01/17	193,052.29	99.7810	194,572.95	1,520.66
TOTAL INVESTMENTS FIXED INCOME SECURITIES		39,381,029.94		40,484,666.94	1,103,637.00
TOTAL INVESTMENT		40,428,751.48		41,532,388.48	1,103,637.00



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
0.0700	BLACKROCK LIQ T FUND INSTL FUND 60	0.07	100.0000	0.07	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		0.07		0.07	0.00
<u>INVESTMENTS EQUITY</u>					
1,848,335.4470	PARAMETRIC TX-MGD EM MK-INST	83,091,437.05	47.7400	88,239,534.24	5,148,097.19
TOTAL INVESTMENTS EQUITY		83,091,437.05		88,239,534.24	5,148,097.19
TOTAL INVESTMENT		83,091,437.12		88,239,534.31	5,148,097.19



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
71.0600	AUD (AUSTRALIAN DOLLARS)	54.01	0.0000	54.51	0.50 C
460.7000	NZD (NEW ZEALAND DOLLAR)	333.50	0.0000	337.32	3.82 C
57.7500	CHF (SWISS FRANC)	59.30	0.0000	60.30	1.00 C
36,219.1500	GBP (GREAT BRITISH POUNDS)	46,266.44	0.0000	47,046.86	780.42 C
35,972.6800	HKD (HONG KONG DOLLARS)	4,611.88	0.0000	4,608.07	3.81-C
13,102,918.0000	JPY (JAPANESE YEN)	116,941.46	0.0000	116,615.50	325.96-C
851.0400	SGD (SINGAPORE DOLLARS)	613.58	0.0000	618.11	4.53 C
2,584.3300	ILS (ISRAELI SHEKEL)	730.31	0.0000	740.56	10.25 C
336.2700	DKK (DANISH KRONE)	50.50	0.0000	51.58	1.08 C
17,829.3100	NOK (NORWEGIAN KRONE)	2,109.78	0.0000	2,128.45	18.67 C
438.2400	SEK (SWEDISH KRONA)	50.20	0.0000	51.96	1.76 C
38,499.7200	EUR (EURO)	43,379.95	0.0000	43,910.86	530.91 C
343,366.5500	BLACKROCK LIQ T FUND INSTL FUND 60	343,366.55	100.0000	343,366.55	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		558,567.46		559,590.63	1,023.17 1,023.17 C 0.00 I



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<u>INVESTMENTS PREFERRED SECURITIES</u>					
1,347.0000	HENKEL AG & CO KGAA	99,338.08	137.4362	185,126.66	85,788.58 14,173.41- C 99,961.99 I
1,488.0000	VOLKSWAGEN AG	168,707.81	152.0923	226,313.41	57,605.60 12,892.70- C 70,498.30 I
540.0000	BAYERISCHE MOTOREN WERKE AG	36,574.67	82.3248	44,455.45	7,880.78 9,089.04- C 16,969.82 I
435.0000	PORSCHE AUTOMOBIL HOLDING SE	23,493.66	56.1036	24,405.09	911.43 4,561.99- C 5,473.42 I
TOTAL INVESTMENTS PREFERRED SECURITIES		328,114.22		480,300.61	152,186.39 40,717.14- C 192,903.53 I
<u>INVESTMENTS EQUITY</u>					
38,054.0000	SCENTRE GROUP	112,700.27	3.1065	118,216.75	5,516.48 18,299.91- C 23,816.39 I
4,433.0000	WESTFIELD CORP	29,595.88	6.1594	27,304.67	2,291.21- 281.22 C 2,572.43- I



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14,024.0000	HEALTHSCOPE LTD	30,715.81	1.6951	23,773.21	6,942.60- 898.80- C 6,043.80- I
27,729.0000	MEDIBANK PVT LTD	52,377.28	2.1477	59,554.68	7,177.40 4,177.10- C 11,354.50 I
5,245.0000	AGL ENERGY LTD	71,374.89	19.5597	102,591.02	31,216.13 14,118.37- C 45,334.50 I
52,534.0000	SOUTH32 LTD	104,287.50	2.0556	107,993.83	3,706.33 123.16 C 3,583.17 I
1,229.0000	CIMIC GROUP LTD	32,017.74	29.7922	36,614.64	4,596.90 377.10 C 4,219.80 I
28,330.0000	VICINITY CENTRES	61,453.93	1.9713	55,847.45	5,606.48- 2,154.51- C 3,451.97- I
8,849.0000	TATTS GROUP LTD	19,974.05	3.2062	28,372.27	8,398.22 5,688.87- C 14,087.09 I
12,897.0000	GOODMAN GROUP	49,717.90	6.0366	77,855.11	28,137.21 16,662.53- C 44,799.74 I
8,403.0000	DEXUS	39,754.57	7.2716	61,103.54	21,348.97 2,503.83- C 23,852.80 I



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7,022.0000	BRAMBLES LTD	47,550.40	7.4633	52,407.97	4,857.57 10,508.24- C 15,365.81 I
2,182.0000	MACQUARIE GROUP LTD	102,230.73	67.8839	148,122.72	45,891.99 21,768.63- C 67,660.62 I
2,648.0000	CROWN RESORTS LTD	19,761.00	9.4193	24,942.50	5,181.50 5,001.19- C 10,182.69 I
3,045.0000	JAMES HARDIE INDUSTRIES PLC	20,086.60	15.7245	47,881.18	27,794.58 9,600.60- C 37,395.18 I
3,968.0000	TREASURY WINE ESTATES LTD	17,875.39	10.0943	40,054.49	22,179.10 8,727.33- C 30,906.43 I
9,676.0000	SYDNEY AIRPORT	40,518.28	5.4383	52,621.81	12,103.53 4,445.46 C 7,658.07 I
15,943.0000	AURIZON HOLDINGS LTD	49,791.33	4.1113	65,547.86	15,756.53 21,021.93- C 36,778.46 I
1,434.0000	RAMSAY HEALTH CARE LTD	29,788.66	56.4548	80,956.30	51,167.64 21,857.83- C 73,025.47 I
17,424.0000	AUSTRALIA & NEW ZEALAND BANKIN	389,966.74	22.0296	383,845.07	6,121.67- 54,446.11- C 48,324.44 I



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8,747.0000	AMCOR LTD/AUSTRALIA	67,266.72	12.4338	108,759.15	41,492.43 17,894.91- C 59,387.34 I
18,973.0000	WESTPAC BANKING CORP	471,330.16	23.4026	444,019.34	27,310.82- 61,498.14- C 34,187.32 I
3,052.0000	BANK OF QUEENSLAND LTD	29,376.02	8.7827	26,804.87	2,571.15- 1,880.06- C 691.09- I
18,370.0000	FORTESCUE METALS GROUP LTD	65,171.52	4.0040	73,553.50	8,381.98 394.09 C 7,987.89 I
21,657.0000	TELSTRA CORP LTD	59,858.47	3.2983	71,431.61	11,573.14 14,322.65- C 25,895.79 I
2,202.0000	BENDIGO & ADELAIDE BANK LTD	20,388.69	8.4989	18,714.61	1,674.08- 3,752.43- C 2,078.35 I
1,636.0000	ASX LTD	47,491.01	41.1215	67,274.86	19,783.85 3,826.82- C 23,610.67 I
14,955.0000	BHP BILLITON LTD	343,815.79	17.8569	267,050.30	76,765.49- 11,981.58- C 64,783.91- I
2,007.0000	CALTEX AUSTRALIA LTD	49,804.82	24.2464	48,662.63	1,142.19- 669.32 C 1,811.51- I



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34,475.0000	MIRVAC GROUP	50,852.66	1.6338	56,325.82	5,473.16 3,959.76- C 9,432.92 I
5,949.0000	HARVEY NORMAN HOLDINGS LTD	20,005.20	2.9301	17,431.35	2,573.85- 3,495.13- C 921.28 I
3,288.0000	CSL LTD	123,938.65	105.8759	348,120.00	224,181.35 40,045.24- C 264,226.59 I
990.0000	REA GROUP LTD	39,521.66	50.9321	50,422.80	10,901.14 519.33 C 10,381.81 I
14,169.0000	TRANSURBAN GROUP	87,753.82	9.0895	128,789.73	41,035.91 19,653.38- C 60,689.29 I
299.0000	COCHLEAR LTD	19,960.68	119.2379	35,652.14	15,691.46 7,148.54- C 22,840.00 I
5,411.0000	ORIGIN ENERGY LTD	29,138.58	5.2619	28,472.48	666.10- 293.25 C 959.35- I
10,673.0000	COMMONWEALTH BANK OF AUSTRALIA	560,320.92	63.5194	677,942.67	117,621.75 95,857.93- C 213,479.68 I
13,967.0000	BORAL LTD	51,582.55	5.3309	74,458.04	22,875.49 1,698.51 C 21,176.98 I



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1,920.0000	RIO TINTO LTD	85,001.94	48.5312	93,180.01	8,178.07 1,910.11- C 10,088.18 I
8,399.0000	APA GROUP	50,133.99	7.0338	59,077.29	8,943.30 8,394.05- C 17,337.35 I
6,916.0000	ARISTOCRAT LEISURE LTD	41,837.62	17.3046	119,678.95	77,841.33 10,110.42 C 67,730.91 I
10,929.0000	INSURANCE AUSTRALIA GROUP LTD	40,290.68	5.2005	56,837.35	16,546.67 10,621.77- C 27,168.44 I
7,952.0000	TPG TELECOM LTD	43,115.40	4.3721	34,767.62	8,347.78- 793.22 C 9,141.00- I
9,227.0000	GPT GROUP/THE	24,866.84	3.6741	33,901.56	9,034.72 6,797.54- C 15,832.26 I
4,895.0000	LENDLEASE GROUP	40,969.55	12.7713	62,515.92	21,546.37 2,806.37- C 24,352.74 I
6,688.0000	SUNCORP GROUP LTD	54,644.97	11.3676	76,027.05	21,382.08 14,152.13- C 35,534.21 I
13,348.0000	NATIONAL AUSTRALIA BANK LTD	324,060.56	22.6970	302,959.68	21,100.88- 35,917.86- C 14,816.98 I



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5,443.0000	NEWCREST MINING LTD	55,168.96	15.4637	84,169.07	29,000.11 868.70 C 28,131.41 I
15,811.0000	OIL SEARCH LTD	81,687.13	5.2312	82,711.78	1,024.65 3,554.58 C 2,529.93- I
24,670.0000	INCITEC PIVOT LTD	65,747.75	2.6156	64,527.85	1,219.90- 1,219.77 C 2,439.67- I
7,122.0000	QANTAS AIRWAYS LTD	19,845.44	4.3875	31,247.96	11,402.52 6,265.48- C 17,668.00 I
5,861.0000	QBE INSURANCE GROUP LTD	49,293.89	9.0588	53,093.98	3,800.09 2,007.33- C 5,807.42 I
4,753.0000	CHALLENGER LTD/AUSTRALIA	30,233.99	10.2324	48,634.82	18,400.83 1,990.92 C 16,409.91 I
13,593.0000	SANTOS LTD	41,297.14	2.3241	31,592.33	9,704.81- 325.38 C 10,030.19- I
1,834.0000	SONIC HEALTHCARE LTD	24,331.44	18.5779	34,071.96	9,740.52 6,831.73- C 16,572.25 I
19,184.0000	STOCKLAND	62,853.64	3.3596	64,452.08	1,598.44 6,001.08- C 7,599.52 I



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8,592.0000	WESFARMERS LTD	261,042.76	30.7740	264,410.60	3,367.84 29,563.43- C 32,931.27 I
12,620.0000	ALUMINA LTD	20,521.55	1.4727	18,585.93	1,935.62- 3,726.64- C 1,791.02 I
1,712.0000	WOODSIDE PETROLEUM LTD	41,037.93	22.9117	39,224.97	1,812.96- 403.99 C 2,216.95- I
3,608.0000	WOOLWORTHS LTD	82,931.76	19.5904	70,682.37	12,249.39- 4,270.77- C 7,978.62- I
7,651.0000	AUCKLAND INTERNATIONAL AIRPORT	21,039.75	5.2205	39,942.70	18,902.95 3,133.99- C 22,036.94 I
4,988.0000	FLETCHER BUILDING LTD	29,421.68	5.8502	29,181.19	240.49- 1,008.32 C 1,248.81- I
13,044.0000	SPARK NEW ZEALAND LTD	15,274.71	2.7677	36,102.09	20,827.38 1,247.43 C 19,579.95 I
1,617.0000	RAIFFEISEN BANK INTERNATIONAL	31,391.73	25.2061	40,758.35	9,366.62 2,732.00 C 6,634.62 I
746.0000	OMV AG	28,806.57	51.8208	38,658.38	9,851.81 7,226.32- C 17,078.13 I



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1,254.0000	VOESTALPINE AG	43,652.24	46.5344	58,354.19	14,701.95 9,488.69- C 24,190.64 I
1,365.0000	ERSTE GROUP BANK AG	39,598.69	38.2369	52,193.43	12,594.74 2,302.98- C 14,897.72 I
4,849.0000	ANHEUSER-BUSCH INBEV SA/NV	282,423.60	110.3025	534,857.26	252,433.66 86,557.49- C 338,991.15 I
809.0000	TELENET GROUP HOLDING NV	43,365.63	62.9013	50,887.18	7,521.55 10,556.23- C 18,077.78 I
1,378.0000	PROXIMUS SADP	39,280.61	34.9350	48,140.49	8,859.88 3,226.81 C 5,633.07 I
1,518.0000	AGEAS	54,255.95	40.2157	61,047.57	6,791.62 5,951.39- C 12,743.01 I
579.0000	UMICORE SA	21,060.05	69.4594	40,217.05	19,157.00 7,517.68- C 26,674.68 I
1,756.0000	KBC GROUP NV	94,569.83	75.7439	133,006.33	38,436.50 17,341.23- C 55,777.73 I
892.0000	SOLVAY SA	99,511.16	134.0146	119,541.05	20,029.89 1,851.67- C 21,881.56 I



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502.0000	UCB SA	21,798.31	68.6953	34,485.05	12,686.74 6,446.20- C 19,132.94 I
441.0000	COLRUYT SA	19,851.03	52.6078	23,200.08	3,349.05 1,702.55- C 5,051.60 I
2,969.0000	VONOVIA SE	100,691.38	39.6512	117,724.48	17,033.10 2,339.42- C 19,372.52 I
1,274.0000	PROSIEBENSAT.1 MEDIA SE	58,833.45	41.7897	53,240.14	5,593.31- 4,883.00- C 710.31- I
1,034.0000	ZALANDO SE	33,928.83	45.6334	47,184.94	13,256.11 479.90 C 12,776.21 I
518.0000	COVESTRO AG	38,920.13	72.0941	37,344.78	1,575.35- 1,959.66 C 3,535.01- I
1,107.0000	QIAGEN NV	26,788.50	33.2185	36,772.91	9,984.41 6,873.87- C 16,858.28 I
2,062.0000	DEUTSCHE WOHNEN AG	40,751.08	38.1970	78,762.25	38,011.17 16,338.74- C 54,349.91 I
799.0000	LANXESS AG	59,725.81	75.6070	60,410.04	684.23 10,844.48- C 11,528.71 I



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598.0000	SYMRISE AG	37,456.45	70.7369	42,300.67	4,844.22 604.93 C 4,239.29 I
1,036.0000	BRENNTAG AG	41,028.96	57.8030	59,883.98	18,855.02 2,612.03- C 21,467.05 I
1,021.0000	K+S AG	28,310.75	25.5711	26,108.12	2,202.63- 2,328.00- C 125.37 I
12,878.0000	TELEFONICA DEUTSCHLAND HOLDING	58,060.62	4.9876	64,230.63	6,170.01 3,442.93 C 2,727.08 I
8,676.0000	COMMERZBANK AG	71,543.13	11.8959	103,209.15	31,666.02 1,378.19 C 30,287.83 I
1,324.0000	OSRAM LICHT AG	47,456.66	79.5533	105,328.65	57,871.99 11,845.08- C 69,717.07 I
1,476.0000	ADIDAS AG	88,150.45	191.3272	282,399.04	194,248.59 32,236.88- C 226,485.47 I
2,628.0000	FRESENIUS SE & CO KGAA	89,569.77	85.6096	224,982.25	135,412.48 20,272.18- C 155,684.66 I
1,307.0000	UNITED INTERNET AG	20,278.07	54.9117	71,769.70	51,491.63 13,415.74- C 64,907.37 I



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402.0000	HANNOVER RUECK SE	20,341.76	119.7007	48,119.69	27,777.93 8,994.89- C 36,772.82 I
1,440.0000	GEA GROUP AG	42,360.16	40.8659	58,846.91	16,486.75 4,188.49- C 20,675.24 I
572.0000	CONTINENTAL AG	58,728.03	215.5069	123,269.96	64,541.93 17,647.25- C 82,189.18 I
6,103.0000	DEUTSCHE POST AG	131,292.81	37.4328	228,452.69	97,159.88 20,766.05- C 117,925.93 I
876.0000	MERCK KGAA	46,659.71	120.6131	105,657.13	58,997.42 9,033.19- C 68,030.61 I
2,231.0000	RWE AG	29,562.09	19.8968	44,389.98	14,827.89 2,329.36 C 12,498.53 I
6,531.0000	SAP SE	360,042.82	104.3032	681,204.84	321,162.02 72,211.21- C 393,373.23 I
8,641.0000	E.ON SE	66,363.32	9.4072	81,288.10	14,924.78 4,265.55 C 10,659.23 I
646.0000	HENKEL AG & CO KGAA	30,417.97	120.7842	78,026.62	47,608.65 14,585.29- C 62,193.94 I



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1,202.0000	METRO AG	34,883.29	33.7089	40,518.16	5,634.87 3,612.91- C 9,247.78 I
4,540.0000	BAYER AG	335,925.96	129.1102	586,160.58	250,234.62 111,580.62- C 361,815.24 I
5,984.0000	BASF SE	406,775.65	92.4872	553,443.40	146,667.75 68,218.85- C 214,886.60 I
439.0000	BEIERSDORF AG	26,432.66	104.9762	46,084.56	19,651.90 8,614.47- C 28,266.37 I
239.0000	HOCHTIEF AG	20,642.86	182.9442	43,723.67	23,080.81 8,173.15- C 31,253.96 I
995.0000	HEIDELBERGCEMENT AG	60,097.59	96.5475	96,064.82	35,967.23 10,353.21- C 46,320.44 I
1,402.0000	FRESENIUS MEDICAL CARE AG & CO	84,184.93	96.0000	134,592.13	50,407.20 26,202.50- C 76,609.70 I
3,202.0000	ALLIANZ SE	437,709.64	196.6308	629,611.89	191,902.25 77,731.83- C 269,634.08 I
1,196.0000	DEUTSCHE LUFTHANSA AG	20,491.66	22.7254	27,179.65	6,687.99 5,080.62- C 11,768.61 I



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1,224.0000	MUENCHENER RUECKVERSICHERUNGS-	206,933.86	201.3641	246,469.66	39,535.80 33,116.66- C 72,652.46 I
460.0000	VOLKSWAGEN AG	56,612.24	154.8296	71,221.64	14,609.40 824.13- C 15,433.53 I
5,468.0000	DAIMLER AG	287,308.70	72.2766	395,208.74	107,900.04 53,260.26- C 161,160.30 I
395.0000	MAN SE	33,357.16	107.0634	42,290.05	8,932.89 7,905.15- C 16,838.04 I
1,154.0000	THYSSENKRUPP AG	28,785.87	28.3711	32,740.34	3,954.47 2,919.39- C 6,873.86 I
5,178.0000	SIEMENS AG	509,237.54	137.2651	710,759.17	201,521.63 94,272.26- C 295,793.89 I
1,151.0000	LINDE AG	151,260.43	189.1031	217,657.77	66,397.34 26,737.24- C 93,134.58 I
8,027.0000	DEUTSCHE BANK AG	170,915.06	17.7070	142,134.41	28,780.65- 5,015.56 C 33,796.21- I
2,308.0000	BAYERISCHE MOTOREN WERKE AG	139,538.27	92.7039	213,960.61	74,422.34 14,745.12- C 89,167.46 I



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15,974.0000	DEUTSCHE TELEKOM AG	221,304.64	17.9294	286,404.97	65,100.33 54,367.30- C 119,467.63 I
7,670.0000	INFINEON TECHNOLOGIES AG	63,209.52	21.0830	161,707.12	98,497.60 15,090.94- C 113,588.54 I
673.0000	DEUTSCHE BOERSE AG	56,866.89	105.4096	70,940.68	14,073.79 1,326.20 C 12,747.59 I
378.0000	FRAPORT AG FRANKFURT AIRPORT S	20,141.04	88.1645	33,326.19	13,185.15 6,229.58- C 19,414.73 I
4,865.0000	RED ELECTRICA CORP SA	80,083.78	20.8663	101,514.86	21,431.08 1,454.64- C 22,885.72 I
1,165.0000	ACS ACTIVIDADES DE CONSTRUCCIO	962.49	0.7983	930.12	32.37- 9.71 C 42.08- I
7,136.0000	INDUSTRIA DE DISENO TEXTIL SA	123,083.19	38.3338	273,550.61	150,467.42 34,829.74- C 185,297.16 I
428.0000	AENA SA	36,615.36	194.8629	83,401.35	46,785.99 5,857.23 C 40,928.76 I
3,878.0000	GRIFOLS SA	40,158.90	27.8123	107,856.14	67,697.24 3,314.39- C 71,011.63 I



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1,165.0000	ACS ACTIVIDADES DE CONSTRUCCIO	38,356.06	38.5791	44,944.66	6,588.60 4,007.61- C 10,596.21 I
5,264.0000	FERROVIAL SA	78,034.51	22.1665	116,684.93	38,650.42 905.15 C 37,745.27 I
13,417.0000	BANCO DE SABADELL SA	26,348.62	2.0290	27,223.61	874.99 3,672.21- C 4,547.20 I
8,703.0000	CAIXABANK SA	38,897.53	4.7674	41,491.54	2,594.01 156.44- C 2,750.45 I
27,037.0000	IBERDROLA SA	176,206.10	7.9074	213,793.27	37,587.17 2,549.67- C 40,136.84 I
3,878.0000	AMADEUS IT GROUP SA	136,775.09	59.7077	231,546.82	94,771.73 17,103.57- C 111,875.30 I
10,470.0000	INTERNATIONAL CONSOLIDATED AIR	58,061.17	7.9256	82,981.89	24,920.72 5,805.70- C 30,726.42 I
10,771.0000	DISTRIBUIDORA INTERNACIONAL DE	52,095.27	6.2171	66,964.79	14,869.52 4,488.59 C 10,380.93 I
6,893.0000	ABERTIS INFRAESTRUCTURAS SA	101,358.77	18.4997	127,518.58	26,159.81 1,950.71 C 24,209.10 I



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3,813.0000	ENDESA SA	76,275.13	23.0048	87,717.66	11,442.53 6,031.56 C 5,410.97 I
9,611.0000	BANKINTER SA	64,061.62	9.1985	88,407.13	24,345.51 641.25- C 24,986.76 I
34,247.0000	BANCO BILBAO VIZCAYA ARGENTARI	258,678.98	8.2860	283,773.93	25,094.95 6,163.33 C 18,931.62 I
4,301.0000	GAS NATURAL SDG SA	78,860.49	23.3698	100,513.81	21,653.32 864.23- C 22,517.55 I
5,146.0000	REPSOL SA	70,402.91	15.2833	78,648.22	8,245.31 3,422.03 C 4,823.28 I
77,572.0000	BANCO SANTANDER SA	472,669.96	6.6060	512,445.72	39,775.76 4,939.77 C 34,835.99 I
19,883.0000	TELEFONICA SA	195,583.88	10.3082	204,959.74	9,375.86 9,676.38 C 300.52- I
2,850.0000	ENAGAS SA	71,345.68	28.0005	79,801.43	8,455.75 244.52 C 8,211.23 I
1,683.0000	VALEO SA	70,951.59	67.2810	113,234.00	42,282.41 10,229.01- C 52,511.42 I



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7,671.0000	ENGIE SA	96,752.88	15.0723	115,620.14	18,867.26 5,745.08 C 13,122.18 I
639.0000	ARKEMA SA	48,272.48	106.5615	68,092.85	19,820.37 10,338.85- C 30,159.22 I
2,285.0000	SES SA	55,425.87	23.4097	53,491.37	1,934.50- 5,039.98- C 3,105.48 I
317.0000	GEMALTO NV	20,537.17	59.9359	18,999.68	1,537.49- 404.80 C 1,942.29- I
1,809.0000	SAFRAN SA	85,804.05	91.5177	165,555.58	79,751.53 17,944.01- C 97,695.54 I
12,218.0000	NATIXIS SA	66,857.66	6.7030	81,897.41	15,039.75 1,568.93- C 16,608.68 I
824.0000	SCOR SE	21,137.94	39.5884	32,620.92	11,482.98 6,097.74- C 17,580.72 I
3,191.0000	REXEL SA	49,245.57	16.3383	52,135.77	2,890.20 2,977.82 C 87.62- I
3,505.0000	VINCI SA	210,615.68	85.2333	298,742.72	88,127.04 40,892.95- C 129,019.99 I



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2,304.0000	AIR LIQUIDE SA	226,988.71	123.4075	284,330.90	57,342.19 38,694.75- C 96,036.94 I
3,898.0000	DANONE SA	244,019.05	75.0595	292,582.30	48,563.25 33,916.98- C 82,480.23 I
1,824.0000	LEGRAND SA	77,747.96	69.8586	127,422.25	49,674.29 12,744.73- C 62,419.02 I
436.0000	IEFFAGE SA	31,555.28	90.7421	39,563.58	8,008.30 237.61 C 7,770.69 I
14,466.0000	TOTAL SA	792,030.62	49.3687	714,167.71	77,862.91- 71,057.01- C 6,805.90- I
249.0000	AEROPORTS DE PARIS	20,801.73	161.1597	40,128.77	19,327.04 7,501.18- C 26,828.22 I
1,524.0000	BUREAU VERITAS SA	20,716.30	22.0981	33,677.59	12,961.29 6,295.26- C 19,256.55 I
2,370.0000	GROUPE EUROTUNNEL SE	24,524.33	10.6504	25,241.58	717.25 4,718.34- C 5,435.59 I
1,264.0000	SUEZ	23,338.77	18.4940	23,376.44	37.67 16.32- C 53.99 I



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729.0000	EDENRED	14,565.66	26.0387	18,982.25	4,416.59 3,548.31- C 7,964.90 I
808.0000	BOUYGUES SA	29,490.59	42.1091	34,024.16	4,533.57 1,785.42 C 2,748.15 I
4,222.0000	AIRBUS SE	168,783.41	82.1196	346,708.95	177,925.54 38,662.81- C 216,588.35 I
2,184.0000	VEOLIA ENVIRONNEMENT SA	37,343.63	21.1001	46,082.78	8,739.15 4,109.10- C 12,848.25 I
1,191.0000	L'OREAL SA	127,388.28	208.0363	247,771.26	120,382.98 46,315.22- C 166,698.20 I
1,967.0000	LVMH MOET HENNESSY LOUIS VUITT	277,748.75	248.9820	489,747.72	211,998.97 62,784.02- C 274,782.99 I
791.0000	THALES SA	40,323.43	107.4854	85,020.98	44,697.55 6,213.78- C 50,911.33 I
1,534.0000	CAPGEMINI SE	99,143.08	103.1969	158,304.14	59,161.06 5,928.14- C 65,089.20 I
1,298.0000	PUBLICIS GROUPE SA	80,106.45	74.4893	96,687.14	16,580.69 12,891.08- C 29,471.77 I



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740.0000	LAGARDERE SCA	19,995.77	31.5362	23,336.79	3,341.02 3,145.88- C 6,486.90 I
8,140.0000	BOLLORE SA	29,742.64	4.5405	36,959.91	7,217.27 688.62 C 6,528.65 I
1,286.0000	CIE GENERALE DES ETABLISSEMENT	109,976.94	132.7600	170,729.39	60,752.45 23,690.75- C 84,443.20 I
1,227.0000	PERNOD RICARD SA	109,818.76	133.7294	164,086.08	54,267.32 21,838.82- C 76,106.14 I
1,760.0000	RENAULT SA	114,407.62	90.3885	159,083.91	44,676.29 5,716.90- C 50,393.19 I
209.0000	REMY COINTREAU SA	20,128.29	116.6212	24,373.84	4,245.55 2,262.04- C 6,507.59 I
3,519.0000	SCHNEIDER ELECTRIC SE	204,298.62	76.7247	269,994.57	65,695.95 34,763.68- C 100,459.63 I
3,151.0000	VIVENDI SA	77,891.77	22.2293	70,044.59	7,847.18- 3,450.95- C 4,396.23 I
11,500.0000	ORANGE SA	180,459.31	15.8422	182,185.75	1,726.44 2,001.51 C 275.07- I



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202.0000	HERMES INTERNATIONAL	59,762.21	493.4589	99,678.71	39,916.50 5,645.00- C 45,561.50 I
684.0000	DASSAULT SYSTEMES SE	20,640.82	89.5217	61,232.89	40,592.07 11,446.12- C 52,038.19 I
528.0000	KERING	81,988.54	340.1120	179,579.14	97,590.60 19,205.50- C 116,796.10 I
1,212.0000	CARREFOUR SA	29,777.57	25.2631	30,618.98	841.41 1,606.72 C 765.31- I
745.0000	ATOS SE	51,206.59	140.1735	104,429.33	53,222.74 19,374.31- C 72,597.05 I
6,939.0000	SANOFI	530,360.61	95.5324	662,899.80	132,539.19 95,962.23- C 228,501.42 I
729.0000	ACCOR SA	27,338.63	46.8138	34,127.32	6,788.69 6,379.33- C 13,168.02 I
10,953.0000	NOKIA OYJ	79,218.78	6.1213	67,046.95	12,171.83- 2,627.68 C 14,799.51- I
6,891.0000	STMICROELECTRONICS NV	54,202.77	14.3367	98,794.29	44,591.52 16,541.40- C 61,132.92 I



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6,223.0000	SOCIETE GENERALE SA	347,198.29	53.7313	334,369.95	12,828.34- 40,189.11- C 27,360.77 I
922.0000	EURAZEO SA	49,964.73	74.9227	69,078.76	19,114.03 1,783.30- C 20,897.33 I
717.0000	SODEXO SA	49,175.35	129.1102	92,572.06	43,396.71 8,304.65- C 51,701.36 I
799.0000	UNIBAIL-RODAMCO SE	158,704.73	251.6623	201,078.22	42,373.49 9,855.87- C 52,229.36 I
14,786.0000	AXA SA	346,824.93	27.3161	403,896.93	57,072.00 39,390.36- C 96,462.36 I
2,050.0000	PEUGEOT SA	30,597.05	19.9197	40,835.40	10,238.35 7,844.49- C 18,082.84 I
724.0000	JCDECAUX SA	20,563.28	32.7565	23,715.78	3,152.50 4,433.11- C 7,585.61 I
1,436.0000	ESSILOR INTERNATIONAL SA	115,134.40	127.0572	182,454.24	67,319.84 16,504.93- C 83,824.77 I
7,269.0000	CREDIT AGRICOLE SA	85,240.57	16.0646	116,773.92	31,533.35 4,770.67 C 26,762.68 I



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1,375.0000	ZODIAC AEROSPACE	25,719.85	27.0880	37,246.09	11,526.24 3,456.66- C 14,982.90 I
5,768.0000	BNP PARIBAS SA	391,940.50	71.9230	414,852.34	22,911.84 40,306.53- C 63,218.37 I
2,629.0000	CIE DE SAINT-GOBAIN	124,623.62	53.3549	140,270.11	15,646.49 17,836.53- C 33,483.02 I
266.0000	WENDEL SA	29,973.32	147.8152	39,318.86	9,345.54 222.35 C 9,123.19 I
1,165.0000	KLEPIERRE	48,917.72	40.9286	47,681.87	1,235.85- 4,524.06- C 3,288.21 I
197.0000	GEICINA SA	20,883.18	156.6545	30,860.94	9,977.76 5,185.66- C 15,163.42 I
507.0000	FONCIERE DES REGIONS	44,037.24	92.6354	46,966.18	2,928.94 2,723.13 C 205.81 I
173.0000	ILIAD SA	31,243.44	236.2079	40,863.97	9,620.53 5,856.12- C 15,476.65 I
247.0000	BANCA MONTE DEI PASCHI DI SIEN	44,030.66	0.0000	0.00	44,030.66-I



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5,222.0000	CNH INDUSTRIAL NV	40,404.34	11.3085	59,053.27	18,648.93 222.64- C 18,871.57 I
593.0000	FERRARI NV	27,381.77	85.7123	50,827.41	23,445.64 1,450.78 C 21,994.86 I
10,229.0000	FIAT CHRYSLER AUTOMOBILES NV	89,724.68	10.5272	107,683.51	17,958.83 5,261.09 C 12,697.74 I
12,682.0000	UNICREDIT SPA	204,941.37	18.6479	236,493.84	31,552.47 10,754.03 C 20,798.44 I
726.0000	EXOR NV	29,414.19	54.0506	39,240.78	9,826.59 8,188.43- C 18,015.02 I
2,012.0000	LEONARDO SPA	27,251.07	16.5950	33,389.15	6,138.08 6,241.34- C 12,379.42 I
10,704.0000	TERNA RETE ELETTRICA NAZIONALE	48,680.20	5.3902	57,697.12	9,016.92 5,132.25- C 14,149.17 I
1,022.0000	PRYSMIAN SPA	20,694.15	29.3691	30,015.28	9,321.13 5,610.68- C 14,931.81 I
3,267.0000	ASSICURAZIONI GENERALI SPA	52,797.19	16.4353	53,694.21	897.02 2,654.29 C 1,757.27- I



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72,334.0000	INTESA SANPAOLO SPA	195,075.67	3.1661	229,021.50	33,945.83 6,087.17- C 40,033.00 I
20,219.0000	INTESA SANPAOLO SPA	48,105.86	2.9608	59,865.78	11,759.92 3,378.68 C 8,381.24 I
6,153.0000	MEDIOBANCA SPA	56,038.85	9.8543	60,633.83	4,594.98 7,997.75- C 12,592.73 I
1,260.0000	LUXOTTICA GROUP SPA	50,396.99	57.7688	72,788.76	22,391.77 4,626.70- C 27,018.47 I
62,803.0000	ENEL SPA	314,425.77	5.3537	336,231.04	21,805.27 30,819.43- C 52,624.70 I
10,195.0000	ENI SPA	211,463.35	15.0096	153,023.26	58,440.09- 17,205.46- C 41,234.63- I
18,260.0000	SNAM SPA	97,885.76	4.3523	79,473.71	18,412.05- 9,774.23- C 8,637.82- I
5,926.0000	TENARIS SA	112,096.85	15.5685	92,258.98	19,837.87- 4,939.35- C 14,898.52- I
35,031.0000	TELECOM ITALIA SPA/MILANO	30,142.26	0.9215	32,283.32	2,141.06 1,694.05 C 447.01 I



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2,674.0000	ATLANTIA SPA	60,462.36	28.1031	75,147.83	14,685.47 14,826.34- C 29,511.81 I
9,870.0000	KONINKLIJKE AHOLD DELHAIZE NV	170,749.86	19.0928	188,446.01	17,696.15 22,574.54- C 40,270.69 I
3,522.0000	NN GROUP NV	113,060.33	35.4939	125,009.57	11,949.24 3,561.88 C 8,387.36 I
5,697.0000	ARCELORMITTAL	117,219.17	22.6513	129,044.59	11,825.42 3,464.26 C 8,361.16 I
1,586.0000	ABN AMRO GROUP NV	31,458.01	26.4721	41,984.85	10,526.84 252.15 C 10,274.69 I
417.0000	ALTICE NV	7,451.91	23.0448	9,609.69	2,157.78 1,846.02- C 4,003.80 I
2,106.0000	ALTICE NV	39,078.14	23.0391	48,520.37	9,442.23 4,073.59- C 13,515.82 I
28,849.0000	ING GROEP NV	322,919.74	17.2223	496,846.28	173,926.54 57,947.02- C 231,873.56 I
552.0000	HEINEKEN HOLDING NV	27,254.91	91.5291	50,524.08	23,269.17 6,322.32- C 29,591.49 I



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1,330.0000	KONINKLIJKE DSM NV	65,384.84	72.5846	96,537.52	31,152.68 9,107.20- C 40,259.88 I
10,117.0000	UNILEVER NV	334,210.93	55.1113	557,561.79	223,350.86 88,334.88- C 311,685.74 I
33.0000	GEMALTO NV	2,062.53	59.9359	1,977.88	84.65- 183.56- C 98.91 I
2,392.0000	ASML HOLDING NV	121,815.61	130.1367	311,287.12	189,471.51 43,291.14- C 232,762.65 I
5,536.0000	RELX NV	44,121.76	20.5299	113,653.53	69,531.77 21,238.04- C 90,769.81 I
506.0000	RANDSTAD HOLDING NV	24,857.29	58.3049	29,502.29	4,645.00 5,514.79- C 10,159.79 I
1,567.0000	AKZO NOBEL NV	97,071.42	86.7844	135,991.23	38,919.81 16,305.09- C 55,224.90 I
2,380.0000	WOLTERS KLUWER NV	60,143.75	42.2744	100,613.28	40,469.53 8,397.38- C 48,866.91 I
957.0000	KONINKLIJKE VOPAK NV	50,023.31	46.3063	44,315.16	5,708.15- 881.60- C 4,826.55- I



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10,494.0000	AEGON NV	58,832.23	5.0993	53,513.09	5,319.14- 2,879.03 C 8,198.17- I
25,877.0000	KONINKLIJKE KPN NV	76,900.16	3.1946	82,668.75	5,768.59 3,535.00 C 2,233.59 I
3,763.0000	KONINKLIJKE PHILIPS NV	115,442.35	35.4654	133,456.31	18,013.96 19,270.32- C 37,284.28 I
1,218.0000	HEINEKEN NV	62,647.05	97.0950	118,261.74	55,614.69 22,106.34- C 77,721.03 I
2,333.0000	GALP ENERGIA SGPS SA	22,925.91	15.1179	35,270.28	12,344.37 751.46 C 11,592.91 I
997.0000	JERONIMO MARTINS SGPS SA	10,177.69	19.4920	19,433.52	9,255.83 3,632.68- C 12,888.51 I
5,152.0000	BANCO ESPIRITO SANTO SA	13,545.89	0.0000	0.00	13,545.89-I
15,796.0000	EDP - ENERGIAS DE PORTUGAL SA	48,348.68	3.2653	51,580.18	3,231.50 3,457.37 C 225.87- I
3,429.0000	CIE FINANCIERE RICHEMONT SA	169,817.18	82.4936	282,870.57	113,053.39 14,017.03 C 99,036.36 I



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701.0000	IDORSIA LTD	5,621.64	18.9004	13,249.20	7,627.56 119.95 C 7,507.61 I
26,592.0000	UBS GROUP AG	453,946.60	16.9581	450,951.89	2,994.71- 27,858.28 C 30,852.99- I
480.0000	VIFOR PHARMA AG	58,595.39	110.3743	52,979.69	5,615.70- 1,155.18 C 6,770.88- I
523.0000	PARGESA HOLDING SA	34,277.03	76.1760	39,840.08	5,563.05 2,115.41 C 3,447.64 I
254.0000	DUFY AG	36,213.98	164.0474	41,668.04	5,454.06 493.09- C 5,947.15 I
273.0000	SWISS PRIME SITE AG	19,979.10	90.9518	24,829.84	4,850.74 236.88- C 5,087.62 I
260.0000	GEBERIT AG	55,746.66	466.9764	121,413.88	65,667.22 7,566.39 C 58,100.83 I
230.0000	SCHINDLER HOLDING AG	20,772.67	211.8728	48,730.75	27,958.08 4,152.25 C 23,805.83 I
88.0000	PARTNERS GROUP HOLDING AG	22,346.93	620.7904	54,629.56	32,282.63 503.76- C 32,786.39 I



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425.0000	KUEHNE + NAGEL INTERNATIONAL A	49,405.66	167.0756	71,007.15	21,601.49 3,433.44 C 18,168.05 I
636.0000	ARYZTA AG	27,407.08	32.9243	20,939.88	6,467.20- 1,649.10 C 8,116.30- I
1,501.0000	JULIUS BAER GROUP LTD	59,575.02	52.6810	79,074.24	19,499.22 4,958.73 C 14,540.49 I
2,623.0000	SWISS RE AG	144,734.03	91.5261	240,073.04	95,339.01 8,545.80 C 86,793.21 I
17.0000	SIKA AG	42,699.35	6,432.4126	109,351.02	66,651.67 1,510.34 C 65,141.33 I
40.0000	SGS SA	60,493.76	2,424.6854	96,987.42	36,493.66 6,174.80 C 30,318.86 I
178.0000	SWISSCOM AG	70,418.73	483.1619	86,002.82	15,584.09 6,267.38 C 9,316.71 I
6.0000	CHOCOLADEFABRIKEN LINDT & SPRU	31,373.06	5,805.8789	34,835.27	3,462.21 2,024.57- C 5,486.78 I
1.0000	CHOCOLADEFABRIKEN LINDT & SPRU	27,285.93	69,806.2966	69,806.30	42,520.37 5,948.07 C 36,572.30 I



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68.0000	GIVAUDAN SA	84,927.24	2,002.8194	136,191.72	51,264.48 3,209.76 C 48,054.72 I
897.0000	ZURICH INSURANCE GROUP AG	220,902.52	291.4425	261,424.01	40,521.49 19,270.04 C 21,251.45 I
12,809.0000	NOVARTIS AG	730,803.62	83.3289	1,067,360.94	336,557.32 47,688.48 C 288,868.84 I
8,919.0000	ABB LTD	183,134.83	24.7271	220,541.87	37,407.04 11,711.13 C 25,695.91 I
4,012.0000	ROCHE HOLDING AG	707,434.30	254.9992	1,023,056.86	315,622.56 74,977.24 C 240,645.32 I
1,187.0000	ADECCO GROUP AG	74,225.88	76.1238	90,359.00	16,133.12 2,459.14 C 13,673.98 I
1,676.0000	LAFARGEHOLCIM LTD	88,470.71	57.3278	96,081.45	7,610.74 3,679.86 C 3,930.88 I
20,167.0000	NESTLE SA	1,125,384.45	87.1403	1,757,360.36	631,975.91 105,382.66 C 526,593.25 I
425.0000	BALOISE HOLDING AG	42,690.13	154.7538	65,770.38	23,080.25 3,641.13 C 19,439.12 I



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388.0000	SONOVA HOLDING AG	49,090.07	162.5854	63,083.17	13,993.10 3,719.88 C 10,273.22 I
8,587.0000	CREDIT SUISSE GROUP AG	137,462.66	14.4729	124,279.04	13,183.62- 2,226.37 C 15,409.99- I
228.0000	SWATCH GROUP AG/THE	80,006.14	369.7593	84,305.12	4,298.98 3,563.09 C 735.89 I
400.0000	LONZA GROUP AG	40,262.65	216.4673	86,586.96	46,324.31 4,681.90 C 41,642.41 I
252.0000	SWISS LIFE HOLDING AG	41,974.42	337.9105	85,153.45	43,179.03 4,495.51 C 38,683.52 I
22,520.0000	NATIONAL GRID PLC	249,721.62	12.3634	278,423.91	28,702.29 35,639.53- C 64,341.82 I
4,912.0000	MERLIN ENTERTAINMENTS PLC	30,200.16	6.2414	30,658.03	457.87 5,168.87- C 5,626.74 I
11,273.0000	COMPASS GROUP PLC	126,630.09	21.0429	237,217.63	110,587.54 41,013.73- C 151,601.27 I
1,350.0000	INTERCONTINENTAL HOTELS GROUP	41,079.10	55.4261	74,825.37	33,746.27 12,819.06- C 46,565.33 I



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1,561.0000	WOLSELEY PLC	49,693.77	61.2195	95,563.66	45,869.89 16,638.09- C 62,507.98 I
1,348.0000	IMI PLC	21,021.35	15.5224	20,924.27	97.08- 3,978.82- C 3,881.74 I
134,469.0000	VODAFONE GROUP PLC	442,672.10	2.8284	380,340.68	62,331.42- 40,571.19- C 21,760.23- I
9,098.0000	STANDARD LIFE PLC	34,688.68	5.1841	47,165.03	12,476.35 8,325.89- C 20,802.24 I
9,514.0000	AUTO TRADER GROUP PLC	48,075.86	4.9360	46,961.20	1,114.66- 1,104.48 C 2,219.14- I
7.0000	LONMIN PLC	181.85	0.8540	5.98	175.87- 1.27- C 174.60- I
12,602.0000	WORLDPAY GROUP PLC	44,631.81	4.0890	51,530.78	6,898.97 2,963.43 C 3,935.54 I
1,110.0000	CRODA INTERNATIONAL PLC	43,316.83	50.4642	56,015.27	12,698.44 10,014.09- C 22,712.53 I
7,697.0000	DIRECT LINE INSURANCE GROUP PL	30,468.89	4.6164	35,532.96	5,064.07 8,593.63- C 13,657.70 I



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1,479.0000	JOHNSON MATTHEY PLC	49,746.14	37.2928	55,156.13	5,409.99 9,499.85- C 14,909.84 I
2,147.0000	LONDON STOCK EXCHANGE GROUP PL	52,721.34	47.3597	101,681.31	48,959.97 17,926.85- C 66,886.82 I
885.0000	RANDGOLD RESOURCES LTD	63,536.95	88.3935	78,228.29	14,691.34 14,703.24- C 29,394.58 I
12,404.0000	G4S PLC	51,306.55	4.2397	52,590.15	1,283.60 11,287.34- C 12,570.94 I
8,446.0000	J SAINSBURY PLC	29,897.66	3.2694	27,613.83	2,283.83- 4,620.59- C 2,336.76 I
1,006.0000	ADMIRAL GROUP PLC	20,592.59	26.0179	26,174.08	5,581.49 4,620.44- C 10,201.93 I
723.0000	BERKELEY GROUP HOLDINGS PLC	34,187.98	41.9171	30,306.08	3,881.90- 3,980.30- C 98.40 I
30,505.0000	ROYAL DUTCH SHELL PLC A SHS	892,312.79	26.4336	806,357.96	85,954.83- 111,010.07- C 25,055.24 I



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26,227.0000	ROYAL DUTCH SHELL PLC B SHS	636,296.14	26.7908	702,643.47	66,347.33 98,146.14- C 164,493.47 I
17,061.0000	CENTRICA PLC	48,410.79	2.6004	44,367.09	4,043.70- 1,395.28 C 5,438.98- I
2,561.0000	BUNZL PLC	40,737.32	29.7199	76,112.86	35,375.54 13,044.18- C 48,419.72 I
6,712.0000	INMARSAT PLC	69,167.94	9.9954	67,089.26	2,078.68- 2,828.53- C 749.85 I
2,414.0000	MONDI PLC	51,268.92	26.1608	63,152.30	11,883.38 11,806.44- C 23,689.82 I
2,156.0000	SEVERN TRENT PLC	52,106.54	28.3430	61,107.70	9,001.16 11,730.04- C 20,731.20 I
899.0000	WHITBREAD PLC	20,681.88	51.5293	46,324.88	25,643.00 8,177.59- C 33,820.59 I
1,665.0000	HARGREAVES LANSDOWN PLC	24,657.67	16.9123	28,159.03	3,501.36 4,994.69- C 8,496.05 I



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3,280.0000	SMITHS GROUP PLC	54,673.30	20.7442	68,041.08	13,367.78 11,743.91- C 25,111.69 I
6,981.0000	ANGLO AMERICAN PLC	98,170.14	13.3012	92,856.01	5,314.13- 15,608.46- C 10,294.33 I
7,641.0000	3I GROUP PLC	41,758.98	11.7230	89,575.63	47,816.65 15,364.41- C 63,181.06 I
9,196.0000	UNILEVER PLC	311,064.43	53.9713	496,320.74	185,256.31 89,392.97- C 274,649.28 I
1,735.0000	TUI AG	20,542.85	14.5352	25,218.66	4,675.81 4,451.79- C 9,127.60 I
9,335.0000	INVESTEC PLC	62,321.87	7.4494	69,540.89	7,219.02 538.12 C 6,680.90 I
6,790.0000	EXPERIAN PLC	81,210.55	20.4584	138,912.96	57,702.41 24,108.69- C 81,811.10 I
7,795.0000	RELX PLC	79,173.23	21.5625	168,080.23	88,907.00 28,995.61- C 117,902.61 I
4,849.0000	SHIRE PLC	174,948.63	55.0495	266,935.03	91,986.40 30,704.70- C 122,691.10 I



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3,373.0000	FRESNILLO PLC	55,408.09	19.3023	65,106.99	9,698.90 2,109.38- C 11,808.28 I
4,069.0000	RECKITT BENCKISER GROUP PLC	242,410.22	101.1102	411,417.68	169,007.46 76,380.11- C 245,387.57 I
7,743.0000	UNITED UTILITIES GROUP PLC	80,087.08	11.2683	87,251.16	7,164.08 4,323.09- C 11,487.17 I
72,451.0000	GLENCORE PLC	287,808.32	3.7305	270,284.57	17,523.75- 54,174.83- C 36,651.08 I
11,281.0000	DIXONS CARPHONE PLC	52,760.43	3.6838	41,557.20	11,203.23- 977.38 C 12,180.61- I
11,421.0000	SEGRO PLC	61,608.72	6.3544	72,574.32	10,965.60 2,361.10- C 13,326.70 I
11,710.0000	ROLLS-ROYCE HOLDINGS PLC	112,244.34	11.5736	135,527.38	23,283.04 23,599.84- C 46,882.88 I
10,313.0000	ROYAL BANK OF SCOTLAND GROUP P	28,937.61	3.2110	33,115.09	4,177.48 1,041.41 C 3,136.07 I
41,132.0000	OLD MUTUAL PLC	94,963.63	2.5121	103,330.55	8,366.92 7,458.48- C 15,825.40 I



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8,782.0000	SAGE GROUP PLC/THE	43,798.19	8.9367	78,482.77	34,684.58 13,487.88- C 48,172.46 I
6,018.0000	MEDICLINIC INTERNATIONAL PLC	57,104.75	9.6317	57,963.66	858.91 1,363.25 C 504.34- I
9,132.0000	WPP PLC	123,356.82	20.9650	191,452.86	68,096.04 35,717.47- C 103,813.51 I
1,734.0000	COCA-COLA HBC AG	41,822.89	29.3302	50,858.72	9,035.83 8,623.94 C 411.89 I
15,878.0000	ABERDEEN ASSET MANAGEMENT PLC	52,152.65	3.9228	62,286.68	10,134.03 945.59 C 9,188.44 I
4,037.0000	ASHTAD GROUP PLC	65,929.49	20.6403	83,324.95	17,395.46 15,909.17- C 33,304.63 I
11,805.0000	BHP BILLITON PLC	212,868.13	15.2756	180,329.07	32,539.06- 2,435.07- C 30,103.99- I
7,181.0000	BARRATT DEVELOPMENTS PLC	42,203.64	7.3195	52,561.93	10,358.29 1,236.20 C 9,122.09 I
4,296.0000	BRITISH LAND CO PLC/THE	32,163.90	7.8651	33,788.65	1,624.75 5,964.62- C 7,589.37 I



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5,666.0000	SKY PLC	53,330.00	12.9115	73,156.92	19,826.92 12,914.19- C 32,741.11 I
20,975.0000	AVIVA PLC	125,265.76	6.8324	143,311.21	18,045.45 14,046.45- C 32,091.90 I
14,408.0000	DIAGEO PLC	267,696.49	29.4666	424,555.94	156,859.45 74,066.89- C 230,926.34 I
1,818.0000	SCHRODERS PLC	53,618.61	40.3194	73,300.68	19,682.07 3,280.07- C 22,962.14 I
22,052.0000	BAE SYSTEMS PLC	131,449.83	8.2288	181,462.56	50,012.73 31,595.02- C 81,607.75 I
12,737.0000	BRITISH AMERICAN TOBACCO PLC	503,781.29	67.9870	865,950.97	362,169.68 155,957.50- C 518,127.18 I
10,133.0000	HAMMERSON PLC	70,311.30	7.4624	75,617.19	5,305.89 3,352.31- C 8,658.20 I
17,020.0000	STANDARD CHARTERED PLC	159,926.07	10.0954	171,824.38	11,898.31 4,789.99- C 16,688.30 I
5,856.0000	IMPERIAL BRANDS PLC	186,122.96	44.7942	262,315.37	76,192.41 48,985.14- C 125,177.55 I



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113,066.0000	HSBC HOLDINGS PLC	1,071,973.23	9.2446	1,045,253.01	26,720.22- 177,711.69- C 150,991.47 I
29,150.0000	LEGAL & GENERAL GROUP PLC	39,755.78	3.3551	97,803.73	58,047.95 17,265.03- C 75,312.98 I
10,757.0000	MEGGITT PLC	65,124.94	6.1946	66,636.30	1,511.36 3,580.41- C 5,091.77 I
10,041.0000	WM MORRISON SUPERMARKETS PLC	29,990.82	3.1330	31,459.13	1,468.31 989.34 C 478.97 I
3,278.0000	ASSOCIATED BRITISH FOODS PLC	78,851.38	38.1371	125,013.65	46,162.27 4,529.64- C 50,691.91 I
3,929.0000	PEARSON PLC	35,549.68	8.9822	35,291.22	258.46- 192.90 C 451.36- I
2,308.0000	PERSIMMON PLC	59,505.38	29.1224	67,214.64	7,709.26 16,660.44- C 24,369.70 I
15,511.0000	PRUDENTIAL PLC	168,873.90	22.8745	354,806.52	185,932.62 41,246.69- C 227,179.31 I
5,996.0000	RIO TINTO PLC	284,048.12	42.1119	252,503.31	31,544.81- 34,243.83- C 2,699.02 I



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8,430.0000	SSE PLC	155,920.35	18.8737	159,105.66	3,185.31 15,322.43- C 18,507.74 I
106,347.0000	BP PLC	826,422.54	5.7517	611,681.43	214,741.11- 91,669.44- C 123,071.67- I
342,650.0000	LLOYDS BANKING GROUP PLC	330,461.25	0.8592	294,423.88	36,037.37- 38,107.19- C 2,069.82 I
33,040.0000	TESCO PLC	96,122.89	2.1926	72,444.42	23,678.47- 7,282.61- C 16,395.86- I
4,247.0000	SMITH & NEPHEW PLC	42,552.13	17.2110	73,095.49	30,543.36 12,903.33- C 43,446.69 I
33,132.0000	GLAXOSMITHKLINE PLC	650,893.54	21.2443	703,867.05	52,973.51 116,507.12- C 169,480.63 I
1,358.0000	WEIR GROUP PLC/THE	31,696.25	22.4848	30,534.39	1,161.86- 718.13 C 1,879.99- I
4,533.0000	BABCOCK INTERNATIONAL GROUP PL	56,060.33	11.4372	51,845.08	4,215.25- 3,487.14- C 728.11- I
8,873.0000	ASTRAZENECA PLC	435,501.00	66.7010	591,838.71	156,337.71 103,014.11- C 259,351.82 I



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7,196.0000	GKN PLC	19,812.66	4.2345	30,472.02	10,659.36 6,446.51- C 17,105.87 I
43,867.0000	BT GROUP PLC	98,306.26	3.8286	167,951.61	69,645.35 20,095.74- C 89,741.09 I
1,233.0000	CARNIVAL PLC	55,656.35	65.9866	81,361.55	25,705.20 14,042.31- C 39,747.51 I
72,489.0000	BARCLAYS PLC	229,718.44	2.6336	190,908.56	38,809.88- 12,648.53- C 26,161.35- I
1,582.0000	INTERTEK GROUP PLC	53,999.85	54.7767	86,656.77	32,656.92 22,799.15- C 55,456.07 I
2,749.0000	BURBERRY GROUP PLC	40,583.00	21.5755	59,311.21	18,728.21 10,494.86- C 29,223.07 I
7,717.0000	LAND SECURITIES GROUP PLC	90,551.62	13.1583	101,543.09	10,991.47 5,484.83- C 16,476.30 I
981.0000	NEXT PLC	32,909.37	50.0875	49,135.85	16,226.48 8,673.82- C 24,900.30 I
11,741.0000	KINGFISHER PLC	39,134.34	3.9059	45,859.68	6,725.34 8,095.48- C 14,820.82 I



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19,948.0000	ITV PLC	50,800.75	2.3562	47,003.38	3,797.37- 10,538.04- C 6,740.67 I
177.0000	PADDY POWER BETFAIR PLC	20,259.38	106.6072	18,869.48	1,389.90- 354.87 C 1,744.77- I
2,731.0000	RYANAIR HOLDINGS PLC	15,228.34	20.4842	55,942.56	40,714.22 10,457.17- C 51,171.39 I
6,118.0000	CRH PLC	153,050.40	35.3285	216,139.98	63,089.58 30,655.37- C 93,744.95 I
1,480.0000	KERRY GROUP PLC	82,522.67	85.9176	127,158.09	44,635.42 3,709.65- C 48,345.07 I
18,576.0000	CHEUNG KONG PROPERTY HOLDINGS	89,245.73	7.8332	145,510.75	56,265.02 808.39- C 57,073.41 I
18,576.0000	CK HUTCHISON HOLDINGS LTD	153,519.32	12.5537	233,197.93	79,678.61 1,295.85- C 80,974.46 I
3,000.0000	CK INFRASTRUCTURE HOLDINGS LTD	20,432.34	8.4033	25,209.92	4,777.58 159.57- C 4,937.15 I
15,000.0000	LINK REIT	60,465.90	7.6090	114,136.39	53,670.49 481.97- C 54,152.46 I



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10,000.0000	TECHTRONIC INDUSTRIES CO LTD	31,371.90	4.5987	45,987.61	14,615.71 334.67- C 14,950.38 I
8,800.0000	WYNN MACAU LTD	19,851.95	2.3365	20,561.46	709.51 73.61- C 783.12 I
22,400.0000	MGM CHINA HOLDINGS LTD	43,813.89	2.2238	49,813.17	5,999.28 302.37- C 6,301.65 I
79,000.0000	AIA GROUP LTD	289,000.28	7.3080	577,336.69	288,336.41 3,190.86- C 291,527.27 I
18,800.0000	SANDS CHINA LTD	39,147.67	4.5795	86,095.47	46,947.80 523.16- C 47,470.96 I
10,250.0000	SWIRE PROPERTIES LTD	26,097.18	3.2985	33,810.18	7,713.00 232.64- C 7,945.64 I
9,000.0000	HANG LUNG PROPERTIES LTD	20,207.22	2.4979	22,481.41	2,274.19 163.61- C 2,437.80 I
7,400.0000	BANK OF EAST ASIA LTD/THE	27,544.66	4.2977	31,803.19	4,258.53 160.51- C 4,419.04 I
14,000.0000	CLP HOLDINGS LTD	106,086.65	10.5809	148,133.91	42,047.26 840.65- C 42,887.91 I



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7,300.0000	HONG KONG EXCHANGES & CLEARING	134,822.13	25.8504	188,708.06	53,885.93 1,036.99- C 54,922.92 I
13,500.0000	MTR CORP LTD	55,240.98	5.6299	76,004.46	20,763.48 464.09- C 21,227.57 I
5,600.0000	HANG SENG BANK LTD	82,409.65	20.9185	117,144.16	34,734.51 671.00- C 35,405.51 I
9,803.0000	HENDERSON LAND DEVELOPMENT CO	43,007.80	5.5787	54,688.19	11,680.39 276.51- C 11,956.90 I
7,000.0000	POWER ASSETS HOLDINGS LTD	41,929.50	8.8324	61,827.08	19,897.58 312.02- C 20,209.60 I
11,000.0000	WHARF HOLDINGS LTD/THE	72,813.14	8.2880	91,168.20	18,355.06 537.64- C 18,892.70 I
43,505.0000	HONG KONG & CHINA GAS CO LTD	52,134.94	1.8804	81,810.99	29,676.05 416.18- C 30,092.23 I
7,000.0000	HYSAN DEVELOPMENT CO LTD	20,761.01	4.7716	33,401.87	12,640.86 168.56- C 12,809.42 I
15,000.0000	GALAXY ENTERTAINMENT GROUP LTD	27,663.21	6.0719	91,078.53	63,415.32 343.71- C 63,759.03 I



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18,500.0000	BOC HONG KONG HOLDINGS LTD	44,646.76	4.7845	88,513.34	43,866.58 446.73- C 44,313.31 I
6,000.0000	YUE YUEN INDUSTRIAL HOLDINGS L	19,389.76	4.1504	24,902.48	5,512.72 125.68- C 5,638.40 I
25,000.0000	NEW WORLD DEVELOPMENT CO LTD	29,107.61	1.2694	31,736.58	2,628.97 192.64- C 2,821.61 I
15,000.0000	SINO LAND CO LTD	22,763.12	1.6396	24,595.05	1,831.93 178.98- C 2,010.91 I
4,000.0000	SUN HUNG KAI PROPERTIES LTD	52,067.99	14.6929	58,771.91	6,703.92 415.06- C 7,118.98 I
2,000.0000	SWIRE PACIFIC LTD	22,344.72	9.7675	19,535.13	2,809.59- 142.15- C 2,667.44- I
6,000.0000	WHEELLOCK & CO LTD	18,362.59	7.5450	45,270.26	26,907.67 228.47- C 27,136.14 I
800.0000	SUNTORY BEVERAGE & FOOD LTD	27,237.03	46.4578	37,166.25	9,929.22 5,572.47- C 15,501.69 I
9,000.0000	CONCORDIA FINANCIAL GROUP LTD	47,532.86	5.0427	45,384.48	2,148.38- 3,734.17- C 1,585.79 I



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5,850.0000	MEBUKI FINANCIAL GROUP INC	21,665.59	3.7201	21,763.08	97.49 2,516.32- C 2,613.81 I
2,600.0000	SEIBU HOLDINGS INC	44,094.91	18.4852	48,061.59	3,966.68 3,860.92- C 7,827.60 I
7,500.0000	RECRUIT HOLDINGS CO LTD	85,326.59	17.1858	128,893.73	43,567.14 2,293.17- C 45,860.31 I
23.0000	NOMURA REAL ESTATE MASTER FUND	31,475.06	1,367.9244	31,462.26	12.80- 644.54 C 657.34- I
2,400.0000	JAPAN POST HOLDINGS CO LTD	28,531.38	12.4065	29,775.72	1,244.34 610.00 C 634.34 I
6,400.0000	JAPAN POST BANK CO LTD	82,247.66	12.7981	81,908.15	339.51- 268.42 C 607.93- I
5,500.0000	SEVEN & I HOLDINGS CO LTD	164,392.35	41.1890	226,539.68	62,147.33 16,623.15- C 78,770.48 I
1,600.0000	BANDAI NAMCO HOLDINGS INC	30,521.85	34.0868	54,538.98	24,017.13 8,177.22- C 32,194.35 I
9,400.0000	MITSUBISHI CHEMICAL HOLDINGS C	48,701.45	8.2778	77,811.85	29,110.40 5,699.79- C 34,810.19 I



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4,400.0000	DAIICHI SANKYO CO LTD	80,402.83	23.5582	103,656.10	23,253.27 12,727.41- C 35,980.68 I
1,600.0000	M3 INC	32,221.29	27.5453	44,072.62	11,851.33 2,015.64 C 9,835.69 I
2,800.0000	ELECTRIC POWER DEVELOPMENT CO	77,925.54	24.7241	69,227.48	8,698.06- 589.08- C 8,108.98- I
1,600.0000	SEGA SAMMY HOLDINGS INC	19,317.94	13.4567	21,530.79	2,212.85 4,213.59- C 6,426.44 I
600.0000	DENA CO LTD	14,841.94	22.3923	13,435.39	1,406.55- 2,629.31- C 1,222.76 I
1,800.0000	NOMURA REAL ESTATE HOLDINGS IN	31,479.62	19.6155	35,307.94	3,828.32 892.84 C 2,935.48 I
1,000.0000	YAMAGUCHI FINANCIAL GROUP INC	10,806.72	12.0772	12,077.25	1,270.53 2,363.54- C 3,634.07 I
10,000.0000	AOZORA BANK LTD	29,284.93	3.8091	38,091.85	8,806.92 5,711.25- C 14,518.17 I
14,000.0000	FUKUOKA FINANCIAL GROUP INC	65,074.04	4.7525	66,536.13	1,462.09 1,623.44- C 3,085.53 I



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4,000.0000	INPEX CORP	46,271.42	9.6208	38,483.44	7,787.98- 2,458.67- C 5,329.31- I
1,800.0000	ISETAN MITSUKOSHI HOLDINGS LTD	19,720.40	10.0213	18,038.45	1,681.95- 3,530.14- C 1,848.19 I
3,800.0000	MS&AD INSURANCE GROUP HOLDINGS	102,736.75	33.5884	127,636.16	24,899.41 12,954.61- C 37,854.02 I
1,500.0000	J FRONT RETAILING CO LTD	18,142.52	15.3435	23,015.31	4,872.79 4,504.12- C 9,376.91 I
1,200.0000	SONY FINANCIAL HOLDINGS INC	19,452.09	17.0345	20,441.44	989.35 4,000.40- C 4,989.75 I
300.0000	TAISHO PHARMACEUTICAL HOLDINGS	18,227.69	76.0946	22,828.41	4,600.72 4,467.54- C 9,068.26 I
2,900.0000	OTSUKA HOLDINGS CO LTD	83,165.52	42.6308	123,629.40	40,463.88 19,815.62- C 60,279.50 I
1,000.0000	MEIJI HOLDINGS CO LTD	19,510.65	81.0786	81,078.67	61,568.02 15,867.15- C 77,435.17 I
7,200.0000	DAI-ICHI LIFE HOLDINGS INC	102,700.68	18.0357	129,857.59	27,156.91 19,157.55- C 46,314.46 I



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2,100.0000	SOMPO HOLDINGS INC	56,680.99	38.6169	81,095.58	24,414.59 20,168.42- C 44,583.01 I
25,315.0000	JXTG HOLDINGS INC	113,901.00	4.3672	110,555.98	3,345.02- 20,072.61- C 16,727.59 I
1,000.0000	JAPAN AIRLINES CO LTD	24,419.12	30.9184	30,918.47	6,499.35 5,628.78- C 12,128.13 I
10.0000	NIPPON PROLOGIS REIT INC	20,028.43	2,130.6513	21,306.51	1,278.08 3,194.56- C 4,472.64 I
1,600.0000	AISIN SEIKI CO LTD	49,701.19	51.1747	81,879.67	32,178.48 6,263.52- C 38,442.00 I
4,000.0000	AJINOMOTO CO INC	39,692.08	21.5957	86,383.05	46,690.97 16,905.25- C 63,596.22 I
6,000.0000	ANA HOLDINGS INC	17,420.30	3.4745	20,847.28	3,426.98 552.32- C 3,979.30 I
1,500.0000	ALPS ELECTRIC CO LTD	42,040.80	28.8358	43,253.83	1,213.03 2,674.36 C 1,461.33- I
3,000.0000	AMADA HOLDINGS CO LTD	25,712.53	11.5521	34,656.46	8,943.93 6,782.29- C 15,726.22 I



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2,000.0000	ASAHI GROUP HOLDINGS LTD	37,200.67	37.6290	75,258.10	38,057.43 14,728.06- C 52,785.49 I
10,000.0000	ASAHI KASEI CORP	59,359.69	10.7467	107,467.07	48,107.38 9,631.67- C 57,739.05 I
1,400.0000	ASAHI GLASS CO LTD	37,056.19	42.0968	58,935.56	21,879.37 2,695.38 C 19,183.99 I
5,000.0000	HIROSHIMA BANK LTD/THE	21,187.56	4.4321	22,160.91	973.35 4,336.91- C 5,310.26 I
6,000.0000	BANK OF KYOTO LTD/THE	48,821.38	9.4339	56,603.77	7,782.39 540.19- C 8,322.58 I
12,600.0000	YAHOO JAPAN CORP	47,343.03	4.3520	54,836.24	7,493.21 3,887.31- C 11,380.52 I
500.0000	TREND MICRO INC/JAPAN	17,780.51	51.5307	25,765.40	7,984.89 5,042.30- C 13,027.19 I
5,500.0000	NTT DATA CORP	43,186.71	11.1249	61,187.25	18,000.54 3,692.56- C 21,693.10 I
10,000.0000	NTT DOCOMO INC	153,788.85	23.6027	236,027.05	82,238.20 40,520.04- C 122,758.24 I



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4,600.0000	BRIDGESTONE CORP	103,812.72	43.0758	198,148.80	94,336.08 23,960.03- C 118,296.11 I
1,700.0000	BROTHER INDUSTRIES LTD	20,615.81	23.0776	39,231.93	18,616.12 7,677.71- C 26,293.83 I
2,100.0000	USS CO LTD	31,071.72	19.8736	41,734.60	10,662.88 6,257.43- C 16,920.31 I
4,100.0000	CANON INC	144,929.94	33.9622	139,245.28	5,684.66- 10,479.42- C 4,794.76 I
2,600.0000	CASIO COMPUTER CO LTD	19,654.39	15.3702	39,962.62	20,308.23 7,820.71- C 28,128.94 I
800.0000	CENTRAL JAPAN RAILWAY CO	60,730.57	162.9583	130,366.67	69,636.10 25,512.86- C 95,148.96 I
4,000.0000	CHIBA BANK LTD/THE	23,891.90	7.2445	28,978.28	5,086.38 5,671.07- C 10,757.45 I
3,600.0000	CHUBU ELECTRIC POWER CO INC	49,847.37	13.2831	47,819.51	2,027.86- 1,232.88 C 3,260.74- I
2,000.0000	CHUGOKU BANK LTD/THE	27,000.83	14.9519	29,903.88	2,903.05 5,852.21- C 8,755.26 I



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1,800.0000	CHUGAI PHARMACEUTICAL CO LTD	41,239.93	37.4243	67,363.83	26,123.90 4,407.29- C 30,531.19 I
3,600.0000	RAKUTEN INC	26,063.90	11.7657	42,356.71	16,292.81 8,289.25- C 24,582.06 I
11,400.0000	KDDI CORP	127,037.42	26.4773	301,842.28	174,804.86 38,812.66- C 213,617.52 I
500.0000	DAITO TRUST CONSTRUCTION CO LT	24,248.57	155.7048	77,852.44	53,603.87 15,235.79- C 68,839.66 I
3,000.0000	DAICEL CORP	36,937.23	12.4332	37,299.75	362.52 1,705.88 C 1,343.36- I
1,700.0000	DAIKIN INDUSTRIES LTD	85,589.93	102.0825	173,540.40	87,950.47 14,444.49- C 102,394.96 I
4,000.0000	DAIWA HOUSE INDUSTRY CO LTD	56,652.12	34.1580	136,632.25	79,980.13 10,480.42- C 90,460.55 I
12,000.0000	DAIWA SECURITIES GROUP INC	66,530.70	5.9255	71,107.15	4,576.45 7,647.70- C 12,224.15 I
200.0000	LAWSON INC	8,549.55	69.9537	13,990.74	5,441.19 2,738.01- C 8,179.20 I



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5,600.0000	MITSUBISHI UFJ LEASE & FINANCE	20,212.29	5.4645	30,601.64	10,389.35 5,988.76- C 16,378.11 I
1,000.0000	DON QUIJOTE HOLDINGS CO LTD	33,841.50	37.9138	37,913.85	4,072.35 5,684.55- C 9,756.90 I
1,700.0000	EAST JAPAN RAILWAY CO	117,649.52	95.6301	162,571.19	44,921.67 31,815.33- C 76,737.00 I
1,400.0000	EISAI CO LTD	53,313.18	55.2242	77,313.99	24,000.81 12,047.27- C 36,048.08 I
500.0000	FAMILYMART UNY HOLDINGS CO LTD	35,481.13	57.2267	28,613.38	6,867.75- 2,538.21- C 4,329.54- I
300.0000	FAST RETAILING CO LTD	53,309.60	333.0366	99,911.00	46,601.40 19,552.66- C 66,154.06 I
87,100.0000	MITSUBISHI UFJ FINANCIAL GROUP	464,437.37	6.7176	585,111.05	120,673.68 69,816.45- C 190,490.13 I
4,500.0000	SUBARU CORP	39,665.24	33.6952	151,628.69	111,963.45 23,605.20- C 135,568.65 I
3,300.0000	FUJIFILM HOLDINGS CORP	113,599.80	35.9558	118,654.32	5,054.52 14,506.22- C 19,560.74 I



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700.0000	MIRACA HOLDINGS INC	31,250.91	44.9448	31,461.37	210.46 4,717.12- C 4,927.58 I
1,200.0000	FANUC CORP	139,306.22	192.7287	231,274.46	91,968.24 29,534.47- C 121,502.71 I
4,000.0000	FUJITSU LTD	17,325.91	7.3673	29,469.56	12,143.65 1,822.08 C 10,321.57 I
800.0000	MCDONALD'S HOLDINGS CO JAPAN L	19,916.46	38.3588	30,687.08	10,770.62 11,172.82- C 21,943.44 I
1,089.0000	NOMURA RESEARCH INSTITUTE LTD	20,506.15	39.3823	42,887.37	22,381.22 8,393.09- C 30,774.31 I
6.0000	NIPPON BUILDING FUND INC	25,552.84	5,108.5793	30,651.48	5,098.64 5,998.52- C 11,097.16 I
11.0000	JAPAN REAL ESTATE INVESTMENT C	48,152.48	4,975.0798	54,725.88	6,573.40 3,120.43- C 9,693.83 I
4,000.0000	HACHIJUNI BANK LTD/THE	22,614.26	6.3456	25,382.70	2,768.44 4,967.41- C 7,735.85 I
1,200.0000	HAMAMATSU PHOTONICS KK	22,620.21	30.7048	36,845.85	14,225.64 14,981.87- C 29,207.51 I



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800.0000	HANKYU HANSHIN HOLDINGS INC	18,483.22	35.9558	28,764.68	10,281.46 5,629.28- C 15,910.74 I
1,500.0000	DENTSU INC	49,670.98	47.7928	71,689.21	22,018.23 5,325.68- C 27,343.91 I
17,600.0000	RESONA HOLDINGS INC	88,534.06	5.5046	96,881.45	8,347.39 3,688.37- C 12,035.76 I
2,000.0000	HINO MOTORS LTD	19,911.51	11.0982	22,196.51	2,285.00 4,488.70- C 6,773.70 I
220.0000	HIROSE ELECTRIC CO LTD	24,806.69	142.5774	31,367.03	6,560.34 5,960.28- C 12,520.62 I
600.0000	HISAMITSU PHARMACEUTICAL CO IN	22,518.43	47.8818	28,729.08	6,210.65 5,622.31- C 11,832.96 I
27,000.0000	HITACHI LTD	110,195.67	6.1356	165,662.15	55,466.48 22,984.39- C 78,450.87 I
1,000.0000	HITACHI CHEMICAL CO LTD	21,624.08	29.8148	29,814.88	8,190.80 5,834.79- C 14,025.59 I
2,000.0000	HITACHI METALS LTD	21,102.39	13.9017	27,803.49	6,701.10 5,441.17- C 12,142.27 I



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3,143.0000	SUMITOMO MITSUI TRUST HOLDINGS	119,124.25	35.7689	112,421.83	6,702.42- 3,798.54- C 2,903.88- I
7,600.0000	HONDA MOTOR CO LTD	255,633.98	27.2694	207,248.12	48,385.86- 24,611.54- C 23,774.32- I
3,000.0000	HOYA CORP	91,696.64	51.9134	155,740.47	64,043.83 14,329.90- C 78,373.73 I
11,000.0000	IHI CORP	20,027.03	3.3997	37,397.65	17,370.62 7,318.75- C 24,689.37 I
4,000.0000	ISUZU MOTORS LTD	21,805.09	12.3353	49,341.40	27,536.31 9,656.16- C 37,192.47 I
11,000.0000	ITOCHU CORP	101,586.04	14.8540	163,394.44	61,808.40 18,246.11- C 80,054.51 I
4,000.0000	JGC CORP	70,559.46	16.2157	64,862.94	5,696.52- 5,777.57- C 81.05 I
5,900.0000	JAPAN TOBACCO INC	122,295.85	35.1281	207,256.13	84,960.28 22,565.81- C 107,526.09 I
4,500.0000	AEON CO LTD	57,282.12	15.1922	68,365.07	11,082.95 6,182.40- C 17,265.35 I



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9,000.0000	KAJIMA CORP	22,230.97	8.4371	75,934.49	53,703.52 14,860.45- C 68,563.97 I
5,100.0000	KANSAI ELECTRIC POWER CO INC/T	51,597.94	13.7682	70,218.05	18,620.11 3,653.00 C 14,967.11 I
1,000.0000	KANSAI PAINT CO LTD	17,155.81	23.0064	23,006.41	5,850.60 1,052.18 C 4,798.42 I
3,200.0000	KAO CORP	86,324.51	59.3805	190,017.79	103,693.28 30,846.63- C 134,539.91 I
8,000.0000	KAWASAKI HEAVY INDUSTRIES LTD	21,975.44	2.9547	23,638.30	1,662.86 4,626.04- C 6,288.90 I
3,000.0000	KEIKYU CORP	24,562.66	12.0416	36,124.95	11,562.29 7,069.69- C 18,631.98 I
3,000.0000	KEIO CORP	19,995.09	8.3659	25,097.90	5,102.81 4,911.67- C 10,014.48 I
2,000.0000	KIKKOMAN CORP	23,529.90	31.9508	63,901.74	40,371.84 12,505.62- C 52,877.46 I
640.0000	KEYENCE CORP	97,249.38	439.1242	281,039.50	183,790.12 17,391.93- C 201,182.05 I



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14,000.0000	KINTETSU GROUP HOLDINGS CO LTD	45,803.55	3.8536	53,951.58	8,148.03 4,302.49- C 12,450.52 I
6,500.0000	KIRIN HOLDINGS CO LTD	93,773.40	20.3720	132,418.11	38,644.71 17,315.92- C 55,960.63 I
1,000.0000	KOITO MANUFACTURING CO LTD	31,821.93	51.4417	51,441.79	19,619.86 2,352.65 C 17,267.21 I
6,200.0000	KOMATSU LTD	131,657.66	25.4049	157,510.67	25,853.01 20,308.66- C 46,161.67 I
1,100.0000	KONAMI HOLDINGS CORP	21,350.45	55.5357	61,089.35	39,738.90 11,955.23- C 51,694.13 I
1,700.0000	JTEKT CORP	20,760.61	14.6137	24,843.36	4,082.75 4,861.87- C 8,944.62 I
8,000.0000	KUBOTA CORP	82,583.48	16.7986	134,389.46	51,805.98 12,920.25- C 64,726.23 I
2,000.0000	KURARAY CO LTD	26,894.36	18.1381	36,276.25	9,381.89 7,099.29- C 16,481.18 I
2,200.0000	KYOCERA CORP	108,222.75	57.9031	127,386.96	19,164.21 18,192.71- C 37,356.92 I



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2,000.0000	KYOWA HAKKO KIRIN CO LTD	21,017.20	18.5742	37,148.45	16,131.25 7,269.96- C 23,401.21 I
4,800.0000	TOKIO MARINE HOLDINGS INC	134,399.97	41.3937	198,689.92	64,289.95 34,600.87- C 98,890.82 I
12.0000	JAPAN RETAIL FUND INVESTMENT C	19,887.19	1,846.7425	22,160.91	2,273.72 8,711.31- C 10,985.03 I
1,500.0000	JFE HOLDINGS INC	19,579.35	17.3593	26,039.07	6,459.72 1,609.98 C 4,849.74 I
2,000.0000	MAKITA CORP	41,530.35	36.9793	73,958.70	32,428.35 3,626.71- C 36,055.06 I
10,200.0000	SUMITOMO MITSUI FINANCIAL GROU	350,007.16	38.9729	397,524.01	47,516.85 38,465.52- C 85,982.37 I
10,300.0000	MARUBENI CORP	59,223.36	6.4595	66,533.82	7,310.46 6,575.44- C 13,885.90 I
2,200.0000	MARUI GROUP CO LTD	31,250.19	14.7383	32,424.35	1,174.16 297.36 C 876.80 I
7,500.0000	PANASONIC CORP	79,431.90	13.5635	101,726.59	22,294.69 5,896.74- C 28,191.43 I



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192,880.0000	MIZUHO FINANCIAL GROUP INC	364,271.14	1.8280	352,594.79	11,676.35- 44,979.86- C 33,303.51 I
1,400.0000	CREDIT SAISON CO LTD	21,181.17	19.5265	27,337.13	6,155.96 5,349.91- C 11,505.87 I
7,000.0000	MITSUBISHI ESTATE CO LTD	117,830.60	18.6320	130,424.52	12,593.92 19,210.09- C 31,804.01 I
5,300.0000	MITSUBISHI CORP	102,767.37	20.9683	111,132.07	8,364.70 8,721.99- C 17,086.69 I
2,000.0000	MITSUBISHI GAS CHEMICAL CO INC	24,360.37	21.1374	42,274.83	17,914.46 8,273.22- C 26,187.68 I
13,000.0000	MITSUBISHI ELECTRIC CORP	126,474.97	14.3778	186,912.59	60,437.62 21,989.86- C 82,427.48 I
21,000.0000	MITSUBISHI HEAVY INDUSTRIES LT	89,527.11	4.0922	85,936.27	3,590.84- 10,258.77- C 6,667.93 I
1,700.0000	MITSUBISHI MATERIALS CORP	53,395.49	30.2598	51,441.79	1,953.70- 2,467.99- C 514.29 I
8,300.0000	MITSUMI & CO LTD	122,261.69	14.2888	118,597.81	3,663.88- 9,750.69- C 6,086.81 I



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7,000.0000	MITSUI CHEMICALS INC	21,538.91	5.2954	37,068.35	15,529.44 7,254.31- C 22,783.75 I
18,000.0000	MITSUI OSK LINES LTD	54,849.58	2.9369	52,865.79	1,983.79- 1,680.05 C 3,663.84- I
5,000.0000	MITSUI FUDOSAN CO LTD	85,868.17	23.8563	119,281.77	33,413.60 23,343.53- C 56,757.13 I
1,500.0000	MURATA MANUFACTURING CO LTD	109,693.41	151.9223	227,883.58	118,190.17 16,462.86- C 134,653.03 I
2,600.0000	SEIKO EPSON CORP	20,581.74	22.2410	57,826.63	37,244.89 11,316.72- C 48,561.61 I
1,000.0000	NGK INSULATORS LTD	20,133.50	19.9270	19,927.02	206.48- 3,899.73- C 3,693.25 I
1,000.0000	NGK SPARK PLUG CO LTD	13,596.23	21.2620	21,262.01	7,665.78 4,160.99- C 11,826.77 I
8,000.0000	NAGOYA RAILROAD CO LTD	31,311.00	4.6635	37,308.65	5,997.65 2,343.27 C 3,654.38 I
800.0000	NINTENDO CO LTD	106,755.36	335.3506	268,280.51	161,525.15 8,139.67- C 169,664.82 I



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2,900.0000	DENSO CORP	92,199.66	42.2036	122,390.52	30,190.86 15,327.11- C 45,517.97 I
1,400.0000	NIDEC CORP	80,642.50	102.4385	143,414.02	62,771.52 14,367.26- C 77,138.78 I
1,000.0000	NH FOODS LTD	12,882.89	30.3933	30,393.38	17,510.49 5,948.01- C 23,458.50 I
1,815.0000	NISSHIN SEIFUN GROUP INC	19,611.80	16.4204	29,803.09	10,191.29 5,832.48- C 16,023.77 I
5,600.0000	NIPPON TELEGRAPH & TELEPHONE C	126,213.80	47.2588	264,649.33	138,435.53 38,007.40- C 176,442.93 I
4,100.0000	NSK LTD	36,133.83	12.4866	51,195.26	15,061.43 1,865.50- C 16,926.93 I
1,000.0000	NISSAN CHEMICAL INDUSTRIES LTD	14,192.47	33.0188	33,018.87	18,826.40 6,461.83- C 25,288.23 I
500.0000	NISSIN FOODS HOLDINGS CO LTD	16,662.57	62.4777	31,238.87	14,576.30 6,113.47- C 20,689.77 I
1,200.0000	NITTO DENKO CORP	48,912.48	82.2356	98,682.80	49,770.32 26,275.83- C 76,046.15 I



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4,000.0000	NIPPON EXPRESS CO LTD	17,503.69	6.2566	25,026.70	7,523.01 4,897.74- C 12,420.75 I
1,500.0000	YAMAHA CORP	19,691.64	34.5318	51,797.79	32,106.15 10,136.85- C 42,243.00 I
3,000.0000	MINEBEA MITSUMI INC	18,493.86	16.0644	48,193.31	29,699.45 9,431.46- C 39,130.91 I
4,576.0000	NIPPON STEEL & SUMITOMO METAL	103,212.08	22.5881	103,363.19	151.11 8,575.86- C 8,726.97 I
17,500.0000	NISSAN MOTOR CO LTD	157,570.06	9.9501	174,127.80	16,557.74 25,520.88- C 42,078.62 I
8,400.0000	NOMURA HOLDINGS INC	48,825.26	5.9932	50,343.18	1,517.92 2,786.44 C 1,268.52- I
500.0000	NITORI HOLDINGS CO LTD	18,898.45	133.8554	66,927.73	48,029.28 13,097.82- C 61,127.10 I
800.0000	ORIENTAL LAND CO LTD/JAPAN	13,841.12	67.7109	54,168.74	40,327.62 10,600.87- C 50,928.49 I
3,500.0000	ODAKYU ELECTRIC RAILWAY CO LTD	58,892.57	20.1673	70,585.61	11,693.04 2,771.33- C 14,464.37 I



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4,000.0000	OBAYASHI CORP	17,674.04	11.7568	47,027.41	29,353.37 9,203.29- C 38,556.66 I
1,800.0000	OLYMPUS CORP	60,191.99	36.4898	65,681.73	5,489.74 4,726.59- C 10,216.33 I
1,600.0000	OMRON CORP	41,041.22	43.3873	69,419.72	28,378.50 4,679.77- C 33,058.27 I
3,000.0000	ONO PHARMACEUTICAL CO LTD	41,111.70	21.8138	65,441.44	24,329.74 2,152.13- C 26,481.87 I
9,000.0000	TAIHEIYO CEMENT CORP	20,268.47	3.6400	32,760.77	12,492.30 14,316.85- C 26,809.15 I
7,600.0000	ORIX CORP	76,455.54	15.4859	117,693.12	41,237.58 9,810.51- C 51,048.09 I
14,000.0000	OSAKA GAS CO LTD	50,830.59	4.0895	57,253.47	6,422.88 4,857.87- C 11,280.75 I
20.0000	UNITED URBAN INVESTMENT CORP	30,554.62	1,428.4442	28,568.88	1,985.74- 4,283.44- C 2,297.70 I
300.0000	RINNAI CORP	21,724.06	93.1826	27,954.79	6,230.73 3,532.36- C 9,763.09 I



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4,400.0000	JAPAN EXCHANGE GROUP INC	54,988.18	18.1114	79,690.28	24,702.10 3,977.68- C 28,679.78 I
4,600.0000	T&D HOLDINGS INC	54,210.31	15.2144	69,986.65	15,776.34 5,611.82- C 21,388.16 I
400.0000	ROHM CO LTD	17,676.76	76.8066	30,722.68	13,045.92 1,899.58 C 11,146.34 I
200.0000	RYOHIN KEIKAKU CO LTD	40,633.18	249.8219	49,964.40	9,331.22 3,089.26 C 6,241.96 I
400.0000	SMC CORP/JAPAN	73,267.72	303.9337	121,573.51	48,305.79 20,237.78- C 68,543.57 I
6,100.0000	SOFTBANK GROUP CORP	199,860.96	80.9629	493,874.13	294,013.17 55,398.09- C 349,411.26 I
2,500.0000	SANTEN PHARMACEUTICAL CO LTD	21,057.94	13.5635	33,908.86	12,850.92 13,262.11- C 26,113.03 I
1,000.0000	SECOM CO LTD	44,078.64	75.8721	75,872.19	31,793.55 14,848.25- C 46,641.80 I
4,700.0000	SEKISUI CHEMICAL CO LTD	44,478.87	17.8978	84,119.79	39,640.92 204.13 C 39,436.79 I



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4,000.0000	SEKISUI HOUSE LTD	47,944.81	17.6174	70,469.91	22,525.10 11,873.25- C 34,398.35 I
15,000.0000	SHARP CORP/JAPAN	30,080.00	3.7112	55,669.27	25,589.27 2,546.00 C 23,043.27 I
200.0000	SHIMAMURA CO LTD	21,468.14	122.4635	24,492.70	3,024.56 3,282.84- C 6,307.40 I
3,000.0000	SHIMADZU CORP	42,980.61	19.0281	57,084.37	14,103.76 3,529.48 C 10,574.28 I
4,000.0000	SHIMIZU CORP	16,694.52	10.5998	42,399.43	25,704.91 8,297.60- C 34,002.51 I
2,900.0000	SHIN-ETSU CHEMICAL CO LTD	166,450.50	90.6461	262,873.79	96,423.29 39,223.11- C 135,646.40 I
2,000.0000	SHIONOGI & CO LTD	48,670.81	55.7048	111,409.75	62,738.94 4,032.27- C 66,771.21 I
500.0000	SHIMANO INC	31,786.17	158.2413	79,120.68	47,334.51 5,289.91- C 52,624.42 I
2,700.0000	SHISEIDO CO LTD	51,809.04	35.5464	95,975.43	44,166.39 16,186.21- C 60,352.60 I



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5,000.0000	SHIZUOKA BANK LTD/THE	45,897.76	9.0334	45,167.32	730.44- 11,727.77- C 10,997.33 I
5,600.0000	SONY CORP	153,799.68	38.1452	213,613.38	59,813.70 2,334.20- C 62,147.90 I
1,000.0000	STANLEY ELECTRIC CO LTD	19,239.15	30.1708	30,170.88	10,931.73 5,904.46- C 16,836.19 I
11,000.0000	SUMITOMO CHEMICAL CO LTD	54,399.47	5.7493	63,243.14	8,843.67 5,408.15- C 14,251.82 I
5,300.0000	SUMITOMO ELECTRIC INDUSTRIES L	66,533.07	15.3969	81,603.77	15,070.70 8,407.59- C 23,478.29 I
3,000.0000	SUMITOMO HEAVY INDUSTRIES LTD	18,142.52	6.5948	19,784.62	1,642.10 3,871.87- C 5,513.97 I
5,000.0000	SUMITOMO METAL MINING CO LTD	73,892.69	13.3543	66,771.98	7,120.71- 2,799.60- C 4,321.11- I
2,000.0000	SUMITOMO REALTY & DEVELOPMENT	42,810.47	30.8383	61,676.75	18,866.28 18,923.50- C 37,789.78 I
8,600.0000	SUMITOMO CORP	95,340.33	13.0117	111,901.03	16,560.70 11,458.97- C 28,019.67 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
1,900.0000	SUMITOMO RUBBER INDUSTRIES LTD	29,114.74	16.8743	32,061.23	2,946.49 1,409.03 C 1,537.46 I
2,000.0000	SURUGA BANK LTD	17,950.87	24.2257	48,451.40	30,500.53 9,481.99- C 39,982.52 I
2,600.0000	SUZUKI MOTOR CORP	66,879.50	47.4368	123,335.70	56,456.20 9,550.98- C 66,007.18 I
550.0000	SUZUKEN CO LTD/AICHI JAPAN	17,514.34	33.1968	18,258.28	743.94 3,573.16- C 4,317.10 I
900.0000	THK CO LTD	19,643.74	28.3018	25,471.70	5,827.96 4,984.83- C 10,812.79 I
900.0000	TDK CORP	58,791.71	65.7707	59,193.66	401.95 4,646.30- C 5,048.25 I
9,000.0000	TAISEI CORP	19,835.39	9.1313	82,182.27	62,346.88 16,083.17- C 78,430.05 I
2,000.0000	TAKASHIMAYA CO LTD	16,843.58	9.5140	19,028.12	2,184.54 3,723.83- C 5,908.37 I
4,700.0000	TAKEDA PHARMACEUTICAL CO LTD	207,234.07	50.8098	238,806.50	31,572.43 31,093.86- C 62,666.29 I



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1,000.0000	MITSUBISHI TANABE PHARMA CORP	14,181.83	23.1043	23,104.31	8,922.48 4,521.54- C 13,444.02 I
1,000.0000	TEIJIN LTD	16,875.51	19.2328	19,232.82	2,357.31 3,763.88- C 6,121.19 I
800.0000	SYSMEX CORP	26,540.74	59.7187	47,775.01	21,234.27 7,163.07- C 28,397.34 I
2,300.0000	TERUMO CORP	63,146.57	39.3823	90,579.38	27,432.81 9,180.38- C 36,613.19 I
5,000.0000	TOBU RAILWAY CO LTD	21,427.64	5.4556	27,278.39	5,850.75 1,686.61 C 4,164.14 I
1,200.0000	TOHO CO LTD/TOKYO	19,177.40	30.7938	36,952.65	17,775.25 7,231.67- C 25,006.92 I
5,000.0000	TOHO GAS CO LTD	30,434.93	7.2801	36,400.85	5,965.92 14,236.77- C 20,202.69 I
16,500.0000	TOKYO ELECTRIC POWER CO HOLDIN	73,783.90	4.1206	67,991.27	5,792.63- 2,341.05 C 8,133.68- I
15,000.0000	TOKYO GAS CO LTD	67,793.93	5.2002	78,003.73	10,209.80 8,502.56- C 18,712.36 I



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1,200.0000	TOKYO ELECTRON LTD	83,334.53	134.9234	161,908.15	78,573.62 15,981.50- C 94,555.12 I
8,000.0000	TOKYU CORP	42,690.55	7.6272	61,018.15	18,327.60 2,925.05- C 21,252.65 I
4,000.0000	TOPPAN PRINTING CO LTD	33,879.22	10.9647	43,859.02	9,979.80 2,546.25- C 12,526.05 I
10,000.0000	TORAY INDUSTRIES INC	60,383.28	8.3686	83,686.36	23,303.08 14,735.46- C 38,038.54 I
1,000.0000	TOTO LTD	28,117.62	38.1808	38,180.85	10,063.23 5,724.58- C 15,787.81 I
2,200.0000	LIXIL GROUP CORP	44,798.16	24.9999	55,000.00	10,201.84 3,514.92- C 13,716.76 I
2,300.0000	MAZDA MOTOR CORP	33,884.93	13.9551	32,096.83	1,788.10- 2,338.34- C 550.24 I
1,200.0000	TOYOTA INDUSTRIES CORP	41,638.12	52.5987	63,118.54	21,480.42 3,985.40- C 25,465.82 I
1,200.0000	TOYOTA TSUSHO CORP	19,049.63	29.9483	35,938.05	16,888.42 7,033.11- C 23,921.53 I



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14,520.0000	TOYOTA MOTOR CORP	581,181.12	52.4474	761,537.52	180,356.40 148,492.98- C 328,849.38 I
3,000.0000	UNICHARM CORP	40,677.61	25.1156	75,347.10	34,669.49 20,638.55- C 55,308.04 I
1,100.0000	WEST JAPAN RAILWAY CO	46,388.22	70.6301	77,693.13	31,304.91 5,927.36- C 37,232.27 I
8,400.0000	YAMADA DENKI CO LTD	32,761.71	4.9661	41,715.91	8,954.20 1,907.85 C 7,046.35 I
700.0000	YAKULT HONSHA CO LTD	18,520.48	68.0847	47,659.31	29,138.83 9,326.98- C 38,465.81 I
1,300.0000	YAMAHA MOTOR CO LTD	19,169.95	25.7920	33,529.72	14,359.77 6,561.80- C 20,921.57 I
12,800.0000	ASTELLAS PHARMA INC	103,223.10	12.2330	156,582.41	53,359.31 19,749.29- C 73,108.60 I
1,000.0000	YAMATO HOLDINGS CO LTD	14,096.64	20.2785	20,278.57	6,181.93 3,968.52- C 10,150.45 I
2,000.0000	YASKAWA ELECTRIC CORP	18,589.69	21.1908	42,381.63	23,791.94 8,294.12- C 32,086.06 I



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2,300.0000	YOKOGAWA ELECTRIC CORP	32,622.92	16.0288	36,866.32	4,243.40 3,886.29- C 8,129.69 I
18,800.0000	OVERSEA-CHINESE BANKING CORP L	118,312.27	7.8367	147,330.50	29,018.23 3,059.38 C 25,958.85 I
14,500.0000	SINGAPORE PRESS HOLDINGS LTD	39,423.92	2.3459	34,016.05	5,407.87- 798.51 C 6,206.38- I
46,000.0000	SINGAPORE TELECOMMUNICATIONS L	106,852.19	2.8252	129,963.32	23,111.13 2,275.20 C 20,835.93 I
8,600.0000	KEPPEL CORP LTD	42,034.51	4.5683	39,288.23	2,746.28- 510.43 C 3,256.71- I
33,742.0000	GLOBAL LOGISTIC PROPERTIES LTD	64,151.00	2.0772	70,089.06	5,938.06 2,790.82- C 8,728.88 I
24,900.0000	SINGAPORE TECHNOLOGIES ENGINEE	57,892.85	2.6727	66,551.91	8,659.06 1,054.29 C 7,604.77 I
11,200.0000	DBS GROUP HOLDINGS LTD	120,327.96	15.0633	168,709.74	48,381.78 2,704.88 C 45,676.90 I
3,000.0000	CITY DEVELOPMENTS LTD	23,337.39	7.7931	23,379.45	42.06 342.15 C 300.09- I



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1,000.0000	JARDINE CYCLE & CARRIAGE LTD	22,406.17	32.2112	32,211.21	9,805.04 471.43 C 9,333.61 I
27,800.0000	CAPITALAND LTD	62,562.22	2.5420	70,668.56	8,106.34 1,739.07 C 6,367.27 I
26,300.0000	GENTING SINGAPORE PLC	16,766.67	0.7880	20,725.21	3,958.54 303.33 C 3,655.21 I
16,000.0000	CAPITALAND MALL TRUST	20,607.34	1.4344	22,950.94	2,343.60 337.85 C 2,005.75 I
8,900.0000	HONGKONG LAND HOLDINGS LTD	57,062.52	7.3600	65,504.00	8,441.48 I
1,800.0000	JARDINE MATHESON HOLDINGS LTD	103,265.54	64.2000	115,560.00	12,294.46 I
15,000.0000	ASCENDAS REAL ESTATE INVESTMEN	20,779.81	1.8956	28,434.47	7,654.66 425.37 C 7,229.29 I
18,000.0000	COMFORTDELGRO CORP LTD	20,113.99	1.6704	30,068.63	9,954.64 440.05 C 9,514.59 I
8,400.0000	UNITED OVERSEAS BANK LTD	115,726.93	16.7919	141,052.40	25,325.47 2,751.07 C 22,574.40 I
11,682.0000	BANK HAPOLIM BM	50,920.75	6.7455	78,801.70	27,880.95 8,590.80 C 19,290.15 I



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5,653.0000	BANK LEUMI LE-ISRAEL BM	24,566.69	4.8628	27,489.87	2,923.18 1,982.99 C 940.19 I
22,660.0000	BEZEQ THE ISRAELI TELECOMMUNIC	48,729.37	1.6606	37,629.22	11,100.15- 3,409.02 C 14,509.17- I
503.0000	NICE LTD	31,072.99	80.1788	40,329.94	9,256.95 3,838.71 C 5,418.24 I
425.0000	CHECK POINT SOFTWARE TECHNOLOG	32,284.30	109.0800	46,359.00	14,074.70 I
2,031.0000	AERCAP HOLDINGS NV	81,767.82	46.4300	94,299.33	12,531.51 I
1,944.0000	MOBILEYE NV	73,434.39	62.8000	122,083.20	48,648.81 I
2,142.0000	NXP SEMICONDUCTORS NV	183,663.43	109.4500	234,441.90	50,778.47 I
11,862.0000	NOVO NORDISK A/S	213,914.58	42.7686	507,321.23	293,406.65 83,424.59- C 376,831.24 I
1,015.0000	ISS A/S	30,230.76	39.2250	39,813.39	9,582.63 273.26 C 9,309.37 I
1,523.0000	TRYG A/S	30,307.61	21.8445	33,269.19	2,961.58 1,615.74 C 1,345.84 I
1,172.0000	DSV A/S	27,012.65	61.3609	71,915.08	44,902.43 6,340.04- C 51,242.47 I



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831.0000	PANDORA A/S	73,370.00	93.1919	77,442.55	4,072.55 6,534.54- C 10,607.09 I
488.0000	CHR HANSEN HOLDING A/S	28,403.65	72.6360	35,446.40	7,042.75 430.53 C 6,612.22 I
1,000.0000	NOVOZYMES A/S	26,215.68	43.7043	43,704.36	17,488.68 6,940.92- C 24,429.60 I
750.0000	COLOPLAST A/S	17,381.99	83.4509	62,588.21	45,206.22 8,801.01- C 54,007.23 I
831.0000	CARLSBERG A/S	70,566.71	106.6914	88,660.57	18,093.86 8,498.70- C 26,592.56 I
62.0000	AP MOLLER - MAERSK A/S	104,553.88	2,008.0382	124,498.37	19,944.49 6,574.41- C 26,518.90 I
25.0000	AP MOLLER - MAERSK A/S	38,402.55	1,906.7926	47,669.82	9,267.27 1,617.90- C 10,885.17 I
5,337.0000	DANSKE BANK A/S	129,558.57	38.4119	205,004.73	75,446.16 18,308.79- C 93,754.95 I
379.0000	GENMAB A/S	50,866.60	213.0760	80,755.81	29,889.21 1,459.60 C 28,429.61 I



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10,157.0000	TDC A/S	52,580.75	5.8078	58,990.00	6,409.25 3,872.14 C 2,537.11 I
1,417.0000	VESTAS WIND SYSTEMS A/S	78,835.69	92.1948	130,640.15	51,804.46 22,296.02- C 74,100.48 I
1,150.0000	NESTE OYJ	20,342.14	39.3375	45,238.20	24,896.06 8,456.27- C 33,352.33 I
771.0000	NOKIAN RENKAAT OYJ	20,049.85	41.3335	31,868.15	11,818.30 5,957.03- C 17,775.33 I
1,638.0000	KONE OYJ	40,535.67	50.8000	83,210.56	42,674.89 13,373.00- C 56,047.89 I
1,109.0000	ORION OYJ	29,103.66	63.7567	70,706.23	41,602.57 12,051.46- C 53,654.03 I
790.0000	WARTSILA OYJ ABP	20,559.99	59.0234	46,628.54	26,068.55 8,716.13- C 34,784.68 I
3,929.0000	UPM-KYMMENE OYJ	55,053.73	28.4681	111,851.27	56,797.54 11,339.38- C 68,136.92 I
7,104.0000	STORA ENSO OYJ	65,051.68	12.8996	91,638.90	26,587.22 344.29- C 26,931.51 I



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1,907.0000	SAMPO OYJ	51,838.65	51.1764	97,593.54	45,754.89 18,242.91- C 63,997.80 I
1,341.0000	FORTUM OYJ	19,813.77	15.6597	20,999.73	1,185.96 447.42 C 738.54 I
2,001.0000	ELISA OYJ	53,795.27	38.6988	77,436.42	23,641.15 1,089.92- C 24,731.07 I
600.0000	METSO OYJ	15,887.30	34.6270	20,776.26	4,888.96 3,883.65- C 8,772.61 I
16,708.0000	NOKIA OYJ	83,266.21	6.1076	102,046.54	18,780.33 4,009.58 C 14,770.75 I
2,663.0000	MARINE HARVEST ASA	45,149.02	17.0593	45,428.98	279.96 681.48- C 961.44 I
4,128.0000	ORKLA ASA	30,212.79	10.1293	41,813.95	11,601.16 3,256.83- C 14,857.99 I
16,241.0000	NORSK HYDRO ASA	87,172.69	5.5248	89,729.60	2,556.91 11,500.32- C 14,057.23 I
1,834.0000	GJENSIDIGE FORSIKRING ASA	25,861.87	17.0115	31,199.23	5,337.36 14,658.82- C 19,996.18 I



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7,525.0000	DNB ASA	100,902.20	16.9518	127,562.93	26,660.73 42,123.27- C 68,784.00 I
5,765.0000	TELENOR ASA	92,621.30	16.5340	95,318.83	2,697.53 20,604.39- C 23,301.92 I
4,002.0000	STATOIL ASA	67,255.37	16.5221	66,121.52	1,133.85- 627.62 C 1,761.47- I
400.0000	INTERNATIONAL PETROLEUM CORP/S	1,029.21	2.9639	1,185.60	156.39 71.74 C 84.65 I
2,957.0000	KINNEVIK AB	67,330.37	30.5766	90,415.06	23,084.69 41.62- C 23,126.31 I
4,160.0000	ESSITY AB	55,495.14	27.3280	113,684.78	58,189.64 11,904.41- C 70,094.05 I
5,090.0000	ATLAS COPCO AB	97,381.12	38.2948	194,920.89	97,539.77 33,274.36- C 130,814.13 I
2,898.0000	ATLAS COPCO AB	53,461.56	34.5128	100,018.12	46,556.56 8,795.12- C 55,351.68 I
8,981.0000	SVENSKA HANDELSBANKEN AB	95,687.06	14.2983	128,413.32	32,726.26 17,097.61- C 49,823.87 I



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4,800.0000	ASSA ABLOY AB	31,611.54	21.9454	105,338.16	73,726.62 18,480.58- C 92,207.20 I
781.0000	ICA GRUPPEN AB	30,255.45	37.1804	29,037.90	1,217.55- 699.85- C 517.70- I
1,863.0000	ELECTROLUX AB	49,647.95	32.7344	60,984.20	11,336.25 8,208.20- C 19,544.45 I
10,756.0000	VOLVO AB	118,706.07	17.0252	183,123.18	64,417.11 34,744.33- C 99,161.44 I
1,800.0000	SKF AB	32,501.10	20.2381	36,428.74	3,927.64 6,391.07- C 10,318.71 I
1,591.0000	SANDVIK AB	20,907.75	15.7091	24,993.33	4,085.58 4,384.84- C 8,470.42 I
4,160.0000	SVENSKA CELLULOSA AB SCA	14,214.14	7.5581	31,442.10	17,227.96 3,292.44- C 20,520.40 I
3,000.0000	BOLIDEN AB	52,918.99	27.2569	81,770.81	28,851.82 20,178.43- C 49,030.25 I
1,966.0000	HEXAGON AB	49,816.34	47.4832	93,352.11	43,535.77 14,306.56- C 57,842.33 I



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2,800.0000	HUSQVARNA AB	20,398.59	9.9234	27,785.71	7,387.12 4,874.74- C 12,261.86 I
502.0000	ETRION CORP	279.38	0.2228	111.89	167.49- 29.11- C 138.38- I
6,614.0000	TELE2 AB	52,811.71	10.4569	69,162.53	16,350.82 5,386.30 C 10,964.52 I
7,600.0000	SKANDINAVISKA ENSKILDA BANKEN	49,380.49	12.0812	91,817.58	42,437.09 16,108.54- C 58,545.63 I
6,723.0000	SWEDBANK AB	102,378.42	24.3403	163,640.25	61,261.83 27,499.17- C 88,761.00 I
1,400.0000	SWEDISH MATCH AB	33,672.32	35.1767	49,247.44	15,575.12 8,640.01- C 24,215.13 I
19,682.0000	NORDEA BANK AB	204,731.78	12.7096	250,150.92	45,419.14 34,790.64- C 80,209.78 I
2,000.0000	SECURITAS AB	21,514.03	16.8355	33,671.03	12,157.00 5,907.27- C 18,064.27 I
4,182.0000	INVESTOR AB	113,414.67	48.1353	201,302.03	87,887.36 11,466.05- C 99,353.41 I



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2,647.0000	HENNES & MAURITZ AB	85,019.86	24.8857	65,872.55	19,147.31- 7,503.09- C 11,644.22- I
14,557.0000	TELEFONAKTIEBOLAGET LM ERICSSO	86,053.47	7.1432	103,984.12	17,930.65 3,652.46 C 14,278.19 I
7,560.0000	TELIA CO AB	30,690.87	4.5989	34,768.00	4,077.13 1,221.23 C 2,855.90 I
2,845.0000	SKANSKA AB	53,760.95	23.7001	67,426.89	13,665.94 7,050.93- C 20,716.87 I
1,200.0000	LUNDIN PETROLEUM AB	30,539.62	19.2185	23,062.29	7,477.33- 5,738.63- C 1,738.70- I
1,500.0000	ALFA LAVAL AB	22,545.81	20.4397	30,659.61	8,113.80 5,378.94- C 13,492.74 I
3,151.0000	MELCO RESORTS & ENTERTAINMENT ADR	47,968.52	22.4500	70,739.95	22,771.43 I
7,819.0000	TEVA PHARMACEUTICAL INDUSTRIES ADR	386,143.87	33.2200	259,747.18	126,396.69- I
TOTAL INVESTMENTS EQUITY		62,682,162.62		83,928,564.18	21,246,401.56 7,748,423.07- C 28,994,824.63 I
TOTAL INVESTMENT		63,568,844.30		84,968,455.42	21,399,611.12 7,788,117.04- C 29,187,728.16 I



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<u>INVESTMENTS REAL ESTATE</u>					
599.8790	PRIME PROPERTY FUND LLC	6,886,001.53	21,660.4396	12,993,642.86	6,107,641.33
2,039,173.0000	FORTRESS JAPAN OPPORTUNITY DOMESTIC FUND © LP	26,368.00	0.6903	1,407,741.00	1,381,373.00
1,735,989.0000	BRAZIL REAL ESTATE OPPORTUNITIES FUND I I	1,716,726.45	0.7737	1,343,195.00	373,531.45-
1,828,783.2300	BROOKFIELD REAL ESTATE FUND	0.00	0.1048	191,790.86	191,790.86
289,353.0000	EXETER INDUSTRIAL VALUE FUND I I LPP	0.00	1.0291	297,785.00	297,785.00
1,839,324.0200	DIVCOWEST FUND I I I	0.00	0.2372	436,410.00	436,410.00
4,767,890.0000	JAMESTOWN PREMIER PROPERTY	3,782,194.71	1.6049	7,652,115.79	3,869,921.08
1,849,673.0000	BROOKFIELD FAIRFIELD MULTIFAMILY	311.00	0.3587	663,517.00	663,206.00
1,194,405.0000	CVI EUROPE REAL ESTATE PARTNER TG LLC	442,822.55	0.7410	885,135.69	442,313.14
1,410,000.0000	SAVANNA REAL ESTATE FUND I I A LP LLC	1,291,796.69	1.5961	2,250,596.69	958,800.00
8,182,468.0000	USAA EAGLE REAL ESTATE LP	7,216,962.21	1.3145	10,756,457.13	3,539,494.92
8,196,660.4400	PRISA REAL ESTATE LP	8,000,454.37	1.3318	10,916,837.00	2,916,382.63



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1,146,735.0000	GREENFIELD ACQUI RTNRS VII LP	1,032,994.00	1.1177	1,281,733.00	248,739.00
1,311,234.6100	NORTHLIGHT REAL ESTATE OPPORTUNITY FUND	1,178,226.82	1.0774	1,412,783.04	234,556.22
1,309,685.0100	H/2 SPECIAL OPPORTUNITIES III LP	1,219,981.01	1.1144	1,459,528.00	239,546.99
357,440.0000	BRV PARTNERS FUND I LP	184,045.00	1.0121	361,775.00	177,730.00
6,463,869.0000	METLIFE CORE PROPERTY FUND L P	6,104,020.00	1.0615	6,861,424.00	757,404.00
3,855,600.0000	INLAND RETAIL PROPERTY	3,855,600.00	1.0544	4,065,449.00	209,849.00
580,500.0000	ASANA PARTNERS I	580,500.00	1.0263	595,813.00	15,313.00
3,225,000.0000	HANCOCK US REAL ESTATE	3,225,000.00	1.0000	3,225,000.00	0.00
5,753,975.8900	UBS TRUMBULL PROPERTY FUND	5,127,348.84	1.3041	7,504,229.44	2,376,880.60
1,180.1100	TTG BRPTP FUND LP	0.00	0.0000	0.00	0.00
3,032,575.0000	LION INDUSTRIAL TRUST	2,942,723.01	1.1251	3,412,043.15	469,320.14
1,927,032.5800	CITIC CAPITAL CHINA	1,520,919.25	0.8301	1,599,716.29	78,797.04
TOTAL INVESTMENTS REAL ESTATE		56,334,995.44		81,574,717.94	25,239,722.50
TOTAL INVESTMENT		56,334,995.44		81,574,717.94	25,239,722.50



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INVESTMENTS FIXED INCOME SECURITIES					
3,983,847.0570	WTC-CTF JPM PAG EMERGING MARKETS DEBT	39,561,530.99	10.7200	42,706,840.45	3,145,309.46
TOTAL INVESTMENTS FIXED INCOME SECURITIES		39,561,530.99		42,706,840.45	3,145,309.46
TOTAL INVESTMENT		39,561,530.99		42,706,840.45	3,145,309.46



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<u>INVESTMENTS PRIVATE EQUITY</u>					
59,072,463.7300	STEPSTONE XL OPP FUND LP	52,234,220.29	1.2445	73,521,411.14	21,287,190.85
TOTAL INVESTMENTS PRIVATE EQUITY		52,234,220.29		73,521,411.14	21,287,190.85
TOTAL INVESTMENT		52,234,220.29		73,521,411.14	21,287,190.85



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
768,795.4100	BLACKROCK LIQ T FUND INSTL FUND 60	768,795.41	100.0000	768,795.41	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		768,795.41		768,795.41	0.00
<u>INVESTMENTS FIXED INCOME SECURITIES</u>					
500,000.0000	SOUTHERN CO GAS CAPITAL CORP 3.250% 06/15/2026 DD 05/18/16	490,950.45	98.1320	490,660.00	290.45-
370,000.0000	AT&T INC 4.350% 06/15/2045 DD 06/15/13	351,715.29	92.8110	343,400.70	8,314.59-
270,000.0000	AT&T INC 5.150% 03/15/2042 DD 03/15/16	264,526.47	102.1190	275,721.30	11,194.83
400,000.0000	ABBVIE INC 3.200% 11/06/2022 DD 05/14/15	401,670.89	102.5660	410,264.00	8,593.11
400,000.0000	AERCAP IRELAND CAPITAL DAC / A 3.750% 05/15/2019 DD 05/15/15	405,027.88	102.7130	410,852.00	5,824.12
500,000.0000	AMAZON.COM INC 2.500% 11/29/2022 DD 11/29/12	491,519.84	100.8010	504,005.00	12,485.16
400,000.0000	AMERICAN EXPRESS CREDIT CORP VAR RT 03/03/2022 DD 03/03/17	400,000.00	100.6790	402,716.00	2,716.00
400,000.0000	AMGEN INC 2.700% 05/01/2022 DD 05/01/15	397,554.61	100.5740	402,296.00	4,741.39



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500,000.0000	ANHEUSER-BUSCH INBEV FINANCE I 4.900% 02/01/2046 DD 01/25/16	573,853.71	112.8640	564,320.00	9,533.71-
500,000.0000	APPLE INC 3.350% 02/09/2027 DD 02/09/17	496,172.60	102.2330	511,165.00	14,992.40
500,000.0000	APPLE INC 3.200% 05/11/2027 DD 05/11/17	500,000.00	101.1680	505,840.00	5,840.00
1,000,000.0000	BABSON CLO LTD 2016 1A B1 144A VAR RT 004/23/2027 DD 02/23/16	1,000,000.00	100.0000	1,000,000.00	0.00
370,000.0000	BANK OF AMERICA CORP 5.650% 05/01/2018 DD 05/02/08	381,861.06	103.1400	381,618.00	243.06-
150,000.0000	BANK OF AMERICA CORP 5.700% 01/24/2022 DD 01/24/12	168,670.47	112.9960	169,494.00	823.53
600,000.0000	BANK OF AMERICA CORP 4.450% 03/03/2026 DD 03/03/16	630,276.02	104.0740	624,444.00	5,832.02-
500,000.0000	BLUEMOUNTAIN CLO 201 4A B 144A VAR RT 01/20/2027 DD 01/13/16	500,000.00	100.0000	500,000.00	0.00
500,000.0000	BRISTOL-MYERS SQUIBB CO 3.250% 02/27/2027 DD 02/27/17	492,235.01	100.8630	504,315.00	12,079.99
400,000.0000	BURLINGTON NORTHERN SANTA FE L 3.250% 06/15/2027 DD 03/09/17	399,014.72	102.1580	408,632.00	9,617.28
450,000.0000	CVS HEALTH CORP 4.750% 12/01/2022 DD 06/01/16	487,962.20	109.6090	493,240.50	5,278.30



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400,000.0000	CHARTER COMMUNICATIONS OPERATI 4.908% 07/23/2025 DD 07/23/16	420,520.81	108.0320	432,128.00	11,607.19
200,000.0000	CITIGROUP INC 2.700% 03/30/2021 DD 03/30/16	202,196.11	100.6640	201,328.00	868.11-
500,000.0000	COMMONWEALTH BANK OF AUSTRALIA 2.300% 09/06/2019 DD 09/08/14	506,189.02	100.6460	503,230.00	2,959.02-
200,000.0000	DAIMLER FINANCE NORTH AME 144A 2.850% 01/06/2022 DD 01/06/17	199,798.18	101.2080	202,416.00	2,617.82
400,000.0000	DELL INTERNATIONAL LLC / 144A 6.020% 06/15/2026 DD 06/01/16	426,448.28	110.1510	440,604.00	14,155.72
200,000.0000	DOW CHEMICAL CO/THE 8.550% 05/15/2019 DD 05/13/09	224,894.70	112.0040	224,008.00	886.70-
800,000.0000	DUKE ENERGY CORP 2.650% 09/01/2026 DD 08/12/16	763,487.88	94.9730	759,784.00	3,703.88-
0.0020	FNMA POOL #0AO9180 3.500% 07/01/2042 DD 06/01/12	0.00	103.2140	0.00	0.00
825,000.0000	FEDEX CORP 3.300% 03/15/2027 DD 01/06/17	832,371.48	100.2180	826,798.50	5,572.98-
200,000.0000	FORD MOTOR CREDIT CO LLC 4.250% 09/20/2022 DD 09/25/12	206,455.01	105.0530	210,106.00	3,650.99
200,000.0000	FORD MOTOR CREDIT CO LLC 2.459% 03/27/2020 DD 03/27/15	201,679.48	100.0870	200,174.00	1,505.48-



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
500,000.0000	GE CAPITAL INTERNATIONAL FUNDI 4.418% 11/15/2035 DD 05/15/16	513,357.62	108.8390	544,195.00	30,837.38
525,000.0000	GENERAL MOTORS FINANCIAL CO IN 3.250% 05/15/2018 DD 11/15/13	529,932.23	101.1720	531,153.00	1,220.77
270,000.0000	GEORGIA-PACIFIC LLC 7.375% 12/01/2025 DD 12/08/95	340,567.63	127.2360	343,537.20	2,969.57
225,000.0000	GEORGIA-PACIFIC LLC 144A 5.400% 11/01/2020 DD 11/02/10	245,185.64	109.3970	246,143.25	957.61
500,000.0000	GOLDMAN SACHS GROUP INC/THE 6.150% 04/01/2018 DD 04/01/08	514,715.78	103.2090	516,045.00	1,329.22
550,000.0000	HCA INC 6.500% 02/15/2020 DD 08/01/11	595,148.72	109.1250	600,187.50	5,038.78
200,000.0000	HSBC HOLDINGS PLC 4.000% 03/30/2022 DD 03/30/12	210,270.36	105.4700	210,940.00	669.64
480,000.0000	HONEYWELL INTERNATIONAL INC 1.850% 11/01/2021 DD 10/31/16	472,121.89	98.3980	472,310.40	188.51
300,000.0000	HYUNDAI CAPITAL AMERICA 144A 2.400% 10/30/2018 DD 10/30/15	302,115.10	100.2090	300,627.00	1,488.10-
1,000,000.0000	INTEL CORP 4.100% 05/11/2047 DD 05/11/17	994,203.93	103.5240	1,035,240.00	41,036.07
500,000.0000	INTERCONTINENTAL EXCHANGE INC 4.000% 10/15/2023 DD 10/08/13	528,498.96	107.2490	536,245.01	7,746.05



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750,000.0000	JPMORGAN CHASE & CO 3.900% 07/15/2025 DD 07/21/15	772,403.14	104.2870	782,152.50	9,749.36
400,000.0000	JOHNSON & JOHNSON 3.625% 03/03/2037 DD 03/03/17	398,995.55	104.5690	418,276.00	19,280.45
520,000.0000	KRAFT HEINZ FOODS CO 5.200% 07/15/2045 DD 07/15/16	601,241.28	108.1830	562,551.60	38,689.68-
400,000.0000	KROGER CO/THE 2.650% 10/15/2026 DD 10/03/16	372,107.41	92.2240	368,896.00	3,211.41-
350,000.0000	L3 TECHNOLOGIES INC 5.200% 10/15/2019 DD 04/15/10	371,795.55	106.7510	373,628.50	1,832.95
500,000.0000	LOCKHEED MARTIN CORP 3.550% 01/15/2026 DD 11/23/15	503,035.26	103.6210	518,105.00	15,069.74
500,000.0000	MCDONALD'S CORP 4.450% 03/01/2047 DD 03/09/17	497,557.55	105.1890	525,945.00	28,387.45
400,000.0000	MICROSOFT CORP 3.300% 02/06/2027 DD 02/06/17	398,628.23	103.0070	412,028.00	13,399.77
0.0130	MINNESOTA ST HSG FIN AGY HOME 3.000% 09/01/2043 DD 07/25/13	0.01	99.9930	0.01	0.00
400,000.0000	MIZUHO FINANCIAL GROUP INC 3.663% 02/28/2027 DD 02/28/17	400,000.00	103.1110	412,444.00	12,444.00
500,000.0000	MORGAN STANLEY 2.375% 07/23/2019 DD 07/23/14	504,488.34	100.6930	503,465.00	1,023.34-



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500,000.0000	NEUBERGER BERMAN CL 23A C 144A VAR RT 10/17/2027 DD 11/29/16	500,000.00	100.0000	500,000.00	0.00
500,000.0000	NEWELL BRANDS INC 4.200% 04/01/2026 DD 03/30/16	532,307.29	106.1790	530,895.00	1,412.29-
250,000.0000	NORFOLK SOUTHERN CORP 2.900% 06/15/2026 DD 06/03/16	240,720.09	98.4110	246,027.50	5,307.41
1,000,000.0000	OAKTREE EIF I SERIES A1 A 144A VAR RT 10/18/2027 DD 01/07/16	999,650.28	99.9650	999,650.28	0.00
450,000.0000	ORACLE CORP 2.800% 07/08/2021 DD 07/08/14	456,723.38	102.7020	462,159.00	5,435.62
225,000.0000	PACIFIC BELL TELEPHONE CO 7.125% 03/15/2026 DD 03/15/93	272,170.47	121.5160	273,411.00	1,240.53
450,000.0000	PACIFICORP 6.000% 01/15/2039 DD 01/08/09	570,925.72	129.8500	584,325.00	13,399.28
225,000.0000	PFIZER INC 2.750% 06/03/2026 DD 06/03/16	217,692.67	98.4310	221,469.75	3,777.08
200,000.0000	PRUDENTIAL FINANCIAL INC 5.750% 07/15/2033 DD 07/07/03	233,135.60	120.8010	241,602.00	8,466.40
650,000.0000	QUALCOMM INC 3.250% 05/20/2027 DD 05/26/17	648,311.40	100.2290	651,488.50	3,177.10
800,000.0000	ROCKWELL COLLINS INC 3.500% 03/15/2027 DD 04/10/17	815,335.45	101.4040	811,232.00	4,103.45-



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400,000.0000	SOUTHWESTERN ELECTRIC POWER CO 3.550% 02/15/2022 DD 02/03/12	415,162.17	103.2350	412,940.00	2,222.17-
750,000.0000	SPIRIT AEROSYSTEMS INC 5.250% 03/15/2022 DD 09/15/14	781,436.12	103.7610	778,207.50	3,228.62-
580,000.0000	SYNCHRONY FINANCIAL 3.750% 08/15/2021 DD 08/11/14	583,846.33	102.7130	595,735.40	11,889.07
3,121,105.7300	US TREAS-CPI INFLAT 3.625% 04/15/2028 DD 04/15/98	4,155,712.10	130.6350	4,077,256.47	78,455.63-
1,377,420.0000	US TREAS-CPI INFLAT 3.375% 04/15/2032 DD 10/15/01	1,939,894.43	137.3860	1,892,382.24	47,512.19-
1,357,435.2000	US TREAS-CPI INFLAT 2.125% 02/15/2040 DD 02/15/10	1,692,354.20	124.3700	1,688,242.16	4,112.04-
2,672,623.5000	US TREAS-CPI INFLAT 0.750% 02/15/2042 DD 02/15/12	2,546,008.53	95.1440	2,542,840.90	3,167.63-
2,115,500.7400	US TREAS-CPI INFLAT 0.750% 02/15/2045 DD 02/15/15	2,053,481.92	93.7820	1,983,958.90	69,523.02-
1,681,963.5000	US TREAS-CPI INFLAT 1.000% 02/15/2046 DD 02/15/16	1,733,763.00	99.9100	1,680,449.73	53,313.27-
740,000.0000	U S TREASURY BOND 3.000% 02/15/2047 DD 02/15/17	761,614.94	103.1560	763,354.40	1,739.46
617,850.7000	US TREAS-CPI INFLAT 0.875% 02/15/2047 DD 02/15/17	605,482.90	97.0440	599,587.03	5,895.87-



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100,000.0000	U S TREASURY NOTE 1.750% 11/30/2021 DD 11/30/16	99,644.67	99.7380	99,738.00	93.33
130,000.0000	U S TREASURY NOTE 2.000% 12/31/2021 DD 12/31/16	130,472.46	100.7230	130,939.90	467.44
4,488,000.0000	U S TREASURY NOTE 2.250% 02/15/2027 DD 02/15/17	4,422,587.24	99.5350	4,467,130.80	44,543.56
740,000.0000	U S TREASURY NOTE 1.875% 03/31/2022 DD 03/31/17	740,027.53	100.0590	740,436.60	409.07
500,000.0000	U S TREASURY NOTE 1.875% 04/30/2022 DD 04/30/17	498,535.79	99.9810	499,905.00	1,369.21
1,000,000.0000	U S TREASURY NOTE 2.375% 05/15/2027 DD 05/15/17	997,026.70	100.6330	1,006,330.00	9,303.30
718,000.0000	UNITED TECHNOLOGIES CORP 4.500% 06/01/2042 DD 06/01/12	799,570.37	109.1950	784,020.10	15,550.27-
490,000.0000	UNITEDHEALTH GROUP INC 2.700% 07/15/2020 DD 07/23/15	505,695.39	102.1050	500,314.50	5,380.89-
600,000.0000	UNITEDHEALTH GROUP INC 4.250% 04/15/2047 DD 03/13/17	630,164.47	106.6050	639,630.00	9,465.53
200,000.0000	VERIZON COMMUNICATIONS INC 4.500% 09/15/2020 DD 09/18/13	216,685.74	106.8240	213,648.00	3,037.74-
500,000.0000	VERIZON COMMUNICATIONS INC 4.125% 03/16/2027 DD 03/16/17	496,798.70	103.2780	516,390.00	19,591.30



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500,000.0000	VISA INC 4.300% 12/14/2045 DD 12/14/15	502,564.61	109.6770	548,385.00	45,820.39
475,000.0000	WALGREEN CO 4.400% 09/15/2042 DD 09/13/12	459,269.22	100.1270	475,603.25	16,334.03
750,000.0000	WELLS FARGO & CO 4.300% 07/22/2027 DD 07/22/15	769,370.28	104.7420	785,565.00	16,194.72
1,830,000.0000	IFL L UL CPURNSA INDEX P 2.775% 2033 JUN 07	0.00	0.0000	0.00	0.00
1,830,000.0000	IFL L UL CPURNSA INDEX P 2.7125% 2033 JUN 10	0.00	0.0000	0.00	0.00
1,830,000.0000	IRS_R US0003M P 6.75% 2038 JUN 19	59,109.00	0.4455	8,153.00	50,956.00-
3,750,000.0000	IRS_R US0003M P 6.75% 2034 JAN 27	99,375.00	0.4845	18,170.00	81,205.00-
4,500,000.0000	IFL L UL CPURNSA INDEX P 196BPS 2038 MAY 23	0.00	3.6622	164,800.00	164,800.00
2,250,000.0000	IFL L UL CPURNSA P 1.775% 2036 JUN 20	0.00	6.6827	150,361.00	150,361.00
5,260,000.0000	IFL L UL CPURNSA P 1.8475% 2038 JUN 28	0.00	5.8526	307,848.00	307,848.00
6,160,000.0000	IFL L UL CPURNSA_INDEX P 2.321% 2037 APR 06	0.00	0.0000	0.00	0.00



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7,900,000.0000	IFL L_UL CPURNSA INDEX P 2.3175% 2037 MAY 03	0.00	0.0000	0.00	0.00
TOTAL INVESTMENTS FIXED INCOME SECURITIES		57,066,048.51		57,712,257.88	646,209.37
TOTAL INVESTMENT		57,834,843.92		58,481,053.29	646,209.37
<u>SHORT FIXED INCOME SECURITIES</u>					
1,830,000.0000-	IFL S UL CPURNSA INDEX P 2.775% 2033 JUN 07	0.00	18.7984	344,011.00-	344,011.00-
1,830,000.0000-	IFL S UL CPURNSA INDEX P 2.7125% 2033 JUN 10	0.00	17.2695	316,033.00-	316,033.00-
1,830,000.0000-	IRS R US0003M P 6.75% 2038 JUN 19	0.00	0.0000	0.00	0.00
3,750,000.0000-	IRS R US0003M P 6.75% 2034 JAN 29	0.00	0.0000	0.00	0.00
4,500,000.0000-	IFL S UL CPURNSA INDEX P 196BPS 2038 MAY 23	0.00	0.0000	0.00	0.00
2,250,000.0000-	IFL S UL CPURNSA P 1.775% 2036 JUN 20	0.00	0.0000	0.00	0.00
5,260,000.0000-	IFL S UL CPURNSA P 1.8475% 2038 JUN 28	0.00	0.0000	0.00	0.00
6,160,000.0000-	IFL L UL CPURNSA INDEX P_2.321% 2037 APR 06	0.00	4.3284	266,633.00-	266,633.00-



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7,900,000.0000-	IFL S_UL CPURNSA INDEX P 2.3175% 2037 MAY 03	0.00	4.2236	333,670.00-	333,670.00-
TOTAL SHORT FIXED INCOME SECURITIES		0.00		1,260,347.00-	1,260,347.00-
TOTAL SHORT INVESTMENT		0.00		1,260,347.00-	1,260,347.00-
TOTAL NET INVESTMENT		57,834,843.92		57,220,706.29	614,137.63-



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
3.2500	BLACKROCK LIQ T FUND INSTL FUND 60	3.25	100.0000	3.25	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		3.25		3.25	0.00
<u>INVESTMENTS ALTERNATIVE INVESTMENTS</u>					
23,947,273.4120	TITAN FUND LP	23,947,273.41	1.0041	24,047,192.00	99,918.59
TOTAL INVESTMENTS ALTERNATIVE INVESTMENTS		23,947,273.41		24,047,192.00	99,918.59
TOTAL INVESTMENT		23,947,276.66		24,047,195.25	99,918.59



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INVESTMENTS ALTERNATIVE INVESTMENTS					
12,290.1400	MAGNITUDE US PARTNERS	12,865,613.65	1,190.8651	14,635,899.00	1,770,285.35
9,741.3000	MAGNITUDE US PARTNERS (SERIES Y)	10,683,350.24	1,206.6467	11,754,308.00	1,070,957.76
9,747.8000	MAGNITUDE US PARTNERS (SERIES X)	10,700,129.24	1,198.4791	11,682,535.00	982,405.76
43.0300	MAGNITUDE US PARTNERS 04/17	43,033.20	1,005.1127	43,250.00	216.80
TOTAL INVESTMENTS ALTERNATIVE INVESTMENTS		34,292,126.33		38,115,992.00	3,823,865.67
TOTAL INVESTMENT		34,292,126.33		38,115,992.00	3,823,865.67



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INVESTMENTS OTHER					
46,149,124.6600	CORE COMMODITY FUND	44,643,000.00	0.7669	35,395,713.22	9,247,286.78-
TOTAL INVESTMENTS OTHER		44,643,000.00		35,395,713.22	9,247,286.78-
TOTAL INVESTMENT		44,643,000.00		35,395,713.22	9,247,286.78-



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INVESTMENTS OTHER					
22,948.7820	MARATHON EAFE	32,684,264.62	1,591.4921	36,522,805.74	3,838,541.12
TOTAL INVESTMENTS OTHER		32,684,264.62		36,522,805.74	3,838,541.12
TOTAL INVESTMENT		32,684,264.62		36,522,805.74	3,838,541.12



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
INVESTMENTS FIXED INCOME SECURITIES					
359,491.0000	ISHARES IBOXX USD HIGH YIELD	31,786,341.57	88.3900	31,775,409.49	10,932.08-
TOTAL INVESTMENTS FIXED INCOME SECURITIES		31,786,341.57		31,775,409.49	10,932.08-
TOTAL INVESTMENT		31,786,341.57		31,775,409.49	10,932.08-



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
INVESTMENTS UNIT OF PARTICIPATION					
29,908,119.3080	PRAIRIE #1 QUALIFIED MTU	298,347,568.65	12.9835	388,313,263.36	89,965,694.71
TOTAL INVESTMENTS UNIT OF PARTICIPATION		298,347,568.65		388,313,263.36	89,965,694.71
TOTAL INVESTMENT		298,347,568.65		388,313,263.36	89,965,694.71



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
481,461.7700	BLACKROCK LIQ T FUND INSTL FUND 60	481,461.77	100.0000	481,461.77	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		481,461.77		481,461.77	0.00
TOTAL INVESTMENT		481,461.77		481,461.77	0.00



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
218,361.7000	BLACKROCK LIQ T FUND INSTL FUND 60	218,361.70	100.0000	218,361.70	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		218,361.70		218,361.70	0.00
<u>INVESTMENTS EQUITY</u>					
439.0000	ADIENT PLC	20,633.00	65.3800	28,701.82	8,068.82
401.0000	AIRCASTLE LTD	4,896.21	21.7500	8,721.75	3,825.54
726.0000	ALLEGION PLC	15,000.95	81.1200	58,893.12	43,892.17
978.0000	ALKERMES PLC	17,198.90	57.9700	56,694.66	39,495.76
1,644.0000	ALLERGAN PLC	369,472.29	243.0900	399,639.96	30,167.67
985.0000	AMDOCS LTD	29,981.22	64.4600	63,493.10	33,511.88
1,851.0000	AON PLC	90,717.51	132.9500	246,090.45	155,372.94
1,403.0000	ARCH CAPITAL GROUP LTD	35,251.56	93.2900	130,885.87	95,634.31
227.0000	ARGO GROUP INTERNATIONAL HOLDI	4,845.28	60.6000	13,756.20	8,910.92
286.0000	ASPEN INSURANCE HOLDINGS LTD	7,107.10	49.8500	14,257.10	7,150.00
737.0000	ARRIS INTERNATIONAL PLC	8,077.52	28.0200	20,650.74	12,573.22



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1,919.0000	ASSURED GUARANTY LTD	26,139.79	41.7400	80,099.06	53,959.27
770.0000	AXIS CAPITAL HOLDINGS LTD	23,669.80	64.6600	49,788.20	26,118.40
3,646.0000	ACCENTURE PLC	155,693.76	123.6800	450,937.28	295,243.52
1,750.0000	BELMOND LTD	14,284.86	13.3000	23,275.00	8,990.14
933.0000	BUNGE LTD	57,873.99	74.6000	69,601.80	11,727.81
227.0000	CARDTRONICS PLC	9,025.52	32.8600	7,459.22	1,566.30-
551.0000	CONSOLIDATED WATER CO LTD	5,052.67	12.4000	6,832.40	1,779.73
1,495.0000	DELPHI AUTOMOTIVE PLC	52,199.52	87.6500	131,036.75	78,837.23
2,412.0000	EATON CORP PLC	124,169.75	77.8300	187,725.96	63,556.21
1,570.0000	ENDO INTERNATIONAL PLC	25,057.20	11.1700	17,536.90	7,520.30-
50.0000	ENSTAR GROUP LTD	5,024.00	198.6500	9,932.50	4,908.50
733.0000	ESSENT GROUP LTD	25,786.94	37.1400	27,223.62	1,436.68
268.0000	EVEREST RE GROUP LTD	24,972.24	254.5900	68,230.12	43,257.88
2,546.0000	FRUIT OF THE LOOM INC CL A	21,603.27	8.4851	21,603.27	0.00
183.0000	HELEN OF TROY LTD	5,927.37	94.1000	17,220.30	11,292.93
653.0000	HERBALIFE LTD	24,980.22	71.3300	46,578.49	21,598.27
1,006.0000	IHS MARKIT LTD	32,976.67	44.0400	44,304.24	11,327.57



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2,177.0000	INGERSOLL-RAND PLC	59,317.31	91.3900	198,956.03	139,638.72
5,916.0000	WEATHERFORD INTERNATIONAL PLC	35,895.57	3.8700	22,894.92	13,000.65-
3,034.0000	INVESCO LTD	75,689.72	35.1900	106,766.46	31,076.74
4,393.0000	JOHNSON CONTROLS INTERNATIONAL	185,690.15	43.3600	190,480.48	4,790.33
719.0000	MALLINCKRODT PLC	31,894.57	44.8100	32,218.39	323.82
2,368.0000	MARVELL TECHNOLOGY GROUP LTD	23,621.38	16.5200	39,119.36	15,497.98
6,639.0000	MEDTRONIC PLC	510,377.41	88.7500	589,211.25	78,833.84
731.0000	MICHAEL KORS HOLDINGS LTD	36,579.24	36.2500	26,498.75	10,080.49-
2,206.0000	NABORS INDUSTRIES LTD	29,667.59	8.1400	17,956.84	11,710.75-
758.0000	NIELSEN HOLDINGS PLC	24,234.23	38.6600	29,304.28	5,070.05
2,489.0000	NOBLE CORP PLC	23,346.82	3.6200	9,010.18	14,336.64-
1,541.0000	NORDIC AMERICAN TANKERS LTD	12,882.76	6.3400	9,769.94	3,112.82-
551.0000	NORWEGIAN CRUISE LINE HOLDINGS	24,194.41	54.2900	29,913.79	5,719.38
1,399.0000	PENTAIR PLC	52,545.31	66.5400	93,089.46	40,544.15
1,284.0000	SHIP FINANCE INTERNATIONAL LTD	13,969.92	13.6000	17,462.40	3,492.48
806.0000	SIGNET JEWELERS LTD	25,872.60	63.2400	50,971.44	25,098.84
2,598.0000	TEXTAINER GROUP HOLDINGS LTD	22,888.38	14.5000	37,671.00	14,782.62



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117.0000	THERAVANCE BIOPHARMA INC	2,294.37	39.8400	4,661.28	2,366.91
294.0000	VALIDUS HOLDINGS LTD	8,822.94	51.9700	15,279.18	6,456.24
1,270.0000	GOLAR LNG LTD	26,109.85	22.2500	28,257.50	2,147.65
12.0000	WHITE MOUNTAINS INSURANCE GROU	4,836.12	868.6300	10,423.56	5,587.44
984.0000	PERRIGO CO PLC	72,628.77	75.5200	74,311.68	1,682.91
2,082.0000	XL GROUP LTD	43,966.30	43.8000	91,191.60	47,225.30
1,918.0000	CHUBB LTD	151,193.68	145.3800	278,838.84	127,645.16
15.0000	GARMIN LTD	471.00	51.0300	765.45	294.45
1,592.0000	TRANSOCEAN LTD	24,453.12	8.2300	13,102.16	11,350.96-
150.0000	CIMPRESS NV	5,083.50	94.5300	14,179.50	9,096.00
4,030.0000	FRANK'S INTERNATIONAL NV	32,305.45	8.2900	33,408.70	1,103.25
1,497.0000	LYONDELLBASELL INDUSTRIES NV	68,057.05	84.3900	126,331.83	58,274.78
2,493.0000	MYLAN NV	110,386.50	38.8200	96,778.26	13,608.24-
351.0000	WRIGHT MEDICAL GROUP NV	7,427.16	27.4900	9,648.99	2,221.83
806.0000	BANCO LATINOAMERICANO DE COMER	13,677.82	27.3800	22,068.28	8,390.46
4,376.0000	TRONOX LTD	24,243.04	15.1200	66,165.12	41,922.08
919.0000	ROYAL CARIBBEAN CRUISES LTD	24,280.67	109.2300	100,382.37	76,101.70



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1,820.0000	BROADCOM LTD	106,863.18	233.0500	424,151.00	317,287.82
1,000.0000	SCORPIO TANKERS INC	4,960.00	3.9700	3,970.00	990.00-
1,748.0000	TEEKAY TANKERS LTD	5,611.08	1.8800	3,286.24	2,324.84-
316.0000	ABM INDUSTRIES INC	7,223.76	41.5200	13,120.32	5,896.56
2,665.0000	AFLAC INC	122,470.34	77.6800	207,017.20	84,546.86
589.0000	AGCO CORP	26,884.93	67.3900	39,692.71	12,807.78
2,036.0000	AES CORP/VA	25,426.81	11.1100	22,619.96	2,806.85-
299.0000	AMAG PHARMACEUTICALS INC	5,142.80	18.4000	5,501.60	358.80
29,769.0000	AT&T INC	926,957.64	37.7300	1,123,184.37	196,226.73
841.0000	AVX CORP	10,024.72	16.3400	13,741.94	3,717.22
477.0000	AARON'S INC	12,883.77	38.9000	18,555.30	5,671.53
9,877.0000	ABBOTT LABORATORIES	260,700.77	48.6100	480,120.97	219,420.20
10,535.0000	ABBVIE INC	283,915.97	72.5100	763,892.85	479,976.88
340.0000	ABIOMED INC	24,595.60	143.3000	48,722.00	24,126.40
667.0000	ACADIA HEALTHCARE CO INC	23,084.87	49.3800	32,936.46	9,851.59
751.0000	ACADIA PHARMACEUTICALS INC	25,579.06	27.8900	20,945.39	4,633.67-
244.0000	ACADIA REALTY TRUST	4,926.36	27.8000	6,783.20	1,856.84



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492.0000	ACI WORLDWIDE INC	5,180.76	22.3700	11,006.04	5,825.28
2,631.0000	ACTIVISION BLIZZARD INC	50,380.88	57.5700	151,466.67	101,085.79
258.0000	ACUITY BRANDS INC	14,107.44	203.2800	52,446.24	38,338.80
1,839.0000	ACTUA CORP	26,036.04	14.0500	25,837.95	198.09-
1,265.0000	ACXIOM CORP	16,031.23	25.9800	32,864.70	16,833.47
2,875.0000	ADOBE SYSTEMS INC	109,521.11	141.4400	406,640.00	297,118.89
539.0000	ADVANCE AUTO PARTS INC	33,342.65	116.5900	62,842.01	29,499.36
1,727.0000	AECOM	37,093.97	32.3300	55,833.91	18,739.94
592.0000	AEGION CORP	10,290.00	21.8800	12,952.96	2,662.96
183.0000	ADVANSIX INC	1,021.53	31.2400	5,716.92	4,695.39
781.0000	AEROJET ROCKETDYNE HOLDINGS IN	4,904.68	20.8000	16,244.80	11,340.12
4,445.0000	ADVANCED MICRO DEVICES INC	53,486.74	12.4800	55,473.60	1,986.86
2,256.0000	AETNA INC	88,492.72	151.8300	342,528.48	254,035.76
470.0000	AFFILIATED MANAGERS GROUP INC	56,659.08	165.8600	77,954.20	21,295.12
2,375.0000	AGILENT TECHNOLOGIES INC	53,797.96	59.3100	140,861.25	87,063.29
333.0000	AGREE REALTY CORP	9,813.51	45.8700	15,274.71	5,461.20
195.0000	AIR LEASE CORP	4,655.27	37.3600	7,285.20	2,629.93



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1,382.0000	AIR PRODUCTS & CHEMICALS INC	86,407.60	143.0600	197,708.92	111,301.32
1,096.0000	AKAMAI TECHNOLOGIES INC	36,166.27	49.8100	54,591.76	18,425.49
146.0000	ALAMO GROUP INC	4,950.86	90.8100	13,258.26	8,307.40
856.0000	ALASKA AIR GROUP INC	14,338.00	89.7600	76,834.56	62,496.56
197.0000	ALBANY INTERNATIONAL CORP	4,873.78	53.4000	10,519.80	5,646.02
536.0000	ALBEMARLE CORP	51,466.36	105.5400	56,569.44	5,103.08
648.0000	ALCOA CORP	12,757.49	32.6500	21,157.20	8,399.71
392.0000	ALERE INC	10,043.04	50.1900	19,674.48	9,631.44
571.0000	ALEXANDER & BALDWIN INC	8,493.22	41.3800	23,627.98	15,134.76
47.0000	ALEXANDER'S INC	15,356.77	421.4600	19,808.62	4,451.85
357.0000	ALEXANDRIA REAL ESTATE EQUITIE	25,139.94	120.4700	43,007.79	17,867.85
1,153.0000	ALEXION PHARMACEUTICALS INC	95,064.09	121.6700	140,285.51	45,221.42
365.0000	ALIGN TECHNOLOGY INC	8,066.50	150.1200	54,793.80	46,727.30
98.0000	ALLEGHANY CORP	28,633.04	594.8000	58,290.40	29,657.36
107.0000	ALLEGiant TRAVEL CO	4,872.78	135.6000	14,509.20	9,636.42
107.0000	ALLETE INC	5,077.15	71.6800	7,669.76	2,592.61
288.0000	ALLIANCE DATA SYSTEMS CORP	44,856.17	256.6900	73,926.72	29,070.55



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1,340.0000	ALLIANT ENERGY CORP	30,649.35	40.1700	53,827.80	23,178.45
393.0000	ALLSCRIPTS HEALTHCARE SOLUTION	4,943.94	12.7600	5,014.68	70.74
2,169.0000	ALLSTATE CORP/THE	81,166.87	88.4400	191,826.36	110,659.49
1,044.0000	ALLY FINANCIAL INC	23,416.92	20.9000	21,819.60	1,597.32-
354.0000	ALMOST FAMILY INC	5,200.26	61.6500	21,824.10	16,623.84
820.0000	ALNYLAM PHARMACEUTICALS INC	28,138.84	79.7600	65,403.20	37,264.36
587.0000	ALON USA ENERGY INC	5,165.60	13.3200	7,818.84	2,653.24
1,380.0000	ALPHABET INC-CL C	294,608.32	908.7300	1,254,047.40	959,439.08
1,640.0000	ALPHABET INC-CL A	577,977.87	929.6800	1,524,675.20	946,697.33
2,384.0000	ALTISOURCE RESIDENTIAL CORP	22,290.40	12.9400	30,848.96	8,558.56
11,116.0000	ALTRIA GROUP INC	189,729.51	74.4700	827,808.52	638,079.01
2,005.0000	AMAZON.COM INC	296,454.21	968.0000	1,940,840.00	1,644,385.79
53.0000	AMERCO	5,074.22	366.0600	19,401.18	14,326.96
1,085.0000	AMEREN CORP	33,801.46	54.6700	59,316.95	25,515.49
2,792.0000	AMERICAN AIRLINES GROUP INC	120,221.18	50.3200	140,493.44	20,272.26
227.0000	AMERICAN ASSETS TRUST INC	5,077.99	39.3900	8,941.53	3,863.54
1,028.0000	AMERICAN AXLE & MANUFACTURING	10,248.04	15.6000	16,036.80	5,788.76



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405.0000	AMERICAN CAMPUS COMMUNITIES IN	14,021.10	47.3000	19,156.50	5,135.40
2,728.0000	AMERICAN ELECTRIC POWER CO INC	100,427.23	69.4700	189,514.16	89,086.93
401.0000	AMERICAN EQUITY INVESTMENT LIF	4,944.33	26.2800	10,538.28	5,593.95
3,114.0000	AMERICAN EXPRESS CO	179,969.31	84.2400	262,323.36	82,354.05
144.0000	AMERICAN FINANCIAL GROUP INC/O	4,982.40	99.3700	14,309.28	9,326.88
2,898.0000	AMERICAN HOMES 4 RENT	41,120.51	22.5700	65,407.86	24,287.35
7,450.0000	AMERICAN INTERNATIONAL GROUP I	263,625.72	62.5200	465,774.00	202,148.28
604.0000	AMERICAN SOFTWARE INC/GA	5,031.32	10.2900	6,215.16	1,183.84
2,286.0000	AMERICAN TOWER CORP	101,514.18	132.3200	302,483.52	200,969.34
1,132.0000	AMERICAN WATER WORKS CO INC	28,899.96	77.9500	88,239.40	59,339.44
1,128.0000	AMERISOURCEBERGEN CORP	37,000.21	94.5300	106,629.84	69,629.63
1,601.0000	AMERIPRISE FINANCIAL INC	74,763.02	127.2900	203,791.29	129,028.27
572.0000	AMERIS BANCORP	5,119.40	48.2000	27,570.40	22,451.00
1,432.0000	AMETEK INC	40,601.97	60.5700	86,736.24	46,134.27
4,375.0000	AMGEN INC	241,930.67	172.2300	753,506.25	511,575.58
1,906.0000	AMPHENOL CORP	31,153.95	73.8200	140,700.92	109,546.97
276.0000	AMTRUST FINANCIAL SERVICES INC	2,515.93	15.1400	4,178.64	1,662.71



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3,025.0000	ANADARKO PETROLEUM CORP	133,976.38	45.3400	137,153.50	3,177.12
1,849.0000	ANALOG DEVICES INC	88,349.26	77.8000	143,852.20	55,502.94
187.0000	ANDERSONS INC/THE	4,965.47	34.1500	6,386.05	1,420.58
173.0000	ANIXTER INTERNATIONAL INC	10,578.95	78.2000	13,528.60	2,949.65
3,252.0000	ANNALY CAPITAL MANAGEMENT INC	34,064.88	12.0500	39,186.60	5,121.72
547.0000	ANSYS INC	29,023.82	121.6800	66,558.96	37,535.14
919.0000	ANTERO RESOURCES CORP	23,792.91	21.6100	19,859.59	3,933.32-
1,049.0000	ANTHEM INC	74,649.18	188.1300	197,348.37	122,699.19
4,254.0000	ANWORTH MORTGAGE ASSET CORP	21,652.86	6.0100	25,566.54	3,913.68
1,754.0000	APACHE CORP	101,713.00	47.9300	84,069.22	17,643.78-
759.0000	APARTMENT INVESTMENT & MANAGEM	18,982.59	42.9700	32,614.23	13,631.64
3,394.0000	APOLLO COMMERCIAL REAL ESTATE	55,584.48	18.5500	62,958.70	7,374.22
29,308.0000	APPLE INC	328,614.55	144.0200	4,220,938.16	3,892,323.61
146.0000	APPLIED INDUSTRIAL TECHNOLOGIE	4,991.74	59.0500	8,621.30	3,629.56
5,581.0000	APPLIED MATERIALS INC	74,267.78	41.3100	230,551.11	156,283.33
1,028.0000	AQUA AMERICA INC	17,632.26	33.3000	34,232.40	16,600.14
688.0000	ARAMARK	25,504.16	40.9800	28,194.24	2,690.08



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3,793.0000	ARCHER-DANIELS-MIDLAND CO	118,389.01	41.3800	156,954.34	38,565.33
1,945.0000	ARCONIC INC	38,107.47	22.6500	44,054.25	5,946.78
195.0000	ARISTA NETWORKS INC	25,683.45	149.7900	29,209.05	3,525.60
5.0000	ARMSTRONG FLOORING INC	56.42	17.9700	89.85	33.43
10.0000	ARMSTRONG WORLD INDUSTRIES INC	383.68	46.0000	460.00	76.32
789.0000	ARROW ELECTRONICS INC	26,447.28	78.4200	61,873.38	35,426.10
236.0000	ARROW FINANCIAL CORP	4,975.44	31.6500	7,469.40	2,493.96
224.0000	ARTESIAN RESOURCES CORP	5,028.80	37.6400	8,431.36	3,402.56
294.0000	ASBURY AUTOMOTIVE GROUP INC	5,092.08	56.5500	16,625.70	11,533.62
37.0000	ASHFORD HOSPITALITY PRIME INC	573.50	10.2900	380.73	192.77-
579.0000	ASHLAND GLOBAL HOLDINGS INC	15,946.99	65.9100	38,161.89	22,214.90
504.0000	ASPEN TECHNOLOGY INC	7,791.84	55.2600	27,851.04	20,059.20
2,277.0000	ASSOCIATED BANC-CORP	24,295.59	25.2000	57,380.40	33,084.81
109.0000	ASSOCIATED CAPITAL GROUP INC	2,270.59	34.0000	3,706.00	1,435.41
342.0000	ASSURANT INC	10,105.19	103.6900	35,461.98	25,356.79
142.0000	ASTEC INDUSTRIES INC	4,979.94	55.5100	7,882.42	2,902.48
133.0000	ASTERIAS BIOTHERAPEUTICS INC	478.79	3.5500	472.15	6.64-



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208.0000	ATHENAHEALTH INC	8,540.48	140.5500	29,234.40	20,693.92
5,454.0000	ATLANTIC POWER CORP	16,580.71	2.4000	13,089.60	3,491.11-
538.0000	ATMOS ENERGY CORP	17,382.78	82.9500	44,627.10	27,244.32
14.0000	ATRION CORP	3,289.44	643.3000	9,006.20	5,716.76
1,560.0000	AUTODESK INC	53,912.82	100.8200	157,279.20	103,366.38
2,789.0000	AUTOMATIC DATA PROCESSING INC	105,255.76	102.4600	285,760.94	180,505.18
529.0000	AUTONATION INC	11,207.50	42.1600	22,302.64	11,095.14
56.0000	AUTOZONE INC	43,052.79	570.4600	31,945.76	11,107.03-
735.0000	AVALONBAY COMMUNITIES INC	99,553.02	192.1700	141,244.95	41,691.93
495.0000	AVANGRID INC	19,181.25	44.1500	21,854.25	2,673.00
640.0000	AVERY DENNISON CORP	18,284.80	88.3700	56,556.80	38,272.00
708.0000	AVIS BUDGET GROUP INC	15,452.38	27.2700	19,307.16	3,854.78
365.0000	AVISTA CORP	9,993.70	42.4600	15,497.90	5,504.20
647.0000	AVNET INC	22,749.55	38.8800	25,155.36	2,405.81
3,866.0000	BB&T CORP	116,678.85	45.4100	175,555.06	58,876.21
481.0000	B&G FOODS INC	19,661.22	35.6000	17,123.60	2,537.62-
3,137.0000	BGC PARTNERS INC	10,728.54	12.6400	39,651.68	28,923.14



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192.0000	BOK FINANCIAL CORP	10,043.52	84.1300	16,152.96	6,109.44
630.0000	BWX TECHNOLOGIES INC	11,904.08	48.7500	30,712.50	18,808.42
315.0000	BABCOCK & WILCOX ENTERPRISES I	4,384.63	11.7600	3,704.40	680.23-
2,132.0000	BAKER HUGHES INC	110,564.94	54.5100	116,215.32	5,650.38
122.0000	BALCHEM CORP	5,055.68	77.7100	9,480.62	4,424.94
1,704.0000	BALL CORP	38,305.92	42.2100	71,925.84	33,619.92
132.0000	BANCFIRST CORP	5,043.72	96.6000	12,751.20	7,707.48
48,794.0000	BANK OF AMERICA CORP	628,432.41	24.2600	1,183,742.44	555,310.03
324.0000	BANK OF HAWAII CORP	14,878.08	82.9700	26,882.28	12,004.20
1,382.0000	BANK MUTUAL CORP	4,906.10	9.1500	12,645.30	7,739.20
42.0000	BANK OF THE OZARKS INC	527.10	46.8700	1,968.54	1,441.44
3,372.0000	BANK OF NEW YORK MELLON CORP/T	101,253.70	51.0200	172,039.44	70,785.74
766.0000	CR BARD INC	57,514.19	316.1100	242,140.26	184,626.07
171.0000	BARNES & NOBLE EDUCATION INC	1,543.48	10.6300	1,817.73	274.25
271.0000	BARNES & NOBLE INC	3,134.23	7.6000	2,059.60	1,074.63-
209.0000	BARNES GROUP INC	4,903.14	58.5300	12,232.77	7,329.63
3,403.0000	BAXTER INTERNATIONAL INC	83,185.00	60.5400	206,017.62	122,832.62



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274.0000	BEACON ROOFING SUPPLY INC	6,088.28	49.0000	13,426.00	7,337.72
2,340.0000	BEAZER HOMES USA INC	34,848.45	13.7200	32,104.80	2,743.65-
1,428.0000	BECTON DICKINSON AND CO	99,915.23	195.1100	278,617.08	178,701.85
1,565.0000	BED BATH & BEYOND INC	60,487.87	30.4000	47,576.00	12,911.87-
282.0000	BELDEN INC	9,145.26	75.4300	21,271.26	12,126.00
674.0000	BEMIS CO INC	22,290.46	46.2500	31,172.50	8,882.04
703.0000	BENCHMARK ELECTRONICS INC	10,258.48	32.3000	22,706.90	12,448.42
675.0000	BENEFICIAL BANCORP INC	5,001.59	15.0000	10,125.00	5,123.41
782.0000	WR BERKLEY CORP	21,364.24	69.1700	54,090.94	32,726.70
9,435.0000	BERKSHIRE HATHAWAY INC	855,254.77	169.3700	1,598,005.95	742,751.18
233.0000	BERKSHIRE HILLS BANCORP INC	5,063.09	35.1500	8,189.95	3,126.86
954.0000	BERRY GLOBAL GROUP INC	15,006.42	57.0100	54,387.54	39,381.12
1,450.0000	BEST BUY CO INC	17,574.00	57.3300	83,128.50	65,554.50
517.0000	BIG LOTS INC	10,407.37	48.3000	24,971.10	14,563.73
1,228.0000	BIOMARIN PHARMACEUTICAL INC	30,086.00	90.8200	111,526.96	81,440.96
974.0000	BIOGEN INC	86,875.66	271.3600	264,304.64	177,428.98
203.0000	BIO-TECHNE CORP	14,837.10	117.5000	23,852.50	9,015.40



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417.0000	BIOVERATIV INC	4,111.01	60.1700	25,090.89	20,979.88
355.0000	BLACK HILLS CORP	16,726.07	67.4700	23,951.85	7,225.78
188.0000	BLACKBAUD INC	4,998.92	85.7500	16,121.00	11,122.08
229.0000	BLACKHAWK NETWORK HOLDINGS INC	5,415.84	43.6000	9,984.40	4,568.56
619.0000	BLACKROCK INC	121,096.16	422.4100	261,471.79	140,375.63
1,502.0000	H&R BLOCK INC	22,412.96	30.9100	46,426.82	24,013.86
846.0000	BLOOMIN' BRANDS INC	13,375.26	21.2300	17,960.58	4,585.32
239.0000	BLUEBIRD BIO INC	27,009.39	105.0500	25,106.95	1,902.44-
2,183.0000	BLUEROCK RESIDENTIAL GROWTH RE	28,060.72	12.8900	28,138.87	78.15
3,360.0000	BOEING CO/THE	263,675.92	197.7500	664,440.00	400,764.08
1,633.0000	BORGWARNER INC	59,852.80	42.3600	69,173.88	9,321.08
58.0000	BOSTON BEER CO INC/THE	5,150.40	132.1500	7,664.70	2,514.30
772.0000	BOSTON PRIVATE FINANCIAL HOLDI	4,701.48	15.3500	11,850.20	7,148.72
242.0000	BOSTON PROPERTIES INC	30,149.24	123.0200	29,770.84	378.40-
7,377.0000	BOSTON SCIENTIFIC CORP	53,585.00	27.7200	204,490.44	150,905.44
216.0000	BOTTOMLINE TECHNOLOGIES DE INC	5,080.32	25.6900	5,549.04	468.72
3,821.0000	BOX INC	49,481.95	18.2400	69,695.04	20,213.09



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1,128.0000	BOYD GAMING CORP	7,185.36	24.8100	27,985.68	20,800.32
2,159.0000	BRANDYWINE REALTY TRUST	21,629.15	17.5300	37,847.27	16,218.12
711.0000	BRINKER INTERNATIONAL INC	14,994.99	38.1000	27,089.10	12,094.11
9,844.0000	BRISTOL-MYERS SQUIBB CO	251,898.47	55.7200	548,507.68	296,609.21
685.0000	BROADRIDGE FINANCIAL SOLUTIONS	14,727.50	75.5600	51,758.60	37,031.10
3,818.0000	BROCADE COMMUNICATIONS SYSTEMS	20,708.78	12.6100	48,144.98	27,436.20
548.0000	BROOKLINE BANCORP INC	5,025.16	14.6000	8,000.80	2,975.64
691.0000	BROWN & BROWN INC	17,406.29	43.0700	29,761.37	12,355.08
1,054.0000	BROWN-FORMAN CORP	21,093.97	48.6000	51,224.40	30,130.43
50.0000	BRUNOS INC NEW	500.00	10.0000	500.00	0.00
903.0000	BRUNSWICK CORP/DE	20,341.83	62.7300	56,645.19	36,303.36
248.0000	BRYN MAWR BANK CORP	4,915.36	42.5000	10,540.00	5,624.64
272.0000	BUFFALO WILD WINGS INC	18,822.40	126.7000	34,462.40	15,640.00
1,675.0000	CBS CORP	46,612.44	63.7800	106,831.50	60,219.06
314.0000	CBOE HOLDINGS INC	7,570.54	91.4000	28,699.60	21,129.06
1,423.0000	CBRE GROUP INC	32,425.28	36.4000	51,797.20	19,371.92
929.0000	CDK GLOBAL INC	14,738.35	62.0600	57,653.74	42,915.39



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448.0000	CDW CORP/DE	25,831.68	62.5300	28,013.44	2,181.76
2,259.0000	CF INDUSTRIES HOLDINGS INC	77,937.85	27.9600	63,161.64	14,776.21-
407.0000	CH ROBINSON WORLDWIDE INC	28,978.80	68.6800	27,952.76	1,026.04-
1,820.0000	CIGNA CORP	69,943.43	167.3900	304,649.80	234,706.37
1,488.0000	CIT GROUP INC	52,677.93	48.7000	72,465.60	19,787.67
1,753.0000	CME GROUP INC	103,678.37	125.2400	219,545.72	115,867.35
1,589.0000	CMS ENERGY CORP	30,429.35	46.2500	73,491.25	43,061.90
209.0000	CSS INDUSTRIES INC	5,032.72	26.1600	5,467.44	434.72
2,691.0000	CNO FINANCIAL GROUP INC	17,478.63	20.8800	56,188.08	38,709.45
6,933.0000	CSX CORP	74,784.19	54.5600	378,264.48	303,480.29
832.0000	CSRA INC	20,359.21	31.7500	26,416.00	6,056.79
651.0000	CU BANCORP	25,721.01	36.1500	23,533.65	2,187.36-
554.0000	CVB FINANCIAL CORP	4,875.20	22.4300	12,426.22	7,551.02
7,051.0000	CVS HEALTH CORP	234,551.31	80.4600	567,323.46	332,772.15
929.0000	CA INC	21,984.69	34.4700	32,022.63	10,037.94
258.0000	CABELA'S INC	6,764.76	59.4200	15,330.36	8,565.60
12.0000	CABLE ONE INC	1,876.41	710.9000	8,530.80	6,654.39



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391.0000	CABOT CORP	15,030.04	53.4300	20,891.13	5,861.09
2,485.0000	CABOT OIL & GAS CORP	38,182.03	25.0800	62,323.80	24,141.77
1,601.0000	CADENCE DESIGN SYSTEMS INC	16,346.21	33.4900	53,617.49	37,271.28
246.0000	CALATLANTIC GROUP INC	10,049.10	35.3500	8,696.10	1,353.00-
488.0000	CALERES INC	5,016.64	27.7800	13,556.64	8,540.00
290.0000	CALGON CARBON CORP	5,060.50	15.1000	4,379.00	681.50-
279.0000	CALIFORNIA WATER SERVICE GROUP	5,091.75	36.8000	10,267.20	5,175.45
781.0000	CALLAWAY GOLF CO	4,810.96	12.7800	9,981.18	5,170.22
2,682.0000	CALPINE CORP	34,981.41	13.5300	36,287.46	1,306.05
428.0000	CAMDEN PROPERTY TRUST	22,136.16	85.5100	36,598.28	14,462.12
441.0000	CAMPBELL SOUP CO	14,893.76	52.1500	22,998.15	8,104.39
478.0000	CANADIAN IMPERIAL BANK OF COMM	11,343.33	81.1600	38,794.48	27,451.15
2,057.0000	CAPITAL ONE FINANCIAL CORP	107,744.99	82.6200	169,949.34	62,204.35
997.0000	CAPITOL FEDERAL FINANCIAL INC	11,764.60	14.2100	14,167.37	2,402.77
2,234.0000	CARDINAL HEALTH INC	105,930.77	77.9200	174,073.28	68,142.51
119.0000	CARE CAPITAL PROPERTIES INC	2,318.65	26.7000	3,177.30	858.65
1,851.0000	CARETRUST REIT INC	21,249.48	18.5400	34,317.54	13,068.06



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181.0000	CARLISLE COS INC	9,945.69	95.4000	17,267.40	7,321.71
1,537.0000	CARMAX INC	40,100.33	63.0600	96,923.22	56,822.89
1,387.0000	CARNIVAL CORP	53,900.31	65.5700	90,945.59	37,045.28
666.0000	CARS.COM INC	7,934.63	26.6300	17,735.58	9,800.95
542.0000	CARTER'S INC	22,250.67	88.9500	48,210.90	25,960.23
113.0000	CASEY'S GENERAL STORES INC	4,901.94	107.1100	12,103.43	7,201.49
3,205.0000	CATERPILLAR INC	200,099.37	107.4600	344,409.30	144,309.93
471.0000	CATHAY GENERAL BANCORP	6,579.87	37.9500	17,874.45	11,294.58
467.0000	CAVIUM INC	13,954.43	62.1300	29,014.71	15,060.28
1,122.0000	CELANESE CORP	36,431.34	94.9400	106,522.68	70,091.34
5,273.0000	CELGENE CORP	143,276.50	129.8700	684,804.51	541,528.01
947.0000	CENTENE CORP	25,112.18	79.8800	75,646.36	50,534.18
3,850.0000	CENTERPOINT ENERGY INC	55,009.40	27.3800	105,413.00	50,403.60
794.0000	CENTERSTATE BANKS INC	5,065.72	24.8600	19,738.84	14,673.12
1,057.0000	CENTRAL GARDEN & PET CO	22,123.01	30.0200	31,731.14	9,608.13
371.0000	CENTRAL PACIFIC FINANCIAL CORP	4,889.59	31.4700	11,675.37	6,785.78
659.0000	CENTURY ALUMINUM CO	4,751.39	15.5800	10,267.22	5,515.83



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2,395.0000	CENTURYLINK INC	66,759.06	23.8800	57,192.60	9,566.46-
1,633.0000	CERNER CORP	45,747.40	66.4700	108,545.51	62,798.11
1,130.0000	CHARTER COMMUNICATIONS INC	66,921.55	336.8500	380,640.50	313,718.95
608.0000	CHATHAM LODGING TRUST	10,019.84	20.0900	12,214.72	2,194.88
166.0000	CHEESECAKE FACTORY INC/THE	5,132.72	50.3000	8,349.80	3,217.08
272.0000	CHEMICAL FINANCIAL CORP	4,972.16	48.4100	13,167.52	8,195.36
1,072.0000	CHEMOURS CO/THE	11,221.47	37.9200	40,650.24	29,428.77
966.0000	CHENIERE ENERGY INC	22,907.61	48.7100	47,053.86	24,146.25
5,212.0000	CHESAPEAKE ENERGY CORP	23,558.24	4.9700	25,903.64	2,345.40
366.0000	CHESAPEAKE UTILITIES CORP	13,240.44	74.9500	27,431.70	14,191.26
10,093.0000	CHEVRON CORP	653,547.59	104.3300	1,053,002.69	399,455.10
586.0000	CHICAGO BRIDGE & IRON CO NV	20,427.96	19.7300	11,561.78	8,866.18-
1,205.0000	CHICO'S FAS INC	14,508.20	9.4200	11,351.10	3,157.10-
248.0000	CHILDREN'S PLACE INC/THE	15,214.32	102.1000	25,320.80	10,106.48
2,436.0000	CHIMERA INVESTMENT CORP	32,886.00	18.6300	45,382.68	12,496.68
214.0000	CHIPOTLE MEXICAN GRILL INC	58,373.12	416.1000	89,045.40	30,672.28
1,672.0000	CHURCH & DWIGHT CO INC	41,186.43	51.8800	86,743.36	45,556.93



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115.0000	CHURCHILL DOWNS INC	4,940.40	183.3000	21,079.50	16,139.10
1,727.0000	CIENA CORP	25,278.11	25.0200	43,209.54	17,931.43
608.0000	CIMAREX ENERGY CO	36,698.88	94.0100	57,158.08	20,459.20
328.0000	CINCINNATI BELL INC	5,100.40	19.5500	6,412.40	1,312.00
607.0000	CINCINNATI FINANCIAL CORP	17,080.98	72.4500	43,977.15	26,896.17
553.0000	CINEMARK HOLDINGS INC	11,082.12	38.8500	21,484.05	10,401.93
23,495.0000	CISCO SYSTEMS INC	582,814.78	31.3000	735,393.50	152,578.72
266.0000	CIRRUS LOGIC INC	3,777.20	62.7200	16,683.52	12,906.32
753.0000	CINTAS CORP	26,575.77	126.0400	94,908.12	68,332.35
13,324.0000	CITIGROUP INC	551,708.89	66.8800	891,109.12	339,400.23
786.0000	CITIZENS FINANCIAL GROUP INC	26,716.14	35.6800	28,044.48	1,328.34
1,336.0000	CITRIX SYSTEMS INC	39,401.13	79.5800	106,318.88	66,917.75
156.0000	CITY HOLDING CO	4,907.76	65.8700	10,275.72	5,367.96
146.0000	CLEARWATER PAPER CORP	5,212.20	46.7500	6,825.50	1,613.30
1,068.0000	CLOROX CO/THE	68,030.53	133.2400	142,300.32	74,269.79
307.0000	CLOVIS ONCOLOGY INC	27,227.83	93.6300	28,744.41	1,516.58
1,233.0000	COACH INC	41,395.73	47.3400	58,370.22	16,974.49



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795.0000	COBIZ FINANCIAL INC	4,984.65	17.4000	13,833.00	8,848.35
158.0000	COCA-COLA BOTTLING CO CONSOLID	9,996.66	228.8700	36,161.46	26,164.80
19,793.0000	COCA-COLA CO/THE	475,130.46	44.8500	887,716.05	412,585.59
6,419.0000	COEUR MINING INC	80,209.52	8.5800	55,075.02	25,134.50-
560.0000	COGENT COMMUNICATIONS HOLDINGS	15,031.20	40.1000	22,456.00	7,424.80
300.0000	COGNEX CORP	5,055.00	84.9000	25,470.00	20,415.00
3,947.0000	COGNIZANT TECHNOLOGY SOLUTIONS	80,491.66	66.4000	262,080.80	181,589.14
97.0000	COHERENT INC	5,028.48	224.9900	21,824.03	16,795.55
631.0000	COLFAX CORP	24,691.03	39.3700	24,842.47	151.44
5,123.0000	COLGATE-PALMOLIVE CO	160,496.40	74.1300	379,767.99	219,271.59
5,165.0000	COLONY NORTHSTAR INC	50,296.36	14.0900	72,774.85	22,478.49
761.0000	COLONY STARWOOD HOMES	25,820.73	34.3100	26,109.91	289.18
529.0000	COLUMBIA BANKING SYSTEM INC	9,517.21	39.8500	21,080.65	11,563.44
27,216.0000	COMCAST CORP	333,302.56	38.9200	1,059,246.72	725,944.16
426.0000	COMERICA INC	14,809.16	73.2400	31,200.24	16,391.08
1,032.0000	COMMERCE BANCSHARES INC/MO	28,806.51	56.8300	58,648.56	29,842.05
91.0000	COMMERCEHUB INC	330.72	17.4200	1,585.22	1,254.50



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183.0000	COMMERCEHUB INC	670.45	17.4400	3,191.52	2,521.07
1,375.0000	COMMERCIAL METALS CO	19,717.50	19.4300	26,716.25	6,998.75
219.0000	COMMUNITY BANK SYSTEM INC	5,315.13	55.7700	12,213.63	6,898.50
205.0000	COMMUNITY TRUST BANCORP INC	5,029.95	43.7500	8,968.75	3,938.80
2,257.0000	CONAGRA BRANDS INC	42,856.92	35.7600	80,710.32	37,853.40
697.0000	CONCHO RESOURCES INC	36,369.46	121.5300	84,706.41	48,336.95
1,288.0000	CONDUENT INC	15,504.48	15.9400	20,530.72	5,026.24
170.0000	CONNECTICUT WATER SERVICE INC	5,026.90	55.5100	9,436.70	4,409.80
6,791.0000	CONOCOPHILLIPS	307,354.24	43.9600	298,532.36	8,821.88-
1,637.0000	CONSOL ENERGY INC	23,425.47	14.9400	24,456.78	1,031.31
306.0000	CONSOLIDATED COMMUNICATIONS HO	5,055.12	21.4700	6,569.82	1,514.70
1,483.0000	CONSOLIDATED EDISON INC	73,093.39	80.8200	119,856.06	46,762.67
789.0000	CONSTELLATION BRANDS INC	33,960.30	193.7300	152,852.97	118,892.67
514.0000	CONTINENTAL RESOURCES INC/OK	20,103.78	32.3300	16,617.62	3,486.16-
1,136.0000	CONVERGYS CORP	14,972.48	23.7800	27,014.08	12,041.60
92.0000	COOPER COS INC/THE	6,992.92	239.4200	22,026.64	15,033.72
364.0000	COOPER TIRE & RUBBER CO	6,329.96	36.1000	13,140.40	6,810.44



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440.0000	COPART INC	4,946.70	31.7900	13,987.60	9,040.90
558.0000	CORE-MARK HOLDING CO INC	25,235.55	33.0600	18,447.48	6,788.07-
263.0000	CORESITE REALTY CORP	22,139.34	103.5300	27,228.39	5,089.05
192.0000	CORELOGIC INC/UNITED STATES	5,018.88	43.3800	8,328.96	3,310.08
991.0000	CORECIVIC INC	23,230.29	27.5800	27,331.78	4,101.49
4,480.0000	CORNING INC	55,819.66	30.0500	134,624.00	78,804.34
1,028.0000	CORPORATE OFFICE PROPERTIES TR	22,338.44	35.0300	36,010.84	13,672.40
2,572.0000	COSTCO WHOLESALE CORP	128,783.64	159.9300	411,339.96	282,556.32
88.0000	COSTAR GROUP INC	4,916.56	263.6000	23,196.80	18,280.24
2,372.0000	COTY INC	45,084.86	18.7600	44,498.72	586.14-
1,089.0000	COVANTA HOLDING CORP	20,789.01	13.2000	14,374.80	6,414.21-
104.0000	CRANE CO	4,877.60	79.3800	8,255.52	3,377.92
1,846.0000	CROWN CASTLE INTERNATIONAL COR	76,770.64	100.1800	184,932.28	108,161.64
531.0000	CROWN HOLDINGS INC	18,044.86	59.6600	31,679.46	13,634.60
591.0000	CUBESMART	6,081.39	24.0400	14,207.64	8,126.25
497.0000	CUMMINS INC	24,037.52	162.2200	80,623.34	56,585.82
158.0000	CURTISS-WRIGHT CORP	4,942.24	91.7800	14,501.24	9,559.00



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425.0000	CYRUSONE INC	21,896.00	55.7500	23,693.75	1,797.75
365.0000	DCT INDUSTRIAL TRUST INC	7,475.20	53.4400	19,505.60	12,030.40
1,732.0000	DDR CORP	22,621.30	9.0700	15,709.24	6,912.06-
1,729.0000	DR HORTON INC	24,185.23	34.5700	59,771.53	35,586.30
194.0000	DST SYSTEMS INC	4,959.61	61.7000	11,969.80	7,010.19
1,473.0000	DTE ENERGY CO	61,570.23	105.7900	155,828.67	94,258.44
204.0000	DSW INC	5,049.00	17.7000	3,610.80	1,438.20-
1,409.0000	DXC TECHNOLOGY CO	42,479.28	76.7200	108,098.48	65,619.20
933.0000	DANA INC	11,447.91	22.3300	20,833.89	9,385.98
3,426.0000	DANAHER CORP	89,503.72	84.3900	289,120.14	199,616.42
480.0000	DARDEN RESTAURANTS INC	18,366.12	90.4400	43,411.20	25,045.08
1,553.0000	DARLING INGREDIENTS INC	23,051.12	15.7400	24,444.22	1,393.10
1,010.0000	DAVITA INC	28,274.95	64.7600	65,407.60	37,132.65
545.0000	DEAN FOODS CO	6,202.92	17.0000	9,265.00	3,062.08
108.0000	DECKERS OUTDOOR CORP	5,114.88	68.2600	7,372.08	2,257.20
1,281.0000	DEERE & CO	54,291.54	123.5900	158,318.79	104,027.25
1,098.0000	DELL TECHNOLOGIES INC CLASS V	51,098.21	61.1100	67,098.78	16,000.57



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5,690.0000	DELTA AIR LINES INC	74,803.06	53.7400	305,780.60	230,977.54
306.0000	DELUXE CORP	7,203.24	69.2200	21,181.32	13,978.08
1,279.0000	DENNY'S CORP	4,898.57	11.7700	15,053.83	10,155.26
1,430.0000	DENTSPLY SIRONA INC	41,952.38	64.8400	92,721.20	50,768.82
742.0000	DERMIRA INC	21,451.22	29.1400	21,621.88	170.66
2,774.0000	DEVON ENERGY CORP	135,707.17	31.9700	88,684.78	47,022.39-
453.0000	DEXCOM INC	36,581.00	73.1500	33,136.95	3,444.05-
66.0000	DIAMOND HILL INVESTMENT GROUP	5,039.10	199.4000	13,160.40	8,121.30
419.0000	DIAMONDBACK ENERGY INC	36,473.95	88.8100	37,211.39	737.44
1,551.0000	DIAMONDROCK HOSPITALITY CO	15,154.80	10.9500	16,983.45	1,828.65
662.0000	DIGITAL REALTY TRUST INC	38,318.86	112.9500	74,772.90	36,454.04
280.0000	DILLARD'S INC	16,599.17	57.6900	16,153.20	445.97-
7,547.0000	WALT DISNEY CO/THE	259,931.21	106.2500	801,868.75	541,937.54
1,040.0000	DISCOVERY COMMUNICATIONS INC	31,638.19	25.8300	26,863.20	4,774.99-
241.0000	DISCOVERY COMMUNICATIONS INC	4,831.36	25.2100	6,075.61	1,244.25
1,495.0000	DISH NETWORK CORP	37,576.96	62.7600	93,826.20	56,249.24
3,192.0000	DISCOVER FINANCIAL SERVICES	76,838.66	62.1900	198,510.48	121,671.82



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297.0000	DOLBY LABORATORIES INC	9,771.30	48.9600	14,541.12	4,769.82
1,292.0000	DOLLAR GENERAL CORP	74,688.64	72.0900	93,140.28	18,451.64
1,113.0000	DOLLAR TREE INC	46,578.41	69.9200	77,820.96	31,242.55
3,181.0000	DOMINION ENERGY INC	122,925.93	76.6300	243,760.03	120,834.10
368.0000	DOMINO'S PIZZA INC	9,126.40	211.5300	77,843.04	68,716.64
548.0000	DOMTAR CORP	20,974.70	38.4200	21,054.16	79.46
678.0000	DONALDSON CO INC	19,695.90	45.5400	30,876.12	11,180.22
122.0000	RR DONNELLEY & SONS CO	2,580.33	12.5400	1,529.88	1,050.45-
45.0000	DONNELLEY FINANCIAL SOLUTIONS	990.95	22.9600	1,033.20	42.25
941.0000	DOUGLAS EMMETT INC	15,272.43	38.2100	35,955.61	20,683.18
352.0000	DOUGLAS DYNAMICS INC	5,047.68	32.9000	11,580.80	6,533.12
1,328.0000	DOVER CORP	52,825.09	80.2200	106,532.16	53,707.07
4,627.0000	DOW CHEMICAL CO/THE	164,370.07	63.0700	291,824.89	127,454.82
1,281.0000	DR PEPPER SNAPPLE GROUP INC	31,429.72	91.1100	116,711.91	85,282.19
201.0000	DRIL-QUIP INC	15,041.95	48.8000	9,808.80	5,233.15-
4,418.0000	EI DU PONT DE NEMOURS & CO	181,645.93	80.7100	356,576.78	174,930.85
3,365.0000	DUKE ENERGY CORP	178,374.92	83.5900	281,280.35	102,905.43



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2,075.0000	DUKE REALTY CORP	24,341.05	27.9500	57,996.25	33,655.20
491.0000	DUN & BRADSTREET CORP/THE	37,710.62	108.1500	53,101.65	15,391.03
851.0000	DUNKIN' BRANDS GROUP INC	27,538.36	55.1200	46,907.12	19,368.76
350.0000	DUPONT FABROS TECHNOLOGY INC	8,708.00	61.1600	21,406.00	12,698.00
321.0000	DYCOM INDUSTRIES INC	4,798.95	89.5200	28,735.92	23,936.97
3,281.0000	EOG RESOURCES INC	136,245.91	90.5200	296,996.12	160,750.21
799.0000	EQT CORP	40,195.51	58.5900	46,813.41	6,617.90
278.0000	EPR PROPERTIES	12,782.44	71.8700	19,979.86	7,197.42
166.0000	EAGLE BANCORP INC	1,933.15	63.3000	10,507.80	8,574.65
1,013.0000	E*TRADE FINANCIAL CORP	9,035.96	38.0300	38,524.39	29,488.43
227.0000	EAGLE MATERIALS INC	14,862.68	92.4200	20,979.34	6,116.66
952.0000	EAST WEST BANCORP INC	17,678.64	58.5800	55,768.16	38,089.52
304.0000	EASTMAN CHEMICAL CO	18,231.76	83.9900	25,532.96	7,301.20
6,217.0000	EBAY INC	74,670.96	34.9200	217,097.64	142,426.68
541.0000	ECHOSTAR CORP	10,898.07	60.7000	32,838.70	21,940.63
1,513.0000	ECOLAB INC	68,501.50	132.7500	200,850.75	132,349.25
301.0000	EDGEWELL PERSONAL CARE CO	21,245.58	76.0200	22,882.02	1,636.44



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2,402.0000	EDISON INTERNATIONAL	99,825.54	78.1900	187,812.38	87,986.84
199.0000	EDUCATION REALTY TRUST INC	4,955.10	38.7500	7,711.25	2,756.15
1,073.0000	EDWARDS LIFESCIENCES CORP	105,744.15	118.2400	126,871.52	21,127.37
584.0000	EL PASO ELECTRIC CO	23,414.48	51.7000	30,192.80	6,778.32
1,799.0000	ELECTRONIC ARTS INC	32,481.90	105.7200	190,190.28	157,708.38
309.0000	ELECTRONICS FOR IMAGING INC	5,101.59	47.3800	14,640.42	9,538.83
358.0000	PERRY ELLIS INTERNATIONAL INC	5,083.60	19.4600	6,966.68	1,883.08
398.0000	EMCOR GROUP INC	11,311.16	65.3800	26,021.24	14,710.08
1,565.0000	EMERSON ELECTRIC CO	79,663.91	59.6200	93,305.30	13,641.39
315.0000	EMPLOYERS HOLDINGS INC	5,021.10	42.3000	13,324.50	8,303.40
220.0000	ENCORE WIRE CORP	5,108.40	42.7000	9,394.00	4,285.60
417.0000	ENERGEN CORP	19,623.06	49.3700	20,587.29	964.23
198.0000	ENERGIZER HOLDINGS INC	3,887.05	48.0200	9,507.96	5,620.91
202.0000	ENERSYS	5,369.16	72.4500	14,634.90	9,265.74
800.0000	ENTEGRIS INC	7,832.00	21.9500	17,560.00	9,728.00
390.0000	ENTERPRISE FINANCIAL SERVICES	5,190.90	40.8000	15,912.00	10,721.10
365.0000	ENVISION HEALTHCARE CORP	16,634.65	62.6700	22,874.55	6,239.90



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576.0000	EQUIFAX INC	21,032.64	137.4200	79,153.92	58,121.28
294.0000	EQUINIX INC	38,809.40	429.1600	126,173.04	87,363.64
1,944.0000	EQUITY COMMONWEALTH	54,672.72	31.6000	61,430.40	6,757.68
292.0000	EQUITY LIFESTYLE PROPERTIES IN	9,962.80	86.3400	25,211.28	15,248.48
2,034.0000	EQUITY RESIDENTIAL	102,719.72	65.8300	133,898.22	31,178.50
408.0000	ESSEX PROPERTY TRUST INC	69,266.16	257.2700	104,966.16	35,700.00
242.0000	ETHAN ALLEN INTERIORS INC	5,055.38	32.3000	7,816.60	2,761.22
321.0000	EURONET WORLDWIDE INC	4,827.84	87.3700	28,045.77	23,217.93
623.0000	EVERCORE PARTNERS INC	16,135.62	70.5000	43,921.50	27,785.88
1,700.0000	EVERSOURCE ENERGY	57,489.19	60.7100	103,207.00	45,717.81
1,031.0000	EXACT SCIENCES CORP	10,907.98	35.3700	36,466.47	25,558.49
4,053.0000	EXELON CORP	129,590.62	36.0700	146,191.71	16,601.09
1,173.0000	EXELIXIS INC	25,863.78	24.6300	28,890.99	3,027.21
719.0000	EXPEDIA INC	30,646.08	148.9500	107,095.05	76,448.97
422.0000	EXPEDITORS INTERNATIONAL OF WA	19,023.76	56.4800	23,834.56	4,810.80
372.0000	EXPONENT INC	9,830.10	58.3000	21,687.60	11,857.50
4,036.0000	EXPRESS SCRIPTS HOLDING CO	137,368.02	63.8400	257,658.24	120,290.22



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559.0000	EXTRA SPACE STORAGE INC	11,453.91	78.0000	43,602.00	32,148.09
2,028.0000	EXTRACTION OIL & GAS INC	27,210.62	13.4500	27,276.60	65.98
5,106.0000	EZCORP INC	59,280.66	7.7000	39,316.20	19,964.46-
20,897.0000	EXXON MOBIL CORP	1,429,678.02	80.7300	1,687,014.81	257,336.79
712.0000	FLIR SYSTEMS INC	25,354.32	34.6600	24,677.92	676.40-
371.0000	FMC CORP	26,114.69	73.0500	27,101.55	986.86
3,702.0000	FNB CORP/PA	42,149.55	14.1600	52,420.32	10,270.77
165.0000	FTD COS INC	3,787.68	20.0000	3,300.00	487.68-
11,518.0000	FACEBOOK INC	455,959.55	150.9800	1,738,987.64	1,283,028.09
238.0000	FAIR ISAAC CORP	6,899.62	139.4100	33,179.58	26,279.96
2,284.0000	FAIRPOINT COMMUNICATIONS INC	31,224.79	15.6500	35,744.60	4,519.81
123.0000	FARO TECHNOLOGIES INC	5,098.35	37.8000	4,649.40	448.95-
867.0000	FASTENAL CO	38,952.28	43.5300	37,740.51	1,211.77-
173.0000	FEDERAL REALTY INVESTMENT TRUS	17,032.80	126.3900	21,865.47	4,832.67
1,803.0000	FEDEX CORP	194,332.46	217.3300	391,845.99	197,513.53
3,634.0000	FELCOR LODGING TRUST INC	16,825.42	7.2100	26,201.14	9,375.72
511.0000	F5 NETWORKS INC	43,737.58	127.0600	64,927.66	21,190.08



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1,023.0000	FIDELITY & GUARANTY LIFE	24,459.93	31.0500	31,764.15	7,304.22
1,973.0000	FIDELITY NATIONAL INFORMATION	47,244.14	85.4000	168,494.20	121,250.06
1,493.0000	FNF GROUP	17,087.75	44.8300	66,931.19	49,843.44
497.0000	FNFV GROUP	2,365.68	15.8000	7,852.60	5,486.92
4,197.0000	FIFTH THIRD BANCORP	61,639.71	25.9600	108,954.12	47,314.41
5,880.0000	FIFTH STREET ASSET MANAGEMENT	35,406.42	4.8500	28,518.00	6,888.42-
724.0000	FINANCIAL ENGINES INC	15,001.28	36.6000	26,498.40	11,497.12
311.0000	FINANCIAL INSTITUTIONS INC	5,010.21	29.8000	9,267.80	4,257.59
626.0000	FIRST AMERICAN FINANCIAL CORP	9,615.36	44.6900	27,975.94	18,360.58
5,524.0000	FIRST BANCORP/PUERTO RICO	22,537.92	5.7900	31,983.96	9,446.04
322.0000	FIRST BUSEY CORP	5,119.80	29.3200	9,441.04	4,321.24
77.0000	FIRST CITIZENS BANCSHARES INC/	15,462.06	372.7000	28,697.90	13,235.84
1,067.0000	FIRST COMMONWEALTH FINANCIAL C	5,217.63	12.6800	13,529.56	8,311.93
366.0000	FIRST DEFIANCE FINANCIAL CORP	5,223.11	52.6800	19,280.88	14,057.77
376.0000	FIRST FINANCIAL BANKSHARES INC	6,282.96	44.2000	16,619.20	10,336.24
349.0000	FIRST FINANCIAL BANCORP	5,772.46	27.7000	9,667.30	3,894.84
557.0000	FIRST HORIZON NATIONAL CORP	5,590.54	17.4200	9,702.94	4,112.40



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465.0000	FIRST INDUSTRIAL REALTY TRUST	4,998.75	28.6200	13,308.30	8,309.55
426.0000	FIRST OF LONG ISLAND CORP/THE	5,097.33	28.6000	12,183.60	7,086.27
974.0000	FIRST MIDWEST BANCORP INC/IL	10,412.72	23.3100	22,703.94	12,291.22
2,184.0000	FIRST POTOMAC REALTY TRUST	23,368.80	11.1100	24,264.24	895.44
440.0000	FIRST REPUBLIC BANK/CA	12,878.80	100.1000	44,044.00	31,165.20
820.0000	FIRST SOLAR INC	33,229.86	39.8800	32,701.60	528.26-
269.0000	1ST SOURCE CORP	4,912.90	47.9400	12,895.86	7,982.96
187.0000	FIRSTCASH INC	7,278.04	58.3000	10,902.10	3,624.06
2,219.0000	FISERV INC	52,357.75	122.3400	271,472.46	219,114.71
3,203.0000	FIRSTENERGY CORP	104,298.40	29.1600	93,399.48	10,898.92-
341.0000	FLEETCOR TECHNOLOGIES INC	51,405.39	144.2100	49,175.61	2,229.78-
527.0000	FLOTEK INDUSTRIES INC	4,774.62	8.9400	4,711.38	63.24-
831.0000	FLUOR CORP	33,781.15	45.7800	38,043.18	4,262.03
264.0000	FLOWERS FOODS INC	4,996.64	17.3100	4,569.84	426.80-
921.0000	FOOT LOCKER INC	22,334.25	49.2800	45,386.88	23,052.63
17,420.0000	FORD MOTOR CO	148,516.13	11.1900	194,929.80	46,413.67
521.0000	FOREST CITY REALTY TRUST INC	8,268.27	24.1700	12,592.57	4,324.30



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305.0000	FORESTAR GROUP INC	4,901.35	17.1500	5,230.75	329.40
1,713.0000	FORTIVE CORP	29,205.83	63.3500	108,518.55	79,312.72
1,350.0000	FORTUNE BRANDS HOME & SECURITY	30,829.20	65.2400	88,074.00	57,244.80
153.0000	FORWARD AIR CORP	4,974.03	53.2800	8,151.84	3,177.81
640.0000	FOUR CORNERS PROPERTY TRUST IN	13,309.87	25.1100	16,070.40	2,760.53
230.0000	FRANKLIN ELECTRIC CO INC	5,146.25	41.4000	9,522.00	4,375.75
2,096.0000	FRANKLIN RESOURCES INC	72,062.42	44.7900	93,879.84	21,817.42
421.0000	FRANKLIN STREET PROPERTIES COR	5,195.14	11.0800	4,664.68	530.46-
6,072.0000	FREEPORT-MCMORAN INC	30,299.28	12.0100	72,924.72	42,625.44
228.0000	HB FULLER CO	5,344.32	51.1100	11,653.08	6,308.76
2,206.0000	FULTON FINANCIAL CORP	22,721.80	19.0000	41,914.00	19,192.20
109.0000	GAMCO INVESTORS INC	2,613.70	29.6000	3,226.40	612.70
135.0000	GATX CORP	4,895.10	64.2700	8,676.45	3,781.35
556.0000	GCP APPLIED TECHNOLOGIES INC	5,265.95	30.5000	16,958.00	11,692.05
2,957.0000	GGP INC	40,741.76	23.5600	69,666.92	28,925.16
1,705.0000	GNC HOLDINGS INC	22,812.90	8.4300	14,373.15	8,439.75-
766.0000	G-III APPAREL GROUP LTD	24,504.34	24.9500	19,111.70	5,392.64-



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1,231.0000	GTT COMMUNICATIONS INC	22,514.99	31.6500	38,961.15	16,446.16
658.0000	ARTHUR J GALLAGHER & CO	18,443.74	57.2500	37,670.50	19,226.76
802.0000	GAMING AND LEISURE PROPERTIES	20,831.62	37.6700	30,211.34	9,379.72
841.0000	GAMESTOP CORP	21,975.33	21.6100	18,174.01	3,801.32-
1,000.0000	GANNETT CO INC	5,051.35	8.7200	8,720.00	3,668.65
1,933.0000	GAP INC/THE	44,676.83	21.9900	42,506.67	2,170.16-
848.0000	GARTNER INC	36,692.84	123.5100	104,736.48	68,043.64
269.0000	GENERAC HOLDINGS INC	5,054.51	36.1300	9,718.97	4,664.46
1,877.0000	GENERAL DYNAMICS CORP	135,135.17	198.1000	371,833.70	236,698.53
45,617.0000	GENERAL ELECTRIC CO	1,123,206.56	27.0100	1,232,115.17	108,908.61
4,189.0000	GENERAL MILLS INC	119,272.77	55.4000	232,070.60	112,797.83
5,791.0000	GENERAL MOTORS CO	164,676.60	34.9300	202,279.63	37,603.03
111.0000	GENESCO INC	5,663.22	33.9000	3,762.90	1,900.32-
336.0000	GENESEE & WYOMING INC	23,574.76	68.3900	22,979.04	595.72-
277.0000	GENUINE PARTS CO	12,696.29	92.7600	25,694.52	12,998.23
4,094.0000	GENWORTH FINANCIAL INC	21,206.92	3.7700	15,434.38	5,772.54-
3,206.0000	GERON CORP	5,129.60	2.7700	8,880.62	3,751.02



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457.0000	GIBRALTAR INDUSTRIES INC	4,958.45	35.6500	16,292.05	11,333.60
7,855.0000	GILEAD SCIENCES INC	181,492.88	70.7800	555,976.90	374,484.02
857.0000	GLACIER BANCORP INC	10,690.57	36.6100	31,374.77	20,684.20
1,497.0000	GLADSTONE COMMERCIAL CORP	22,385.71	21.7900	32,619.63	10,233.92
331.0000	PH GLATFELTER CO	4,981.55	19.5400	6,467.74	1,486.19
926.0000	GLOBAL NET LEASE INC	22,001.77	22.2400	20,594.24	1,407.53-
1,836.0000	GLOBAL PAYMENTS INC	41,379.59	90.3200	165,827.52	124,447.93
13,802.0000	GOLD RESOURCE CORP	61,424.42	4.0800	56,312.16	5,112.26-
1,617.0000	GOLDMAN SACHS GROUP INC/THE	266,532.92	221.9000	358,812.30	92,279.38
1,825.0000	GOODYEAR TIRE & RUBBER CO/THE	26,715.63	34.9600	63,802.00	37,086.37
556.0000	WR GRACE & CO	21,402.92	72.0100	40,037.56	18,634.64
729.0000	GRACO INC	23,524.83	109.2800	79,665.12	56,140.29
12.0000	GRAHAM HOLDINGS CO	2,925.27	599.6500	7,195.80	4,270.53
156.0000	WW GRAINGER INC	27,139.32	180.5300	28,162.68	1,023.36
1,629.0000	GRAMERCY PROPERTY TRUST	31,469.60	29.7100	48,397.59	16,927.99
377.0000	GRAND CANYON EDUCATION INC	5,108.35	78.4100	29,560.57	24,452.22
230.0000	GRANITE CONSTRUCTION INC	5,621.20	48.2400	11,095.20	5,474.00



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2,181.0000	GRAPHIC PACKAGING HOLDING CO	10,425.85	13.7800	30,054.18	19,628.33
269.0000	GREAT SOUTHERN BANCORP INC	4,898.49	53.5000	14,391.50	9,493.01
881.0000	GREAT PLAINS ENERGY INC	17,144.26	29.2800	25,795.68	8,651.42
567.0000	GREEN DOT CORP	7,189.56	38.5300	21,846.51	14,656.95
485.0000	GREEN PLAINS INC	4,951.85	20.5500	9,966.75	5,014.90
249.0000	GREENBRIER COS INC/THE	4,932.69	46.2500	11,516.25	6,583.56
511.0000	GRIFFON CORP	4,997.58	21.9500	11,216.45	6,218.87
131.0000	GROUP 1 AUTOMOTIVE INC	5,148.30	63.3200	8,294.92	3,146.62
737.0000	GRUBHUB INC	23,326.05	43.6000	32,133.20	8,807.15
414.0000	GUIDEWIRE SOFTWARE INC	23,486.22	68.7100	28,445.94	4,959.72
379.0000	H&E EQUIPMENT SERVICES INC	4,839.83	20.4100	7,735.39	2,895.56
572.0000	HCA HEALTHCARE INC	45,172.41	87.2000	49,878.40	4,705.99
2,915.0000	HCP INC	95,699.45	31.9600	93,163.40	2,536.05-
637.0000	HD SUPPLY HOLDINGS INC	23,014.81	30.6300	19,511.31	3,503.50-
350.0000	HFF INC	4,802.00	34.7700	12,169.50	7,367.50
267.0000	HNI CORP	6,442.71	39.8700	10,645.29	4,202.58
163.0000	HSN INC	4,995.95	31.9000	5,199.70	203.75



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1,649.0000	HRG GROUP INC	22,162.56	17.7100	29,203.79	7,041.23
6,556.0000	HP INC	72,018.24	17.4800	114,598.88	42,580.64
517.0000	HAIN CELESTIAL GROUP INC/THE	21,822.16	38.8200	20,069.94	1,752.22-
4,891.0000	HALLIBURTON CO	140,389.29	42.7100	208,894.61	68,505.32
758.0000	HALOZYME THERAPEUTICS INC	4,972.48	12.8200	9,717.56	4,745.08
244.0000	HALYARD HEALTH INC	5,303.86	39.2800	9,584.32	4,280.46
3,440.0000	HANESBRANDS INC	25,923.08	23.1600	79,670.40	53,747.32
136.0000	HANOVER INSURANCE GROUP INC/TH	4,955.84	88.6300	12,053.68	7,097.84
416.0000	HARLEY-DAVIDSON INC	24,839.36	54.0200	22,472.32	2,367.04-
999.0000	HARRIS CORP	38,806.55	109.0800	108,970.92	70,164.37
2,153.0000	HARTFORD FINANCIAL SERVICES GR	52,917.27	52.5700	113,183.21	60,265.94
435.0000	HASBRO INC	22,277.95	111.5100	48,506.85	26,228.90
879.0000	HAWAIIAN HOLDINGS INC	5,054.25	46.9500	41,269.05	36,214.80
290.0000	HAWAIIAN TELCOM HOLDCO INC	5,744.90	24.9900	7,247.10	1,502.20
380.0000	HEALTHSOUTH CORP	10,028.20	48.4000	18,392.00	8,363.80
238.0000	HEALTHCARE REALTY TRUST INC	4,874.24	34.1500	8,127.70	3,253.46
456.0000	HEALTHCARE TRUST OF AMERICA IN	10,177.92	31.1100	14,186.16	4,008.24



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9,775.0000	HECLA MINING CO	22,678.00	5.1000	49,852.50	27,174.50
196.0000	HEICO CORP	5,343.74	71.8400	14,080.64	8,736.90
853.0000	HELMERICH & PAYNE INC	34,565.69	54.3400	46,352.02	11,786.33
514.0000	JACK HENRY & ASSOCIATES INC	15,060.20	103.8700	53,389.18	38,328.98
985.0000	HERITAGE COMMERCE CORP	4,869.25	13.7800	13,573.30	8,704.05
136.0000	HERC HOLDINGS INC	5,271.81	39.3200	5,347.52	75.71
1,099.0000	HERITAGE FINANCIAL CORP/WA	16,066.78	26.5000	29,123.50	13,056.72
229.0000	HERSHA HOSPITALITY TRUST	4,983.04	18.5100	4,238.79	744.25-
612.0000	HERSHEY CO/THE	33,932.30	107.3700	65,710.44	31,778.14
1,590.0000	HESS CORP	73,107.57	43.8700	69,753.30	3,354.27-
7,290.0000	HEWLETT PACKARD ENTERPRISE CO	75,262.13	16.5900	120,941.10	45,678.97
238.0000	HEXCEL CORP	4,990.86	52.7900	12,564.02	7,573.16
151.0000	HIGHWOODS PROPERTIES INC	4,898.44	50.7100	7,657.21	2,758.77
149.0000	HILL-ROM HOLDINGS INC	5,264.17	79.6100	11,861.89	6,597.72
215.0000	HILLENBRAND INC	4,882.65	36.1000	7,761.50	2,878.85
215.0000	HILLTOP HOLDINGS INC	4,321.50	26.2100	5,635.15	1,313.65
1,984.0000	HOLOGIC INC	36,485.40	45.3800	90,033.92	53,548.52



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836.0000	HOME BANCSHARES INC/AR	4,932.40	24.9000	20,816.40	15,884.00
7,155.0000	HOME DEPOT INC/THE	261,661.93	153.4000	1,097,577.00	835,915.07
338.0000	HOMESTREET INC	4,912.76	27.6750	9,354.15	4,441.39
4,599.0000	HONEYWELL INTERNATIONAL INC	189,237.54	133.2900	613,000.71	423,763.17
1,335.0000	HOPE BANCORP INC	10,325.32	18.6500	24,897.75	14,572.43
331.0000	HORACE MANN EDUCATORS CORP	4,951.76	37.8000	12,511.80	7,560.04
1,006.0000	HORMEL FOODS CORP	20,941.61	34.1100	34,314.66	13,373.05
1,240.0000	HOSPITALITY PROPERTIES TRUST	28,796.72	29.1500	36,146.00	7,349.28
3,222.0000	HOST HOTELS & RESORTS INC	53,611.81	18.2700	58,865.94	5,254.13
2,202.0000	HOUGHTON MIFFLIN HARCOURT CO	23,803.62	12.3000	27,084.60	3,280.98
28,247.0000	HOVNANIAN ENTERPRISES INC	54,516.71	2.8000	79,091.60	24,574.89
185.0000	HOWARD HUGHES CORP/THE	15,117.50	122.8400	22,725.40	7,607.90
136.0000	HUB GROUP INC	4,920.48	38.3500	5,215.60	295.12
568.0000	HUDSON PACIFIC PROPERTIES INC	8,792.64	34.1900	19,419.92	10,627.28
1,046.0000	HUMANA INC	66,756.45	240.6200	251,688.52	184,932.07
544.0000	JB HUNT TRANSPORT SERVICES INC	24,871.68	91.3800	49,710.72	24,839.04
10,092.0000	HUNTINGTON BANCSHARES INC/OH	61,809.11	13.5200	136,443.84	74,634.73



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371.0000	HUNTINGTON INGALLS INDUSTRIES	13,890.61	186.1600	69,065.36	55,174.75
165.0000	HURON CONSULTING GROUP INC	4,851.00	43.2000	7,128.00	2,277.00
263.0000	HYATT HOTELS CORP	10,325.38	56.2100	14,783.23	4,457.85
29.0000	HYSTER-YALE MATERIALS HANDLING	903.94	70.2500	2,037.25	1,133.31
437.0000	IAC/INTERACTIVECORP	15,950.50	103.2400	45,115.88	29,165.38
198.0000	ICF INTERNATIONAL INC	4,950.00	47.1000	9,325.80	4,375.80
449.0000	ILG INC	4,392.75	27.4900	12,343.01	7,950.26
2,377.0000	ISTAR INC	15,359.36	12.0400	28,619.08	13,259.72
809.0000	ITT INC	15,859.06	40.1800	32,505.62	16,646.56
315.0000	IDACORP INC	15,032.32	85.3500	26,885.25	11,852.93
287.0000	IDEX CORP	14,860.69	113.0100	32,433.87	17,573.18
684.0000	IDEXX LABORATORIES INC	25,571.34	161.4200	110,411.28	84,839.94
2,697.0000	ILLINOIS TOOL WORKS INC	121,557.84	143.2500	386,345.25	264,787.41
752.0000	ILLUMINA INC	29,561.12	173.5200	130,487.04	100,925.92
1,021.0000	INCYTE CORP	16,407.47	125.9100	128,554.11	112,146.64
2,913.0000	INDEPENDENCE REALTY TRUST INC	23,595.30	9.8700	28,751.31	5,156.01
190.0000	INDEPENDENT BANK CORP/ROCKLAND	4,932.40	66.6500	12,663.50	7,731.10



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4,365.0000	INFINERA CORP	44,043.31	10.6700	46,574.55	2,531.24
259.0000	INGEVITY CORP	4,733.04	57.4000	14,866.60	10,133.56
301.0000	INGLES MARKETS INC	4,809.98	33.3000	10,023.30	5,213.32
455.0000	INGREDION INC	24,374.35	119.2100	54,240.55	29,866.20
305.0000	INSIGHT ENTERPRISES INC	5,072.15	39.9900	12,196.95	7,124.80
156.0000	INNOSPEC INC	4,873.11	65.5500	10,225.80	5,352.69
1,491.0000	INNERWORKINGS INC	10,362.45	11.6000	17,295.60	6,933.15
245.0000	INSULET CORP	5,049.45	51.3100	12,570.95	7,521.50
2,154.0000	INTEGRATED DEVICE TECHNOLOGY I	13,311.72	25.7900	55,551.66	42,239.94
24,722.0000	INTEL CORP	515,352.30	33.7400	834,120.28	318,767.98
629.0000	INTER PARFUMS INC	10,258.99	36.6500	23,052.85	12,793.86
1,474.0000	INTERACTIVE BROKERS GROUP INC	24,203.52	37.4200	55,157.08	30,953.56
3,103.0000	INTERCONTINENTAL EXCHANGE INC	123,725.01	65.9200	204,549.76	80,824.75
1,103.0000	INTERNATIONAL BANCSHARES CORP	17,780.36	35.0500	38,660.15	20,879.79
4,230.0000	INTERNATIONAL BUSINESS MACHINE	352,716.63	153.8300	650,700.90	297,984.27
762.0000	INTERNATIONAL FLAVORS & FRAGRA	30,228.77	135.0000	102,870.00	72,641.23
1,997.0000	INTERNATIONAL PAPER CO	69,043.58	56.6100	113,050.17	44,006.59



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590.0000	INTERNATIONAL SPEEDWAY CORP	14,974.20	37.5500	22,154.50	7,180.30
3,469.0000	INTERPUBLIC GROUP OF COS INC/T	34,237.99	24.6000	85,337.40	51,099.41
1,584.0000	INTRA-CELLULAR THERAPIES INC	24,251.04	12.4200	19,673.28	4,577.76-
228.0000	INTUITIVE SURGICAL INC	62,985.48	935.3700	213,264.36	150,278.88
2,106.0000	INTUIT INC	68,708.46	132.8100	279,697.86	210,989.40
611.0000	INVESCO MORTGAGE CAPITAL INC	9,691.26	16.7100	10,209.81	518.55
925.0000	INVESTORS BANCORP INC	5,045.78	13.3600	12,358.00	7,312.22
727.0000	IONIS PHARMACEUTICALS INC	25,296.66	50.8700	36,982.49	11,685.83
4,789.0000	IRIDIUM COMMUNICATIONS INC	38,654.72	11.0500	52,918.45	14,263.73
1,266.0000	IRON MOUNTAIN INC	31,628.68	34.3600	43,499.76	11,871.08
524.0000	ITRON INC	19,209.84	67.7500	35,501.00	16,291.16
85.0000	J ALEXANDER'S HOLDINGS INC	344.94	12.2500	1,041.25	696.31
20,321.0000	JPMORGAN CHASE & CO	822,021.40	91.4000	1,857,339.40	1,035,318.00
1,169.0000	JABIL INC	20,656.23	29.1900	34,123.11	13,466.88
225.0000	JACK IN THE BOX INC	5,033.25	98.5000	22,162.50	17,129.25
670.0000	JACOBS ENGINEERING GROUP INC	27,365.06	54.3900	36,441.30	9,076.24
852.0000	JETBLUE AIRWAYS CORP	4,311.12	22.8300	19,451.16	15,140.04



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13,629.0000	JOHNSON & JOHNSON	955,568.04	132.2900	1,802,980.41	847,412.37
441.0000	JONES LANG LASALLE INC	32,828.04	125.0000	55,125.00	22,296.96
180.0000	J2 GLOBAL INC	4,905.00	85.0900	15,316.20	10,411.20
1,751.0000	JUNIPER NETWORKS INC	30,244.13	27.8800	48,817.88	18,573.75
1,329.0000	JUNO THERAPEUTICS INC	23,749.23	29.8900	39,723.81	15,974.58
487.0000	KLX INC	8,064.93	50.0000	24,350.00	16,285.07
97.0000	KAISER ALUMINUM CORP	5,134.21	88.5200	8,586.44	3,452.23
357.0000	KANSAS CITY SOUTHERN	22,727.02	104.6500	37,360.05	14,633.03
646.0000	KAPSTONE PAPER AND PACKAGING C	5,151.85	20.6300	13,326.98	8,175.13
530.0000	KATE SPADE & CO	9,778.50	18.4900	9,799.70	21.20
1,511.0000	KB HOME	12,254.21	23.9700	36,218.67	23,964.46
1,037.0000	KELLOGG CO	51,706.58	69.4600	72,030.02	20,323.44
320.0000	KELLY SERVICES INC	5,027.20	22.4500	7,184.00	2,156.80
329.0000	KEMPER CORP	9,298.36	38.6000	12,699.40	3,401.04
6,524.0000	KEYCORP	48,212.36	18.7400	122,259.76	74,047.40
1,187.0000	KEYSIGHT TECHNOLOGIES INC	20,815.68	38.9300	46,209.91	25,394.23
380.0000	KFORCE INC	4,913.40	19.6000	7,448.00	2,534.60



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348.0000	KILROY REALTY CORP	13,241.40	75.1500	26,152.20	12,910.80
1,959.0000	KIMBERLY-CLARK CORP	122,849.74	129.1100	252,926.49	130,076.75
2,422.0000	KIMCO REALTY CORP	43,813.98	18.3500	44,443.70	629.72
9,750.0000	KINDER MORGAN INC/DE	174,464.32	19.1600	186,810.00	12,345.68
320.0000	KIRBY CORP	17,798.40	66.8500	21,392.00	3,593.60
329.0000	KITE PHARMA INC	25,737.67	103.6700	34,107.43	8,369.76
267.0000	KITE REALTY GROUP TRUST	4,891.44	18.9300	5,054.31	162.87
306.0000	KNIGHT TRANSPORTATION INC	4,938.84	37.0500	11,337.30	6,398.46
665.0000	KNOWLES CORP	10,420.51	16.9200	11,251.80	831.29
1,404.0000	KOHL'S CORP	55,431.33	38.6700	54,292.68	1,138.65-
3,176.0000	KRAFT HEINZ CO/THE	94,272.39	85.6400	271,992.64	177,720.25
7,550.0000	KROGER CO/THE	86,141.74	23.3200	176,066.00	89,924.26
1,782.0000	L BRANDS INC	48,353.87	53.8900	96,031.98	47,678.11
391.0000	LHC GROUP INC	5,106.46	67.8900	26,544.99	21,438.53
684.0000	LKQ CORP	17,583.48	32.9500	22,537.80	4,954.32
450.0000	LPL FINANCIAL HOLDINGS INC	15,174.00	42.4600	19,107.00	3,933.00
132.0000	LTC PROPERTIES INC	4,909.08	51.3900	6,783.48	1,874.40



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45.0000	LSC COMMUNICATIONS INC	1,288.48	21.4000	963.00	325.48-
514.0000	LA-Z-BOY INC	4,821.32	32.5000	16,705.00	11,883.68
206.0000	LABORATORY CORP OF AMERICA HOL	13,784.66	154.1400	31,752.84	17,968.18
306.0000	LAKELAND BANCORP INC	2,728.33	18.8500	5,768.10	3,039.77
346.0000	LAKELAND FINANCIAL CORP	5,102.35	45.8800	15,874.48	10,772.13
1,072.0000	LAM RESEARCH CORP	26,299.73	141.4300	151,612.96	125,313.23
725.0000	LAMAR ADVERTISING CO	17,624.75	73.5700	53,338.25	35,713.50
752.0000	LAMB WESTON HOLDINGS INC	12,444.91	44.0400	33,118.08	20,673.17
68.0000	LANCASTER COLONY CORP	4,872.20	122.6200	8,338.16	3,465.96
110.0000	LANDSTAR SYSTEM INC	4,950.00	85.6000	9,416.00	4,466.00
1,219.0000	LAS VEGAS SANDS CORP	46,558.51	63.8900	77,881.91	31,323.40
723.0000	LASALLE HOTEL PROPERTIES	17,967.86	29.8000	21,545.40	3,577.54
555.0000	ESTEE LAUDER COS INC/THE	45,557.89	95.9800	53,268.90	7,711.01
769.0000	LEAR CORP	35,204.07	142.0800	109,259.52	74,055.45
645.0000	LEGGETT & PLATT INC	14,847.90	52.5300	33,881.85	19,033.95
367.0000	LEGACYTEXAS FINANCIAL GROUP IN	4,965.51	38.1300	13,993.71	9,028.20
637.0000	LEGG MASON INC	18,066.78	38.1600	24,307.92	6,241.14



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830.0000	LEIDOS HOLDINGS INC	24,715.57	51.6900	42,902.70	18,187.13
4,456.0000	LENDINGCLUB CORP	21,745.28	5.5100	24,552.56	2,807.28
1,244.0000	LENNAR CORP	47,296.88	53.3200	66,330.08	19,033.20
507.0000	LENNOX INTERNATIONAL INC	22,782.20	183.6400	93,105.48	70,323.28
1,958.0000	LEUCADIA NATIONAL CORP	36,373.23	26.1600	51,221.28	14,848.05
1,420.0000	LEVEL 3 COMMUNICATIONS INC	37,765.21	59.3000	84,206.00	46,440.79
1,405.0000	LEXINGTON REALTY TRUST	11,522.34	9.9100	13,923.55	2,401.21
580.0000	LIBERTY EXPEDIA HOLDINGS INC	14,283.19	54.0200	31,331.60	17,048.41
3,710.0000	LIBERTY INTERACTIVE CORP QVC G	43,774.05	24.5400	91,043.40	47,269.35
551.0000	LIBERTY VENTURES	5,579.35	52.2900	28,811.79	23,232.44
735.0000	LIBERTY PROPERTY TRUST	22,785.00	40.7100	29,921.85	7,136.85
392.0000	LIBERTY TRIPADVISOR HOLDINGS I	3,586.72	11.6000	4,547.20	960.48
312.0000	LIFEPOINT HEALTH INC	11,821.68	67.1500	20,950.80	9,129.12
298.0000	LIFE STORAGE INC	19,937.37	74.1000	22,081.80	2,144.43
4,589.0000	ELI LILLY & CO	294,212.78	82.3000	377,674.70	83,461.92
421.0000	LINCOLN ELECTRIC HOLDINGS INC	14,010.88	92.0900	38,769.89	24,759.01
1,252.0000	LINCOLN NATIONAL CORP	37,987.69	67.5800	84,610.16	46,622.47



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80.0000	LINDSAY CORP	4,973.60	89.2500	7,140.00	2,166.40
447.0000	LIONS GATE ENTERTAINMENT CORP	7,159.58	28.2200	12,614.34	5,454.76
447.0000	LIONS GATE ENTERTAINMENT CORP	6,920.92	26.2800	11,747.16	4,826.24
89.0000	LITTELFUSE INC	4,903.90	165.0000	14,685.00	9,781.10
238.0000	LIVE NATION ENTERTAINMENT INC	2,606.10	34.8500	8,294.30	5,688.20
902.0000	LOCKHEED MARTIN CORP	202,333.53	277.6100	250,404.22	48,070.69
1,714.0000	LOEWS CORP	65,020.59	46.8100	80,232.34	15,211.75
229.0000	LOGMEIN INC	9,902.13	104.5000	23,930.50	14,028.37
6,472.0000	LOWE'S COS INC	185,574.89	77.5300	501,774.16	316,199.27
524.0000	LULULEMON ATHLETICA INC	29,350.04	59.6700	31,267.08	1,917.04
429.0000	LUMENTUM HOLDINGS INC	26,795.34	57.0500	24,474.45	2,320.89-
350.0000	M&T BANK CORP	35,739.14	161.9500	56,682.50	20,943.36
323.0000	MB FINANCIAL INC	6,137.00	44.0400	14,224.92	8,087.92
1,123.0000	MDU RESOURCES GROUP INC	24,762.15	26.2000	29,422.60	4,660.45
1,123.0000	MGE ENERGY INC	54,836.12	64.3500	72,265.05	17,428.93
1,967.0000	MGIC INVESTMENT CORP	11,861.01	11.2000	22,030.40	10,169.39
2,953.0000	MGM RESORTS INTERNATIONAL	32,134.93	31.2900	92,399.37	60,264.44



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626.0000	MGP INGREDIENTS INC	20,889.62	51.1700	32,032.42	11,142.80
310.0000	MKS INSTRUMENTS INC	7,777.90	67.3000	20,863.00	13,085.10
138.0000	MSA SAFETY INC	4,854.84	81.1700	11,201.46	6,346.62
592.0000	MSCI INC	19,662.02	102.9900	60,970.08	41,308.06
171.0000	MTS SYSTEMS CORP	9,876.96	51.8000	8,857.80	1,019.16-
832.0000	MACERICH CO/THE	36,059.04	58.0600	48,305.92	12,246.88
2,177.0000	MACY'S INC	81,325.15	23.2400	50,593.48	30,731.67-
324.0000	STEVEN MADDEN LTD	7,583.76	39.9500	12,943.80	5,360.04
649.0000	MAINSOURCE FINANCIAL GROUP INC	5,750.14	33.5100	21,747.99	15,997.85
112.0000	MANHATTAN ASSOCIATES INC	2,021.04	48.0600	5,382.72	3,361.68
1,365.0000	MANITOWOC CO INC/THE	4,176.89	6.0100	8,203.65	4,026.76
747.0000	MANPOWERGROUP INC	27,982.62	111.6500	83,402.55	55,419.93
4,383.0000	MARATHON OIL CORP	101,759.09	11.8500	51,938.55	49,820.54-
2,846.0000	MARATHON PETROLEUM CORP	76,133.26	52.3300	148,931.18	72,797.92
398.0000	MARCUS CORP/THE	5,034.70	30.2000	12,019.60	6,984.90
103.0000	MARKEL CORP	38,804.94	975.8600	100,513.58	61,708.64
208.0000	MARKETAXESS HOLDINGS INC	5,002.40	201.1000	41,828.80	36,826.40



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228.0000	MARRIOTT VACATIONS WORLDWIDE C	8,796.24	117.7500	26,847.00	18,050.76
3,194.0000	MARSH & MCLENNAN COS INC	93,046.70	77.9600	249,004.24	155,957.54
2,558.0000	MARRIOTT INTERNATIONAL INC/MD	118,150.17	100.3100	256,592.98	138,442.81
744.0000	MARTEN TRANSPORT LTD	9,869.66	27.4000	20,385.60	10,515.94
263.0000	MARTIN MARIETTA MATERIALS INC	24,547.70	222.5800	58,538.54	33,990.84
2,790.0000	MASCO CORP	34,572.91	38.2100	106,605.90	72,032.99
336.0000	MASTEC INC	6,132.00	45.1500	15,170.40	9,038.40
6,247.0000	MASTERCARD INC	215,469.18	121.4500	758,698.15	543,228.97
571.0000	MATSON INC	10,212.74	30.0400	17,152.84	6,940.10
1,937.0000	MATTEL INC	36,237.04	21.5300	41,703.61	5,466.57
151.0000	MATTHEWS INTERNATIONAL CORP	5,013.20	61.2500	9,248.75	4,235.55
1,184.0000	MAXIM INTEGRATED PRODUCTS INC	28,131.84	44.9000	53,161.60	25,029.76
248.0000	MAXIMUS INC	4,969.30	62.6300	15,532.24	10,562.94
770.0000	MCCORMICK & CO INC/MD	38,243.12	97.5100	75,082.70	36,839.58
4,457.0000	MCDONALD'S CORP	177,119.85	153.1600	682,634.12	505,514.27
186.0000	MCGRATH RENTCORP	5,025.72	34.6300	6,441.18	1,415.46
1,566.0000	MCKESSON CORP	83,676.54	164.5400	257,669.64	173,993.10



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1,404.0000	MEDIA GEN INC CVR	0.00	0.0000	0.00	0.00
1,490.0000	MEDICAL PROPERTIES TRUST INC	20,675.26	12.8700	19,176.30	1,498.96-
571.0000	MEDICINES CO/THE	15,047.24	38.0100	21,703.71	6,656.47
476.0000	MEDNAX INC	19,747.21	60.3700	28,736.12	8,988.91
16,722.0000	MERCK & CO INC	703,917.33	64.0900	1,071,712.98	367,795.65
160.0000	MEREDITH CORP	4,865.60	59.4500	9,512.00	4,646.40
221.0000	MERITAGE HOMES CORP	5,049.85	42.2000	9,326.20	4,276.35
828.0000	MERITOR INC	4,148.28	16.6100	13,753.08	9,604.80
94.0000	MESA LABORATORIES INC	5,018.66	143.3100	13,471.14	8,452.48
2,810.0000	METLIFE INC	110,912.48	54.9400	154,381.40	43,468.92
191.0000	METTLER-TOLEDO INTERNATIONAL I	30,401.47	588.5400	112,411.14	82,009.67
40,843.0000	MICROSOFT CORP	1,116,722.20	68.9300	2,815,307.99	1,698,585.79
830.0000	MICROCHIP TECHNOLOGY INC	29,986.38	77.1800	64,059.40	34,073.02
5,321.0000	MICRON TECHNOLOGY INC	45,059.45	29.8600	158,885.06	113,825.61
621.0000	MICROSEMI CORP	13,367.26	46.8000	29,062.80	15,695.54
643.0000	MID-AMERICA APARTMENT COMMUNIT	41,919.18	105.3800	67,759.34	25,840.16
462.0000	MIDDLEBY CORP/THE	15,559.41	121.5100	56,137.62	40,578.21



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233.0000	MIDDLESEX WATER CO	4,499.23	39.6000	9,226.80	4,727.57
3,705.0000	MINDBODY INC	62,144.34	27.2000	100,776.00	38,631.66
274.0000	MINERALS TECHNOLOGIES INC	8,787.18	73.2000	20,056.80	11,269.62
250.0000	MOBILE MINI INC	5,067.50	29.8500	7,462.50	2,395.00
2,748.0000	MODEL N INC	35,773.79	13.3000	36,548.40	774.61
748.0000	MODINE MANUFACTURING CO	5,071.44	16.5500	12,379.40	7,307.96
339.0000	MOHAWK INDUSTRIES INC	19,329.78	241.6900	81,932.91	62,603.13
831.0000	MOLSON COORS BREWING CO	43,216.13	86.3400	71,748.54	28,532.41
9,882.0000	MONDELEZ INTERNATIONAL INC	185,251.81	43.1900	426,803.58	241,551.77
584.0000	MONMOUTH REAL ESTATE INVESTMEN	4,905.60	15.0500	8,789.20	3,883.60
2,205.0000	MONOGRAM RESIDENTIAL TRUST INC	22,380.75	9.7100	21,410.55	970.20-
345.0000	MONOLITHIC POWER SYSTEMS INC	5,226.75	96.4000	33,258.00	28,031.25
148.0000	MONRO MUFFLER BRAKE INC	5,046.80	41.7500	6,179.00	1,132.20
2,832.0000	MONSANTO CO	134,135.13	118.3600	335,195.52	201,060.39
2,204.0000	MONSTER BEVERAGE CORP	47,406.38	49.6800	109,494.72	62,088.34
1,393.0000	MOODY'S CORP	45,467.52	121.6800	169,500.24	124,032.72
270.0000	MOOG INC	11,134.80	71.7200	19,364.40	8,229.60



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6,241.0000	MORGAN STANLEY	126,518.60	44.5600	278,098.96	151,580.36
1,045.0000	MOSAIC CO/THE	31,004.25	22.8300	23,857.35	7,146.90-
297.0000	MOTOROLA SOLUTIONS INC	21,719.61	86.7400	25,761.78	4,042.17
294.0000	MOVADO GROUP INC	4,933.32	25.2500	7,423.50	2,490.18
450.0000	MUELLER INDUSTRIES INC	8,181.00	30.4500	13,702.50	5,521.50
733.0000	MURPHY OIL CORP	31,617.09	25.6300	18,786.79	12,830.30-
307.0000	MURPHY USA INC	8,906.37	74.1100	22,751.77	13,845.40
231.0000	NBT BANCORP INC	5,058.90	36.9500	8,535.45	3,476.55
449.0000	NCI BUILDING SYSTEMS INC	4,992.88	16.7000	7,498.30	2,505.42
943.0000	NCR CORP	17,200.32	40.8400	38,512.12	21,311.80
1,290.0000	NCS MULTISTAGE HOLDINGS INC	31,051.95	25.1800	32,482.20	1,430.25
1,909.0000	NRG ENERGY INC	31,352.17	17.2200	32,872.98	1,520.81
1,500.0000	NRG YIELD INC	22,485.00	17.6000	26,400.00	3,915.00
22.0000	NVR INC	15,137.32	2,410.6100	53,033.42	37,896.10
55.0000	NACCO INDUSTRIES INC	1,640.63	70.8500	3,896.75	2,256.12
790.0000	NASDAQ INC	26,129.25	71.4900	56,477.10	30,347.85
211.0000	NATIONAL HEALTHCARE CORP	9,881.13	70.1400	14,799.54	4,918.41



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1,722.0000	NATIONAL OILWELL VARCO INC	59,581.02	32.9400	56,722.68	2,858.34-
346.0000	NATIONAL RETAIL PROPERTIES INC	9,935.06	39.1000	13,528.60	3,593.54
1,062.0000	NATIONAL STORAGE AFFILIATES TR	21,760.38	23.1100	24,542.82	2,782.44
283.0000	NATURAL GAS SERVICES GROUP INC	4,944.01	24.8500	7,032.55	2,088.54
507.0000	NAVIGANT CONSULTING INC	5,070.00	19.7600	10,018.32	4,948.32
1,873.0000	NAVIENT CORP	19,133.35	16.6500	31,185.45	12,052.10
1,849.0000	NEKTAR THERAPEUTICS	22,650.25	19.5500	36,147.95	13,497.70
233.0000	NELNET INC	5,039.79	47.0100	10,953.33	5,913.54
618.0000	NETAPP INC	25,745.88	40.0500	24,750.90	994.98-
2,163.0000	NETFLIX INC	17,285.46	149.4100	323,173.83	305,888.37
244.0000	NETSCOUT SYSTEMS INC	4,862.92	34.4000	8,393.60	3,530.68
858.0000	NEUROCRINE BIOSCIENCES INC	39,193.44	46.0000	39,468.00	274.56
220.0000	NEW JERSEY RESOURCES CORP	4,907.10	39.7000	8,734.00	3,826.90
1,495.0000	NEW RESIDENTIAL INVESTMENT COR	23,546.25	15.5600	23,262.20	284.05-
2,617.0000	NEW YORK COMMUNITY BANCORP INC	31,508.68	13.1300	34,361.21	2,852.53
3,654.0000	NEW YORK MORTGAGE TRUST INC	28,683.90	6.2200	22,727.88	5,956.02-
1,492.0000	NEW YORK TIMES CO/THE	11,785.88	17.7000	26,408.40	14,622.52



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1,976.0000	NEWELL BRANDS INC	38,136.34	53.6200	105,953.12	67,816.78
920.0000	NEWFIELD EXPLORATION CO	22,194.32	28.4600	26,183.20	3,988.88
28.0000	NEWMARKET CORP	6,298.54	460.4800	12,893.44	6,594.90
3,577.0000	NEWMONT MINING CORP	111,794.72	32.3900	115,859.03	4,064.31
564.0000	NEWPARK RESOURCES INC	4,980.12	7.3500	4,145.40	834.72-
2,841.0000	NEWS CORP	25,202.85	13.7000	38,921.70	13,718.85
496.0000	NEWSTAR FINANCIAL INC	4,786.40	10.5000	5,208.00	421.60
175.0000	NEXSTAR MEDIA GROUP INC	10,736.22	59.8000	10,465.00	271.22-
2,655.0000	NEXTERA ENERGY INC	122,289.36	140.1300	372,045.15	249,755.79
6,179.0000	NIKE INC	128,566.56	59.0000	364,561.00	235,994.44
1,797.0000	NISOURCE INC	14,563.49	25.3600	45,571.92	31,008.43
2,391.0000	NOBLE ENERGY INC	85,781.00	28.3000	67,665.30	18,115.70-
1,083.0000	NORDSTROM INC	46,697.13	47.8300	51,799.89	5,102.76
2,212.0000	NORFOLK SOUTHERN CORP	95,264.87	121.7000	269,200.40	173,935.53
457.0000	NORTHERN TRUST CORP	39,690.74	97.2100	44,424.97	4,734.23
506.0000	NORTHFIELD BANCORP INC	5,089.21	17.1500	8,677.90	3,588.69
1,620.0000	NORTHROP GRUMMAN CORP	99,427.41	256.7100	415,870.20	316,442.79



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2,200.0000	NORTHSTAR REALTY EUROPE CORP	22,750.51	12.6800	27,896.00	5,145.49
631.0000	NORTHWEST BANCSHARES INC	7,666.65	15.6100	9,849.91	2,183.26
127.0000	NORTHWESTERN CORP	4,991.10	61.0200	7,749.54	2,758.44
324.0000	NOW INC	5,806.76	16.0800	5,209.92	596.84-
423.0000	NU SKIN ENTERPRISES INC	20,306.26	62.8400	26,581.32	6,275.06
463.0000	NUCOR CORP	21,492.46	57.8700	26,793.81	5,301.35
2,870.0000	NVIDIA CORP	183,383.20	144.5600	414,887.20	231,504.00
730.0000	OGE ENERGY CORP	19,800.98	34.7900	25,396.70	5,595.72
260.0000	O'REILLY AUTOMOTIVE INC	24,086.40	218.7400	56,872.40	32,786.00
420.0000	OFG BANCORP	4,863.60	10.0000	4,200.00	663.60-
2,314.0000	OASIS PETROLEUM INC	23,672.22	8.0500	18,627.70	5,044.52-
4,674.0000	OCCIDENTAL PETROLEUM CORP	215,825.45	59.8700	279,832.38	64,006.93
256.0000	OCEANEERING INTERNATIONAL INC	10,759.38	22.8400	5,847.04	4,912.34-
384.0000	OCEANFIRST FINANCIAL CORP	4,995.84	27.1200	10,414.08	5,418.24
4,141.0000	OFFICE DEPOT INC	9,603.60	5.6400	23,355.24	13,751.64
241.0000	OIL STATES INTERNATIONAL INC	9,971.45	27.1500	6,543.15	3,428.30-
207.0000	OLD DOMINION FREIGHT LINE INC	4,987.32	95.2400	19,714.68	14,727.36



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563.0000	OLD NATIONAL BANCORP/IN	5,804.53	17.2500	9,711.75	3,907.22
2,881.0000	OLD REPUBLIC INTERNATIONAL COR	26,706.87	19.5300	56,265.93	29,559.06
1,616.0000	OMNICOM GROUP INC	75,605.60	82.9000	133,966.40	58,360.80
604.0000	OMEGA HEALTHCARE INVESTORS INC	12,321.60	33.0200	19,944.08	7,622.48
962.0000	OMEGA PROTEIN CORP	6,195.28	17.9000	17,219.80	11,024.52
1,997.0000	ON SEMICONDUCTOR CORP	16,013.97	14.0400	28,037.88	12,023.91
391.0000	ONE GAS INC	4,511.97	69.8100	27,295.71	22,783.74
316.0000	ONE LIBERTY PROPERTIES INC	4,964.36	23.4300	7,403.88	2,439.52
2,485.0000	1-800-FLOWERS.COM INC	14,288.75	9.7500	24,228.75	9,940.00
1,562.0000	ONEOK INC	31,937.21	52.1600	81,473.92	49,536.71
2,508.0000	OPKO HEALTH INC	9,954.42	6.5800	16,502.64	6,548.22
20,664.0000	ORACLE CORP	369,211.95	50.1400	1,036,092.96	666,881.01
237.0000	ORBITAL ATK INC	7,446.80	98.3600	23,311.32	15,864.52
4,748.0000	ORCHID ISLAND CAPITAL INC	43,349.24	9.8600	46,815.28	3,466.04
853.0000	ORION GROUP HOLDINGS INC	5,263.01	7.4700	6,371.91	1,108.90
394.0000	ORITANI FINANCIAL CORP	4,988.04	17.0500	6,717.70	1,729.66
502.0000	ORMAT TECHNOLOGIES INC	9,957.56	58.6800	29,457.36	19,499.80



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216.0000	OSHKOSH CORP	8,340.48	68.8800	14,878.08	6,537.60
164.0000	OWENS & MINOR INC	4,995.44	32.1900	5,279.16	283.72
922.0000	OWENS CORNING	27,927.17	66.9200	61,700.24	33,773.07
166.0000	PDC ENERGY INC	4,926.88	43.1100	7,156.26	2,229.38
2,152.0000	PG&E CORP	96,366.69	66.3700	142,828.24	46,461.55
813.0000	PHH CORP	13,605.15	13.7700	11,195.01	2,410.14-
1,739.0000	PNC FINANCIAL SERVICES GROUP I	126,791.70	124.8700	217,148.93	90,357.23
1,383.0000	PNM RESOURCES INC	25,490.37	38.2500	52,899.75	27,409.38
1,500.0000	PPG INDUSTRIES INC	50,790.90	109.9600	164,940.00	114,149.10
1,319.0000	PPL CORP	39,298.88	38.6600	50,992.54	11,693.66
123.0000	PRA GROUP INC	4,940.09	37.9000	4,661.70	278.39-
497.0000	PVH CORP	38,153.27	114.5000	56,906.50	18,753.23
708.0000	PTC INC	16,156.56	55.1200	39,024.96	22,868.40
2,393.0000	PACCAR INC	90,780.85	66.0400	158,033.72	67,252.87
4,360.0000	PACIFIC BIOSCIENCES OF CALIFOR	23,500.40	3.5600	15,521.60	7,978.80-
736.0000	PACIRA PHARMACEUTICALS INC/DE	23,320.16	47.7000	35,107.20	11,787.04
303.0000	PACKAGING CORP OF AMERICA	10,062.45	111.3900	33,751.17	23,688.72



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1,123.0000	PACWEST BANCORP	28,747.17	46.7000	52,444.10	23,696.93
494.0000	PALO ALTO NETWORKS INC	38,930.81	133.8100	66,102.14	27,171.33
1,618.0000	PANDORA MEDIA INC	17,342.30	8.9200	14,432.56	2,909.74-
1,114.0000	PARATEK PHARMACEUTICALS INC	25,966.77	24.1000	26,847.40	880.63
350.0000	PAREXEL INTERNATIONAL CORP	7,808.50	86.9100	30,418.50	22,610.00
253.0000	PARK-OHIO HOLDINGS CORP	5,039.76	38.1000	9,639.30	4,599.54
1,007.0000	PARKER-HANNIFIN CORP	52,493.70	159.8200	160,938.74	108,445.04
814.0000	PARSLEY ENERGY INC	25,738.68	27.7500	22,588.50	3,150.18-
1,393.0000	PATTERN ENERGY GROUP INC	31,814.40	23.8400	33,209.12	1,394.72
304.0000	PATTERSON COS INC	9,228.30	46.9500	14,272.80	5,044.50
665.0000	PAYCOM SOFTWARE INC	23,328.20	68.4100	45,492.65	22,164.45
1,787.0000	PAYCHEX INC	56,823.68	56.9400	101,751.78	44,928.10
6,217.0000	PAYPAL HOLDINGS INC	110,955.68	53.6700	333,666.39	222,710.71
248.0000	PEBBLEBROOK HOTEL TRUST	4,816.16	32.2400	7,995.52	3,179.36
403.0000	PENN NATIONAL GAMING INC	3,428.84	21.4000	8,624.20	5,195.36
4,094.0000	JC PENNEY CO INC	34,530.70	4.6500	19,037.10	15,493.60-
302.0000	PENNS WOODS BANCORP INC	12,360.86	41.1800	12,436.36	75.50



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976.0000	PENNSYLVANIA REAL ESTATE INVES	13,459.04	11.3200	11,048.32	2,410.72-
301.0000	PENNYMAC MORTGAGE INVESTMENT T	4,894.26	18.2900	5,505.29	611.03
265.0000	PENSKE AUTOMOTIVE GROUP INC	5,708.10	43.9100	11,636.15	5,928.05
1,268.0000	PEOPLE'S UNITED FINANCIAL INC	5,163.35	17.6600	22,392.88	17,229.53
6,604.0000	PEPSICO INC	499,612.78	115.4900	762,695.96	263,083.18
441.0000	PERKINELMER INC	14,886.81	68.1400	30,049.74	15,162.93
28,040.0000	PFIZER INC	806,542.91	33.5900	941,863.60	135,320.69
7,892.0000	PHILIP MORRIS INTERNATIONAL IN	325,549.66	117.4500	926,915.40	601,365.74
3,803.0000	PHILLIPS 66	103,310.27	82.6900	314,470.07	211,159.80
1,452.0000	PHYSICIANS REALTY TRUST	23,449.80	20.1400	29,243.28	5,793.48
1,117.0000	PILGRIM'S PRIDE CORP	5,683.25	21.9200	24,484.64	18,801.39
322.0000	PINNACLE FINANCIAL PARTNERS IN	4,842.88	62.8000	20,221.60	15,378.72
538.0000	PINNACLE ENTERTAINMENT INC	6,014.84	19.7600	10,630.88	4,616.04
454.0000	PINNACLE WEST CAPITAL CORP	19,893.33	85.1600	38,662.64	18,769.31
828.0000	PIONEER NATURAL RESOURCES CO	110,201.46	159.5800	132,132.24	21,930.78
142.0000	PLANTRONICS INC	4,955.80	52.3100	7,428.02	2,472.22
2,374.0000	PLATFORM SPECIALTY PRODUCTS CO	23,407.64	12.6800	30,102.32	6,694.68



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158.0000	PLEXUS CORP	5,040.20	52.5700	8,306.06	3,265.86
517.0000	POLARIS INDUSTRIES INC	31,479.88	92.2300	47,682.91	16,203.03
409.0000	POLYONE CORP	9,742.38	38.7400	15,844.66	6,102.28
286.0000	POOL CORP	8,196.76	117.5700	33,625.02	25,428.26
599.0000	POPULAR INC	9,326.43	41.7100	24,984.29	15,657.86
197.0000	PORTLAND GENERAL ELECTRIC CO	4,934.85	45.6900	9,000.93	4,066.08
434.0000	POST HOLDINGS INC	18,659.63	77.6500	33,700.10	15,040.47
171.0000	POWER INTEGRATIONS INC	6,279.12	72.9000	12,465.90	6,186.78
1,884.0000	PRAXAIR INC	112,074.06	132.5500	249,724.20	137,650.14
2,318.0000	PREFERRED APARTMENT COMMUNITIE	25,988.95	15.7500	36,508.50	10,519.55
1,884.0000	T ROWE PRICE GROUP INC	89,739.25	74.2100	139,811.64	50,072.39
255.0000	PRICELINE GROUP INC/THE	95,568.68	1,870.5200	476,982.60	381,413.92
1,342.0000	PRINCIPAL FINANCIAL GROUP INC	40,511.83	64.0700	85,981.94	45,470.11
13,512.0000	PROCTER & GAMBLE CO/THE	908,961.02	87.1500	1,177,570.80	268,609.78
2,268.0000	PROGRESSIVE CORP/THE	44,656.92	44.0900	99,996.12	55,339.20
2,702.0000	PROLOGIS INC	75,744.25	58.6400	158,445.28	82,701.03
278.0000	PROSPERITY BANCSHARES INC	11,801.10	64.2400	17,858.72	6,057.62



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359.0000	PROVIDENT FINANCIAL SERVICES I	4,957.79	25.3800	9,111.42	4,153.63
1,245.0000	PRUDENTIAL FINANCIAL INC	87,384.13	108.1400	134,634.30	47,250.17
3,279.0000	PUBLIC SERVICE ENTERPRISE GROU	100,870.89	43.0100	141,029.79	40,158.90
661.0000	PUBLIC STORAGE	70,642.22	208.5300	137,838.33	67,196.11
1,140.0000	PULTEGROUP INC	22,357.50	24.5300	27,964.20	5,606.70
2,042.0000	PZEN A INVESTMENT MANAGEMENT IN	17,635.28	10.1600	20,746.72	3,111.44
1,207.0000	QEP RESOURCES INC	22,703.67	10.1000	12,190.70	10,512.97-
1,804.0000	QTS REALTY TRUST INC	51,594.40	52.3300	94,403.32	42,808.92
991.0000	QORVO INC	11,289.87	63.3200	62,750.12	51,460.25
9,341.0000	QUALCOMM INC	353,796.40	55.2200	515,810.02	162,013.62
583.0000	QUALITY CARE PROPERTIES INC	17,985.55	18.3100	10,674.73	7,310.82-
311.0000	QUANEX BUILDING PRODUCTS CORP	4,948.01	21.1500	6,577.65	1,629.64
1,366.0000	QUANTA SERVICES INC	31,598.99	32.9200	44,968.72	13,369.73
281.0000	RLJ LODGING TRUST	4,804.00	19.8700	5,583.47	779.47
20.0000	RMR GROUP INC/THE	260.00	48.6500	973.00	713.00
859.0000	RPM INTERNATIONAL INC	24,731.52	54.5500	46,858.45	22,126.93
649.0000	RSP PERMIAN INC	22,403.48	32.2700	20,943.23	1,460.25-



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933.0000	RADIAN GROUP INC	9,665.88	16.3500	15,254.55	5,588.67
366.0000	RALPH LAUREN CORP	30,625.05	73.8000	27,010.80	3,614.25-
680.0000	RAMCO-GERSHENSON PROPERTIES TR	10,145.60	12.9000	8,772.00	1,373.60-
1,076.0000	RANGE RESOURCES CORP	41,715.89	23.1700	24,930.92	16,784.97-
609.0000	RAYMOND JAMES FINANCIAL INC	18,702.39	80.2200	48,853.98	30,151.59
1,787.0000	RAYTHEON CO	85,851.23	161.4800	288,564.76	202,713.53
841.0000	REALOGY HOLDINGS CORP	26,519.63	32.4500	27,290.45	770.82
1,212.0000	REALTY INCOME CORP	66,051.61	55.1800	66,878.16	826.55
611.0000	RED HAT INC	39,281.19	95.7500	58,503.25	19,222.06
148.0000	REGAL BELOIT CORP	9,713.24	81.5500	12,069.40	2,356.16
418.0000	REGAL ENTERTAINMENT GROUP	4,928.22	20.4600	8,552.28	3,624.06
531.0000	REGENCY CENTERS CORP	21,824.10	62.6400	33,261.84	11,437.74
366.0000	REGENERON PHARMACEUTICALS INC	141,628.20	491.1400	179,757.24	38,129.04
7,014.0000	REGIONS FINANCIAL CORP	48,588.92	14.6400	102,684.96	54,096.04
345.0000	REINSURANCE GROUP OF AMERICA I	18,554.10	128.3900	44,294.55	25,740.45
447.0000	RELIANCE STEEL & ALUMINUM CO	22,028.16	72.8100	32,546.07	10,517.91
345.0000	RENASANT CORP	4,988.70	43.7400	15,090.30	10,101.60



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1,866.0000	REPUBLIC SERVICES INC	46,899.63	63.7300	118,920.18	72,020.55
915.0000	RESMED INC	23,601.94	77.8700	71,251.05	47,649.11
418.0000	RESOURCES CONNECTION INC	5,082.88	13.7000	5,726.60	643.72
384.0000	RETAIL OPPORTUNITY INVESTMENTS	5,026.56	19.1900	7,368.96	2,342.40
579.0000	REXNORD CORP	12,280.59	23.2500	13,461.75	1,181.16
4,003.0000	REYNOLDS AMERICAN INC	139,866.44	65.0400	260,355.12	120,488.68
1,044.0000	RICE ENERGY INC	23,197.68	26.6300	27,801.72	4,604.04
3,125.0000	RIGEL PHARMACEUTICALS INC	9,750.00	2.7300	8,531.25	1,218.75-
227.0000	RIGNET INC	4,939.52	16.0500	3,643.35	1,296.17-
1,228.0000	RINGCENTRAL INC	16,504.32	36.5500	44,883.40	28,379.08
2,242.0000	RING ENERGY INC	26,614.40	13.0000	29,146.00	2,531.60
3,958.0000	RITE AID CORP	31,171.04	2.9500	11,676.10	19,494.94-
873.0000	ROBERT HALF INTERNATIONAL INC	25,047.88	47.9300	41,842.89	16,795.01
1,001.0000	ROCKWELL AUTOMATION INC	57,419.76	161.9600	162,121.96	104,702.20
760.0000	ROCKWELL COLLINS INC	53,652.25	105.0800	79,860.80	26,208.55
110.0000	ROGERS CORP	4,951.10	108.6200	11,948.20	6,997.10
321.0000	ROPER TECHNOLOGIES INC	63,403.03	231.5300	74,321.13	10,918.10



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708.0000	ROSETTA STONE INC	5,210.88	10.7800	7,632.24	2,421.36
1,676.0000	ROSS STORES INC	96,360.79	57.7300	96,755.48	394.69
350.0000	ROYAL GOLD INC	19,143.81	78.1700	27,359.50	8,215.69
344.0000	RYDER SYSTEM INC	17,888.72	71.9800	24,761.12	6,872.40
488.0000	RYMAN HOSPITALITY PROPERTIES I	13,519.13	64.0100	31,236.88	17,717.75
281.0000	S&T BANCORP INC	4,979.32	35.8600	10,076.66	5,097.34
949.0000	S&P GLOBAL INC	70,596.80	145.9900	138,544.51	67,947.71
577.0000	SBA COMMUNICATIONS CORP	21,135.51	134.9000	77,837.30	56,701.79
872.0000	SEI INVESTMENTS CO	14,640.88	53.7800	46,896.16	32,255.28
316.0000	SEACOR MARINE HOLDINGS INC	7,955.65	20.3600	6,433.76	1,521.89-
214.0000	SJW GROUP	4,962.66	49.1800	10,524.52	5,561.86
686.0000	SL GREEN REALTY CORP	39,657.66	105.8000	72,578.80	32,921.14
3,528.0000	SLM CORP	20,584.41	11.5000	40,572.00	19,987.59
483.0000	SP PLUS CORP	10,007.76	30.5500	14,755.65	4,747.89
255.0000	SVB FINANCIAL GROUP	14,614.05	175.7900	44,826.45	30,212.40
695.0000	SAFEWAY CASA LEY CVR	705.36	1.0100	701.95	3.41-
695.0000	SAFEWAY PDC LLC CVR	22.10	0.0300	20.85	1.25-



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352.0000	ST JOE CO/THE	5,079.36	18.7500	6,600.00	1,520.64
3,185.0000	SALESFORCE.COM INC	101,075.20	86.6000	275,821.00	174,745.80
3,204.0000	SANCHEZ ENERGY CORP	21,979.44	7.1800	23,004.72	1,025.28
109.0000	SANDERSON FARMS INC	5,261.43	115.6500	12,605.85	7,344.42
276.0000	SANDY SPRING BANCORP INC	4,832.76	40.6600	11,222.16	6,389.40
1,333.0000	SANMINA CORP	12,210.93	38.1000	50,787.30	38,576.37
130.0000	SAUL CENTERS INC	4,982.90	57.9800	7,537.40	2,554.50
753.0000	SCANA CORP	27,245.81	67.0100	50,458.53	23,212.72
515.0000	HENRY SCHEIN INC	40,663.39	183.0200	94,255.30	53,591.91
8,506.0000	SCHLUMBERGER LTD	526,783.48	65.8400	560,035.04	33,251.56
194.0000	SCHOLASTIC CORP	4,834.48	43.5900	8,456.46	3,621.98
6,043.0000	CHARLES SCHWAB CORP/THE	106,767.19	42.9600	259,607.28	152,840.09
190.0000	SCHWEITZER-MAUDUIT INTERNATIONAL	5,102.45	37.2300	7,073.70	1,971.25
165.0000	SCIENCE APPLICATIONS INTERNATIONAL	4,839.30	69.4200	11,454.30	6,615.00
515.0000	SCIENTIFIC GAMES CORP	5,000.65	26.1000	13,441.50	8,440.85
1,023.0000	EW SCRIPPS CO/THE	7,948.87	17.8100	18,219.63	10,270.76
621.0000	SEACOAST BANKING CORP OF FLORIDA	4,685.76	24.1000	14,966.10	10,280.34



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315.0000	SEACOR HOLDINGS INC	12,031.06	34.3000	10,804.50	1,226.56-
899.0000	SEALED AIR CORP	19,824.16	44.7600	40,239.24	20,415.08
886.0000	SEATTLE GENETICS INC	19,069.78	51.7400	45,841.64	26,771.86
297.0000	SELECT COMFORT CORP	4,814.37	35.4900	10,540.53	5,726.16
600.0000	SELECT MEDICAL HOLDINGS CORP	5,106.00	15.3500	9,210.00	4,104.00
321.0000	SELECTIVE INSURANCE GROUP INC	5,091.06	50.0500	16,066.05	10,974.99
190.0000	SEMGROUP CORP	4,866.93	27.0000	5,130.00	263.07
1,416.0000	SEMPRA ENERGY	75,155.45	112.7500	159,654.00	84,498.55
136.0000	SENSIENT TECHNOLOGIES CORP	4,944.96	80.5300	10,952.08	6,007.12
1,420.0000	SERVICE CORP INTERNATIONAL/US	15,804.60	33.4500	47,499.00	31,694.40
581.0000	SERVICENOW INC	17,406.76	106.0000	61,586.00	44,179.24
2,457.0000	SERVICESTOURCE INTERNATIONAL IN	9,926.28	3.8800	9,533.16	393.12-
112.0000	SHERWIN-WILLIAMS CO/THE	29,968.99	350.9600	39,307.52	9,338.53
458.0000	SHUTTERFLY INC	13,593.44	47.5000	21,755.00	8,161.56
246.0000	SIGNATURE BANK/NEW YORK NY	13,731.72	143.5300	35,308.38	21,576.66
248.0000	SILICON LABORATORIES INC	9,936.20	68.3500	16,950.80	7,014.60
588.0000	SILGAN HOLDINGS INC	11,780.58	31.7800	18,686.64	6,906.06



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202.0000	SIMMONS FIRST NATIONAL CORP	4,930.82	52.9000	10,685.80	5,754.98
1,380.0000	SIMON PROPERTY GROUP INC	117,345.95	161.7600	223,228.80	105,882.85
168.0000	SIMPSON MANUFACTURING CO INC	4,935.84	43.7100	7,343.28	2,407.44
22,006.0000	SIRIUS XM HOLDINGS INC	43,119.42	5.4700	120,372.82	77,253.40
148.0000	SIX FLAGS ENTERTAINMENT CORP	4,997.96	59.6100	8,822.28	3,824.32
1,053.0000	SKECHERS U.S.A. INC	4,794.66	29.5000	31,063.50	26,268.84
1,709.0000	SKYWORKS SOLUTIONS INC	27,531.54	95.9500	163,978.55	136,447.01
1,824.0000	AO SMITH CORP	28,189.92	56.3300	102,745.92	74,556.00
312.0000	JM SMUCKER CO/THE	27,727.44	118.3300	36,918.96	9,191.52
159.0000	SNAP-ON INC	9,926.66	158.0000	25,122.00	15,195.34
229.0000	SNYDER'S-LANCE INC	4,813.58	34.6200	7,927.98	3,114.40
375.0000	SONIC AUTOMOTIVE INC	5,231.25	19.4500	7,293.75	2,062.50
534.0000	SONOCO PRODUCTS CO	17,336.55	51.4200	27,458.28	10,121.73
174.0000	SOUTH STATE CORP	4,840.68	85.7000	14,911.80	10,071.12
4,072.0000	SOUTHERN CO/THE	153,419.76	47.8800	194,967.36	41,547.60
345.0000	SOUTHSIDE BANCSHARES INC	5,037.90	34.9400	12,054.30	7,016.40
3,990.0000	SOUTHWEST AIRLINES CO	45,283.11	62.1400	247,938.60	202,655.49



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272.0000	SOUTHWEST GAS HOLDINGS INC	10,194.56	73.0600	19,872.32	9,677.76
2,519.0000	SOUTHWESTERN ENERGY CO	31,587.36	6.0800	15,315.52	16,271.84-
363.0000	SPEEDWAY MOTORSPORTS INC	5,027.55	18.2700	6,632.01	1,604.46
384.0000	SPIRE INC	22,282.34	69.7500	26,784.00	4,501.66
1,117.0000	SPIRIT AEROSYSTEMS HOLDINGS IN	22,330.82	57.9400	64,718.98	42,388.16
415.0000	SPIRIT AIRLINES INC	4,988.47	51.6500	21,434.75	16,446.28
3,283.0000	SPIRIT REALTY CAPITAL INC	31,738.98	7.4100	24,327.03	7,411.95-
671.0000	SPLUNK INC	33,438.80	56.8900	38,173.19	4,734.39
7,545.0000	SPRINT CORP	39,156.10	8.2100	61,944.45	22,788.35
887.0000	SPROUTS FARMERS MARKET INC	23,088.61	22.6700	20,108.29	2,980.32-
1,176.0000	SQUARE INC	28,058.48	23.4600	27,588.96	469.52-
1,186.0000	STANLEY BLACK & DECKER INC	68,473.54	140.7300	166,905.78	98,432.24
2,453.0000	STAPLES INC	24,284.70	10.0700	24,701.71	417.01
8,740.0000	STARBUCKS CORP	149,663.32	58.3100	509,629.40	359,966.08
554.0000	STARWOOD PROPERTY TRUST INC	11,102.16	22.3900	12,404.06	1,301.90
1,390.0000	STATE STREET CORP	83,669.38	89.7300	124,724.70	41,055.32
1,291.0000	STEEL DYNAMICS INC	19,704.08	35.8100	46,230.71	26,526.63



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605.0000	STERICYCLE INC	38,965.96	76.3200	46,173.60	7,207.64
1,202.0000	STERLING BANCORP/DE	9,804.58	23.2500	27,946.50	18,141.92
827.0000	STIFEL FINANCIAL CORP	32,320.81	45.9800	38,025.46	5,704.65
327.0000	STOCK YARDS BANCORP INC	4,907.18	38.9000	12,720.30	7,813.12
686.0000	STONEGATE BANK	17,499.86	46.1800	31,679.48	14,179.62
854.0000	STORE CAPITAL CORP	22,161.30	22.4500	19,172.30	2,989.00-
2,020.0000	STRYKER CORP	100,430.20	138.7800	280,335.60	179,905.40
79.0000	STURM RUGER & CO INC	2,193.04	62.1500	4,909.85	2,716.81
431.0000	SUN BANCORP INC/NJ	5,348.71	24.6500	10,624.15	5,275.44
355.0000	SUN COMMUNITIES INC	22,741.35	87.6900	31,129.95	8,388.60
216.0000	SUNCOKE ENERGY INC	2,608.06	10.9000	2,354.40	253.66-
1,431.0000	SUNSTONE HOTEL INVESTORS INC	11,913.91	16.1200	23,067.72	11,153.81
2,689.0000	SUNTRUST BANKS INC	68,076.91	56.7200	152,520.08	84,443.17
1,214.0000	SUPERIOR ENERGY SERVICES INC	22,823.20	10.4300	12,662.02	10,161.18-
633.0000	SWIFT TRANSPORTATION CO	9,944.43	26.5000	16,774.50	6,830.07
1,438.0000	SYMANTEC CORP	32,891.02	28.2500	40,623.50	7,732.48
194.0000	SYNAPTICS INC	4,855.82	51.7100	10,031.74	5,175.92



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342.0000	SYNOPSIS INC	9,919.68	72.9300	24,942.06	15,022.38
1,368.0000	SYNOVUS FINANCIAL CORP	17,524.08	44.2400	60,520.32	42,996.24
130.0000	SYNNEX CORP	4,956.90	119.9600	15,594.80	10,637.90
3,751.0000	SYNCHRONY FINANCIAL	106,404.77	29.8200	111,854.82	5,450.05
1,253.0000	SYSCO CORP	42,876.29	50.3300	63,063.49	20,187.20
2,163.0000	TCF FINANCIAL CORP	22,062.60	15.9400	34,478.22	12,415.62
1,514.0000	TD AMERITRADE HOLDING CORP	28,160.40	42.9900	65,086.86	36,926.46
1,554.0000	TFS FINANCIAL CORP	25,840.25	15.4700	24,040.38	1,799.87-
2,526.0000	TJX COS INC/THE	52,320.11	72.1700	182,301.42	129,981.31
2,525.0000	T-MOBILE US INC	55,914.29	60.6200	153,065.50	97,151.21
948.0000	TAILORED BRANDS INC	24,791.10	11.1600	10,579.68	14,211.42-
437.0000	TAKE-TWO INTERACTIVE SOFTWARE	6,471.97	73.3800	32,067.06	25,595.09
183.0000	TANGER FACTORY OUTLET CENTERS	4,884.27	25.9800	4,754.34	129.93-
2,698.0000	TARGET CORP	151,033.77	52.2900	141,078.42	9,955.35-
1,034.0000	TARGA RESOURCES CORP	34,000.12	45.2000	46,736.80	12,736.68
186.0000	TAUBMAN CENTERS INC	7,456.74	59.5500	11,076.30	3,619.56
223.0000	TEAM INC	4,995.20	23.4500	5,229.35	234.15



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277.0000	TECH DATA CORP	12,772.47	101.0000	27,977.00	15,204.53
2,000.0000	TEGNA INC	13,706.07	14.4100	28,820.00	15,113.93
754.0000	TELADOC INC	24,625.64	34.7000	26,163.80	1,538.16
102.0000	TELEDYNE TECHNOLOGIES INC	4,876.62	127.6500	13,020.30	8,143.68
144.0000	TELEFLEX INC	9,796.02	207.7600	29,917.44	20,121.42
1,863.0000	TELEPHONE & DATA SYSTEMS INC	45,502.19	27.7500	51,698.25	6,196.06
388.0000	TEMPUR SEALY INTERNATIONAL INC	15,357.04	53.3900	20,715.32	5,358.28
106.0000	TENNANT CO	4,983.06	73.8000	7,822.80	2,839.74
671.0000	TENNECO INC	18,150.55	57.8300	38,803.93	20,653.38
1,170.0000	TERADYNE INC	16,169.40	30.0300	35,135.10	18,965.70
556.0000	TEREX CORP	14,190.44	37.5000	20,850.00	6,659.56
2,392.0000	TERRENO REALTY CORP	42,955.92	33.6600	80,514.72	37,558.80
267.0000	TESARO INC	9,972.45	139.8600	37,342.62	27,370.17
689.0000	TESLA INC	66,419.76	361.6100	249,149.29	182,729.53
573.0000	TESORO CORP	14,607.06	93.6000	53,632.80	39,025.74
370.0000	TETRA TECH INC	8,376.80	45.7500	16,927.50	8,550.70
5,432.0000	TETRAPHASE PHARMACEUTICALS INC	23,792.16	7.1300	38,730.16	14,938.00



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6,700.0000	TEXAS INSTRUMENTS INC	224,685.83	76.9300	515,431.00	290,745.17
1,348.0000	TEXTRON INC	37,364.20	47.1000	63,490.80	26,126.60
2,460.0000	THERMO FISHER SCIENTIFIC INC	96,752.51	174.4700	429,196.20	332,443.69
264.0000	THOR INDUSTRIES INC	6,293.76	104.5200	27,593.28	21,299.52
1,204.0000	3D SYSTEMS CORP	21,684.04	18.7000	22,514.80	830.76
3,378.0000	3M CO	252,771.69	208.1900	703,265.82	450,494.13
906.0000	TIFFANY & CO	30,337.41	93.8700	85,046.22	54,708.81
4,563.0000	TILLY'S INC	35,910.70	10.1500	46,314.45	10,403.75
697.0000	TIME INC	8,393.70	14.3500	10,001.95	1,608.25
5,580.0000	TIME WARNER INC	203,652.12	100.4100	560,287.80	356,635.68
2,384.0000	TITAN INTERNATIONAL INC	23,625.44	12.0100	28,631.84	5,006.40
2,974.0000	TIVO CORP	58,914.94	18.6500	55,465.10	3,449.84-
820.0000	TIVITY HEALTH INC	5,584.20	39.8500	32,677.00	27,092.80
1,241.0000	TOLL BROTHERS INC	27,612.41	39.5100	49,031.91	21,419.50
130.0000	TOMPKINS FINANCIAL CORP	5,062.20	78.7200	10,233.60	5,171.40
310.0000	TOPBUILD CORP	4,479.13	53.0700	16,451.70	11,972.57
819.0000	TORCHMARK CORP	22,753.64	76.5000	62,653.50	39,899.86



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736.0000	TORO CO/THE	10,992.16	69.2900	50,997.44	40,005.28
891.0000	TOTAL SYSTEM SERVICES INC	19,795.33	58.2500	51,900.75	32,105.42
249.0000	TOWNE BANK/PORTSMOUTH VA	3,215.24	30.8000	7,669.20	4,453.96
595.0000	TRACTOR SUPPLY CO	25,024.53	54.2100	32,254.95	7,230.42
57.0000	TRANSDIGM GROUP INC	4,891.17	268.8700	15,325.59	10,434.42
2,086.0000	TRAVELERS COS INC/THE	96,978.76	126.5300	263,941.58	166,962.82
85.0000	TREEHOUSE FOODS INC	4,606.15	81.6900	6,943.65	2,337.50
2.0000	TREX CO INC	25.86	67.6600	135.32	109.46
422.0000	TRICO BANCSHARES	6,055.70	35.1500	14,833.30	8,777.60
1,458.0000	TRIMBLE INC	27,024.03	35.6700	52,006.86	24,982.83
1,299.0000	TRINITY INDUSTRIES INC	20,398.01	28.0300	36,410.97	16,012.96
735.0000	TRIPADVISOR INC	26,729.35	38.2000	28,077.00	1,347.65
345.0000	TRUEBLUE INC	5,023.20	26.5000	9,142.50	4,119.30
150.0000	TRUSTMARK CORP	3,406.50	32.1600	4,824.00	1,417.50
314.0000	TUPPERWARE BRANDS CORP	14,974.66	70.2300	22,052.22	7,077.56
11,508.0000	TWENTY-FIRST CENTURY FOX INC	197,578.78	28.3400	326,136.72	128,557.94
3,246.0000	TWITTER INC	53,618.38	17.8700	58,006.02	4,387.64



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
86.0000	TYLER TECHNOLOGIES INC	4,999.18	175.6700	15,107.62	10,108.44
2,338.0000	TYSON FOODS INC	38,339.08	62.6300	146,428.94	108,089.86
1,181.0000	UDR INC	26,938.61	38.9700	46,023.57	19,084.96
286.0000	UGI CORP	5,960.24	48.4100	13,845.26	7,885.02
190.0000	UMB FINANCIAL CORP	7,607.60	74.8600	14,223.40	6,615.80
6,138.0000	US BANCORP	212,682.43	51.9200	318,684.96	106,002.53
2,244.0000	UMH PROPERTIES INC	21,205.80	17.0500	38,260.20	17,054.40
366.0000	USANA HEALTH SCIENCES INC	14,231.91	64.1000	23,460.60	9,228.69
412.0000	US SILICA HOLDINGS INC	4,865.72	35.4900	14,621.88	9,756.16
269.0000	ULTA BEAUTY INC	16,901.27	287.3400	77,294.46	60,393.19
269.0000	ULTIMATE SOFTWARE GROUP INC/TH	23,379.35	210.0600	56,506.14	33,126.79
2,104.0000	UMPQUA HOLDINGS CORP	22,409.37	18.3600	38,629.44	16,220.07
1,435.0000	UNDER ARMOUR INC	15,081.68	21.7600	31,225.60	16,143.92
1,449.0000	UNDER ARMOUR INC	14,635.71	20.1600	29,211.84	14,576.13
97.0000	UNIFIRST CORP/MA	4,938.27	140.7000	13,647.90	8,709.63
802.0000	UNION BANKSHARES CORP	9,587.27	33.9000	27,187.80	17,600.53
3,830.0000	UNION PACIFIC CORP	83,603.92	108.9100	417,125.30	333,521.38



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773.0000	UNITED COMMUNITY BANKS INC/GA	5,094.07	27.8000	21,489.40	16,395.33
586.0000	UNITED BANKSHARES INC/WV	10,942.20	39.2000	22,971.20	12,029.00
1,783.0000	UNITED CONTINENTAL HOLDINGS IN	43,817.39	75.2500	134,170.75	90,353.36
942.0000	UNITED FINANCIAL BANCORP INC	9,977.00	16.6900	15,721.98	5,744.98
277.0000	UNITED FIRE GROUP INC	4,855.81	44.0600	12,204.62	7,348.81
322.0000	UNITED NATURAL FOODS INC	14,770.35	36.7000	11,817.40	2,952.95-
2,748.0000	UNITED PARCEL SERVICE INC	218,789.75	110.5900	303,901.32	85,111.57
789.0000	UNITED RENTALS INC	27,392.69	112.7100	88,928.19	61,535.50
554.0000	UNITED STATES CELLULAR CORP	24,481.26	38.3200	21,229.28	3,251.98-
1,236.0000	UNITED STATES STEEL CORP	23,623.02	22.1400	27,365.04	3,742.02
5,059.0000	UNITED TECHNOLOGIES CORP	322,158.63	122.1100	617,754.49	295,595.86
548.0000	UNITED THERAPEUTICS CORP	24,908.59	129.7300	71,092.04	46,183.45
5,552.0000	UNITEDHEALTH GROUP INC	275,245.28	185.4200	1,029,451.84	754,206.56
1,234.0000	UNITI GROUP INC	25,531.46	25.1400	31,022.76	5,491.30
537.0000	UNITIL CORP	14,936.01	48.3100	25,942.47	11,006.46
300.0000	UNIVERSAL DISPLAY CORP	25,518.00	109.2500	32,775.00	7,257.00
184.0000	UNIVERSAL FOREST PRODUCTS INC	4,852.08	87.3100	16,065.04	11,212.96



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451.0000	UNIVERSAL HEALTH REALTY INCOME	21,738.20	79.5400	35,872.54	14,134.34
410.0000	UNIVERSAL HEALTH SERVICES INC	24,507.64	122.0800	50,052.80	25,545.16
2,183.0000	UNUM GROUP	42,731.57	46.6300	101,793.29	59,061.72
166.0000	URBAN EDGE PROPERTIES	2,591.56	23.7300	3,939.18	1,347.62
477.0000	URBAN OUTFITTERS INC	14,707.10	18.5400	8,843.58	5,863.52-
228.0000	VCA INC	5,002.32	92.3100	21,046.68	16,044.36
1,653.0000	VF CORP	62,918.13	57.6000	95,212.80	32,294.67
370.0000	VSE CORP	4,713.80	44.9800	16,642.60	11,928.80
208.0000	VAIL RESORTS INC	9,195.68	202.8300	42,188.64	32,992.96
2,657.0000	VALERO ENERGY CORP	76,545.87	67.4600	179,241.22	102,695.35
187.0000	VALMONT INDUSTRIES INC	19,106.48	149.6000	27,975.20	8,868.72
1,589.0000	VALVOLINE INC	15,933.02	23.7200	37,691.08	21,758.06
370.0000	VANTIV INC	10,019.60	63.3400	23,435.80	13,416.20
399.0000	VAREX IMAGING CORP	5,758.51	33.8000	13,486.20	7,727.69
998.0000	VARIAN MEDICAL SYSTEMS INC	42,646.59	103.1900	102,983.62	60,337.03
92.0000	VECTRUS INC	1,180.67	32.3200	2,973.44	1,792.77
1,483.0000	VENTAS INC	77,501.50	69.4800	103,038.84	25,537.34



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7,770.0000	VEREIT INC	71,714.28	8.1400	63,247.80	8,466.48-
1,225.0000	VERISIGN INC	28,840.42	92.9600	113,876.00	85,035.58
19,304.0000	VERIZON COMMUNICATIONS INC	705,887.70	44.6600	862,116.64	156,228.94
145.0000	VERINT SYSTEMS INC	5,067.75	40.7000	5,901.50	833.75
740.0000	VERISK ANALYTICS INC	36,444.00	84.3700	62,433.80	25,989.80
45.0000	VERITIV CORP	1,140.41	45.0000	2,025.00	884.59
1,450.0000	VERTEX PHARMACEUTICALS INC	59,787.33	128.8700	186,861.50	127,074.17
691.0000	VERSUM MATERIALS INC	6,925.07	32.5000	22,457.50	15,532.43
117.0000	VIASAT INC	4,891.77	66.2000	7,745.40	2,853.63
3,184.0000	VIACOM INC	118,909.35	33.5700	106,886.88	12,022.47-
8,827.0000	VISA INC	218,970.52	93.7800	827,796.06	608,825.54
1,523.0000	VISHAY INTERTECHNOLOGY INC	14,377.12	16.6000	25,281.80	10,904.68
376.0000	VISTA OUTDOOR INC	7,257.20	22.5100	8,463.76	1,206.56
85.0000	VISTEON CORP	4,961.45	102.0600	8,675.10	3,713.65
304.0000	VLASIC FOODS INTL INC COM	3,211.50	10.5641	3,211.50	0.00
5,930.0000	VONAGE HOLDINGS CORP	11,207.70	6.5400	38,782.20	27,574.50
333.0000	VORNADO REALTY TRUST	25,018.58	93.9000	31,268.70	6,250.12



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773.0000	VOYA FINANCIAL INC	22,123.26	36.8900	28,515.97	6,392.71
664.0000	VULCAN MATERIALS CO	36,410.98	126.6800	84,115.52	47,704.54
90.0000	WD-40 CO	4,888.80	110.3500	9,931.50	5,042.70
313.0000	WGL HOLDINGS INC	19,836.65	83.4300	26,113.59	6,276.94
213.0000	WABCO HOLDINGS INC	14,611.56	127.5100	27,159.63	12,548.07
384.0000	WSFS FINANCIAL CORP	4,825.60	45.3500	17,414.40	12,588.80
2,104.0000	WEC ENERGY GROUP INC	46,908.39	61.3800	129,143.52	82,235.13
1,221.0000	WABASH NATIONAL CORP	10,036.73	21.9800	26,837.58	16,800.85
270.0000	WABTEC CORP/DE	18,324.99	91.5000	24,705.00	6,380.01
6,711.0000	WAL-MART STORES INC	365,960.40	75.6800	507,888.48	141,928.08
4,127.0000	WALGREENS BOOTS ALLIANCE INC	184,909.82	78.3100	323,185.37	138,275.55
664.0000	WASHINGTON FEDERAL INC	13,638.56	33.2000	22,044.80	8,406.24
809.0000	WASHINGTON PRIME GROUP INC	9,469.09	8.3700	6,771.33	2,697.76-
218.0000	WASHINGTON TRUST BANCORP INC	4,848.32	51.5500	11,237.90	6,389.58
643.0000	WASTE MANAGEMENT INC	23,102.99	73.3500	47,164.05	24,061.06
95.0000	WATERS CORP	8,628.85	183.8400	17,464.80	8,835.95
70.0000	WATSCO INC	5,804.40	154.2000	10,794.00	4,989.60



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149.0000	WATTS WATER TECHNOLOGIES INC	4,936.37	63.2000	9,416.80	4,480.43
367.0000	WAYFAIR INC	27,345.17	76.8800	28,214.96	869.79
696.0000	WEBSTER FINANCIAL CORP	13,671.32	52.2200	36,345.12	22,673.80
780.0000	WEINGARTEN REALTY INVESTORS	18,166.20	30.1000	23,478.00	5,311.80
130.0000	WEIS MARKETS INC	4,803.50	48.7200	6,333.60	1,530.10
1,365.0000	WELBILT INC	13,182.40	18.8500	25,730.25	12,547.85
253.0000	WELLCARE HEALTH PLANS INC	12,419.77	179.5600	45,428.68	33,008.91
24,833.0000	WELLS FARGO & CO	864,740.84	55.4100	1,375,996.53	511,255.69
1,740.0000	WELLTOWER INC	86,473.75	74.8500	130,239.00	43,765.25
3,177.0000	WENDY'S CO/THE	14,804.82	15.5100	49,275.27	34,470.45
261.0000	WESBANCO INC	4,909.41	39.5400	10,319.94	5,410.53
551.0000	WESCO INTERNATIONAL INC	19,494.38	57.3000	31,572.30	12,077.92
164.0000	WEST PHARMACEUTICAL SERVICES I	4,991.34	94.5200	15,501.28	10,509.94
831.0000	WESTAR ENERGY INC	30,016.82	53.0200	44,059.62	14,042.80
729.0000	WESTERN ALLIANCE BANCORP	4,891.59	49.2000	35,866.80	30,975.21
3,722.0000	WESTERN ASSET MORTGAGE CAPITAL	52,852.40	10.3000	38,336.60	14,515.80-
1,752.0000	WESTERN DIGITAL CORP	50,390.92	88.6000	155,227.20	104,836.28



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472.0000	WESTLAKE CHEMICAL CORP	18,799.76	66.2100	31,251.12	12,451.36
2,929.0000	WESTMORELAND COAL CO	22,289.69	4.8700	14,264.23	8,025.46-
1,557.0000	WESTROCK CO	44,296.54	56.6600	88,219.62	43,923.08
135.0000	WESTWOOD HOLDINGS GROUP INC	4,885.65	56.6900	7,653.15	2,767.50
229.0000	WEX INC	11,216.42	104.2700	23,877.83	12,661.41
4,346.0000	WEYERHAEUSER CO	74,342.04	33.5000	145,591.00	71,248.96
453.0000	WHIRLPOOL CORP	38,455.39	191.6200	86,803.86	48,348.47
1,862.0000	WHITESTONE REIT	22,101.45	12.2500	22,809.50	708.05
2,010.0000	WHITING PETROLEUM CORP	23,617.50	5.5100	11,075.10	12,542.40-
1,035.0000	WHOLE FOODS MARKET INC	31,106.44	42.1100	43,583.85	12,477.41
3,711.0000	WILLIAMS COS INC/THE	72,216.83	30.2800	112,369.08	40,152.25
553.0000	WILLIAMS-SONOMA INC	19,887.91	48.5000	26,820.50	6,932.59
390.0000	WINTRUST FINANCIAL CORP	11,633.70	76.4400	29,811.60	18,177.90
2,098.0000	WISDOMTREE INVESTMENTS INC	22,511.54	10.1700	21,336.66	1,174.88-
248.0000	WOLVERINE WORLD WIDE INC	5,023.24	28.0100	6,946.48	1,923.24
365.0000	WOODWARD INC	11,815.05	67.5800	24,666.70	12,851.65
490.0000	WORKDAY INC	39,316.22	97.0000	47,530.00	8,213.78



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227.0000	WORLD FUEL SERVICES CORP	7,792.91	38.4500	8,728.15	935.24
342.0000	WORTHINGTON INDUSTRIES INC	6,730.56	50.2200	17,175.24	10,444.68
2,203.0000	WPX ENERGY INC	26,735.91	9.6600	21,280.98	5,454.93-
1,042.0000	WYNDHAM WORLDWIDE CORP	37,453.86	100.4100	104,627.22	67,173.36
450.0000	WYNN RESORTS LTD	42,630.70	134.1200	60,354.00	17,723.30
896.0000	XPO LOGISTICS INC	20,590.08	64.6300	57,908.48	37,318.40
1,678.0000	XILINX INC	42,099.64	64.3200	107,928.96	65,829.32
1,610.0000	XEROX CORP	36,708.96	28.7300	46,255.30	9,546.34
950.0000	XYLEM INC/NY	24,870.03	55.4300	52,658.50	27,788.47
265.0000	XPERI CORP	4,285.05	29.8000	7,897.00	3,611.95
2,560.0000	YELP INC	67,315.64	30.0200	76,851.20	9,535.56
503.0000	YORK WATER CO/THE	8,910.09	34.8500	17,529.55	8,619.46
1,359.0000	YUM! BRANDS INC	25,416.78	73.7600	100,239.84	74,823.06
1,359.0000	YUM CHINA HOLDINGS INC	10,352.57	39.4300	53,585.37	43,232.80
848.0000	ZAYO GROUP HOLDINGS INC	22,285.44	30.9000	26,203.20	3,917.76
745.0000	ZEBRA TECHNOLOGIES CORP	22,305.30	100.5200	74,887.40	52,582.10
644.0000	ZILLOW GROUP INC	13,458.53	49.0100	31,562.44	18,103.91



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1,270.0000	ZIMMER BIOMET HOLDINGS INC	82,266.71	128.4000	163,068.00	80,801.29
1,713.0000	ZIONS BANCORPORATION	26,568.63	43.9100	75,217.83	48,649.20
1,157.0000	ZOETIS INC	55,316.17	62.3800	72,173.66	16,857.49
3,400.0000	ZYNGA INC	8,364.00	3.6400	12,376.00	4,012.00
TOTAL INVESTMENTS EQUITY		65,498,605.14		133,257,265.03	67,758,659.89
TOTAL INVESTMENT		65,716,966.84		133,475,626.73	67,758,659.89



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
227,600.3600	BLACKROCK LIQ T FUND INSTL FUND 60	227,600.36	100.0000	227,600.36	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		227,600.36		227,600.36	0.00
<u>INVESTMENTS FIXED INCOME SECURITIES</u>					
115,507.8900	ADVANCED DISPOSAL 10/16 COV-LITE TLB	115,507.89	100.3040	115,859.03	351.14
100,000.0000	AES CORP/VA 4.875% 05/15/2023 DD 04/30/13	101,275.92	101.8750	101,875.00	599.08
100,000.0000	AES CORP/VA 5.500% 04/15/2025 DD 04/06/15	99,180.21	104.6250	104,625.00	5,444.79
25,000.0000	AK STEEL CORP 7.000% 03/15/2027 DD 03/23/17	25,000.00	103.2500	25,812.50	812.50
100,000.0000	AMC NETWORKS INC 5.000% 04/01/2024 DD 03/30/16	100,000.00	102.3750	102,375.00	2,375.00
25,000.0000	AMN HEALTHCARE INC 144A 5.125% 10/01/2024 DD 10/03/16	25,000.00	101.2500	25,312.50	312.50
75,000.0000	AMERICAN TIRE DISTRIBUTOR 144A 10.250% 03/01/2022 DD 02/25/15	68,794.90	103.5000	77,625.00	8,830.10
50,000.0000	ACADIA HEALTHCARE CO INC 6.500% 03/01/2024 DD 02/16/16	50,086.97	106.7500	53,375.00	3,288.03



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50,000.0000	AECOM 5.750% 10/15/2022 DD 10/15/15	49,947.41	104.6250	52,312.50	2,365.09
50,000.0000	AECOM 5.875% 10/15/2024 DD 10/15/15	49,344.00	108.7500	54,375.00	5,031.00
50,000.0000	AECOM 5.125% 03/15/2027 DD 02/21/17	50,000.00	100.3750	50,187.50	187.50
50,000.0000	ADVANCED DISPOSAL SERVICE 144A 5.625% 11/15/2024 DD 11/10/16	50,000.00	103.0000	51,500.00	1,500.00
100,000.0000	ALBERTSONS COS LLC / SAFE 144A 5.750% 03/15/2025 DD 08/09/16	100,000.00	93.0000	93,000.00	7,000.00-
100,000.0000	ALLIANCE DATA SYSTEMS COR 144A 5.250% 12/01/2017 DD 11/20/12	100,454.95	100.7500	100,750.00	295.05
50,000.0000	ALLIANCE DATA SYSTEMS COR 144A 5.875% 11/01/2021 DD 10/27/16	50,000.00	103.5000	51,750.00	1,750.00
50,000.0000	ALLY FINANCIAL INC 4.750% 09/10/2018 DD 09/09/13	51,363.70	102.7500	51,375.00	11.30
100,000.0000	ALLY FINANCIAL INC 4.625% 05/19/2022 DD 05/19/15	99,567.96	104.0000	104,000.00	4,432.04
25,000.0000	ALPHA 3 BV / ALPHA US BID 144A 6.250% 02/01/2025 DD 01/31/17	25,000.00	102.8750	25,718.75	718.75
30,000.0000	ALPINE FINANCE MERGER SUB 144A 6.875% 08/01/2025 DD 07/12/17	30,000.00	101.7500	30,525.00	525.00



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200,000.0000	ALTICE LUXEMBOURG SA 144A 7.750% 05/15/2022 DD 05/08/14	210,424.00	106.1250	212,250.00	1,826.00
45,000.0000	AMERICAN AXLE & MANUFACTURING 7.750% 11/15/2019 DD 11/03/11	49,667.47	109.7500	49,387.50	279.97-
25,000.0000	AMERICAN AXLE & MANUFACTU 144A 6.250% 04/01/2025 DD 03/23/17	25,000.00	97.5000	24,375.00	625.00-
25,000.0000	AMERICAN AXLE & MANUFACTU 144A 6.500% 04/01/2027 DD 03/23/17	25,000.00	97.2500	24,312.50	687.50-
52,000.0000	AMERICAN BUILDERS & CONTR 144A 5.625% 04/15/2021 DD 04/16/13	52,308.63	102.8750	53,495.00	1,186.37
25,000.0000	AMERIGAS PARTNERS LP / AMERIGA 5.750% 05/20/2027 DD 02/13/17	25,000.00	101.2500	25,312.50	312.50
13,500.0000	ANCESTRY.COM 10/16 2ND LIEN COV-LITE TL	13,372.43	102.0830	13,781.21	408.78
19,800.0000	ANCESTRY.COM 2/17 TL	19,710.53	100.3330	19,865.93	155.40
75,000.0000	ANGLO AMERICAN CAPITAL PL 144A 9.375% 04/08/2019 DD 04/08/09	84,390.42	111.8750	83,906.25	484.17-
100,000.0000	ARAMARK SERVICES INC 5.125% 01/15/2024 DD 12/17/15	100,000.00	105.1250	105,125.00	5,125.00
400,000.0000	ARDAGH PACKAGING FINANCE 144A 6.000% 02/15/2025 DD 01/30/17	404,848.81	105.0000	420,000.00	15,151.19
200,000.0000	PETSMART INC 144A 7.125% 03/15/2023 DD 03/04/15	201,880.15	89.0000	178,000.00	23,880.15-



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25,000.0000	ASCENT RESOURCES UTICA HO 144A 10.000% 04/01/2022 DD 04/05/17	25,000.00	100.0000	25,000.00	0.00
100,000.0000	BASS PRO SHOPS 11/16 COV-LITE TLB	99,042.86	97.0500	97,050.00	1,992.86-
150,000.0000	BAYTEX ENERGY CORP 144A 5.125% 06/01/2021 DD 06/06/14	134,446.14	88.7500	133,125.00	1,321.14-
25,000.0000	BLOCK COMMUNICATIONS INC 144A 6.875% 02/15/2025 DD 02/16/17	25,000.00	107.2500	26,812.50	1,812.50
100,000.0000	BLUE RACER MIDSTREAM LLC 144A 6.125% 11/15/2022 DD 11/13/14	101,152.67	100.7500	100,750.00	402.67-
125,000.0000	BLUESCOPE STEEL FINANCE L 144A 6.500% 05/15/2021 DD 05/05/16	132,504.85	105.5000	131,875.00	629.85-
50,000.0000	BOMBARDIER INC 144A 6.000% 10/15/2022 DD 04/03/14	50,121.49	100.0000	50,000.00	121.49-
40,000.0000	BRAND ENERGY & INFRASTRUC 144A 8.500% 07/15/2025 DD 06/21/17	40,000.00	103.5000	41,400.00	1,400.00
105,000.0000	BWAY HOLDING CO 144A 5.500% 04/15/2024 DD 04/03/17	105,000.00	102.1250	107,231.25	2,231.25
105,000.0000	BWAY HOLDING CO 144A 7.250% 04/15/2025 DD 04/03/17	105,000.00	101.5000	106,575.00	1,575.00
50,000.0000	CCO HOLDINGS LLC / CCO HO 144A 5.875% 04/01/2024 DD 02/19/16	50,000.00	106.7500	53,375.00	3,375.00



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200,000.0000	CCO HOLDINGS LLC / CCO HO 144A 5.125% 05/01/2027 DD 02/06/17	199,756.07	102.2500	204,500.00	4,743.93
50,000.0000	CBS RADIO INC 144A 7.250% 11/01/2024 DD 10/17/16	50,999.40	103.0000	51,500.00	500.60
25,000.0000	OUTFRONT MEDIA CAPITAL LLC / O 5.625% 02/15/2024 DD 11/15/14	25,000.00	104.3750	26,093.75	1,093.75
100,000.0000	CDW LLC / CDW FINANCE CORP 5.000% 09/01/2023 DD 03/03/15	100,562.60	104.1250	104,125.00	3,562.40
100,000.0000	CHS/COMMUNITY HEALTH SYSTEMS I 6.250% 03/31/2023 DD 03/16/17	100,429.56	103.2350	103,235.00	2,805.44
25,000.0000	CNH INDUSTRIAL CAPITAL LLC 4.375% 04/05/2022 DD 04/10/17	25,000.00	104.6500	26,162.50	1,162.50
45,000.0000	CTR PARTNERSHIP LP / CARETRUST 5.250% 06/01/2025 DD 05/24/17	45,000.00	103.0000	46,350.00	1,350.00
100,000.0000	CST BRANDS INC 5.000% 05/01/2023 DD 11/01/13	100,204.20	105.0200	105,020.00	4,815.80
75,000.0000	CABLEVISION SYSTEMS CORP 7.750% 04/15/2018 DD 04/15/10	75,058.13	103.7500	77,812.50	2,754.37
50,000.0000	CABLEVISION SYSTEMS CORP 8.000% 04/15/2020 DD 04/15/10	55,482.67	111.3750	55,687.50	204.83
100,000.0000	CABLEVISION SYSTEMS CORP 5.875% 09/15/2022 DD 09/27/12	85,857.59	105.1250	105,125.00	19,267.41



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25,000.0000	CALATLANTIC GROUP INC 5.000% 06/15/2027 DD 06/09/17	25,000.00	100.2500	25,062.50	62.50
50,000.0000	CALPINE CORP 5.375% 01/15/2023 DD 07/22/14	50,000.00	97.5000	48,750.00	1,250.00-
100,000.0000	CALPINE CORP 144A 5.250% 06/01/2026 DD 05/31/16	100,000.00	98.0000	98,000.00	2,000.00-
50,000.0000	CAMELOT FINANCE SA 144A 7.875% 10/15/2024 DD 10/03/16	50,000.00	107.7500	53,875.00	3,875.00
50,000.0000	CENTENE CORP 4.750% 05/15/2022 DD 04/29/14	50,734.80	104.3750	52,187.50	1,452.70
100,000.0000	CENTENE CORP 4.750% 01/15/2025 DD 11/09/16	100,000.00	102.7500	102,750.00	2,750.00
175,000.0000	CENTURYLINK INC 5.625% 04/01/2025 DD 10/01/15	175,000.00	99.8330	174,707.75	292.25-
132,000.0000	CEQUEL COMMUNICATIONS HOL 144A 6.375% 09/15/2020 DD 10/25/12	128,966.50	102.0000	134,640.00	5,673.50
50,000.0000	CHANGE HEALTHCARE HOLDING 144A 5.750% 03/01/2025 DD 02/15/17	50,000.00	102.0000	51,000.00	1,000.00
50,000.0000	CHENIERE CORPUS CHRISTI HOLDIN 5.875% 03/31/2025 DD 12/09/16	50,000.00	106.6250	53,312.50	3,312.50
50,000.0000	CHENIERE CORPUS CHRISTI H 144A 5.125% 06/30/2027 DD 05/19/17	50,000.00	102.5000	51,250.00	1,250.00



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61,000.0000	CHESAPEAKE ENERGY CORP 144A 8.000% 12/15/2022 DD 12/23/13	62,521.85	105.7500	64,507.50	1,985.65
150,000.0000	CHURCHILL DOWNS INC 5.375% 12/15/2021 DD 12/16/13	151,153.62	103.7500	155,625.00	4,471.38
100,000.0000	FRONTIER COMMUNICATIONS CORP 7.125% 03/15/2019 DD 03/23/07	103,168.58	104.2500	104,250.00	1,081.42
100,000.0000	CLEAR CHANNEL WORLDWIDE HOLDIN 6.500% 11/15/2022 DD 05/15/13	103,349.64	102.7700	102,770.00	579.64-
50,000.0000	COGENT COMMUNICATIONS GRO 144A 5.375% 03/01/2022 DD 02/20/15	50,168.50	105.0000	52,500.00	2,331.50
100,000.0000	COMMScope TECHNOLOGIES LL 144A 6.000% 06/15/2025 DD 06/11/15	100,000.00	106.7500	106,750.00	6,750.00
25,000.0000	UNITI GROUP INC / CSL CAP 144A 7.125% 12/15/2024 DD 12/15/16	25,000.00	99.2820	24,820.50	179.50-
50,000.0000	COTT HOLDINGS INC 144A 5.500% 04/01/2025 DD 03/22/17	50,000.00	102.0000	51,000.00	1,000.00
15,000.0000	COVANTA HOLDING CORP 5.875% 07/01/2025 DD 03/16/17	15,000.00	97.0000	14,550.00	450.00-
50,000.0000	CRESTWOOD MIDSTREAM PARTN 144A 5.750% 04/01/2025 DD 03/14/17	50,000.00	99.7500	49,875.00	125.00-
150,000.0000	CROWNROCK LP / CROWNROCK 144A 7.125% 04/15/2021 DD 04/15/13	140,035.47	102.7500	154,125.00	14,089.53



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25,000.0000	CYRUSONE LP / CYRUSONE FI 144A 5.000% 03/15/2024 DD 03/17/17	25,000.00	103.0000	25,750.00	750.00
15,000.0000	CYRUSONE LP / CYRUSONE FI 144A 5.375% 03/15/2027 DD 03/17/17	15,000.00	104.1250	15,618.75	618.75
100,000.0000	DANA INC 5.375% 09/15/2021 DD 08/02/13	102,411.61	102.8750	102,875.00	463.39
155,000.0000	DAVITA INC 5.750% 08/15/2022 DD 08/28/12	160,025.52	102.7500	159,262.50	763.02-
75,000.0000	DENBURY RESOURCES INC 144A 9.000% 05/15/2021 DD 05/10/16	78,309.44	95.2500	71,437.50	6,871.94-
200,000.0000	DISH DBS CORP 7.875% 09/01/2019 DD 08/17/09	200,801.69	110.2500	220,500.00	19,698.31
50,000.0000	DISH DBS CORP 5.875% 07/15/2022 DD 05/16/12	50,961.74	107.5000	53,750.00	2,788.26
25,000.0000	DOLE FOOD CO INC 144A 7.250% 06/15/2025 DD 04/06/17	25,000.00	104.0000	26,000.00	1,000.00
125,000.0000	RR DONNELLEY & SONS CO 6.000% 04/01/2024 DD 03/20/14	123,564.98	97.3750	121,718.75	1,846.23-
100,000.0000	DYNEGY INC 5.875% 06/01/2023 DD 12/01/13	98,887.86	93.5000	93,500.00	5,387.86-
100,000.0000	DYNEGY INC 7.375% 11/01/2022 DD 05/01/15	99,442.13	98.7500	98,750.00	692.13-



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75,000.0000	EMC CORP 2.650% 06/01/2020 DD 06/06/13	72,871.01	98.1230	73,592.25	721.24
25,000.0000	ELDORADO RESORTS INC 144A 6.000% 04/01/2025 DD 03/29/17	25,000.00	106.0000	26,500.00	1,500.00
150,000.0000	ENDO FINANCE LLC / ENDO F 144A VAR RT 01/15/2022 DD 05/06/14	151,966.14	95.7500	143,625.00	8,341.14-
25,000.0000	ENPRO INDUSTRIES INC 144A 5.875% 09/15/2022 DD 03/15/17	25,239.17	104.2500	26,062.50	823.33
150,000.0000	ENTEGRIS INC 144A 6.000% 04/01/2022 DD 04/01/14	150,000.00	104.6250	156,937.50	6,937.50
50,000.0000	EQUINIX INC 5.375% 05/15/2027 DD 03/22/17	50,000.00	106.6250	53,312.50	3,312.50
100,000.0000	TRONOX FINANCE LLC 144A 7.500% 03/15/2022 DD 03/19/15	100,000.00	103.0000	103,000.00	3,000.00
50,000.0000	EXTRACTION OIL & GAS INC 144A 7.875% 07/15/2021 DD 07/18/16	50,000.00	102.7500	51,375.00	1,375.00
25,000.0000	FMG RESOURCES AUGUST 2006 144A 4.750% 05/15/2022 DD 05/12/17	25,000.00	100.3750	25,093.75	93.75
50,000.0000	FMG RESOURCES AUGUST 2006 144A 5.125% 05/15/2024 DD 05/12/17	50,000.00	100.0000	50,000.00	0.00
150,000.0000	FTI CONSULTING INC 6.000% 11/15/2022 DD 05/15/13	150,000.00	103.7500	155,625.00	5,625.00



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100,000.0000	FELCOR LODGING LP 5.625% 03/01/2023 DD 03/01/13	100,000.00	103.7500	103,750.00	3,750.00
75,000.0000	FERRELLGAS LP / FERRELLGAS FIN VAR RT 06/15/2023 DD 06/15/16	75,000.00	93.2500	69,937.50	5,062.50-
125,000.0000	FIRST DATA CORP 144A 5.375% 08/15/2023 DD 08/11/15	125,000.00	104.5000	130,625.00	5,625.00
150,000.0000	FIRST QUALITY FINANCE CO 144A 4.625% 05/15/2021 DD 05/14/13	150,000.00	100.8750	151,312.50	1,312.50
10,000.0000	FIRSTCASH INC 144A 5.375% 06/01/2024 DD 05/30/17	10,000.00	104.3750	10,437.50	437.50
50,000.0000	FLEX ACQUISITION CO INC 144A 6.875% 01/15/2025 DD 01/17/17	50,000.00	104.0000	52,000.00	2,000.00
125,000.0000	FREEPORT-MCMORAN INC 3.875% 03/15/2023 DD 09/15/13	115,525.99	93.0000	116,250.00	724.01
15,000.0000	FRESENIUS MEDICAL CARE US 144A 5.625% 07/31/2019 DD 01/26/12	15,981.08	105.7500	15,862.50	118.58-
150,000.0000	FRESENIUS US FINANCE II I 144A 4.500% 01/15/2023 DD 09/25/15	150,000.00	105.0000	157,500.00	7,500.00
100,000.0000	FRONTIER COMMUNICATIONS CORP 7.125% 01/15/2023 DD 08/15/12	93,796.60	83.2500	83,250.00	10,546.60-
75,000.0000	GFL ENVIRONMENTAL INC 144A 5.625% 05/01/2022 DD 05/12/17	75,243.94	102.2500	76,687.50	1,443.56



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100,000.0000	TEGNA INC 5.125% 07/15/2020 DD 07/29/13	102,888.85	102.5000	102,500.00	388.85-
200,000.0000	GARDA WORLD SECURITY CORP 144A 7.250% 11/15/2021 DD 11/08/13	203,505.90	101.1250	202,250.00	1,255.90-
100,000.0000	GENESIS ENERGY LP / GENESIS EN 6.000% 05/15/2023 DD 05/21/15	100,000.00	98.0000	98,000.00	2,000.00-
175,000.0000	GIBSON ENERGY INC 144A 6.750% 07/15/2021 DD 06/28/13	173,503.55	103.2500	180,687.50	7,183.95
150,000.0000	GOODYEAR TIRE & RUBBER CO/THE 5.000% 05/31/2026 DD 05/13/16	150,000.00	103.5000	155,250.00	5,250.00
45,000.0000	GOODYEAR TIRE & RUBBER CO/THE 4.875% 03/15/2027 DD 03/07/17	45,000.00	101.5000	45,675.00	675.00
93,720.9246	WHEELABRATOR TECHNOLOGIES 10/14 TLB	92,289.75	100.3750	94,072.38	1,782.63
1,372.5800	WHEELABRATOR TECHNOLOGIES 10/14 TLC	1,351.61	100.3750	1,377.73	26.12
25,000.0000	GENESYS TELECOMMUNICATION 144A 10.000% 11/30/2024 DD 12/01/16	25,000.00	112.3750	28,093.75	3,093.75
49,749.9800	GENESYS 1/17 (USD) COV-LT TLB 0.000% 12/01/2023 DD 01/09/17	49,105.86	100.2250	49,861.92	756.06
100,000.0000	GRINDING MEDIA INC / MOLY 144A 7.375% 12/15/2023 DD 12/16/16	100,445.45	108.7500	108,750.00	8,304.55



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200,000.0000	GROUP 1 AUTOMOTIVE INC VAR RT 06/01/2022 DD 06/01/15	200,693.59	101.5000	203,000.00	2,306.41
25,000.0000	GULFPORT ENERGY CORP 144A 6.000% 10/15/2024 DD 10/14/16	25,000.00	97.2500	24,312.50	687.50-
100,000.0000	GULFPORT ENERGY CORP 144A 6.375% 05/15/2025 DD 12/21/16	100,000.00	98.5000	98,500.00	1,500.00-
100,000.0000	HCA INC 4.500% 02/15/2027 DD 08/15/16	100,116.62	102.8750	102,875.00	2,758.38
100,000.0000	HCA INC 5.500% 06/15/2047 DD 06/22/17	100,000.00	103.5000	103,500.00	3,500.00
150,000.0000	HCA INC 6.500% 02/15/2020 DD 08/01/11	163,844.46	109.1250	163,687.50	156.96-
150,000.0000	HCA INC 5.875% 05/01/2023 DD 10/23/12	162,114.20	108.8750	163,312.50	1,198.30
100,000.0000	HD SUPPLY INC 144A 5.750% 04/15/2024 DD 04/11/16	100,000.00	106.2500	106,250.00	6,250.00
150,000.0000	HALYARD HEALTH INC 6.250% 10/15/2022 DD 04/15/15	150,000.00	104.2500	156,375.00	6,375.00
50,000.0000	HERTZ CORP/THE 5.875% 10/15/2020 DD 10/16/12	50,512.85	96.7500	48,375.00	2,137.85-
50,000.0000	HERTZ CORP/THE 144A 7.625% 06/01/2022 DD 06/06/17	50,000.00	99.7600	49,880.00	120.00-



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84,000.0000	HERC RENTALS INC 144A 7.500% 06/01/2022 DD 06/09/16	84,000.00	105.5000	88,620.00	4,620.00
25,000.0000	HILL-ROM HOLDINGS INC 144A 5.000% 02/15/2025 DD 02/14/17	25,000.00	102.0000	25,500.00	500.00
50,000.0000	HOLLY ENERGY PARTNERS LP 144A 6.000% 08/01/2024 DD 07/19/16	50,000.00	104.0000	52,000.00	2,000.00
115,000.0000	HOLOGIC INC 144A 5.250% 07/15/2022 DD 07/02/15	115,000.00	105.0000	120,750.00	5,750.00
125,000.0000	HUNTSMAN INTERNATIONAL LLC 4.875% 11/15/2020 DD 11/19/12	130,746.06	105.2500	131,562.50	816.44
200,000.0000	INFOR US INC 6.500% 05/15/2022 DD 11/15/15	202,668.83	103.5000	207,000.00	4,331.17
250,000.0000	INMARSAT FINANCE PLC 144A 4.875% 05/15/2022 DD 06/04/14	241,077.72	101.5000	253,750.00	12,672.28
50,000.0000	INTELSAT JACKSON HOLDINGS SA 7.250% 04/01/2019 DD 10/01/11	43,157.12	100.0250	50,012.50	6,855.38
50,000.0000	INTELSAT JACKSON HOLDINGS SA 7.500% 04/01/2021 DD 10/01/11	41,503.42	92.2500	46,125.00	4,621.58
75,000.0000	INTELSAT JACKSON HOLDINGS SA 5.500% 08/01/2023 DD 06/05/13	63,745.58	82.7500	62,062.50	1,683.08-
75,000.0000	INVENTIV GROUP HOLDINGS I 144A 7.500% 10/01/2024 DD 10/14/16	75,000.00	108.5000	81,375.00	6,375.00



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150,000.0000	IRON MOUNTAIN INC 6.000% 08/15/2023 DD 08/13/13	153,267.78	106.2500	159,375.00	6,107.22
50,000.0000	PATHEON HOLDINGS I BV 144A 7.500% 02/01/2022 DD 02/05/14	52,911.15	106.2500	53,125.00	213.85
20,000.0000	J2 CLOUD SERVICES LLC / J 144A 6.000% 07/15/2025 DD 06/27/17	20,000.00	103.0000	20,600.00	600.00
25,000.0000	RP CROWN PARENT LLC 144A 7.375% 10/15/2024 DD 10/06/16	25,000.00	104.0000	26,000.00	1,000.00
10,000.0000	JONAH ENERGY 5/14 COV-LITE 2ND LIEN TL	9,700.00	95.1670	9,516.70	183.30-
50,000.0000	JUPITER RESOURCES INC 144A 8.500% 10/01/2022 DD 09/18/14	48,478.46	75.0000	37,500.00	10,978.46-
125,000.0000	KFC HOLDING CO/PIZZA HUT 144A 5.000% 06/01/2024 DD 06/16/16	125,000.00	104.2500	130,312.50	5,312.50
25,000.0000	KFC HOLDING CO/PIZZA HUT 144A 4.750% 06/01/2027 DD 06/15/17	25,000.00	102.1250	25,531.25	531.25
100,000.0000	KLX INC 144A 5.875% 12/01/2022 DD 12/08/14	100,000.00	105.0000	105,000.00	5,000.00
15,000.0000	KINROSS GOLD CORP 144A 4.500% 07/15/2027 DD 07/06/17	15,000.00	99.7500	14,962.50	37.50-
25,000.0000	KOPPERS INC 144A 6.000% 02/15/2025 DD 01/25/17	25,000.00	106.2500	26,562.50	1,562.50



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25,000.0000	KRONOS ACQUISITION HOLDIN 144A 9.000% 08/15/2023 DD 08/26/15	25,682.17	99.7500	24,937.50	744.67-
100,000.0000	LENNAR CORP VAR RT 12/01/2018 DD 02/04/13	102,221.27	102.2500	102,250.00	28.73
50,000.0000	LENNAR CORP 4.500% 04/30/2024 DD 04/28/17	50,000.00	103.3600	51,680.00	1,680.00
50,000.0000	LIONS GATE ENTERTAINMENT 144A 5.875% 11/01/2024 DD 10/27/16	50,477.16	105.2500	52,625.00	2,147.84
75,000.0000	MDC PARTNERS INC 144A 6.500% 05/01/2024 DD 03/23/16	75,000.00	99.7500	74,812.50	187.50-
50,000.0000	MGM RESORTS INTERNATIONAL 6.750% 10/01/2020 DD 04/01/13	53,756.69	110.7900	55,395.00	1,638.31
200,000.0000	MPH ACQUISITION HOLDINGS 144A 7.125% 06/01/2024 DD 06/07/16	200,000.00	106.6250	213,250.00	13,250.00
175,000.0000	MSCI INC 144A 5.750% 08/15/2025 DD 08/13/15	176,253.69	108.3120	189,546.00	13,292.31
25,000.0000	MALLINCKRODT INTERNATIONA 144A 5.500% 04/15/2025 DD 04/15/15	25,000.00	87.5000	21,875.00	3,125.00-
150,000.0000	MEDIACOM BROADBAND LLC / MEDIA 5.500% 04/15/2021 DD 03/17/14	150,000.00	102.2500	153,375.00	3,375.00
100,000.0000	MICRON TECHNOLOGY INC 144A 5.250% 01/15/2024 DD 04/30/15	100,000.00	103.5000	103,500.00	3,500.00



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50,000.0000	MIDAS INTERMEDIATE HOLDCO 144A 7.875% 10/01/2022 DD 09/24/14	50,441.03	103.0000	51,500.00	1,058.97
175,000.0000	MIDCONTINENT COMMUNICATIO 144A 6.875% 08/15/2023 DD 08/14/15	176,262.82	107.7500	188,562.50	12,299.68
65,000.0000	MOLINA HEALTHCARE INC VAR RT 11/15/2022 DD 05/15/16	65,000.00	105.8750	68,818.75	3,818.75
25,000.0000	MOLINA HEALTHCARE INC 144A 4.875% 06/15/2025 DD 06/06/17	25,000.00	100.7500	25,187.50	187.50
150,000.0000	NATURE'S BOUNTY CO/THE 144A 7.625% 05/15/2021 DD 05/05/16	150,000.00	106.2500	159,375.00	9,375.00
125,000.0000	NCR CORP 4.625% 02/15/2021 DD 02/15/13	125,189.60	102.0000	127,500.00	2,310.40
75,000.0000	NGL ENERGY PARTNERS LP / 144A 7.500% 11/01/2023 DD 10/24/16	75,000.00	98.6250	73,968.75	1,031.25-
75,000.0000	NGL ENERGY PARTNERS LP / 144A 6.125% 03/01/2025 DD 02/22/17	75,000.00	91.5000	68,625.00	6,375.00-
150,000.0000	NRG ENERGY INC 6.625% 03/15/2023 DD 03/15/13	151,520.94	102.7500	154,125.00	2,604.06
150,000.0000	NRG ENERGY INC 6.250% 07/15/2022 DD 07/15/14	153,289.77	102.6250	153,937.50	647.73
300,000.0000	NAVISTAR INTERNATIONAL CORP 8.250% 11/01/2021 DD 10/28/09	302,897.07	101.0000	303,000.00	102.93



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50,000.0000	NAVIENT CORP 5.000% 10/26/2020 DD 11/06/14	50,000.00	103.7500	51,875.00	1,875.00
75,000.0000	NAVIENT CORP 7.250% 09/25/2023 DD 09/16/16	74,912.84	107.7500	80,812.50	5,899.66
70,000.0000	NAVIENT CORP 6.500% 06/15/2022 DD 03/07/17	70,469.37	106.0000	74,200.00	3,730.63
200,000.0000	CSC HOLDINGS LLC 144A 10.875% 10/15/2025 DD 10/09/15	200,000.00	120.3750	240,750.00	40,750.00
75,000.0000	NFP CORP 144A 6.875% 07/15/2025 DD 07/12/17	75,000.00	101.0000	75,750.00	750.00
75,000.0000	NIELSEN FINANCE LLC / NIELSEN 4.500% 10/01/2020 DD 04/01/13	76,605.52	101.5280	76,146.00	459.52-
50,000.0000	NIELSEN FINANCE LLC / NIE 144A 5.000% 04/15/2022 DD 04/11/14	50,501.82	103.7500	51,875.00	1,373.18
50,000.0000	NOVA CHEMICALS CORP 144A 4.875% 06/01/2024 DD 06/09/17	50,000.00	99.6250	49,812.50	187.50-
25,000.0000	NOVA CHEMICALS CORP 144A 5.250% 06/01/2027 DD 06/09/17	25,000.00	99.5000	24,875.00	125.00-
200,000.0000	NOVELIS CORP 144A 6.250% 08/15/2024 DD 08/29/16	200,000.00	105.0000	210,000.00	10,000.00
21,000.0000	NUANCE COMMUNICATIONS INC 144A 5.375% 08/15/2020 DD 08/14/12	21,379.99	101.6250	21,341.25	38.74-



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25,000.0000	NUANCE COMMUNICATIONS INC 144A 5.625% 12/15/2026 DD 12/22/16	24,774.92	106.7500	26,687.50	1,912.58
200,000.0000	SFR GROUP SA 144A 6.000% 05/15/2022 DD 05/08/14	203,679.25	104.6250	209,250.00	5,570.75
200,000.0000	OASIS PETROLEUM INC 6.500% 11/01/2021 DD 11/10/11	195,688.39	97.0000	194,000.00	1,688.39-
25,000.0000	1011778 BC ULC / NEW RED 144A 4.250% 05/15/2024 DD 05/17/17	25,000.00	99.3690	24,842.25	157.75-
125,000.0000	ORBITAL ATK INC 5.500% 10/01/2023 DD 04/01/16	125,000.00	105.2500	131,562.50	6,562.50
25,000.0000	ORCHESTRA BORROWER LLC / 144A 6.750% 06/15/2022 DD 06/16/17	25,000.00	103.0400	25,760.00	760.00
50,000.0000	PTC INC 6.000% 05/15/2024 DD 05/12/16	50,000.00	108.2500	54,125.00	4,125.00
25,000.0000	PARK AEROSPACE HOLDINGS L 144A 5.250% 08/15/2022 DD 02/03/17	25,000.00	104.5320	26,133.00	1,133.00
25,000.0000	PARK AEROSPACE HOLDINGS L 144A 5.500% 02/15/2024 DD 02/03/17	25,000.00	104.4500	26,112.50	1,112.50
25,000.0000	PEABODY ENERGY CORP 144A 6.375% 03/31/2025 DD 02/15/17	25,000.00	98.5000	24,625.00	375.00-
150,000.0000	PENSKE AUTOMOTIVE GROUP INC 5.750% 10/01/2022 DD 04/01/13	150,481.37	103.2500	154,875.00	4,393.63



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50,000.0000	PETSMART INC 144A 5.875% 06/01/2025 DD 05/31/17	50,000.00	96.3750	48,187.50	1,812.50-
150,000.0000	PLATFORM SPECIALTY PRODUC 144A 6.500% 02/01/2022 DD 02/02/15	143,823.05	103.2500	154,875.00	11,051.95
150,000.0000	POLYONE CORP 5.250% 03/15/2023 DD 09/15/13	150,360.72	105.0000	157,500.00	7,139.28
50,000.0000	QUEBECOR MEDIA INC 5.750% 01/15/2023 DD 12/15/12	50,000.00	105.5000	52,750.00	2,750.00
100,000.0000	RSI HOME PRODUCTS INC 144A 6.500% 03/15/2023 DD 03/16/15	100,000.00	105.2500	105,250.00	5,250.00
75,000.0000	RADIATE HOLDCO LLC / RADI 144A 6.625% 02/15/2025 DD 02/01/17	75,140.47	100.0000	75,000.00	140.47-
100,000.0000	RANGE RESOURCES CORP 4.875% 05/15/2025 DD 11/15/15	90,428.30	95.0000	95,000.00	4,571.70
100,000.0000	REALOGY GROUP LLC / REALO 144A 4.500% 04/15/2019 DD 04/07/14	101,744.51	103.2500	103,250.00	1,505.49
100,000.0000	REGIONALCARE HOSPITAL PAR 144A 8.250% 05/01/2023 DD 04/29/16	103,194.05	107.2500	107,250.00	4,055.95
64,813.5500	REYNOLDS GROUP ISSUER INC / RE VAR RT 02/15/2021 DD 02/15/12	66,417.71	102.7500	66,595.92	178.21
50,000.0000	REYNOLDS GROUP ISSUER INC / RE 5.750% 10/15/2020 DD 09/28/12	51,403.63	102.3340	51,167.00	236.63-



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25,000.0000	ROCKIES EXPRESS PIPELINE 144A 6.000% 01/15/2019 DD 01/17/13	26,232.69	104.2500	26,062.50	170.19-
5,000.0000	SBA COMMUNICATIONS CORP 4.875% 09/01/2024 DD 03/01/17	4,962.68	101.7500	5,087.50	124.82
175,000.0000	SESI LLC 6.375% 05/01/2019 DD 11/01/11	161,657.96	98.7500	172,812.50	11,154.54
25,000.0000	NAVIENT CORP 7.250% 01/25/2022 DD 01/27/12	25,518.51	109.2500	27,312.50	1,793.99
150,000.0000	SM ENERGY CO 6.500% 01/01/2023 DD 06/29/12	145,803.00	95.2500	142,875.00	2,928.00-
50,000.0000	SPX FLOW INC 144A 5.625% 08/15/2024 DD 08/10/16	51,158.97	103.0000	51,500.00	341.03
50,000.0000	SEAGATE HDD CAYMAN 144A 4.875% 03/01/2024 DD 02/03/17	49,680.54	101.9210	50,960.50	1,279.96
50,000.0000	SEMGROUP CORP 144A 6.375% 03/15/2025 DD 03/15/17	49,255.63	96.7500	48,375.00	880.63-
125,000.0000	SENSATA TECHNOLOGIES BV 144A 5.000% 10/01/2025 DD 03/26/15	125,000.00	104.5800	130,725.00	5,725.00
100,000.0000	SERVICE CORP INTERNATIONAL/US 7.625% 10/01/2018 DD 10/03/06	100,329.23	106.7500	106,750.00	6,420.77
150,000.0000	SHEA HOMES LP / SHEA HOME 144A 5.875% 04/01/2023 DD 03/23/15	150,000.00	102.9500	154,425.00	4,425.00



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225,000.0000	SIGNODE INDUSTRIAL GROUP 144A 6.375% 05/01/2022 DD 04/29/14	224,271.37	104.5000	235,125.00	10,853.63
125,000.0000	SIRIUS XM RADIO INC 144A 6.000% 07/15/2024 DD 05/06/14	127,489.88	106.2500	132,812.50	5,322.62
25,000.0000	SIRIUS XM RADIO INC 144A 5.000% 08/01/2027 DD 07/05/17	25,000.00	100.7500	25,187.50	187.50
40,000.0000	SIX FLAGS ENTERTAINMENT C 144A 4.875% 07/31/2024 DD 06/16/16	39,610.15	100.6120	40,244.80	634.65
25,000.0000	SONIC AUTOMOTIVE INC 144A 6.125% 03/15/2027 DD 03/10/17	25,000.00	99.5000	24,875.00	125.00-
25,000.0000	SPECTRUM BRANDS INC 6.125% 12/15/2024 DD 12/15/15	25,000.00	107.1250	26,781.25	1,781.25
225,000.0000	SPRINGLEAF FINANCE CORP 6.000% 06/01/2020 DD 12/01/13	220,413.55	105.5000	237,375.00	16,961.45
50,000.0000	SPRINT CAPITAL CORP 6.900% 05/01/2019 DD 05/06/99	53,533.43	106.7450	53,372.50	160.93-
25,000.0000	SPRINT COMMUNICATIONS INC 7.000% 08/15/2020 DD 08/14/12	27,087.18	110.0000	27,500.00	412.82
150,000.0000	SPRINT COMMUNICATIONS INC 6.000% 11/15/2022 DD 11/14/12	135,483.95	106.0000	159,000.00	23,516.05
100,000.0000	SPRINT CORP 7.250% 09/15/2021 DD 09/15/14	83,503.66	111.1250	111,125.00	27,621.34



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100,000.0000	SPRINT CORP 7.875% 09/15/2023 DD 09/15/14	99,433.30	115.0000	115,000.00	15,566.70
100,000.0000	SPRINT CORP 7.125% 06/15/2024 DD 06/15/14	98,155.59	111.2500	111,250.00	13,094.41
25,000.0000	CALATLANTIC GROUP INC 8.375% 05/15/2018 DD 05/03/10	26,359.47	105.1250	26,281.25	78.22-
25,000.0000	STARWOOD PROPERTY TRUST I 144A 5.000% 12/15/2021 DD 12/16/16	25,000.00	104.0000	26,000.00	1,000.00
75,000.0000	STERIGENICS-NORDION TOPCO 144A 8.125% 11/01/2021 DD 11/01/16	75,000.00	102.5000	76,875.00	1,875.00
100,000.0000	SUBURBAN PROPANE PARTNERS LP/S 5.500% 06/01/2024 DD 05/27/14	100,744.16	99.5000	99,500.00	1,244.16-
100,000.0000	SUMMIT MATERIALS LLC / SUMMIT 6.125% 07/15/2023 DD 07/08/15	99,484.27	104.7500	104,750.00	5,265.73
25,000.0000	SUMMIT MIDSTREAM HOLDINGS LLC 5.750% 04/15/2025 DD 02/15/17	25,000.00	100.5000	25,125.00	125.00
50,000.0000	SUNCOKE ENERGY PARTNERS L 144A 7.500% 06/15/2025 DD 05/24/17	49,263.67	98.7500	49,375.00	111.33
50,000.0000	THC ESCROW CORP III 144A 4.625% 07/15/2024 DD 06/14/17	50,000.00	100.2700	50,135.00	135.00
75,000.0000	THC ESCROW CORP III 144A 5.125% 05/01/2025 DD 06/14/17	75,000.00	100.3750	75,281.25	281.25



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
50,000.0000	THC ESCROW CORP III 144A 7.000% 08/01/2025 DD 06/14/17	50,000.00	99.6250	49,812.50	187.50-
50,000.0000	T-MOBILE USA INC 6.125% 01/15/2022 DD 11/21/13	52,835.27	105.0940	52,547.00	288.27-
100,000.0000	T-MOBILE USA INC 6.500% 01/15/2026 DD 11/05/15	100,000.00	110.3750	110,375.00	10,375.00
25,000.0000	T-MOBILE USA INC 5.375% 04/15/2027 DD 03/16/17	25,000.00	107.2500	26,812.50	1,812.50
25,000.0000	TRI POINTE GROUP INC 5.250% 06/01/2027 DD 06/08/17	25,000.00	100.2500	25,062.50	62.50
50,000.0000	TALLGRASS ENERGY PARTNERS 144A 5.500% 09/15/2024 DD 09/01/16	50,000.00	101.2500	50,625.00	625.00
145,000.0000	TECK RESOURCES LTD 4.750% 01/15/2022 DD 07/05/11	132,083.50	103.5000	150,075.00	17,991.50
200,000.0000	TELECOM ITALIA SPA/MILANO 144A 5.303% 05/30/2024 DD 05/30/14	198,105.97	107.2500	214,500.00	16,394.03
50,000.0000	TELESAT CANADA / TELESAT 144A 8.875% 11/15/2024 DD 11/17/16	50,000.00	112.2500	56,125.00	6,125.00
50,000.0000	TEMPO ACQUISITION LLC / T 144A 6.750% 06/01/2025 DD 05/01/17	50,000.00	102.2500	51,125.00	1,125.00
75,000.0000	TENET HEALTHCARE CORP 8.125% 04/01/2022 DD 09/27/13	77,924.96	106.1250	79,593.75	1,668.79



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25,000.0000	TENET HEALTHCARE CORP 144A 7.500% 01/01/2022 DD 12/01/16	25,000.00	108.4800	27,120.00	2,120.00
40,000.0000	TENET HEALTHCARE CORP 144A 4.625% 07/15/2024 DD 06/14/17	40,000.00	100.1250	40,050.00	50.00
125,000.0000	TEAM HEALTH HOLDINGS INC 144A 6.375% 02/01/2025 DD 02/01/17	121,896.86	97.0000	121,250.00	646.86-
50,000.0000	TEREX CORP 144A 5.625% 02/01/2025 DD 01/31/17	50,000.00	102.8750	51,437.50	1,437.50
150,000.0000	TESORO LOGISTICS LP / TESORO L 5.500% 10/15/2019 DD 10/15/15	149,091.75	105.5000	158,250.00	9,158.25
250,000.0000	TOWNSQUARE MEDIA INC 144A 6.500% 04/01/2023 DD 04/01/15	250,000.00	100.5000	251,250.00	1,250.00
150,000.0000	TRANSDIGM INC 6.000% 07/15/2022 DD 06/04/14	154,425.55	103.0000	154,500.00	74.45
25,000.0000	TRINIDAD DRILLING LTD 144A 6.625% 02/15/2025 DD 02/08/17	25,000.00	95.0000	23,750.00	1,250.00-
100,000.0000	TRONOX FINANCE LLC 6.375% 08/15/2020 DD 08/15/13	90,926.17	100.2500	100,250.00	9,323.83
25,000.0000	USG CORP 144A 4.875% 06/01/2027 DD 05/15/17	25,000.00	102.8750	25,718.75	718.75
25,000.0000	ULTRA RESOURCES INC 144A 6.875% 04/15/2022 DD 04/12/17	25,000.00	99.2500	24,812.50	187.50-



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25,000.0000	ULTRA RESOURCES INC 144A 7.125% 04/15/2025 DD 04/12/17	24,634.48	98.6250	24,656.25	21.77
25,000.0000	UNITED RENTALS NORTH AMERICA I 5.875% 09/15/2026 DD 05/13/16	26,123.79	106.5000	26,625.00	501.21
50,000.0000	UNITED RENTALS NORTH AMERICA I 5.500% 05/15/2027 DD 11/07/16	50,670.39	103.0000	51,500.00	829.61
25,000.0000	UNITI GROUP INC / UNITI F 144A 7.125% 12/15/2024 DD 12/15/16	25,123.05	99.1250	24,781.25	341.80-
100,000.0000	UNIVERSAL HEALTH SERVICES 144A 4.750% 08/01/2022 DD 08/07/14	101,263.37	103.3750	103,375.00	2,111.63
100,000.0000	UNIVISION COMMUNICATIONS 144A 5.125% 05/15/2023 DD 05/21/13	102,243.15	100.9680	100,968.00	1,275.15-
50,000.0000	UNIVISION COMMUNICATIONS 144A 5.125% 02/15/2025 DD 02/19/15	47,473.74	99.1250	49,562.50	2,088.76
75,000.0000	USIS MERGER SUB INC 144A 6.875% 05/01/2025 DD 04/18/17	75,000.00	101.7500	76,312.50	1,312.50
25,000.0000	VALEANT PHARMACEUTICALS I 144A 6.500% 03/15/2022 DD 03/21/17	25,000.00	104.8750	26,218.75	1,218.75
25,000.0000	VERISIGN INC 144A 4.750% 07/15/2027 DD 07/05/17	25,000.00	101.1250	25,281.25	281.25
200,000.0000	VIASAT INC 6.875% 06/15/2020 DD 06/15/12	201,606.72	101.9680	203,936.00	2,329.28



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150,000.0000	VIKING CRUISES LTD 144A 8.500% 10/15/2022 DD 10/19/12	142,378.71	105.0000	157,500.00	15,121.29
150,000.0000	VISTA OUTDOOR INC 5.875% 10/01/2023 DD 10/01/16	150,000.00	102.7500	154,125.00	4,125.00
150,000.0000	VALEANT PHARMACEUTICALS I 144A 7.500% 07/15/2021 DD 07/12/13	150,000.00	96.8750	145,312.50	4,687.50-
96,000.0000	WMG ACQUISITION CORP 144A 5.625% 04/15/2022 DD 04/09/14	96,120.69	103.5000	99,360.00	3,239.31
50,000.0000	WAVEDIVISION ESCROW LLC / 144A 8.125% 09/01/2020 DD 08/21/12	51,644.23	103.5800	51,790.00	145.77
100,000.0000	WEATHERFORD INTERNATIONAL LTD 7.750% 06/15/2021 DD 06/17/16	102,955.91	100.5000	100,500.00	2,455.91-
25,000.0000	WEATHERFORD INTERNATIONAL 144A 9.875% 02/15/2024 DD 11/18/16	25,249.84	104.5000	26,125.00	875.16
75,000.0000	WELLCARE HEALTH PLANS INC 5.250% 04/01/2025 DD 03/22/17	75,000.00	104.7500	78,562.50	3,562.50
150,000.0000	WESCO DISTRIBUTION INC 5.375% 06/15/2024 DD 12/15/16	150,000.00	104.3750	156,562.50	6,562.50
200,000.0000	WHITING PETROLEUM CORP 5.750% 03/15/2021 DD 09/12/13	187,191.88	94.0000	188,000.00	808.12
50,000.0000	WHITING PETROLEUM CORP 6.250% 04/01/2023 DD 03/27/15	48,068.25	91.7500	45,875.00	2,193.25-



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153,000.0000	WIDOPENWEST FINANCE LLC / WID 10.250% 07/15/2019 DD 01/15/13	158,293.25	103.0000	157,590.00	703.25-
25,000.0000	WILDHORSE RESOURCE DEVELO 144A 6.875% 02/01/2025 DD 02/01/17	24,818.50	94.0000	23,500.00	1,318.50-
200,000.0000	WIND ACQUISITION FINANCE 144A 4.750% 07/15/2020 DD 07/10/14	202,778.62	101.0500	202,100.00	678.62-
200,000.0000	WPX ENERGY INC 6.000% 01/15/2022 DD 11/14/11	181,295.02	99.0000	198,000.00	16,704.98
200,000.0000	ZF NORTH AMERICA CAPITAL 144A 4.750% 04/29/2025 DD 04/29/15	201,457.48	105.5000	211,000.00	9,542.52
50,000.0000	ZAYO GROUP LLC / ZAYO CAP 144A 5.750% 01/15/2027 DD 01/27/17	50,000.00	104.6250	52,312.50	2,312.50
125,000.0000	BRAND ENERGY 6/17 TL 0.000% 06/21/2024 DD 06/01/17	123,751.47	99.7810	124,726.25	974.78
TOTAL INVESTMENTS FIXED INCOME SECURITIES		24,870,364.78		25,594,141.87	723,777.09
TOTAL INVESTMENT		25,097,965.14		25,821,742.23	723,777.09



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
17.6700	BLACKROCK LIQ T FUND INSTL FUND 60	17.67	100.0000	17.67	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		17.67		17.67	0.00
<u>INVESTMENTS EQUITY</u>					
1,052,241.5830	PARAMETRIC TX-MGD EM MK-INST	48,513,090.82	47.7400	50,234,013.17	1,720,922.35
TOTAL INVESTMENTS EQUITY		48,513,090.82		50,234,013.17	1,720,922.35
TOTAL INVESTMENT		48,513,108.49		50,234,030.84	1,720,922.35



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
72.2900	AUD (AUSTRALIAN DOLLARS)	54.95	0.0000	55.45	0.50 C
283.4500	NZD (NEW ZEALAND DOLLAR)	206.22	0.0000	207.54	1.32 C
53.0100	CHF (SWISS FRANC)	54.43	0.0000	55.35	0.92 C
25,872.1900	GBP (GREAT BRITISH POUNDS)	33,075.56	0.0000	33,606.68	531.12 C
21,089.1100	HKD (HONG KONG DOLLARS)	2,703.69	0.0000	2,701.50	2.19-C
10,000,770.0000	JPY (JAPANESE YEN)	89,263.92	0.0000	89,006.49	257.43-C
858.6000	SGD (SINGAPORE DOLLARS)	619.01	0.0000	623.60	4.59 C
727.5200	ILS (ISRAELI SHEKEL)	196.92	0.0000	208.48	11.56 C
6,285.6800	DKK (DANISH KRONE)	943.84	0.0000	964.24	20.40 C
4,267.8000	NOK (NORWEGIAN KRONE)	505.43	0.0000	509.49	4.06 C
446.6600	SEK (SWEDISH KRONA)	51.17	0.0000	52.96	1.79 C
23,622.5200	EUR (EURO)	26,650.99	0.0000	26,942.67	291.68 C
305,926.6200	BLACKROCK LIQ T FUND INSTL FUND 60	305,926.62	100.0000	305,926.62	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		460,252.75		460,861.07	608.32 608.32 C 0.00 I



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<u>INVESTMENTS PREFERRED SECURITIES</u>					
713.0000	HENKEL AG & CO KGAA	39,255.97	137.4362	97,992.06	58,736.09 18,317.43- C 77,053.52 I
424.0000	VOLKSWAGEN AG	39,923.73	152.0923	64,487.15	24,563.42 12,054.40- C 36,617.82 I
438.0000	BAYERISCHE MOTOREN WERKE AG	15,786.09	82.3248	36,058.31	20,272.22 6,740.27- C 27,012.49 I
TOTAL INVESTMENTS PREFERRED SECURITIES		94,965.79		198,537.52	103,571.73 37,112.10- C 140,683.83 I
<u>INVESTMENTS EQUITY</u>					
31,105.0000	SCENTRE GROUP	94,852.88	3.1065	96,629.32	1,776.44 18,224.94- C 20,001.38 I
4,619.0000	AGL ENERGY LTD	54,419.33	19.5597	90,346.60	35,927.27 11,393.79- C 47,321.06 I
58,193.0000	SOUTH32 LTD	118,637.56	2.0556	119,627.00	989.44 959.06 C 30.38 I



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41,007.0000	VICINITY CENTRES	91,523.99	1.9713	80,837.86	10,686.13- 710.04 C 11,396.17- I
6,637.0000	TATTS GROUP LTD	14,981.11	3.2062	21,280.01	6,298.90 4,266.83- C 10,565.73 I
11,261.0000	GOODMAN GROUP	45,560.27	6.0366	67,979.09	22,418.82 5,901.74- C 28,320.56 I
3,380.0000	DEXUS	15,136.42	7.2716	24,578.12	9,441.70 4,928.13- C 14,369.83 I
1,634.0000	MACQUARIE GROUP LTD	63,116.65	67.8839	110,922.33	47,805.68 26,460.15- C 74,265.83 I
1,986.0000	CROWN RESORTS LTD	14,820.75	9.4193	18,706.88	3,886.13 3,750.88- C 7,637.01 I
2,284.0000	JAMES HARDIE INDUSTRIES PLC	15,066.60	15.7245	35,914.82	20,848.22 7,201.23- C 28,049.45 I
2,571.0000	TREASURY WINE ESTATES LTD	8,929.90	10.0943	25,952.65	17,022.75 10,647.67- C 27,670.42 I
5,234.0000	SYDNEY AIRPORT	10,743.15	5.4383	28,464.50	17,721.35 4,774.61- C 22,495.96 I



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15,315.0000	AURIZON HOLDINGS LTD	50,004.51	4.1113	62,965.91	12,961.40 9,502.14- C 22,463.54 I
806.0000	RAMSAY HEALTH CARE LTD	30,447.59	56.4548	45,502.63	15,055.04 11,259.23- C 26,314.27 I
6,000.0000	AUSTRALIA & NEW ZEALAND BANKIN	121,654.20	22.0296	132,178.06	10,523.86 3,985.16- C 14,509.02 I
3,160.0000	AMCOR LTD/AUSTRALIA	21,041.79	12.4338	39,291.06	18,249.27 11,460.21- C 29,709.48 I
7,822.0000	WESTPAC BANKING CORP	188,333.66	23.4026	183,055.88	5,277.78- 10,872.64- C 5,594.86 I
3,052.0000	BANK OF QUEENSLAND LTD	29,376.02	8.7827	26,804.87	2,571.15- 1,880.06- C 691.09- I
18,373.0000	FORTESCUE METALS GROUP LTD	63,789.00	4.0040	73,565.51	9,776.51 1,743.44 C 8,033.07 I
17,411.0000	TELSTRA CORP LTD	48,122.81	3.2983	57,426.96	9,304.15 11,514.59- C 20,818.74 I
1,652.0000	BENDIGO & ADELAIDE BANK LTD	15,296.14	8.4989	14,040.21	1,255.93- 2,815.17- C 1,559.24 I



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689.0000	ASX LTD	21,512.80	41.1215	28,332.75	6,819.95 5,680.96- C 12,500.91 I
5,898.0000	BHP BILLITON LTD	106,204.02	17.8569	105,320.14	883.88- 1,536.39 C 2,420.27- I
10,886.0000	MIRVAC GROUP	14,642.90	1.6338	17,785.73	3,142.83 3,566.18- C 6,709.01 I
4,462.0000	HARVEY NORMAN HOLDINGS LTD	15,004.74	2.9301	13,074.24	1,930.50- 2,621.51- C 691.01 I
3,485.0000	COMPUTERSHARE LTD	29,580.61	10.8460	37,798.61	8,218.00 1,547.32 C 6,670.68 I
2,434.0000	CSL LTD	87,373.88	105.8759	257,701.97	170,328.09 43,326.27- C 213,654.36 I
818.0000	REA GROUP LTD	29,597.06	50.9321	41,662.47	12,065.41 7,989.77- C 20,055.18 I
14,158.0000	TRANSURBAN GROUP	92,279.61	9.0895	128,689.74	36,410.13 6,403.71- C 42,813.84 I
226.0000	COCHLEAR LTD	15,087.34	119.2379	26,947.77	11,860.43 5,403.25- C 17,263.68 I



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7,311.0000	ORIGIN ENERGY LTD	31,523.48	5.2619	38,470.21	6,946.73 945.39 C 6,001.34 I
7,694.0000	COMMONWEALTH BANK OF AUSTRALIA	402,077.86	63.5194	488,718.34	86,640.48 80,066.77- C 166,707.25 I
1,285.0000	RIO TINTO LTD	60,390.49	48.5312	62,362.66	1,972.17 1,810.84- C 3,783.01 I
5,231.0000	APA GROUP	30,146.87	7.0338	36,794.06	6,647.19 9,104.38- C 15,751.57 I
3,015.0000	ARISTOCRAT LEISURE LTD	30,333.42	17.3046	52,173.51	21,840.09 1,282.14 C 20,557.95 I
8,312.0000	INSURANCE AUSTRALIA GROUP LTD	30,019.09	5.2005	43,227.38	13,208.29 8,667.45- C 21,875.74 I
7,418.0000	GPT GROUP/THE	19,990.81	3.6741	27,254.99	7,264.18 5,464.85- C 12,729.03 I
5,112.0000	LENDLEASE GROUP	47,131.83	12.7713	65,287.31	18,155.48 4,839.43- C 22,994.91 I
5,081.0000	SUNCORP GROUP LTD	40,539.00	11.3676	57,759.19	17,220.19 11,581.20- C 28,801.39 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
5,204.0000	NATIONAL AUSTRALIA BANK LTD	126,926.07	22.6970	118,115.24	8,810.83- 13,868.62- C 5,057.79 I
4,156.0000	NEWCREST MINING LTD	45,678.53	15.4637	64,267.25	18,588.72 2,429.77- C 21,018.49 I
17,101.0000	OIL SEARCH LTD	89,151.75	5.2312	89,460.14	308.39 2,935.71 C 2,627.32- I
5,341.0000	QANTAS AIRWAYS LTD	14,882.68	4.3875	23,433.78	8,551.10 4,698.66- C 13,249.76 I
5,136.0000	QBE INSURANCE GROUP LTD	43,196.29	9.0588	46,526.31	3,330.02 1,759.03- C 5,089.05 I
1,475.0000	SONIC HEALTHCARE LTD	19,568.63	18.5779	27,402.48	7,833.85 5,494.42- C 13,328.27 I
4,848.0000	WESFARMERS LTD	143,928.07	30.7740	149,192.58	5,264.51 26,826.43- C 32,090.94 I
9,755.0000	ALUMINA LTD	15,862.74	1.4727	14,366.54	1,496.20- 2,880.62- C 1,384.42 I
375.0000	WOODSIDE PETROLEUM LTD	8,989.03	22.9117	8,591.92	397.11- 88.50 C 485.61- I



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6,947.0000	AUCKLAND INTERNATIONAL AIRPORT	25,143.09	5.2205	36,267.41	11,124.32 6,112.26- C 17,236.58 I
9,783.0000	SPARK NEW ZEALAND LTD	11,456.03	2.7677	27,076.57	15,620.54 935.59 C 14,684.95 I
1,285.0000	OMV AG	44,222.28	51.8208	66,589.85	22,367.57 4,463.46 C 17,904.11 I
2,277.0000	ERSTE GROUP BANK AG	60,057.76	38.2369	87,065.52	27,007.76 9,110.87- C 36,118.63 I
245.0000	IMMOFINANZ AG	0.00	2.2822	559.15	559.15 I
3,229.0000	ANHEUSER-BUSCH INBEV SA/NV	166,276.98	110.3025	356,167.06	189,890.08 69,304.84- C 259,194.92 I
1,737.0000	AGEAS	59,674.89	40.2157	69,854.83	10,179.94 9,566.91- C 19,746.85 I
422.0000	UMICORE SA	15,349.46	69.4594	29,311.91	13,962.45 5,479.18- C 19,441.63 I
1,206.0000	KBC GROUP NV	61,950.22	75.7439	91,347.17	29,396.95 18,016.42- C 47,413.37 I



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280.0000	SOLVAY SA	29,235.57	134.0146	37,524.10	8,288.53 7,014.27- C 15,302.80 I
369.0000	UCB SA	16,023.06	68.6953	25,348.58	9,325.52 4,738.33- C 14,063.85 I
2,905.0000	VONOVIA SE	94,028.23	39.6512	115,186.80	21,158.57 5,281.13 C 15,877.44 I
889.0000	QIAGEN NV	21,513.07	33.2185	29,531.27	8,018.20 5,520.21- C 13,538.41 I
1,907.0000	DEUTSCHE WOHNEN AG	37,687.83	38.1970	72,841.72	35,153.89 15,110.56- C 50,264.45 I
631.0000	LANXESS AG	29,060.45	75.6070	47,708.05	18,647.60 4,254.01- C 22,901.61 I
507.0000	BRENNTAG AG	19,442.18	57.8030	29,306.16	9,863.98 7,452.76- C 17,316.74 I
13,861.0000	TELEFONICA DEUTSCHLAND HOLDING	59,322.60	4.9876	69,133.47	9,810.87 4,633.95 C 5,176.92 I
354.0000	OSRAM LICHT AG	10,258.82	79.5533	28,161.89	17,903.07 5,085.47- C 22,988.54 I



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1,036.0000	ADIDAS AG	65,806.43	191.3272	198,215.04	132,408.61 34,800.99- C 167,209.60 I
1,998.0000	FRESENIUS SE & CO KGAA	57,849.16	85.6096	171,048.15	113,198.99 28,511.81- C 141,710.80 I
980.0000	UNITED INTERNET AG	15,204.65	54.9117	53,813.54	38,608.89 10,059.20- C 48,668.09 I
302.0000	HANNOVER RUECK SE	15,281.62	119.7007	36,149.62	20,868.00 6,757.36- C 27,625.36 I
656.0000	GEA GROUP AG	15,646.56	40.8659	26,808.03	11,161.47 5,011.16- C 16,172.63 I
464.0000	CONTINENTAL AG	46,835.25	215.5069	99,995.21	53,159.96 14,190.69- C 67,350.65 I
3,383.0000	DEUTSCHE POST AG	59,680.89	37.4328	126,635.33	66,954.44 23,671.60- C 90,626.04 I
463.0000	MERCK KGAA	26,460.71	120.6131	55,843.89	29,383.18 9,095.57- C 38,478.75 I
3,393.0000	SAP SE	167,117.92	104.3032	353,901.09	186,783.17 66,153.80- C 252,936.97 I



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3,848.0000	E.ON SE	29,552.83	9.4072	36,199.12	6,646.29 1,899.54 C 4,746.75 I
520.0000	HENKEL AG & CO KGAA	24,485.06	120.7842	62,807.81	38,322.75 11,740.50- C 50,063.25 I
954.0000	METRO AG	29,919.53	33.7089	32,158.34	2,238.81 181.86 C 2,056.95 I
3,306.0000	BAYER AG	226,752.51	129.1102	426,838.52	200,086.01 79,787.78- C 279,873.79 I
3,672.0000	BASF SE	233,752.41	92.4872	339,613.00	105,860.59 63,482.97- C 169,343.56 I
180.0000	HOCHTIEF AG	15,546.92	182.9442	32,929.96	17,383.04 6,155.50- C 23,538.54 I
563.0000	HEIDELBERGCEMENT AG	32,103.03	96.5475	54,356.27	22,253.24 10,160.68- C 32,413.92 I
971.0000	FRESENIUS MEDICAL CARE AG & CO	54,716.77	96.0000	93,216.09	38,499.32 17,424.66- C 55,923.98 I
1,815.0000	ALLIANZ SE	231,078.78	196.6308	356,884.94	125,806.16 66,711.57- C 192,517.73 I



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1,024.0000	MUENCHENER RUECKVERSICHERUNGS-	169,897.91	201.3641	206,196.84	36,298.93 26,785.90- C 63,084.83 I
68.0000	VOLKSWAGEN AG	6,594.43	154.8296	10,528.42	3,933.99 1,968.05- C 5,902.04 I
3,895.0000	DAIMLER AG	190,386.59	72.2766	281,517.57	91,130.98 51,399.71- C 142,530.69 I
386.0000	THYSSENKRUPP AG	9,747.99	28.3711	10,951.28	1,203.29 2,285.21- C 3,488.50 I
3,039.0000	SIEMENS AG	293,120.12	137.2651	417,148.92	124,028.80 60,288.62- C 184,317.42 I
954.0000	LINDE AG	121,691.01	189.1031	180,404.44	58,713.43 18,519.19- C 77,232.62 I
1,919.0000	DEUTSCHE BANK AG	37,189.49	17.7070	33,979.81	3,209.68- 1,103.68 C 4,313.36- I
1,324.0000	BAYERISCHE MOTOREN WERKE AG	63,042.09	92.7039	122,739.97	59,697.88 22,943.45- C 82,641.33 I
11,333.0000	DEUTSCHE TELEKOM AG	153,804.20	17.9294	203,194.41	49,390.21 37,982.61- C 87,372.82 I



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6,285.0000	INFINEON TECHNOLOGIES AG	54,946.54	21.0830	132,507.08	77,560.54 25,075.12- C 102,635.66 I
3,004.0000	RED ELECTRICA CORP SA	34,763.94	20.8663	62,682.55	27,918.61 10,413.87- C 38,332.48 I
5,512.0000	INDUSTRIA DE DISENO TEXTIL SA	78,389.29	38.3338	211,296.38	132,907.09 43,792.40- C 176,699.49 I
350.0000	AENA SA	29,942.47	194.8629	68,202.04	38,259.57 4,789.79 C 33,469.78 I
3,079.0000	GRIFOLS SA	33,238.60	27.8123	85,634.11	52,395.51 1,771.98- C 54,167.49 I
5,449.0000	FERROVIAL SA	84,944.66	22.1665	120,785.75	35,841.09 2,908.24 C 32,932.85 I
11,039.0000	CAIXABANK SA	31,765.11	4.7674	52,628.42	20,863.31 2,491.73 C 18,371.58 I
16,642.0000	IBERDROLA SA	107,573.11	7.9074	131,595.51	24,022.40 7,026.22- C 31,048.62 I
1,158.0000	AMADEUS IT GROUP SA	23,116.04	59.7077	69,141.62	46,025.58 10,275.31- C 56,300.89 I



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14,405.0000	INTERNATIONAL CONSOLIDATED AIR	69,376.46	7.9256	114,169.45	44,792.99 2,768.04- C 47,561.03 I
2,074.0000	DISTRIBUIDORA INTERNACIONAL DE	10,199.43	6.2171	12,894.34	2,694.91 3,457.74- C 6,152.65 I
2,355.0000	ENDESA SA	44,418.51	23.0048	54,176.52	9,758.01 3,804.77 C 5,953.24 I
1,786.0000	BANKINTER SA	9,732.00	9.1985	16,428.58	6,696.58 3,070.96- C 9,767.54 I
24,829.0000	BANCO BILBAO VIZCAYA ARGENTARI	177,693.26	8.2860	205,735.48	28,042.22 813.11- C 28,855.33 I
922.0000	GAS NATURAL SDG SA	16,606.98	23.3698	21,547.02	4,940.04 4,027.73- C 8,967.77 I
1,989.0000	REPSOL SA	29,377.03	15.2833	30,398.62	1,021.59 1,595.15 C 573.56- I
38,089.0000	BANCO SANTANDER SA	216,194.55	6.6060	251,618.43	35,423.88 7,763.95 C 27,659.93 I
11,245.0000	TELEFONICA SA	108,515.04	10.3082	115,916.73	7,401.69 6,082.70 C 1,318.99 I



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3,795.0000	ENAGAS SA	96,388.64	28.0005	106,261.91	9,873.27 3,459.71 C 6,413.56 I
1,077.0000	VALEO SA	38,162.13	67.2810	72,461.68	34,299.55 15,031.72- C 49,331.27 I
2,806.0000	ENGIE SA	33,671.44	15.0723	42,293.07	8,621.63 2,219.31 C 6,402.32 I
470.0000	ARKEMA SA	31,027.95	106.5615	50,083.95	19,056.00 5,186.08- C 24,242.08 I
252.0000	IMERYS SA	15,816.57	86.8528	21,886.93	6,070.36 4,091.27- C 10,161.63 I
750.0000	SAFRAN SA	19,945.62	91.5177	68,638.30	48,692.68 12,830.36- C 61,523.04 I
13,977.0000	NATIXIS SA	78,728.90	6.7030	93,688.00	14,959.10 1,836.44 C 13,122.66 I
662.0000	SCOR SE	16,982.19	39.5884	26,207.58	9,225.39 4,898.92- C 14,124.31 I
2,761.0000	VINCI SA	164,818.64	85.2333	235,329.15	70,510.51 35,715.54- C 106,226.05 I



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1,367.0000	AIR LIQUIDE SA	129,706.65	123.4075	168,698.07	38,991.42 29,016.00- C 68,007.42 I
1,533.0000	DANONE SA	94,390.25	75.0595	115,066.36	20,676.11 21,509.06- C 42,185.17 I
480.0000	LEGRAND SA	15,534.73	69.8586	33,532.17	17,997.44 6,268.09- C 24,265.53 I
295.0000	IEFFAGE SA	15,626.63	90.7421	26,768.94	11,142.31 5,003.83- C 16,146.14 I
6,451.0000	TOTAL SA	338,992.43	49.3687	318,477.53	20,514.90- 13,071.86- C 7,443.04- I
187.0000	AEROPORTS DE PARIS	15,622.18	161.1597	30,136.87	14,514.69 5,633.40- C 20,148.09 I
1,628.0000	BUREAU VERITAS SA	29,434.12	22.0981	35,975.80	6,541.68 6,235.96- C 12,777.64 I
2,598.0000	EDENRED	55,708.08	26.0387	67,648.69	11,940.61 712.27 C 11,228.34 I
3,278.0000	AIRBUS SE	125,831.14	82.1196	269,188.05	143,356.91 19,158.24- C 162,515.15 I



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5,563.0000	VEOLIA ENVIRONNEMENT SA	96,188.61	21.1001	117,380.27	21,191.66 6,876.00 C 14,315.66 I
942.0000	L'OREAL SA	100,755.47	208.0363	195,970.21	95,214.74 36,632.20- C 131,846.94 I
1,249.0000	LVMH MOET HENNESSY LOUIS VUITT	159,381.12	248.9820	310,978.60	151,597.48 38,873.76- C 190,471.24 I
377.0000	THALES SA	15,183.26	107.4854	40,522.01	25,338.75 7,574.65- C 32,913.40 I
809.0000	CAPGEMINI SE	40,722.86	103.1969	83,486.34	42,763.48 15,605.89- C 58,369.37 I
882.0000	CASINO GUICHARD PERRACHON SA	47,730.04	59.1489	52,169.35	4,439.31 2,737.56 C 1,701.75 I
350.0000	INGENICO GROUP SA	29,629.13	90.6623	31,731.81	2,102.68 1,665.13 C 437.55 I
474.0000	PUBLICIS GROUPE SA	20,473.33	74.4893	35,307.94	14,834.61 6,600.02- C 21,434.63 I
919.0000	CIE GENERALE DES ETABLISSEMENT	73,487.50	132.7600	122,006.46	48,518.96 9,639.64- C 58,158.60 I



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791.0000	PERNOD RICARD SA	68,566.50	133.7294	105,780.02	37,213.52 19,773.18- C 56,986.70 I
649.0000	RENAULT SA	31,205.32	90.3885	58,662.19	27,456.87 10,965.58- C 38,422.45 I
1,886.0000	SCHNEIDER ELECTRIC SE	112,216.96	76.7247	144,702.97	32,486.01 27,048.95- C 59,534.96 I
1,828.0000	VIVENDI SA	33,582.43	22.2293	40,635.20	7,052.77 2,132.32 C 4,920.45 I
4,433.0000	ORANGE SA	66,050.42	15.8422	70,228.65	4,178.23 139.89 C 4,038.34 I
43.0000	HERMES INTERNATIONAL	5,910.71	493.4589	21,218.74	15,308.03 3,966.39- C 19,274.42 I
640.0000	DASSAULT SYSTEMES SE	19,313.04	89.5217	57,293.93	37,980.89 10,709.79- C 48,690.68 I
454.0000	KERING	71,925.69	340.1120	154,410.85	82,485.16 14,917.50- C 97,402.66 I
3,512.0000	CARREFOUR SA	81,066.72	25.2631	88,724.30	7,657.58 130.87 C 7,526.71 I



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301.0000	ATOS SE	15,655.00	140.1735	42,192.25	26,537.25 7,886.86- C 34,424.11 I
3,191.0000	SANOFI	237,608.67	95.5324	304,844.11	67,235.44 55,651.12- C 122,886.56 I
586.0000	ACCOR SA	21,975.91	46.8138	27,432.93	5,457.02 5,127.98- C 10,585.00 I
4,216.0000	NOKIA OYJ	27,418.81	6.1213	25,807.53	1,611.28- 2,147.33 C 3,758.61 I
1,555.0000	STMICROELECTRONICS NV	15,796.00	14.3367	22,293.59	6,497.59 4,167.28- C 10,664.87 I
2,721.0000	SOCIETE GENERALE SA	88,216.42	53.7313	146,202.90	57,986.48 1,401.71 C 56,584.77 I
376.0000	SODEXO SA	22,942.37	129.1102	48,545.46	25,603.09 9,074.48- C 34,677.57 I
472.0000	UNIBAIL-RODAMCO SE	85,689.07	251.6623	118,784.63	33,095.56 11,839.22- C 44,934.78 I
8,069.0000	AXA SA	184,114.31	27.3161	220,414.20	36,299.89 33,060.78- C 69,360.67 I



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4,097.0000	PEUGEOT SA	59,025.69	19.9197	81,611.04	22,585.35 4,354.27- C 26,939.62 I
803.0000	ESSILOR INTERNATIONAL SA	51,905.94	127.0572	102,026.99	50,121.05 19,071.63- C 69,192.68 I
2,262.0000	CREDIT AGRICOLE SA	28,662.92	16.0646	36,338.23	7,675.31 3,240.19- C 10,915.50 I
970.0000	ZODIAC AEROSPACE	19,567.36	27.0880	26,275.42	6,708.06 2,076.82- C 8,784.88 I
2,695.0000	BNP PARIBAS SA	173,523.65	71.9230	193,832.71	20,309.06 3,841.90- C 24,150.96 I
1,164.0000	CIE DE SAINT-GOBAIN	48,271.51	53.3549	62,105.14	13,833.63 2,408.46- C 16,242.09 I
332.0000	WENDEL SA	36,231.34	147.8152	49,074.67	12,843.33 4,375.87- C 17,219.20 I
389.0000	KLEPIERRE	15,409.88	40.9286	15,921.25	511.37 2,945.16- C 3,456.53 I
133.0000	GECINA SA	15,050.60	156.6545	20,835.05	5,784.45 3,894.65- C 9,679.10 I



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190.0000	ILIAD SA	34,313.61	236.2079	44,879.50	10,565.89 6,431.59- C 16,997.48 I
155.0000	BANCA MONTE DEI PASCHI DI SIEN	29,223.11	0.0000	0.00	29,223.11-I
2,514.0000	CNH INDUSTRIAL NV	19,352.89	11.3085	28,429.70	9,076.81 1,195.21 C 7,881.60 I
147.0000	FERRARI NV	7,210.19	85.7123	12,599.71	5,389.52 447.96 C 4,941.56 I
8,643.0000	FIAT CHRYSLER AUTOMOBILES NV	74,625.10	10.5272	90,987.25	16,362.15 6,098.79 C 10,263.36 I
10,190.0000	UNICREDIT SPA	167,678.00	18.6479	190,023.04	22,345.04 8,339.83 C 14,005.21 I
727.0000	EXOR NV	29,454.72	54.0506	39,294.83	9,840.11 8,199.71- C 18,039.82 I
1,741.0000	LEONARDO SPA	23,653.35	16.5950	28,891.90	5,238.55 4,722.84- C 9,961.39 I
14,800.0000	TERNA RETE ELETTRICA NAZIONALE	66,109.66	5.3902	79,775.54	13,665.88 584.80- C 14,250.68 I



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1,306.0000	PRYSMIAN SPA	20,667.44	29.3691	38,356.13	17,688.69 8,059.29- C 25,747.98 I
37,642.0000	INTESA SANPAOLO SPA	96,882.96	3.1661	119,180.85	22,297.89 7,663.29- C 29,961.18 I
561.0000	LUXOTTICA GROUP SPA	15,181.47	57.7688	32,408.33	17,226.86 6,058.01- C 23,284.87 I
26,098.0000	ENEL SPA	110,614.02	5.3537	139,721.95	29,107.93 2,469.39- C 31,577.32 I
12,801.0000	ENI SPA	200,576.81	15.0096	192,138.38	8,438.43- 8,571.14 C 17,009.57- I
1,964.0000	TENARIS SA	27,729.75	15.5685	30,576.55	2,846.80 2,726.43- C 5,573.23 I
2,206.0000	ATLANTIA SPA	48,276.85	28.1031	61,995.55	13,718.70 2,872.42- C 16,591.12 I
5,882.0000	KONINKLIJKE AHOLD DELHAIZE NV	94,071.11	19.0928	112,303.89	18,232.78 20,992.69- C 39,225.47 I
5,336.0000	ARCELORMITTAL	109,959.26	22.6513	120,867.46	10,908.20 4,423.05 C 6,485.15 I



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1,443.0000	ABN AMRO GROUP NV	23,978.69	26.4721	38,199.33	14,220.64 916.01 C 13,304.63 I
278.0000	ALTICE NV	4,967.94	23.0448	6,406.46	1,438.52 1,230.67- C 2,669.19 I
4,750.0000	ALTICE NV	81,742.21	23.0391	109,435.77	27,693.56 1,524.63 C 26,168.93 I
19,742.0000	ING GROEP NV	217,688.53	17.2223	340,002.75	122,314.22 44,126.95- C 166,441.17 I
1,235.0000	KONINKLIJKE DSM NV	58,851.34	72.5846	89,641.98	30,790.64 4,676.39- C 35,467.03 I
5,823.0000	UNILEVER NV	182,185.72	55.1113	320,913.54	138,727.82 59,987.54- C 198,715.36 I
1,328.0000	ASML HOLDING NV	41,296.66	130.1367	172,821.61	131,524.95 36,037.26- C 167,562.21 I
4,451.0000	RELX NV	35,469.91	20.5299	91,378.58	55,908.67 17,080.90- C 72,989.57 I
146.0000	RANDSTAD HOLDING NV	7,172.26	58.3049	8,512.52	1,340.26 1,591.22- C 2,931.48 I



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923.0000	AKZO NOBEL NV	53,693.34	86.7844	80,102.05	26,408.71 14,973.26- C 41,381.97 I
1,113.0000	WOLTERS KLUWER NV	24,519.12	42.2744	47,051.51	22,532.39 8,795.21- C 31,327.60 I
564.0000	KONINKLIJKE VOPAK NV	25,558.26	46.3063	26,116.77	558.51 1,750.58 C 1,192.07- I
2,496.0000	KONINKLIJKE KPN NV	7,289.03	3.1946	7,973.93	684.90 534.49 C 150.41 I
624.0000	KONINKLIJKE PHILIPS NV	17,668.95	35.4654	22,130.41	4,461.46 125.15 C 4,336.31 I
947.0000	HEINEKEN NV	48,708.35	97.0950	91,948.99	43,240.64 17,187.79- C 60,428.43 I
1,446.0000	JERONIMO MARTINS SGPS SA	14,761.22	19.4920	28,185.43	13,424.21 5,268.62- C 18,692.83 I
3,864.0000	BANCO ESPIRITO SANTO SA	10,159.42	0.0001	0.44	10,158.98- 0.09- C 10,158.89- I
2,156.0000	CIE FINANCIERE RICHEMONT SA	88,667.57	82.4936	177,856.21	89,188.64 13,994.62 C 75,194.02 I



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592.0000	IDORSIA LTD	4,747.52	18.9004	11,189.06	6,441.54 101.30 C 6,340.24 I
14,948.0000	UBS GROUP AG	243,638.12	16.9581	253,490.86	9,852.74 17,802.24 C 7,949.50- I
968.0000	PARGESA HOLDING SA	63,442.00	76.1760	73,738.42	10,296.42 3,915.30 C 6,381.12 I
267.0000	SWISS PRIME SITE AG	20,353.83	90.9518	24,284.13	3,930.30 223.93- C 4,154.23 I
155.0000	GEBERIT AG	28,368.29	466.9764	72,381.35	44,013.06 6,167.46 C 37,845.60 I
194.0000	SCHINDLER HOLDING AG	17,521.30	211.8728	41,103.33	23,582.03 3,502.33 C 20,079.70 I
115.0000	PARTNERS GROUP HOLDING AG	30,129.42	620.7904	71,390.90	41,261.48 4,149.13- C 45,410.61 I
177.0000	KUEHNE + NAGEL INTERNATIONAL A	18,218.87	167.0756	29,572.39	11,353.52 2,519.81 C 8,833.71 I
827.0000	JULIUS BAER GROUP LTD	30,690.61	52.6810	43,567.22	12,876.61 3,712.28 C 9,164.33 I



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1,887.0000	SWISS RE AG	98,300.90	91.5261	172,709.81	74,408.91 6,932.49 C 67,476.42 I
10.0000	SIKA AG	18,597.62	6,432.4126	64,324.13	45,726.51 1,537.44 C 44,189.07 I
22.0000	SGS SA	31,118.38	2,424.6854	53,343.08	22,224.70 4,545.26 C 17,679.44 I
94.0000	SWISSCOM AG	34,677.50	483.1619	45,417.22	10,739.72 3,869.91 C 6,869.81 I
31.0000	GIVAUDAN SA	27,523.91	2,002.8194	62,087.40	34,563.49 5,290.33 C 29,273.16 I
201.0000	ZURICH INSURANCE GROUP AG	49,561.95	291.4425	58,579.96	9,018.01 4,991.48 C 4,026.53 I
8,793.0000	NOVARTIS AG	476,740.31	83.3289	732,711.74	255,971.43 59,080.21 C 196,891.22 I
3,237.0000	ABB LTD	67,155.40	24.7271	80,041.94	12,886.54 2,187.12 C 10,699.42 I
2,694.0000	ROCHE HOLDING AG	440,277.34	254.9992	686,967.89	246,690.55 58,535.16 C 188,155.39 I



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491.0000	ADECCO GROUP AG	28,742.22	76.1238	37,376.81	8,634.59 3,184.80 C 5,449.79 I
911.0000	LAFARGEHOLCIM LTD	48,870.87	57.3278	52,225.66	3,354.79 1,532.47 C 1,822.32 I
12,354.0000	NESTLE SA	635,217.58	87.1403	1,076,532.45	441,314.87 91,729.19 C 349,585.68 I
199.0000	BALOISE HOLDING AG	18,010.91	154.7538	30,796.01	12,785.10 2,624.06 C 10,161.04 I
6,094.0000	CREDIT SUISSE GROUP AG	92,636.06	14.4729	88,198.03	4,438.03- 2,588.02 C 7,026.05- I
421.0000	LONZA GROUP AG	34,970.24	216.4673	91,132.77	56,162.53 2,808.11- C 58,970.64 I
352.0000	SWISS LIFE HOLDING AG	82,025.22	337.9105	118,944.50	36,919.28 7,048.42 C 29,870.86 I
12,309.0000	NATIONAL GRID PLC	124,713.15	12.3634	152,181.16	27,468.01 27,950.74- C 55,418.75 I
8,394.0000	COMPASS GROUP PLC	91,143.84	21.0429	176,634.86	85,491.02 30,708.67- C 116,199.69 I



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2,134.0000	INTERCONTINENTAL HOTELS GROUP	82,020.93	55.4261	118,279.50	36,258.57 1,317.67- C 37,576.24 I
1,050.0000	WOLSELEY PLC	27,819.99	61.2195	64,280.49	36,460.50 11,347.26- C 47,807.76 I
61,185.0000	VODAFONE GROUP PLC	164,677.54	2.8284	173,059.55	8,382.01 324.03- C 8,706.04 I
16,810.0000	STANDARD LIFE PLC	71,491.39	5.1841	87,144.88	15,653.49 3,995.05- C 19,648.54 I
578.0000	CRODA INTERNATIONAL PLC	20,951.73	50.4642	29,168.31	8,216.58 5,546.45- C 13,763.03 I
0.7000	IGAS ENERGY PLC	17.30	0.9384	0.66	16.64- 0.16- C 16.48- I
773.0000	JOHNSON MATTHEY PLC	23,576.49	37.2928	28,827.38	5,250.89 5,088.80- C 10,339.69 I
885.0000	LONDON STOCK EXCHANGE GROUP PL	29,110.43	47.3597	41,913.35	12,802.92 11,345.10- C 24,148.02 I
360.0000	RANDGOLD RESOURCES LTD	28,734.77	88.3935	31,821.68	3,086.91 5,617.39- C 8,704.30 I



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4,646.0000	J SAINSBURY PLC	16,344.79	3.2694	15,189.90	1,154.89- 2,352.79- C 1,197.90 I
1,631.0000	BERKELEY GROUP HOLDINGS PLC	58,619.72	41.9171	68,366.82	9,747.10 1,607.92 C 8,139.18 I
17,514.0000	ROYAL DUTCH SHELL PLC A SHS	505,646.38	26.4336	462,958.64	42,687.74- 64,881.76- C 22,194.02 I
17,157.0000	ROYAL DUTCH SHELL PLC B SHS	417,442.31	26.7908	459,650.51	42,208.20 63,409.08- C 105,617.28 I
10,532.0000	CENTRICA PLC	29,885.18	2.6004	27,388.44	2,496.74- 861.32 C 3,358.06- I
1,362.0000	BUNZL PLC	15,489.17	29.7199	40,478.61	24,989.44 7,145.59- C 32,135.03 I
7,735.0000	INMARSAT PLC	72,854.75	9.9954	77,314.58	4,459.83 1,818.35 C 2,641.48 I
2,802.0000	MONDI PLC	56,607.12	26.1608	73,302.71	16,695.59 1,724.01 C 14,971.58 I



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945.0000	SEVERN TRENT PLC	17,543.38	28.3430	26,784.22	9,240.84 4,728.15- C 13,968.99 I
700.0000	WHITBREAD PLC	16,104.15	51.5293	36,070.54	19,966.39 6,367.44- C 26,333.83 I
1,558.0000	SMITHS GROUP PLC	27,438.02	20.7442	32,319.51	4,881.49 5,705.28- C 10,586.77 I
3,510.0000	3I GROUP PLC	15,826.38	11.7230	41,147.81	25,321.43 7,263.73- C 32,585.16 I
5,131.0000	UNILEVER PLC	155,721.97	53.9713	276,927.11	121,205.14 48,885.18- C 170,090.32 I
1,151.0000	TUI AG	13,633.18	14.5352	16,730.07	3,096.89 2,953.31- C 6,050.20 I
5,943.0000	EXPERIAN PLC	71,269.42	20.4584	121,584.64	50,315.22 15,803.66- C 66,118.88 I
4,848.0000	RELX PLC	39,186.98	21.5625	104,535.34	65,348.36 18,453.35- C 83,801.71 I
2,242.0000	SHIRE PLC	49,639.68	55.0495	123,420.98	73,781.30 21,787.15- C 95,568.45 I



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1,180.0000	FRESNILLO PLC	15,740.56	19.3023	22,776.83	7,036.27 4,020.72- C 11,056.99 I
2,980.0000	RECKITT BENCKISER GROUP PLC	162,486.31	101.1102	301,308.60	138,822.29 54,109.66- C 192,931.95 I
2,725.0000	UNITED UTILITIES GROUP PLC	23,744.01	11.2683	30,706.37	6,962.36 5,420.52- C 12,382.88 I
23,038.0000	GLENCORE PLC	62,258.44	3.7305	85,945.21	23,686.77 7,683.61- C 31,370.38 I
6,750.0000	SEGRO PLC	35,908.15	6.3544	42,892.63	6,984.48 2,137.89- C 9,122.37 I
7,413.0000	ROLLS-ROYCE HOLDINGS PLC	69,601.92	11.5736	85,795.43	16,193.51 15,145.21- C 31,338.72 I
18,462.0000	OLD MUTUAL PLC	40,076.89	2.5121	46,379.67	6,302.78 8,187.28- C 14,490.06 I
4,990.0000	SAGE GROUP PLC/THE	19,468.25	8.9367	44,594.51	25,126.26 7,872.13- C 32,998.39 I
5,960.0000	MEDICLINIC INTERNATIONAL PLC	56,554.65	9.6317	57,405.02	850.37 1,350.11 C 499.74- I



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5,012.0000	WPP PLC	52,955.76	20.9650	105,076.85	52,121.09 18,548.92- C 70,670.01 I
20,315.0000	ABERDEEN ASSET MANAGEMENT PLC	66,646.60	3.9228	79,692.27	13,045.67 1,008.67 C 12,037.00 I
7,487.0000	ANTOFAGASTA PLC	71,392.36	10.3851	77,753.29	6,360.93 1,459.46 C 4,901.47 I
2,263.0000	ASHTREAD GROUP PLC	39,620.01	20.6403	46,709.03	7,089.02 9,442.86- C 16,531.88 I
1,117.0000	BHP BILLITON PLC	20,312.51	15.2756	17,062.90	3,249.61- 536.59 C 3,786.20- I
3,453.0000	BRITISH LAND CO PLC/THE	25,852.71	7.8651	27,158.34	1,305.63 4,794.18- C 6,099.81 I
4,555.0000	SKY PLC	42,873.27	12.9115	58,812.17	15,938.90 10,381.95- C 26,320.85 I
16,276.0000	AVIVA PLC	93,390.41	6.8324	111,205.40	17,814.99 13,427.15- C 31,242.14 I
10,005.0000	DIAGEO PLC	172,654.22	29.4666	294,814.15	122,159.93 52,042.73- C 174,202.66 I



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703.0000	SCHRODERS PLC	15,460.18	40.3194	28,344.54	12,884.36 5,003.60- C 17,887.96 I
14,153.0000	BAE SYSTEMS PLC	81,296.60	8.2288	116,462.90	35,166.30 20,558.86- C 55,725.16 I
7,982.0000	BRITISH AMERICAN TOBACCO PLC	279,472.83	67.9870	542,672.58	263,199.75 95,796.45- C 358,996.20 I
13,594.0000	HAMMERSON PLC	93,875.38	7.4624	101,444.79	7,569.41 769.84- C 8,339.25 I
10,480.0000	STANDARD CHARTERED PLC	97,605.25	10.0954	105,800.20	8,194.95 1,362.49- C 9,557.44 I
4,865.0000	IMPERIAL BRANDS PLC	155,605.53	44.7942	217,924.23	62,318.70 41,136.56- C 103,455.26 I
60,543.0000	HSBC HOLDINGS PLC	542,171.42	9.2446	559,697.46	17,526.04 62,640.48- C 80,166.52 I
22,756.0000	LEGAL & GENERAL GROUP PLC	31,035.70	3.3551	76,350.66	45,314.96 13,477.92- C 58,792.88 I
11,827.0000	MEGGITT PLC	71,393.43	6.1946	73,264.62	1,871.19 1,723.10 C 148.09 I



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10,935.0000	WM MORRISON SUPERMARKETS PLC	28,897.79	3.1330	34,260.09	5,362.30 6,926.15- C 12,288.45 I
1,425.0000	ASSOCIATED BRITISH FOODS PLC	21,504.73	38.1371	54,345.47	32,840.74 9,593.47- C 42,434.21 I
4,036.0000	PERSIMMON PLC	88,094.76	29.1224	117,538.24	29,443.48 2,587.07- C 32,030.55 I
10,123.0000	PRUDENTIAL PLC	88,434.91	22.8745	231,558.66	143,123.75 40,876.41- C 184,000.16 I
3,510.0000	RIO TINTO PLC	150,341.06	42.1119	147,812.98	2,528.08- 7,244.32- C 4,716.24 I
3,690.0000	SSE PLC	62,544.47	18.8737	69,644.11	7,099.64 12,294.08- C 19,393.72 I
53,775.0000	BP PLC	400,884.47	5.7517	309,300.39	91,584.08- 37,991.49- C 53,592.59- I
163,141.0000	LLOYDS BANKING GROUP PLC	130,141.50	0.8592	140,179.79	10,038.29 2,829.07 C 7,209.22 I
3,541.0000	SMITH & NEPHEW PLC	35,478.79	17.2110	60,944.46	25,465.67 10,758.37- C 36,224.04 I



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13,118.0000	GLAXOSMITHKLINE PLC	253,385.07	21.2443	278,683.08	25,298.01 49,195.14- C 74,493.15 I
5,310.0000	ASTRAZENECA PLC	240,384.40	66.7010	354,182.75	113,798.35 62,522.88- C 176,321.23 I
7,326.0000	GKN PLC	20,170.55	4.2345	31,022.51	10,851.96 6,562.99- C 17,414.95 I
30,991.0000	BT GROUP PLC	59,434.39	3.8286	118,653.85	59,219.46 20,945.63- C 80,165.09 I
842.0000	CARNIVAL PLC	36,792.37	65.9866	55,560.77	18,768.40 6,721.13- C 25,489.53 I
40,139.0000	BARCLAYS PLC	105,847.84	2.6336	105,710.92	136.92- 2,717.53 C 2,854.45- I
1,452.0000	INTERTEK GROUP PLC	49,553.74	54.7767	79,535.80	29,982.06 15,826.96- C 45,809.02 I
1,734.0000	BURBERRY GROUP PLC	19,319.59	21.5755	37,412.02	18,092.43 6,604.21- C 24,696.64 I
3,023.0000	LAND SECURITIES GROUP PLC	31,496.72	13.1583	39,777.73	8,281.01 7,021.84- C 15,302.85 I



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788.0000	NEXT PLC	26,435.13	50.0875	39,468.96	13,033.83 6,967.34- C 20,001.17 I
21,170.0000	KINGFISHER PLC	83,184.46	3.9059	82,688.81	495.65- 3,604.66- C 3,109.01 I
29,194.0000	ITV PLC	37,427.53	2.3562	68,789.69	31,362.16 5,990.11- C 37,352.27 I
5,151.0000	CRH PLC	136,328.33	35.3285	181,977.30	45,648.97 21,117.38- C 66,766.35 I
805.0000	KERRY GROUP PLC	25,659.93	85.9176	69,163.69	43,503.76 12,928.61- C 56,432.37 I
12,392.0000	CHEUNG KONG PROPERTY HOLDINGS	54,195.47	7.8332	97,069.83	42,874.36 489.89- C 43,364.25 I
13,392.0000	CK HUTCHISON HOLDINGS LTD	102,627.94	12.5537	168,119.44	65,491.50 855.62- C 66,347.12 I
4,000.0000	CK INFRASTRUCTURE HOLDINGS LTD	18,780.87	8.4033	33,613.23	14,832.36 87.63- C 14,919.99 I
13,360.0000	LINK REIT	57,751.01	7.6090	101,657.48	43,906.47 589.90- C 44,496.37 I



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9,000.0000	TECHTRONIC INDUSTRIES CO LTD	30,343.27	4.5987	41,388.85	11,045.58 286.41- C 11,331.99 I
47,800.0000	AIA GROUP LTD	150,684.05	7.3080	349,325.24	198,641.19 1,806.66- C 200,447.85 I
10,000.0000	SANDS CHINA LTD	16,457.09	4.5795	45,795.46	29,338.37 231.14- C 29,569.51 I
2,100.0000	SWIRE PROPERTIES LTD	3,862.12	3.2985	6,926.96	3,064.84 34.51- C 3,099.35 I
8,500.0000	CLP HOLDINGS LTD	61,660.43	10.5809	89,938.45	28,278.02 453.89- C 28,731.91 I
4,700.0000	HONG KONG EXCHANGES & CLEARING	80,061.03	25.8504	121,496.97	41,435.94 613.18- C 42,049.12 I
6,000.0000	MTR CORP LTD	22,820.12	5.6299	33,779.76	10,959.64 170.47- C 11,130.11 I
1,000.0000	HANG SENG BANK LTD	14,049.24	20.9185	20,918.60	6,869.36 105.58- C 6,974.94 I
8,169.0000	HENDERSON LAND DEVELOPMENT CO	35,839.84	5.5787	45,572.56	9,732.72 230.43- C 9,963.15 I



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6,000.0000	POWER ASSETS HOLDINGS LTD	35,939.52	8.8324	52,994.64	17,055.12 267.45- C 17,322.57 I
7,000.0000	WHARF HOLDINGS LTD/THE	41,758.36	8.2880	58,016.13	16,257.77 306.27- C 16,564.04 I
34,568.0000	HONG KONG & CHINA GAS CO LTD	41,290.02	1.8804	65,004.99	23,714.97 329.61- C 24,044.58 I
10,000.0000	GALAXY ENTERTAINMENT GROUP LTD	18,442.23	6.0719	60,719.02	42,276.79 229.15- C 42,505.94 I
15,000.0000	BOC HONG KONG HOLDINGS LTD	36,200.02	4.7845	71,767.58	35,567.56 362.19- C 35,929.75 I
13,000.0000	YUE YUEN INDUSTRIAL HOLDINGS L	45,976.57	4.1504	53,955.38	7,978.81 310.05- C 8,288.86 I
4,000.0000	WHEELLOCK & CO LTD	12,241.68	7.5450	30,180.17	17,938.49 152.31- C 18,090.80 I
12,200.0000	CONCORDIA FINANCIAL GROUP LTD	60,820.16	5.0427	61,521.18	701.02 3,265.33- C 3,966.35 I
4,680.0000	MEBUKI FINANCIAL GROUP INC	17,332.47	3.7201	17,410.47	78.00 2,013.05- C 2,091.05 I



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3,000.0000	RECRUIT HOLDINGS CO LTD	28,731.79	17.1858	51,557.49	22,825.70 2,628.06 C 20,197.64 I
5,082.0000	JAPAN POST HOLDINGS CO LTD	68,102.64	12.4065	63,050.09	5,052.55- 1,594.36 C 6,646.91- I
7,200.0000	JAPAN POST BANK CO LTD	84,102.81	12.7981	92,146.67	8,043.86 1,305.44 C 6,738.42 I
3,000.0000	SEVEN & I HOLDINGS CO LTD	74,071.28	41.1890	123,567.10	49,495.82 24,182.18- C 73,678.00 I
1,500.0000	BANDAI NAMCO HOLDINGS INC	28,614.24	34.0868	51,130.29	22,516.05 7,666.15- C 30,182.20 I
4,500.0000	MITSUBISHI CHEMICAL HOLDINGS C	23,285.01	8.2778	37,250.35	13,965.34 7,289.92- C 21,255.26 I
2,600.0000	ELECTRIC POWER DEVELOPMENT CO	65,847.70	24.7241	64,282.66	1,565.04- 1,625.53 C 3,190.57- I
1,200.0000	SEGA SAMMY HOLDINGS INC	14,488.46	13.4567	16,148.09	1,659.63 3,160.21- C 4,819.84 I
1,700.0000	NOMURA REAL ESTATE HOLDINGS IN	28,832.35	19.6155	33,346.39	4,514.04 1,699.78 C 2,814.26 I



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1,000.0000	YAMAGUCHI FINANCIAL GROUP INC	10,806.72	12.0772	12,077.25	1,270.53 2,363.54- C 3,634.07 I
10,000.0000	AOZORA BANK LTD	22,321.02	3.8091	38,091.85	15,770.83 14,662.97- C 30,433.80 I
17,000.0000	FUKUOKA FINANCIAL GROUP INC	80,003.08	4.7525	80,793.87	790.79 358.18- C 1,148.97 I
2,100.0000	INPEX CORP	21,925.31	9.6208	20,203.81	1,721.50- 1,029.86 C 2,751.36- I
1,400.0000	ISETAN MITSUKOSHI HOLDINGS LTD	15,338.08	10.0213	14,029.90	1,308.18- 2,745.66- C 1,437.48 I
1,000.0000	J FRONT RETAILING CO LTD	12,095.00	15.3435	15,343.54	3,248.54 3,002.73- C 6,251.27 I
2,300.0000	OTSUKA HOLDINGS CO LTD	65,923.65	42.6308	98,050.90	32,127.25 28,156.21- C 60,283.46 I
600.0000	MEIJI HOLDINGS CO LTD	11,706.38	81.0786	48,647.20	36,940.82 9,520.28- C 46,461.10 I
6,300.0000	DAI-ICHI LIFE HOLDINGS INC	81,981.59	18.0357	113,625.40	31,643.81 20,205.81- C 51,849.62 I



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900.0000	SOMPO HOLDINGS INC	25,711.52	38.6169	34,755.25	9,043.73 12,654.00- C 21,697.73 I
5,100.0000	JXTG HOLDINGS INC	16,886.17	4.3672	22,272.78	5,386.61 4,358.81- C 9,745.42 I
300.0000	JAPAN AIRLINES CO LTD	7,510.23	30.9184	9,275.54	1,765.31 1,303.56- C 3,068.87 I
800.0000	AISIN SEIKI CO LTD	23,721.54	51.1747	40,939.83	17,218.29 8,011.94- C 25,230.23 I
3,000.0000	AJINOMOTO CO INC	29,769.06	21.5957	64,787.29	35,018.23 12,678.94- C 47,697.17 I
2,000.0000	AMADA HOLDINGS CO LTD	17,141.70	11.5521	23,104.31	5,962.61 4,521.54- C 10,484.15 I
10,700.0000	ACOM CO LTD	30,200.49	4.5656	48,852.79	18,652.30 2,490.19 C 16,162.11 I
1,600.0000	ASAHI GROUP HOLDINGS LTD	29,760.53	37.6290	60,206.48	30,445.95 11,782.45- C 42,228.40 I
6,000.0000	ASAHI KASEI CORP	32,835.39	10.7467	64,480.24	31,644.85 12,618.83- C 44,263.68 I



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1,200.0000	ASAHI GLASS CO LTD	31,762.44	42.0968	50,516.20	18,753.76 2,310.34 C 16,443.42 I
4,000.0000	HIROSHIMA BANK LTD/THE	16,950.05	4.4321	17,728.73	778.68 3,469.53- C 4,248.21 I
9,000.0000	BANK OF KYOTO LTD/THE	72,645.92	9.4339	84,905.66	12,259.74 182.60 C 12,077.14 I
3,000.0000	NTT DATA CORP	19,803.45	11.1249	33,374.87	13,571.42 6,531.49- C 20,102.91 I
6,700.0000	NTT DOCOMO INC	102,969.54	23.6027	158,138.12	55,168.58 29,697.22- C 84,865.80 I
2,500.0000	BRIDGESTONE CORP	41,736.30	43.0758	107,689.56	65,953.26 21,074.94- C 87,028.20 I
1,300.0000	BROTHER INDUSTRIES LTD	15,765.03	23.0776	30,000.89	14,235.86 5,871.19- C 20,107.05 I
1,000.0000	CANON INC	29,728.38	33.9622	33,962.26	4,233.88 64.85 C 4,169.03 I
700.0000	CENTRAL JAPAN RAILWAY CO	53,139.24	162.9583	114,070.84	60,931.60 22,323.74- C 83,255.34 I



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4,000.0000	CHIBA BANK LTD/THE	23,891.90	7.2445	28,978.28	5,086.38 5,671.07- C 10,757.45 I
2,900.0000	CHUBU ELECTRIC POWER CO INC	36,469.89	13.2831	38,521.27	2,051.38 1,761.74 C 289.64 I
2,000.0000	CHUGOKU BANK LTD/THE	27,000.83	14.9519	29,903.88	2,903.05 5,852.21- C 8,755.26 I
900.0000	CHUGAI PHARMACEUTICAL CO LTD	17,152.34	37.4243	33,681.91	16,529.57 6,591.59- C 23,121.16 I
2,900.0000	RAKUTEN INC	20,995.91	11.7657	34,120.68	13,124.77 6,677.44- C 19,802.21 I
7,200.0000	KDDI CORP	62,221.16	26.4773	190,637.23	128,416.07 37,307.88- C 165,723.95 I
400.0000	DAITO TRUST CONSTRUCTION CO LT	19,398.86	155.7048	62,281.95	42,883.09 12,188.62- C 55,071.71 I
1,000.0000	DAIKIN INDUSTRIES LTD	42,055.71	102.0825	102,082.59	60,026.88 19,977.64- C 80,004.52 I
3,000.0000	DAIWA HOUSE INDUSTRY CO LTD	33,953.32	34.1580	102,474.19	68,520.87 20,054.25- C 88,575.12 I



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7,000.0000	DAIWA SECURITIES GROUP INC	36,742.85	5.9255	41,479.17	4,736.32 8,117.52- C 12,853.84 I
200.0000	LAWSON INC	8,549.55	69.9537	13,990.74	5,441.19 2,738.01- C 8,179.20 I
4,200.0000	MITSUBISHI UFJ LEASE & FINANCE	15,159.21	5.4645	22,951.23	7,792.02 4,491.57- C 12,283.59 I
500.0000	EAST JAPAN RAILWAY CO	34,602.80	95.6301	47,815.06	13,212.26 9,357.45- C 22,569.71 I
1,100.0000	EISAI CO LTD	39,468.48	55.2242	60,746.70	21,278.22 11,888.18- C 33,166.40 I
200.0000	FAST RETAILING CO LTD	35,539.73	333.0366	66,607.33	31,067.60 13,035.09- C 44,102.69 I
58,400.0000	MITSUBISHI UFJ FINANCIAL GROUP	302,154.77	6.7176	392,313.26	90,158.49 65,879.14- C 156,037.63 I
3,000.0000	SUBARU CORP	15,395.58	33.6952	101,085.79	85,690.21 19,782.55- C 105,472.76 I
1,000.0000	FUJIFILM HOLDINGS CORP	32,595.17	35.9558	35,955.85	3,360.68 1,644.41 C 1,716.27 I



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500.0000	MIRACA HOLDINGS INC	18,947.95	44.9448	22,472.41	3,524.46 7,985.98- C 11,510.44 I
600.0000	FANUC CORP	65,223.61	192.7287	115,637.23	50,413.62 22,630.30- C 73,043.92 I
847.0000	NOMURA RESEARCH INSTITUTE LTD	15,949.23	39.3823	33,356.84	17,407.61 6,527.97- C 23,935.58 I
6.0000	NIPPON BUILDING FUND INC	25,552.84	5,108.5793	30,651.48	5,098.64 5,998.52- C 11,097.16 I
3.0000	JAPAN REAL ESTATE INVESTMENT C	12,568.81	4,975.0798	14,925.24	2,356.43 2,920.90- C 5,277.33 I
13,000.0000	HACHIJUNI BANK LTD/THE	76,760.70	6.3456	82,493.77	5,733.07 1,337.36- C 7,070.43 I
1,400.0000	HAMAMATSU PHOTONICS KK	31,350.22	30.7048	42,986.83	11,636.61 4,531.50- C 16,168.11 I
1,000.0000	HANKYU HANSHIN HOLDINGS INC	23,104.03	35.9558	35,955.85	12,851.82 7,036.61- C 19,888.43 I
700.0000	DENTSU INC	18,595.01	47.7928	33,454.96	14,859.95 6,547.17- C 21,407.12 I



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9,000.0000	RESONA HOLDINGS INC	45,879.59	5.5046	49,541.65	3,662.06 12,214.09- C 15,876.15 I
210.0000	HIROSE ELECTRIC CO LTD	23,444.73	142.5774	29,941.26	6,496.53 5,859.53- C 12,356.06 I
18,000.0000	HITACHI LTD	70,525.83	6.1356	110,441.43	39,915.60 21,613.49- C 61,529.09 I
1,445.0000	SUMITOMO MITSUI TRUST HOLDINGS	55,300.00	35.7689	51,686.14	3,613.86- 1,342.27- C 2,271.59- I
2,600.0000	HONDA MOTOR CO LTD	87,047.84	27.2694	70,900.67	16,147.17- 6,867.79- C 9,279.38- I
1,700.0000	HOYA CORP	46,372.00	51.9134	88,252.93	41,880.93 17,271.17- C 59,152.10 I
9,000.0000	IHI CORP	16,385.75	3.3997	30,598.08	14,212.33 5,988.06- C 20,200.39 I
3,000.0000	ISUZU MOTORS LTD	16,353.81	12.3353	37,006.05	20,652.24 7,242.10- C 27,894.34 I
9,200.0000	ITOCHU CORP	90,603.96	14.8540	136,657.17	46,053.21 13,689.42- C 59,742.63 I



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3,600.0000	JAPAN TOBACCO INC	66,501.25	35.1281	126,461.37	59,960.12 24,748.57- C 84,708.69 I
2,600.0000	AEON CO LTD	30,173.64	15.1922	39,499.82	9,326.18 7,730.15- C 17,056.33 I
7,000.0000	KAJIMA CORP	17,290.75	8.4371	59,060.16	41,769.41 11,558.11- C 53,327.52 I
4,000.0000	KANEKA CORP	23,423.87	7.6183	30,473.48	7,049.61 11,918.50- C 18,968.11 I
3,300.0000	KANSAI ELECTRIC POWER CO INC/T	31,643.91	13.7682	45,435.21	13,791.30 2,077.95 C 11,713.35 I
2,000.0000	KANSAI PAINT CO LTD	33,218.05	23.0064	46,012.81	12,794.76 2,022.16 C 10,772.60 I
3,000.0000	KAO CORP	83,734.73	59.3805	178,141.68	94,406.95 31,651.26- C 126,058.21 I
6,000.0000	KAWASAKI HEAVY INDUSTRIES LTD	16,481.58	2.9547	17,728.73	1,247.15 3,469.53- C 4,716.68 I
2,000.0000	KEIKYU CORP	16,375.11	12.0416	24,083.30	7,708.19 4,713.13- C 12,421.32 I



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2,000.0000	KIKKOMAN CORP	23,529.90	31.9508	63,901.74	40,371.84 12,505.62- C 52,877.46 I
440.0000	KEYENCE CORP	48,358.74	439.1242	193,214.66	144,855.92 37,812.26- C 182,668.18 I
7,000.0000	KINTETSU GROUP HOLDINGS CO LTD	21,687.96	3.8536	26,975.79	5,287.83 5,279.18- C 10,567.01 I
3,000.0000	KOMATSU LTD	63,051.62	25.4049	76,214.84	13,163.22 14,915.31- C 28,078.53 I
800.0000	KONAMI HOLDINGS CORP	15,527.61	55.5357	44,428.62	28,901.01 8,694.74- C 37,595.75 I
1,300.0000	JTEKT CORP	15,875.76	14.6137	18,997.86	3,122.10 3,717.90- C 6,840.00 I
5,000.0000	KUBOTA CORP	46,048.34	16.7986	83,993.41	37,945.07 16,437.59- C 54,382.66 I
1,500.0000	KURARAY CO LTD	20,170.77	18.1381	27,207.19	7,036.42 5,324.47- C 12,360.89 I
100.0000	KYOCERA CORP	4,987.09	57.9031	5,790.32	803.23 146.43 C 656.80 I



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2,700.0000	KYOWA HAKKO KIRIN CO LTD	30,956.67	18.5742	50,150.41	19,193.74 5,745.52- C 24,939.26 I
2,900.0000	TOKIO MARINE HOLDINGS INC	80,865.14	41.3937	120,041.82	39,176.68 23,492.28- C 62,668.96 I
1,000.0000	MAKITA CORP	16,981.98	36.9793	36,979.35	19,997.37 7,236.88- C 27,234.25 I
6,100.0000	SUMITOMO MITSUI FINANCIAL GROU	202,012.52	38.9729	237,734.95	35,722.43 35,830.65- C 71,553.08 I
2,100.0000	MARUI GROUP CO LTD	15,628.74	14.7383	30,950.51	15,321.77 6,057.04- C 21,378.81 I
800.0000	PANASONIC CORP	7,749.24	13.5635	10,850.84	3,101.60 1,626.90- C 4,728.50 I
130,600.0000	MIZUHO FINANCIAL GROUP INC	236,600.91	1.8280	238,743.67	2,142.76 27,916.17- C 30,058.93 I
1,000.0000	CREDIT SAISON CO LTD	15,129.41	19.5265	19,526.52	4,397.11 3,821.37- C 8,218.48 I
5,100.0000	MITSUBISHI CORP	103,072.16	20.9683	106,938.41	3,866.25 5,961.81- C 9,828.06 I



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1,500.0000	MITSUBISHI GAS CHEMICAL CO INC	18,270.28	21.1374	31,706.12	13,435.84 6,204.92- C 19,640.76 I
8,000.0000	MITSUBISHI ELECTRIC CORP	73,251.46	14.3778	115,023.13	41,771.67 22,510.12- C 64,281.79 I
13,000.0000	MITSUBISHI HEAVY INDUSTRIES LT	54,672.42	4.0922	53,198.64	1,473.78- 10,411.03- C 8,937.25 I
2,100.0000	MITSUBISHI MATERIALS CORP	67,109.21	30.2598	63,545.74	3,563.47- 1,494.02- C 2,069.45- I
4,200.0000	MITSUI & CO LTD	61,293.78	14.2888	60,013.35	1,280.43- 3,280.08- C 1,999.65 I
5,000.0000	MITSUI CHEMICALS INC	15,384.93	5.2954	26,477.39	11,092.46 5,181.65- C 16,274.11 I
18,000.0000	MITSUI OSK LINES LTD	52,179.63	2.9369	52,865.79	686.16 1,336.83 C 650.67- I
3,000.0000	MITSUI FUDOSAN CO LTD	51,520.90	23.8563	71,569.06	20,048.16 14,006.12- C 34,054.28 I
1,100.0000	MURATA MANUFACTURING CO LTD	74,737.89	151.9223	167,114.62	92,376.73 20,556.27- C 112,933.00 I



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2,000.0000	SEIKO EPSON CORP	15,832.11	22.2410	44,482.02	28,649.91 8,705.18- C 37,355.09 I
600.0000	NINTENDO CO LTD	73,591.25	335.3506	201,210.39	127,619.14 22,525.84- C 150,144.98 I
1,900.0000	DENSO CORP	56,338.67	42.2036	80,186.90	23,848.23 15,692.63- C 39,540.86 I
800.0000	NIDEC CORP	42,375.12	102.4385	81,950.87	39,575.75 16,037.85- C 55,613.60 I
1,000.0000	NH FOODS LTD	12,882.89	30.3933	30,393.38	17,510.49 5,948.01- C 23,458.50 I
1,210.0000	NISSHIN SEIFUN GROUP INC	13,074.53	16.4204	19,868.72	6,794.19 3,888.32- C 10,682.51 I
4,000.0000	NIPPON TELEGRAPH & TELEPHONE C	84,217.89	47.2588	189,035.24	104,817.35 36,994.34- C 141,811.69 I
3,000.0000	NSK LTD	32,238.25	12.4866	37,459.95	5,221.70 160.85- C 5,382.55 I
1,000.0000	NISSAN CHEMICAL INDUSTRIES LTD	14,192.47	33.0188	33,018.87	18,826.40 6,461.83- C 25,288.23 I



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400.0000	NISSIN FOODS HOLDINGS CO LTD	13,330.06	62.4777	24,991.10	11,661.04 4,890.77- C 16,551.81 I
600.0000	NITTO DENKO CORP	23,380.84	82.2356	49,341.40	25,960.56 9,656.14- C 35,616.70 I
3,000.0000	NIPPON EXPRESS CO LTD	13,127.77	6.2566	18,770.02	5,642.25 3,673.32- C 9,315.57 I
1,100.0000	YAMAHA CORP	14,440.55	34.5318	37,985.05	23,544.50 7,433.72- C 30,978.22 I
2,000.0000	MINEBEA MITSUMI INC	12,329.24	16.0644	32,128.87	19,799.63 6,287.63- C 26,087.26 I
1,255.0000	NIPPON STEEL & SUMITOMO METAL	26,849.32	22.5881	28,348.08	1,498.76 7,352.45- C 8,851.21 I
1,000.0000	NIPPON ELECTRIC GLASS CO LTD	28,598.11	36.3563	36,356.35	7,758.24 919.35 C 6,838.89 I
4,000.0000	NISSAN MOTOR CO LTD	34,624.09	9.9501	39,800.64	5,176.55 7,789.01- C 12,965.56 I
300.0000	NITORI HOLDINGS CO LTD	11,339.06	133.8554	40,156.64	28,817.58 7,858.66- C 36,676.24 I



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800.0000	ORIENTAL LAND CO LTD/JAPAN	13,841.12	67.7109	54,168.74	40,327.62 10,600.87- C 50,928.49 I
3,000.0000	OBAYASHI CORP	13,255.53	11.7568	35,270.56	22,015.03 6,902.48- C 28,917.51 I
2,000.0000	OJI HOLDINGS CORP	8,837.02	5.1619	10,323.96	1,486.94 2,020.40- C 3,507.34 I
900.0000	OLYMPUS CORP	22,763.58	36.4898	32,840.87	10,077.29 10,246.45- C 20,323.74 I
800.0000	OMRON CORP	18,457.66	43.3873	34,709.86	16,252.20 6,792.75- C 23,044.95 I
1,300.0000	ONO PHARMACEUTICAL CO LTD	11,377.40	21.8138	28,357.96	16,980.56 5,549.68- C 22,530.24 I
6,500.0000	ORIX CORP	66,734.81	15.4859	100,658.59	33,923.78 6,918.27- C 40,842.05 I
7,000.0000	OSAKA GAS CO LTD	24,818.19	4.0895	28,626.73	3,808.54 5,602.29- C 9,410.83 I
1,200.0000	ALFRESA HOLDINGS CORP	13,095.82	19.2862	23,143.47	10,047.65 4,529.17- C 14,576.82 I



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2,000.0000	JAPAN EXCHANGE GROUP INC	23,115.52	18.1114	36,222.85	13,107.33 4,661.13- C 17,768.46 I
2,900.0000	T&D HOLDINGS INC	34,272.73	15.2144	44,122.02	9,849.29 8,634.70- C 18,483.99 I
200.0000	SMC CORP/JAPAN	27,128.60	303.9337	60,786.75	33,658.15 11,896.03- C 45,554.18 I
4,100.0000	SOFTBANK GROUP CORP	118,382.05	80.9629	331,948.19	213,566.14 59,207.26- C 272,773.40 I
2,000.0000	SANTEN PHARMACEUTICAL CO LTD	12,031.12	13.5635	27,127.09	15,095.97 5,308.78- C 20,404.75 I
700.0000	SECOM CO LTD	30,855.05	75.8721	53,110.54	22,255.49 10,393.77- C 32,649.26 I
2,000.0000	SEKISUI CHEMICAL CO LTD	13,670.77	17.8978	35,795.66	22,124.89 7,005.24- C 29,130.13 I
2,000.0000	SEKISUI HOUSE LTD	19,888.62	17.6174	35,234.96	15,346.34 6,895.50- C 22,241.84 I
1,000.0000	SHIMADZU CORP	8,070.43	19.0281	19,028.12	10,957.69 3,723.80- C 14,681.49 I



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3,000.0000	SHIMIZU CORP	12,520.89	10.5998	31,799.57	19,278.68 6,223.20- C 25,501.88 I
800.0000	SHIN-ETSU CHEMICAL CO LTD	45,924.37	90.6461	72,516.91	26,592.54 12,118.71- C 38,711.25 I
1,900.0000	SHIONOGI & CO LTD	45,108.18	55.7048	105,839.26	60,731.08 4,709.80- C 65,440.88 I
300.0000	SHIMANO INC	13,351.35	158.2413	47,472.41	34,121.06 9,290.36- C 43,411.42 I
6,000.0000	SHIZUOKA BANK LTD/THE	52,717.81	9.0334	54,200.78	1,482.97 2,056.41- C 3,539.38 I
2,900.0000	SHOWA SHELL SEKIYU KK	19,797.65	9.2737	26,893.91	7,096.26 12,455.02- C 19,551.28 I
1,900.0000	SONY CORP	45,592.45	38.1452	72,475.97	26,883.52 3,314.64 C 23,568.88 I
700.0000	STANLEY ELECTRIC CO LTD	13,467.41	30.1708	21,119.61	7,652.20 4,133.14- C 11,785.34 I
11,000.0000	SUMITOMO CHEMICAL CO LTD	54,772.56	5.7493	63,243.14	8,470.58 5,185.94- C 13,656.52 I



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2,000.0000	SUMITOMO HEAVY INDUSTRIES LTD	12,095.00	6.5948	13,189.75	1,094.75 2,581.23- C 3,675.98 I
7,000.0000	SUMITOMO METAL MINING CO LTD	100,540.17	13.3543	93,480.77	7,059.40- 6,485.70- C 573.70- I
820.0000	SUMITOMO REALTY & DEVELOPMENT	15,680.07	30.8383	25,287.47	9,607.40 4,948.78- C 14,556.18 I
7,400.0000	SUMITOMO CORP	81,714.63	13.0117	96,286.93	14,572.30 9,059.30- C 23,631.60 I
2,100.0000	SUMITOMO RUBBER INDUSTRIES LTD	22,012.72	16.8743	35,436.10	13,423.38 13,640.69- C 27,064.07 I
1,000.0000	SURUGA BANK LTD	8,975.43	24.2257	24,225.70	15,250.27 4,741.00- C 19,991.27 I
1,400.0000	SUZUKI MOTOR CORP	31,182.97	47.4368	66,411.53	35,228.56 12,996.78- C 48,225.34 I
600.0000	THK CO LTD	13,095.82	28.3018	16,981.13	3,885.31 3,323.21- C 7,208.52 I
6,000.0000	TAISEI CORP	13,223.59	9.1313	54,788.18	41,564.59 10,722.08- C 52,286.67 I



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1,000.0000	TAKASHIMAYA CO LTD	8,421.78	9.5140	9,514.06	1,092.28 1,861.91- C 2,954.19 I
600.0000	TAKEDA PHARMACEUTICAL CO LTD	24,626.51	50.8098	30,485.94	5,859.43 13,565.00- C 19,424.43 I
1,000.0000	MITSUBISHI TANABE PHARMA CORP	14,181.83	23.1043	23,104.31	8,922.48 4,521.54- C 13,444.02 I
800.0000	TEIJIN LTD	13,500.42	19.2328	15,386.26	1,885.84 3,011.11- C 4,896.95 I
800.0000	SYSMEX CORP	26,540.74	59.7187	47,775.01	21,234.27 7,163.07- C 28,397.34 I
900.0000	TOHO CO LTD/TOKYO	14,383.04	30.7938	27,714.49	13,331.45 5,423.73- C 18,755.18 I
6,000.0000	TOHO GAS CO LTD	29,762.75	7.2801	43,681.02	13,918.27 2,226.57 C 11,691.70 I
8,700.0000	TOKYO ELECTRIC POWER CO HOLDIN	29,343.63	4.1206	35,849.94	6,506.31 850.90- C 7,357.21 I
9,000.0000	TOKYO GAS CO LTD	39,670.78	5.2002	46,802.24	7,131.46 9,159.24- C 16,290.70 I



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1,000.0000	TOKYO ELECTRON LTD	69,770.23	134.9234	134,923.45	65,153.22 11,016.38- C 76,169.60 I
7,926.0000	TOKYU CORP	36,585.38	7.6272	60,453.74	23,868.36 18,496.29- C 42,364.65 I
3,000.0000	TOPPAN PRINTING CO LTD	27,149.98	10.9647	32,894.27	5,744.29 3,105.79- C 8,850.08 I
9,000.0000	TORAY INDUSTRIES INC	54,538.06	8.3686	75,317.73	20,779.67 13,106.39- C 33,886.06 I
1,000.0000	TOTO LTD	13,670.77	38.1808	38,180.85	24,510.08 7,472.03- C 31,982.11 I
1,000.0000	LIXIL GROUP CORP	20,484.86	24.9999	25,000.00	4,515.14 4,892.52- C 9,407.66 I
700.0000	TOYOTA INDUSTRIES CORP	19,884.36	52.5987	36,819.15	16,934.79 7,205.55- C 24,140.34 I
900.0000	TOYOTA TSUSHO CORP	14,287.22	29.9483	26,953.54	12,666.32 5,274.83- C 17,941.15 I
11,260.0000	TOYOTA MOTOR CORP	445,463.67	52.4474	590,558.71	145,095.04 118,305.72- C 263,400.76 I



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900.0000	UNICHARM CORP	9,710.07	25.1156	22,604.13	12,894.06 4,423.62- C 17,317.68 I
600.0000	WEST JAPAN RAILWAY CO	20,729.73	70.6301	42,378.07	21,648.34 8,293.42- C 29,941.76 I
8,400.0000	YAMADA DENKI CO LTD	32,761.71	4.9661	41,715.91	8,954.20 1,907.85 C 7,046.35 I
500.0000	YAKULT HONSHA CO LTD	13,228.91	68.0847	34,042.36	20,813.45 6,662.11- C 27,475.56 I
900.0000	YAMAHA MOTOR CO LTD	13,271.50	25.7920	23,212.89	9,941.39 4,542.77- C 14,484.16 I
9,000.0000	ASTELLAS PHARMA INC	65,447.20	12.2330	110,097.00	44,649.80 21,546.09- C 66,195.89 I
800.0000	YAMATO HOLDINGS CO LTD	11,277.31	20.2785	16,222.85	4,945.54 3,174.81- C 8,120.35 I
1,000.0000	YASKAWA ELECTRIC CORP	9,294.84	21.1908	21,190.81	11,895.97 4,147.07- C 16,043.04 I
1,700.0000	YOKOGAWA ELECTRIC CORP	15,004.83	16.0288	27,249.02	12,244.19 5,332.65- C 17,576.84 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
43,600.0000	SINGAPORE TELECOMMUNICATIONS L	104,220.55	2.8252	123,182.63	18,962.08 2,545.39 C 16,416.69 I
14,100.0000	STARHUB LTD	29,752.05	1.9755	27,854.89	1,897.16- 631.72 C 2,528.88- I
11,800.0000	KEPPEL CORP LTD	51,725.95	4.5683	53,907.11	2,181.16 1,222.56 C 958.60 I
30,100.0000	GLOBAL LOGISTIC PROPERTIES LTD	48,631.38	2.0772	62,523.88	13,892.50 513.46- C 14,405.96 I
7,000.0000	SINGAPORE TECHNOLOGIES ENGINEE	16,346.20	2.6727	18,709.37	2,363.17 273.81 C 2,089.36 I
11,200.0000	DBS GROUP HOLDINGS LTD	114,359.05	15.0633	168,709.74	54,350.69 2,766.18 C 51,584.51 I
1,000.0000	JARDINE CYCLE & CARRIAGE LTD	22,406.17	32.2112	32,211.21	9,805.04 471.43 C 9,333.61 I
23,000.0000	GENTING SINGAPORE PLC	14,662.87	0.7880	18,124.70	3,461.83 265.26 C 3,196.57 I
12,000.0000	CAPITALAND MALL TRUST	15,455.50	1.4344	17,213.20	1,757.70 253.39 C 1,504.31 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
9,500.0000	HONGKONG LAND HOLDINGS LTD	59,485.50	7.3600	69,920.00	10,434.50 I
11,000.0000	ASCENDAS REAL ESTATE INVESTMEN	15,238.53	1.8956	20,851.94	5,613.41 311.94 C 5,301.47 I
20,000.0000	COMFORTDELGRO CORP LTD	30,872.78	1.6704	33,409.59	2,536.81 3,733.62- C 6,270.43 I
500.0000	UNITED OVERSEAS BANK LTD	6,894.03	16.7919	8,395.98	1,501.95 203.30- C 1,705.25 I
4,983.0000	BANK HAPOLIM BM	20,845.61	6.7455	33,613.15	12,767.54 2,424.69 C 10,342.85 I
7,787.0000	BANK LEUMI LE-ISRAEL BM	30,792.57	4.8628	37,867.26	7,074.69 3,398.26 C 3,676.43 I
701.0000	NICE LTD	20,040.18	80.1788	56,205.35	36,165.17 3,901.41 C 32,263.76 I
1,591.0000	AERCAP HOLDINGS NV	63,888.56	46.4300	73,870.13	9,981.57 I
2,417.0000	MOBILEYE NV	89,452.11	62.8000	151,787.60	62,335.49 I
1,363.0000	NXP SEMICONDUCTORS NV	117,854.98	109.4500	149,180.35	31,325.37 I
8,500.0000	NOVO NORDISK A/S	135,253.36	42.7686	363,533.17	228,279.81 62,532.75- C 290,812.56 I



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1,500.0000	DSV A/S	28,012.01	61.3609	92,041.48	64,029.47 14,617.61- C 78,647.08 I
416.0000	PANDORA A/S	30,445.75	93.1919	38,767.87	8,322.12 7,680.75- C 16,002.87 I
1,000.0000	NOVOZYMES A/S	26,215.68	43.7043	43,704.36	17,488.68 6,940.92- C 24,429.60 I
500.0000	COLOPLAST A/S	14,432.49	83.4509	41,725.47	27,292.98 8,697.65- C 35,990.63 I
49.0000	AP MOLLER - MAERSK A/S	76,045.58	2,008.0382	98,393.88	22,348.30 6,609.82 C 15,738.48 I
9.0000	AP MOLLER - MAERSK A/S	14,242.97	1,906.7926	17,161.13	2,918.16 2,413.17- C 5,331.33 I
3,418.0000	DANSKE BANK A/S	76,178.70	38.4119	131,292.14	55,113.44 19,054.27- C 74,167.71 I
1,239.0000	VESTAS WIND SYSTEMS A/S	56,290.56	92.1948	114,229.46	57,938.90 13,556.45- C 71,495.35 I
862.0000	NESTE OYJ	15,247.76	39.3375	33,908.98	18,661.22 6,338.52- C 24,999.74 I



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578.0000	NOKIAN RENKAAT OYJ	15,030.89	41.3335	23,890.78	8,859.89 4,465.84- C 13,325.73 I
1,228.0000	KONE OYJ	25,879.95	50.8000	62,382.52	36,502.57 11,661.00- C 48,163.57 I
1,119.0000	ORION OYJ	30,466.09	63.7567	71,343.80	40,877.71 14,887.39- C 55,765.10 I
672.0000	WARTSILA OYJ ABP	17,489.02	59.0234	39,663.77	22,174.75 7,414.25- C 29,589.00 I
2,079.0000	UPM-KYMMENE OYJ	28,102.21	28.4681	59,185.24	31,083.03 11,063.33- C 42,146.36 I
2,779.0000	STORA ENSO OYJ	21,925.24	12.8996	35,848.05	13,922.81 4,358.62- C 18,281.43 I
1,121.0000	SAMPO OYJ	30,472.53	51.1764	57,368.83	26,896.30 10,723.80- C 37,620.10 I
729.0000	ELISA OYJ	15,096.99	38.6988	28,211.47	13,114.48 5,273.49- C 18,387.97 I
511.0000	METSO OYJ	13,530.68	34.6270	17,694.45	4,163.77 3,307.56- C 7,471.33 I



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16,027.0000	NOKIA OYJ	71,915.50	6.1076	97,887.24	25,971.74 5,136.61 C 20,835.13 I
17,726.0000	NORSK HYDRO ASA	91,187.58	5.5248	97,934.05	6,746.47 5,296.01- C 12,042.48 I
4,700.0000	DNB ASA	61,333.08	16.9518	79,673.86	18,340.78 25,070.74- C 43,411.52 I
413.0000	TELENOR ASA	6,511.37	16.5340	6,828.57	317.20 30.88 C 286.32 I
2,857.0000	SCHIBSTED ASA	59,310.68	24.0669	68,759.13	9,448.45 310.92 C 9,137.53 I
1,173.0000	INTERNATIONAL PETROLEUM CORP/S	3,019.86	2.9639	3,476.77	456.91 210.38 C 246.53 I
865.0000	KINNEVIK AB	23,637.11	30.5766	26,448.77	2,811.66 6,947.55- C 9,759.21 I
2,200.0000	ESSITY AB	24,712.88	27.3280	60,121.76	35,408.88 10,547.79- C 45,956.67 I
2,600.0000	ATLAS COPCO AB	39,190.12	38.2948	99,566.66	60,376.54 17,468.02- C 77,844.56 I



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1,661.0000	ATLAS COPCO AB	25,866.16	34.5128	57,325.77	31,459.61 7,495.75- C 38,955.36 I
6,000.0000	SVENSKA HANDELSBANKEN AB	59,536.55	14.2983	85,790.00	26,253.45 15,051.03- C 41,304.48 I
4,200.0000	ASSA ABLOY AB	27,660.10	21.9454	92,170.89	64,510.79 16,170.52- C 80,681.31 I
331.0000	ELECTROLUX AB	7,587.27	32.7344	10,835.09	3,247.82 1,900.91- C 5,148.73 I
7,547.0000	VOLVO AB	82,486.19	17.0252	128,489.27	46,003.08 6,809.82- C 52,812.90 I
3,038.0000	INDUSTRIVARDEN AB	55,593.87	23.9491	72,757.41	17,163.54 5,666.26 C 11,497.28 I
3,195.0000	SVENSKA CELLULOSA AB SCA	12,396.56	7.5581	24,148.44	11,751.88 1,741.19- C 13,493.07 I
1,300.0000	BOLIDEN AB	20,046.99	27.2569	35,434.02	15,387.03 9,403.33- C 24,790.36 I
1,159.0000	HEXAGON AB	19,908.24	47.4832	55,033.11	35,124.87 11,092.16- C 46,217.03 I



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6,200.0000	SKANDINAVISKA ENSKILDA BANKEN	40,284.08	12.0812	74,903.82	34,619.74 13,141.17- C 47,760.91 I
2,500.0000	SWEDBANK AB	26,108.25	24.3403	60,850.91	34,742.66 10,675.72- C 45,418.38 I
1,200.0000	SWEDISH MATCH AB	28,861.98	35.1767	42,212.09	13,350.11 7,405.71- C 20,755.82 I
13,000.0000	NORDEA BANK AB	133,225.25	12.7096	165,225.18	31,999.93 28,987.19- C 60,987.12 I
1,600.0000	SECURITAS AB	17,211.22	16.8355	26,936.83	9,725.61 4,725.80- C 14,451.41 I
3,095.0000	INVESTOR AB	76,513.48	48.1353	148,978.90	72,465.42 11,385.35- C 83,850.77 I
5,046.0000	TELEFONAKTIEBOLAGET LM ERICSSO	29,829.35	7.1432	36,044.78	6,215.43 1,266.07 C 4,949.36 I
1,600.0000	SKANSKA AB	29,626.06	23.7001	37,920.22	8,294.16 6,652.75- C 14,946.91 I
3,521.0000	LUNDIN PETROLEUM AB	44,351.64	19.2185	67,668.59	23,316.95 6,542.49- C 29,859.44 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
1,300.0000	ALFA LAVAL AB	19,539.70	20.4397	26,571.66	7,031.96 4,661.74- C 11,693.70 I
2,696.0000	MELCO RESORTS & ENTERTAINMENT ADR	45,414.12	22.4500	60,525.20	15,111.08 I
2,222.0000	TEVA PHARMACEUTICAL INDUSTRIES ADR	74,996.00	33.2200	73,814.84	1,181.16-I
TOTAL INVESTMENTS EQUITY		33,248,705.60		49,206,427.52	15,957,721.92 5,202,006.73- C 21,159,728.65 I
TOTAL INVESTMENT		33,803,924.14		49,865,826.11	16,061,901.97 5,238,510.51- C 21,300,412.48 I



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<u>INVESTMENTS REAL ESTATE</u>					
365.4840	PRIME PROPERTY FUND LLC	3,613,290.58	22,334.0281	8,162,729.93	4,549,439.35
1,631,341.0000	FORTRESS JAPAN OPPORTUNITY DOMESTIC FUND © LP	21,090.00	0.6903	1,126,194.00	1,105,104.00
1,388,791.0000	BRAZIL REAL ESTATE OPPORTUNITIES FUND I I	1,373,380.96	0.7737	1,074,557.00	298,823.96-
1,463,026.5900	BROOKFIELD REAL ESTATE FUND	0.00	0.1048	153,434.89	153,434.89
231,482.0000	EXETER INDUSTRIAL VALUE FUND I I LPP	0.00	1.0291	238,228.00	238,228.00
1,471,453.6400	DIVCOWEST FUND I I I	0.00	0.2372	349,126.00	349,126.00
2,702,602.7550	JAMESTOWN PREMIER PROPERTY	2,068,696.15	1.7888	4,834,631.64	2,765,935.49
1,479,839.0000	BROOKFIELD FAIRFIELD MULTIFAMILY	231.00	0.3586	530,814.00	530,583.00
955,518.0000	CVI EUROPE REAL ESTATE PARTNER TG LLC	354,253.46	0.7410	708,102.85	353,849.39
1,128,000.0000	SAVANNA REAL ESTATE FUND I I A LP LLC	1,033,437.35	1.5961	1,800,475.35	767,038.00
5,414,950.4850	USAA EAGLE REAL ESTATE LP	4,730,136.22	1.3447	7,281,817.95	2,551,681.73
4,947,645.6900	PRISA REAL ESTATE LP	4,824,165.22	1.3886	6,870,410.00	2,046,244.78



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917,387.0000	GREENFIELD ACQUI RTNRS VII LP	826,394.00	1.1177	1,025,386.00	198,992.00
1,048,987.7100	NORTHLIGHT REAL ESTATE OPPORTUNITY FUND	942,581.48	1.0774	1,130,226.23	187,644.75
1,047,748.0000	H/2 SPECIAL OPPORTUNITIES III LP	975,985.00	1.1144	1,167,624.00	191,639.00
285,951.0000	BRV PARTNERS FUND I LP	147,235.00	1.0121	289,421.00	142,186.00
4,047,685.0200	METLIFE CORE PROPERTY FUND L P	3,806,617.86	1.0687	4,325,988.00	519,370.14
2,386,800.0000	INLAND RETAIL PROPERTY	2,386,800.00	1.0544	2,516,706.00	129,906.00
364,500.0000	ASANA PARTNERS I	364,500.00	1.0263	374,115.00	9,615.00
2,025,000.0000	HANCOCK US REAL ESTATE	2,025,000.00	1.0000	2,025,000.00	0.00
3,496,151.6220	UBS TRUMBULL PROPERTY FUND	3,042,093.91	1.3598	4,754,188.48	1,712,094.57
944.0800	TTG BRPTP FUND LP	0.00	0.0000	0.00	0.00
1,904,175.0000	LION INDUSTRIAL TRUST	1,847,756.33	1.1251	2,142,445.03	294,688.70
1,541,626.0800	CITIC CAPITAL CHINA	1,216,735.41	0.8301	1,279,773.24	63,037.83
TOTAL INVESTMENTS REAL ESTATE		35,600,379.93		54,161,394.59	18,561,014.66
TOTAL INVESTMENT		35,600,379.93		54,161,394.59	18,561,014.66



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
INVESTMENTS FIXED INCOME SECURITIES					
2,753,401.6160	WTC-CTF JPM PAG EMERGING MARKETS DEBT	27,300,049.39	10.7200	29,516,465.32	2,216,415.93
TOTAL INVESTMENTS FIXED INCOME SECURITIES		27,300,049.39		29,516,465.32	2,216,415.93
TOTAL INVESTMENT		27,300,049.39		29,516,465.32	2,216,415.93



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
<u>INVESTMENTS PRIVATE EQUITY</u>					
47,189,579.3200	STEPSTONE XL OPP FUND LP	41,726,990.02	1.2446	58,732,433.56	17,005,443.54
TOTAL INVESTMENTS PRIVATE EQUITY		41,726,990.02		58,732,433.56	17,005,443.54
TOTAL INVESTMENT		41,726,990.02		58,732,433.56	17,005,443.54



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
51,963.2700	BLACKROCK LIQ T FUND INSTL FUND 60	51,963.27	100.0000	51,963.27	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		51,963.27		51,963.27	0.00
<u>INVESTMENTS FIXED INCOME SECURITIES</u>					
350,000.0000	AT&T INC 4.350% 06/15/2045 DD 06/15/13	332,703.66	92.8110	324,838.50	7,865.16-
150,000.0000	AT&T INC 5.150% 03/15/2042 DD 03/15/16	146,959.15	102.1190	153,178.50	6,219.35
300,000.0000	ABBVIE INC 3.200% 11/06/2022 DD 05/14/15	301,253.17	102.5660	307,698.00	6,444.83
300,000.0000	AERCAP IRELAND CAPITAL DAC / A 3.750% 05/15/2019 DD 05/15/15	303,770.92	102.7130	308,139.00	4,368.08
300,000.0000	AMAZON.COM INC 2.500% 11/29/2022 DD 11/29/12	294,911.90	100.8010	302,403.00	7,491.10
300,000.0000	AMERICAN EXPRESS CREDIT CORP VAR RT 03/03/2022 DD 03/03/17	300,000.00	100.6790	302,037.00	2,037.00
300,000.0000	AMGEN INC 2.700% 05/01/2022 DD 05/01/15	298,165.96	100.5740	301,722.00	3,556.04
500,000.0000	ANHEUSER-BUSCH INBEV FINANCE I 4.900% 02/01/2046 DD 01/25/16	573,853.71	112.8640	564,320.00	9,533.71-



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250,000.0000	APPLE INC 3.350% 02/09/2027 DD 02/09/17	248,086.30	102.2330	255,582.50	7,496.20
250,000.0000	BANK OF AMERICA CORP 5.700% 01/24/2022 DD 01/24/12	281,117.45	112.9960	282,490.00	1,372.55
250,000.0000	BANK OF AMERICA CORP 4.450% 03/03/2026 DD 03/03/16	262,615.01	104.0740	260,185.00	2,430.01-
250,000.0000	BRISTOL-MYERS SQUIBB CO 3.250% 02/27/2027 DD 02/27/17	246,117.52	100.8630	252,157.50	6,039.98
300,000.0000	BURLINGTON NORTHERN SANTA FE L 3.250% 06/15/2027 DD 03/09/17	299,261.03	102.1580	306,474.00	7,212.97
275,000.0000	CVS HEALTH CORP 4.750% 12/01/2022 DD 06/01/16	298,199.14	109.6090	301,424.75	3,225.61
300,000.0000	CHARTER COMMUNICATIONS OPERATI 4.908% 07/23/2025 DD 07/23/16	315,390.61	108.0320	324,096.00	8,705.39
300,000.0000	CITIGROUP INC 2.700% 03/30/2021 DD 03/30/16	303,294.16	100.6640	301,992.00	1,302.16-
500,000.0000	COMMONWEALTH BANK OF AUSTRALIA 2.300% 09/06/2019 DD 09/08/14	506,189.02	100.6460	503,230.00	2,959.02-
150,000.0000	DAIMLER FINANCE NORTH AME 144A 2.850% 01/06/2022 DD 01/06/17	149,848.62	101.2080	151,812.00	1,963.38
300,000.0000	DELL INTERNATIONAL LLC / 144A 6.020% 06/15/2026 DD 06/01/16	319,836.20	110.1510	330,453.00	10,616.80



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325,000.0000	DUKE ENERGY CORP 2.650% 09/01/2026 DD 08/12/16	310,166.95	94.9730	308,662.25	1,504.70-
325,000.0000	FEDEX CORP 3.300% 03/15/2027 DD 01/06/17	327,903.92	100.2180	325,708.50	2,195.42-
200,000.0000	FORD MOTOR CREDIT CO LLC 4.250% 09/20/2022 DD 09/25/12	206,455.01	105.0530	210,106.00	3,650.99
175,000.0000	FORD MOTOR CREDIT CO LLC 2.459% 03/27/2020 DD 03/27/15	176,469.55	100.0870	175,152.25	1,317.30-
250,000.0000	GENERAL MOTORS FINANCIAL CO IN 3.250% 05/15/2018 DD 11/15/13	252,348.69	101.1720	252,930.00	581.31
150,000.0000	GEORGIA-PACIFIC LLC 7.375% 12/01/2025 DD 12/08/95	189,204.24	127.2360	190,854.00	1,649.76
5,000.0000	GEORGIA-PACIFIC LLC 8.000% 01/15/2024 DD 12/11/03	6,263.90	128.3490	6,417.45	153.55
125,000.0000	GEORGIA-PACIFIC LLC 144A 5.400% 11/01/2020 DD 11/02/10	136,214.25	109.3970	136,746.25	532.00
203,000.0000	GOLDMAN SACHS GROUP INC/THE 5.750% 01/24/2022 DD 01/24/12	228,853.17	112.5870	228,551.61	301.56-
250,000.0000	GOLDMAN SACHS GROUP INC/THE 3.750% 02/25/2026 DD 02/25/16	259,276.17	101.8250	254,562.50	4,713.67-
350,000.0000	HCA INC 6.500% 02/15/2020 DD 08/01/11	378,731.00	109.1250	381,937.50	3,206.50



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300,000.0000	HSBC HOLDINGS PLC 4.000% 03/30/2022 DD 03/30/12	315,405.53	105.4700	316,410.00	1,004.47
360,000.0000	HONEYWELL INTERNATIONAL INC 1.850% 11/01/2021 DD 10/31/16	354,091.42	98.3980	354,232.80	141.38
300,000.0000	HYUNDAI CAPITAL AMERICA 144A 2.400% 10/30/2018 DD 10/30/15	302,115.10	100.2090	300,627.00	1,488.10-
250,000.0000	INTERCONTINENTAL EXCHANGE INC 4.000% 10/15/2023 DD 10/08/13	264,249.48	107.2490	268,122.50	3,873.02
200,000.0000	JPMORGAN CHASE & CO 3.300% 04/01/2026 DD 03/23/16	203,952.07	99.3000	198,600.00	5,352.07-
300,000.0000	JOHNSON & JOHNSON 3.625% 03/03/2037 DD 03/03/17	299,246.65	104.5690	313,707.00	14,460.35
220,000.0000	KRAFT HEINZ FOODS CO 5.200% 07/15/2045 DD 07/15/16	254,371.32	108.1830	238,002.60	16,368.72-
300,000.0000	KROGER CO/THE 2.650% 10/15/2026 DD 10/03/16	279,080.57	92.2240	276,672.00	2,408.57-
250,000.0000	LOCKHEED MARTIN CORP 3.550% 01/15/2026 DD 11/23/15	251,517.62	103.6210	259,052.50	7,534.88
300,000.0000	MCDONALD'S CORP 4.450% 03/01/2047 DD 03/09/17	298,534.53	105.1890	315,567.00	17,032.47
300,000.0000	MICROSOFT CORP 3.300% 02/06/2027 DD 02/06/17	298,971.17	103.0070	309,021.00	10,049.83



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300,000.0000	MIZUHO FINANCIAL GROUP INC 3.663% 02/28/2027 DD 02/28/17	300,000.00	103.1110	309,333.00	9,333.00
500,000.0000	MORGAN STANLEY 2.375% 07/23/2019 DD 07/23/14	504,488.34	100.6930	503,465.00	1,023.34-
500,000.0000	NEUBERGER BERMAN CL 23A C 144A VAR RT 10/17/2027 DD 11/29/16	500,000.00	100.0000	500,000.00	0.00
750,000.0000	NEWELL BRANDS INC 4.200% 04/01/2026 DD 03/30/16	797,848.90	106.1790	796,342.50	1,506.40-
250,000.0000	ORACLE CORP 2.800% 07/08/2021 DD 07/08/14	253,735.21	102.7020	256,755.00	3,019.79
125,000.0000	PACIFIC BELL TELEPHONE CO 7.125% 03/15/2026 DD 03/15/93	151,205.81	121.5160	151,895.00	689.19
250,000.0000	PACIFICORP 6.000% 01/15/2039 DD 01/08/09	317,180.95	129.8500	324,625.00	7,444.05
125,000.0000	PFIZER INC 2.750% 06/03/2026 DD 06/03/16	120,940.37	98.4310	123,038.75	2,098.38
375,000.0000	PRUDENTIAL FINANCIAL INC 5.750% 07/15/2033 DD 07/07/03	437,129.21	120.8010	453,003.75	15,874.54
150,000.0000	QUALCOMM INC 3.250% 05/20/2027 DD 05/26/17	149,610.32	100.2290	150,343.50	733.18
325,000.0000	ROCKWELL COLLINS INC 3.500% 03/15/2027 DD 04/10/17	331,230.03	101.4040	329,563.00	1,667.03-



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300,000.0000	SOUTHWESTERN ELECTRIC POWER CO 3.550% 02/15/2022 DD 02/03/12	311,371.62	103.2350	309,705.00	1,666.62-
500,000.0000	SPIRIT AEROSYSTEMS INC 5.250% 03/15/2022 DD 09/15/14	520,957.41	103.7610	518,805.00	2,152.41-
1,239,577.6000	US TREAS-CPI INFLAT 3.625% 04/15/2028 DD 04/15/98	1,655,479.77	130.6350	1,619,322.20	36,157.57-
688,730.0000	US TREAS-CPI INFLAT 3.375% 04/15/2032 DD 10/15/01	971,536.49	137.3860	946,218.60	25,317.89-
803,159.1000	US TREAS-CPI INFLAT 2.125% 02/15/2040 DD 02/15/10	997,537.60	124.3700	998,888.97	1,351.37
503,153.2500	US TREAS-CPI INFLAT 0.750% 02/15/2042 DD 02/15/12	474,379.40	95.1440	478,720.13	4,340.73
1,661,280.0000	US TREAS-CPI INFLAT 0.750% 02/15/2045 DD 02/15/15	1,612,875.12	93.7820	1,557,981.61	54,893.51-
572,698.9500	US TREAS-CPI INFLAT 1.000% 02/15/2046 DD 02/15/16	588,050.98	99.9100	572,183.52	15,867.46-
130,000.0000	U S TREASURY BOND 3.000% 02/15/2047 DD 02/15/17	133,797.22	103.1560	134,102.80	305.58
144,000.0000	U S TREASURY NOTE 2.250% 02/15/2027 DD 02/15/17	140,795.07	99.5350	143,330.40	2,535.33
310,000.0000	U S TREASURY NOTE 1.875% 04/30/2022 DD 04/30/17	310,950.34	99.9810	309,941.10	1,009.24-



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300,000.0000	UNITED TECHNOLOGIES CORP 4.500% 06/01/2042 DD 06/01/12	334,082.32	109.1950	327,585.00	6,497.32-
200,000.0000	UNITEDHEALTH GROUP INC 4.250% 04/15/2047 DD 03/13/17	210,054.83	106.6050	213,210.00	3,155.17
200,000.0000	VERIZON COMMUNICATIONS INC 4.500% 09/15/2020 DD 09/18/13	216,685.74	106.8240	213,648.00	3,037.74-
250,000.0000	VERIZON COMMUNICATIONS INC 4.125% 03/16/2027 DD 03/16/17	248,399.35	103.2780	258,195.00	9,795.65
175,000.0000	WALGREEN CO 4.400% 09/15/2042 DD 09/13/12	169,204.45	100.1270	175,222.25	6,017.80
400,000.0000	WELLS FARGO & CO 4.400% 06/14/2046 DD 06/14/16	397,695.86	101.2400	404,960.00	7,264.14
1,535,000.0000	IFL L UL CPURNSA INDEX P 2.775% 2033 JUN 07	0.00	0.0000	0.00	0.00
1,535,000.0000	IFL L UL CPURNSA INDEX P 2.7125% 2033 JUN 10	0.00	0.0000	0.00	0.00
1,535,000.0000	IRS_R US0003M P 6.75% 2038 JUN 19	49,580.50	0.4454	6,838.00	42,742.50-
3,000,000.0000	IRS_R US0003M P 6.75% VAR RT 01/27/2034 DD 01/23/14	79,500.00	0.4845	14,537.00	64,963.00-
2,700,000.0000	IFL_L UL CPURNSA INDEX P 196BPS 2038 MAY 23	0.00	3.6622	98,880.00	98,880.00



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1,350,000.0000	IFL L UL CPURNSA P 1.775% 2036 JUN 20	0.00	6.6827	90,217.00	90,217.00
1,250,000.0000	IFL L UL CPURNSA P 1.8475% 2038 JUN 28	0.00	5.8526	73,158.00	73,158.00
3,420,000.0000	IFL L UL CPURNSA INDEX P 2.321% 2037 APR 06	0.00	0.0000	0.00	0.00
750,000.0000	IFL L UL CPURNSA INDEX P 2.3175% 2037 MAY 03	0.00	0.0000	0.00	0.00
TOTAL INVESTMENTS FIXED INCOME SECURITIES		24,661,299.05		24,819,889.54	158,590.49
TOTAL INVESTMENT		24,713,262.32		24,871,852.81	158,590.49
<u>SHORT FIXED INCOME SECURITIES</u>					
1,535,000.0000-	IFL S UL CPURNSA INDEX P 2.775% 2033 JUN 07	0.00	18.7984	288,556.00-	288,556.00-
1,535,000.0000-	IFL S UL CPURNSA INDEX P 2.7125% 2033 JUN 10	0.00	17.2695	265,088.00-	265,088.00-
1,535,000.0000-	IRS R US0003M P 6.75% 2038 JUN 19	0.00	0.0000	0.00	0.00
3,000,000.0000-	IRS R US0003M P 6.75% 6.750% 01/27/2034 DD 01/23/14	0.00	0.0000	0.00	0.00
2,700,000.0000-	IFL_S UL CPURNSA INDEX P 196BPS 2038 MAY 23	0.00	0.0000	0.00	0.00



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1,350,000.0000-	IFL S UL CPURNSA P_1.775% 2036 JUN 20	0.00	0.0000	0.00	0.00
1,250,000.0000-	IFL S_UL CPURNSA P 1.8475% 2038 JUN 28	0.00	0.0000	0.00	0.00
3,420,000.0000-	IFL_L UL CPURNSA INDEX P 2.321% 2037 APR 06	0.00	4.3284	148,033.00-	148,033.00-
750,000.0000-	IFL S UL CPURNSA INDEX P 2.3175% 2037 MAY 03	0.00	4.2237	31,678.00-	31,678.00-
TOTAL SHORT FIXED INCOME SECURITIES		0.00		733,355.00-	733,355.00-
TOTAL SHORT INVESTMENT		0.00		733,355.00-	733,355.00-
TOTAL NET INVESTMENT		24,713,262.32		24,138,497.81	574,764.51-



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INVESTMENTS ALTERNATIVE INVESTMENTS					
16,877,229.0000	TITAN FUND LP	16,877,229.00	1.0387	17,531,346.00	654,117.00
TOTAL INVESTMENTS ALTERNATIVE INVESTMENTS		16,877,229.00		17,531,346.00	654,117.00
TOTAL INVESTMENT		16,877,229.00		17,531,346.00	654,117.00



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INVESTMENTS ALTERNATIVE INVESTMENTS					
6,394.3200	MAGNITUDE US PARTNERS	6,394,322.93	1,190.8661	7,614,779.00	1,220,456.07
5,056.3100	MAGNITUDE US PARTNERS (SERIES Y)	5,327,093.30	1,206.6455	6,101,174.00	774,080.70
5,083.5200	MAGNITUDE US PARTNERS (SERIES X)	5,325,894.74	1,198.4784	6,092,489.00	766,594.26
22.4300	MAGNITUDE US PARTNERS 04/17	22,428.66	1,004.9933	22,542.00	113.34
TOTAL INVESTMENTS ALTERNATIVE INVESTMENTS		17,069,739.63		19,830,984.00	2,761,244.37
TOTAL INVESTMENT		17,069,739.63		19,830,984.00	2,761,244.37



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<u>INVESTMENTS OTHER</u>					
30,240,000.0000	CORE COMMODITY FUND	30,240,000.00	0.7670	23,195,312.08	7,044,687.92-
TOTAL INVESTMENTS OTHER		30,240,000.00		23,195,312.08	7,044,687.92-
TOTAL INVESTMENT		30,240,000.00		23,195,312.08	7,044,687.92-



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
INVESTMENTS OTHER					
13,348.1690	MARATHON EAFE	19,225,261.40	1,591.4922	21,243,506.95	2,018,245.55
TOTAL INVESTMENTS OTHER		19,225,261.40		21,243,506.95	2,018,245.55
TOTAL INVESTMENT		19,225,261.40		21,243,506.95	2,018,245.55



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
INVESTMENTS FIXED INCOME SECURITIES					
179,178.0000	ISHARES IBOXX USD HIGH YIELD	15,842,984.70	88.3900	15,837,543.42	5,441.28-
TOTAL INVESTMENTS FIXED INCOME SECURITIES		15,842,984.70		15,837,543.42	5,441.28-
TOTAL INVESTMENT		15,842,984.70		15,837,543.42	5,441.28-



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
<u>INVESTMENTS UNIT OF PARTICIPATION</u>					
33,460,105.5150	PRAIRIE #2 QUALIFIED MTU	337,452,777.82	13.0545	436,807,122.35	99,354,344.53
TOTAL INVESTMENTS UNIT OF PARTICIPATION		337,452,777.82		436,807,122.35	99,354,344.53
TOTAL INVESTMENT		337,452,777.82		436,807,122.35	99,354,344.53



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
INVESTMENTS CASH EQUIVALENTS					
479,943.4700	BLACKROCK LIQ T FUND INSTL FUND 60	479,943.47	100.0000	479,943.47	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		479,943.47		479,943.47	0.00
TOTAL INVESTMENT		479,943.47		479,943.47	0.00



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
<u>INVESTMENTS CASH EQUIVALENTS</u>					
251,342.7900	BLACKROCK LIQ T FUND INSTL FUND 60	251,342.79	100.0000	251,342.79	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		251,342.79		251,342.79	0.00
<u>INVESTMENTS EQUITY</u>					
512.0000	ADIENT PLC	24,064.00	65.3800	33,474.56	9,410.56
817.0000	AIRCASTLE LTD	9,958.93	21.7500	17,769.75	7,810.82
817.0000	ALLEGION PLC	17,401.98	81.1200	66,275.04	48,873.06
1,534.0000	ALKERMES PLC	27,727.47	57.9700	88,925.98	61,198.51
1,436.0000	ALLERGAN PLC	249,795.41	243.0900	349,077.24	99,281.83
1,134.0000	AMDOCS LTD	34,523.32	64.4600	73,097.64	38,574.32
2,137.0000	AON PLC	104,734.37	132.9500	284,114.15	179,379.78
1,611.0000	ARCH CAPITAL GROUP LTD	40,345.59	93.2900	150,290.19	109,944.60
227.0000	ARGO GROUP INTERNATIONAL HOLDI	4,845.28	60.6000	13,756.20	8,910.92
445.0000	ASPEN INSURANCE HOLDINGS LTD	11,058.25	49.8500	22,183.25	11,125.00
780.0000	ARRIS INTERNATIONAL PLC	8,548.80	28.0200	21,855.60	13,306.80



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1,804.0000	ASSURED GUARANTY LTD	24,191.64	41.7400	75,298.96	51,107.32
814.0000	AXIS CAPITAL HOLDINGS LTD	25,022.36	64.6600	52,633.24	27,610.88
3,820.0000	ACCENTURE PLC	164,380.99	123.6800	472,457.60	308,076.61
1,090.0000	BUNGE LTD	65,437.24	74.6000	81,314.00	15,876.76
272.0000	CARDTRONICS PLC	10,814.72	32.8600	8,937.92	1,876.80-
1,572.0000	DELPHI AUTOMOTIVE PLC	54,873.45	87.6500	137,785.80	82,912.35
2,577.0000	EATON CORP PLC	132,663.96	77.8300	200,567.91	67,903.95
50.0000	ENSTAR GROUP LTD	5,024.00	198.6500	9,932.50	4,908.50
3,134.0000	ENSCO PLC	22,690.16	5.1600	16,171.44	6,518.72-
76.0000	EVEREST RE GROUP LTD	9,153.44	254.5900	19,348.84	10,195.40
2,529.0000	FRUIT OF THE LOOM INC CL A	21,459.36	8.4853	21,459.36	0.00
25.0000	HELEN OF TROY LTD	809.75	94.1000	2,352.50	1,542.75
866.0000	HERBALIFE LTD	20,641.11	71.3300	61,771.78	41,130.67
2,192.0000	HORIZON PHARMA PLC	5,282.72	11.8700	26,019.04	20,736.32
1,038.0000	IHS MARKIT LTD	34,025.65	44.0400	45,713.52	11,687.87
2,452.0000	INGERSOLL-RAND PLC	68,877.08	91.3900	224,088.28	155,211.20
2,817.0000	INVESCO LTD	69,802.59	35.1900	99,130.23	29,327.64



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2,097.0000	JOHNSON CONTROLS INTERNATIONAL	59,524.94	43.3600	90,925.92	31,400.98
4,793.0000	KOSMOS ENERGY LTD	28,182.84	6.4100	30,723.13	2,540.29
997.0000	MALLINCKRODT PLC	46,830.53	44.8100	44,675.57	2,154.96-
2,454.0000	MARVELL TECHNOLOGY GROUP LTD	24,455.34	16.5200	40,540.08	16,084.74
8,756.0000	MEDTRONIC PLC	671,881.76	88.7500	777,095.00	105,213.24
1,037.0000	MICHAEL KORS HOLDINGS LTD	46,708.53	36.2500	37,591.25	9,117.28-
1,713.0000	NIELSEN HOLDINGS PLC	56,377.60	38.6600	66,224.58	9,846.98
1,246.0000	NORDIC AMERICAN TANKERS LTD	9,830.94	6.3400	7,899.64	1,931.30-
605.0000	NORWEGIAN CRUISE LINE HOLDINGS	31,877.45	54.2900	32,845.45	968.00
388.0000	ONEBEACON INSURANCE GROUP LTD	4,904.32	18.2300	7,073.24	2,168.92
1,475.0000	PENTAIR PLC	55,187.69	66.5400	98,146.50	42,958.81
857.0000	PROTHENA CORP PLC	24,990.12	54.1200	46,380.84	21,390.72
353.0000	RENAISSANCERE HOLDINGS LTD	20,092.76	139.0500	49,084.65	28,991.89
1,049.0000	SHIP FINANCE INTERNATIONAL LTD	11,413.12	13.6000	14,266.40	2,853.28
619.0000	SIGNET JEWELERS LTD	19,869.90	63.2400	39,145.56	19,275.66
189.0000	THERAVANCE BIOPHARMA INC	3,706.29	39.8400	7,529.76	3,823.47
843.0000	VALIDUS HOLDINGS LTD	23,994.65	51.9700	43,810.71	19,816.06



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1,160.0000	GOLAR LNG LTD	28,037.20	22.2500	25,810.00	2,227.20-
43.0000	WHITE MOUNTAINS INSURANCE GROU	17,329.43	868.6300	37,351.09	20,021.66
680.0000	PERRIGO CO PLC	56,639.57	75.5200	51,353.60	5,285.97-
1,948.0000	XL GROUP LTD	41,278.12	43.8000	85,322.40	44,044.28
189.0000	ALLIED WORLD ASSURANCE CO HOLD	5,240.61	52.9000	9,998.10	4,757.49
3,099.0000	CHUBB LTD	222,696.19	145.3800	450,532.62	227,836.43
1,406.0000	STRATASYS LTD	28,077.82	23.3100	32,773.86	4,696.04
253.0000	CIMPRESS NV	8,574.17	94.5300	23,916.09	15,341.92
1,411.0000	LYONDELLBASELL INDUSTRIES NV	100,710.19	84.3900	119,074.29	18,364.10
2,225.0000	MYLAN NV	83,723.61	38.8200	86,374.50	2,650.89
789.0000	QIAGEN NV	14,170.03	33.5300	26,455.17	12,285.14
351.0000	WRIGHT MEDICAL GROUP NV	7,427.16	27.4900	9,648.99	2,221.83
908.0000	BANCO LATINOAMERICANO DE COMER	15,408.76	27.3800	24,861.04	9,452.28
954.0000	ROYAL CARIBBEAN CRUISES LTD	36,372.20	109.2300	104,205.42	67,833.22
2,230.0000	BROADCOM LTD	234,516.24	233.0500	519,701.50	285,185.26
2,930.0000	DORIAN LPG LTD	25,256.60	8.1800	23,967.40	1,289.20-
3,252.0000	TEEKAY CORP	26,763.96	6.6700	21,690.84	5,073.12-



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220.0000	ABM INDUSTRIES INC	5,005.00	41.5200	9,134.40	4,129.40
2,507.0000	AFLAC INC	163,545.21	77.6800	194,743.76	31,198.55
558.0000	AGCO CORP	20,210.76	67.3900	37,603.62	17,392.86
1,370.0000	AGNC INVESTMENT CORP	24,728.50	21.2900	29,167.30	4,438.80
2,864.0000	AES CORP/VA	35,050.76	11.1100	31,819.04	3,231.72-
4,412.0000	AK STEEL HOLDING CORP	13,236.00	6.5700	28,986.84	15,750.84
299.0000	AMAG PHARMACEUTICALS INC	5,142.80	18.4000	5,501.60	358.80
314.0000	AMC NETWORKS INC	11,817.91	53.4100	16,770.74	4,952.83
33,373.0000	AT&T INC	986,703.65	37.7300	1,259,163.29	272,459.64
477.0000	AV HOMES INC	3,429.63	20.0500	9,563.85	6,134.22
10,530.0000	ABBOTT LABORATORIES	287,324.16	48.6100	511,863.30	224,539.14
11,318.0000	ABBVIE INC	314,813.48	72.5100	820,668.18	505,854.70
247.0000	ABIOMED INC	24,512.28	143.3000	35,395.10	10,882.82
810.0000	ACADIA HEALTHCARE CO INC	18,160.20	49.3800	39,997.80	21,837.60
816.0000	ACADIA REALTY TRUST	23,968.24	27.8000	22,684.80	1,283.44-
492.0000	ACI WORLDWIDE INC	5,180.76	22.3700	11,006.04	5,825.28
1,298.0000	ACLARIS THERAPEUTICS INC	26,855.62	27.1200	35,201.76	8,346.14



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
2,928.0000	ACTIVISION BLIZZARD INC	53,987.84	57.5700	168,564.96	114,577.12
273.0000	ACUITY BRANDS INC	14,927.64	203.2800	55,495.44	40,567.80
924.0000	ACXIOM CORP	11,400.69	25.9800	24,005.52	12,604.83
3,110.0000	ADOBE SYSTEMS INC	109,409.67	141.4400	439,878.40	330,468.73
269.0000	ADVANCE AUTO PARTS INC	24,659.65	116.5900	31,362.71	6,703.06
190.0000	ADVISORY BOARD CO/THE	5,176.55	51.5000	9,785.00	4,608.45
1,410.0000	AECOM	30,098.87	32.3300	45,585.30	15,486.43
2,536.0000	AERIE PHARMACEUTICALS INC	52,643.00	52.5500	133,266.80	80,623.80
193.0000	ADVANSIX INC	1,079.01	31.2400	6,029.32	4,950.31
5,145.0000	ADVANCED MICRO DEVICES INC	59,615.96	12.4800	64,209.60	4,593.64
2,511.0000	AETNA INC	98,546.20	151.8300	381,245.13	282,698.93
386.0000	AFFILIATED MANAGERS GROUP INC	33,296.10	165.8600	64,021.96	30,725.86
2,530.0000	AGILENT TECHNOLOGIES INC	56,630.72	59.3100	150,054.30	93,423.58
436.0000	AIR LEASE CORP	10,221.40	37.3600	16,288.96	6,067.56
1,484.0000	AIR PRODUCTS & CHEMICALS INC	92,760.39	143.0600	212,301.04	119,540.65
1,000.0000	AKAMAI TECHNOLOGIES INC	40,851.93	49.8100	49,810.00	8,958.07
1,484.0000	AKORN INC	25,779.58	33.5400	49,773.36	23,993.78



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1,164.0000	ALASKA AIR GROUP INC	19,497.00	89.7600	104,480.64	84,983.64
197.0000	ALBANY INTERNATIONAL CORP	4,873.78	53.4000	10,519.80	5,646.02
518.0000	ALBEMARLE CORP	45,558.29	105.5400	54,669.72	9,111.43
799.0000	ALCOA CORP	16,009.68	32.6500	26,087.35	10,077.67
218.0000	ALERE INC	5,057.60	50.1900	10,941.42	5,883.82
500.0000	ALEXANDER & BALDWIN INC	7,437.14	41.3800	20,690.00	13,252.86
66.0000	ALEXANDER'S INC	26,434.66	421.4600	27,816.36	1,381.70
350.0000	ALEXANDRIA REAL ESTATE EQUITIE	38,753.13	120.4700	42,164.50	3,411.37
1,344.0000	ALEXION PHARMACEUTICALS INC	125,021.46	121.6700	163,524.48	38,503.02
387.0000	ALIGN TECHNOLOGY INC	8,552.70	150.1200	58,096.44	49,543.74
41.0000	ALLEGHANY CORP	11,979.12	594.8000	24,386.80	12,407.68
233.0000	ALLEGiant TRAVEL CO	10,876.44	135.6000	31,594.80	20,718.36
510.0000	ALLETE INC	24,367.80	71.6800	36,556.80	12,189.00
303.0000	ALLIANCE DATA SYSTEMS CORP	47,682.44	256.6900	77,777.07	30,094.63
1,276.0000	ALLIANT ENERGY CORP	28,484.41	40.1700	51,256.92	22,772.51
2,619.0000	ALLSTATE CORP/THE	69,075.82	88.4400	231,624.36	162,548.54
1,677.0000	ALLY FINANCIAL INC	33,574.35	20.9000	35,049.30	1,474.95



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354.0000	ALMOST FAMILY INC	5,200.26	61.6500	21,824.10	16,623.84
602.0000	ALNYLAM PHARMACEUTICALS INC	31,773.56	79.7600	48,015.52	16,241.96
587.0000	ALON USA ENERGY INC	5,165.60	13.3200	7,818.84	2,653.24
1,451.0000	ALPHABET INC-CL C	310,681.74	908.7300	1,318,567.23	1,007,885.49
2,200.0000	ALPHABET INC-CL A	912,574.23	929.6800	2,045,296.00	1,132,721.77
2,684.0000	ALTISOURCE RESIDENTIAL CORP	25,095.40	12.9400	34,730.96	9,635.56
11,541.0000	ALTRIA GROUP INC	196,942.13	74.4700	859,458.27	662,516.14
2,253.0000	AMAZON.COM INC	389,751.47	968.0000	2,180,904.00	1,791,152.53
142.0000	AMERCO	12,483.47	366.0600	51,980.52	39,497.05
1,005.0000	AMEREN CORP	31,399.31	54.6700	54,943.35	23,544.04
2,686.0000	AMERICAN AIRLINES GROUP INC	112,424.35	50.3200	135,159.52	22,735.17
227.0000	AMERICAN ASSETS TRUST INC	5,077.99	39.3900	8,941.53	3,863.54
1,028.0000	AMERICAN AXLE & MANUFACTURING	10,248.04	15.6000	16,036.80	5,788.76
637.0000	AMERICAN CAMPUS COMMUNITIES IN	30,378.53	47.3000	30,130.10	248.43-
2,889.0000	AMERICAN ELECTRIC POWER CO INC	106,435.83	69.4700	200,698.83	94,263.00
1,311.0000	AMERICAN EQUITY INVESTMENT LIF	15,006.03	26.2800	34,453.08	19,447.05
4,376.0000	AMERICAN EXPRESS CO	241,865.65	84.2400	368,634.24	126,768.59



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507.0000	AMERICAN FINANCIAL GROUP INC/O	17,542.20	99.3700	50,380.59	32,838.39
1,496.0000	AMERICAN HOMES 4 RENT	24,235.20	22.5700	33,764.72	9,529.52
5,664.0000	AMERICAN INTERNATIONAL GROUP I	202,329.90	62.5200	354,113.28	151,783.38
261.0000	AMERICAN NATIONAL INSURANCE CO	30,978.09	116.4900	30,403.89	574.20-
1,100.0000	AMERICAN OUTDOOR BRANDS CORP	8,767.00	22.1600	24,376.00	15,609.00
604.0000	AMERICAN SOFTWARE INC/GA	5,031.32	10.2900	6,215.16	1,183.84
286.0000	AMERICAN STATES WATER CO	5,052.19	47.4100	13,559.26	8,507.07
2,402.0000	AMERICAN TOWER CORP	119,412.74	132.3200	317,832.64	198,419.90
1,201.0000	AMERICAN WATER WORKS CO INC	30,661.53	77.9500	93,617.95	62,956.42
383.0000	AMERICAN WOODMARK CORP	24,561.79	95.5500	36,595.65	12,033.86
1,580.0000	AMERISOURCEBERGEN CORP	34,727.76	94.5300	149,357.40	114,629.64
1,712.0000	AMERIPRISE FINANCIAL INC	79,988.74	127.2900	217,920.48	137,931.74
572.0000	AMERIS BANCORP	5,119.40	48.2000	27,570.40	22,451.00
1,519.0000	AMETEK INC	43,068.71	60.5700	92,005.83	48,937.12
4,490.0000	AMGEN INC	254,102.80	172.2300	773,312.70	519,209.90
2,002.0000	AMPHENOL CORP	38,195.60	73.8200	147,787.64	109,592.04
544.0000	AMTRUST FINANCIAL SERVICES INC	4,958.94	15.1400	8,236.16	3,277.22



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3,388.0000	ANADARKO PETROLEUM CORP	152,620.16	45.3400	153,611.92	991.76
1,878.0000	ANALOG DEVICES INC	76,209.51	77.8000	146,108.40	69,898.89
187.0000	ANDERSONS INC/THE	4,965.47	34.1500	6,386.05	1,420.58
183.0000	ANIXTER INTERNATIONAL INC	11,190.45	78.2000	14,310.60	3,120.15
16,153.0000	ANNALY CAPITAL MANAGEMENT INC	169,138.11	12.0500	194,643.65	25,505.54
464.0000	ANSYS INC	19,965.92	121.6800	56,459.52	36,493.60
1,291.0000	ANTERO RESOURCES CORP	35,212.14	21.6100	27,898.51	7,313.63-
967.0000	ANTHEM INC	102,944.36	188.1300	181,921.71	78,977.35
756.0000	APARTMENT INVESTMENT & MANAGEM	18,907.56	42.9700	32,485.32	13,577.76
981.0000	APPFOLIO INC	31,990.41	32.6000	31,980.60	9.81-
32,237.0000	APPLE INC	491,498.73	144.0200	4,642,772.74	4,151,274.01
1,294.0000	APPLE HOSPITALITY REIT INC	24,508.36	18.7100	24,210.74	297.62-
146.0000	APPLIED INDUSTRIAL TECHNOLOGIE	4,991.74	59.0500	8,621.30	3,629.56
7,326.0000	APPLIED MATERIALS INC	92,164.92	41.3100	302,637.06	210,472.14
1,088.0000	AQUA AMERICA INC	18,661.38	33.3000	36,230.40	17,569.02
841.0000	ARAMARK	30,797.42	40.9800	34,464.18	3,666.76
4,314.0000	ARCHER-DANIELS-MIDLAND CO	134,913.26	41.3800	178,513.32	43,600.06



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2,397.0000	ARCONIC INC	47,794.12	22.6500	54,292.05	6,497.93
1,758.0000	ARES COMMERCIAL REAL ESTATE CO	22,889.16	13.0900	23,012.22	123.06
286.0000	ARISTA NETWORKS INC	40,927.08	149.7900	42,839.94	1,912.86
1,717.0000	ARLINGTON ASSET INVESTMENT COR	24,055.17	13.6700	23,471.39	583.78-
219.0000	ARMSTRONG FLOORING INC	2,137.82	17.9700	3,935.43	1,797.61
439.0000	ARMSTRONG WORLD INDUSTRIES INC	14,570.03	46.0000	20,194.00	5,623.97
835.0000	ARROW ELECTRONICS INC	27,989.20	78.4200	65,480.70	37,491.50
237.0000	ARROW FINANCIAL CORP	4,996.51	31.6500	7,501.05	2,504.54
797.0000	ARTESIAN RESOURCES CORP	24,237.97	37.6400	29,999.08	5,761.11
294.0000	ASBURY AUTOMOTIVE GROUP INC	5,092.08	56.5500	16,625.70	11,533.62
1,853.0000	ASHFORD HOSPITALITY PRIME INC	22,717.78	10.2900	19,067.37	3,650.41-
633.0000	ASHLAND GLOBAL HOLDINGS INC	18,522.24	65.9100	41,721.03	23,198.79
533.0000	ASPEN TECHNOLOGY INC	8,240.18	55.2600	29,453.58	21,213.40
1,932.0000	ASSOCIATED BANC-CORP	25,239.94	25.2000	48,686.40	23,446.46
109.0000	ASSOCIATED CAPITAL GROUP INC	2,270.59	34.0000	3,706.00	1,435.41
364.0000	ASSURANT INC	10,782.18	103.6900	37,743.16	26,960.98
141.0000	ASTEC INDUSTRIES INC	4,974.48	55.5100	7,826.91	2,852.43



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324.0000	ATHENAHEALTH INC	19,058.80	140.5500	45,538.20	26,479.40
310.0000	ATMOS ENERGY CORP	10,104.45	82.9500	25,714.50	15,610.05
1,401.0000	AUTODESK INC	48,390.54	100.8200	141,248.82	92,858.28
2,932.0000	AUTOMATIC DATA PROCESSING INC	110,530.10	102.4600	300,412.72	189,882.62
258.0000	AUTONATION INC	5,462.81	42.1600	10,877.28	5,414.47
118.0000	AUTOZONE INC	73,850.08	570.4600	67,314.28	6,535.80-
802.0000	AVALONBAY COMMUNITIES INC	143,625.13	192.1700	154,120.34	10,495.21
518.0000	AVANGRID INC	20,072.50	44.1500	22,869.70	2,797.20
356.0000	AVERY DENNISON CORP	14,939.42	88.3700	31,459.72	16,520.30
397.0000	AVIS BUDGET GROUP INC	10,180.04	27.2700	10,826.19	646.15
365.0000	AVISTA CORP	9,993.70	42.4600	15,497.90	5,504.20
622.0000	AVNET INC	21,849.31	38.8800	24,183.36	2,334.05
4,256.0000	BB&T CORP	127,674.64	45.4100	193,264.96	65,590.32
317.0000	BOK FINANCIAL CORP	16,582.27	84.1300	26,669.21	10,086.94
1,111.0000	BSB BANCORP INC/MA	24,980.06	29.2500	32,496.75	7,516.69
1,026.0000	BWX TECHNOLOGIES INC	18,815.93	48.7500	50,017.50	31,201.57
513.0000	BABCOCK & WILCOX ENTERPRISES I	6,930.47	11.7600	6,032.88	897.59-



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2,964.0000	BAKER HUGHES INC	134,396.23	54.5100	161,567.64	27,171.41
838.0000	BALCHEM CORP	66,972.96	77.7100	65,120.98	1,851.98-
1,918.0000	BALL CORP	42,591.52	42.2100	80,958.78	38,367.26
132.0000	BANCFIRST CORP	5,043.72	96.6000	12,751.20	7,707.48
1,692.0000	BANCORPSOUTH INC	17,715.24	30.5000	51,606.00	33,890.76
54,113.0000	BANK OF AMERICA CORP	661,259.54	24.2600	1,312,781.38	651,521.84
453.0000	BANK OF HAWAII CORP	20,583.71	82.9700	37,585.41	17,001.70
1,382.0000	BANK MUTUAL CORP	4,906.10	9.1500	12,645.30	7,739.20
106.0000	BANK OF THE OZARKS INC	1,330.30	46.8700	4,968.22	3,637.92
5,469.0000	BANK OF NEW YORK MELLON CORP/T	185,332.22	51.0200	279,028.38	93,696.16
788.0000	CR BARD INC	59,162.72	316.1100	249,094.68	189,931.96
343.0000	BARNES GROUP INC	8,046.78	58.5300	20,075.79	12,029.01
3,510.0000	BAXTER INTERNATIONAL INC	85,752.25	60.5400	212,495.40	126,743.15
1,540.0000	BECTON DICKINSON AND CO	107,757.73	195.1100	300,469.40	192,711.67
1,569.0000	BED BATH & BEYOND INC	60,608.12	30.4000	47,697.60	12,910.52-
450.0000	BELDEN INC	14,878.89	75.4300	33,943.50	19,064.61
988.0000	BEMIS CO INC	32,700.33	46.2500	45,695.00	12,994.67



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703.0000	BENCHMARK ELECTRONICS INC	10,258.48	32.3000	22,706.90	12,448.42
675.0000	BENEFICIAL BANCORP INC	5,001.59	15.0000	10,125.00	5,123.41
720.0000	WR BERKLEY CORP	20,381.00	69.1700	49,802.40	29,421.40
11,466.0000	BERKSHIRE HATHAWAY INC	1,185,177.02	169.3700	1,941,996.42	756,819.40
620.0000	BERRY GLOBAL GROUP INC	31,254.20	57.0100	35,346.20	4,092.00
1,441.0000	BEST BUY CO INC	17,464.92	57.3300	82,612.53	65,147.61
500.0000	BIG LOTS INC	10,062.45	48.3000	24,150.00	14,087.55
896.0000	BIOMARIN PHARMACEUTICAL INC	84,417.22	90.8200	81,374.72	3,042.50-
1,275.0000	BIOGEN INC	127,995.78	271.3600	345,984.00	217,988.22
135.0000	BIO-TECHNE CORP	9,942.75	117.5000	15,862.50	5,919.75
637.0000	BIOVERATIV INC	10,845.51	60.1700	38,328.29	27,482.78
166.0000	BLACK HILLS CORP	4,968.38	67.4700	11,200.02	6,231.64
188.0000	BLACKBAUD INC	4,998.92	85.7500	16,121.00	11,122.08
175.0000	BLACKHAWK NETWORK HOLDINGS INC	4,138.74	43.6000	7,630.00	3,491.26
653.0000	BLACKROCK INC	136,911.15	422.4100	275,833.73	138,922.58
1,867.0000	H&R BLOCK INC	26,637.61	30.9100	57,708.97	31,071.36
398.0000	BLUEBIRD BIO INC	27,286.88	105.0500	41,809.90	14,523.02



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1,995.0000	BLUEROCK RESIDENTIAL GROWTH RE	22,860.71	12.8900	25,715.55	2,854.84
3,674.0000	BOEING CO/THE	290,752.53	197.7500	726,533.50	435,780.97
1,225.0000	BORGWARNER INC	45,567.39	42.3600	51,891.00	6,323.61
58.0000	BOSTON BEER CO INC/THE	5,150.40	132.1500	7,664.70	2,514.30
772.0000	BOSTON PRIVATE FINANCIAL HOLDI	4,701.48	15.3500	11,850.20	7,148.72
890.0000	BOSTON PROPERTIES INC	106,738.90	123.0200	109,487.80	2,748.90
10,921.0000	BOSTON SCIENTIFIC CORP	58,427.35	27.7200	302,730.12	244,302.77
216.0000	BOTTOMLINE TECHNOLOGIES DE INC	5,080.32	25.6900	5,549.04	468.72
1,049.0000	BRANDYWINE REALTY TRUST	12,923.68	17.5300	18,388.97	5,465.29
839.0000	BRIDGE BANCORP INC	30,589.94	33.3000	27,938.70	2,651.24-
390.0000	BRINKER INTERNATIONAL INC	9,582.30	38.1000	14,859.00	5,276.70
209.0000	BRINK'S CO/THE	5,277.25	67.0000	14,003.00	8,725.75
10,703.0000	BRISTOL-MYERS SQUIBB CO	278,388.92	55.7200	596,371.16	317,982.24
685.0000	BROADRIDGE FINANCIAL SOLUTIONS	14,727.50	75.5600	51,758.60	37,031.10
4,306.0000	BROCADE COMMUNICATIONS SYSTEMS	23,166.28	12.6100	54,298.66	31,132.38
2,537.0000	BROOKDALE SENIOR LIVING INC	30,697.70	14.7100	37,319.27	6,621.57
141.0000	BROWN & BROWN INC	3,551.79	43.0700	6,072.87	2,521.08



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1,512.0000	BROWN-FORMAN CORP	31,184.88	48.6000	73,483.20	42,298.32
49.0000	BRUNOS INC NEW	490.00	10.0000	490.00	0.00
1,091.0000	BRUNSWICK CORP/DE	28,145.61	62.7300	68,438.43	40,292.82
1,069.0000	BUCKLE INC/THE	26,468.44	17.8000	19,028.20	7,440.24-
334.0000	BUFFALO WILD WINGS INC	23,267.18	126.7000	42,317.80	19,050.62
392.0000	BURLINGTON STORES INC	24,762.64	91.9900	36,060.08	11,297.44
3,312.0000	CBS CORP	93,942.89	63.7800	211,239.36	117,296.47
332.0000	CBOE HOLDINGS INC	8,004.52	91.4000	30,344.80	22,340.28
1,484.0000	CBRE GROUP INC	34,639.38	36.4000	54,017.60	19,378.22
977.0000	CDK GLOBAL INC	15,482.97	62.0600	60,632.62	45,149.65
537.0000	CDW CORP/DE	32,123.34	62.5300	33,578.61	1,455.27
2,055.0000	CF INDUSTRIES HOLDINGS INC	57,479.31	27.9600	57,457.80	21.51-
398.0000	CH ROBINSON WORLDWIDE INC	28,982.36	68.6800	27,334.64	1,647.72-
1,790.0000	CIGNA CORP	70,576.88	167.3900	299,628.10	229,051.22
1,575.0000	CIT GROUP INC	53,802.00	48.7000	76,702.50	22,900.50
2,080.0000	CME GROUP INC	122,378.46	125.2400	260,499.20	138,120.74
3,119.0000	CMS ENERGY CORP	45,324.68	46.2500	144,253.75	98,929.07



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216.0000	CSS INDUSTRIES INC	4,965.84	26.1600	5,650.56	684.72
556.0000	CNA FINANCIAL CORP	15,050.92	48.7500	27,105.00	12,054.08
3,355.0000	CNO FINANCIAL GROUP INC	22,180.10	20.8800	70,052.40	47,872.30
6,944.0000	CSX CORP	74,903.54	54.5600	378,864.64	303,961.10
869.0000	CSRA INC	19,891.35	31.7500	27,590.75	7,699.40
563.0000	CVB FINANCIAL CORP	4,954.40	22.4300	12,628.09	7,673.69
1,176.0000	CVR ENERGY INC	27,353.76	21.7600	25,589.76	1,764.00-
7,681.0000	CVS HEALTH CORP	255,508.23	80.4600	618,013.26	362,505.03
7,531.0000	CYS INVESTMENTS INC	61,415.23	8.4100	63,335.71	1,920.48
948.0000	CA INC	31,151.28	34.4700	32,677.56	1,526.28
475.0000	CABELA'S INC	13,473.09	59.4200	28,224.50	14,751.41
19.0000	CABLE ONE INC	2,843.87	710.9000	13,507.10	10,663.23
567.0000	CABOT CORP	21,028.56	53.4300	30,294.81	9,266.25
148.0000	CABOT MICROELECTRONICS CORP	4,992.04	73.8300	10,926.84	5,934.80
3,050.0000	CABOT OIL & GAS CORP	50,242.78	25.0800	76,494.00	26,251.22
1,694.0000	CADENCE DESIGN SYSTEMS INC	17,295.74	33.4900	56,732.06	39,436.32
784.0000	CALATLANTIC GROUP INC	27,432.16	35.3500	27,714.40	282.24



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488.0000	CALERES INC	5,016.64	27.7800	13,556.64	8,540.00
472.0000	CALIFORNIA WATER SERVICE GROUP	9,888.40	36.8000	17,369.60	7,481.20
781.0000	CALLAWAY GOLF CO	4,810.96	12.7800	9,981.18	5,170.22
3,134.0000	CALLON PETROLEUM CO	32,457.57	10.6100	33,251.74	794.17
2,404.0000	CALPINE CORP	31,148.82	13.5300	32,526.12	1,377.30
349.0000	CAMDEN PROPERTY TRUST	18,050.28	85.5100	29,842.99	11,792.71
505.0000	CANADIAN IMPERIAL BANK OF COMM	11,984.07	81.1600	40,985.80	29,001.73
158.0000	CAPELLA EDUCATION CO	4,962.78	85.6000	13,524.80	8,562.02
1,434.0000	CAPITAL BANK FINANCIAL CORP	39,635.76	38.1000	54,635.40	14,999.64
2,489.0000	CAPITAL ONE FINANCIAL CORP	136,475.25	82.6200	205,641.18	69,165.93
2,130.0000	CARDINAL HEALTH INC	100,998.74	77.9200	165,969.60	64,970.86
127.0000	CARE CAPITAL PROPERTIES INC	2,835.17	26.7000	3,390.90	555.73
386.0000	CARLISLE COS INC	18,311.84	95.4000	36,824.40	18,512.56
1,674.0000	CARMAX INC	53,654.92	63.0600	105,562.44	51,907.52
2,542.0000	CARNIVAL CORP	126,127.33	65.5700	166,678.94	40,551.61
547.0000	CARPENTER TECHNOLOGY CORP	20,397.63	37.4300	20,474.21	76.58
235.0000	CARRIZO OIL & GAS INC	4,763.45	17.4200	4,093.70	669.75-



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722.0000	CARS.COM INC	8,601.81	26.6300	19,226.86	10,625.05
570.0000	CARTER'S INC	23,356.90	88.9500	50,701.50	27,344.60
173.0000	CASEY'S GENERAL STORES INC	9,824.67	107.1100	18,530.03	8,705.36
1,125.0000	CATALENT INC	28,811.25	35.1000	39,487.50	10,676.25
3,721.0000	CATCHMARK TIMBER TRUST INC	43,605.14	11.3700	42,307.77	1,297.37-
3,055.0000	CATERPILLAR INC	213,734.12	107.4600	328,290.30	114,556.18
498.0000	CATHAY GENERAL BANCORP	6,957.06	37.9500	18,899.10	11,942.04
678.0000	CAVIUM INC	27,230.40	62.1300	42,124.14	14,893.74
1,924.0000	CEDAR REALTY TRUST INC	9,985.56	4.8500	9,331.40	654.16-
1,095.0000	CELANESE CORP	35,554.65	94.9400	103,959.30	68,404.65
5,680.0000	CELGENE CORP	154,367.88	129.8700	737,661.60	583,293.72
981.0000	CENTENE CORP	25,687.80	79.8800	78,362.28	52,674.48
4,068.0000	CENTERPOINT ENERGY INC	57,228.91	27.3800	111,381.84	54,152.93
371.0000	CENTRAL PACIFIC FINANCIAL CORP	4,889.59	31.4700	11,675.37	6,785.78
2,960.0000	CENTURYLINK INC	79,770.19	23.8800	70,684.80	9,085.39-
1,984.0000	CERNER CORP	56,304.70	66.4700	131,876.48	75,571.78
688.0000	CEVA INC	31,035.68	45.4500	31,269.60	233.92



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1,334.0000	CHARTER COMMUNICATIONS INC	78,941.87	336.8500	449,357.90	370,416.03
345.0000	CHEESECAKE FACTORY INC/THE	10,196.63	50.3000	17,353.50	7,156.87
101.0000	CHEMED CORP	5,071.21	204.5300	20,657.53	15,586.32
272.0000	CHEMICAL FINANCIAL CORP	4,972.16	48.4100	13,167.52	8,195.36
1,052.0000	CHEMOURS CO/THE	25,889.72	37.9200	39,891.84	14,002.12
863.0000	CHENIERE ENERGY INC	23,681.45	48.7100	42,036.73	18,355.28
5,996.0000	CHESAPEAKE ENERGY CORP	24,343.76	4.9700	29,800.12	5,456.36
232.0000	CHESAPEAKE LODGING TRUST	5,052.96	24.4700	5,677.04	624.08
195.0000	CHESAPEAKE UTILITIES CORP	5,166.20	74.9500	14,615.25	9,449.05
11,469.0000	CHEVRON CORP	828,825.69	104.3300	1,196,560.77	367,735.08
1,607.0000	CHICO'S FAS INC	19,348.28	9.4200	15,137.94	4,210.34-
113.0000	CHILDREN'S PLACE INC/THE	4,993.47	102.1000	11,537.30	6,543.83
2,574.0000	CHIMERA INVESTMENT CORP	34,749.00	18.6300	47,953.62	13,204.62
5,339.0000	CHIMERIX INC	24,612.79	5.4500	29,097.55	4,484.76
228.0000	CHIPOTLE MEXICAN GRILL INC	56,209.41	416.1000	94,870.80	38,661.39
1,233.0000	CHURCH & DWIGHT CO INC	32,326.63	51.8800	63,968.04	31,641.41
115.0000	CHURCHILL DOWNS INC	4,940.40	183.3000	21,079.50	16,139.10



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1,253.0000	CIENA CORP	15,324.19	25.0200	31,350.06	16,025.87
547.0000	CIMAREX ENERGY CO	35,029.49	94.0100	51,423.47	16,393.98
328.0000	CINCINNATI BELL INC	5,100.40	19.5500	6,412.40	1,312.00
791.0000	CINCINNATI FINANCIAL CORP	22,258.74	72.4500	57,307.95	35,049.21
586.0000	CINEMARK HOLDINGS INC	11,743.44	38.8500	22,766.10	11,022.66
163.0000	CIRCOR INTERNATIONAL INC	5,251.86	59.3800	9,678.94	4,427.08
30,253.0000	CISCO SYSTEMS INC	753,168.18	31.3000	946,918.90	193,750.72
470.0000	CIRRUS LOGIC INC	30,850.80	62.7200	29,478.40	1,372.40-
796.0000	CINTAS CORP	25,280.96	126.0400	100,327.84	75,046.88
16,466.0000	CITIGROUP INC	696,317.39	66.8800	1,101,246.08	404,928.69
2,133.0000	CITIZENS FINANCIAL GROUP INC	76,919.18	35.6800	76,105.44	813.74-
1,417.0000	CITRIX SYSTEMS INC	41,740.96	79.5800	112,764.86	71,023.90
156.0000	CITY HOLDING CO	4,907.76	65.8700	10,275.72	5,367.96
146.0000	CLEARWATER PAPER CORP	5,212.20	46.7500	6,825.50	1,613.30
893.0000	CLOROX CO/THE	56,914.83	133.2400	118,983.32	62,068.49
361.0000	CLOVIS ONCOLOGY INC	32,017.09	93.6300	33,800.43	1,783.34
1,384.0000	COACH INC	47,845.48	47.3400	65,518.56	17,673.08



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1,773.0000	COBIZ FINANCIAL INC	30,793.14	17.4000	30,850.20	57.06
166.0000	COCA-COLA BOTTLING CO CONSOLID	10,121.02	228.8700	37,992.42	27,871.40
24,324.0000	COCA-COLA CO/THE	642,885.14	44.8500	1,090,931.40	448,046.26
8,806.0000	COEUR MINING INC	23,864.26	8.5800	75,555.48	51,691.22
320.0000	COGENT COMMUNICATIONS HOLDINGS	5,020.80	40.1000	12,832.00	7,811.20
593.0000	COGNEX CORP	17,378.58	84.9000	50,345.70	32,967.12
3,832.0000	COGNIZANT TECHNOLOGY SOLUTIONS	78,146.45	66.4000	254,444.80	176,298.35
97.0000	COHERENT INC	5,028.48	224.9900	21,824.03	16,795.55
5,922.0000	COLGATE-PALMOLIVE CO	185,496.58	74.1300	438,997.86	253,501.28
3,721.0000	COLONY NORTHSTAR INC	40,644.95	14.0900	52,428.89	11,783.94
835.0000	COLONY STARWOOD HOMES	24,849.60	34.3100	28,648.85	3,799.25
529.0000	COLUMBIA BANKING SYSTEM INC	9,517.21	39.8500	21,080.65	11,563.44
1,367.0000	COLUMBIA PROPERTY TRUST INC	30,741.99	22.3800	30,593.46	148.53-
483.0000	COMFORT SYSTEMS USA INC	5,028.03	37.1000	17,919.30	12,891.27
25,758.0000	COMCAST CORP	457,124.61	38.9200	1,002,501.36	545,376.75
630.0000	COMERICA INC	24,394.07	73.2400	46,141.20	21,747.13
1,163.0000	COMMERCE BANCSHARES INC/MO	34,100.41	56.8300	66,093.29	31,992.88



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100.0000	COMMERCEHUB INC	365.44	17.4200	1,742.00	1,376.56
201.0000	COMMERCEHUB INC	740.39	17.4400	3,505.44	2,765.05
1,005.0000	COMMERCIAL METALS CO	18,088.10	19.4300	19,527.15	1,439.05
232.0000	COMMUNITY BANK SYSTEM INC	5,630.64	55.7700	12,938.64	7,308.00
205.0000	COMMUNITY TRUST BANCORP INC	5,029.95	43.7500	8,968.75	3,938.80
2,460.0000	CONAGRA BRANDS INC	46,696.70	35.7600	87,969.60	41,272.90
775.0000	CONCHO RESOURCES INC	55,703.22	121.5300	94,185.75	38,482.53
1,548.0000	CONDUENT INC	18,816.88	15.9400	24,675.12	5,858.24
184.0000	CONMED CORP	4,999.28	50.9400	9,372.96	4,373.68
512.0000	CONNECTICUT WATER SERVICE INC	14,783.82	55.5100	28,421.12	13,637.30
7,624.0000	CONOCOPHILLIPS	345,683.36	43.9600	335,151.04	10,532.32-
1,843.0000	CONSOL ENERGY INC	26,373.33	14.9400	27,534.42	1,161.09
1,378.0000	CONSOLIDATED EDISON INC	64,322.15	80.8200	111,369.96	47,047.81
1,149.0000	CONSTELLATION BRANDS INC	24,794.71	193.7300	222,595.77	197,801.06
514.0000	CONTINENTAL RESOURCES INC/OK	20,103.78	32.3300	16,617.62	3,486.16-
1,136.0000	CONVERGYS CORP	14,972.48	23.7800	27,014.08	12,041.60
344.0000	COOPER COS INC/THE	20,708.80	239.4200	82,360.48	61,651.68



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775.0000	COOPER TIRE & RUBBER CO	13,477.25	36.1000	27,977.50	14,500.25
1,354.0000	COPART INC	21,700.32	31.7900	43,043.66	21,343.34
3,185.0000	CORCEPT THERAPEUTICS INC	5,096.00	11.8000	37,583.00	32,487.00
387.0000	CORELOGIC INC/UNITED STATES	9,845.28	43.3800	16,788.06	6,942.78
1,583.0000	CORECIVIC INC	34,567.73	27.5800	43,659.14	9,091.41
774.0000	CORNERSTONE ONDEMAND INC	21,880.98	35.7500	27,670.50	5,789.52
4,176.0000	CORNING INC	66,152.81	30.0500	125,488.80	59,335.99
1,532.0000	CORPORATE OFFICE PROPERTIES TR	35,828.10	35.0300	53,665.96	17,837.86
208.0000	CORVEL CORP	5,049.20	47.4500	9,869.60	4,820.40
2,491.0000	COSTCO WHOLESALE CORP	124,731.35	159.9300	398,385.63	273,654.28
160.0000	COSTAR GROUP INC	8,939.20	263.6000	42,176.00	33,236.80
2,539.0000	COTY INC	47,797.75	18.7600	47,631.64	166.11-
564.0000	CRANE CO	20,332.20	79.3800	44,770.32	24,438.12
2,200.0000	CROWN CASTLE INTERNATIONAL COR	122,061.42	100.1800	220,396.00	98,334.58
783.0000	CROWN HOLDINGS INC	28,362.84	59.6600	46,713.78	18,350.94
626.0000	CUBESMART	6,441.54	24.0400	15,049.04	8,607.50
757.0000	CUMMINS INC	49,133.78	162.2200	122,800.54	73,666.76



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303.0000	CURTISS-WRIGHT CORP	9,886.74	91.7800	27,809.34	17,922.60
3,166.0000	CYPRESS SEMICONDUCTOR CORP	36,894.64	13.6500	43,215.90	6,321.26
1,030.0000	DCT INDUSTRIAL TRUST INC	29,147.89	53.4400	55,043.20	25,895.31
2,016.0000	DR HORTON INC	32,323.83	34.5700	69,693.12	37,369.29
444.0000	DST SYSTEMS INC	11,350.86	61.7000	27,394.80	16,043.94
1,553.0000	DTE ENERGY CO	64,899.41	105.7900	164,291.87	99,392.46
272.0000	DSW INC	6,732.00	17.7000	4,814.40	1,917.60-
1,645.0000	DXC TECHNOLOGY CO	52,675.64	76.7200	126,204.40	73,528.76
376.0000	DANA INC	4,872.96	22.3300	8,396.08	3,523.12
3,760.0000	DANAHER CORP	101,163.73	84.3900	317,306.40	216,142.67
484.0000	DARDEN RESTAURANTS INC	26,585.32	90.4400	43,772.96	17,187.64
1,793.0000	DARLING INGREDIENTS INC	24,331.01	15.7400	28,221.82	3,890.81
577.0000	DEAN FOODS CO	6,567.12	17.0000	9,809.00	3,241.88
108.0000	DECKERS OUTDOOR CORP	5,114.88	68.2600	7,372.08	2,257.20
1,658.0000	DEERE & CO	90,266.32	123.5900	204,912.22	114,645.90
1,254.0000	DELL TECHNOLOGIES INC CLASS V	58,137.84	61.1100	76,631.94	18,494.10
5,859.0000	DELTA AIR LINES INC	48,198.43	53.7400	314,862.66	266,664.23



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1,089.0000	DELTA NATURAL GAS CO INC	24,655.07	30.4700	33,181.83	8,526.76
324.0000	DELUXE CORP	7,626.96	69.2200	22,427.28	14,800.32
1,027.0000	DENTSPLY SIRONA INC	35,743.09	64.8400	66,590.68	30,847.59
2,854.0000	DEVON ENERGY CORP	99,748.04	31.9700	91,242.38	8,505.66-
413.0000	DEXCOM INC	32,189.22	73.1500	30,210.95	1,978.27-
612.0000	DIAMONDBACK ENERGY INC	48,596.73	88.8100	54,351.72	5,754.99
1,609.0000	DIAMONDROCK HOSPITALITY CO	15,734.80	10.9500	17,618.55	1,883.75
616.0000	DICK'S SPORTING GOODS INC	31,428.32	39.8300	24,535.28	6,893.04-
773.0000	DIGITAL REALTY TRUST INC	46,114.51	112.9500	87,310.35	41,195.84
894.0000	DIGITALGLOBE INC	14,289.73	33.3000	29,770.20	15,480.47
353.0000	DIME COMMUNITY BANCSHARES INC	4,994.95	19.6000	6,918.80	1,923.85
146.0000	DILLARD'S INC	7,402.20	57.6900	8,422.74	1,020.54
289.0000	DINEEQUITY INC	15,272.21	44.0500	12,730.45	2,541.76-
9,771.0000	WALT DISNEY CO/THE	315,018.35	106.2500	1,038,168.75	723,150.40
1,382.0000	DISCOVERY COMMUNICATIONS INC	34,882.77	25.8300	35,697.06	814.29
595.0000	DISCOVERY COMMUNICATIONS INC	10,977.75	25.2100	14,999.95	4,022.20
1,137.0000	DISH NETWORK CORP	24,860.90	62.7600	71,358.12	46,497.22



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3,333.0000	DISCOVER FINANCIAL SERVICES	80,232.42	62.1900	207,279.27	127,046.85
1,305.0000	DOLBY LABORATORIES INC	65,276.10	48.9600	63,892.80	1,383.30-
1,272.0000	DOLLAR GENERAL CORP	66,204.24	72.0900	91,698.48	25,494.24
1,666.0000	DOLLAR TREE INC	53,713.75	69.9200	116,486.72	62,772.97
3,781.0000	DOMINION ENERGY INC	146,080.26	76.6300	289,738.03	143,657.77
706.0000	DOMINO'S PIZZA INC	25,725.92	211.5300	149,340.18	123,614.26
620.0000	DOMTAR CORP	19,486.60	38.4200	23,820.40	4,333.80
174.0000	DONALDSON CO INC	5,054.70	45.5400	7,923.96	2,869.26
1,302.0000	DOUGLAS EMMETT INC	20,154.96	38.2100	49,749.42	29,594.46
1,560.0000	DOVER CORP	62,055.00	80.2200	125,143.20	63,088.20
6,443.0000	DOW CHEMICAL CO/THE	289,477.60	63.0700	406,360.01	116,882.41
1,709.0000	DR PEPPER SNAPPLE GROUP INC	41,930.83	91.1100	155,706.99	113,776.16
489.0000	DRIL-QUIP INC	28,006.89	48.8000	23,863.20	4,143.69-
5,059.0000	EI DU PONT DE NEMOURS & CO	268,706.12	80.7100	408,311.89	139,605.77
4,458.0000	DUKE ENERGY CORP	240,616.29	83.5900	372,644.22	132,027.93
3,570.0000	DUKE REALTY CORP	41,840.40	27.9500	99,781.50	57,941.10
302.0000	DUN & BRADSTREET CORP/THE	23,194.72	108.1500	32,661.30	9,466.58



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849.0000	DUNKIN' BRANDS GROUP INC	27,473.64	55.1200	46,796.88	19,323.24
660.0000	CONTRA DYAX CORPORATION	0.00	0.0000	0.00	0.00
321.0000	DYCOM INDUSTRIES INC	4,798.95	89.5200	28,735.92	23,936.97
2,071.0000	EL POLLO LOCO HOLDINGS INC	24,789.87	13.8500	28,683.35	3,893.48
3,492.0000	EOG RESOURCES INC	152,807.97	90.5200	316,095.84	163,287.87
1,022.0000	EQT CORP	41,356.70	58.5900	59,878.98	18,522.28
294.0000	EPR PROPERTIES	13,518.12	71.8700	21,129.78	7,611.66
435.0000	EAGLE BANCORP INC	5,065.77	63.3000	27,535.50	22,469.73
3,452.0000	E*TRADE FINANCIAL CORP	30,791.84	38.0300	131,279.56	100,487.72
174.0000	EAGLE MATERIALS INC	14,383.28	92.4200	16,081.08	1,697.80
1,560.0000	EAST WEST BANCORP INC	28,969.20	58.5800	91,384.80	62,415.60
1,423.0000	EASTERLY GOVERNMENT PROPERTIES	25,172.87	20.9500	29,811.85	4,638.98
440.0000	EASTMAN CHEMICAL CO	35,934.80	83.9900	36,955.60	1,020.80
6,508.0000	EBAY INC	77,582.16	34.9200	227,259.36	149,677.20
573.0000	ECHOSTAR CORP	11,542.68	60.7000	34,781.10	23,238.42
1,980.0000	ECOLAB INC	89,493.64	132.7500	262,845.00	173,351.36
260.0000	EDGEWELL PERSONAL CARE CO	15,800.56	76.0200	19,765.20	3,964.64



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3,262.0000	EDISON INTERNATIONAL	142,167.79	78.1900	255,055.78	112,887.99
199.0000	EDUCATION REALTY TRUST INC	4,955.10	38.7500	7,711.25	2,756.15
1,090.0000	EDWARDS LIFESCIENCES CORP	96,773.12	118.2400	128,881.60	32,108.48
632.0000	EL PASO ELECTRIC CO	25,084.08	51.7000	32,674.40	7,590.32
2,031.0000	ELECTRONIC ARTS INC	35,830.24	105.7200	214,717.32	178,887.08
421.0000	EMCOR GROUP INC	11,964.82	65.3800	27,524.98	15,560.16
2,820.0000	EMERSON ELECTRIC CO	133,583.17	59.6200	168,128.40	34,545.23
315.0000	EMPLOYERS HOLDINGS INC	5,021.10	42.3000	13,324.50	8,303.40
220.0000	ENCORE WIRE CORP	5,108.40	42.7000	9,394.00	4,285.60
622.0000	ENERGEN CORP	33,646.56	49.3700	30,708.14	2,938.42-
2,386.0000	ENERGOUS CORP	25,554.06	16.2600	38,796.36	13,242.30
224.0000	ENERGIZER HOLDINGS INC	4,225.08	48.0200	10,756.48	6,531.40
569.0000	ENERSYS	15,124.02	72.4500	41,224.05	26,100.03
757.0000	ENTERGY CORP	55,043.28	76.7700	58,114.89	3,071.61
390.0000	ENTERPRISE FINANCIAL SERVICES	5,190.90	40.8000	15,912.00	10,721.10
515.0000	ENVISION HEALTHCARE CORP	30,010.24	62.6700	32,275.05	2,264.81
775.0000	EQUIFAX INC	26,793.85	137.4200	106,500.50	79,706.65



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354.0000	EQUINIX INC	112,456.99	429.1600	151,922.64	39,465.65
909.0000	EQUITY COMMONWEALTH	22,420.15	31.6000	28,724.40	6,304.25
156.0000	EQUITY LIFESTYLE PROPERTIES IN	4,885.92	86.3400	13,469.04	8,583.12
1,945.0000	EQUITY RESIDENTIAL	98,237.86	65.8300	128,039.35	29,801.49
464.0000	ERIE INDEMNITY CO	19,759.86	125.0700	58,032.48	38,272.62
1,701.0000	ESSENDANT INC	35,210.70	14.8300	25,225.83	9,984.87-
417.0000	ESSEX PROPERTY TRUST INC	66,306.17	257.2700	107,281.59	40,975.42
242.0000	ETHAN ALLEN INTERIORS INC	5,055.38	32.3000	7,816.60	2,761.22
323.0000	EURONET WORLDWIDE INC	4,857.92	87.3700	28,220.51	23,362.59
740.0000	EVERCORE PARTNERS INC	18,206.96	70.5000	52,170.00	33,963.04
1,979.0000	EVERSOURCE ENERGY	86,302.64	60.7100	120,145.09	33,842.45
1,502.0000	EXACT SCIENCES CORP	15,891.16	35.3700	53,125.74	37,234.58
5,932.0000	EXELON CORP	186,467.38	36.0700	213,967.24	27,499.86
1,863.0000	EXELIXIS INC	41,468.27	24.6300	45,885.69	4,417.42
579.0000	EXPEDIA INC	54,396.46	148.9500	86,242.05	31,845.59
544.0000	EXPEDITORS INTERNATIONAL OF WA	24,387.52	56.4800	30,725.12	6,337.60
4,231.0000	EXPRESS SCRIPTS HOLDING CO	142,735.79	63.8400	270,107.04	127,371.25



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701.0000	EXTRA SPACE STORAGE INC	29,870.87	78.0000	54,678.00	24,807.13
25,681.0000	EXXON MOBIL CORP	1,775,079.85	80.7300	2,073,227.13	298,147.28
750.0000	FLIR SYSTEMS INC	25,027.50	34.6600	25,995.00	967.50
611.0000	FMC CORP	39,152.19	73.0500	44,633.55	5,481.36
800.0000	FNB CORP/PA	8,088.00	14.1600	11,328.00	3,240.00
1,092.0000	FTD COS INC	27,900.60	20.0000	21,840.00	6,060.60-
13,576.0000	FACEBOOK INC	646,705.87	150.9800	2,049,704.48	1,402,998.61
251.0000	FAIR ISAAC CORP	7,276.49	139.4100	34,991.91	27,715.42
1,420.0000	FAIRPOINT COMMUNICATIONS INC	19,412.96	15.6500	22,223.00	2,810.04
1,517.0000	FASTENAL CO	66,021.21	43.5300	66,035.01	13.80
410.0000	FEDERAL REALTY INVESTMENT TRUS	45,974.01	126.3900	51,819.90	5,845.89
1,241.0000	FEDERAL SIGNAL CORP	5,174.97	17.3600	21,543.76	16,368.79
1,997.0000	FEDEX CORP	213,562.73	217.3300	434,008.01	220,445.28
4,736.0000	FELCOR LODGING TRUST INC	21,927.68	7.2100	34,146.56	12,218.88
411.0000	F5 NETWORKS INC	31,815.80	127.0600	52,221.66	20,405.86
2,102.0000	FIDELITY NATIONAL INFORMATION	50,080.54	85.4000	179,510.80	129,430.26
1,579.0000	FNF GROUP	18,072.04	44.8300	70,786.57	52,714.53



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526.0000	FNFV GROUP	2,503.71	15.8000	8,310.80	5,807.09
4,749.0000	FIFTH THIRD BANCORP	67,886.43	25.9600	123,284.04	55,397.61
934.0000	FINANCIAL ENGINES INC	19,668.68	36.6000	34,184.40	14,515.72
897.0000	FINANCIAL INSTITUTIONS INC	24,940.07	29.8000	26,730.60	1,790.53
1,439.0000	FINISAR CORP	24,765.19	25.9800	37,385.22	12,620.03
2,091.0000	FIREEYE INC	31,568.64	15.2100	31,804.11	235.47
2,510.0000	FIRST BANCORP/PUERTO RICO	9,638.40	5.7900	14,532.90	4,894.50
24.0000	FIRST CITIZENS BANCSHARES INC/	4,320.24	372.7000	8,944.80	4,624.56
1,067.0000	FIRST COMMONWEALTH FINANCIAL C	5,217.63	12.6800	13,529.56	8,311.93
366.0000	FIRST DEFIANCE FINANCIAL CORP	5,223.11	52.6800	19,280.88	14,057.77
2,112.0000	FIRST DATA CORP	25,175.04	18.2000	38,438.40	13,263.36
396.0000	FIRST FINANCIAL BANKSHARES INC	6,617.16	44.2000	17,503.20	10,886.04
2,776.0000	FIRST HORIZON NATIONAL CORP	22,715.04	17.4200	48,357.92	25,642.88
887.0000	FIRST INDUSTRIAL REALTY TRUST	10,226.50	28.6200	25,385.94	15,159.44
616.0000	FIRST REPUBLIC BANK/CA	23,695.84	100.1000	61,661.60	37,965.76
714.0000	FIRST SOLAR INC	11,345.46	39.8800	28,474.32	17,128.86
269.0000	1ST SOURCE CORP	4,912.90	47.9400	12,895.86	7,982.96



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129.0000	FIRSTCASH INC	5,020.68	58.3000	7,520.70	2,500.02
2,442.0000	FISERV INC	57,643.41	122.3400	298,754.28	241,110.87
2,475.0000	FIRSTENERGY CORP	77,275.77	29.1600	72,171.00	5,104.77-
480.0000	FLEETCOR TECHNOLOGIES INC	50,393.75	144.2100	69,220.80	18,827.05
646.0000	FLOTEK INDUSTRIES INC	4,921.03	8.9400	5,775.24	854.21
1,267.0000	FLUOR CORP	50,272.93	45.7800	58,003.26	7,730.33
1,430.0000	FLOWERS FOODS INC	27,613.30	17.3100	24,753.30	2,860.00-
832.0000	FOOT LOCKER INC	16,698.23	49.2800	41,000.96	24,302.73
22,259.0000	FORD MOTOR CO	201,763.11	11.1900	249,078.21	47,315.10
1,238.0000	FOREST CITY REALTY TRUST INC	18,322.40	24.1700	29,922.46	11,600.06
887.0000	FORTINET INC	19,986.48	37.4400	33,209.28	13,222.80
1,880.0000	FORTIVE CORP	33,010.59	63.3500	119,098.00	86,087.41
1,423.0000	FORTUNE BRANDS HOME & SECURITY	28,053.03	65.2400	92,836.52	64,783.49
135.0000	FORWARD AIR CORP	5,111.10	53.2800	7,192.80	2,081.70
153.0000	FOUR CORNERS PROPERTY TRUST IN	2,761.90	25.1100	3,841.83	1,079.93
228.0000	FRANKLIN ELECTRIC CO INC	5,180.16	41.4000	9,439.20	4,259.04
1,454.0000	FRANKLIN RESOURCES INC	55,760.01	44.7900	65,124.66	9,364.65



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7,832.0000	FREEPORT-MCMORAN INC	45,911.52	12.0100	94,062.32	48,150.80
228.0000	HB FULLER CO	5,344.32	51.1100	11,653.08	6,308.76
2,352.0000	FULTON FINANCIAL CORP	24,225.60	19.0000	44,688.00	20,462.40
109.0000	GAMCO INVESTORS INC	2,613.70	29.6000	3,226.40	612.70
293.0000	GATX CORP	10,624.18	64.2700	18,831.11	8,206.93
1,185.0000	GEO GROUP INC/THE	27,918.60	29.5700	35,040.45	7,121.85
648.0000	GCP APPLIED TECHNOLOGIES INC	6,370.38	30.5000	19,764.00	13,393.62
2,764.0000	GGP INC	38,935.12	23.5600	65,119.84	26,184.72
862.0000	G -III APPAREL GROUP LTD	27,575.38	24.9500	21,506.90	6,068.48-
1,109.0000	GAIN CAPITAL HOLDINGS INC	4,935.05	6.2300	6,909.07	1,974.02
696.0000	ARTHUR J GALLAGHER & CO	19,508.88	57.2500	39,846.00	20,337.12
894.0000	GAMING AND LEISURE PROPERTIES	29,569.81	37.6700	33,676.98	4,107.17
890.0000	GAMESTOP CORP	23,255.70	21.6100	19,232.90	4,022.80-
1,083.0000	GANNETT CO INC	5,470.61	8.7200	9,443.76	3,973.15
1,327.0000	GAP INC/THE	25,435.93	21.9900	29,180.73	3,744.80
916.0000	GARTNER INC	40,923.64	123.5100	113,135.16	72,211.52
1,910.0000	GENERAL DYNAMICS CORP	136,978.44	198.1000	378,371.00	241,392.56



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52,775.0000	GENERAL ELECTRIC CO	1,283,886.15	27.0100	1,425,452.75	141,566.60
4,469.0000	GENERAL MILLS INC	127,235.56	55.4000	247,582.60	120,347.04
8,163.0000	GENERAL MOTORS CO	237,303.85	34.9300	285,133.59	47,829.74
150.0000	GENESCO INC	7,653.00	33.9000	5,085.00	2,568.00-
89.0000	GENESEE & WYOMING INC	4,938.61	68.3900	6,086.71	1,148.10
1,473.0000	GENUINE PARTS CO	64,646.82	92.7600	136,635.48	71,988.66
816.0000	GENTHERM INC	27,588.96	38.8000	31,660.80	4,071.84
457.0000	GIBRALTAR INDUSTRIES INC	4,958.45	35.6500	16,292.05	11,333.60
9,068.0000	GILEAD SCIENCES INC	227,687.52	70.7800	641,833.04	414,145.52
882.0000	GLACIER BANCORP INC	11,015.07	36.6100	32,290.02	21,274.95
1,455.0000	GLADSTONE COMMERCIAL CORP	24,487.65	21.7900	31,704.45	7,216.80
1,043.0000	GLOBAL NET LEASE INC	24,781.69	22.2400	23,196.32	1,585.37-
1,292.0000	GLOBAL PAYMENTS INC	30,340.36	90.3200	116,693.44	86,353.08
1,975.0000	GOLDMAN SACHS GROUP INC/THE	299,376.63	221.9000	438,252.50	138,875.87
1,489.0000	GOODYEAR TIRE & RUBBER CO/THE	21,789.87	34.9600	52,055.44	30,265.57
2,991.0000	GOPRO INC	26,410.53	8.1300	24,316.83	2,093.70-
416.0000	GORMAN-RUPP CO/THE	9,771.01	25.4700	10,595.52	824.51



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648.0000	WR GRACE & CO	25,891.75	72.0100	46,662.48	20,770.73
625.0000	GRACO INC	20,168.75	109.2800	68,300.00	48,131.25
19.0000	GRAHAM HOLDINGS CO	4,433.51	599.6500	11,393.35	6,959.84
345.0000	WW GRAINGER INC	69,041.67	180.5300	62,282.85	6,758.82-
1,015.0000	GRAMERCY PROPERTY TRUST	27,283.19	29.7100	30,155.65	2,872.46
377.0000	GRAND CANYON EDUCATION INC	5,108.35	78.4100	29,560.57	24,452.22
244.0000	GRANITE CONSTRUCTION INC	5,963.36	48.2400	11,770.56	5,807.20
1,883.0000	GREAT AJAX CORP	24,463.56	13.9800	26,324.34	1,860.78
549.0000	GREAT SOUTHERN BANCORP INC	9,997.29	53.5000	29,371.50	19,374.21
932.0000	GREAT PLAINS ENERGY INC	18,136.72	29.2800	27,288.96	9,152.24
649.0000	GREEN DOT CORP	8,229.32	38.5300	25,005.97	16,776.65
485.0000	GREEN PLAINS INC	4,951.85	20.5500	9,966.75	5,014.90
249.0000	GREENBRIER COS INC/THE	4,932.69	46.2500	11,516.25	6,583.56
821.0000	GRIFFIN INDUSTRIAL REALTY INC	25,017.10	31.6700	26,001.07	983.97
1,066.0000	GRIFFON CORP	10,247.88	21.9500	23,398.70	13,150.82
152.0000	GROUP 1 AUTOMOTIVE INC	5,973.60	63.3200	9,624.64	3,651.04
6,409.0000	GROUPON INC	25,293.22	3.8400	24,610.56	682.66-



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862.0000	GRUBHUB INC	25,928.96	43.6000	37,583.20	11,654.24
434.0000	GUIDEWIRE SOFTWARE INC	24,620.82	68.7100	29,820.14	5,199.32
379.0000	H&E EQUIPMENT SERVICES INC	4,839.83	20.4100	7,735.39	2,895.56
1,092.0000	HCA HEALTHCARE INC	62,520.15	87.2000	95,222.40	32,702.25
2,947.0000	HCP INC	95,940.82	31.9600	94,186.12	1,754.70-
349.0000	HFF INC	4,788.28	34.7700	12,134.73	7,346.45
2,366.0000	HMS HOLDINGS CORP	24,559.08	18.5000	43,771.00	19,211.92
488.0000	HNI CORP	12,111.22	39.8700	19,456.56	7,345.34
163.0000	HSN INC	4,995.95	31.9000	5,199.70	203.75
1,885.0000	HRG GROUP INC	25,127.05	17.7100	33,383.35	8,256.30
8,768.0000	HP INC	107,451.12	17.4800	153,264.64	45,813.52
604.0000	HAEMONETICS CORP	18,038.46	39.4900	23,851.96	5,813.50
494.0000	HAIN CELESTIAL GROUP INC/THE	20,668.48	38.8200	19,177.08	1,491.40-
5,285.0000	HALLIBURTON CO	153,551.43	42.7100	225,722.35	72,170.92
720.0000	HALLMARK FINANCIAL SERVICES IN	4,989.60	11.2700	8,114.40	3,124.80
237.0000	HALYARD HEALTH INC	5,153.55	39.2800	9,309.36	4,155.81
3,976.0000	HANESBRANDS INC	31,517.60	23.1600	92,084.16	60,566.56



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142.0000	HANOVER INSURANCE GROUP INC/TH	6,178.42	88.6300	12,585.46	6,407.04
1,043.0000	HARLEY-DAVIDSON INC	53,543.59	54.0200	56,342.86	2,799.27
1,141.0000	HARRIS CORP	44,322.60	109.0800	124,460.28	80,137.68
2,263.0000	HARTFORD FINANCIAL SERVICES GR	55,768.39	52.5700	118,965.91	63,197.52
637.0000	HASBRO INC	16,282.40	111.5100	71,031.87	54,749.47
845.0000	HAWAIIAN ELECTRIC INDUSTRIES I	24,766.95	32.3800	27,361.10	2,594.15
879.0000	HAWAIIAN HOLDINGS INC	5,054.25	46.9500	41,269.05	36,214.80
746.0000	HAYNES INTERNATIONAL INC	31,466.28	36.3100	27,087.26	4,379.02-
205.0000	HEALTHSOUTH CORP	4,987.65	48.4000	9,922.00	4,934.35
174.0000	HEALTHCARE REALTY TRUST INC	3,563.52	34.1500	5,942.10	2,378.58
8,374.0000	HECLA MINING CO	24,200.86	5.1000	42,707.40	18,506.54
512.0000	HEICO CORP	13,959.17	71.8400	36,782.08	22,822.91
1,080.0000	HELMERICH & PAYNE INC	51,944.42	54.3400	58,687.20	6,742.78
544.0000	JACK HENRY & ASSOCIATES INC	15,939.20	103.8700	56,505.28	40,566.08
985.0000	HERITAGE COMMERCE CORP	4,869.25	13.7800	13,573.30	8,704.05
385.0000	HERITAGE FINANCIAL CORP/WA	4,966.50	26.5000	10,202.50	5,236.00
5,497.0000	HERON THERAPEUTICS INC	50,023.25	13.8500	76,133.45	26,110.20



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932.0000	HERSHEY CO/THE	49,928.96	107.3700	100,068.84	50,139.88
1,768.0000	HESS CORP	81,559.18	43.8700	77,562.16	3,997.02-
9,036.0000	HEWLETT PACKARD ENTERPRISE CO	96,343.69	16.5900	149,907.24	53,563.55
425.0000	HEXCEL CORP	10,060.43	52.7900	22,435.75	12,375.32
151.0000	HIGHWOODS PROPERTIES INC	4,898.44	50.7100	7,657.21	2,758.77
627.0000	HILL-ROM HOLDINGS INC	17,336.55	79.6100	49,915.47	32,578.92
215.0000	HILLENBRAND INC	4,882.65	36.1000	7,761.50	2,878.85
785.0000	HILLTOP HOLDINGS INC	9,252.00	26.2100	20,574.85	11,322.85
161.0000	HILTON GRAND VACATIONS INC	3,025.33	36.0600	5,805.66	2,780.33
707.0000	HILTON WORLDWIDE HOLDINGS INC	32,562.50	61.8500	43,727.95	11,165.45
1,911.0000	HOLOGIC INC	35,479.86	45.3800	86,721.18	51,241.32
836.0000	HOME BANCSHARES INC/AR	4,932.40	24.9000	20,816.40	15,884.00
8,084.0000	HOME DEPOT INC/THE	295,717.57	153.4000	1,240,085.60	944,368.03
338.0000	HOMESTREET INC	4,912.76	27.6750	9,354.15	4,441.39
4,841.0000	HONEYWELL INTERNATIONAL INC	199,472.78	133.2900	645,256.89	445,784.11
1,335.0000	HOPE BANCORP INC	10,325.32	18.6500	24,897.75	14,572.43
2,968.0000	HORMEL FOODS CORP	33,285.11	34.1100	101,238.48	67,953.37



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2,202.0000	HOSPITALITY PROPERTIES TRUST	48,928.44	29.1500	64,188.30	15,259.86
4,338.0000	HOST HOTELS & RESORTS INC	62,120.16	18.2700	79,255.26	17,135.10
2,476.0000	HOUGHTON MIFFLIN HARCOURT CO	26,765.56	12.3000	30,454.80	3,689.24
185.0000	HOWARD HUGHES CORP/THE	15,117.50	122.8400	22,725.40	7,607.90
1,170.0000	HUMANA INC	74,670.22	240.6200	281,525.40	206,855.18
450.0000	JB HUNT TRANSPORT SERVICES INC	20,574.00	91.3800	41,121.00	20,547.00
8,830.0000	HUNTINGTON BANCSHARES INC/OH	50,288.46	13.5200	119,381.60	69,093.14
344.0000	HUNTINGTON INGALLS INDUSTRIES	12,961.36	186.1600	64,039.04	51,077.68
2,133.0000	HUNTSMAN CORP	26,136.75	25.8400	55,116.72	28,979.97
165.0000	HURON CONSULTING GROUP INC	4,851.00	43.2000	7,128.00	2,277.00
514.0000	HYATT HOTELS CORP	19,943.20	56.2100	28,891.94	8,948.74
303.0000	IAC/INTERACTIVECORP	11,608.50	103.2400	31,281.72	19,673.22
198.0000	ICF INTERNATIONAL INC	4,950.00	47.1000	9,325.80	4,375.80
926.0000	ILG INC	10,432.22	27.4900	25,455.74	15,023.52
287.0000	IPG PHOTONICS CORP	25,000.57	145.1000	41,643.70	16,643.13
2,031.0000	ISTAR INC	12,348.48	12.0400	24,453.24	12,104.76
788.0000	ITT INC	15,320.78	40.1800	31,661.84	16,341.06



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315.0000	IDACORP INC	15,032.32	85.3500	26,885.25	11,852.93
287.0000	IDEX CORP	14,860.69	113.0100	32,433.87	17,573.18
724.0000	IDEXX LABORATORIES INC	27,066.74	161.4200	116,868.08	89,801.34
2,798.0000	ILLINOIS TOOL WORKS INC	126,121.80	143.2500	400,813.50	274,691.70
852.0000	ILLUMINA INC	144,546.23	173.5200	147,839.04	3,292.81
1,211.0000	INCYTE CORP	19,460.77	125.9100	152,477.01	133,016.24
190.0000	INDEPENDENT BANK CORP/ROCKLAND	4,932.40	66.6500	12,663.50	7,731.10
95.0000	INFINITY PROPERTY & CASUALTY C	5,136.65	94.0000	8,930.00	3,793.35
3,119.0000	INFINERA CORP	27,104.11	10.6700	33,279.73	6,175.62
341.0000	INGEVITY CORP	6,107.18	57.4000	19,573.40	13,466.22
337.0000	INGLES MARKETS INC	5,048.26	33.3000	11,222.10	6,173.84
412.0000	INGREDION INC	20,064.33	119.2100	49,114.52	29,050.19
305.0000	INSIGHT ENTERPRISES INC	5,072.15	39.9900	12,196.95	7,124.80
156.0000	INNOSPEC INC	4,873.11	65.5500	10,225.80	5,352.69
245.0000	INSULET CORP	5,049.45	51.3100	12,570.95	7,521.50
2,593.0000	INTEGRATED DEVICE TECHNOLOGY I	16,024.74	25.7900	66,873.47	50,848.73
28,133.0000	INTEL CORP	586,714.59	33.7400	949,207.42	362,492.83



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883.0000	INTEGER HOLDINGS CORP	26,896.18	43.2500	38,189.75	11,293.57
1,135.0000	INTERACTIVE BROKERS GROUP INC	18,637.04	37.4200	42,471.70	23,834.66
260.0000	INTERCEPT PHARMACEUTICALS INC	28,220.40	121.0700	31,478.20	3,257.80
3,229.0000	INTERCONTINENTAL EXCHANGE INC	132,866.71	65.9200	212,855.68	79,988.97
1,182.0000	INTERNATIONAL BANCSHARES CORP	19,053.84	35.0500	41,429.10	22,375.26
5,433.0000	INTERNATIONAL BUSINESS MACHINE	539,290.95	153.8300	835,758.39	296,467.44
910.0000	INTERNATIONAL FLAVORS & FRAGRA	36,099.79	135.0000	122,850.00	86,750.21
2,693.0000	INTERNATIONAL PAPER CO	93,190.33	56.6100	152,450.73	59,260.40
186.0000	INTERNATIONAL SPEEDWAY CORP	4,992.24	37.5500	6,984.30	1,992.06
3,696.0000	INTERPUBLIC GROUP OF COS INC/T	36,512.41	24.6000	90,921.60	54,409.19
2,465.0000	INTERSECT ENT INC	27,509.40	27.9500	68,896.75	41,387.35
256.0000	INTUITIVE SURGICAL INC	70,720.53	935.3700	239,454.72	168,734.19
2,235.0000	INTUIT INC	72,897.66	132.8100	296,830.35	223,932.69
4,358.0000	INVESCO MORTGAGE CAPITAL INC	64,149.76	16.7100	72,822.18	8,672.42
925.0000	INVESTORS BANCORP INC	5,045.78	13.3600	12,358.00	7,312.22
699.0000	IONIS PHARMACEUTICALS INC	32,349.72	50.8700	35,558.13	3,208.41
6,678.0000	IRIDIUM COMMUNICATIONS INC	55,360.62	11.0500	73,791.90	18,431.28



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1,375.0000	IRON MOUNTAIN INC	34,079.37	34.3600	47,245.00	13,165.63
90.0000	J ALEXANDER'S HOLDINGS INC	365.24	12.2500	1,102.50	737.26
20,434.0000	JPMORGAN CHASE & CO	826,555.30	91.4000	1,867,667.60	1,041,112.30
1,050.0000	JABIL INC	30,964.25	29.1900	30,649.50	314.75-
225.0000	JACK IN THE BOX INC	5,033.25	98.5000	22,162.50	17,129.25
488.0000	JACOBS ENGINEERING GROUP INC	25,010.00	54.3900	26,542.32	1,532.32
813.0000	JETBLUE AIRWAYS CORP	5,162.55	22.8300	18,560.79	13,398.24
15,552.0000	JOHNSON & JOHNSON	1,065,740.79	132.2900	2,057,374.08	991,633.29
376.0000	JONES LANG LASALLE INC	26,928.52	125.0000	47,000.00	20,071.48
180.0000	J2 GLOBAL INC	4,905.00	85.0900	15,316.20	10,411.20
3,428.0000	JUNIPER NETWORKS INC	59,237.94	27.8800	95,572.64	36,334.70
1,493.0000	JUNO THERAPEUTICS INC	26,679.91	29.8900	44,625.77	17,945.86
379.0000	KAR AUCTION SERVICES INC	5,040.70	41.9700	15,906.63	10,865.93
328.0000	KLX INC	5,431.82	50.0000	16,400.00	10,968.18
535.0000	KANSAS CITY SOUTHERN	35,229.71	104.6500	55,987.75	20,758.04
646.0000	KAPSTONE PAPER AND PACKAGING C	5,332.73	20.6300	13,326.98	7,994.25
1,596.0000	KB HOME	12,943.56	23.9700	38,256.12	25,312.56



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866.0000	KELLOGG CO	61,474.69	69.4600	60,152.36	1,322.33-
320.0000	KELLY SERVICES INC	5,027.20	22.4500	7,184.00	2,156.80
314.0000	KEMPER CORP	9,143.68	38.6000	12,120.40	2,976.72
6,436.0000	KEYCORP	51,101.84	18.7400	120,610.64	69,508.80
1,265.0000	KEYSIGHT TECHNOLOGIES INC	21,921.34	38.9300	49,246.45	27,325.11
667.0000	KEYW HOLDING CORP/THE	4,970.82	9.3500	6,236.45	1,265.63
426.0000	KFORCE INC	5,197.20	19.6000	8,349.60	3,152.40
369.0000	KILROY REALTY CORP	14,040.45	75.1500	27,730.35	13,689.90
1,988.0000	KIMBERLY-CLARK CORP	129,187.29	129.1100	256,670.68	127,483.39
2,883.0000	KIMCO REALTY CORP	51,500.67	18.3500	52,903.05	1,402.38
11,402.0000	KINDER MORGAN INC/DE	210,496.82	19.1600	218,462.32	7,965.50
525.0000	KIRBY CORP	20,007.75	66.8500	35,096.25	15,088.50
601.0000	KITE PHARMA INC	28,018.62	103.6700	62,305.67	34,287.05
1,113.0000	KITE REALTY GROUP TRUST	25,677.66	18.9300	21,069.09	4,608.57-
306.0000	KNIGHT TRANSPORTATION INC	4,938.84	37.0500	11,337.30	6,398.46
780.0000	KNOWLES CORP	12,222.83	16.9200	13,197.60	974.77
894.0000	KOHL'S CORP	39,928.74	38.6700	34,570.98	5,357.76-



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3,435.0000	KRAFT HEINZ CO/THE	103,389.63	85.6400	294,173.40	190,783.77
7,912.0000	KROGER CO/THE	90,643.20	23.3200	184,507.84	93,864.64
1,885.0000	L BRANDS INC	51,159.09	53.8900	101,582.65	50,423.56
390.0000	LHC GROUP INC	5,093.40	67.8900	26,477.10	21,383.70
1,271.0000	LKQ CORP	27,050.07	32.9500	41,879.45	14,829.38
622.0000	LPL FINANCIAL HOLDINGS INC	20,223.92	42.4600	26,410.12	6,186.20
514.0000	LA-Z-BOY INC	4,821.32	32.5000	16,705.00	11,883.68
831.0000	LABORATORY CORP OF AMERICA HOL	55,604.11	154.1400	128,090.34	72,486.23
346.0000	LAKELAND FINANCIAL CORP	5,102.35	45.8800	15,874.48	10,772.13
1,138.0000	LAM RESEARCH CORP	27,918.93	141.4300	160,947.34	133,028.41
766.0000	LAMAR ADVERTISING CO	18,621.46	73.5700	56,354.62	37,733.16
820.0000	LAMB WESTON HOLDINGS INC	13,565.92	44.0400	36,112.80	22,546.88
68.0000	LANCASTER COLONY CORP	4,930.68	122.6200	8,338.16	3,407.48
110.0000	LANDSTAR SYSTEM INC	4,950.00	85.6000	9,416.00	4,466.00
1,132.0000	LANNETT CO INC	28,254.72	20.4000	23,092.80	5,161.92-
2,210.0000	LAREDO PETROLEUM INC	26,387.40	10.5200	23,249.20	3,138.20-
2,223.0000	LAS VEGAS SANDS CORP	94,953.77	63.8900	142,027.47	47,073.70



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752.0000	LASALLE HOTEL PROPERTIES	18,700.40	29.8000	22,409.60	3,709.20
1,204.0000	ESTEE LAUDER COS INC/THE	91,374.74	95.9800	115,559.92	24,185.18
803.0000	LEAR CORP	38,882.32	142.0800	114,090.24	75,207.92
567.0000	LEGGETT & PLATT INC	12,978.63	52.5300	29,784.51	16,805.88
940.0000	LEGG MASON INC	29,384.40	38.1600	35,870.40	6,486.00
1,002.0000	LEIDOS HOLDINGS INC	27,957.76	51.6900	51,793.38	23,835.62
4,992.0000	LENDINGCLUB CORP	27,056.64	5.5100	27,505.92	449.28
1,012.0000	LENNAR CORP	19,885.80	53.3200	53,959.84	34,074.04
38.0000	LENNOX INTERNATIONAL INC	2,405.40	183.6400	6,978.32	4,572.92
1,278.0000	LEUCADIA NATIONAL CORP	21,514.86	26.1600	33,432.48	11,917.62
1,637.0000	LEVEL 3 COMMUNICATIONS INC	46,564.89	59.3000	97,074.10	50,509.21
403.0000	LIBERTY EXPEDIA HOLDINGS INC	4,784.60	54.0200	21,770.06	16,985.46
4,166.0000	LIBERTY INTERACTIVE CORP QVC G	49,154.36	24.5400	102,233.64	53,079.28
604.0000	LIBERTY VENTURES	6,147.14	52.2900	31,583.16	25,436.02
778.0000	LIBERTY PROPERTY TRUST	24,118.00	40.7100	31,672.38	7,554.38
862.0000	LIBERTY MEDIA CORP-LIBERTY SIR	24,045.93	41.9800	36,186.76	12,140.83
215.0000	LIBERTY MEDIA CORP-LIBERTY FOR	5,874.37	35.0300	7,531.45	1,657.08



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1,908.0000	LIBERTY TRIPADVISOR HOLDINGS I	27,096.43	11.6000	22,132.80	4,963.63-
326.0000	LIFEPOINT HEALTH INC	12,249.18	67.1500	21,890.90	9,641.72
327.0000	LIFE STORAGE INC	22,114.04	74.1000	24,230.70	2,116.66
5,216.0000	ELI LILLY & CO	361,919.20	82.3000	429,276.80	67,357.60
278.0000	LINCOLN ELECTRIC HOLDINGS INC	9,980.20	92.0900	25,601.02	15,620.82
1,312.0000	LINCOLN NATIONAL CORP	39,367.52	67.5800	88,664.96	49,297.44
279.0000	LITHIA MOTORS INC	5,354.01	94.2300	26,290.17	20,936.16
75.0000	LITTELFUSE INC	4,898.25	165.0000	12,375.00	7,476.75
1,108.0000	LOCKHEED MARTIN CORP	120,152.00	277.6100	307,591.88	187,439.88
680.0000	LOEWS CORP	25,330.00	46.8100	31,830.80	6,500.80
243.0000	LOGMEIN INC	10,495.20	104.5000	25,393.50	14,898.30
1,166.0000	LOUISIANA-PACIFIC CORP	30,734.93	24.1100	28,112.26	2,622.67-
6,611.0000	LOWE'S COS INC	189,425.65	77.5300	512,550.83	323,125.18
554.0000	LULULEMON ATHLETICA INC	33,526.26	59.6700	33,057.18	469.08-
505.0000	LUMENTUM HOLDINGS INC	31,542.30	57.0500	28,810.25	2,732.05-
1,085.0000	M&T BANK CORP	82,071.55	161.9500	175,715.75	93,644.20
344.0000	MB FINANCIAL INC	6,536.00	44.0400	15,149.76	8,613.76



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968.0000	MDU RESOURCES GROUP INC	20,031.06	26.2000	25,361.60	5,330.54
453.0000	MGE ENERGY INC	20,453.76	64.3500	29,150.55	8,696.79
3,013.0000	MGM RESORTS INTERNATIONAL	30,503.52	31.2900	94,276.77	63,773.25
203.0000	MKS INSTRUMENTS INC	5,093.27	67.3000	13,661.90	8,568.63
138.0000	MSA SAFETY INC	4,854.84	81.1700	11,201.46	6,346.62
840.0000	MSCI INC	30,204.52	102.9900	86,511.60	56,307.08
547.0000	MACOM TECHNOLOGY SOLUTIONS HOL	31,053.19	55.7700	30,506.19	547.00-
1,188.0000	MACERICH CO/THE	50,432.16	58.0600	68,975.28	18,543.12
381.0000	MACQUARIE INFRASTRUCTURE CORP	30,742.89	78.4000	29,870.40	872.49-
714.0000	STEVEN MADDEN LTD	18,714.14	39.9500	28,524.30	9,810.16
649.0000	MAINSOURCE FINANCIAL GROUP INC	5,750.14	33.5100	21,747.99	15,997.85
1,451.0000	MANITOWOC CO INC/THE	3,749.36	6.0100	8,720.51	4,971.15
412.0000	MANPOWERGROUP INC	15,714.52	111.6500	45,999.80	30,285.28
5,282.0000	MARATHON OIL CORP	84,118.74	11.8500	62,591.70	21,527.04-
2,535.0000	MARATHON PETROLEUM CORP	72,970.38	52.3300	132,656.55	59,686.17
513.0000	MARCUS CORP/THE	4,945.32	30.2000	15,492.60	10,547.28
53.0000	MARKEL CORP	19,967.59	975.8600	51,720.58	31,752.99



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208.0000	MARKETAXESS HOLDINGS INC	5,002.40	201.1000	41,828.80	36,826.40
3,608.0000	MARSH & MCLENNAN COS INC	107,513.60	77.9600	281,279.68	173,766.08
2,837.0000	MARRIOTT INTERNATIONAL INC/MD	132,546.68	100.3100	284,579.47	152,032.79
1,217.0000	MARTEN TRANSPORT LTD	19,674.95	27.4000	33,345.80	13,670.85
366.0000	MARTIN MARIETTA MATERIALS INC	58,143.06	222.5800	81,464.28	23,321.22
2,938.0000	MASCO CORP	42,183.77	38.2100	112,260.98	70,077.21
356.0000	MASTEC INC	6,497.00	45.1500	16,073.40	9,576.40
5,883.0000	MASTERCARD INC	170,523.05	121.4500	714,490.35	543,967.30
1,148.0000	MATADOR RESOURCES CO	25,588.92	21.3700	24,532.76	1,056.16-
500.0000	MATSON INC	8,942.86	30.0400	15,020.00	6,077.14
2,505.0000	MATTEL INC	46,739.54	21.5300	53,932.65	7,193.11
153.0000	MATTHEWS INTERNATIONAL CORP	4,915.89	61.2500	9,371.25	4,455.36
2,078.0000	MAXIM INTEGRATED PRODUCTS INC	49,373.28	44.9000	93,302.20	43,928.92
502.0000	MAXIMUS INC	31,093.88	62.6300	31,440.26	346.38
441.0000	MCCORMICK & CO INC/MD	23,031.29	97.5100	43,001.91	19,970.62
4,819.0000	MCDONALD'S CORP	224,974.69	153.1600	738,078.04	513,103.35
1,684.0000	MCKESSON CORP	90,057.62	164.5400	277,085.36	187,027.74



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Schedule E.7

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821.0000	MEDICINES CO/THE	24,052.78	38.0100	31,206.21	7,153.43
572.0000	MEDIDATA SOLUTIONS INC	25,728.56	78.2000	44,730.40	19,001.84
514.0000	MEDNAX INC	19,905.31	60.3700	31,030.18	11,124.87
17,262.0000	MERCK & CO INC	717,882.77	64.0900	1,106,321.58	388,438.81
1,448.0000	MERCURY SYSTEMS INC	25,412.40	42.0900	60,946.32	35,533.92
128.0000	MERCURY GENERAL CORP	4,974.08	54.0000	6,912.00	1,937.92
160.0000	MEREDITH CORP	4,865.60	59.4500	9,512.00	4,646.40
984.0000	MERIDIAN BANCORP INC	5,120.14	16.9000	16,629.60	11,509.46
221.0000	MERITAGE HOMES CORP	5,049.85	42.2000	9,326.20	4,276.35
1,315.0000	MERITOR INC	6,588.15	16.6100	21,842.15	15,254.00
94.0000	MESA LABORATORIES INC	5,018.66	143.3100	13,471.14	8,452.48
4,763.0000	METLIFE INC	194,474.55	54.9400	261,679.22	67,204.67
124.0000	METTLER-TOLEDO INTERNATIONAL I	19,685.56	588.5400	72,978.96	53,293.40
43,797.0000	MICROSOFT CORP	1,237,254.74	68.9300	3,018,927.21	1,781,672.47
751.0000	MICROCHIP TECHNOLOGY INC	56,151.23	77.1800	57,962.18	1,810.95
6,065.0000	MICRON TECHNOLOGY INC	65,953.46	29.8600	181,100.90	115,147.44
827.0000	MICROSEMI CORP	15,828.23	46.8000	38,703.60	22,875.37



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911.0000	MID-AMERICA APARTMENT COMMUNIT	73,203.67	105.3800	96,001.18	22,797.51
351.0000	MIDDLEBY CORP/THE	10,661.04	121.5100	42,650.01	31,988.97
2,387.0000	MODEL N INC	31,074.90	13.3000	31,747.10	672.20
358.0000	MOHAWK INDUSTRIES INC	20,413.16	241.6900	86,525.02	66,111.86
862.0000	MOLSON COORS BREWING CO	42,668.50	86.3400	74,425.08	31,756.58
10,788.0000	MONDELEZ INTERNATIONAL INC	205,927.40	43.1900	465,933.72	260,006.32
2,411.0000	MONOGRAM RESIDENTIAL TRUST INC	24,110.00	9.7100	23,410.81	699.19-
345.0000	MONOLITHIC POWER SYSTEMS INC	5,226.75	96.4000	33,258.00	28,031.25
366.0000	MONOTYPE IMAGING HOLDINGS INC	5,025.18	18.3000	6,697.80	1,672.62
148.0000	MONRO MUFFLER BRAKE INC	5,046.80	41.7500	6,179.00	1,132.20
3,073.0000	MONSANTO CO	147,297.31	118.3600	363,720.28	216,422.97
2,643.0000	MONSTER BEVERAGE CORP	73,998.17	49.6800	131,304.24	57,306.07
1,388.0000	MOODY'S CORP	53,181.58	121.6800	168,891.84	115,710.26
221.0000	MOOG INC	9,483.64	71.7200	15,850.12	6,366.48
9,977.0000	MORGAN STANLEY	211,601.19	44.5600	444,575.12	232,973.93
83.0000	MORNINGSTAR INC	4,849.69	78.3400	6,502.22	1,652.53
657.0000	MOTOROLA SOLUTIONS INC	45,785.45	86.7400	56,988.18	11,202.73



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294.0000	MOVADO GROUP INC	4,933.32	25.2500	7,423.50	2,490.18
476.0000	MUELLER INDUSTRIES INC	8,653.68	30.4500	14,494.20	5,840.52
1,130.0000	MURPHY OIL CORP	29,899.15	25.6300	28,961.90	937.25-
350.0000	MURPHY USA INC	9,641.63	74.1100	25,938.50	16,296.87
449.0000	NCI BUILDING SYSTEMS INC	4,992.88	16.7000	7,498.30	2,505.42
1,002.0000	NCR CORP	17,446.56	40.8400	40,921.68	23,475.12
1,316.0000	NCS MULTISTAGE HOLDINGS INC	31,677.70	25.1800	33,136.88	1,459.18
544.0000	NIC INC	6,832.64	18.9500	10,308.80	3,476.16
100.0000	NN INC	614.00	27.4500	2,745.00	2,131.00
3,632.0000	NRG ENERGY INC	35,993.12	17.2200	62,543.04	26,549.92
1,646.0000	NRG YIELD INC	24,673.54	17.6000	28,969.60	4,296.06
11.0000	NVR INC	7,904.41	2,410.6100	26,516.71	18,612.30
738.0000	NASDAQ INC	22,396.95	71.4900	52,759.62	30,362.67
332.0000	NATIONAL HEALTH INVESTORS INC	16,244.76	79.2000	26,294.40	10,049.64
2,125.0000	NATIONAL OILWELL VARCO INC	75,204.96	32.9400	69,997.50	5,207.46-
766.0000	NATIONAL RETAIL PROPERTIES INC	23,034.41	39.1000	29,950.60	6,916.19
1,765.0000	NATIONAL STORAGE AFFILIATES TR	22,680.25	23.1100	40,789.15	18,108.90



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254.0000	NATIONSTAR MORTGAGE HOLDINGS I	4,937.76	17.8900	4,544.06	393.70-
216.0000	NAVIGATORS GROUP INC/THE	4,966.92	54.9000	11,858.40	6,891.48
607.0000	NATUS MEDICAL INC	5,032.03	37.3000	22,641.10	17,609.07
507.0000	NAVIGANT CONSULTING INC	5,070.00	19.7600	10,018.32	4,948.32
2,501.0000	NAVIENT CORP	26,744.53	16.6500	41,641.65	14,897.12
2,079.0000	NEKTAR THERAPEUTICS	25,467.75	19.5500	40,644.45	15,176.70
233.0000	NELNET INC	5,039.79	47.0100	10,953.33	5,913.54
1,400.0000	NETAPP INC	41,905.48	40.0500	56,070.00	14,164.52
2,296.0000	NETFLIX INC	29,739.76	149.4100	343,045.36	313,305.60
818.0000	NETSCOUT SYSTEMS INC	31,173.98	34.4000	28,139.20	3,034.78-
577.0000	NEUROCRINE BIOSCIENCES INC	30,927.20	46.0000	26,542.00	4,385.20-
1,960.0000	NEW RESIDENTIAL INVESTMENT COR	24,343.20	15.5600	30,497.60	6,154.40
2,373.0000	NEW SENIOR INVESTMENT GROUP IN	24,038.49	10.0500	23,848.65	189.84-
2,764.0000	NEW YORK COMMUNITY BANCORP INC	33,278.56	13.1300	36,291.32	3,012.76
3,972.0000	NEW YORK MORTGAGE TRUST INC	29,468.02	6.2200	24,705.84	4,762.18-
1,539.0000	NEW YORK TIMES CO/THE	12,161.41	17.7000	27,240.30	15,078.89
2,709.0000	NEWELL BRANDS INC	46,268.04	53.6200	145,256.58	98,988.54



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972.0000	NEWFIELD EXPLORATION CO	22,323.60	28.4600	27,663.12	5,339.52
2,727.0000	NEWMONT MINING CORP	65,110.82	32.3900	88,327.53	23,216.71
3,343.0000	NEWS CORP	30,581.98	13.7000	45,799.10	15,217.12
496.0000	NEWSTAR FINANCIAL INC	4,786.40	10.5000	5,208.00	421.60
2,875.0000	NEXTERA ENERGY INC	159,981.80	140.1300	402,873.75	242,891.95
1,238.0000	NEXPOINT RESIDENTIAL TRUST INC	31,604.95	24.8900	30,813.82	791.13-
7,962.0000	NIKE INC	162,169.69	59.0000	469,758.00	307,588.31
1,904.0000	NISOURCE INC	15,455.01	25.3600	48,285.44	32,830.43
2,530.0000	NOBLE ENERGY INC	90,768.51	28.3000	71,599.00	19,169.51-
1,077.0000	NORDSTROM INC	48,382.85	47.8300	51,512.91	3,130.06
2,417.0000	NORFOLK SOUTHERN CORP	104,380.57	121.7000	294,148.90	189,768.33
783.0000	NORTHERN TRUST CORP	58,848.15	97.2100	76,115.43	17,267.28
1,106.0000	NORTHROP GRUMMAN CORP	68,473.34	256.7100	283,921.26	215,447.92
453.0000	NORTHSTAR REALTY EUROPE CORP	5,232.15	12.6800	5,744.04	511.89
511.0000	NORTHWEST NATURAL GAS CO	30,869.51	59.8500	30,583.35	286.16-
422.0000	NOW INC	8,195.33	16.0800	6,785.76	1,409.57-
344.0000	NU SKIN ENTERPRISES INC	12,425.28	62.8400	21,616.96	9,191.68



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1,357.0000	NUANCE COMMUNICATIONS INC	22,770.46	17.4100	23,625.37	854.91
1,348.0000	NUCOR CORP	64,306.57	57.8700	78,008.76	13,702.19
3,473.0000	NVIDIA CORP	45,792.17	144.5600	502,056.88	456,264.71
871.0000	OGE ENERGY CORP	24,753.82	34.7900	30,302.09	5,548.27
402.0000	O'REILLY AUTOMOTIVE INC	43,292.22	218.7400	87,933.48	44,641.26
420.0000	OFG BANCORP	4,863.60	10.0000	4,200.00	663.60-
2,608.0000	OASIS PETROLEUM INC	25,819.20	8.0500	20,994.40	4,824.80-
4,892.0000	OCCIDENTAL PETROLEUM CORP	225,355.79	59.8700	292,884.04	67,528.25
384.0000	OCEANFIRST FINANCIAL CORP	4,995.84	27.1200	10,414.08	5,418.24
5,675.0000	OFFICE DEPOT INC	13,285.20	5.6400	32,007.00	18,721.80
207.0000	OLD DOMINION FREIGHT LINE INC	4,987.32	95.2400	19,714.68	14,727.36
596.0000	OLD NATIONAL BANCORP/IN	6,144.76	17.2500	10,281.00	4,136.24
1,639.0000	OLD REPUBLIC INTERNATIONAL COR	15,193.53	19.5300	32,009.67	16,816.14
3,519.0000	OLD SECOND BANCORP INC	25,006.01	11.5500	40,644.45	15,638.44
1,067.0000	OLIN CORP	27,336.54	30.2800	32,308.76	4,972.22
1,714.0000	OMNICOM GROUP INC	80,191.38	82.9000	142,090.60	61,899.22
1,069.0000	OMEGA HEALTHCARE INVESTORS INC	26,369.90	33.0200	35,298.38	8,928.48



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540.0000	ON ASSIGNMENT INC	25,088.40	54.1500	29,241.00	4,152.60
2,129.0000	ON SEMICONDUCTOR CORP	31,226.78	14.0400	29,891.16	1,335.62-
321.0000	ONE GAS INC	6,291.99	69.8100	22,409.01	16,117.02
1,285.0000	ONEOK INC	44,638.95	52.1600	67,025.60	22,386.65
2,516.0000	OPKO HEALTH INC	17,554.52	6.5800	16,555.28	999.24-
21,740.0000	ORACLE CORP	388,448.16	50.1400	1,090,043.60	701,595.44
339.0000	ORBITAL ATK INC	10,405.44	98.3600	33,344.04	22,938.60
394.0000	ORITANI FINANCIAL CORP	4,988.04	17.0500	6,717.70	1,729.66
809.0000	ORMAT TECHNOLOGIES INC	14,788.52	58.6800	47,472.12	32,683.60
833.0000	OSHKOSH CORP	15,979.90	68.8800	57,377.04	41,397.14
937.0000	OTTER TAIL CORP	25,055.38	39.6000	37,105.20	12,049.82
1,078.0000	OWENS CORNING	28,408.02	66.9200	72,139.76	43,731.74
155.0000	OXFORD INDUSTRIES INC	5,068.50	62.4900	9,685.95	4,617.45
1,022.0000	PDVWIRELESS INC	24,568.88	23.3000	23,812.60	756.28-
964.0000	PBF ENERGY INC	27,608.96	22.2600	21,458.64	6,150.32-
691.0000	PDC ENERGY INC	31,557.07	43.1100	29,789.01	1,768.06-
2,770.0000	PG&E CORP	162,718.17	66.3700	183,844.90	21,126.73



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2,176.0000	PNC FINANCIAL SERVICES GROUP I	146,634.63	124.8700	271,717.12	125,082.49
545.0000	PNM RESOURCES INC	8,910.75	38.2500	20,846.25	11,935.50
1,832.0000	PPG INDUSTRIES INC	103,567.72	109.9600	201,446.72	97,879.00
2,128.0000	PPL CORP	65,068.81	38.6600	82,268.48	17,199.67
123.0000	PRA GROUP INC	4,940.09	37.9000	4,661.70	278.39-
377.0000	PVH CORP	27,132.69	114.5000	43,166.50	16,033.81
996.0000	PTC INC	22,294.00	55.1200	54,899.52	32,605.52
2,578.0000	PACCAR INC	97,811.90	66.0400	170,251.12	72,439.22
828.0000	PACIRA PHARMACEUTICALS INC/DE	26,235.18	47.7000	39,495.60	13,260.42
525.0000	PACKAGING CORP OF AMERICA	19,952.55	111.3900	58,479.75	38,527.20
1,047.0000	PACWEST BANCORP	22,495.44	46.7000	48,894.90	26,399.46
504.0000	PALO ALTO NETWORKS INC	33,881.54	133.8100	67,440.24	33,558.70
1,812.0000	PANDORA MEDIA INC	20,063.06	8.9200	16,163.04	3,900.02-
138.0000	PANERA BREAD CO	25,062.18	314.6400	43,420.32	18,358.14
718.0000	PAPA JOHN'S INTERNATIONAL INC	12,974.26	71.7600	51,523.68	38,549.42
1,667.0000	PARAMOUNT GROUP INC	27,605.52	16.0000	26,672.00	933.52-
386.0000	PAREXEL INTERNATIONAL CORP	19,528.72	86.9100	33,547.26	14,018.54



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348.0000	PARK HOTELS & RESORTS INC	7,602.25	26.9600	9,382.08	1,779.83
81.0000	PARK NATIONAL CORP	5,158.89	103.7200	8,401.32	3,242.43
1,301.0000	PARKER-HANNIFIN CORP	67,930.06	159.8200	207,925.82	139,995.76
1,835.0000	PARSLEY ENERGY INC	49,278.34	27.7500	50,921.25	1,642.91
649.0000	PATTERSON COS INC	20,540.85	46.9500	30,470.55	9,929.70
1,502.0000	PATTERSON-UTI ENERGY INC	24,783.00	20.1900	30,325.38	5,542.38
1,703.0000	PAYCHEX INC	69,566.94	56.9400	96,968.82	27,401.88
7,044.0000	PAYPAL HOLDINGS INC	138,952.48	53.6700	378,051.48	239,099.00
879.0000	PEBBLEBROOK HOTEL TRUST	23,766.28	32.2400	28,338.96	4,572.68
427.0000	PENN NATIONAL GAMING INC	3,633.04	21.4000	9,137.80	5,504.76
8,500.0000	JC PENNEY CO INC	66,059.98	4.6500	39,525.00	26,534.98-
1,383.0000	PENNSYLVANIA REAL ESTATE INVES	19,071.57	11.3200	15,655.56	3,416.01-
1,483.0000	PENNYMAC FINANCIAL SERVICES IN	25,344.47	16.7000	24,766.10	578.37-
710.0000	PENSKE AUTOMOTIVE GROUP INC	10,799.10	43.9100	31,176.10	20,377.00
4,281.0000	PEOPLE'S UNITED FINANCIAL INC	31,153.49	17.6600	75,602.46	44,448.97
7,779.0000	PEPSICO INC	577,634.68	115.4900	898,396.71	320,762.03
335.0000	PERKINELMER INC	11,241.47	68.1400	22,826.90	11,585.43



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31,332.0000	PFIZER INC	825,276.90	33.5900	1,052,441.88	227,164.98
395.0000	PHARMERICA CORP	5,186.35	26.2500	10,368.75	5,182.40
8,854.0000	PHILIP MORRIS INTERNATIONAL IN	406,174.13	117.4500	1,039,902.30	633,728.17
4,086.0000	PHILLIPS 66	111,081.33	82.6900	337,871.34	226,790.01
1,229.0000	PHYSICIANS REALTY TRUST	25,059.31	20.1400	24,752.06	307.25-
322.0000	PINNACLE FINANCIAL PARTNERS IN	4,842.88	62.8000	20,221.60	15,378.72
361.0000	PINNACLE WEST CAPITAL CORP	14,934.57	85.1600	30,742.76	15,808.19
998.0000	PIONEER NATURAL RESOURCES CO	135,913.68	159.5800	159,260.84	23,347.16
1,055.0000	PITNEY BOWES INC	14,927.87	15.1000	15,930.50	1,002.63
287.0000	PLANTRONICS INC	10,135.20	52.3100	15,012.97	4,877.77
2,277.0000	PLATFORM SPECIALTY PRODUCTS CO	25,206.39	12.6800	28,872.36	3,665.97
336.0000	PLEXUS CORP	10,175.50	52.5700	17,663.52	7,488.02
547.0000	POLARIS INDUSTRIES INC	35,156.31	92.2300	50,449.81	15,293.50
409.0000	POLYONE CORP	9,742.38	38.7400	15,844.66	6,102.28
303.0000	POOL CORP	8,683.98	117.5700	35,623.71	26,939.73
1,294.0000	POPULAR INC	20,147.58	41.7100	53,972.74	33,825.16
584.0000	PORTLAND GENERAL ELECTRIC CO	24,790.80	45.6900	26,682.96	1,892.16



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1,482.0000	PORTOLA PHARMACEUTICALS INC	27,402.18	56.1700	83,243.94	55,841.76
366.0000	POST HOLDINGS INC	20,377.14	77.6500	28,419.90	8,042.76
181.0000	POWER INTEGRATIONS INC	6,646.32	72.9000	13,194.90	6,548.58
1,910.0000	PRAXAIR INC	113,560.77	132.5500	253,170.50	139,609.73
1,777.0000	PREFERRED APARTMENT COMMUNITIE	24,806.92	15.7500	27,987.75	3,180.83
1,841.0000	T ROWE PRICE GROUP INC	87,703.03	74.2100	136,620.61	48,917.58
306.0000	PRICELINE GROUP INC/THE	127,117.24	1,870.5200	572,379.12	445,261.88
215.0000	PRIMERICA INC	5,022.40	75.7500	16,286.25	11,263.85
1,408.0000	PRINCIPAL FINANCIAL GROUP INC	42,730.56	64.0700	90,210.56	47,480.00
16,095.0000	PROCTER & GAMBLE CO/THE	1,097,235.65	87.1500	1,402,679.25	305,443.60
3,363.0000	PROGRESSIVE CORP/THE	66,217.47	44.0900	148,274.67	82,057.20
2,901.0000	PROLOGIS INC	86,339.55	58.6400	170,114.64	83,775.09
499.0000	PROOFPOINT INC	23,148.61	86.8300	43,328.17	20,179.56
295.0000	PROSPERITY BANCSHARES INC	12,522.75	64.2400	18,950.80	6,428.05
380.0000	PROVIDENT FINANCIAL SERVICES I	5,247.80	25.3800	9,644.40	4,396.60
1,746.0000	PRUDENTIAL FINANCIAL INC	113,857.82	108.1400	188,812.44	74,954.62
3,155.0000	PUBLIC SERVICE ENTERPRISE GROU	97,082.50	43.0100	135,696.55	38,614.05



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805.0000	PUBLIC STORAGE	69,477.30	208.5300	167,866.65	98,389.35
1,297.0000	PULTEGROUP INC	23,864.80	24.5300	31,815.41	7,950.61
932.0000	PZENA INVESTMENT MANAGEMENT IN	5,070.08	10.1600	9,469.12	4,399.04
122.0000	QUAKER CHEMICAL CORP	4,941.00	145.2300	17,718.06	12,777.06
1,047.0000	QORVO INC	11,927.85	63.3200	66,296.04	54,368.19
9,631.0000	QUALCOMM INC	363,996.00	55.2200	531,823.82	167,827.82
522.0000	QUALITY CARE PROPERTIES INC	16,103.70	18.3100	9,557.82	6,545.88-
1,161.0000	QUANEX BUILDING PRODUCTS CORP	22,900.01	21.1500	24,555.15	1,655.14
1,445.0000	QUANTA SERVICES INC	33,426.46	32.9200	47,569.40	14,142.94
474.0000	QUINTILES IMS HOLDINGS INC	38,129.98	89.5000	42,423.00	4,293.02
166.0000	RLI CORP	4,999.09	54.6200	9,066.92	4,067.83
1,116.0000	RLJ LODGING TRUST	25,261.50	19.8700	22,174.92	3,086.58-
36.0000	RMR GROUP INC/THE	468.00	48.6500	1,751.40	1,283.40
752.0000	RPM INTERNATIONAL INC	19,908.98	54.5500	41,021.60	21,112.62
1,058.0000	RSP PERMIAN INC	35,570.59	32.2700	34,141.66	1,428.93-
4,385.0000	RADISYS CORP	10,077.61	3.7600	16,487.60	6,409.99
506.0000	RALPH LAUREN CORP	42,339.55	73.8000	37,342.80	4,996.75-



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680.0000	RAMCO-GERSHENSON PROPERTIES TR	10,145.60	12.9000	8,772.00	1,373.60-
1,259.0000	RANGE RESOURCES CORP	32,648.66	23.1700	29,171.03	3,477.63-
1,118.0000	RAYMOND JAMES FINANCIAL INC	34,333.78	80.2200	89,685.96	55,352.18
2,524.0000	RAYONIER INC	66,103.56	28.7700	72,615.48	6,511.92
2,345.0000	RAYTHEON CO	112,928.70	161.4800	378,670.60	265,741.90
130.0000	RBC BEARINGS INC	4,838.60	101.7600	13,228.80	8,390.20
5,493.0000	REALNETWORKS INC	24,397.71	4.3300	23,784.69	613.02-
1,018.0000	REALOGY HOLDINGS CORP	31,598.63	32.4500	33,034.10	1,435.47
1,461.0000	REALTY INCOME CORP	80,407.55	55.1800	80,617.98	210.43
915.0000	RED HAT INC	59,977.27	95.7500	87,611.25	27,633.98
603.0000	REDWOOD TRUST INC	9,919.35	17.0400	10,275.12	355.77
418.0000	REGAL ENTERTAINMENT GROUP	4,928.22	20.4600	8,552.28	3,624.06
562.0000	REGENCY CENTERS CORP	23,098.20	62.6400	35,203.68	12,105.48
432.0000	REGENERON PHARMACEUTICALS INC	158,973.82	491.1400	212,172.48	53,198.66
6,294.0000	REGIONS FINANCIAL CORP	41,552.58	14.6400	92,144.16	50,591.58
526.0000	REINSURANCE GROUP OF AMERICA I	28,049.28	128.3900	67,533.14	39,483.86
473.0000	RELIANCE STEEL & ALUMINUM CO	23,309.44	72.8100	34,439.13	11,129.69



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345.0000	RENASANT CORP	4,988.70	43.7400	15,090.30	10,101.60
880.0000	RENEWABLE ENERGY GROUP INC	6,186.40	12.9500	11,396.00	5,209.60
6,220.0000	REPUBLIC FIRST BANCORP INC	24,649.86	9.2500	57,535.00	32,885.14
2,250.0000	REPUBLIC SERVICES INC	55,838.60	63.7300	143,392.50	87,553.90
966.0000	RESMED INC	24,246.60	77.8700	75,222.42	50,975.82
1,208.0000	RETAIL OPPORTUNITY INVESTMENTS	24,764.00	19.1900	23,181.52	1,582.48-
316.0000	REVLON INC	4,954.88	23.7000	7,489.20	2,534.32
1,192.0000	REXFORD INDUSTRIAL REALTY INC	25,127.36	27.4400	32,708.48	7,581.12
4,784.0000	REYNOLDS AMERICAN INC	148,854.45	65.0400	311,151.36	162,296.91
1,176.0000	RICE ENERGY INC	26,130.72	26.6300	31,316.88	5,186.16
6,267.0000	RIGEL PHARMACEUTICALS INC	16,607.55	2.7300	17,108.91	501.36
4,113.0000	RINGCENTRAL INC	61,941.78	36.5500	150,330.15	88,388.37
2,639.0000	RING ENERGY INC	31,326.23	13.0000	34,307.00	2,980.77
924.0000	ROBERT HALF INTERNATIONAL INC	28,297.13	47.9300	44,287.32	15,990.19
1,048.0000	ROCKWELL AUTOMATION INC	60,101.96	161.9600	169,734.08	109,632.12
946.0000	ROCKWELL COLLINS INC	60,516.46	105.0800	99,405.68	38,889.22
870.0000	ROLLINS INC	23,324.70	40.7100	35,417.70	12,093.00



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433.0000	ROPER TECHNOLOGIES INC	58,181.65	231.5300	100,252.49	42,070.84
1,662.0000	ROSS STORES INC	86,500.02	57.7300	95,947.26	9,447.24
395.0000	ROYAL GOLD INC	31,287.95	78.1700	30,877.15	410.80-
275.0000	RUSH ENTERPRISES INC	5,049.00	37.1800	10,224.50	5,175.50
323.0000	RYDER SYSTEM INC	16,910.88	71.9800	23,249.54	6,338.66
603.0000	RYMAN HOSPITALITY PROPERTIES I	22,823.55	64.0100	38,598.03	15,774.48
281.0000	S&T BANCORP INC	4,979.32	35.8600	10,076.66	5,097.34
1,369.0000	S&P GLOBAL INC	98,560.03	145.9900	199,860.31	101,300.28
623.0000	SBA COMMUNICATIONS CORP	25,290.00	134.9000	84,042.70	58,752.70
1,749.0000	SEI INVESTMENTS CO	35,319.39	53.7800	94,061.22	58,741.83
248.0000	SEACOR MARINE HOLDINGS INC	6,243.68	20.3600	5,049.28	1,194.40-
214.0000	SJW GROUP	4,962.66	49.1800	10,524.52	5,561.86
837.0000	SL GREEN REALTY CORP	51,158.20	105.8000	88,554.60	37,396.40
2,501.0000	SLM CORP	14,947.14	11.5000	28,761.50	13,814.36
622.0000	SS&C TECHNOLOGIES HOLDINGS INC	5,128.39	38.4100	23,891.02	18,762.63
542.0000	SAFEWAY CASA LEY CVR	550.08	1.0100	547.42	2.66-
542.0000	SAFEWAY PDC LLC CVR	17.24	0.0300	16.26	0.98-



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120.0000	SAFETY INSURANCE GROUP INC	4,950.00	68.3000	8,196.00	3,246.00
378.0000	SAGE THERAPEUTICS INC	30,621.78	79.6400	30,103.92	517.86-
411.0000	ST JOE CO/THE	5,930.73	18.7500	7,706.25	1,775.52
3,801.0000	SALESFORCE.COM INC	143,154.09	86.6000	329,166.60	186,012.51
830.0000	SALLY BEAUTY HOLDINGS INC	15,641.11	20.2500	16,807.50	1,166.39
109.0000	SANDERSON FARMS INC	5,261.43	115.6500	12,605.85	7,344.42
276.0000	SANDY SPRING BANCORP INC	4,832.76	40.6600	11,222.16	6,389.40
1,407.0000	SANMINA CORP	12,883.59	38.1000	53,606.70	40,723.11
1,451.0000	SCANA CORP	49,643.40	67.0100	97,231.51	47,588.11
166.0000	SCANSOURCE INC	4,965.06	40.3000	6,689.80	1,724.74
466.0000	HENRY SCHEIN INC	35,281.04	183.0200	85,287.32	50,006.28
9,033.0000	SCHLUMBERGER LTD	560,509.16	65.8400	594,732.72	34,223.56
194.0000	SCHOLASTIC CORP	4,834.48	43.5900	8,456.46	3,621.98
7,756.0000	CHARLES SCHWAB CORP/THE	94,455.14	42.9600	333,197.76	238,742.62
223.0000	SCIENCE APPLICATIONS INTERNATI	6,404.61	69.4200	15,480.66	9,076.05
515.0000	SCIENTIFIC GAMES CORP	5,000.65	26.1000	13,441.50	8,440.85
112.0000	SCOTTS MIRACLE-GRO CO/THE	4,957.12	89.4600	10,019.52	5,062.40



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432.0000	SCRIPPS NETWORKS INTERACTIVE I	22,272.92	68.3100	29,509.92	7,237.00
247.0000	SEACOR HOLDINGS INC	9,433.88	34.3000	8,472.10	961.78-
885.0000	SEALED AIR CORP	24,751.46	44.7600	39,612.60	14,861.14
1,234.0000	SEATTLE GENETICS INC	27,004.51	51.7400	63,847.16	36,842.65
600.0000	SELECT MEDICAL HOLDINGS CORP	5,106.00	15.3500	9,210.00	4,104.00
340.0000	SELECTIVE INSURANCE GROUP INC	5,392.40	50.0500	17,017.00	11,624.60
702.0000	SEMGROUP CORP	25,249.65	27.0000	18,954.00	6,295.65-
1,489.0000	SEMPRA ENERGY	78,923.46	112.7500	167,884.75	88,961.29
1,419.0000	SENIOR HOUSING PROPERTIES TRUS	30,903.72	20.4400	29,004.36	1,899.36-
265.0000	SENSIENT TECHNOLOGIES CORP	9,877.89	80.5300	21,340.45	11,462.56
1,811.0000	SERVICE CORP INTERNATIONAL/US	14,958.86	33.4500	60,577.95	45,619.09
735.0000	SERVICEMASTER GLOBAL HOLDINGS	25,438.35	39.1900	28,804.65	3,366.30
852.0000	SERVICENOW INC	68,307.16	106.0000	90,312.00	22,004.84
996.0000	SHENANDOAH TELECOMMUNICATIONS	5,522.82	30.7000	30,577.20	25,054.38
393.0000	SHERWIN-WILLIAMS CO/THE	110,419.04	350.9600	137,927.28	27,508.24
574.0000	SHUTTERFLY INC	17,036.32	47.5000	27,265.00	10,228.68
260.0000	SIGNATURE BANK/NEW YORK NY	14,513.20	143.5300	37,317.80	22,804.60



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248.0000	SILGAN HOLDINGS INC	4,968.68	31.7800	7,881.44	2,912.76
202.0000	SIMMONS FIRST NATIONAL CORP	4,930.82	52.9000	10,685.80	5,754.98
1,920.0000	SIMON PROPERTY GROUP INC	195,990.96	161.7600	310,579.20	114,588.24
725.0000	SIMPSON MANUFACTURING CO INC	27,661.94	43.7100	31,689.75	4,027.81
19,708.0000	SIRIUS XM HOLDINGS INC	38,546.63	5.4700	107,802.76	69,256.13
284.0000	SIX FLAGS ENTERTAINMENT CORP	5,236.05	59.6100	16,929.24	11,693.19
1,053.0000	SKECHERS U.S.A. INC	4,794.66	29.5000	31,063.50	26,268.84
1,809.0000	SKYWORKS SOLUTIONS INC	28,039.50	95.9500	173,573.55	145,534.05
832.0000	AO SMITH CORP	12,858.56	56.3300	46,866.56	34,008.00
574.0000	JM SMUCKER CO/THE	69,916.16	118.3300	67,921.42	1,994.74-
284.0000	SNAP-ON INC	14,603.28	158.0000	44,872.00	30,268.72
229.0000	SNYDER'S-LANCE INC	4,813.58	34.6200	7,927.98	3,114.40
375.0000	SONIC AUTOMOTIVE INC	5,231.25	19.4500	7,293.75	2,062.50
693.0000	SONOCO PRODUCTS CO	21,755.05	51.4200	35,634.06	13,879.01
268.0000	SOUTH STATE CORP	6,934.43	85.7000	22,967.60	16,033.17
5,599.0000	SOUTHERN CO/THE	219,264.80	47.8800	268,080.12	48,815.32
344.0000	SOUTHSIDE BANCSHARES INC	5,031.40	34.9400	12,019.36	6,987.96



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4,521.0000	SOUTHWEST AIRLINES CO	37,786.12	62.1400	280,934.94	243,148.82
133.0000	SOUTHWEST GAS HOLDINGS INC	4,984.84	73.0600	9,716.98	4,732.14
4,005.0000	SOUTHWESTERN ENERGY CO	30,743.37	6.0800	24,350.40	6,392.97-
903.0000	SPARTANNASH CO	14,948.21	25.9600	23,441.88	8,493.67
6,217.0000	SPECTRUM PHARMACEUTICALS INC	27,541.31	7.4500	46,316.65	18,775.34
237.0000	SPECTRUM BRANDS HOLDINGS INC	24,572.16	125.0400	29,634.48	5,062.32
363.0000	SPEEDWAY MOTORSPORTS INC	5,027.55	18.2700	6,632.01	1,604.46
125.0000	SPIRE INC	4,991.25	69.7500	8,718.75	3,727.50
995.0000	SPIRIT AEROSYSTEMS HOLDINGS IN	19,907.90	57.9400	57,650.30	37,742.40
415.0000	SPIRIT AIRLINES INC	4,988.47	51.6500	21,434.75	16,446.28
4,046.0000	SPIRIT REALTY CAPITAL INC	40,055.40	7.4100	29,980.86	10,074.54-
437.0000	SPOK HOLDINGS INC	4,959.95	17.7000	7,734.90	2,774.95
643.0000	SPLUNK INC	32,310.34	56.8900	36,580.27	4,269.93
5,513.0000	SPRINT CORP	36,457.71	8.2100	45,261.73	8,804.02
1,167.0000	SPROUTS FARMERS MARKET INC	24,436.98	22.6700	26,455.89	2,018.91
1,312.0000	SQUARE INC	31,302.76	23.4600	30,779.52	523.24-
1,048.0000	STANLEY BLACK & DECKER INC	63,638.44	140.7300	147,485.04	83,846.60



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3,746.0000	STAPLES INC	35,895.15	10.0700	37,722.22	1,827.07
8,542.0000	STARBUCKS CORP	146,604.17	58.3100	498,084.02	351,479.85
1,034.0000	STARWOOD PROPERTY TRUST INC	21,920.58	22.3900	23,151.26	1,230.68
1,936.0000	STATE STREET CORP	132,308.62	89.7300	173,717.28	41,408.66
874.0000	STEEL DYNAMICS INC	25,125.13	35.8100	31,297.94	6,172.81
714.0000	STERICYCLE INC	41,276.93	76.3200	54,492.48	13,215.55
726.0000	STIFEL FINANCIAL CORP	24,700.72	45.9800	33,381.48	8,680.76
1,246.0000	STORE CAPITAL CORP	30,538.23	22.4500	27,972.70	2,565.53-
2,243.0000	STRYKER CORP	111,458.04	138.7800	311,283.54	199,825.50
115.0000	STURM RUGER & CO INC	3,192.40	62.1500	7,147.25	3,954.85
431.0000	SUN BANCORP INC/NJ	5,348.71	24.6500	10,624.15	5,275.44
361.0000	SUN COMMUNITIES INC	28,887.22	87.6900	31,656.09	2,768.87
1,473.0000	SUNSTONE HOTEL INVESTORS INC	12,284.67	16.1200	23,744.76	11,460.09
2,833.0000	SUNTRUST BANKS INC	74,836.57	56.7200	160,687.76	85,851.19
1,679.0000	SUPERIOR ENERGY SERVICES INC	24,227.97	10.4300	17,511.97	6,716.00-
1,893.0000	SUPERVALU INC	5,054.31	3.2900	6,227.97	1,173.66
2,749.0000	SYMANTEC CORP	59,536.45	28.2500	77,659.25	18,122.80



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306.0000	SYNAPTICS INC	14,800.30	51.7100	15,823.26	1,022.96
923.0000	SYNOPSIS INC	23,407.28	72.9300	67,314.39	43,907.11
691.0000	SYNOVUS FINANCIAL CORP	8,851.71	44.2400	30,569.84	21,718.13
172.0000	SYNNEX CORP	5,144.52	119.9600	20,633.12	15,488.60
4,194.0000	SYNCHRONY FINANCIAL	132,878.92	29.8200	125,065.08	7,813.84-
2,140.0000	SYSCO CORP	88,583.65	50.3300	107,706.20	19,122.55
2,285.0000	TCF FINANCIAL CORP	23,307.00	15.9400	36,422.90	13,115.90
1,077.0000	TD AMERITRADE HOLDING CORP	20,032.20	42.9900	46,300.23	26,268.03
519.0000	TFS FINANCIAL CORP	4,899.36	15.4700	8,028.93	3,129.57
2,835.0000	TJX COS INC/THE	63,836.91	72.1700	204,601.95	140,765.04
3,178.0000	T-MOBILE US INC	86,007.51	60.6200	192,650.36	106,642.85
2,508.0000	TRI POINTE GROUP INC	31,768.82	13.1900	33,080.52	1,311.70
576.0000	TABLEAU SOFTWARE INC	30,810.24	61.2700	35,291.52	4,481.28
462.0000	TAKE-TWO INTERACTIVE SOFTWARE	6,842.22	73.3800	33,901.56	27,059.34
183.0000	TANGER FACTORY OUTLET CENTERS	4,884.27	25.9800	4,754.34	129.93-
1,460.0000	TARGET CORP	109,976.44	52.2900	76,343.40	33,633.04-
979.0000	TARGA RESOURCES CORP	45,532.52	45.2000	44,250.80	1,281.72-



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180.0000	TAUBMAN CENTERS INC	7,216.20	59.5500	10,719.00	3,502.80
293.0000	TECH DATA CORP	13,510.23	101.0000	29,593.00	16,082.77
2,166.0000	TEGNA INC	14,843.68	14.4100	31,212.06	16,368.38
229.0000	TELEDYNE TECHNOLOGIES INC	14,788.97	127.6500	29,231.85	14,442.88
269.0000	TELEFLEX INC	14,883.77	207.7600	55,887.44	41,003.67
424.0000	TEMPUR SEALY INTERNATIONAL INC	25,417.76	53.3900	22,637.36	2,780.40-
8.0000	TENNANT CO	306.32	73.8000	590.40	284.08
373.0000	TENNECO INC	10,089.65	57.8300	21,570.59	11,480.94
2,492.0000	TERADATA CORP	65,863.56	29.4900	73,489.08	7,625.52
1,238.0000	TERADYNE INC	17,109.16	30.0300	37,177.14	20,067.98
1,161.0000	TEREX CORP	18,634.05	37.5000	43,537.50	24,903.45
1,110.0000	TERRENO REALTY CORP	25,241.40	33.6600	37,362.60	12,121.20
279.0000	TESARO INC	39,439.01	139.8600	39,020.94	418.07-
774.0000	TESLA INC	161,238.34	361.6100	279,886.14	118,647.80
711.0000	TESORO CORP	46,836.41	93.6000	66,549.60	19,713.19
392.0000	TETRA TECH INC	8,874.88	45.7500	17,934.00	9,059.12
7,279.0000	TEXAS INSTRUMENTS INC	244,128.67	76.9300	559,973.47	315,844.80



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1,748.0000	TEXTRON INC	31,848.56	47.1000	82,330.80	50,482.24
2,629.0000	THERMO FISHER SCIENTIFIC INC	103,380.78	174.4700	458,681.63	355,300.85
237.0000	THOR INDUSTRIES INC	7,245.09	104.5200	24,771.24	17,526.15
3,584.0000	3M CO	268,203.98	208.1900	746,152.96	477,948.98
804.0000	TIFFANY & CO	26,927.00	93.8700	75,471.48	48,544.48
709.0000	TIME INC	8,685.35	14.3500	10,174.15	1,488.80
5,673.0000	TIME WARNER INC	210,551.20	100.4100	569,625.93	359,074.73
552.0000	TIMKEN CO/THE	17,960.03	46.2500	25,530.00	7,569.97
1,306.0000	TOLL BROTHERS INC	28,007.74	39.5100	51,600.06	23,592.32
130.0000	TOMPKINS FINANCIAL CORP	5,062.20	78.7200	10,233.60	5,171.40
326.0000	TOPBUILD CORP	5,457.70	53.0700	17,300.82	11,843.12
933.0000	TORCHMARK CORP	26,189.27	76.5000	71,374.50	45,185.23
1,624.0000	TORO CO/THE	20,056.40	69.2900	112,526.96	92,470.56
1,020.0000	TOTAL SYSTEM SERVICES INC	18,125.40	58.2500	59,415.00	41,289.60
395.0000	TOWNE BANK/PORTSMOUTH VA	5,100.49	30.8000	12,166.00	7,065.51
804.0000	TRACTOR SUPPLY CO	26,097.84	54.2100	43,584.84	17,487.00
211.0000	TRANSDIGM GROUP INC	50,357.10	268.8700	56,731.57	6,374.47



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1,823.0000	TRAVELERS COS INC/THE	84,751.63	126.5300	230,664.19	145,912.56
376.0000	TREEHOUSE FOODS INC	24,496.21	81.6900	30,715.44	6,219.23
807.0000	TRIBUNE MEDIA CO	26,978.01	40.7700	32,901.39	5,923.38
422.0000	TRICO BANCSHARES	6,055.70	35.1500	14,833.30	8,777.60
1,544.0000	TRIMBLE INC	28,618.04	35.6700	55,074.48	26,456.44
1,700.0000	TRINITY INDUSTRIES INC	17,187.00	28.0300	47,651.00	30,464.00
864.0000	TRIPADVISOR INC	30,656.76	38.2000	33,004.80	2,348.04
345.0000	TRUEBLUE INC	5,023.20	26.5000	9,142.50	4,119.30
3,817.0000	TRUSTCO BANK CORP NY	30,941.78	7.7500	29,581.75	1,360.03-
434.0000	TUPPERWARE BRANDS CORP	20,697.46	70.2300	30,479.82	9,782.36
12,630.0000	TWENTY-FIRST CENTURY FOX INC	216,805.30	28.3400	357,934.20	141,128.90
4,196.0000	TWITTER INC	75,964.44	17.8700	74,982.52	981.92-
191.0000	TYLER TECHNOLOGIES INC	31,883.63	175.6700	33,552.97	1,669.34
2,472.0000	TYSON FOODS INC	40,278.10	62.6300	154,821.36	114,543.26
1,250.0000	UDR INC	28,512.50	38.9700	48,712.50	20,200.00
1,057.0000	UGI CORP	20,769.53	48.4100	51,169.37	30,399.84
9,057.0000	US BANCORP	363,688.19	51.9200	470,239.44	106,551.25



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5,482.0000	UMH PROPERTIES INC	67,209.32	17.0500	93,468.10	26,258.78
412.0000	US SILICA HOLDINGS INC	4,865.72	35.4900	14,621.88	9,756.16
321.0000	ULTA BEAUTY INC	28,047.39	287.3400	92,236.14	64,188.75
157.0000	ULTIMATE SOFTWARE GROUP INC/TH	22,295.35	210.0600	32,979.42	10,684.07
390.0000	ULTRAGENYX PHARMACEUTICAL INC	27,112.80	62.1100	24,222.90	2,889.90-
2,143.0000	UMPQUA HOLDINGS CORP	22,843.44	18.3600	39,345.48	16,502.04
1,518.0000	UNDER ARMOUR INC	15,948.61	21.7600	33,031.68	17,083.07
1,528.0000	UNDER ARMOUR INC	15,421.05	20.1600	30,804.48	15,383.43
1,210.0000	UNION BANKSHARES CORP	14,442.71	33.9000	41,019.00	26,576.29
4,281.0000	UNION PACIFIC CORP	104,326.71	108.9100	466,243.71	361,917.00
1,093.0000	UNISYS CORP	16,248.96	12.8000	13,990.40	2,258.56-
773.0000	UNITED COMMUNITY BANKS INC/GA	5,094.07	27.8000	21,489.40	16,395.33
1,089.0000	UNITED BANKSHARES INC/WV	16,376.94	39.2000	42,688.80	26,311.86
1,795.0000	UNITED CONTINENTAL HOLDINGS IN	43,020.22	75.2500	135,073.75	92,053.53
942.0000	UNITED FINANCIAL BANCORP INC	9,977.00	16.6900	15,721.98	5,744.98
277.0000	UNITED FIRE GROUP INC	4,855.81	44.0600	12,204.62	7,348.81
3,891.0000	UNITED PARCEL SERVICE INC	317,116.96	110.5900	430,305.69	113,188.73



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877.0000	UNITED RENTALS INC	29,665.30	112.7100	98,846.67	69,181.37
1,392.0000	UNITED STATES STEEL CORP	25,042.08	22.1400	30,818.88	5,776.80
5,385.0000	UNITED TECHNOLOGIES CORP	342,881.26	122.1100	657,562.35	314,681.09
577.0000	UNITED THERAPEUTICS CORP	30,322.24	129.7300	74,854.21	44,531.97
6,172.0000	UNITEDHEALTH GROUP INC	308,251.92	185.4200	1,144,412.24	836,160.32
723.0000	UNITIL CORP	19,860.65	48.3100	34,928.13	15,067.48
455.0000	UNIVERSAL CORP/VA	24,865.75	64.7000	29,438.50	4,572.75
413.0000	UNIVERSAL DISPLAY CORP	25,399.50	109.2500	45,120.25	19,720.75
322.0000	UNIVERSAL ELECTRONICS INC	5,255.04	66.8500	21,525.70	16,270.66
251.0000	UNIVERSAL FOREST PRODUCTS INC	9,814.10	87.3100	21,914.81	12,100.71
346.0000	UNIVERSAL HEALTH SERVICES INC	14,933.36	122.0800	42,239.68	27,306.32
2,315.0000	UNUM GROUP	45,314.50	46.6300	107,948.45	62,633.95
403.0000	URBAN EDGE PROPERTIES	6,400.34	23.7300	9,563.19	3,162.85
1,511.0000	URSTADT BIDDLE PROPERTIES INC	30,625.41	19.8000	29,917.80	707.61-
776.0000	VCA INC	16,594.96	92.3100	71,632.56	55,037.60
1,543.0000	VF CORP	63,002.23	57.6000	88,876.80	25,874.57
6.0000	VSE CORP	66.60	44.9800	269.88	203.28



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226.0000	VAIL RESORTS INC	9,991.46	202.8300	45,839.58	35,848.12
3,315.0000	VALERO ENERGY CORP	84,158.71	67.4600	223,629.90	139,471.19
241.0000	VALMONT INDUSTRIES INC	20,325.94	149.6000	36,053.60	15,727.66
1,737.0000	VALVOLINE INC	18,500.82	23.7200	41,201.64	22,700.82
645.0000	VANTIV INC	34,361.41	63.3400	40,854.30	6,492.89
423.0000	VAREX IMAGING CORP	6,104.89	33.8000	14,297.40	8,192.51
1,059.0000	VARIAN MEDICAL SYSTEMS INC	45,253.25	103.1900	109,278.21	64,024.96
592.0000	VECTREN CORP	24,147.68	58.4400	34,596.48	10,448.80
1,220.0000	VECTOR GROUP LTD	15,446.90	21.3200	26,010.40	10,563.50
729.0000	VEEVA SYSTEMS INC	24,530.85	61.3100	44,694.99	20,164.14
2,106.0000	VENTAS INC	115,477.96	69.4800	146,324.88	30,846.92
4,393.0000	VEREIT INC	40,301.57	8.1400	35,759.02	4,542.55-
1,677.0000	VERIFONE SYSTEMS INC	29,951.22	18.1000	30,353.70	402.48
1,238.0000	VERISIGN INC	29,146.48	92.9600	115,084.48	85,938.00
22,422.0000	VERIZON COMMUNICATIONS INC	832,703.53	44.6600	1,001,366.52	168,662.99
145.0000	VERINT SYSTEMS INC	5,067.75	40.7000	5,901.50	833.75
1,120.0000	VERISK ANALYTICS INC	52,152.76	84.3700	94,494.40	42,341.64



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51.0000	VERITIV CORP	1,289.12	45.0000	2,295.00	1,005.88
1,564.0000	VERTEX PHARMACEUTICALS INC	57,135.04	128.8700	201,552.68	144,417.64
742.0000	VERSUM MATERIALS INC	7,434.21	32.5000	24,115.00	16,680.79
149.0000	VIASAT INC	7,852.09	66.2000	9,863.80	2,011.71
3,550.0000	VIACOM INC	132,577.60	33.5700	119,173.50	13,404.10-
10,342.0000	VISA INC	259,960.13	93.7800	969,872.76	709,912.63
2,019.0000	VISHAY INTERTECHNOLOGY INC	19,059.36	16.6000	33,515.40	14,456.04
371.0000	VISHAY PRECISION GROUP INC	4,960.27	17.3000	6,418.30	1,458.03
360.0000	VISTA OUTDOOR INC	6,471.68	22.5100	8,103.60	1,631.92
258.0000	VISTEON CORP	14,889.92	102.0600	26,331.48	11,441.56
332.0000	VLASIC FOODS INTL INC COM	3,527.39	10.6246	3,527.39	0.00
471.0000	VMWARE INC	24,892.35	87.4300	41,179.53	16,287.18
7,229.0000	VONAGE HOLDINGS CORP	13,662.81	6.5400	47,277.66	33,614.85
815.0000	VORNADO REALTY TRUST	62,536.96	93.9000	76,528.50	13,991.54
673.0000	VOYA FINANCIAL INC	26,866.16	36.8900	24,826.97	2,039.19-
996.0000	VULCAN MATERIALS CO	57,455.44	126.6800	126,173.28	68,717.84
90.0000	WD-40 CO	4,888.80	110.3500	9,931.50	5,042.70



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213.0000	WABCO HOLDINGS INC	14,611.56	127.5100	27,159.63	12,548.07
384.0000	WSFS FINANCIAL CORP	4,825.60	45.3500	17,414.40	12,588.80
1,647.0000	WEC ENERGY GROUP INC	43,446.80	61.3800	101,092.86	57,646.06
545.0000	WABASH NATIONAL CORP	4,845.05	21.9800	11,979.10	7,134.05
320.0000	WABTEC CORP/DE	15,928.17	91.5000	29,280.00	13,351.83
9,425.0000	WAL-MART STORES INC	499,908.14	75.6800	713,284.00	213,375.86
4,977.0000	WALGREENS BOOTS ALLIANCE INC	303,179.47	78.3100	389,748.87	86,569.40
571.0000	WASHINGTON FEDERAL INC	9,889.72	33.2000	18,957.20	9,067.48
2,675.0000	WASHINGTON PRIME GROUP INC	27,830.62	8.3700	22,389.75	5,440.87-
218.0000	WASHINGTON TRUST BANCORP INC	4,848.32	51.5500	11,237.90	6,389.58
2,245.0000	WASTE MANAGEMENT INC	107,300.69	73.3500	164,670.75	57,370.06
320.0000	WATERS CORP	29,330.56	183.8400	58,828.80	29,498.24
1,807.0000	WATERSTONE FINANCIAL INC	25,152.36	18.8500	34,061.95	8,909.59
218.0000	WATSCO INC	30,504.74	154.2000	33,615.60	3,110.86
189.0000	WATTS WATER TECHNOLOGIES INC	6,261.57	63.2000	11,944.80	5,683.23
432.0000	WAYFAIR INC	32,188.32	76.8800	33,212.16	1,023.84
222.0000	WEBMD HEALTH CORP	5,179.26	58.6500	13,020.30	7,841.04



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721.0000	WEBSTER FINANCIAL CORP	14,170.57	52.2200	37,650.62	23,480.05
826.0000	WEINGARTEN REALTY INVESTORS	19,237.54	30.1000	24,862.60	5,625.06
1,451.0000	WELBILT INC	11,833.07	18.8500	27,351.35	15,518.28
267.0000	WELLCARE HEALTH PLANS INC	13,107.03	179.5600	47,942.52	34,835.49
28,494.0000	WELLS FARGO & CO	1,030,322.29	55.4100	1,578,852.54	548,530.25
2,852.0000	WELLTOWER INC	121,776.29	74.8500	213,472.20	91,695.91
3,177.0000	WENDY'S CO/THE	14,804.82	15.5100	49,275.27	34,470.45
261.0000	WESBANCO INC	4,909.41	39.5400	10,319.94	5,410.53
380.0000	WESCO AIRCRAFT HOLDINGS INC	5,035.00	10.8500	4,123.00	912.00-
576.0000	WESCO INTERNATIONAL INC	20,378.88	57.3000	33,004.80	12,625.92
306.0000	WEST PHARMACEUTICAL SERVICES I	9,691.02	94.5200	28,923.12	19,232.10
704.0000	WESTAR ENERGY INC	24,998.56	53.0200	37,326.08	12,327.52
729.0000	WESTERN ALLIANCE BANCORP	4,891.59	49.2000	35,866.80	30,975.21
2,116.0000	WESTERN DIGITAL CORP	59,450.09	88.6000	187,477.60	128,027.51
2,417.0000	WESTERN UNION CO/THE	47,598.62	19.0500	46,043.85	1,554.77-
636.0000	WESTLAKE CHEMICAL CORP	25,331.88	66.2100	42,109.56	16,777.68
2,048.0000	WESTROCK CO	57,100.95	56.6600	116,039.68	58,938.73



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135.0000	WESTWOOD HOLDINGS GROUP INC	4,885.65	56.6900	7,653.15	2,767.50
358.0000	WEX INC	20,422.49	104.2700	37,328.66	16,906.17
4,707.0000	WEYERHAEUSER CO	82,023.75	33.5000	157,684.50	75,660.75
357.0000	WHIRLPOOL CORP	35,735.02	191.6200	68,408.34	32,673.32
1,956.0000	WHITESTONE REIT	22,788.18	12.2500	23,961.00	1,172.82
1,724.0000	WHOLE FOODS MARKET INC	54,856.19	42.1100	72,597.64	17,741.45
137.0000	JOHN WILEY & SONS INC	4,945.70	52.7500	7,226.75	2,281.05
4,420.0000	WILLIAMS COS INC/THE	95,700.86	30.2800	133,837.60	38,136.74
615.0000	WILLIAMS-SONOMA INC	21,863.25	48.5000	29,827.50	7,964.25
221.0000	WINTRUST FINANCIAL CORP	6,917.30	76.4400	16,893.24	9,975.94
387.0000	WOODWARD INC	12,527.19	67.5800	26,153.46	13,626.27
777.0000	WORKDAY INC	57,023.66	97.0000	75,369.00	18,345.34
445.0000	WORLD FUEL SERVICES CORP	15,276.85	38.4500	17,110.25	1,833.40
361.0000	WORTHINGTON INDUSTRIES INC	7,104.48	50.2200	18,129.42	11,024.94
2,045.0000	WPX ENERGY INC	28,207.51	9.6600	19,754.70	8,452.81-
1,099.0000	WYNDHAM WORLDWIDE CORP	39,201.38	100.4100	110,350.59	71,149.21
519.0000	WYNN RESORTS LTD	42,319.12	134.1200	69,608.28	27,289.16



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1,757.0000	XO GROUP INC	31,147.82	17.6200	30,958.34	189.48-
1,214.0000	XPO LOGISTICS INC	36,038.90	64.6300	78,460.82	42,421.92
1,915.0000	XILINX INC	45,059.95	64.3200	123,172.80	78,112.85
1,935.0000	XEROX CORP	44,551.52	28.7300	55,592.55	11,041.03
1,134.0000	XYLEM INC/NY	31,196.40	55.4300	62,857.62	31,661.22
279.0000	XPERI CORP	4,511.43	29.8000	8,314.20	3,802.77
929.0000	YELP INC	25,017.97	30.0200	27,888.58	2,870.61
293.0000	YORK WATER CO/THE	5,051.32	34.8500	10,211.05	5,159.73
1,773.0000	YUM! BRANDS INC	44,183.08	73.7600	130,776.48	86,593.40
2,070.0000	YUM CHINA HOLDINGS INC	28,171.53	39.4300	81,620.10	53,448.57
962.0000	ZAYO GROUP HOLDINGS INC	25,541.10	30.9000	29,725.80	4,184.70
552.0000	ZEBRA TECHNOLOGIES CORP	16,526.88	100.5200	55,487.04	38,960.16
679.0000	ZILLOW GROUP INC	32,123.49	48.8400	33,162.36	1,038.87
838.0000	ZILLOW GROUP INC	23,553.89	49.0100	41,070.38	17,516.49
1,013.0000	ZIMMER BIOMET HOLDINGS INC	68,539.07	128.4000	130,069.20	61,530.13
1,913.0000	ZIONS BANCORPORATION	29,670.63	43.9100	83,999.83	54,329.20
2,650.0000	ZOETIS INC	128,339.85	62.3800	165,307.00	36,967.15



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TOTAL INVESTMENTS EQUITY		77,602,650.70		152,295,607.98	74,692,957.28
TOTAL INVESTMENT		77,853,993.49		152,546,950.77	74,692,957.28



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
438,660.8400	BLACKROCK LIQ T FUND INSTL FUND 60	438,660.84	100.0000	438,660.84	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		438,660.84		438,660.84	0.00
<u>INVESTMENTS FIXED INCOME SECURITIES</u>					
133,182.4600	ADVANCED DISPOSAL 10/16 COV-LITE TLB	133,182.46	100.3040	133,587.33	404.87
175,000.0000	AES CORP/VA 4.875% 05/15/2023 DD 04/30/13	177,232.88	101.8750	178,281.25	1,048.37
100,000.0000	AES CORP/VA 5.500% 04/15/2025 DD 04/06/15	99,180.21	104.6250	104,625.00	5,444.79
25,000.0000	AK STEEL CORP 7.000% 03/15/2027 DD 03/23/17	25,000.00	103.2500	25,812.50	812.50
100,000.0000	AMC NETWORKS INC 5.000% 04/01/2024 DD 03/30/16	100,000.00	102.3750	102,375.00	2,375.00
25,000.0000	AMN HEALTHCARE INC 144A 5.125% 10/01/2024 DD 10/03/16	25,000.00	101.2500	25,312.50	312.50
75,000.0000	AMERICAN TIRE DISTRIBUTOR 144A 10.250% 03/01/2022 DD 02/25/15	68,794.83	103.5000	77,625.00	8,830.17
50,000.0000	ACADIA HEALTHCARE CO INC 6.500% 03/01/2024 DD 02/16/16	50,086.97	106.7500	53,375.00	3,288.03



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50,000.0000	AECOM 5.750% 10/15/2022 DD 10/15/15	49,947.41	104.6250	52,312.50	2,365.09
50,000.0000	AECOM 5.875% 10/15/2024 DD 10/15/15	49,344.00	108.7500	54,375.00	5,031.00
50,000.0000	AECOM 5.125% 03/15/2027 DD 02/21/17	50,000.00	100.3750	50,187.50	187.50
75,000.0000	ADVANCED DISPOSAL SERVICE 144A 5.625% 11/15/2024 DD 11/10/16	75,000.00	103.0000	77,250.00	2,250.00
200,000.0000	ALBERTSONS COS LLC / SAFE 144A 5.750% 03/15/2025 DD 08/09/16	200,000.00	93.0000	186,000.00	14,000.00-
100,000.0000	ALLIANCE DATA SYSTEMS COR 144A 5.250% 12/01/2017 DD 11/20/12	100,454.95	100.7500	100,750.00	295.05
50,000.0000	ALLIANCE DATA SYSTEMS COR 144A 5.875% 11/01/2021 DD 10/27/16	50,000.00	103.5000	51,750.00	1,750.00
50,000.0000	ALLY FINANCIAL INC 4.750% 09/10/2018 DD 09/09/13	51,363.70	102.7500	51,375.00	11.30
100,000.0000	ALLY FINANCIAL INC 4.625% 05/19/2022 DD 05/19/15	99,567.96	104.0000	104,000.00	4,432.04
25,000.0000	ALPHA 3 BV / ALPHA US BID 144A 6.250% 02/01/2025 DD 01/31/17	25,000.00	102.8750	25,718.75	718.75
35,000.0000	ALPINE FINANCE MERGER SUB 144A 6.875% 08/01/2025 DD 07/12/17	35,000.00	101.7500	35,612.50	612.50



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200,000.0000	ALTICE LUXEMBOURG SA 144A 7.750% 05/15/2022 DD 05/08/14	210,424.00	106.1250	212,250.00	1,826.00
65,000.0000	AMERICAN AXLE & MANUFACTURING 7.750% 11/15/2019 DD 11/03/11	71,741.90	109.7500	71,337.50	404.40-
25,000.0000	AMERICAN AXLE & MANUFACTU 144A 6.250% 04/01/2025 DD 03/23/17	25,000.00	97.5000	24,375.00	625.00-
25,000.0000	AMERICAN AXLE & MANUFACTU 144A 6.500% 04/01/2027 DD 03/23/17	25,000.00	97.2500	24,312.50	687.50-
95,000.0000	AMERICAN BUILDERS & CONTR 144A 5.625% 04/15/2021 DD 04/16/13	95,308.65	102.8750	97,731.25	2,422.60
25,000.0000	AMERIGAS PARTNERS LP / AMERIGA 5.750% 05/20/2027 DD 02/13/17	25,000.00	101.2500	25,312.50	312.50
18,000.0000	ANCESTRY.COM 10/16 2ND LIEN COV-LITE TL	17,829.91	102.0830	18,374.94	545.03
19,800.0000	ANCESTRY.COM 2/17 TL	19,710.52	100.3330	19,865.93	155.41
75,000.0000	ANGLO AMERICAN CAPITAL PL 144A 9.375% 04/08/2019 DD 04/08/09	84,390.42	111.8750	83,906.25	484.17-
25,000.0000	ANTERO MIDSTREAM PARTNERS 144A 5.375% 09/15/2024 DD 09/13/16	25,000.00	102.2500	25,562.50	562.50
100,000.0000	ARAMARK SERVICES INC 5.125% 01/15/2024 DD 12/17/15	100,000.00	105.1250	105,125.00	5,125.00
200,000.0000	ARDAGH PACKAGING FINANCE 144A 4.625% 05/15/2023 DD 05/16/16	200,000.00	102.4590	204,918.00	4,918.00



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200,000.0000	ARDAGH PACKAGING FINANCE 144A 6.000% 02/15/2025 DD 01/30/17	202,903.26	105.0000	210,000.00	7,096.74
250,000.0000	PETSMART INC 144A 7.125% 03/15/2023 DD 03/04/15	249,619.86	89.0000	222,500.00	27,119.86-
25,000.0000	ASCENT RESOURCES UTICA HO 144A 10.000% 04/01/2022 DD 04/05/17	25,000.00	100.0000	25,000.00	0.00
99,336.0400	BASS PRO SHOPS 11/16 COV-LITE TLB	98,385.26	97.0500	96,405.63	1,979.63-
150,000.0000	BAYTEX ENERGY CORP 144A 5.125% 06/01/2021 DD 06/06/14	134,446.14	88.7500	133,125.00	1,321.14-
50,000.0000	BLOCK COMMUNICATIONS INC 144A 6.875% 02/15/2025 DD 02/16/17	50,000.00	107.2500	53,625.00	3,625.00
100,000.0000	BLUE RACER MIDSTREAM LLC 144A 6.125% 11/15/2022 DD 11/13/14	101,152.67	100.7500	100,750.00	402.67-
150,000.0000	BLUESCOPE STEEL FINANCE L 144A 6.500% 05/15/2021 DD 05/05/16	159,005.82	105.5000	158,250.00	755.82-
50,000.0000	BOMBARDIER INC 144A 6.000% 10/15/2022 DD 04/03/14	50,121.49	100.0000	50,000.00	121.49-
45,000.0000	BRAND ENERGY & INFRASTRUC 144A 8.500% 07/15/2025 DD 06/21/17	45,000.00	103.5000	46,575.00	1,575.00
105,000.0000	BWAY HOLDING CO 144A 5.500% 04/15/2024 DD 04/03/17	105,000.00	102.1250	107,231.25	2,231.25



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160,000.0000	BWAY HOLDING CO 144A 7.250% 04/15/2025 DD 04/03/17	160,000.00	101.5000	162,400.00	2,400.00
50,000.0000	CCO HOLDINGS LLC / CCO HO 144A 5.875% 04/01/2024 DD 02/19/16	50,000.00	106.7500	53,375.00	3,375.00
300,000.0000	CCO HOLDINGS LLC / CCO HO 144A 5.125% 05/01/2027 DD 02/06/17	299,879.14	102.2500	306,750.00	6,870.86
55,000.0000	CBS RADIO INC 144A 7.250% 11/01/2024 DD 10/17/16	56,199.28	103.0000	56,650.00	450.72
30,000.0000	OUTFRONT MEDIA CAPITAL LLC / O 5.625% 02/15/2024 DD 11/15/14	30,000.00	104.3750	31,312.50	1,312.50
25,000.0000	CDK GLOBAL INC VAR RT 10/15/2019 DD 04/15/15	25,807.67	103.0000	25,750.00	57.67-
100,000.0000	CDW LLC / CDW FINANCE CORP 5.000% 09/01/2023 DD 03/03/15	100,562.60	104.1250	104,125.00	3,562.40
125,000.0000	CHS/COMMUNITY HEALTH SYSTEMS I 6.250% 03/31/2023 DD 03/16/17	125,859.13	103.2350	129,043.75	3,184.62
25,000.0000	CNH INDUSTRIAL CAPITAL LLC 4.375% 04/05/2022 DD 04/10/17	25,000.00	104.6500	26,162.50	1,162.50
50,000.0000	CTR PARTNERSHIP LP / CARETRUST 5.250% 06/01/2025 DD 05/24/17	50,000.00	103.0000	51,500.00	1,500.00
100,000.0000	CST BRANDS INC 5.000% 05/01/2023 DD 11/01/13	100,204.20	105.0200	105,020.00	4,815.80



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150,000.0000	CABLEVISION SYSTEMS CORP 7.750% 04/15/2018 DD 04/15/10	150,058.15	103.7500	155,625.00	5,566.85
50,000.0000	CABLEVISION SYSTEMS CORP 8.000% 04/15/2020 DD 04/15/10	55,482.67	111.3750	55,687.50	204.83
250,000.0000	CABLEVISION SYSTEMS CORP 5.875% 09/15/2022 DD 09/27/12	229,858.44	105.1250	262,812.50	32,954.06
25,000.0000	CALATLANTIC GROUP INC 5.000% 06/15/2027 DD 06/09/17	25,000.00	100.2500	25,062.50	62.50
50,000.0000	CALPINE CORP 5.375% 01/15/2023 DD 07/22/14	50,000.00	97.5000	48,750.00	1,250.00-
50,000.0000	CALPINE CORP 5.750% 01/15/2025 DD 07/22/14	50,000.00	93.7500	46,875.00	3,125.00-
100,000.0000	CALPINE CORP 144A 5.250% 06/01/2026 DD 05/31/16	100,000.00	98.0000	98,000.00	2,000.00-
50,000.0000	CAMELOT FINANCE SA 144A 7.875% 10/15/2024 DD 10/03/16	50,000.00	107.7500	53,875.00	3,875.00
50,000.0000	CENTENE CORP 4.750% 05/15/2022 DD 04/29/14	50,734.80	104.3750	52,187.50	1,452.70
150,000.0000	CENTENE CORP 6.125% 02/15/2024 DD 02/11/16	150,000.00	108.1180	162,177.00	12,177.00
125,000.0000	CENTENE CORP 4.750% 01/15/2025 DD 11/09/16	125,000.00	102.7500	128,437.50	3,437.50



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100,000.0000	CENTURYLINK INC 5.625% 04/01/2025 DD 10/01/15	100,000.00	99.8330	99,833.00	167.00-
50,000.0000	CENTURYLINK INC 7.500% 04/01/2024 DD 04/06/16	50,000.00	109.5000	54,750.00	4,750.00
132,000.0000	CEQUEL COMMUNICATIONS HOL 144A 6.375% 09/15/2020 DD 10/25/12	128,966.50	102.0000	134,640.00	5,673.50
50,000.0000	CHANGE HEALTHCARE HOLDING 144A 5.750% 03/01/2025 DD 02/15/17	50,000.00	102.0000	51,000.00	1,000.00
55,000.0000	CHENIERE CORPUS CHRISTI HOLDIN 5.875% 03/31/2025 DD 12/09/16	55,000.00	106.6250	58,643.75	3,643.75
75,000.0000	CHENIERE CORPUS CHRISTI H 144A 5.125% 06/30/2027 DD 05/19/17	75,000.00	102.5000	76,875.00	1,875.00
61,000.0000	CHESAPEAKE ENERGY CORP 144A 8.000% 12/15/2022 DD 12/23/15	62,521.85	105.7500	64,507.50	1,985.65
150,000.0000	CHURCHILL DOWNS INC 5.375% 12/15/2021 DD 12/16/13	151,153.62	103.7500	155,625.00	4,471.38
150,000.0000	FRONTIER COMMUNICATIONS CORP 7.125% 03/15/2019 DD 03/23/07	154,752.84	104.2500	156,375.00	1,622.16
100,000.0000	CLEAR CHANNEL WORLDWIDE HOLDIN 7.625% 03/15/2020 DD 03/15/12	102,215.32	99.5000	99,500.00	2,715.32-
50,000.0000	COGENT COMMUNICATIONS GRO 144A 5.375% 03/01/2022 DD 02/20/15	50,168.50	105.0000	52,500.00	2,331.50



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100,000.0000	COMMSCOPE TECHNOLOGIES LL 144A 6.000% 06/15/2025 DD 06/11/15	100,000.00	106.7500	106,750.00	6,750.00
25,000.0000	UNITI GROUP INC / CSL CAP 144A 7.125% 12/15/2024 DD 12/15/16	25,000.00	99.2820	24,820.50	179.50-
50,000.0000	COTT HOLDINGS INC 144A 5.500% 04/01/2025 DD 03/22/17	50,000.00	102.0000	51,000.00	1,000.00
20,000.0000	COVANTA HOLDING CORP 5.875% 07/01/2025 DD 03/16/17	20,000.00	97.0000	19,400.00	600.00-
50,000.0000	CRESTWOOD MIDSTREAM PARTN 144A 5.750% 04/01/2025 DD 03/14/17	50,000.00	99.7500	49,875.00	125.00-
150,000.0000	CROWNROCK LP / CROWNROCK 144A 7.125% 04/15/2021 DD 04/15/13	140,035.47	102.7500	154,125.00	14,089.53
25,000.0000	CYRUSONE LP / CYRUSONE FI 144A 5.000% 03/15/2024 DD 03/17/17	25,000.00	103.0000	25,750.00	750.00
20,000.0000	CYRUSONE LP / CYRUSONE FI 144A 5.375% 03/15/2027 DD 03/17/17	20,000.00	104.1250	20,825.00	825.00
100,000.0000	DANA INC 5.375% 09/15/2021 DD 08/02/13	102,411.61	102.8750	102,875.00	463.39
185,000.0000	DAVITA INC 5.750% 08/15/2022 DD 08/28/12	188,817.14	102.7500	190,087.50	1,270.36
75,000.0000	DENBURY RESOURCES INC 144A 9.000% 05/15/2021 DD 05/10/16	78,309.44	95.2500	71,437.50	6,871.94-



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225,000.0000	DISH DBS CORP 7.875% 09/01/2019 DD 08/17/09	225,901.92	110.2500	248,062.50	22,160.58
100,000.0000	DISH DBS CORP 5.875% 07/15/2022 DD 05/16/12	101,923.48	107.5000	107,500.00	5,576.52
25,000.0000	DOLE FOOD CO INC 144A 7.250% 06/15/2025 DD 04/06/17	25,000.00	104.0000	26,000.00	1,000.00
150,000.0000	RR DONNELLEY & SONS CO 6.000% 04/01/2024 DD 03/20/14	148,008.31	97.3750	146,062.50	1,945.81-
100,000.0000	DYNEGY INC 5.875% 06/01/2023 DD 12/01/13	98,887.86	93.5000	93,500.00	5,387.86-
100,000.0000	DYNEGY INC 6.750% 11/01/2019 DD 05/01/15	100,809.13	103.1250	103,125.00	2,315.87
100,000.0000	EMC CORP 2.650% 06/01/2020 DD 06/06/13	97,161.35	98.1230	98,123.00	961.65
75,000.0000	ESH HOSPITALITY INC 144A 5.250% 05/01/2025 DD 05/15/15	72,017.37	103.6250	77,718.75	5,701.38
25,000.0000	ELDORADO RESORTS INC 144A 6.000% 04/01/2025 DD 03/29/17	25,000.00	106.0000	26,500.00	1,500.00
150,000.0000	ENDO FINANCE LLC / ENDO F 144A VAR RT 01/15/2022 DD 05/06/14	151,966.14	95.7500	143,625.00	8,341.14-
25,000.0000	ENPRO INDUSTRIES INC 144A 5.875% 09/15/2022 DD 03/15/17	25,239.17	104.2500	26,062.50	823.33



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200,000.0000	ENTEGRIS INC 144A 6.000% 04/01/2022 DD 04/01/14	200,000.00	104.6250	209,250.00	9,250.00
50,000.0000	EQUINIX INC 5.375% 05/15/2027 DD 03/22/17	50,000.00	106.6250	53,312.50	3,312.50
100,000.0000	TRONOX FINANCE LLC 144A 7.500% 03/15/2022 DD 03/19/15	100,000.00	103.0000	103,000.00	3,000.00
50,000.0000	EXTRACTION OIL & GAS INC 144A 7.875% 07/15/2021 DD 07/18/16	50,000.00	102.7500	51,375.00	1,375.00
25,000.0000	FMG RESOURCES AUGUST 2006 144A 4.750% 05/15/2022 DD 05/12/17	25,000.00	100.3750	25,093.75	93.75
50,000.0000	FMG RESOURCES AUGUST 2006 144A 5.125% 05/15/2024 DD 05/12/17	50,000.00	100.0000	50,000.00	0.00
150,000.0000	FTI CONSULTING INC 6.000% 11/15/2022 DD 05/15/13	150,000.00	103.7500	155,625.00	5,625.00
100,000.0000	FELCOR LODGING LP 5.625% 03/01/2023 DD 03/01/13	100,000.00	103.7500	103,750.00	3,750.00
75,000.0000	FERRELLGAS LP / FERRELLGAS FIN VAR RT 06/15/2023 DD 06/15/16	75,000.00	93.2500	69,937.50	5,062.50-
125,000.0000	FIRST DATA CORP 144A 5.375% 08/15/2023 DD 08/11/15	125,000.00	104.5000	130,625.00	5,625.00
175,000.0000	FIRST QUALITY FINANCE CO 144A 4.625% 05/15/2021 DD 05/14/13	175,000.00	100.8750	176,531.25	1,531.25



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10,000.0000	FIRSTCASH INC 144A 5.375% 06/01/2024 DD 05/30/17	10,000.00	104.3750	10,437.50	437.50
50,000.0000	FLEX ACQUISITION CO INC 144A 6.875% 01/15/2025 DD 01/17/17	50,000.00	104.0000	52,000.00	2,000.00
125,000.0000	FREEPORT-MCMORAN INC 3.875% 03/15/2023 DD 09/15/13	115,525.99	93.0000	116,250.00	724.01
20,000.0000	FRESENIUS MEDICAL CARE US 144A 5.625% 07/31/2019 DD 01/26/12	21,308.10	105.7500	21,150.00	158.10-
150,000.0000	FRESENIUS US FINANCE II I 144A 4.500% 01/15/2023 DD 09/25/15	150,000.00	105.0000	157,500.00	7,500.00
100,000.0000	FRONTIER COMMUNICATIONS CORP 7.125% 01/15/2023 DD 08/15/12	93,796.60	83.2500	83,250.00	10,546.60-
100,000.0000	GFL ENVIRONMENTAL INC 144A 5.625% 05/01/2022 DD 05/12/17	100,365.91	102.2500	102,250.00	1,884.09
100,000.0000	TEGNA INC 5.125% 07/15/2020 DD 07/29/13	102,888.85	102.5000	102,500.00	388.85-
200,000.0000	GARDA WORLD SECURITY CORP 144A 7.250% 11/15/2021 DD 11/08/13	203,505.90	101.1250	202,250.00	1,255.90-
100,000.0000	GENESIS ENERGY LP / GENESIS EN 6.000% 05/15/2023 DD 05/21/15	100,000.00	98.0000	98,000.00	2,000.00-
200,000.0000	GIBSON ENERGY INC 144A 6.750% 07/15/2021 DD 06/28/13	198,289.73	103.2500	206,500.00	8,210.27



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200,000.0000	GOODYEAR TIRE & RUBBER CO/THE 5.000% 05/31/2026 DD 05/13/16	200,000.00	103.5000	207,000.00	7,000.00
55,000.0000	GOODYEAR TIRE & RUBBER CO/THE 4.875% 03/15/2027 DD 03/07/17	55,000.00	101.5000	55,825.00	825.00
92,926.8200	WHEELABRATOR TECHNOLOGIES 10/14 TLB	91,507.73	100.3750	93,275.30	1,767.57
1,372.5800	WHEELABRATOR TECHNOLOGIES 10/14 TLC	1,351.61	100.3750	1,377.73	26.12
25,000.0000	GENESYS TELECOMMUNICATION 144A 10.000% 11/30/2024 DD 12/01/16	25,000.00	112.3750	28,093.75	3,093.75
74,625.0000	GENESYS 1/17 (USD) COV-LT TLB 0.000% 12/01/2023 DD 01/09/17	73,658.81	100.2250	74,792.91	1,134.10
100,000.0000	GRINDING MEDIA INC / MOLY 144A 7.375% 12/15/2023 DD 12/16/16	100,445.45	108.7500	108,750.00	8,304.55
300,000.0000	GROUP 1 AUTOMOTIVE INC VAR RT 06/01/2022 DD 06/01/15	300,693.59	101.5000	304,500.00	3,806.41
25,000.0000	GULFPORT ENERGY CORP 144A 6.000% 10/15/2024 DD 10/14/16	25,000.00	97.2500	24,312.50	687.50-
50,000.0000	HCA INC 5.250% 04/15/2025 DD 10/17/14	50,885.94	107.5000	53,750.00	2,864.06
150,000.0000	HCA INC 4.500% 02/15/2027 DD 08/15/16	150,174.90	102.8750	154,312.50	4,137.60



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100,000.0000	HCA INC 5.500% 06/15/2047 DD 06/22/17	100,000.00	103.5000	103,500.00	3,500.00
50,000.0000	HCA HEALTHCARE INC 6.250% 02/15/2021 DD 12/06/12	52,011.46	109.2500	54,625.00	2,613.54
250,000.0000	HCA INC 6.500% 02/15/2020 DD 08/01/11	272,993.16	109.1250	272,812.50	180.66-
100,000.0000	HD SUPPLY INC 144A 5.750% 04/15/2024 DD 04/11/16	100,000.00	106.2500	106,250.00	6,250.00
150,000.0000	HALCON RESOURCES CORP 144A 6.750% 02/15/2025 DD 02/16/17	150,000.00	90.0000	135,000.00	15,000.00-
150,000.0000	HALYARD HEALTH INC 6.250% 10/15/2022 DD 04/15/15	150,000.00	104.2500	156,375.00	6,375.00
100,000.0000	HERTZ CORP/THE 5.875% 10/15/2020 DD 10/16/12	101,025.72	96.7500	96,750.00	4,275.72-
50,000.0000	HERTZ CORP/THE 144A 7.625% 06/01/2022 DD 06/06/17	50,000.00	99.7600	49,880.00	120.00-
138,000.0000	HERC RENTALS INC 144A 7.500% 06/01/2022 DD 06/09/16	138,000.00	105.5000	145,590.00	7,590.00
25,000.0000	HILL-ROM HOLDINGS INC 144A 5.000% 02/15/2025 DD 02/14/17	25,000.00	102.0000	25,500.00	500.00
50,000.0000	HOLLY ENERGY PARTNERS LP 144A 6.000% 08/01/2024 DD 07/19/16	50,000.00	104.0000	52,000.00	2,000.00



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135,000.0000	HOLOGIC INC 144A 5.250% 07/15/2022 DD 07/02/15	135,000.00	105.0000	141,750.00	6,750.00
25,000.0000	HUDBAY MINERALS INC 144A 7.625% 01/15/2025 DD 12/12/16	25,000.00	104.7500	26,187.50	1,187.50
125,000.0000	HUGHES SATELLITE SYSTEMS CORP 7.625% 06/15/2021 DD 12/15/11	126,836.25	113.6250	142,031.25	15,195.00
175,000.0000	HUNTSMAN INTERNATIONAL LLC 4.875% 11/15/2020 DD 11/19/12	183,038.35	105.2500	184,187.50	1,149.15
200,000.0000	INFOR US INC 6.500% 05/15/2022 DD 11/15/15	202,668.83	103.5000	207,000.00	4,331.17
250,000.0000	INMARSAT FINANCE PLC 144A 4.875% 05/15/2022 DD 06/04/14	241,077.74	101.5000	253,750.00	12,672.26
50,000.0000	INTELSAT JACKSON HOLDINGS SA 7.250% 04/01/2019 DD 10/01/11	43,157.12	100.0250	50,012.50	6,855.38
50,000.0000	INTELSAT JACKSON HOLDINGS SA 7.500% 04/01/2021 DD 10/01/11	41,503.42	92.2500	46,125.00	4,621.58
100,000.0000	INTELSAT JACKSON HOLDINGS SA 5.500% 08/01/2023 DD 06/05/13	84,709.74	82.7500	82,750.00	1,959.74-
100,000.0000	INVENTIV GROUP HOLDINGS I 144A 7.500% 10/01/2024 DD 10/14/16	100,000.00	108.5000	108,500.00	8,500.00
150,000.0000	IRON MOUNTAIN INC 6.000% 08/15/2023 DD 08/13/13	152,243.54	106.2500	159,375.00	7,131.46



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50,000.0000	PATHEON HOLDINGS I BV 144A 7.500% 02/01/2022 DD 02/05/14	52,911.15	106.2500	53,125.00	213.85
25,000.0000	J2 CLOUD SERVICES LLC / J 144A 6.000% 07/15/2025 DD 06/27/17	25,000.00	103.0000	25,750.00	750.00
25,000.0000	RP CROWN PARENT LLC 144A 7.375% 10/15/2024 DD 10/06/16	25,000.00	104.0000	26,000.00	1,000.00
10,000.0000	JONAH ENERGY 5/14 COV-LITE 2ND LIEN TL	9,700.00	95.1670	9,516.70	183.30-
50,000.0000	JUPITER RESOURCES INC 144A 8.500% 10/01/2022 DD 09/18/14	48,478.46	75.0000	37,500.00	10,978.46-
125,000.0000	KFC HOLDING CO/PIZZA HUT 144A 5.000% 06/01/2024 DD 06/16/16	125,000.00	104.2500	130,312.50	5,312.50
25,000.0000	KFC HOLDING CO/PIZZA HUT 144A 4.750% 06/01/2027 DD 06/15/17	25,000.00	102.1250	25,531.25	531.25
100,000.0000	KLX INC 144A 5.875% 12/01/2022 DD 12/08/14	100,000.00	105.0000	105,000.00	5,000.00
20,000.0000	KINROSS GOLD CORP 144A 4.500% 07/15/2027 DD 07/06/17	20,000.00	99.7500	19,950.00	50.00-
25,000.0000	KOPPERS INC 144A 6.000% 02/15/2025 DD 01/25/17	25,000.00	106.2500	26,562.50	1,562.50
100,000.0000	KRONOS ACQUISITION HOLDIN 144A 9.000% 08/15/2023 DD 08/26/15	102,072.11	99.7500	99,750.00	2,322.11-



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100,000.0000	LENNAR CORP VAR RT 12/01/2018 DD 02/04/13	102,221.27	102.2500	102,250.00	28.73
50,000.0000	LENNAR CORP 4.500% 04/30/2024 DD 04/28/17	50,000.00	103.3600	51,680.00	1,680.00
75,000.0000	LIONS GATE ENTERTAINMENT 144A 5.875% 11/01/2024 DD 10/27/16	75,715.74	105.2500	78,937.50	3,221.76
90,000.0000	MDC PARTNERS INC 144A 6.500% 05/01/2024 DD 03/23/16	90,000.00	99.7500	89,775.00	225.00-
50,000.0000	MGM RESORTS INTERNATIONAL 6.750% 10/01/2020 DD 04/01/13	53,756.69	110.7900	55,395.00	1,638.31
225,000.0000	MPH ACQUISITION HOLDINGS 144A 7.125% 06/01/2024 DD 06/07/16	225,813.75	106.6250	239,906.25	14,092.50
175,000.0000	MSCI INC 144A 5.750% 08/15/2025 DD 08/13/15	176,253.69	108.3120	189,546.00	13,292.31
25,000.0000	MALLINCKRODT INTERNATIONAL 144A 5.500% 04/15/2025 DD 04/15/15	25,000.00	87.5000	21,875.00	3,125.00-
150,000.0000	MEDIACOM BROADBAND LLC / MEDIA 5.500% 04/15/2021 DD 03/17/14	150,000.00	102.2500	153,375.00	3,375.00
100,000.0000	MICRON TECHNOLOGY INC 144A 5.250% 01/15/2024 DD 04/30/15	100,000.00	103.5000	103,500.00	3,500.00
50,000.0000	MIDAS INTERMEDIATE HOLDCO 144A 7.875% 10/01/2022 DD 09/24/14	50,441.03	103.0000	51,500.00	1,058.97



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175,000.0000	MIDCONTINENT COMMUNICATIO 144A 6.875% 08/15/2023 DD 08/14/15	176,262.85	107.7500	188,562.50	12,299.65
65,000.0000	MOLINA HEALTHCARE INC VAR RT 11/15/2022 DD 05/15/16	65,000.00	105.8750	68,818.75	3,818.75
50,000.0000	MOLINA HEALTHCARE INC 144A 4.875% 06/15/2025 DD 06/06/17	50,000.00	100.7500	50,375.00	375.00
150,000.0000	NATURE'S BOUNTY CO/THE 144A 7.625% 05/15/2021 DD 05/05/16	150,000.00	106.2500	159,375.00	9,375.00
125,000.0000	NCR CORP 4.625% 02/15/2021 DD 02/15/13	125,188.98	102.0000	127,500.00	2,311.02
100,000.0000	NGL ENERGY PARTNERS LP / 144A 7.500% 11/01/2023 DD 10/24/16	100,000.00	98.6250	98,625.00	1,375.00-
75,000.0000	NGL ENERGY PARTNERS LP / 144A 6.125% 03/01/2025 DD 02/22/17	75,000.00	91.5000	68,625.00	6,375.00-
150,000.0000	NRG ENERGY INC 6.625% 03/15/2023 DD 03/15/13	151,520.94	102.7500	154,125.00	2,604.06
150,000.0000	NRG ENERGY INC 6.250% 07/15/2022 DD 07/15/14	153,289.77	102.6250	153,937.50	647.73
300,000.0000	NAVISTAR INTERNATIONAL CORP 8.250% 11/01/2021 DD 10/28/09	302,897.07	101.0000	303,000.00	102.93
50,000.0000	NAVIENT CORP 5.000% 10/26/2020 DD 11/06/14	50,000.00	103.7500	51,875.00	1,875.00



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75,000.0000	NAVIENT CORP 7.250% 09/25/2023 DD 09/16/16	74,912.84	107.7500	80,812.50	5,899.66
25,000.0000	NAVIENT CORP 6.500% 06/15/2022 DD 03/07/17	25,000.00	106.0000	26,500.00	1,500.00
200,000.0000	NEXSTAR BROADCASTING INC 144A 5.625% 08/01/2024 DD 07/27/16	200,000.00	101.2500	202,500.00	2,500.00
90,000.0000	NFP CORP 144A 6.875% 07/15/2025 DD 07/12/17	90,000.00	101.0000	90,900.00	900.00
100,000.0000	NIELSEN FINANCE LLC / NIELSEN 4.500% 10/01/2020 DD 04/01/13	102,140.71	101.5280	101,528.00	612.71-
50,000.0000	NIELSEN FINANCE LLC / NIE 144A 5.000% 04/15/2022 DD 04/11/14	50,501.82	103.7500	51,875.00	1,373.18
50,000.0000	NOVA CHEMICALS CORP 144A 4.875% 06/01/2024 DD 06/09/17	50,000.00	99.6250	49,812.50	187.50-
25,000.0000	NOVA CHEMICALS CORP 144A 5.250% 06/01/2027 DD 06/09/17	25,000.00	99.5000	24,875.00	125.00-
95,000.0000	NOVELIS CORP 144A 6.250% 08/15/2024 DD 08/29/16	95,000.00	105.0000	99,750.00	4,750.00
23,000.0000	NUANCE COMMUNICATIONS INC 144A 5.375% 08/15/2020 DD 08/14/12	23,416.20	101.6250	23,373.75	42.45-
50,000.0000	NUANCE COMMUNICATIONS INC 144A 5.625% 12/15/2026 DD 12/22/16	49,549.83	106.7500	53,375.00	3,825.17



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200,000.0000	SFR GROUP SA 144A 6.000% 05/15/2022 DD 05/08/14	203,679.25	104.6250	209,250.00	5,570.75
200,000.0000	OASIS PETROLEUM INC 6.500% 11/01/2021 DD 11/10/11	195,688.39	97.0000	194,000.00	1,688.39-
100,000.0000	OASIS PETROLEUM INC 6.875% 03/15/2022 DD 03/15/14	94,427.26	97.0000	97,000.00	2,572.74
50,000.0000	1011778 BC ULC / NEW RED 144A 4.250% 05/15/2024 DD 05/17/17	50,000.00	99.3690	49,684.50	315.50-
125,000.0000	ORBITAL ATK INC 5.500% 10/01/2023 DD 04/01/16	125,000.00	105.2500	131,562.50	6,562.50
25,000.0000	ORCHESTRA BORROWER LLC / 144A 6.750% 06/15/2022 DD 06/16/17	25,000.00	103.0400	25,760.00	760.00
50,000.0000	PTC INC 6.000% 05/15/2024 DD 05/12/16	50,000.00	108.2500	54,125.00	4,125.00
50,000.0000	PARK AEROSPACE HOLDINGS L 144A 5.250% 08/15/2022 DD 02/03/17	50,000.00	104.5320	52,266.00	2,266.00
25,000.0000	PARK AEROSPACE HOLDINGS L 144A 5.500% 02/15/2024 DD 02/03/17	25,000.00	104.4500	26,112.50	1,112.50
25,000.0000	PEABODY ENERGY CORP 144A 6.375% 03/31/2025 DD 02/15/17	25,000.00	98.5000	24,625.00	375.00-
150,000.0000	PENSKE AUTOMOTIVE GROUP INC 5.750% 10/01/2022 DD 04/01/13	150,481.37	103.2500	154,875.00	4,393.63



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50,000.0000	PETSMART INC 144A 5.875% 06/01/2025 DD 05/31/17	50,000.00	96.3750	48,187.50	1,812.50-
200,000.0000	PLATFORM SPECIALTY PRODUC 144A 6.500% 02/01/2022 DD 02/02/15	192,283.25	103.2500	206,500.00	14,216.75
150,000.0000	POLYONE CORP 5.250% 03/15/2023 DD 09/15/13	150,360.72	105.0000	157,500.00	7,139.28
200,000.0000	POST HOLDINGS INC 144A 6.000% 12/15/2022 DD 06/02/14	204,553.22	106.0000	212,000.00	7,446.78
25,000.0000	POST HOLDINGS INC 144A 5.750% 03/01/2027 DD 02/14/17	25,000.00	102.7500	25,687.50	687.50
80,000.0000	QUEBECOR MEDIA INC 5.750% 01/15/2023 DD 12/15/12	80,000.00	105.5000	84,400.00	4,400.00
250,000.0000	RSI HOME PRODUCTS INC 144A 6.500% 03/15/2023 DD 03/16/15	250,000.00	105.2500	263,125.00	13,125.00
75,000.0000	RADIATE HOLDCO LLC / RADI 144A 6.625% 02/15/2025 DD 02/01/17	75,140.47	100.0000	75,000.00	140.47-
100,000.0000	RANGE RESOURCES CORP 4.875% 05/15/2025 DD 11/15/15	90,428.30	95.0000	95,000.00	4,571.70
100,000.0000	RANGE RESOURCES CORP 144A 5.000% 03/15/2023 DD 09/16/16	89,548.13	97.7500	97,750.00	8,201.87
100,000.0000	REALOGY GROUP LLC / REALO 144A 4.500% 04/15/2019 DD 04/07/14	101,744.51	103.2500	103,250.00	1,505.49



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100,000.0000	REGIONALCARE HOSPITAL PAR 144A 8.250% 05/01/2023 DD 04/29/16	103,194.05	107.2500	107,250.00	4,055.95
64,813.5500	REYNOLDS GROUP ISSUER INC / RE VAR RT 02/15/2021 DD 02/15/12	66,417.71	102.7500	66,595.92	178.21
50,000.0000	REYNOLDS GROUP ISSUER INC / RE 5.750% 10/15/2020 DD 09/28/12	51,403.63	102.3340	51,167.00	236.63-
100,000.0000	RITE AID CORP 144A 6.125% 04/01/2023 DD 04/02/15	102,722.75	98.1880	98,188.00	4,534.75-
25,000.0000	ROCKIES EXPRESS PIPELINE 144A 6.000% 01/15/2019 DD 01/17/13	26,232.69	104.2500	26,062.50	170.19-
10,000.0000	SBA COMMUNICATIONS CORP 4.875% 09/01/2024 DD 03/01/17	9,925.36	101.7500	10,175.00	249.64
175,000.0000	SESI LLC 6.375% 05/01/2019 DD 11/01/11	161,657.96	98.7500	172,812.50	11,154.54
175,000.0000	NAVIENT CORP 7.250% 01/25/2022 DD 01/27/12	178,707.78	109.2500	191,187.50	12,479.72
150,000.0000	SM ENERGY CO 6.500% 01/01/2023 DD 06/29/12	145,803.00	95.2500	142,875.00	2,928.00-
100,000.0000	SPX FLOW INC 144A 5.625% 08/15/2024 DD 08/10/16	102,317.94	103.0000	103,000.00	682.06
50,000.0000	SEAGATE HDD CAYMAN 144A 4.875% 03/01/2024 DD 02/03/17	49,680.54	101.9210	50,960.50	1,279.96



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50,000.0000	SEMGROUP CORP 144A 6.375% 03/15/2025 DD 03/15/17	49,255.63	96.7500	48,375.00	880.63-
125,000.0000	SENSATA TECHNOLOGIES BV 144A 5.000% 10/01/2025 DD 03/26/15	125,000.00	104.5800	130,725.00	5,725.00
100,000.0000	SERVICE CORP INTERNATIONAL/US 7.625% 10/01/2018 DD 10/03/06	100,329.23	106.7500	106,750.00	6,420.77
150,000.0000	SHEA HOMES LP / SHEA HOME 144A 5.875% 04/01/2023 DD 03/23/15	150,000.00	102.9500	154,425.00	4,425.00
225,000.0000	SIGNODE INDUSTRIAL GROUP 144A 6.375% 05/01/2022 DD 04/29/14	224,271.37	104.5000	235,125.00	10,853.63
250,000.0000	SIRIUS XM RADIO INC 144A 6.000% 07/15/2024 DD 05/06/14	252,489.89	106.2500	265,625.00	13,135.11
50,000.0000	SIRIUS XM RADIO INC 144A 5.000% 08/01/2027 DD 07/05/17	50,000.00	100.7500	50,375.00	375.00
45,000.0000	SIX FLAGS ENTERTAINMENT C 144A 4.875% 07/31/2024 DD 06/16/16	44,561.42	100.6120	45,275.40	713.98
25,000.0000	SONIC AUTOMOTIVE INC 144A 6.125% 03/15/2027 DD 03/10/17	25,000.00	99.5000	24,875.00	125.00-
25,000.0000	SPECTRUM BRANDS INC 6.125% 12/15/2024 DD 12/15/15	25,000.00	107.1250	26,781.25	1,781.25
100,000.0000	SPRINGLEAF FINANCE CORP 6.000% 06/01/2020 DD 12/01/13	98,308.56	105.5000	105,500.00	7,191.44



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150,000.0000	SPRINGLEAF FINANCE CORP 5.250% 12/15/2019 DD 12/03/14	146,050.44	104.0100	156,015.00	9,964.56
50,000.0000	SPRINT CAPITAL CORP 6.900% 05/01/2019 DD 05/06/99	53,533.43	106.7450	53,372.50	160.93-
25,000.0000	SPRINT COMMUNICATIONS INC 7.000% 08/15/2020 DD 08/14/12	27,087.18	110.0000	27,500.00	412.82
200,000.0000	SPRINT COMMUNICATIONS INC 6.000% 11/15/2022 DD 11/14/12	175,323.13	106.0000	212,000.00	36,676.87
100,000.0000	SPRINT CORP 7.250% 09/15/2021 DD 09/15/14	83,503.66	111.1250	111,125.00	27,621.34
100,000.0000	SPRINT CORP 7.875% 09/15/2023 DD 09/15/14	99,433.30	115.0000	115,000.00	15,566.70
150,000.0000	SPRINT CORP 7.125% 06/15/2024 DD 06/15/14	147,076.38	111.2500	166,875.00	19,798.62
35,000.0000	CALATLANTIC GROUP INC 8.375% 05/15/2018 DD 05/03/10	36,903.26	105.1250	36,793.75	109.51-
25,000.0000	STARWOOD PROPERTY TRUST I 144A 5.000% 12/15/2021 DD 12/16/16	25,000.00	104.0000	26,000.00	1,000.00
100,000.0000	STERIGENICS-NORDION TOPCO 144A 8.125% 11/01/2021 DD 11/01/16	100,000.00	102.5000	102,500.00	2,500.00
100,000.0000	SUBURBAN PROPANE PARTNERS LP/S 5.500% 06/01/2024 DD 05/27/14	100,744.16	99.5000	99,500.00	1,244.16-



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100,000.0000	SUMMIT MATERIALS LLC / SUMMIT 6.125% 07/15/2023 DD 07/08/15	99,484.27	104.7500	104,750.00	5,265.73
25,000.0000	SUMMIT MIDSTREAM HOLDINGS LLC 5.750% 04/15/2025 DD 02/15/17	25,000.00	100.5000	25,125.00	125.00
50,000.0000	SUNCOKE ENERGY PARTNERS L 144A 7.500% 06/15/2025 DD 05/24/17	49,263.67	98.7500	49,375.00	111.33
25,000.0000	SYMANTEC CORP 144A 5.000% 04/15/2025 DD 02/09/17	25,000.00	104.6560	26,164.00	1,164.00
60,000.0000	THC ESCROW CORP III 144A 4.625% 07/15/2024 DD 06/14/17	60,000.00	100.2700	60,162.00	162.00
100,000.0000	THC ESCROW CORP III 144A 5.125% 05/01/2025 DD 06/14/17	100,000.00	100.3750	100,375.00	375.00
75,000.0000	THC ESCROW CORP III 144A 7.000% 08/01/2025 DD 06/14/17	75,000.00	99.6250	74,718.75	281.25-
100,000.0000	T-MOBILE USA INC 6.125% 01/15/2022 DD 11/21/13	105,672.02	105.0940	105,094.00	578.02-
100,000.0000	T-MOBILE USA INC 6.500% 01/15/2026 DD 11/05/15	100,000.00	110.3750	110,375.00	10,375.00
25,000.0000	T-MOBILE USA INC 5.375% 04/15/2027 DD 03/16/17	25,000.00	107.2500	26,812.50	1,812.50
50,000.0000	TRI POINTE GROUP INC 5.250% 06/01/2027 DD 06/08/17	50,000.00	100.2500	50,125.00	125.00



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144,374.9990	ALLFLEX 7/13 TL	144,375.00	100.2500	144,735.94	360.94
50,000.0000	TALLGRASS ENERGY PARTNERS 144A 5.500% 09/15/2024 DD 09/01/16	50,000.00	101.2500	50,625.00	625.00
193,000.0000	TECK RESOURCES LTD 4.750% 01/15/2022 DD 07/05/11	176,917.36	103.5000	199,755.00	22,837.64
200,000.0000	TELECOM ITALIA SPA/MILANO 144A 5.303% 05/30/2024 DD 05/30/14	198,105.97	107.2500	214,500.00	16,394.03
75,000.0000	TELESAT CANADA / TELESAT 144A 8.875% 11/15/2024 DD 11/17/16	75,000.00	112.2500	84,187.50	9,187.50
50,000.0000	TEMPO ACQUISITION LLC / T 144A 6.750% 06/01/2025 DD 05/01/17	50,000.00	102.2500	51,125.00	1,125.00
100,000.0000	TENET HEALTHCARE CORP 8.125% 04/01/2022 DD 09/27/13	103,899.94	106.1250	106,125.00	2,225.06
25,000.0000	TENET HEALTHCARE CORP 144A 7.500% 01/01/2022 DD 12/01/16	25,000.00	108.4800	27,120.00	2,120.00
48,000.0000	TENET HEALTHCARE CORP 144A 4.625% 07/15/2024 DD 06/14/17	48,000.00	100.1250	48,060.00	60.00
125,000.0000	TEAM HEALTH HOLDINGS INC 144A 6.375% 02/01/2025 DD 02/01/17	121,896.86	97.0000	121,250.00	646.86-
50,000.0000	TEREX CORP 144A 5.625% 02/01/2025 DD 01/31/17	50,000.00	102.8750	51,437.50	1,437.50
150,000.0000	TESORO LOGISTICS LP / TESORO L 5.500% 10/15/2019 DD 10/15/15	149,091.75	105.5000	158,250.00	9,158.25



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250,000.0000	TOWNSQUARE MEDIA INC 144A 6.500% 04/01/2023 DD 04/01/15	250,000.00	100.5000	251,250.00	1,250.00
150,000.0000	TRANSDIGM INC 6.000% 07/15/2022 DD 06/04/14	154,425.55	103.0000	154,500.00	74.45
50,000.0000	TRANSDIGM INC 6.500% 05/15/2025 DD 11/15/15	50,725.66	101.7500	50,875.00	149.34
50,000.0000	TRINIDAD DRILLING LTD 144A 6.625% 02/15/2025 DD 02/08/17	50,000.00	95.0000	47,500.00	2,500.00-
100,000.0000	TRONOX FINANCE LLC 6.375% 08/15/2020 DD 08/15/13	90,926.17	100.2500	100,250.00	9,323.83
25,000.0000	USG CORP 144A 4.875% 06/01/2027 DD 05/15/17	25,000.00	102.8750	25,718.75	718.75
25,000.0000	ULTRA RESOURCES INC 144A 6.875% 04/15/2022 DD 04/12/17	25,000.00	99.2500	24,812.50	187.50-
25,000.0000	ULTRA RESOURCES INC 144A 7.125% 04/15/2025 DD 04/12/17	24,634.48	98.6250	24,656.25	21.77
25,000.0000	UNITED RENTALS NORTH AMERICA I 5.875% 09/15/2026 DD 05/13/16	26,123.79	106.5000	26,625.00	501.21
50,000.0000	UNITED RENTALS NORTH AMERICA I 5.500% 05/15/2027 DD 11/07/16	50,670.39	103.0000	51,500.00	829.61
25,000.0000	UNITI GROUP INC / UNITI F 144A 7.125% 12/15/2024 DD 12/15/16	25,123.05	99.1250	24,781.25	341.80-



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180,000.0000	UNITYMEDIA HESSEN GMBH & 144A 5.500% 01/15/2023 DD 12/14/12	181,087.15	103.7500	186,750.00	5,662.85
100,000.0000	UNIVERSAL HEALTH SERVICES 144A 4.750% 08/01/2022 DD 08/07/14	101,263.37	103.3750	103,375.00	2,111.63
150,000.0000	UNIVISION COMMUNICATIONS 144A 5.125% 05/15/2023 DD 05/21/13	153,364.77	100.9680	151,452.00	1,912.77-
75,000.0000	USIS MERGER SUB INC 144A 6.875% 05/01/2025 DD 04/18/17	75,000.00	101.7500	76,312.50	1,312.50
125,000.0000	VALEANT PHARMACEUTICALS I 144A 5.375% 03/15/2020 DD 03/27/15	120,937.50	96.6250	120,781.25	156.25-
50,000.0000	VALEANT PHARMACEUTICALS I 144A 6.500% 03/15/2022 DD 03/21/17	50,000.00	104.8750	52,437.50	2,437.50
30,000.0000	VERISIGN INC 144A 4.750% 07/15/2027 DD 07/05/17	30,000.00	101.1250	30,337.50	337.50
200,000.0000	VIASAT INC 6.875% 06/15/2020 DD 06/15/12	200,901.67	101.9680	203,936.00	3,034.33
50,000.0000	VIDEOTRON LTD 5.000% 07/15/2022 DD 07/15/12	50,506.52	105.7500	52,875.00	2,368.48
150,000.0000	VIKING CRUISES LTD 144A 8.500% 10/15/2022 DD 10/19/12	142,378.71	105.0000	157,500.00	15,121.29
150,000.0000	VISTA OUTDOOR INC 5.875% 10/01/2023 DD 10/01/16	150,000.00	102.7500	154,125.00	4,125.00



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175,000.0000	VALEANT PHARMACEUTICALS I 144A 7.500% 07/15/2021 DD 07/12/13	174,281.25	96.8750	169,531.25	4,750.00-
138,000.0000	WMG ACQUISITION CORP 144A 5.625% 04/15/2022 DD 04/09/14	138,120.69	103.5000	142,830.00	4,709.31
50,000.0000	WAVEDIVISION ESCROW LLC / 144A 8.125% 09/01/2020 DD 08/21/12	51,644.23	103.5800	51,790.00	145.77
150,000.0000	WEATHERFORD INTERNATIONAL LTD 8.250% 06/15/2023 DD 06/17/16	151,669.79	100.0000	150,000.00	1,669.79-
30,000.0000	WEATHERFORD INTERNATIONAL 144A 9.875% 02/15/2024 DD 11/18/16	30,299.81	104.5000	31,350.00	1,050.19
75,000.0000	WELLCARE HEALTH PLANS INC 5.250% 04/01/2025 DD 03/22/17	75,000.00	104.7500	78,562.50	3,562.50
150,000.0000	WESCO DISTRIBUTION INC 5.375% 06/15/2024 DD 12/15/16	150,000.00	104.3750	156,562.50	6,562.50
200,000.0000	WHITING PETROLEUM CORP 5.750% 03/15/2021 DD 09/12/13	187,191.88	94.0000	188,000.00	808.12
50,000.0000	WHITING PETROLEUM CORP 6.250% 04/01/2023 DD 03/27/15	48,236.60	91.7500	45,875.00	2,361.60-
159,000.0000	WIDEOPENWEST FINANCE LLC / WID 10.250% 07/15/2019 DD 01/15/13	165,135.08	103.0000	163,770.00	1,365.08-
50,000.0000	WILDHORSE RESOURCE DEVELO 144A 6.875% 02/01/2025 DD 02/01/17	49,636.99	94.0000	47,000.00	2,636.99-



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200,000.0000	WIND ACQUISITION FINANCE 144A 4.750% 07/15/2020 DD 07/10/14	202,778.62	101.0500	202,100.00	678.62-
200,000.0000	WPX ENERGY INC 6.000% 01/15/2022 DD 11/14/11	181,295.02	99.0000	198,000.00	16,704.98
200,000.0000	ZF NORTH AMERICA CAPITAL 144A 4.500% 04/29/2022 DD 04/29/15	192,941.03	105.0000	210,000.00	17,058.97
50,000.0000	ZAYO GROUP LLC / ZAYO CAP 144A 5.750% 01/15/2027 DD 01/27/17	50,000.00	104.6250	52,312.50	2,312.50
145,000.0000	BRAND ENERGY 6/17 TL 0.000% 06/21/2024 DD 06/01/17	143,551.70	99.7810	144,682.45	1,130.75
TOTAL INVESTMENTS FIXED INCOME SECURITIES		29,547,645.34		30,382,708.18	835,062.84
TOTAL INVESTMENT		29,986,306.18		30,821,369.02	835,062.84



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
34.2300	BLACKROCK LIQ T FUND INSTL FUND 60	34.23	100.0000	34.23	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		34.23		34.23	0.00
<u>INVESTMENTS EQUITY</u>					
1,118,715.4170	PARAMETRIC TX-MGD EM MK-INST	51,431,717.21	47.7400	53,407,474.01	1,975,756.80
TOTAL INVESTMENTS EQUITY		51,431,717.21		53,407,474.01	1,975,756.80
TOTAL INVESTMENT		51,431,751.44		53,407,508.24	1,975,756.80



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
76.4000	AUD (AUSTRALIAN DOLLARS)	58.08	0.0000	58.60	0.52 C
76.3600	NZD (NEW ZEALAND DOLLAR)	53.29	0.0000	55.91	2.62 C
56.3200	CHF (SWISS FRANC)	57.83	0.0000	58.81	0.98 C
26,401.1300	GBP (GREAT BRITISH POUNDS)	33,753.64	0.0000	34,293.75	540.11 C
23,371.8500	HKD (HONG KONG DOLLARS)	2,996.40	0.0000	2,993.92	2.48-C
9,745,194.0000	JPY (JAPANESE YEN)	86,971.48	0.0000	86,731.88	239.60-C
859.3700	SGD (SINGAPORE DOLLARS)	619.55	0.0000	624.16	4.61 C
3,432.3900	ILS (ISRAELI SHEKEL)	968.90	0.0000	983.58	14.68 C
339.5200	DKK (DANISH KRONE)	50.98	0.0000	52.08	1.10 C
9,791.7300	NOK (NORWEGIAN KRONE)	1,160.27	0.0000	1,168.93	8.66 C
440.2200	SEK (SWEDISH KRONA)	50.42	0.0000	52.19	1.77 C
30,171.7200	EUR (EURO)	34,038.08	0.0000	34,412.36	374.28 C
311,266.6200	BLACKROCK LIQ T FUND INSTL FUND 60	311,266.62	100.0000	311,266.62	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		472,045.54		472,752.79	707.25 707.25 C 0.00 I



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<u>INVESTMENTS PREFERRED SECURITIES</u>					
1,051.0000	HENKEL AG & CO KGAA	70,983.72	137.4362	144,445.53	73,461.81 11,414.92- C 84,876.73 I
658.0000	VOLKSWAGEN AG	71,370.04	152.0923	100,076.76	28,706.72 7,800.02- C 36,506.74 I
250.0000	BAYERISCHE MOTOREN WERKE AG	9,010.33	82.3248	20,581.22	11,570.89 3,847.20- C 15,418.09 I
375.0000	PORSCHE AUTOMOBIL HOLDING SE	20,253.15	56.1036	21,038.87	785.72 3,932.73- C 4,718.45 I
TOTAL INVESTMENTS PREFERRED SECURITIES		171,617.24		286,142.38	114,525.14 26,994.87- C 141,520.01 I
<u>INVESTMENTS EQUITY</u>					
28,816.0000	SCENTRE GROUP	86,863.43	3.1065	89,518.42	2,654.99 20,073.23- C 22,728.22 I
4,940.0000	AGL ENERGY LTD	58,222.97	19.5597	96,625.29	38,402.32 12,202.24- C 50,604.56 I



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44,943.0000	SOUTH32 LTD	89,140.99	2.0556	92,389.06	3,248.07 84.25 C 3,163.82 I
34,138.0000	VICINITY CENTRES	74,273.27	1.9713	67,296.87	6,976.40- 5,139.89- C 1,836.51- I
7,964.0000	TATTS GROUP LTD	17,976.43	3.2062	25,534.73	7,558.30 5,119.93- C 12,678.23 I
12,342.0000	GOODMAN GROUP	47,469.68	6.0366	74,504.75	27,035.07 1,397.35- C 28,432.42 I
4,056.0000	DEXUS	18,164.01	7.2716	29,493.75	11,329.74 5,913.75- C 17,243.49 I
1,965.0000	MACQUARIE GROUP LTD	91,217.53	67.8839	133,391.91	42,174.38 20,719.40- C 62,893.78 I
5,986.0000	CROWN RESORTS LTD	48,558.95	9.4193	56,384.37	7,825.42 2,741.64- C 10,567.06 I
2,741.0000	JAMES HARDIE INDUSTRIES PLC	18,081.23	15.7245	43,100.92	25,019.69 8,642.10- C 33,661.79 I
2,759.0000	TREASURY WINE ESTATES LTD	9,582.71	10.0943	27,850.39	18,267.68 11,426.25- C 29,693.93 I



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6,530.0000	SYDNEY AIRPORT	30,183.30	5.4383	35,512.65	5,329.35 1,828.77 C 3,500.58 I
12,410.0000	AURIZON HOLDINGS LTD	41,530.92	4.1113	51,022.33	9,491.41 17,374.38- C 26,865.79 I
806.0000	RAMSAY HEALTH CARE LTD	30,447.59	56.4548	45,502.63	15,055.04 11,259.23- C 26,314.27 I
8,262.0000	AUSTRALIA & NEW ZEALAND BANKIN	177,804.38	22.0296	182,009.18	4,204.80 28,952.93- C 33,157.73 I
4,634.0000	AMCOR LTD/AUSTRALIA	36,362.15	12.4338	57,618.60	21,256.45 15,671.63- C 36,928.08 I
10,280.0000	WESTPAC BANKING CORP	257,181.90	23.4026	240,579.71	16,602.19- 30,319.05- C 13,716.86 I
1,797.0000	BANK OF QUEENSLAND LTD	17,296.43	8.7827	15,782.55	1,513.88- 1,106.97- C 406.91- I
11,786.0000	FORTESCUE METALS GROUP LTD	32,026.38	4.0040	47,191.16	15,164.78 1,159.71 C 14,005.07 I
18,685.0000	TELSTRA CORP LTD	51,644.06	3.2983	61,629.02	9,984.96 12,357.14- C 22,342.10 I



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6,193.0000	BENDIGO & ADELAIDE BANK LTD	56,625.82	8.4989	52,633.77	3,992.05- 2,098.89- C 1,893.16- I
739.0000	ASX LTD	23,073.95	41.1215	30,388.83	7,314.88 6,093.21- C 13,408.09 I
9,330.0000	BHP BILLITON LTD	191,740.92	17.8569	166,605.10	25,135.82- 744.55 C 25,880.37- I
13,063.0000	MIRVAC GROUP	17,571.21	1.6338	21,342.54	3,771.33 4,279.35- C 8,050.68 I
2,865.0000	CSL LTD	112,537.31	105.8759	303,334.49	190,797.18 38,648.31- C 229,445.49 I
818.0000	REA GROUP LTD	29,597.06	50.9321	41,662.47	12,065.41 7,989.77- C 20,055.18 I
9,382.0000	TRANSURBAN GROUP	53,132.17	9.0895	85,278.09	32,145.92 19,313.95- C 51,459.87 I
269.0000	COCHLEAR LTD	17,957.95	119.2379	32,075.00	14,117.05 6,431.32- C 20,548.37 I
13,135.0000	ORIGIN ENERGY LTD	66,193.76	5.2619	69,115.88	2,922.12 1,576.85 C 1,345.27 I



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7,985.0000	COMMONWEALTH BANK OF AUSTRALIA	419,391.79	63.5194	507,202.49	87,810.70 98,030.43- C 185,841.13 I
8,135.0000	BORAL LTD	29,751.65	5.3309	43,367.66	13,616.01 2,320.64 C 11,295.37 I
2,970.0000	RIO TINTO LTD	144,460.23	48.5312	144,137.82	322.41- 1,471.54- C 1,149.13 I
11,802.0000	APA GROUP	73,712.30	7.0338	83,013.48	9,301.18 6,220.77- C 15,521.95 I
3,087.0000	ARISTOCRAT LEISURE LTD	31,038.88	17.3046	53,419.45	22,380.57 1,427.68 C 20,952.89 I
8,920.0000	INSURANCE AUSTRALIA GROUP LTD	32,214.91	5.2005	46,389.34	14,174.43 9,301.47- C 23,475.90 I
11,821.0000	GPT GROUP/THE	35,753.44	3.6741	43,432.36	7,678.92 4,341.75- C 12,020.67 I
5,706.0000	LENDLEASE GROUP	53,567.07	12.7713	72,873.51	19,306.44 3,043.15- C 22,349.59 I
6,838.0000	SUNCORP GROUP LTD	57,888.74	11.3676	77,732.20	19,843.46 12,140.58- C 31,984.04 I



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7,299.0000	NATIONAL AUSTRALIA BANK LTD	172,064.23	22.6970	165,665.47	6,398.76- 18,761.50- C 12,362.74 I
2,971.0000	NEWCREST MINING LTD	29,922.57	15.4637	45,942.74	16,020.17 10,092.35- C 26,112.52 I
14,141.0000	OIL SEARCH LTD	72,786.80	5.2312	73,975.54	1,188.74 2,688.80 C 1,500.06- I
13,382.0000	INCITEC PIVOT LTD	32,310.92	2.6156	35,002.50	2,691.58 2,455.04- C 5,146.62 I
14,234.0000	SANTOS LTD	42,383.74	2.3241	33,082.11	9,301.63- 906.14 C 10,207.77- I
3,682.0000	SONIC HEALTHCARE LTD	54,734.26	18.5779	68,404.02	13,669.76 3,577.20- C 17,246.96 I
4,063.0000	WESFARMERS LTD	120,164.02	30.7740	125,034.95	4,870.93 25,092.02- C 29,962.95 I
11,358.0000	ALUMINA LTD	18,469.39	1.4727	16,727.34	1,742.05- 3,353.97- C 1,611.92 I
1,313.0000	WOODSIDE PETROLEUM LTD	31,473.60	22.9117	30,083.17	1,390.43- 309.83 C 1,700.26- I



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1,237.0000	WOOLWORTHS LTD	23,112.64	19.5904	24,233.40	1,120.76 249.59 C 871.17 I
8,029.0000	AUCKLAND INTERNATIONAL AIRPORT	22,878.09	5.2205	41,916.08	19,037.99 4,227.69- C 23,265.68 I
4,126.0000	FLETCHER BUILDING LTD	20,022.69	5.8502	24,138.25	4,115.56 1,819.76- C 5,935.32 I
11,740.0000	SPARK NEW ZEALAND LTD	13,747.69	2.7677	32,492.99	18,745.30 1,122.77 C 17,622.53 I
1,726.0000	RAIFFEISEN BANK INTERNATIONAL	33,507.82	25.2061	43,505.82	9,998.00 2,916.15 C 7,081.85 I
1,220.0000	OMV AG	30,432.20	51.8208	63,221.48	32,789.28 5,637.32- C 38,426.60 I
1,927.0000	ERSTE GROUP BANK AG	47,056.01	38.2369	73,682.59	26,626.58 2,332.11 C 24,294.47 I
294.0000	IMMOFINANZ AG	0.00	2.2822	670.97	670.97 I
3,609.0000	ANHEUSER-BUSCH INBEV SA/NV	196,726.19	110.3025	398,082.05	201,355.86 71,530.07- C 272,885.93 I



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1,405.0000	PROXIMUS SADP	40,050.27	34.9350	49,083.74	9,033.47 3,290.03 C 5,743.44 I
1,100.0000	AGEAS	38,500.91	40.2157	44,237.37	5,736.46 6,237.25- C 11,973.71 I
521.0000	UMICORE SA	18,950.42	69.4594	36,188.40	17,237.98 6,764.61- C 24,002.59 I
1,512.0000	KBC GROUP NV	80,842.10	75.7439	114,524.82	33,682.72 15,049.01- C 48,731.73 I
255.0000	SOLVAY SA	26,625.26	134.0146	34,173.73	7,548.47 6,388.01- C 13,936.48 I
433.0000	UCB SA	18,802.13	68.6953	29,745.08	10,942.95 5,560.17- C 16,503.12 I
2,272.0000	VONOVIA SE	73,257.31	39.6512	90,087.57	16,830.26 4,825.22 C 12,005.04 I
2,213.0000	QIAGEN NV	52,790.21	33.2185	73,512.59	20,722.38 5,619.53- C 26,341.91 I
1,907.0000	DEUTSCHE WOHNEN AG	37,687.83	38.1970	72,841.72	35,153.89 15,110.56- C 50,264.45 I



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514.0000	LANXESS AG	29,649.72	75.6070	38,862.03	9,212.31 582.65 C 8,629.66 I
507.0000	BRENNTAG AG	19,442.18	57.8030	29,306.16	9,863.98 7,452.76- C 17,316.74 I
1,531.0000	K+S AG	35,793.74	25.5711	39,149.40	3,355.66 2,624.14 C 731.52 I
5,000.0000	COMMERZBANK AG	43,319.90	11.8959	59,479.68	16,159.78 3,121.16 C 13,038.62 I
1,199.0000	OSRAM LICHT AG	43,265.48	79.5533	95,384.48	52,119.00 10,654.05- C 62,773.05 I
1,343.0000	ADIDAS AG	79,981.67	191.3272	256,952.51	176,970.84 37,726.91- C 214,697.75 I
1,818.0000	FRESENIUS SE & CO KGAA	45,819.25	85.6096	155,638.40	109,819.15 29,093.07- C 138,912.22 I
1,176.0000	UNITED INTERNET AG	18,245.59	54.9117	64,576.25	46,330.66 12,071.03- C 58,401.69 I
362.0000	HANNOVER RUECK SE	18,317.70	119.7007	43,331.66	25,013.96 8,099.88- C 33,113.84 I



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787.0000	GEA GROUP AG	18,771.10	40.8659	32,161.47	13,390.37 6,011.86- C 19,402.23 I
497.0000	CONTINENTAL AG	51,092.45	215.5069	107,106.94	56,014.49 15,159.02- C 71,173.51 I
4,720.0000	DEUTSCHE POST AG	94,863.15	37.4328	176,683.06	81,819.91 19,275.39- C 101,095.30 I
552.0000	MERCK KGAA	27,434.01	120.6131	66,578.47	39,144.46 15,659.11- C 54,803.57 I
3,989.0000	SAP SE	200,935.15	104.3032	416,065.85	215,130.70 76,326.16- C 291,456.86 I
1,178.0000	E.ON SE	10,737.80	9.4072	11,081.74	343.94 524.67 C 180.73- I
329.0000	HENKEL AG & CO KGAA	17,091.08	120.7842	39,738.02	22,646.94 7,587.54- C 30,234.48 I
959.0000	METRO AG	30,340.61	33.7089	32,326.89	1,986.28 194.15 C 1,792.13 I
3,548.0000	BAYER AG	243,350.86	129.1102	458,083.20	214,732.34 85,628.29- C 300,360.63 I



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4,323.0000	BASF SE	281,043.77	92.4872	399,822.16	118,778.39 63,259.98- C 182,038.37 I
379.0000	BEIERSDORF AG	22,819.99	104.9762	39,785.99	16,966.00 7,437.09- C 24,403.09 I
215.0000	HOCHTIEF AG	18,569.95	182.9442	39,333.01	20,763.06 7,352.43- C 28,115.49 I
1,021.0000	HEIDELBERGCEMENT AG	63,018.73	96.5475	98,575.06	35,556.33 13,850.36- C 49,406.69 I
1,271.0000	FRESENIUS MEDICAL CARE AG & CO	76,802.94	96.0000	122,016.12	45,213.18 23,845.76- C 69,058.94 I
1,948.0000	ALLIANZ SE	248,011.82	196.6308	383,036.84	135,025.02 71,600.06- C 206,625.08 I
847.0000	MUENCHENER RUECKVERSICHERUNGS-	139,614.18	201.3641	170,555.39	30,941.21 31,881.46- C 62,822.67 I
190.0000	VOLKSWAGEN AG	18,425.63	154.8296	29,417.64	10,992.01 5,498.97- C 16,490.98 I
4,228.0000	DAIMLER AG	211,994.98	72.2766	305,585.69	93,590.71 44,637.55- C 138,228.26 I



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184.0000	MAN SE	15,538.53	107.0634	19,699.67	4,161.14 3,682.43- C 7,843.57 I
3,777.0000	SIEMENS AG	380,751.86	137.2651	518,450.63	137,698.77 80,244.58- C 217,943.35 I
651.0000	LINDE AG	77,980.37	189.1031	123,106.18	45,125.81 23,011.90- C 68,137.71 I
3,821.0000	DEUTSCHE BANK AG	75,054.30	17.7070	67,658.60	7,395.70- 2,918.57 C 10,314.27- I
1,421.0000	BAYERISCHE MOTOREN WERKE AG	67,660.75	92.7039	131,732.25	64,071.50 24,624.36- C 88,695.86 I
14,715.0000	DEUTSCHE TELEKOM AG	204,636.73	17.9294	263,831.80	59,195.07 43,975.34- C 103,170.41 I
4,663.0000	INFINEON TECHNOLOGIES AG	32,588.98	21.0830	98,310.35	65,721.37 18,376.92- C 84,098.29 I
340.0000	FRAPORT AG FRANKFURT AIRPORT S	18,116.28	88.1645	29,975.94	11,859.66 5,603.33- C 17,462.99 I
2,462.0000	RED ELECTRICA CORP SA	36,886.70	20.8663	51,372.98	14,486.28 5,369.41- C 19,855.69 I



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1,534.0000	ACS ACTIVIDADES DE CONSTRUCCIO	1,267.35	0.7983	1,224.72	42.63- 12.78 C 55.41- I
5,447.0000	INDUSTRIA DE DISENO TEXTIL SA	88,340.72	38.3338	208,804.67	120,463.95 40,319.66- C 160,783.61 I
306.0000	AENA SA	30,299.72	194.8629	59,628.07	29,328.35 831.24 C 28,497.11 I
2,390.0000	GRIFOLS SA	16,018.71	27.8123	66,471.43	50,452.72 12,425.27- C 62,877.99 I
1,534.0000	ACS ACTIVIDADES DE CONSTRUCCIO	48,626.91	38.5791	59,180.35	10,553.44 3,966.81 C 6,586.63 I
4,617.0000	FERROVIAL SA	68,654.11	22.1665	102,343.15	33,689.04 932.78 C 32,756.26 I
7,272.0000	CAIXABANK SA	20,191.38	4.7674	34,669.25	14,477.87 1,457.53 C 13,020.34 I
17,260.0000	IBERDROLA SA	107,825.17	7.9074	136,482.30	28,657.13 4,166.92- C 32,824.05 I
2,403.0000	AMADEUS IT GROUP SA	69,199.82	59.7077	143,477.83	74,278.01 7,883.89- C 82,161.90 I



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10,778.0000	INTERNATIONAL CONSOLIDATED AIR	54,712.10	7.9256	85,423.00	30,710.90 744.38 C 29,966.52 I
2,865.0000	DISTRIBUIDORA INTERNACIONAL DE	14,929.86	6.2171	17,812.11	2,882.25 3,851.37- C 6,733.62 I
2,739.0000	ABERTIS INFRAESTRUCTURAS SA	39,001.87	18.4997	50,670.74	11,668.87 3,396.42 C 8,272.45 I
3,374.0000	ENDESA SA	70,057.06	23.0048	77,618.51	7,561.45 3,701.47 C 3,859.98 I
2,143.0000	BANKINTER SA	11,677.31	9.1985	19,712.47	8,035.16 3,684.79- C 11,719.95 I
23,079.0000	BANCO BILBAO VIZCAYA ARGENTARI	164,871.86	8.2860	191,234.81	26,362.95 3,935.11 C 22,427.84 I
3,855.0000	GAS NATURAL SDG SA	70,081.43	23.3698	90,090.85	20,009.42 1,204.55 C 18,804.87 I
4,624.0000	REPSOL SA	69,665.33	15.2833	70,670.30	1,004.97 1,388.67 C 383.70- I
48,219.0000	BANCO SANTANDER SA	287,709.93	6.6060	318,537.88	30,827.95 8,273.47 C 22,554.48 I



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18,217.0000	TELEFONICA SA	176,005.74	10.3082	187,786.14	11,780.40 9,317.57 C 2,462.83 I
825.0000	ENAGAS SA	18,520.95	28.0005	23,100.41	4,579.46 4,318.10- C 8,897.56 I
1,077.0000	VALEO SA	38,162.09	67.2810	72,461.68	34,299.59 15,031.72- C 49,331.31 I
4,837.0000	ENGIE SA	58,043.03	15.0723	72,905.05	14,862.02 3,825.66 C 11,036.36 I
4,648.0000	ELECTRICITE DE FRANCE SA	45,970.94	10.8146	50,266.71	4,295.77 2,637.74 C 1,658.03 I
565.0000	ARKEMA SA	35,962.32	106.5615	60,207.30	24,244.98 5,368.54- C 29,613.52 I
302.0000	IMERYS SA	18,954.78	86.8528	26,229.57	7,274.79 4,903.03- C 12,177.82 I
1,267.0000	SAFRAN SA	51,231.82	91.5177	115,952.97	64,721.15 23,131.33- C 87,852.48 I
11,149.0000	NATIXIS SA	62,098.13	6.7030	74,731.88	12,633.75 97.03 C 12,536.72 I



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1,444.0000	SCOR SE	42,874.47	39.5884	57,165.78	14,291.31 1,467.57- C 15,758.88 I
2,508.0000	VINCI SA	145,509.27	85.2333	213,765.12	68,255.85 35,131.72- C 103,387.57 I
1,804.0000	AIR LIQUIDE SA	173,012.64	123.4075	222,627.15	49,614.51 30,726.22- C 80,340.73 I
2,373.0000	DANONE SA	146,172.34	75.0595	178,116.42	31,944.08 32,931.93- C 64,876.01 I
1,695.0000	LEGRAND SA	79,567.49	69.8586	118,410.48	38,842.99 11,979.35- C 50,822.34 I
354.0000	IEFFAGE SA	18,751.96	90.7421	32,122.72	13,370.76 6,004.63- C 19,375.39 I
8,022.0000	TOTAL SA	442,233.77	49.3687	396,035.77	46,198.00- 42,343.62- C 3,854.38- I
224.0000	AEROPORTS DE PARIS	18,713.19	161.1597	36,099.78	17,386.59 6,748.01- C 24,134.60 I
1,372.0000	BUREAU VERITAS SA	18,650.10	22.0981	30,318.67	11,668.57 5,667.39- C 17,335.96 I



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2,830.0000	EDENRED	57,565.89	26.0387	73,689.68	16,123.79 1,570.56 C 14,553.23 I
2,457.0000	AIRBUS SE	79,751.65	82.1196	201,767.86	122,016.21 35,898.38- C 157,914.59 I
3,972.0000	VEOLIA ENVIRONNEMENT SA	71,153.01	21.1001	83,809.90	12,656.89 3,372.97 C 9,283.92 I
1,027.0000	L'OREAL SA	109,846.98	208.0363	213,653.30	103,806.32 39,937.64- C 143,743.96 I
1,052.0000	LVMH MOET HENNESSY LOUIS VUITT	126,242.33	248.9820	261,929.13	135,686.80 48,961.72- C 184,648.52 I
452.0000	THALES SA	18,203.80	107.4854	48,583.42	30,379.62 9,081.58- C 39,461.20 I
988.0000	CAPGEMINI SE	61,688.64	103.1969	101,958.60	40,269.96 6,102.51- C 46,372.47 I
934.0000	CASINO GUICHARD PERRACHON SA	50,544.03	59.1489	55,245.09	4,701.06 2,898.97 C 1,802.09 I
1,566.0000	PUBLICIS GROUPE SA	87,262.91	74.4893	116,650.28	29,387.37 2,187.38- C 31,574.75 I



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661.0000	CIE GENERALE DES ETABLISSEMENT	49,863.14	132.7600	87,754.37	37,891.23 16,519.81- C 54,411.04 I
880.0000	PERNOD RICARD SA	76,952.35	133.7294	117,681.95	40,729.60 20,358.19- C 61,087.79 I
795.0000	RENAULT SA	38,225.31	90.3885	71,858.93	33,633.62 13,432.39- C 47,066.01 I
2,544.0000	SCHNEIDER ELECTRIC SE	151,450.70	76.7247	195,187.89	43,737.19 25,375.58- C 69,112.77 I
3,765.0000	VIVENDI SA	70,097.93	22.2293	83,693.39	13,595.46 3,351.87 C 10,243.59 I
3,586.0000	ORANGE SA	55,709.26	15.8422	56,810.27	1,101.01 2,981.10 C 1,880.09- I
88.0000	HERMES INTERNATIONAL	12,097.05	493.4589	43,424.39	31,327.34 8,117.18- C 39,444.52 I
616.0000	DASSAULT SYSTEMES SE	18,588.80	89.5217	55,145.41	36,556.61 10,308.18- C 46,864.79 I
461.0000	KERING	74,059.99	340.1120	156,791.64	82,731.65 28,262.49- C 110,994.14 I



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1,192.0000	CARREFOUR SA	30,326.06	25.2631	30,113.71	212.35- 1,075.91 C 1,288.26- I
369.0000	ATOS SE	30,536.20	140.1735	51,724.06	21,187.86 10,793.31- C 31,981.17 I
4,245.0000	SANOFI	312,729.87	95.5324	405,535.33	92,805.46 72,678.49- C 165,483.95 I
1,867.0000	ACCOR SA	69,474.43	46.8138	87,401.51	17,927.08 529.35- C 18,456.43 I
1,631.0000	NOKIA OYJ	11,796.39	6.1213	9,983.90	1,812.49- 391.29 C 2,203.78- I
5,374.0000	STMICROELECTRONICS NV	56,030.34	14.3367	77,045.50	21,015.16 4,053.15- C 25,068.31 I
2,245.0000	SOCIETE GENERALE SA	94,668.32	53.7313	120,626.79	25,958.47 1,715.23- C 27,673.70 I
372.0000	EURAZEO SA	18,013.03	74.9227	27,871.26	9,858.23 5,059.24- C 14,917.47 I
404.0000	SODEXO SA	24,650.84	129.1102	52,160.55	27,509.71 9,750.23- C 37,259.94 I



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587.0000	UNIBAIL-RODAMCO SE	110,510.33	251.6623	147,725.80	37,215.47 10,014.44- C 47,229.91 I
11,877.0000	AXA SA	252,588.70	27.3161	324,434.18	71,845.48 39,934.37- C 111,779.85 I
3,981.0000	PEUGEOT SA	61,562.60	19.9197	79,300.35	17,737.75 2,946.84 C 14,790.91 I
652.0000	JCDECAUX SA	18,518.33	32.7565	21,357.30	2,838.97 3,992.27- C 6,831.24 I
862.0000	ESSILOR INTERNATIONAL SA	55,719.70	127.0572	109,523.37	53,803.67 20,472.91- C 74,276.58 I
2,992.0000	CREDIT AGRICOLE SA	31,241.58	16.0646	48,065.42	16,823.84 2,275.69 C 14,548.15 I
1,405.0000	ZODIAC AEROSPACE	26,281.02	27.0880	38,058.73	11,777.71 3,532.08- C 15,309.79 I
3,505.0000	BNP PARIBAS SA	237,452.16	71.9230	252,090.41	14,638.25 23,527.12- C 38,165.37 I
492.0000	CIE DE SAINT-GOBAIN	24,076.24	53.3549	26,250.63	2,174.39 4,906.95- C 7,081.34 I



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261.0000	WENDEL SA	19,350.98	147.8152	38,579.79	19,228.81 3,049.36- C 22,278.17 I
274.0000	GECINA SA	33,873.46	156.6545	42,923.34	9,049.88 6,405.29- C 15,455.17 I
126.0000	ILIAD SA	23,643.03	236.2079	29,762.20	6,119.17 1,994.94 C 4,124.23 I
9,538.0000	CNH INDUSTRIAL NV	78,616.04	11.3085	107,860.98	29,244.94 4,858.78 C 24,386.16 I
521.0000	FERRARI NV	26,125.26	85.7123	44,656.13	18,530.87 733.62 C 17,797.25 I
3,982.0000	FIAT CHRYSLER AUTOMOBILES NV	30,391.92	10.5272	41,919.62	11,527.70 808.59 C 10,719.11 I
11,245.0000	UNICREDIT SPA	173,080.49	18.6479	209,696.68	36,616.19 10,957.46 C 25,658.73 I
727.0000	EXOR NV	29,454.72	54.0506	39,294.83	9,840.11 8,199.71- C 18,039.82 I
2,907.0000	LEONARDO SPA	30,508.39	16.5950	48,241.67	17,733.28 272.81 C 17,460.47 I



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13,546.0000	TERNA RETE ELETTRICA NAZIONALE	60,064.93	5.3902	73,016.19	12,951.26 8,527.07- C 21,478.33 I
1,187.0000	PRYSMIAN SPA	29,389.44	29.3691	34,861.20	5,471.76 7,274.54- C 12,746.30 I
47,137.0000	INTESA SANPAOLO SPA	102,802.09	3.1661	149,243.60	46,441.51 3,670.58- C 50,112.09 I
4,427.0000	MEDIOBANCA SPA	35,386.90	9.8543	43,625.22	8,238.32 3,889.94- C 12,128.26 I
673.0000	LUXOTTICA GROUP SPA	18,212.35	57.7688	38,878.44	20,666.09 7,267.44- C 27,933.53 I
25,143.0000	ENEL SPA	108,617.28	5.3537	134,609.13	25,991.85 3,713.18- C 29,705.03 I
11,784.0000	ENI SPA	181,235.36	15.0096	176,873.57	4,361.79- 9,281.38 C 13,643.17- I
16,184.0000	SNAM SPA	67,861.03	4.3523	70,438.25	2,577.22 525.54 C 2,051.68 I
1,688.0000	TENARIS SA	23,832.91	15.5685	26,279.64	2,446.73 2,343.30- C 4,790.03 I



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1,278.0000	ATLANTIA SPA	26,251.10	28.1031	35,915.83	9,664.73 6,713.66- C 16,378.39 I
8,503.0000	KONINKLIJKE AHOLD DELHAIZE NV	133,219.77	19.0928	162,346.14	29,126.37 26,648.99- C 55,775.36 I
1,093.0000	NN GROUP NV	30,000.22	35.4939	38,794.85	8,794.63 219.39 C 8,575.24 I
4,121.0000	ARCELORMITTAL	81,078.59	22.6513	93,346.10	12,267.51 2,394.35 C 9,873.16 I
1,849.0000	ABN AMRO GROUP NV	30,725.29	26.4721	48,947.03	18,221.74 1,173.73 C 17,048.01 I
475.0000	ALTICE NV	8,582.53	23.0448	10,946.29	2,363.76 1,642.19- C 4,005.95 I
2,335.0000	ALTICE NV	40,669.75	23.0391	53,796.32	13,126.57 4,350.33- C 17,476.90 I
21,830.0000	ING GROEP NV	245,285.97	17.2223	375,962.92	130,676.95 57,524.40- C 188,201.35 I
173.0000	HEINEKEN HOLDING NV	7,721.88	91.5291	15,834.54	8,112.66 2,959.93- C 11,072.59 I



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661.0000	KONINKLIJKE DSM NV	30,260.33	72.5846	47,978.42	17,718.09 8,968.48- C 26,686.57 I
6,988.0000	UNILEVER NV	218,635.38	55.1113	385,118.30	166,482.92 71,989.15- C 238,472.07 I
1,919.0000	ASML HOLDING NV	78,935.02	130.1367	249,732.43	170,797.41 49,087.66- C 219,885.07 I
5,151.0000	RELX NV	44,121.37	20.5299	105,749.51	61,628.14 16,695.80- C 78,323.94 I
1,391.0000	AKZO NOBEL NV	82,827.83	86.7844	120,717.17	37,889.34 13,790.93- C 51,680.27 I
1,044.0000	WOLTERS KLUWER NV	22,999.06	42.2744	44,134.56	21,135.50 8,249.96- C 29,385.46 I
10,563.0000	KONINKLIJKE KPN NV	21,164.56	3.1946	33,745.41	12,580.85 5,262.03- C 17,842.88 I
1,747.0000	KONINKLIJKE PHILIPS NV	51,045.67	35.4654	61,958.06	10,912.39 1,547.38 C 9,365.01 I
1,002.0000	HEINEKEN NV	51,537.24	97.0950	97,289.21	45,751.97 18,186.03- C 63,938.00 I



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1,956.0000	GALP ENERGIA SGPS SA	29,612.02	15.1179	29,570.79	41.23- 1,982.10 C 2,023.33- I
4,636.0000	BANCO ESPIRITO SANTO SA	12,190.60	0.0001	0.52	12,190.08- 0.10- C 12,189.98- I
2,239.0000	CIE FINANCIERE RICHEMONT SA	89,018.46	82.4936	184,703.18	95,684.72 15,738.18 C 79,946.54 I
697.0000	IDORSIA LTD	5,589.56	18.9004	13,173.60	7,584.04 119.27 C 7,464.77 I
14,454.0000	UBS GROUP AG	228,714.21	16.9581	245,113.52	16,399.31 17,613.85 C 1,214.54- I
715.0000	PARGESA HOLDING SA	46,860.56	76.1760	54,465.88	7,605.32 2,892.00 C 4,713.32 I
815.0000	SWISS PRIME SITE AG	63,352.56	90.9518	74,125.72	10,773.16 2,023.77 C 8,749.39 I
166.0000	GEBERIT AG	30,381.52	466.9764	77,518.09	47,136.57 6,605.15 C 40,531.42 I
207.0000	SCHINDLER HOLDING AG	18,695.40	211.8728	43,857.67	25,162.27 3,737.02 C 21,425.25 I



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114.0000	PARTNERS GROUP HOLDING AG	29,614.44	620.7904	70,770.11	41,155.67 4,915.86- C 46,071.53 I
149.0000	KUEHNE + NAGEL INTERNATIONAL A	15,336.79	167.0756	24,894.27	9,557.48 2,121.21 C 7,436.27 I
1,139.0000	JULIUS BAER GROUP LTD	44,438.34	52.6810	60,003.71	15,565.37 4,624.34 C 10,941.03 I
1,935.0000	SWISS RE AG	100,377.75	91.5261	177,103.06	76,725.31 8,133.30 C 68,592.01 I
18.0000	SIKA AG	53,847.01	6,432.4126	115,783.43	61,936.42 5,676.56- C 67,612.98 I
24.0000	SGS SA	33,947.33	2,424.6854	58,192.45	24,245.12 4,958.46 C 19,286.66 I
101.0000	SWISSCOM AG	37,259.87	483.1619	48,799.35	11,539.48 4,158.09 C 7,381.39 I
36.0000	GIVAUDAN SA	34,950.05	2,002.8194	72,101.50	37,151.45 5,621.56 C 31,529.89 I
565.0000	ZURICH INSURANCE GROUP AG	134,580.23	291.4425	164,665.07	30,084.84 12,352.71 C 17,732.13 I



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9,862.0000	NOVARTIS AG	541,829.54	83.3289	821,790.42	279,960.88 52,681.40 C 227,279.48 I
4,884.0000	ABB LTD	99,565.13	24.7271	120,767.63	21,202.50 9,008.19 C 12,194.31 I
3,014.0000	ROCHE HOLDING AG	492,574.58	254.9992	768,567.64	275,993.06 65,488.12 C 210,504.94 I
527.0000	ADECCO GROUP AG	30,849.59	76.1238	40,117.27	9,267.68 3,418.31 C 5,849.37 I
1,315.0000	LAFARGEHOLCIM LTD	69,988.00	57.3278	75,386.10	5,398.10 4,002.81 C 1,395.29 I
14,275.0000	NESTLE SA	733,991.49	87.1403	1,243,929.15	509,937.66 105,992.72 C 403,944.94 I
206.0000	BALOISE HOLDING AG	18,644.45	154.7538	31,879.29	13,234.84 2,716.38 C 10,518.46 I
12,208.0000	CREDIT SUISSE GROUP AG	185,120.12	14.4729	176,685.51	8,434.61- 5,196.34 C 13,630.95- I
223.0000	LONZA GROUP AG	18,318.22	216.4673	48,272.23	29,954.01 4,113.18 C 25,840.83 I



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297.0000	SWISS LIFE HOLDING AG	62,829.48	337.9105	100,359.42	37,529.94 6,299.36 C 31,230.58 I
15,159.0000	NATIONAL GRID PLC	162,350.95	12.3634	187,416.87	25,065.92 34,723.38- C 59,789.30 I
6,456.0000	ROYAL MAIL PLC	37,284.15	5.4711	35,321.92	1,962.23- 830.74 C 2,792.97- I
9,039.4240	COMPASS GROUP PLC	98,260.00	21.0429	190,216.51	91,956.51 32,734.25- C 124,690.76 I
1,762.0000	INTERCONTINENTAL HOTELS GROUP	63,256.12	55.4261	97,660.96	34,404.84 2,647.64- C 37,052.48 I
1,126.0000	WOLSELEY PLC	29,829.79	61.2195	68,933.17	39,103.38 12,168.33- C 51,271.71 I
80,790.0000	VODAFONE GROUP PLC	219,964.25	2.8284	228,511.58	8,547.33 4,501.95- C 13,049.28 I
18,180.0000	STANDARD LIFE PLC	77,361.42	5.1841	94,247.11	16,885.69 4,262.96- C 21,148.65 I
5.0000	LONMIN PLC	129.90	0.8540	4.27	125.63- 0.91- C 124.72- I



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8,168.0000	WORLDPAY GROUP PLC	29,884.85	4.0890	33,399.72	3,514.87 708.39- C 4,223.26 I
546.0000	CRODA INTERNATIONAL PLC	19,779.97	50.4642	27,553.46	7,773.49 5,239.39- C 13,012.88 I
15,155.0000	DIRECT LINE INSURANCE GROUP PL	63,743.18	4.6164	69,962.58	6,219.40 6,125.37- C 12,344.77 I
831.0000	JOHNSON MATTHEY PLC	25,302.12	37.2928	30,990.36	5,688.24 5,470.64- C 11,158.88 I
1,898.0000	LONDON STOCK EXCHANGE GROUP PL	61,463.89	47.3597	89,888.74	28,424.85 9,687.30- C 38,112.15 I
574.0000	RANDGOLD RESOURCES LTD	36,715.65	88.3935	50,737.90	14,022.25 10,257.34- C 24,279.59 I
6,071.0000	J SAINSBURY PLC	21,396.78	3.2694	19,848.88	1,547.90- 3,149.66- C 1,601.76 I
1,657.0000	BERKELEY GROUP HOLDINGS PLC	59,554.18	41.9171	69,456.66	9,902.48 1,633.54 C 8,268.94 I
17,462.0000	ROYAL DUTCH SHELL PLC A SHS	509,690.74	26.4336	461,584.09	48,106.65- 68,898.00- C 20,791.35 I



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19,825.0000	ROYAL DUTCH SHELL PLC B SHS	487,418.28	26.7908	531,128.48	43,710.20 74,802.95- C 118,513.15 I
10,532.0000	CENTRICA PLC	29,885.18	2.6004	27,388.44	2,496.74- 861.32 C 3,358.06- I
18,915.0000	COBHAM PLC	26,849.66	1.6834	31,842.25	4,992.59 1,250.21 C 3,742.38 I
1,634.0000	BUNZL PLC	18,582.17	29.7199	48,562.44	29,980.27 8,572.62- C 38,552.89 I
4,261.0000	INMARSAT PLC	40,134.17	9.9954	42,590.49	2,456.32 1,001.68 C 1,454.64 I
2,011.0000	MONDI PLC	39,978.22	26.1608	52,609.48	12,631.26 4,706.59- C 17,337.85 I
1,274.0000	SEVERN TRENT PLC	26,886.56	28.3430	36,109.10	9,222.54 6,661.56- C 15,884.10 I
1,457.0000	WHITBREAD PLC	47,207.41	51.5293	75,078.26	27,870.85 3,501.81- C 31,372.66 I



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3,478.0000	SMITHS GROUP PLC	58,172.47	20.7442	72,148.44	13,975.97 13,639.57- C 27,615.54 I
4,295.0000	ANGLO AMERICAN PLC	63,835.08	13.3012	57,128.86	6,706.22- 5,847.35- C 858.87- I
4,223.0000	3I GROUP PLC	19,302.93	11.7230	49,506.34	30,203.41 8,409.21- C 38,612.62 I
6,246.0000	UNILEVER PLC	197,350.95	53.9713	337,105.19	139,754.24 62,731.77- C 202,486.01 I
5,784.0000	EXPERIAN PLC	64,346.11	20.4584	118,331.75	53,985.64 21,534.04- C 75,519.68 I
5,365.0000	RELX PLC	44,925.52	21.5625	115,683.19	70,757.67 18,658.63- C 89,416.30 I
2,407.0000	SHIRE PLC	53,292.82	55.0495	132,504.15	79,211.33 23,390.60- C 102,601.93 I
1,415.0000	FRESNILLO PLC	18,875.03	19.3023	27,312.89	8,437.86 4,821.46- C 13,259.32 I
8,692.0000	CAPITA PLC	55,033.98	8.9822	78,073.62	23,039.64 2,455.30 C 20,584.34 I



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2,865.0000	RECKITT BENCKISER GROUP PLC	161,063.61	101.1102	289,680.92	128,617.31 50,841.24- C 179,458.55 I
2,923.0000	UNITED UTILITIES GROUP PLC	25,469.15	11.2683	32,937.51	7,468.36 5,814.36- C 13,282.72 I
27,635.0000	GLENCORE PLC	68,180.05	3.7305	103,094.70	34,914.65 2,398.30- C 37,312.95 I
8,302.0000	DIXONS CARPHONE PLC	33,177.68	3.6838	30,583.09	2,594.59- 961.79 C 3,556.38- I
7,366.0000	SEGRO PLC	38,931.08	6.3544	46,806.97	7,875.89 2,728.60- C 10,604.49 I
7,955.0000	ROLLS-ROYCE HOLDINGS PLC	74,690.75	11.5736	92,068.34	17,377.59 16,252.58- C 33,630.17 I
19,813.0000	OLD MUTUAL PLC	43,009.40	2.5121	49,773.61	6,764.21 8,786.39- C 15,550.60 I
5,199.0000	SAGE GROUP PLC/THE	20,284.02	8.9367	46,462.30	26,178.28 8,201.86- C 34,380.14 I
5,681.0000	MEDICLINIC INTERNATIONAL PLC	53,907.27	9.6317	54,717.78	810.51 1,286.91 C 476.40- I



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5,404.0000	WPP PLC	57,382.52	20.9650	113,295.15	55,912.63 20,068.12- C 75,980.75 I
1,638.0000	COCA-COLA HBC AG	34,027.96	29.3302	48,043.02	14,015.06 1,129.93 C 12,885.13 I
9,441.0000	ABERDEEN ASSET MANAGEMENT PLC	30,717.49	3.9228	37,035.43	6,317.94 871.04 C 5,446.90 I
2,954.0000	ANTOFAGASTA PLC	31,819.54	10.3851	30,677.60	1,141.94- 6,201.89- C 5,059.95 I
2,519.0000	ASHTAD GROUP PLC	43,101.13	20.6403	51,992.95	8,891.82 8,765.90- C 17,657.72 I
7,402.0000	BHP BILLITON PLC	130,223.43	15.2756	113,070.38	17,153.05- 4,049.70 C 21,202.75- I
9,733.0000	BRITISH LAND CO PLC/THE	75,713.18	7.8651	76,551.44	838.26 3,167.00- C 4,005.26 I
4,889.0000	SKY PLC	46,016.87	12.9115	63,124.63	17,107.76 11,143.21- C 28,250.97 I
11,870.0000	AVIVA PLC	70,353.58	6.8324	81,101.50	10,747.92 14,316.62- C 25,064.54 I



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10,737.0000	DIAGEO PLC	185,286.07	29.4666	316,383.76	131,097.69 55,850.34- C 186,948.03 I
944.0000	SCHRODERS PLC	22,323.40	40.3194	38,061.52	15,738.12 5,215.76- C 20,953.88 I
15,189.0000	BAE SYSTEMS PLC	87,247.42	8.2288	124,987.98	37,740.56 22,063.80- C 59,804.36 I
8,565.0000	BRITISH AMERICAN TOBACCO PLC	299,885.26	67.9870	582,309.02	282,423.76 102,793.39- C 385,217.15 I
3,031.0000	HAMMERSON PLC	18,399.06	7.4624	22,618.75	4,219.69 3,992.82- C 8,212.51 I
11,556.0000	STANDARD CHARTERED PLC	106,384.22	10.0954	116,662.90	10,278.68 2,806.54- C 13,085.22 I
5,162.0000	IMPERIAL BRANDS PLC	164,751.52	44.7942	231,228.13	66,476.61 43,489.23- C 109,965.84 I
73,187.0000	HSBC HOLDINGS PLC	708,870.54	9.2446	676,586.53	32,284.01- 117,878.13- C 85,594.12 I
25,149.0000	LEGAL & GENERAL GROUP PLC	34,299.28	3.3551	84,379.62	50,080.34 14,895.30- C 64,975.64 I



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9,952.0000	MEGGITT PLC	58,403.09	6.1946	61,649.58	3,246.49 2,518.86- C 5,765.35 I
24,220.0000	WM MORRISON SUPERMARKETS PLC	69,491.95	3.1330	75,882.89	6,390.94 3,630.76- C 10,021.70 I
1,312.0000	ASSOCIATED BRITISH FOODS PLC	19,799.55	38.1371	50,035.97	30,236.42 8,832.71- C 39,069.13 I
3,272.0000	PERSIMMON PLC	70,763.37	29.1224	95,288.69	24,525.32 8,169.16- C 32,694.48 I
10,909.0000	PRUDENTIAL PLC	95,841.84	22.8745	249,538.02	153,696.18 44,202.13- C 197,898.31 I
3,055.0000	RIO TINTO PLC	168,995.99	42.1119	128,652.03	40,343.96- 23,445.49- C 16,898.47- I
6,077.0000	SSE PLC	108,296.72	18.8737	114,695.74	6,399.02 10,495.49- C 16,894.51 I
67,006.0000	BP PLC	458,607.30	5.7517	385,401.80	73,205.50- 33,872.14- C 39,333.36- I
198,291.0000	LLOYDS BANKING GROUP PLC	188,656.92	0.8592	170,382.62	18,274.30- 23,351.57- C 5,077.27 I



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3,800.0000	SMITH & NEPHEW PLC	38,073.71	17.2110	65,402.13	27,328.42 11,545.27- C 38,873.69 I
16,490.0000	GLAXOSMITHKLINE PLC	318,517.98	21.2443	350,318.96	31,800.98 61,840.83- C 93,641.81 I
1,874.0000	BABCOCK INTERNATIONAL GROUP PL	21,149.32	11.4372	21,433.42	284.10 4,308.28- C 4,592.38 I
5,930.0000	ASTRAZENECA PLC	268,451.78	66.7010	395,537.42	127,085.64 69,823.13- C 196,908.77 I
10,769.0000	GKN PLC	29,649.06	4.2345	45,602.16	15,953.10 9,647.39- C 25,600.49 I
33,259.0000	BT GROUP PLC	63,783.83	3.8286	127,337.24	63,553.41 22,478.47- C 86,031.88 I
1,152.0000	CARNIVAL PLC	51,230.14	65.9866	76,016.63	24,786.49 7,301.18- C 32,087.67 I
10,148.0000	MARKS & SPENCER GROUP PLC	45,222.54	4.3294	43,934.75	1,287.79- 1,033.29 C 2,321.08- I
64,266.0000	BARCLAYS PLC	177,963.40	2.6336	169,252.30	8,711.10- 4,434.11 C 13,145.21- I



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680.0000	INTERTEK GROUP PLC	19,764.86	54.7767	37,248.17	17,483.31 7,194.73- C 24,678.04 I
1,861.0000	BURBERRY GROUP PLC	20,734.47	21.5755	40,152.12	19,417.65 7,087.93- C 26,505.58 I
5,195.0000	LAND SECURITIES GROUP PLC	60,641.91	13.1583	68,357.70	7,715.79 6,234.02- C 13,949.81 I
1,467.0000	NEXT PLC	58,469.62	50.0875	73,478.38	15,008.76 4,368.78- C 19,377.54 I
10,129.0000	KINGFISHER PLC	33,761.54	3.9059	39,563.29	5,801.75 6,984.00- C 12,785.75 I
15,062.0000	ITV PLC	31,684.10	2.3562	35,490.52	3,806.42 6,054.65- C 9,861.07 I
3,562.0000	RYANAIR HOLDINGS PLC	19,862.28	20.4842	72,965.00	53,102.72 13,639.18- C 66,741.90 I
3,583.0000	CRH PLC	91,448.43	35.3285	126,582.15	35,133.72 24,563.22- C 59,696.94 I
602.0000	KERRY GROUP PLC	19,189.59	85.9176	51,722.41	32,532.82 9,668.36- C 42,201.18 I



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12,840.0000	CHEUNG KONG PROPERTY HOLDINGS	56,400.48	7.8332	100,579.14	44,178.66 507.60- C 44,686.26 I
12,840.0000	CK HUTCHISON HOLDINGS LTD	96,994.32	12.5537	161,189.79	64,195.47 813.48- C 65,008.95 I
4,000.0000	CK INFRASTRUCTURE HOLDINGS LTD	26,166.51	8.4033	33,613.23	7,446.72 189.73- C 7,636.45 I
14,140.0000	LINK REIT	61,253.71	7.6090	107,592.57	46,338.86 479.03- C 46,817.89 I
10,000.0000	TECHTRONIC INDUSTRIES CO LTD	31,371.90	4.5987	45,987.61	14,615.71 334.67- C 14,950.38 I
60,600.0000	AIA GROUP LTD	214,993.01	7.3080	442,868.40	227,875.39 2,431.18- C 230,306.57 I
11,600.0000	SANDS CHINA LTD	19,090.29	4.5795	53,122.74	34,032.45 268.11- C 34,300.56 I
4,100.0000	SWIRE PROPERTIES LTD	9,595.32	3.2985	13,524.07	3,928.75 79.05- C 4,007.80 I
4,800.0000	BANK OF EAST ASIA LTD/THE	17,866.79	4.2977	20,629.10	2,762.31 104.10- C 2,866.41 I



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13,000.0000	CLP HOLDINGS LTD	98,825.03	10.5809	137,552.92	38,727.89 781.54- C 39,509.43 I
4,400.0000	HONG KONG EXCHANGES & CLEARING	74,950.83	25.8504	113,741.84	38,791.01 574.03- C 39,365.04 I
6,500.0000	MTR CORP LTD	24,721.83	5.6299	36,594.74	11,872.91 184.68- C 12,057.59 I
3,300.0000	HANG SENG BANK LTD	46,362.45	20.9185	69,031.38	22,668.93 348.38- C 23,017.31 I
8,169.0000	HENDERSON LAND DEVELOPMENT CO	35,839.84	5.5787	45,572.56	9,732.72 230.43- C 9,963.15 I
6,500.0000	POWER ASSETS HOLDINGS LTD	40,776.85	8.8324	57,410.86	16,634.01 302.48- C 16,936.49 I
6,000.0000	WHARF HOLDINGS LTD/THE	34,720.99	8.2880	49,728.11	15,007.12 250.96- C 15,258.08 I
36,437.0000	HONG KONG & CHINA GAS CO LTD	43,381.42	1.8804	68,519.64	25,138.22 345.82- C 25,484.04 I
8,000.0000	HYSAN DEVELOPMENT CO LTD	31,582.14	4.7716	38,173.56	6,591.42 148.74- C 6,740.16 I



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13,000.0000	GALAXY ENTERTAINMENT GROUP LTD	40,096.82	6.0719	78,934.73	38,837.91 551.79- C 39,389.70 I
11,000.0000	KERRY PROPERTIES LTD	31,603.57	3.3946	37,340.92	5,737.35 239.98- C 5,977.33 I
16,000.0000	BOC HONG KONG HOLDINGS LTD	38,613.39	4.7845	76,552.08	37,938.69 386.34- C 38,325.03 I
5,500.0000	YUE YUEN INDUSTRIAL HOLDINGS L	17,773.89	4.1504	22,827.28	5,053.39 115.20- C 5,168.59 I
1,000.0000	SUN HUNG KAI PROPERTIES LTD	13,078.18	14.6929	14,692.98	1,614.80 100.62- C 1,715.42 I
12,000.0000	WHEELOCK & CO LTD	45,850.00	7.5450	90,540.51	44,690.51 533.51- C 45,224.02 I
12,900.0000	CONCORDIA FINANCIAL GROUP LTD	64,352.43	5.0427	65,051.08	698.65 3,151.70- C 3,850.35 I
5,850.0000	MEBUKI FINANCIAL GROUP INC	21,665.59	3.7201	21,763.08	97.49 2,516.32- C 2,613.81 I
3,000.0000	RECRUIT HOLDINGS CO LTD	28,805.43	17.1858	51,557.49	22,752.06 2,357.94 C 20,394.12 I



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2,209.0000	JAPAN POST HOLDINGS CO LTD	28,136.61	12.4065	27,406.07	730.54- 125.04 C 855.58- I
2,270.0000	JAPAN POST BANK CO LTD	29,158.79	12.7981	29,051.80	106.99- 734.65 C 841.64- I
3,300.0000	SEVEN & I HOLDINGS CO LTD	81,478.41	41.1890	135,923.81	54,445.40 26,600.40- C 81,045.80 I
1,400.0000	BANDAI NAMCO HOLDINGS INC	21,386.68	34.0868	47,721.61	26,334.93 9,650.53- C 35,985.46 I
12,500.0000	MITSUBISHI CHEMICAL HOLDINGS C	76,971.30	8.2778	103,473.21	26,501.91 4,063.96- C 30,565.87 I
2,800.0000	DAIICHI SANKYO CO LTD	52,080.93	23.5582	65,962.97	13,882.04 12,909.01- C 26,791.05 I
1,600.0000	ELECTRIC POWER DEVELOPMENT CO	40,521.66	24.7241	39,558.56	963.10- 1,000.33 C 1,963.43- I
1,200.0000	SEGA SAMMY HOLDINGS INC	15,295.88	13.4567	16,148.09	852.21 836.35- C 1,688.56 I
2,400.0000	NOMURA REAL ESTATE HOLDINGS IN	40,704.49	19.6155	47,077.25	6,372.76 2,399.69 C 3,973.07 I



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1,000.0000	YAMAGUCHI FINANCIAL GROUP INC	10,806.72	12.0772	12,077.25	1,270.53 2,363.54- C 3,634.07 I
15,000.0000	AOZORA BANK LTD	51,236.08	3.8091	57,137.77	5,901.69 2,999.64- C 8,901.33 I
11,000.0000	FUKUOKA FINANCIAL GROUP INC	50,675.17	4.7525	52,278.39	1,603.22 2,062.65- C 3,665.87 I
2,000.0000	INPEX CORP	22,203.12	9.6208	19,241.72	2,961.40- 880.01 C 3,841.41- I
4,700.0000	ISETAN MITSUKOSHI HOLDINGS LTD	53,286.86	10.0213	47,100.39	6,186.47- 1,780.84- C 4,405.63- I
1,500.0000	J FRONT RETAILING CO LTD	18,142.52	15.3435	23,015.31	4,872.79 4,504.12- C 9,376.91 I
2,400.0000	OTSUKA HOLDINGS CO LTD	68,677.49	42.6308	102,313.99	33,636.50 29,783.17- C 63,419.67 I
1,000.0000	MEIJI HOLDINGS CO LTD	19,510.65	81.0786	81,078.67	61,568.02 15,867.15- C 77,435.17 I
5,400.0000	DAI-ICHI LIFE HOLDINGS INC	77,538.30	18.0357	97,393.20	19,854.90 15,825.24- C 35,680.14 I



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2,419.0000	SOMPO HOLDINGS INC	53,626.59	38.6169	93,414.39	39,787.80 36,167.05- C 75,954.85 I
18,362.0000	JXTG HOLDINGS INC	64,670.11	4.3672	80,190.75	15,520.64 2,602.19- C 18,122.83 I
900.0000	AISIN SEIKI CO LTD	26,686.74	51.1747	46,057.31	19,370.57 9,013.46- C 28,384.03 I
3,000.0000	AJINOMOTO CO INC	29,769.06	21.5957	64,787.29	35,018.23 12,678.94- C 47,697.17 I
3,000.0000	AMADA HOLDINGS CO LTD	25,712.53	11.5521	34,656.46	8,943.93 6,782.29- C 15,726.22 I
2,400.0000	AEON FINANCIAL SERVICE CO LTD	43,410.11	21.1641	50,793.87	7,383.76 1,284.43 C 6,099.33 I
12,600.0000	ACOM CO LTD	35,563.19	4.5656	57,527.59	21,964.40 2,932.38 C 19,032.02 I
1,700.0000	ASAHI GROUP HOLDINGS LTD	31,620.56	37.6290	63,969.38	32,348.82 12,518.86- C 44,867.68 I
6,000.0000	ASAHI KASEI CORP	32,835.39	10.7467	64,480.24	31,644.85 12,618.83- C 44,263.68 I



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1,200.0000	ASAHI GLASS CO LTD	31,762.44	42.0968	50,516.20	18,753.76 2,310.34 C 16,443.42 I
5,000.0000	HIROSHIMA BANK LTD/THE	21,187.56	4.4321	22,160.91	973.35 4,336.91- C 5,310.26 I
6,000.0000	BANK OF KYOTO LTD/THE	49,993.73	9.4339	56,603.77	6,610.04 2,555.05- C 9,165.09 I
3,000.0000	NTT DATA CORP	19,803.45	11.1249	33,374.87	13,571.42 6,531.49- C 20,102.91 I
8,400.0000	NTT DOCOMO INC	132,127.53	23.6027	198,262.72	66,135.19 25,626.76- C 91,761.95 I
2,700.0000	BRIDGESTONE CORP	45,075.20	43.0758	116,304.73	71,229.53 22,760.95- C 93,990.48 I
1,500.0000	BROTHER INDUSTRIES LTD	18,190.42	23.0776	34,616.41	16,425.99 6,774.45- C 23,200.44 I
2,000.0000	CANON INC	62,474.15	33.9622	67,924.53	5,450.38 1,439.54 C 4,010.84 I
700.0000	CENTRAL JAPAN RAILWAY CO	53,139.24	162.9583	114,070.84	60,931.60 22,323.74- C 83,255.34 I



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9,000.0000	CHIBA BANK LTD/THE	56,091.90	7.2445	65,201.14	9,109.24 3,781.71- C 12,890.95 I
2,600.0000	CHUBU ELECTRIC POWER CO INC	32,697.13	13.2831	34,536.31	1,839.18 1,579.50 C 259.68 I
2,000.0000	CHUGOKU BANK LTD/THE	27,000.83	14.9519	29,903.88	2,903.05 5,852.21- C 8,755.26 I
1,000.0000	CHUGAI PHARMACEUTICAL CO LTD	19,058.15	37.4243	37,424.35	18,366.20 7,323.96- C 25,690.16 I
3,100.0000	RAKUTEN INC	22,443.91	11.7657	36,473.83	14,029.92 7,137.96- C 21,167.88 I
7,800.0000	KDDI CORP	67,406.24	26.4773	206,523.66	139,117.42 40,416.83- C 179,534.25 I
400.0000	DAITO TRUST CONSTRUCTION CO LT	19,398.86	155.7048	62,281.95	42,883.09 12,188.62- C 55,071.71 I
1,100.0000	DAIKIN INDUSTRIES LTD	46,261.27	102.0825	112,290.85	66,029.58 21,975.39- C 88,004.97 I
2,000.0000	DAI NIPPON PRINTING CO LTD	20,170.57	11.1071	22,214.31	2,043.74 561.73 C 1,482.01 I



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3,000.0000	DAIWA HOUSE INDUSTRY CO LTD	33,953.32	34.1580	102,474.19	68,520.87 20,054.25- C 88,575.12 I
9,000.0000	DAIWA SECURITIES GROUP INC	48,584.58	5.9255	53,330.36	4,745.78 8,533.53- C 13,279.31 I
200.0000	LAWSON INC	8,549.55	69.9537	13,990.74	5,441.19 2,738.01- C 8,179.20 I
5,000.0000	mitsubishi UFJ LEASE & FINANCE	18,046.68	5.4645	27,322.89	9,276.21 5,347.10- C 14,623.31 I
1,000.0000	DON QUIJOTE HOLDINGS CO LTD	33,841.50	37.9138	37,913.85	4,072.35 5,684.55- C 9,756.90 I
1,500.0000	EAST JAPAN RAILWAY CO	103,808.40	95.6301	143,445.17	39,636.77 28,072.35- C 67,709.12 I
1,100.0000	EISAI CO LTD	39,468.48	55.2242	60,746.70	21,278.22 11,888.18- C 33,166.40 I
300.0000	FAST RETAILING CO LTD	69,534.82	333.0366	99,911.00	30,376.18 17,272.51- C 47,648.69 I
67,500.0000	MITSUBISHI UFJ FINANCIAL GROUP	354,869.06	6.7176	453,444.27	98,575.21 70,587.64- C 169,162.85 I



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4,000.0000	SUBARU CORP	20,527.45	33.6952	134,781.05	114,253.60 26,376.81- C 140,630.41 I
800.0000	FANUC CORP	86,964.82	192.7287	154,182.98	67,218.16 30,173.73- C 97,391.89 I
4,000.0000	FUJITSU LTD	21,444.29	7.3673	29,469.56	8,025.27 2,367.36- C 10,392.63 I
968.0000	NOMURA RESEARCH INSTITUTE LTD	18,227.69	39.3823	38,122.11	19,894.42 7,460.52- C 27,354.94 I
6.0000	NIPPON BUILDING FUND INC	25,552.84	5,108.5793	30,651.48	5,098.64 5,998.52- C 11,097.16 I
6.0000	JAPAN REAL ESTATE INVESTMENT C	25,137.60	4,975.0798	29,850.48	4,712.88 5,841.77- C 10,554.65 I
7,900.0000	HACHIJUNI BANK LTD/THE	47,241.99	6.3456	50,130.83	2,888.84 1,267.68 C 1,621.16 I
1,600.0000	HAMAMATSU PHOTONICS KK	29,817.38	30.7048	49,127.80	19,310.42 7,365.91- C 26,676.33 I
1,000.0000	HANKYU HANSHIN HOLDINGS INC	23,104.03	35.9558	35,955.85	12,851.82 7,036.61- C 19,888.43 I



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700.0000	DENTSU INC	18,595.01	47.7928	33,454.96	14,859.95 6,547.17- C 21,407.12 I
4,200.0000	RESONA HOLDINGS INC	20,370.98	5.5046	23,119.44	2,748.46 9,088.12- C 11,836.58 I
210.0000	HIROSE ELECTRIC CO LTD	23,444.73	142.5774	29,941.26	6,496.53 5,859.53- C 12,356.06 I
20,000.0000	HITACHI LTD	78,362.03	6.1356	122,712.70	44,350.67 24,014.98- C 68,365.65 I
2,000.0000	HITACHI METALS LTD	21,102.39	13.9017	27,803.49	6,701.10 5,441.17- C 12,142.27 I
1,394.0000	SUMITOMO MITSUI TRUST HOLDINGS	52,969.04	35.7689	49,861.92	3,107.12- 1,172.40- C 1,934.72- I
4,000.0000	HONDA MOTOR CO LTD	129,592.82	27.2694	109,077.96	20,514.86- 7,491.54- C 13,023.32- I
1,800.0000	HOYA CORP	49,099.77	51.9134	93,444.28	44,344.51 18,287.13- C 62,631.64 I
10,000.0000	IHI CORP	18,206.40	3.3997	33,997.86	15,791.46 6,653.42- C 22,444.88 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
3,500.0000	ISUZU MOTORS LTD	19,079.45	12.3353	43,173.73	24,094.28 8,449.13- C 32,543.41 I
9,400.0000	ITOCHU CORP	90,386.58	14.8540	139,627.98	49,241.40 17,430.86- C 66,672.26 I
4,000.0000	JAPAN TOBACCO INC	73,890.29	35.1281	140,512.63	66,622.34 27,498.45- C 94,120.79 I
6,100.0000	AEON CO LTD	65,652.02	15.1922	92,672.66	27,020.64 5,277.82- C 32,298.46 I
8,000.0000	KAJIMA CORP	19,760.86	8.4371	67,497.33	47,736.47 13,209.28- C 60,945.75 I
3,300.0000	KANSAI ELECTRIC POWER CO INC/T	31,643.91	13.7682	45,435.21	13,791.30 2,077.95 C 11,713.35 I
3,000.0000	KAO CORP	83,734.73	59.3805	178,141.68	94,406.95 31,651.26- C 126,058.21 I
13,000.0000	KAWASAKI HEAVY INDUSTRIES LTD	37,396.08	2.9547	38,412.24	1,016.16 3,402.39- C 4,418.55 I
3,000.0000	KEIKYU CORP	24,562.66	12.0416	36,124.95	11,562.29 7,069.69- C 18,631.98 I



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3,000.0000	KEIO CORP	19,995.09	8.3659	25,097.90	5,102.81 4,911.67- C 10,014.48 I
2,000.0000	KIKKOMAN CORP	23,529.90	31.9508	63,901.74	40,371.84 12,505.62- C 52,877.46 I
440.0000	KEYENCE CORP	48,358.74	439.1242	193,214.66	144,855.92 37,812.26- C 182,668.18 I
7,000.0000	KINTETSU GROUP HOLDINGS CO LTD	21,687.96	3.8536	26,975.79	5,287.83 5,279.18- C 10,567.01 I
4,100.0000	KOMATSU LTD	86,170.55	25.4049	104,160.28	17,989.73 20,384.27- C 38,374.00 I
1,000.0000	KONAMI HOLDINGS CORP	19,409.50	55.5357	55,535.78	36,126.28 10,868.38- C 46,994.66 I
1,600.0000	JTEKT CORP	19,539.40	14.6137	23,381.99	3,842.59 4,575.88- C 8,418.47 I
5,000.0000	KUBOTA CORP	46,048.34	16.7986	83,993.41	37,945.07 16,437.59- C 54,382.66 I
700.0000	KURARAY CO LTD	9,413.03	18.1381	12,696.69	3,283.66 2,484.76- C 5,768.42 I



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2,500.0000	KYOCERA CORP	124,840.85	57.9031	144,757.91	19,917.06 12,647.46- C 32,564.52 I
2,000.0000	KYOWA HAKKO KIRIN CO LTD	21,017.20	18.5742	37,148.45	16,131.25 7,269.96- C 23,401.21 I
3,200.0000	TOKIO MARINE HOLDINGS INC	89,230.50	41.3937	132,459.94	43,229.44 25,922.52- C 69,151.96 I
3,300.0000	JFE HOLDINGS INC	54,332.94	17.3593	57,285.95	2,953.01 1,448.61 C 1,504.40 I
1,200.0000	MAKITA CORP	20,378.38	36.9793	44,375.22	23,996.84 8,684.25- C 32,681.09 I
6,300.0000	SUMITOMO MITSUI FINANCIAL GROU	206,866.45	38.9729	245,529.54	38,663.09 44,616.07- C 83,279.16 I
5,900.0000	MARUBENI CORP	35,020.84	6.4595	38,111.60	3,090.76 963.73 C 2,127.03 I
3,100.0000	PANASONIC CORP	30,028.31	13.5635	42,046.99	12,018.68 6,304.24- C 18,322.92 I
113,800.0000	MIZUHO FINANCIAL GROUP INC	204,154.11	1.8280	208,032.39	3,878.28 41,041.07- C 44,919.35 I



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1,200.0000	CREDIT SAISON CO LTD	18,155.29	19.5265	23,431.83	5,276.54 4,585.63- C 9,862.17 I
5,000.0000	MITSUBISHI CORP	92,787.17	20.9683	104,841.58	12,054.41 14,629.64- C 26,684.05 I
1,500.0000	MITSUBISHI GAS CHEMICAL CO INC	18,270.28	21.1374	31,706.12	13,435.84 6,204.92- C 19,640.76 I
12,000.0000	MITSUBISHI ELECTRIC CORP	118,119.49	14.3778	172,534.70	54,415.21 28,151.01- C 82,566.22 I
14,000.0000	MITSUBISHI HEAVY INDUSTRIES LT	58,877.99	4.0922	57,290.85	1,587.14- 11,211.86- C 9,624.72 I
1,700.0000	MITSUBISHI MATERIALS CORP	53,395.49	30.2598	51,441.79	1,953.70- 2,467.99- C 514.29 I
2,400.0000	MITSUMI & CO LTD	34,907.74	14.2888	34,293.34	614.40- 4,397.01- C 3,782.61 I
6,000.0000	MITSUMI CHEMICALS INC	18,461.93	5.2954	31,772.87	13,310.94 6,217.99- C 19,528.93 I
3,000.0000	MITSUMI FUDOSAN CO LTD	51,520.90	23.8563	71,569.06	20,048.16 14,006.12- C 34,054.28 I



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1,100.0000	MURATA MANUFACTURING CO LTD	72,749.11	151.9223	167,114.62	94,365.51 18,467.47- C 112,832.98 I
2,200.0000	SEIKO EPSON CORP	17,415.31	22.2410	48,930.22	31,514.91 9,575.67- C 41,090.58 I
1,000.0000	NGK SPARK PLUG CO LTD	13,596.23	21.2620	21,262.01	7,665.78 4,160.99- C 11,826.77 I
700.0000	NINTENDO CO LTD	102,565.22	335.3506	234,745.45	132,180.23 5,196.71- C 137,376.94 I
2,000.0000	DENSO CORP	59,303.88	42.2036	84,407.26	25,103.38 16,518.58- C 41,621.96 I
1,200.0000	NIDEC CORP	70,048.72	102.4385	122,926.30	52,877.58 10,700.37- C 63,577.95 I
1,000.0000	NH FOODS LTD	12,882.89	30.3933	30,393.38	17,510.49 5,948.01- C 23,458.50 I
1,210.0000	NISSHIN SEIFUN GROUP INC	13,074.53	16.4204	19,868.72	6,794.19 3,888.32- C 10,682.51 I
4,400.0000	NIPPON TELEGRAPH & TELEPHONE C	92,639.67	47.2588	207,938.76	115,299.09 40,693.78- C 155,992.87 I



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2,000.0000	NSK LTD	15,906.64	12.4866	24,973.30	9,066.66 4,887.29- C 13,953.95 I
1,000.0000	NISSAN CHEMICAL INDUSTRIES LTD	14,192.47	33.0188	33,018.87	18,826.40 6,461.83- C 25,288.23 I
500.0000	NISSIN FOODS HOLDINGS CO LTD	16,662.57	62.4777	31,238.87	14,576.30 6,113.47- C 20,689.77 I
700.0000	NITTO DENKO CORP	27,277.65	82.2356	57,564.97	30,287.32 11,265.50- C 41,552.82 I
4,000.0000	NIPPON EXPRESS CO LTD	17,503.69	6.2566	25,026.70	7,523.01 4,897.74- C 12,420.75 I
1,400.0000	YAMAHA CORP	18,378.87	34.5318	48,344.60	29,965.73 9,461.07- C 39,426.80 I
2,000.0000	MINEBEA MITSUMI INC	12,329.24	16.0644	32,128.87	19,799.63 6,287.63- C 26,087.26 I
1,829.0000	NIPPON STEEL & SUMITOMO METAL	35,066.68	22.5881	41,313.65	6,246.97 5,393.75- C 11,640.72 I
1,000.0000	NIPPON ELECTRIC GLASS CO LTD	28,598.11	36.3563	36,356.35	7,758.24 919.35 C 6,838.89 I



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10,600.0000	NISSAN MOTOR CO LTD	91,753.83	9.9501	105,471.69	13,717.86 20,640.89- C 34,358.75 I
3,300.0000	NOMURA HOLDINGS INC	19,325.51	5.9932	19,777.68	452.17 1,008.14 C 555.97- I
400.0000	NITORI HOLDINGS CO LTD	15,118.77	133.8554	53,542.18	38,423.41 10,478.29- C 48,901.70 I
800.0000	ORIENTAL LAND CO LTD/JAPAN	13,841.12	67.7109	54,168.74	40,327.62 10,600.87- C 50,928.49 I
3,000.0000	OBAYASHI CORP	13,255.53	11.7568	35,270.56	22,015.03 6,902.48- C 28,917.51 I
1,000.0000	OLYMPUS CORP	28,433.99	36.4898	36,489.85	8,055.86 12,967.32- C 21,023.18 I
800.0000	OMRON CORP	18,457.66	43.3873	34,709.86	16,252.20 6,792.75- C 23,044.95 I
2,000.0000	ONO PHARMACEUTICAL CO LTD	17,503.69	21.8138	43,627.62	26,123.93 8,537.96- C 34,661.89 I
6,800.0000	ORIX CORP	69,385.93	15.4859	105,304.37	35,918.44 7,696.07- C 43,614.51 I



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8,000.0000	OSAKA GAS CO LTD	28,363.64	4.0895	32,716.27	4,352.63 6,402.59- C 10,755.22 I
2,000.0000	JAPAN EXCHANGE GROUP INC	24,629.90	18.1114	36,222.85	11,592.95 5,559.30- C 17,152.25 I
2,400.0000	T&D HOLDINGS INC	28,363.64	15.2144	36,514.77	8,151.13 7,145.96- C 15,297.09 I
200.0000	SMC CORP/JAPAN	27,128.60	303.9337	60,786.75	33,658.15 11,896.03- C 45,554.18 I
4,300.0000	SOFTBANK GROUP CORP	123,901.34	80.9629	348,140.78	224,239.44 76,982.65- C 301,222.09 I
2,500.0000	SANTEN PHARMACEUTICAL CO LTD	15,038.90	13.5635	33,908.86	18,869.96 6,635.98- C 25,505.94 I
900.0000	SECOM CO LTD	39,670.78	75.8721	68,284.97	28,614.19 13,363.43- C 41,977.62 I
2,000.0000	SEKISUI CHEMICAL CO LTD	13,670.77	17.8978	35,795.66	22,124.89 7,005.24- C 29,130.13 I
2,000.0000	SEKISUI HOUSE LTD	19,888.62	17.6174	35,234.96	15,346.34 6,895.50- C 22,241.84 I



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23,000.0000	SHARP CORP/JAPAN	48,907.55	3.7112	85,359.55	36,452.00 2,158.50 C 34,293.50 I
4,000.0000	SHIMIZU CORP	16,694.52	10.5998	42,399.43	25,704.91 8,297.60- C 34,002.51 I
2,200.0000	SHIN-ETSU CHEMICAL CO LTD	128,353.56	90.6461	199,421.49	71,067.93 36,955.53- C 108,023.46 I
1,900.0000	SHIONOGI & CO LTD	45,108.18	55.7048	105,839.26	60,731.08 4,709.80- C 65,440.88 I
400.0000	SHIMANO INC	17,801.81	158.2413	63,296.54	45,494.73 12,387.19- C 57,881.92 I
1,000.0000	SHISEIDO CO LTD	19,467.92	35.5464	35,546.46	16,078.54 16,472.29- C 32,550.83 I
6,000.0000	SHIZUOKA BANK LTD/THE	52,717.81	9.0334	54,200.78	1,482.97 2,056.41- C 3,539.38 I
5,000.0000	SONY CORP	103,784.35	38.1452	190,726.23	86,941.88 1,902.24 C 85,039.64 I
900.0000	STANLEY ELECTRIC CO LTD	17,315.24	30.1708	27,153.79	9,838.55 5,314.02- C 15,152.57 I



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6,000.0000	SUMITOMO CHEMICAL CO LTD	29,385.77	5.7493	34,496.26	5,110.49 6,750.96- C 11,861.45 I
3,200.0000	SUMITOMO ELECTRIC INDUSTRIES L	39,930.56	15.3969	49,270.20	9,339.64 9,642.21- C 18,981.85 I
2,000.0000	SUMITOMO HEAVY INDUSTRIES LTD	12,095.00	6.5948	13,189.75	1,094.75 2,581.23- C 3,675.98 I
4,000.0000	SUMITOMO METAL MINING CO LTD	61,298.61	13.3543	53,417.58	7,881.03- 3,052.07- C 4,828.96- I
1,000.0000	SUMITOMO REALTY & DEVELOPMENT	19,122.04	30.8383	30,838.38	11,716.34 6,035.09- C 17,751.43 I
8,300.0000	SUMITOMO CORP	91,162.58	13.0117	107,997.50	16,834.92 9,403.26- C 26,238.18 I
2,000.0000	SURUGA BANK LTD	17,950.87	24.2257	48,451.40	30,500.53 9,481.99- C 39,982.52 I
1,500.0000	SUZUKI MOTOR CORP	33,410.34	47.4368	71,155.21	37,744.87 13,925.15- C 51,670.02 I
500.0000	TDK CORP	33,538.10	65.7707	32,885.37	652.73- 6,435.69- C 5,782.96 I



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8,000.0000	TAISEI CORP	17,631.46	9.1313	73,050.90	55,419.44 14,296.14- C 69,715.58 I
2,000.0000	TAKASHIMAYA CO LTD	16,843.58	9.5140	19,028.12	2,184.54 3,723.83- C 5,908.37 I
1,300.0000	TAKEDA PHARMACEUTICAL CO LTD	57,440.64	50.8098	66,052.86	8,612.22 12,926.60- C 21,538.82 I
1,000.0000	MITSUBISHI TANABE PHARMA CORP	14,181.83	23.1043	23,104.31	8,922.48 4,521.54- C 13,444.02 I
1,000.0000	TEIJIN LTD	16,875.51	19.2328	19,232.82	2,357.31 3,763.88- C 6,121.19 I
1,400.0000	SYSMEX CORP	27,661.54	59.7187	83,606.26	55,944.72 33,995.13- C 89,939.85 I
400.0000	TERUMO CORP	10,859.96	39.3823	15,752.94	4,892.98 3,082.87- C 7,975.85 I
1,100.0000	TOHO CO LTD/TOKYO	17,579.28	30.7938	33,873.26	16,293.98 6,629.03- C 22,923.01 I
3,000.0000	TOHO GAS CO LTD	18,246.09	7.2801	21,840.51	3,594.42 8,542.05- C 12,136.47 I



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7,900.0000	TOKYO ELECTRIC POWER CO HOLDIN	29,353.99	4.1206	32,553.40	3,199.41 3,194.25- C 6,393.66 I
2,000.0000	TOKYO GAS CO LTD	8,815.73	5.2002	10,400.50	1,584.77 2,035.39- C 3,620.16 I
700.0000	TOKYO ELECTRON LTD	47,475.03	134.9234	94,446.42	46,971.39 18,483.23- C 65,454.62 I
10,000.0000	TOKYU CORP	52,355.06	7.6272	76,272.69	23,917.63 1,181.31- C 25,098.94 I
10,000.0000	TORAY INDUSTRIES INC	60,866.05	8.3686	83,686.36	22,820.31 14,349.21- C 37,169.52 I
1,000.0000	LIXIL GROUP CORP	20,484.86	24.9999	25,000.00	4,515.14 4,892.52- C 9,407.66 I
700.0000	MAZDA MOTOR CORP	9,875.10	13.9551	9,768.60	106.50- 1,911.71- C 1,805.21 I
700.0000	TOYOTA INDUSTRIES CORP	19,884.36	52.5987	36,819.15	16,934.79 7,205.55- C 24,140.34 I
1,100.0000	TOYOTA TSUSHO CORP	17,462.17	29.9483	32,943.22	15,481.05 6,447.01- C 21,928.06 I



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12,060.0000	TOYOTA MOTOR CORP	476,689.35	52.4474	632,516.70	155,827.35 129,906.17- C 285,733.52 I
900.0000	UNICHARM CORP	9,710.07	25.1156	22,604.13	12,894.06 4,423.62- C 17,317.68 I
1,100.0000	WEST JAPAN RAILWAY CO	43,723.37	70.6301	77,693.13	33,969.76 13,020.64- C 46,990.40 I
600.0000	YAKULT HONSHA CO LTD	15,874.70	68.0847	40,850.83	24,976.13 7,994.56- C 32,970.69 I
1,100.0000	YAMAHA MOTOR CO LTD	16,220.72	25.7920	28,371.31	12,150.59 5,552.29- C 17,702.88 I
9,500.0000	ASTELLAS PHARMA INC	69,083.15	12.2330	116,213.50	47,130.35 22,743.08- C 69,873.43 I
2,872.0000	YAMATO HOLDINGS CO LTD	42,065.90	20.2785	58,240.05	16,174.15 19,377.30- C 35,551.45 I
3,000.0000	YASKAWA ELECTRIC CORP	35,694.28	21.1908	63,572.44	27,878.16 184.59- C 28,062.75 I
9,000.0000	OVERSEA-CHINESE BANKING CORP L	57,183.03	7.8367	70,530.56	13,347.53 1,032.24 C 12,315.29 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
31,000.0000	SINGAPORE TELECOMMUNICATIONS L	70,835.90	2.8252	87,583.98	16,748.08 1,281.82 C 15,466.26 I
11,000.0000	SEBACORP INDUSTRIES LTD	25,196.28	2.2369	24,606.89	589.39- 315.79 C 905.18- I
19,700.0000	STARHUB LTD	41,120.42	1.9755	38,917.82	2,202.60- 1,292.57 C 3,495.17- I
9,200.0000	KEPPEL CORP LTD	40,328.71	4.5683	42,029.27	1,700.56 953.18 C 747.38 I
8,600.0000	WILMAR INTERNATIONAL LTD	20,336.41	2.4330	20,924.57	588.16 235.91 C 352.25 I
22,000.0000	GLOBAL LOGISTIC PROPERTIES LTD	35,174.96	2.0772	45,698.51	10,523.55 5,084.37- C 15,607.92 I
8,600.0000	DBS GROUP HOLDINGS LTD	90,941.75	15.0633	129,544.98	38,603.23 2,098.07 C 36,505.16 I
1,000.0000	JARDINE CYCLE & CARRIAGE LTD	22,406.17	32.2112	32,211.21	9,805.04 471.43 C 9,333.61 I
8,900.0000	CAPITALAND LTD	20,272.43	2.5420	22,624.11	2,351.68 255.07 C 2,096.61 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
28,000.0000	GENTING SINGAPORE PLC	17,850.45	0.7880	22,064.86	4,214.41 322.93 C 3,891.48 I
14,000.0000	CAPITALAND MALL TRUST	18,031.42	1.4344	20,082.07	2,050.65 295.62 C 1,755.03 I
2,800.0000	HONGKONG LAND HOLDINGS LTD	17,487.72	7.3600	20,608.00	3,120.28 I
15,000.0000	COMFORTDELGRO CORP LTD	16,761.65	1.6704	25,057.20	8,295.55 366.73 C 7,928.82 I
2,600.0000	UNITED OVERSEAS BANK LTD	31,730.21	16.7919	43,659.08	11,928.87 921.89 C 11,006.98 I
10,400.0000	UOL GROUP LTD	45,316.88	5.5488	57,708.54	12,391.66 1,916.66 C 10,475.00 I
11,659.0000	BANK HAPOLIM BM	61,590.31	6.7455	78,646.55	17,056.24 5,367.71 C 11,688.53 I
6,726.0000	BANK LEUMI LE-ISRAEL BM	27,867.13	4.8628	32,707.75	4,840.62 2,677.96 C 2,162.66 I
17,743.0000	BEZEQ THE ISRAELI TELECOMMUNIC	31,931.02	1.6606	29,464.05	2,466.97- 2,407.09 C 4,874.06- I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
11,220.0000	ISRAEL CHEMICALS LTD	46,663.85	4.7196	52,953.95	6,290.10 4,335.63 C 1,954.47 I
701.0000	NICE LTD	20,040.22	80.1788	56,205.35	36,165.13 3,901.41 C 32,263.72 I
699.0000	CHECK POINT SOFTWARE TECHNOLOG	56,619.15	109.0800	76,246.92	19,627.77 I
680.0000	AERCAP HOLDINGS NV	29,355.60	46.4300	31,572.40	2,216.80 I
1,680.0000	NXP SEMICONDUCTORS NV	146,124.98	109.4500	183,876.00	37,751.02 I
9,250.0000	NOVO NORDISK A/S	147,187.48	42.7686	395,609.62	248,422.14 68,050.36- C 316,472.50 I
1,508.0000	ISS A/S	42,022.85	39.2250	59,151.32	17,128.47 5,236.41- C 22,364.88 I
1,000.0000	DONG ENERGY A/S	34,832.99	45.0849	45,084.99	10,252.00 3,028.68 C 7,223.32 I
1,000.0000	DSV A/S	18,674.67	61.3609	61,360.99	42,686.32 9,745.06- C 52,431.38 I
454.0000	PANDORA A/S	33,226.86	93.1919	42,309.17	9,082.31 8,382.36- C 17,464.67 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
1,000.0000	NOVOZYMES A/S	26,215.68	43.7043	43,704.36	17,488.68 6,940.92- C 24,429.60 I
750.0000	COLOPLAST A/S	21,318.35	83.4509	62,588.21	41,269.86 10,205.24- C 51,475.10 I
22.0000	AP MOLLER - MAERSK A/S	34,142.91	2,008.0382	44,176.84	10,033.93 2,967.68 C 7,066.25 I
17.0000	AP MOLLER - MAERSK A/S	25,166.23	1,906.7926	32,415.48	7,249.25 2,177.58 C 5,071.67 I
4,923.0000	DANSKE BANK A/S	129,208.91	38.4119	189,102.17	59,893.26 9,092.83- C 68,986.09 I
169.0000	GENMAB A/S	21,770.53	213.0760	36,009.85	14,239.32 783.56 C 13,455.76 I
831.0000	VESTAS WIND SYSTEMS A/S	32,325.13	92.1948	76,613.95	44,288.82 525.81 C 43,763.01 I
1,035.0000	NESTE OYJ	18,307.92	39.3375	40,714.38	22,406.46 7,610.62- C 30,017.08 I
694.0000	NOKIAN RENKAAT OYJ	18,047.47	41.3335	28,685.47	10,638.00 5,362.11- C 16,000.11 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
878.0000	KONE OYJ	18,503.75	50.8000	44,602.49	26,098.74 8,337.43- C 34,436.17 I
1,119.0000	ORION OYJ	30,466.09	63.7567	71,343.80	40,877.71 14,887.39- C 55,765.10 I
720.0000	WARTSILA OYJ ABP	18,738.23	59.0234	42,496.89	23,758.66 7,943.84- C 31,702.50 I
2,231.0000	UPM-KYMMENE OYJ	30,156.83	28.4681	63,512.39	33,355.56 11,872.22- C 45,227.78 I
2,707.0000	STORA ENSO OYJ	20,055.39	12.8996	34,919.27	14,863.88 6,527.38- C 21,391.26 I
1,803.0000	SAMPO OYJ	49,011.57	51.1764	92,271.19	43,259.62 17,248.01- C 60,507.63 I
878.0000	ELISA OYJ	28,715.42	38.6988	33,977.60	5,262.18 2,277.49 C 2,984.69 I
549.0000	METSO OYJ	14,536.88	34.6270	19,010.28	4,473.40 3,553.54- C 8,026.94 I
22,186.0000	NOKIA OYJ	99,549.13	6.1076	135,504.22	35,955.09 7,110.54 C 28,844.55 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
946.0000	MARINE HARVEST ASA	16,038.67	17.0593	16,138.12	99.45 242.09- C 341.54 I
9,979.0000	NORSK HYDRO ASA	54,349.83	5.5248	55,132.79	782.96 12,231.49- C 13,014.45 I
4,100.0000	DNB ASA	52,598.77	16.9518	69,502.73	16,903.96 28,210.53- C 45,114.49 I
3,596.0000	TELENOR ASA	58,524.11	16.5340	59,456.47	932.36 23,213.42- C 24,145.78 I
2,034.0000	SCHIBSTED ASA	42,225.39	24.0669	48,952.08	6,726.69 221.36 C 6,505.33 I
2,548.0000	STATOIL ASA	44,738.22	16.5221	42,098.36	2,639.86- 2,022.51- C 617.35- I
902.0000	INTERNATIONAL PETROLEUM CORP/S	2,322.57	2.9639	2,673.53	350.96 161.78 C 189.18 I
2,681.0000	KINNEVIK AB	59,606.67	30.5766	81,975.91	22,369.24 1,865.94 C 20,503.30 I
2,400.0000	ESSITY AB	26,959.50	27.3280	65,587.38	38,627.88 11,506.66- C 50,134.54 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
3,793.0000	ATLAS COPCO AB	69,829.49	38.2948	145,252.44	75,422.95 33,768.21- C 109,191.16 I
1,600.0000	ATLAS COPCO AB	21,656.47	34.5128	55,220.49	33,564.02 9,687.91- C 43,251.93 I
6,300.0000	SVENSKA HANDELSBANKEN AB	62,513.38	14.2983	90,079.49	27,566.11 15,803.59- C 43,369.70 I
4,200.0000	ASSA ABLOY AB	27,660.10	21.9454	92,170.89	64,510.79 16,170.52- C 80,681.31 I
728.0000	ICA GRUPPEN AB	22,081.29	37.1804	27,067.34	4,986.05 2,107.98 C 2,878.07 I
1,000.0000	ELECTROLUX AB	22,922.28	32.7344	32,734.41	9,812.13 5,742.95- C 15,555.08 I
7,788.0000	VOLVO AB	84,851.79	17.0252	132,592.35	47,740.56 6,394.13- C 54,134.69 I
3,891.0000	SVENSKA CELLULOSA AB SCA	15,470.16	7.5581	29,408.95	13,938.79 805.77- C 14,744.56 I
1,900.0000	BOLIDEN AB	29,299.44	27.2569	51,788.18	22,488.74 13,743.32- C 36,232.06 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
1,015.0000	HEXAGON AB	22,810.03	47.4832	48,195.52	25,385.49 8,653.52- C 34,039.01 I
4,598.0000	TELE2 AB	36,714.28	10.4569	48,081.24	11,366.96 3,744.51 C 7,622.45 I
10,111.0000	SKANDINAVISKA ENSKILDA BANKEN	73,447.96	12.0812	122,153.63	48,705.67 11,694.37- C 60,400.04 I
3,910.0000	SWEDBANK AB	50,005.25	24.3403	95,170.82	45,165.57 22,474.37- C 67,639.94 I
1,200.0000	SWEDISH MATCH AB	28,861.98	35.1767	42,212.09	13,350.11 7,405.71- C 20,755.82 I
12,800.0000	NORDEA BANK AB	131,175.63	12.7096	162,683.25	31,507.62 28,541.24- C 60,048.86 I
1,800.0000	SECURITAS AB	19,362.63	16.8355	30,303.93	10,941.30 5,316.54- C 16,257.84 I
3,043.0000	INVESTOR AB	71,722.11	48.1353	146,475.86	74,753.75 32,183.72- C 106,937.47 I
481.0000	HENNES & MAURITZ AB	13,762.94	24.8857	11,970.04	1,792.90- 420.45 C 2,213.35- I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
8,703.0000	TELEFONAKTIEBOLAGET LM ERICSSO	49,520.48	7.1432	62,167.60	12,647.12 2,523.59 C 10,123.53 I
1,600.0000	SKANSKA AB	29,626.06	23.7001	37,920.22	8,294.16 6,652.75- C 14,946.91 I
2,708.0000	LUNDIN PETROLEUM AB	56,278.88	19.2185	52,043.89	4,234.99- 4,053.11 C 8,288.10- I
1,250.0000	ALFA LAVAL AB	18,788.18	20.4397	25,549.67	6,761.49 4,482.46- C 11,243.95 I
4,009.0000	TEVA PHARMACEUTICAL INDUSTRIES ADR	136,589.69	33.2200	133,178.98	3,410.71-I
TOTAL INVESTMENTS EQUITY		39,256,899.54		56,855,854.11	17,598,954.57 6,042,671.51- C 23,641,626.08 I
TOTAL INVESTMENT		39,900,562.32		57,614,749.28	17,714,186.96 6,068,959.13- C 23,783,146.09 I



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
<u>INVESTMENTS REAL ESTATE</u>					
404.1330	PRIME PROPERTY FUND LLC	3,994,102.13	22,209.2623	8,975,495.81	4,981,393.68
1,767,290.0000	FORTRESS JAPAN OPPORTUNITY DOMESTIC FUND © LP	22,852.00	0.6903	1,220,046.00	1,197,194.00
1,504,525.0000	BRAZIL REAL ESTATE OPPORTUNITIES FUND II	1,487,830.79	0.7737	1,164,101.00	323,729.79-
1,584,946.1200	BROOKFIELD REAL ESTATE FUND	0.00	0.1048	166,221.21	166,221.21
250,772.0000	EXETER INDUSTRIAL VALUE FUND II LPP	0.00	1.0291	258,080.00	258,080.00
1,594,075.4400	DIVCOWEST FUND III	0.00	0.2372	378,217.00	378,217.00
3,002,169.2300	JAMESTOWN PREMIER PROPERTY	2,298,345.39	1.7880	5,367,963.29	3,069,617.90
1,603,036.0000	BROOKFIELD FAIRFIELD MULTIFAMILY	279.00	0.3587	575,050.00	574,771.00
1,035,155.0000	CVI EUROPE REAL ESTATE PARTNER TG LLC	383,779.76	0.7410	767,116.79	383,337.03
1,222,000.0000	SAVANNA REAL ESTATE FUND IIA LP LLC	1,119,557.13	1.5961	1,950,515.13	830,958.00
6,012,458.7380	USAA EAGLE REAL ESTATE LP	5,251,069.18	1.3441	8,081,704.19	2,830,635.01
5,487,621.9100	PRISA REAL ESTATE LP	5,350,557.05	1.3897	7,626,240.00	2,275,682.95



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
993,837.0000	GREENFIELD ACQUI RTNRS VII LP	895,262.00	1.1177	1,110,836.00	215,574.00
1,136,403.3600	NORTHLIGHT REAL ESTATE OPPORTUNITY FUND	1,021,129.94	1.0774	1,224,412.50	203,282.56
1,135,061.0000	H/2 SPECIAL OPPORTUNITIES III LP	1,057,318.00	1.1144	1,264,924.00	207,606.00
309,778.0000	BRV PARTNERS FUND I LP	159,502.00	1.0121	313,533.00	154,031.00
4,498,071.0150	METLIFE CORE PROPERTY FUND L P	4,226,377.64	1.0680	4,804,375.00	577,997.36
2,662,200.0000	INLAND RETAIL PROPERTY	2,662,200.00	1.0544	2,807,095.00	144,895.00
405,000.0000	ASANA PARTNERS I	405,000.00	1.0263	415,683.00	10,683.00
2,250,000.0000	HANCOCK US REAL ESTATE	2,250,000.00	1.0000	2,250,000.00	0.00
3,881,939.1300	UBS TRUMBULL PROPERTY FUND	3,377,815.53	1.3593	5,276,978.21	1,899,162.68
1,022.7600	TTG BRPTP FUND LP	0.00	12.7879	13,079.00	13,079.00
2,115,750.0000	LION INDUSTRIAL TRUST	2,053,062.43	1.1251	2,380,500.32	327,437.89
1,670,094.9300	CITIC CAPITAL CHINA	1,318,130.05	0.8301	1,386,421.92	68,291.87
TOTAL INVESTMENTS REAL ESTATE		39,334,170.02		59,778,588.37	20,444,418.35
TOTAL INVESTMENT		39,334,170.02		59,778,588.37	20,444,418.35



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INVESTMENTS FIXED INCOME SECURITIES					
2,939,649.6810	WTC-CTF JPM PAG EMERGING MARKETS DEBT	29,146,820.23	10.7200	31,513,044.58	2,366,224.35
TOTAL INVESTMENTS FIXED INCOME SECURITIES		29,146,820.23		31,513,044.58	2,366,224.35
TOTAL INVESTMENT		29,146,820.23		31,513,044.58	2,366,224.35



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
<u>INVESTMENTS PRIVATE EQUITY</u>					
50,749,915.7400	STEPSTONE XL OPP FUND LP	44,927,468.17	1.2460	63,236,932.51	18,309,464.34
TOTAL INVESTMENTS PRIVATE EQUITY		44,927,468.17		63,236,932.51	18,309,464.34
TOTAL INVESTMENT		44,927,468.17		63,236,932.51	18,309,464.34



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
107,155.0000	BLACKROCK LIQ T FUND INSTL FUND 60	107,155.00	100.0000	107,155.00	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		107,155.00		107,155.00	0.00
<u>INVESTMENTS FIXED INCOME SECURITIES</u>					
280,000.0000	AT&T INC 4.350% 06/15/2045 DD 06/15/13	266,162.91	92.8110	259,870.80	6,292.11-
180,000.0000	AT&T INC 5.150% 03/15/2042 DD 03/15/16	176,350.98	102.1190	183,814.20	7,463.22
300,000.0000	ABBVIE INC 3.200% 11/06/2022 DD 05/14/15	301,253.17	102.5660	307,698.00	6,444.83
300,000.0000	AERCAP IRELAND CAPITAL DAC / A 3.750% 05/15/2019 DD 05/15/15	303,770.92	102.7130	308,139.00	4,368.08
300,000.0000	AMAZON.COM INC 2.500% 11/29/2022 DD 11/29/12	294,911.90	100.8010	302,403.00	7,491.10
300,000.0000	AMERICAN EXPRESS CREDIT CORP VAR RT 03/03/2022 DD 03/03/17	300,000.00	100.6790	302,037.00	2,037.00
300,000.0000	AMGEN INC 2.700% 05/01/2022 DD 05/01/15	298,165.96	100.5740	301,722.00	3,556.04
500,000.0000	ANHEUSER-BUSCH INBEV FINANCE I 4.900% 02/01/2046 DD 01/25/16	573,853.71	112.8640	564,320.00	9,533.71-



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250,000.0000	APPLE INC 3.350% 02/09/2027 DD 02/09/17	248,086.30	102.2330	255,582.50	7,496.20
491,000.0000	BANK OF AMERICA CORP 5.700% 01/24/2022 DD 01/24/12	551,560.16	112.9960	554,810.36	3,250.20
250,000.0000	BANK OF AMERICA CORP 4.450% 03/03/2026 DD 03/03/16	262,615.01	104.0740	260,185.00	2,430.01-
250,000.0000	BRISTOL-MYERS SQUIBB CO 3.250% 02/27/2027 DD 02/27/17	246,117.52	100.8630	252,157.50	6,039.98
300,000.0000	BURLINGTON NORTHERN SANTA FE L 3.250% 06/15/2027 DD 03/09/17	299,261.03	102.1580	306,474.00	7,212.97
275,000.0000	CVS HEALTH CORP 4.750% 12/01/2022 DD 06/01/16	298,199.14	109.6090	301,424.75	3,225.61
300,000.0000	CHARTER COMMUNICATIONS OPERATI 4.908% 07/23/2025 DD 07/23/16	315,390.61	108.0320	324,096.00	8,705.39
500,000.0000	CITIGROUP INC 2.700% 03/30/2021 DD 03/30/16	505,490.24	100.6640	503,320.00	2,170.24-
150,000.0000	DAIMLER FINANCE NORTH AME 144A 2.850% 01/06/2022 DD 01/06/17	149,848.62	101.2080	151,812.00	1,963.38
300,000.0000	DELL INTERNATIONAL LLC / 144A 6.020% 06/15/2026 DD 06/01/16	319,836.20	110.1510	330,453.00	10,616.80
200,000.0000	DOW CHEMICAL CO/THE 8.550% 05/15/2019 DD 05/13/09	224,894.70	112.0040	224,008.00	886.70-



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375,000.0000	DUKE ENERGY CORP 2.650% 09/01/2026 DD 08/12/16	357,884.94	94.9730	356,148.75	1,736.19-
0.0040	FNMA POOL #0AO7284 3.500% 07/01/2042 DD 06/01/12	0.00	103.2290	0.00	0.00
0.0100	FNMA POOL #0AQ4086 4.000% 06/01/2043 DD 06/01/13	0.01	105.9880	0.01	0.00
350,000.0000	FEDEX CORP 3.300% 03/15/2027 DD 01/06/17	353,127.30	100.2180	350,763.00	2,364.30-
400,000.0000	FORD MOTOR CREDIT CO LLC 4.250% 09/20/2022 DD 09/25/12	412,910.04	105.0530	420,212.00	7,301.96
225,000.0000	GENERAL MOTORS FINANCIAL CO IN 3.250% 05/15/2018 DD 11/15/13	227,113.81	101.1720	227,637.00	523.19
180,000.0000	GEORGIA-PACIFIC LLC 7.375% 12/01/2025 DD 12/08/95	227,045.10	127.2360	229,024.80	1,979.70
5,000.0000	GEORGIA-PACIFIC LLC 8.000% 01/15/2024 DD 12/11/03	6,263.90	128.3490	6,417.45	153.55
150,000.0000	GEORGIA-PACIFIC LLC 144A 5.400% 11/01/2020 DD 11/02/10	163,457.09	109.3970	164,095.50	638.41
500,000.0000	GOLDMAN SACHS GROUP INC/THE 5.750% 01/24/2022 DD 01/24/12	563,677.76	112.5870	562,935.00	742.76-
250,000.0000	GOLDMAN SACHS GROUP INC/THE 3.750% 02/25/2026 DD 02/25/16	259,276.17	101.8250	254,562.50	4,713.67-



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350,000.0000	HCA INC 6.500% 02/15/2020 DD 08/01/11	378,731.00	109.1250	381,937.50	3,206.50
500,000.0000	HSBC HOLDINGS PLC 4.000% 03/30/2022 DD 03/30/12	525,675.90	105.4700	527,350.00	1,674.10
360,000.0000	HONEYWELL INTERNATIONAL INC 1.850% 11/01/2021 DD 10/31/16	354,091.42	98.3980	354,232.80	141.38
266,000.0000	HYUNDAI CAPITAL AMERICA 144A 2.400% 10/30/2018 DD 10/30/15	267,875.39	100.2090	266,555.94	1,319.45-
0.0170	ILLINOIS ST HSG DEV AUTH 3.875% 12/01/2043 DD 10/01/13	0.02	102.0240	0.02	0.00
250,000.0000	INTERCONTINENTAL EXCHANGE INC 4.000% 10/15/2023 DD 10/08/13	264,249.48	107.2490	268,122.50	3,873.02
200,000.0000	JPMORGAN CHASE & CO 3.300% 04/01/2026 DD 03/23/16	203,952.07	99.3000	198,600.00	5,352.07-
300,000.0000	JOHNSON & JOHNSON 3.625% 03/03/2037 DD 03/03/17	299,246.65	104.5690	313,707.00	14,460.35
260,000.0000	KRAFT HEINZ FOODS CO 5.200% 07/15/2045 DD 07/15/16	300,620.64	108.1830	281,275.80	19,344.84-
300,000.0000	KROGER CO/THE 2.650% 10/15/2026 DD 10/03/16	279,080.57	92.2240	276,672.00	2,408.57-
250,000.0000	LOCKHEED MARTIN CORP 3.550% 01/15/2026 DD 11/23/15	251,517.62	103.6210	259,052.50	7,534.88



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200,000.0000	MCDONALD'S CORP 4.450% 03/01/2047 DD 03/09/17	199,023.03	105.1890	210,378.00	11,354.97
300,000.0000	MICROSOFT CORP 3.300% 02/06/2027 DD 02/06/17	298,971.17	103.0070	309,021.00	10,049.83
300,000.0000	MIZUHO FINANCIAL GROUP INC 3.663% 02/28/2027 DD 02/28/17	300,000.00	103.1110	309,333.00	9,333.00
253,000.0000	MORGAN STANLEY 2.375% 07/23/2019 DD 07/23/14	255,271.11	100.6930	254,753.29	517.82-
500,000.0000	NEUBERGER BERMAN CL 23A C 144A VAR RT 10/17/2027 DD 11/29/16	500,000.00	100.0000	500,000.00	0.00
750,000.0000	NEWELL BRANDS INC 4.200% 04/01/2026 DD 03/30/16	797,848.90	106.1790	796,342.50	1,506.40-
300,000.0000	ORACLE CORP 2.800% 07/08/2021 DD 07/08/14	304,482.25	102.7020	308,106.00	3,623.75
150,000.0000	PACIFIC BELL TELEPHONE CO 7.125% 03/15/2026 DD 03/15/93	181,446.98	121.5160	182,274.00	827.02
300,000.0000	PACIFICORP 6.000% 01/15/2039 DD 01/08/09	380,617.14	129.8500	389,550.00	8,932.86
150,000.0000	PFIZER INC 2.750% 06/03/2026 DD 06/03/16	145,128.45	98.4310	147,646.50	2,518.05
400,000.0000	PRUDENTIAL FINANCIAL INC 5.750% 07/15/2033 DD 07/07/03	466,271.17	120.8010	483,204.00	16,932.83



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200,000.0000	QUALCOMM INC 3.250% 05/20/2027 DD 05/26/17	199,480.43	100.2290	200,458.00	977.57
375,000.0000	ROCKWELL COLLINS INC 3.500% 03/15/2027 DD 04/10/17	382,188.49	101.4040	380,265.00	1,923.49-
300,000.0000	SOUTHWESTERN ELECTRIC POWER CO 3.550% 02/15/2022 DD 02/03/12	311,371.62	103.2350	309,705.00	1,666.62-
500,000.0000	SPIRIT AEROSYSTEMS INC 5.250% 03/15/2022 DD 09/15/14	520,957.41	103.7610	518,805.00	2,152.41-
1,466,248.5970	US TREAS-CPI INFLAT 3.625% 04/15/2028 DD 04/15/98	1,955,155.57	130.6350	1,915,433.85	39,721.72-
757,570.5000	US TREAS-CPI INFLAT 3.375% 04/15/2032 DD 10/15/01	1,068,654.22	137.3860	1,040,795.81	27,858.41-
893,642.7000	US TREAS-CPI INFLAT 2.125% 02/15/2040 DD 02/15/10	1,111,380.81	124.3700	1,111,423.43	42.62
427,376.7500	US TREAS-CPI INFLAT 0.750% 02/15/2042 DD 02/15/12	402,935.04	95.1440	406,623.34	3,688.30
1,907,956.1900	US TREAS-CPI INFLAT 0.750% 02/15/2045 DD 02/15/15	1,851,987.99	93.7820	1,789,319.47	62,668.52-
727,467.0500	US TREAS-CPI INFLAT 1.000% 02/15/2046 DD 02/15/16	754,184.74	99.9100	726,812.33	27,372.41-
50,000.0000	U S TREASURY BOND 3.000% 02/15/2047 DD 02/15/17	51,460.47	103.1560	51,578.00	117.53



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300,000.0000	U S TREASURY NOTE 1.750% 11/30/2021 DD 11/30/16	298,934.03	99.7380	299,214.00	279.97
884,000.0000	U S TREASURY NOTE 2.250% 02/15/2027 DD 02/15/17	871,586.10	99.5350	879,889.40	8,303.30
360,000.0000	U S TREASURY NOTE 1.875% 03/31/2022 DD 03/31/17	360,013.39	100.0590	360,212.40	199.01
330,000.0000	U S TREASURY NOTE 1.875% 04/30/2022 DD 04/30/17	331,011.65	99.9810	329,937.30	1,074.35-
350,000.0000	UNITED TECHNOLOGIES CORP 4.500% 06/01/2042 DD 06/01/12	389,762.69	109.1950	382,182.50	7,580.19-
200,000.0000	UNITEDHEALTH GROUP INC 4.250% 04/15/2047 DD 03/13/17	210,054.83	106.6050	213,210.00	3,155.17
200,000.0000	VERIZON COMMUNICATIONS INC 5.150% 09/15/2023 DD 09/18/13	219,596.64	111.0790	222,158.00	2,561.36
250,000.0000	VERIZON COMMUNICATIONS INC 4.125% 03/16/2027 DD 03/16/17	248,399.35	103.2780	258,195.00	9,795.65
200,000.0000	WALGREEN CO 4.400% 09/15/2042 DD 09/13/12	193,376.50	100.1270	200,254.00	6,877.50
400,000.0000	WELLS FARGO & CO 4.400% 06/14/2046 DD 06/14/16	397,695.86	101.2400	404,960.00	7,264.14
1,635,000.0000	IFL L UL CPURNSA INDEX P 2.775% 2033 JUN 07	0.00	0.0000	0.00	0.00



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1,635,000.0000	IFL L UL CPURNSA INDEX P 2.7125% 2033 JUN 10	0.00	0.0000	0.00	0.00
1,635,000.0000	IRS_R US0003M P 6.75% 2038 JUN 19	52,810.50	0.4455	7,284.00	45,526.50-
3,250,000.0000	IRS-R US0003M P 6.75% 2034 JAN 29	86,125.00	0.4845	15,748.00	70,377.00-
2,800,000.0000	IFL L_UL CPURNSA INDEX P 196BPS 2038 MAY 23	0.00	3.6622	102,542.00	102,542.00
1,400,000.0000	IFL L UL CPURNSA INDEX P 1.775% 2036 JUN 20	0.00	6.6827	93,558.00	93,558.00
1,490,000.0000	IFL L UL CPURNSA P_1.8475% 2038 JUN 28	0.00	5.8526	87,204.00	87,204.00
2,800,000.0000	INF L UL CONSUMER PRICE URBAN P 1.96% 2038 MAY 23	0.00	0.0000	0.00	0.00
4,420,000.0000	IFL L_UL CPURNSA INDEX P 2.321% 2037 APR 06	0.00	0.0000	0.00	0.00
850,000.0000	IFL_L UL CPURNSA INDEX P 2.3175% 2037 MAY 03	0.00	0.0000	0.00	0.00
TOTAL INVESTMENTS FIXED INCOME SECURITIES		27,729,749.49		27,892,005.30	162,255.81
TOTAL INVESTMENT		27,836,904.49		27,999,160.30	162,255.81

SHORT FIXED INCOME SECURITIES



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1,635,000.0000-	IFL S UL CPURNSA INDEX P 2.775% 2033 JUN 07	0.00	18.7984	307,354.00-	307,354.00-
1,635,000.0000-	IFL S UL CPURNSA INDEX P 2.7125% 2033 JUN 10	0.00	17.2696	282,358.00-	282,358.00-
1,635,000.0000-	IRS R US0003M P 6.75% 2038 JUN 19	0.00	0.0000	0.00	0.00
3,250,000.0000-	IRS R US0003M P 6.75% 2034 JAN 27	0.00	0.0000	0.00	0.00
2,800,000.0000-	IFL S_UL CPURNSA INDEX P 196BPS 2038 MAY 23	0.00	0.0000	0.00	0.00
1,400,000.0000-	IFL S UL CPURNSA INDEX P 1.775% 2036 JUN 20	0.00	0.0000	0.00	0.00
1,490,000.0000-	IFL S UL CPURNSA P_1.8475% 2038 JUN 28	0.00	0.0000	0.00	0.00
2,800,000.0000-	INF S UL CONSUMER PRICE URBAN P 1.96% 2038 MAY 23	0.00	0.0000	0.00	0.00
4,420,000.0000-	IFL L UL_CPURNSA INDEX P 2.321% 2037 APR 06	0.00	4.3284	191,318.00-	191,318.00-
850,000.0000-	IFL_S UL CPURNSA INDEX P 2.3175% 2037 MAY 03	0.00	4.2236	35,901.00-	35,901.00-
TOTAL SHORT FIXED INCOME SECURITIES		0.00		816,931.00-	816,931.00-
TOTAL SHORT INVESTMENT		0.00		816,931.00-	816,931.00-
TOTAL NET INVESTMENT		27,836,904.49		27,182,229.30	654,675.19-



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<u>INVESTMENTS CASH EQUIVALENTS</u>					
2.3300	BLACKROCK LIQ T FUND INSTL FUND 60	2.33	100.0000	2.33	0.00
TOTAL INVESTMENTS CASH EQUIVALENTS		2.33		2.33	0.00
<u>INVESTMENTS ALTERNATIVE INVESTMENTS</u>					
15,890,520.0280	TITAN FUND LP	15,890,520.03	1.0175	16,169,586.00	279,065.97
TOTAL INVESTMENTS ALTERNATIVE INVESTMENTS		15,890,520.03		16,169,586.00	279,065.97
TOTAL INVESTMENT		15,890,522.36		16,169,588.33	279,065.97



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INVESTMENTS ALTERNATIVE INVESTMENTS					
8,460.8700	MAGNITUDE US PARTNERS	8,624,657.51	1,190.8645	10,075,750.00	1,451,092.49
6,699.2500	MAGNITUDE US PARTNERS (SERIES Y)	7,258,215.88	1,206.6455	8,083,620.00	825,404.12
6,717.5900	MAGNITUDE US PARTNERS (SERIES X)	7,253,966.34	1,198.4793	8,050,893.00	796,926.66
29.6500	MAGNITUDE US PARTNERS 04/17	29,648.09	1,004.9915	29,798.00	149.91
TOTAL INVESTMENTS ALTERNATIVE INVESTMENTS		23,166,487.82		26,240,061.00	3,073,573.18
TOTAL INVESTMENT		23,166,487.82		26,240,061.00	3,073,573.18



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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
<u>INVESTMENTS OTHER</u>					
31,688,000.0000	CORE COMMODITY FUND	31,688,000.00	0.7670	24,306,417.20	7,381,582.80-
TOTAL INVESTMENTS OTHER		31,688,000.00		24,306,417.20	7,381,582.80-
TOTAL INVESTMENT		31,688,000.00		24,306,417.20	7,381,582.80-



BNY MELLON

TRDNSN [REDACTED] MONTHLY FINAL 232113
INVESTMENT DETAIL
[REDACTED]
MARATHON EAFE-PI 2
XCEL ENERGY NDT

30 JUNE 2017

2017-06-30 CYCLE A 23:21:19 RUN DATE: 17-JUL-17
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<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
INVESTMENTS OTHER					
15,908.6180	MARATHON EAFE	22,662,252.25	1,591.4921	25,318,441.14	2,656,188.89
TOTAL INVESTMENTS OTHER		22,662,252.25		25,318,441.14	2,656,188.89
TOTAL INVESTMENT		22,662,252.25		25,318,441.14	2,656,188.89



BNY MELLON

TRDNSN [REDACTED] MONTHLY FINAL 232113

INVESTMENT DETAIL

2017-06-30 CYCLE A 23:21:19 RUN DATE: 17-JUL-17

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M1101

[REDACTED]
GOLDMAN PI 2
XCEL ENERGY NDT

30 JUNE 2017

<u>SHARES/ PAR VALUE</u>	<u>SECURITY DESCRIPTION</u>	<u>COST</u>	<u>PRICE</u>	<u>MARKET VALUE</u>	<u>UNREALIZED GAIN/LOSS</u>
INVESTMENTS FIXED INCOME SECURITIES					
224,540.0000	ISHARES IBOXX USD HIGH YIELD	19,853,622.64	88.3900	19,847,090.60	6,532.04-
TOTAL INVESTMENTS FIXED INCOME SECURITIES		19,853,622.64		19,847,090.60	6,532.04-
TOTAL INVESTMENT		19,853,622.64		19,847,090.60	6,532.04-



MONTICELLO-MINN - [REDACTED]

Statement of Change in Net Assets
Book Value
1/1/2017 - 6/30/2017

Report ID: GL8800
Base Currency: USD
Status: REVISED

NET ASSETS - BEGINNING OF PERIOD		504,432,968.35
RECEIPTS:		
CONTRIBUTIONS:		
COMPANY	6,696,114.00	6,696,114.00
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	1,962.83	1,962.83
MASTER TRUST INVESTMENT GAIN/LOSS	29,923.20	29,923.20
MASTER TRUST ALLOCATED EXPENSES	-6,447,219.44	-6,447,219.44
MASTER TRUST CHANGE IN REALIZED G/L	4,959,148.24	4,959,148.24
MASTER TRUST INTEREST INCOME EARNED	1,239,376.45	1,239,376.45
MASTER TRUST DIVIDEND INCOME EARNED	3,859,210.98	3,859,210.98
TOTAL RECEIPTS:		10,338,516.26
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	58.88	58.88
TOTAL DISBURSEMENTS:		58.88
NET ASSETS - END OF PERIOD		514,771,425.73



MONTICELLO-MINN - [REDACTED]

Statement of Change in Net Assets

Book Value

1/1/2017 - 6/30/2017

Report ID: GL8800

Base Currency: USD

Status: REVISED

NET ASSETS - BEGINNING OF PERIOD		9,416,018.29
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	45.80	45.80
MASTER TRUST INVESTMENT GAIN/LOSS	581.85	581.85
MASTER TRUST ALLOCATED EXPENSES	-124,988.86	-124,988.86
MASTER TRUST CHANGE IN REALIZED G/L	96,620.34	96,620.34
MASTER TRUST INTEREST INCOME EARNED	24,108.96	24,108.96
MASTER TRUST DIVIDEND INCOME EARNED	75,057.85	75,057.85
TOTAL RECEIPTS:		71,425.94
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	1.37	1.37
TOTAL DISBURSEMENTS:		1.37
NET ASSETS - END OF PERIOD		9,487,442.86



MONTICELLO-WIS - [REDACTED]

Statement of Change in Net Assets

Book Value

1/1/2017 - 6/30/2017

Report ID: GL8800

Base Currency: USD

Status: REVISED

NET ASSETS - BEGINNING OF PERIOD		10,004,575.11
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	15.11	15.11
MASTER TRUST INVESTMENT GAIN/LOSS	582.80	582.80
MASTER TRUST ALLOCATED EXPENSES	-125,193.22	-125,193.22
MASTER TRUST CHANGE IN REALIZED G/L	96,766.52	96,766.52
MASTER TRUST INTEREST INCOME EARNED	24,160.32	24,160.32
MASTER TRUST DIVIDEND INCOME EARNED	75,180.61	75,180.61
TOTAL RECEIPTS:		71,512.14
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	0.45	0.45
TOTAL DISBURSEMENTS:		0.45
NET ASSETS - END OF PERIOD		10,076,086.80



Statement of Change in Net Assets

Report ID: GL8800

Base Currency: USD

Status: REVISED

Book Value

1/1/2017 - 6/30/2017

PRAIRIE#1-MINN - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>292,599,638.67</u>
RECEIPTS:		
CONTRIBUTIONS:		
COMPANY	<u>24,632.00</u>	24,632.00
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	<u>1,361.88</u>	1,361.88
MASTER TRUST INVESTMENT GAIN/LOSS	<u>22,177.33</u>	22,177.33
MASTER TRUST ALLOCATED EXPENSES	<u>-2,291,178.74</u>	-2,291,178.74
MASTER TRUST CHANGE IN REALIZED G/L	<u>4,802,728.67</u>	4,802,728.67
MASTER TRUST INTEREST INCOME EARNED	<u>681,682.00</u>	681,682.00
MASTER TRUST DIVIDEND INCOME EARNED	<u>2,506,567.70</u>	2,506,567.70
TOTAL RECEIPTS:		<u>5,747,970.84</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>40.86</u>	40.86
TOTAL DISBURSEMENTS:		<u>40.86</u>
NET ASSETS - END OF PERIOD		<u>298,347,568.65</u>



Statement of Change in Net Assets
Book Value
1/1/2017 - 6/30/2017

Report ID: GL8800
Base Currency: USD
Status: REVISED

PRAIRIE#1-MINN - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>7,171,931.58</u>
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	<u>32.15</u>	32.15
MASTER TRUST INVESTMENT GAIN/LOSS	<u>559.09</u>	559.09
MASTER TRUST ALLOCATED EXPENSES	<u>-57,759.57</u>	-57,759.57
MASTER TRUST CHANGE IN REALIZED G/L	<u>121,079.57</u>	121,079.57
MASTER TRUST INTEREST INCOME EARNED	<u>17,185.20</u>	17,185.20
MASTER TRUST DIVIDEND INCOME EARNED	<u>63,191.43</u>	63,191.43
TOTAL RECEIPTS:		<u>144,287.87</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>0.97</u>	0.97
TOTAL DISBURSEMENTS:		<u>0.97</u>
NET ASSETS - END OF PERIOD		<u>7,316,218.48</u>



Statement of Change in Net Assets

Report ID: GL8800

Base Currency: USD

Status: REVISED

Book Value

1/1/2017 - 6/30/2017

PRAIRIE#1 WIS - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		5,836,629.84
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	7.21	7.21
MASTER TRUST INVESTMENT GAIN/LOSS	344.64	344.64
MASTER TRUST ALLOCATED EXPENSES	-35,604.49	-35,604.49
MASTER TRUST CHANGE IN REALIZED G/L	74,623.73	74,623.73
MASTER TRUST INTEREST INCOME EARNED	10,606.33	10,606.33
MASTER TRUST DIVIDEND INCOME EARNED	38,952.85	38,952.85
TOTAL RECEIPTS:		88,930.27
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	0.22	0.22
TOTAL DISBURSEMENTS:		0.22
NET ASSETS - END OF PERIOD		5,925,559.89



Statement of Change in Net Assets

Report ID: GL8800

Base Currency: USD

Status: REVISED

Book Value

1/1/2017 - 6/30/2017

PRAIRIE#2 MINN - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		331,992,382.37
RECEIPTS:		
CONTRIBUTIONS:		
COMPANY	294,670.00	294,670.00
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	1,383.21	1,383.21
MASTER TRUST INVESTMENT GAIN/LOSS	22,187.90	22,187.90
MASTER TRUST ALLOCATED EXPENSES	-3,247,237.18	-3,247,237.18
MASTER TRUST CHANGE IN REALIZED G/L	4,887,571.56	4,887,571.56
MASTER TRUST INTEREST INCOME EARNED	778,995.10	778,995.10
MASTER TRUST DIVIDEND INCOME EARNED	2,722,866.36	2,722,866.36
TOTAL RECEIPTS:		5,460,436.95
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	41.50	41.50
TOTAL DISBURSEMENTS:		41.50
NET ASSETS - END OF PERIOD		337,452,777.82



Statement of Change in Net Assets

Report ID: GL8800

Base Currency: USD

Status: REVISED

Book Value

1/1/2017 - 6/30/2017

PRAIRIE#2 MINN - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>6,804,931.54</u>
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	<u>21.96</u>	21.96
MASTER TRUST INVESTMENT GAIN/LOSS	<u>455.44</u>	455.44
MASTER TRUST ALLOCATED EXPENSES	<u>-66,636.99</u>	-66,636.99
MASTER TRUST CHANGE IN REALIZED G/L	<u>100,337.80</u>	100,337.80
MASTER TRUST INTEREST INCOME EARNED	<u>15,986.14</u>	15,986.14
MASTER TRUST DIVIDEND INCOME EARNED	<u>55,891.63</u>	55,891.63
TOTAL RECEIPTS:		<u>106,055.98</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>0.66</u>	0.66
TOTAL DISBURSEMENTS:		<u>0.66</u>
NET ASSETS - END OF PERIOD		<u>6,910,986.86</u>



Statement of Change in Net Assets

Report ID: GL8800

Base Currency: USD

Status: REVISED

Book Value

1/1/2017 - 6/30/2017

PRAIRIE#2 WIS - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>5,489,199.02</u>
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	<u>9.74</u>	9.74
MASTER TRUST INVESTMENT GAIN/LOSS	<u>359.83</u>	359.83
MASTER TRUST ALLOCATED EXPENSES	<u>-52,645.72</u>	-52,645.72
MASTER TRUST CHANGE IN REALIZED G/L	<u>79,256.15</u>	79,256.15
MASTER TRUST INTEREST INCOME EARNED	<u>12,644.15</u>	12,644.15
MASTER TRUST DIVIDEND INCOME EARNED	<u>44,156.50</u>	44,156.50
TOTAL RECEIPTS:		<u>83,780.65</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>0.30</u>	0.30
TOTAL DISBURSEMENTS:		<u>0.30</u>
NET ASSETS - END OF PERIOD		<u>5,572,979.37</u>

 MONTICELLO-MINN - [REDACTED]	Statement of Change in Net Assets Market Value 1/1/2017 - 6/30/2017		Report ID: GL8800 Base Currency: USD Status: REVISED
NET ASSETS - BEGINNING OF PERIOD		<u>598,834,561.85</u>	
RECEIPTS:			
CONTRIBUTIONS:			
COMPANY	<u>6,696,114.00</u>		6,696,114.00
INVESTMENT INCOME:			
REALIZED GAIN/LOSS	1,962.83		
UNREALIZED GAIN/LOSS-INVESTMENT	<u>32,711,208.79</u>		32,713,171.62
MASTER TRUST INVESTMENT GAIN/LOSS	<u>29,923.20</u>		29,923.20
MASTER TRUST ALLOCATED EXPENSES	<u>-6,447,219.44</u>		-6,447,219.44
MASTER TRUST CHANGE IN REALIZED G/L	<u>4,959,148.24</u>		4,959,148.24
MASTER TRUST INTEREST INCOME EARNED	<u>1,239,376.45</u>		1,239,376.45
MASTER TRUST DIVIDEND INCOME EARNED	<u>3,859,210.98</u>		3,859,210.98
TOTAL RECEIPTS:		<u>43,049,725.05</u>	
DISBURSEMENTS:			
ADMINISTRATIVE EXPENSES:			
TRUSTEE/CUSTODIAN	<u>58.88</u>		58.88
TOTAL DISBURSEMENTS:		<u>58.88</u>	
NET ASSETS - END OF PERIOD		<u>641,884,228.02</u>	



Statement of Change in Net Assets
Market Value
1/1/2017 - 6/30/2017

Report ID: GL8800
Base Currency: USD
Status: REVISED

MONTICELLO-MINN - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>11,702,136.01</u>
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	45.80	
UNREALIZED GAIN/LOSS-INVESTMENT	<u>637,356.02</u>	
		637,401.82
MASTER TRUST INVESTMENT GAIN/LOSS	<u>581.85</u>	
		581.85
MASTER TRUST ALLOCATED EXPENSES	<u>-124,988.86</u>	
		-124,988.86
MASTER TRUST CHANGE IN REALIZED G/L	<u>96,620.34</u>	
		96,620.34
MASTER TRUST INTEREST INCOME EARNED	<u>24,108.96</u>	
		24,108.96
MASTER TRUST DIVIDEND INCOME EARNED	<u>75,057.85</u>	
		75,057.85
TOTAL RECEIPTS:		<u>708,781.96</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>1.37</u>	
		1.37
TOTAL DISBURSEMENTS:		<u>1.37</u>
NET ASSETS - END OF PERIOD		<u>12,410,916.60</u>



MONTICELLO-WIS - [REDACTED]

Statement of Change in Net Assets
Market Value
1/1/2017 - 6/30/2017

Report ID: GL8800
Base Currency: USD
Status: REVISED

NET ASSETS - BEGINNING OF PERIOD		<u>11,721,296.14</u>
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	15.11	
UNREALIZED GAIN/LOSS-INVESTMENT	<u>638,398.32</u>	
		638,413.43
MASTER TRUST INVESTMENT GAIN/LOSS	<u>582.80</u>	
		582.80
MASTER TRUST ALLOCATED EXPENSES	<u>-125,193.22</u>	
		-125,193.22
MASTER TRUST CHANGE IN REALIZED G/L	<u>96,766.52</u>	
		96,766.52
MASTER TRUST INTEREST INCOME EARNED	<u>24,160.32</u>	
		24,160.32
MASTER TRUST DIVIDEND INCOME EARNED	<u>75,180.61</u>	
		75,180.61
TOTAL RECEIPTS:		<u>709,910.46</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>0.45</u>	
		0.45
TOTAL DISBURSEMENTS:		<u>0.45</u>
NET ASSETS - END OF PERIOD		<u>12,431,206.15</u>



Statement of Change in Net Assets
Market Value
1/1/2017 - 6/30/2017

Report ID: GL8800
Base Currency: USD
Status: REVISED

PRAIRIE#1-MINN - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>364,752,198.60</u>
RECEIPTS:		
CONTRIBUTIONS:		
COMPANY	<u>24,632.00</u>	24,632.00
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	1,361.88	
UNREALIZED GAIN/LOSS-INVESTMENT	<u>17,813,134.78</u>	17,814,496.66
MASTER TRUST INVESTMENT GAIN/LOSS	<u>22,177.33</u>	22,177.33
MASTER TRUST ALLOCATED EXPENSES	<u>-2,291,178.74</u>	-2,291,178.74
MASTER TRUST CHANGE IN REALIZED G/L	<u>4,802,728.67</u>	4,802,728.67
MASTER TRUST INTEREST INCOME EARNED	<u>681,682.00</u>	681,682.00
MASTER TRUST DIVIDEND INCOME EARNED	<u>2,506,567.70</u>	2,506,567.70
TOTAL RECEIPTS:		<u>23,561,105.62</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>40.86</u>	40.86
TOTAL DISBURSEMENTS:		<u>40.86</u>
NET ASSETS - END OF PERIOD		<u>388,313,263.36</u>



Statement of Change in Net Assets
Market Value
1/1/2017 - 6/30/2017

Report ID: GL8800
Base Currency: USD
Status: REVISED

PRAIRIE#1-MINN - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>9,195,799.02</u>
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	32.15	
UNREALIZED GAIN/LOSS-INVESTMENT	<u>449,080.68</u>	
		449,112.83
MASTER TRUST INVESTMENT GAIN/LOSS	<u>559.09</u>	
		559.09
MASTER TRUST ALLOCATED EXPENSES	<u>-57,759.57</u>	
		-57,759.57
MASTER TRUST CHANGE IN REALIZED G/L	<u>121,079.57</u>	
		121,079.57
MASTER TRUST INTEREST INCOME EARNED	<u>17,185.20</u>	
		17,185.20
MASTER TRUST DIVIDEND INCOME EARNED	<u>63,191.43</u>	
		63,191.43
TOTAL RECEIPTS:		<u>593,368.55</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>0.97</u>	
		0.97
TOTAL DISBURSEMENTS:		<u>0.97</u>
NET ASSETS - END OF PERIOD		<u>9,789,166.60</u>



Statement of Change in Net Assets
Market Value
1/1/2017 - 6/30/2017

Report ID: GL8800
Base Currency: USD
Status: REVISED

PRAIRIE#1 WIS - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>5,668,539.54</u>
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	7.21	
UNREALIZED GAIN/LOSS-INVESTMENT	<u>276,825.00</u>	
		276,832.21
MASTER TRUST INVESTMENT GAIN/LOSS	<u>344.64</u>	
		344.64
MASTER TRUST ALLOCATED EXPENSES	<u>-35,604.49</u>	
		-35,604.49
MASTER TRUST CHANGE IN REALIZED G/L	<u>74,623.73</u>	
		74,623.73
MASTER TRUST INTEREST INCOME EARNED	<u>10,606.33</u>	
		10,606.33
MASTER TRUST DIVIDEND INCOME EARNED	<u>38,952.85</u>	
		38,952.85
TOTAL RECEIPTS:		<u>365,755.27</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>0.22</u>	
		0.22
TOTAL DISBURSEMENTS:		<u>0.22</u>
NET ASSETS - END OF PERIOD		<u>6,034,294.59</u>



Statement of Change in Net Assets
Market Value
1/1/2017 - 6/30/2017

Report ID: GL8800
Base Currency: USD
Status: REVISED

PRAIRIE#2 MINN - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>410,699,887.21</u>
RECEIPTS:		
CONTRIBUTIONS:		
COMPANY	<u>294,670.00</u>	294,670.00
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	1,383.21	
UNREALIZED GAIN/LOSS-INVESTMENT	<u>20,646,839.69</u>	20,648,222.90
MASTER TRUST INVESTMENT GAIN/LOSS	<u>22,187.90</u>	22,187.90
MASTER TRUST ALLOCATED EXPENSES	<u>-3,247,237.18</u>	-3,247,237.18
MASTER TRUST CHANGE IN REALIZED G/L	<u>4,887,571.56</u>	4,887,571.56
MASTER TRUST INTEREST INCOME EARNED	<u>778,995.10</u>	778,995.10
MASTER TRUST DIVIDEND INCOME EARNED	<u>2,722,866.36</u>	2,722,866.36
TOTAL RECEIPTS:		<u>26,107,276.64</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>41.50</u>	41.50
TOTAL DISBURSEMENTS:		<u>41.50</u>
NET ASSETS - END OF PERIOD		<u>436,807,122.35</u>



Statement of Change in Net Assets
Market Value
1/1/2017 - 6/30/2017

Report ID: GL8800
Base Currency: USD
Status: REVISED

PRAIRIE#2 MINN - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>8,432,962.84</u>
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	21.96	
UNREALIZED GAIN/LOSS-INVESTMENT	<u>423,865.80</u>	
		423,887.76
MASTER TRUST INVESTMENT GAIN/LOSS	<u>455.44</u>	
		455.44
MASTER TRUST ALLOCATED EXPENSES	<u>-66,636.99</u>	
		-66,636.99
MASTER TRUST CHANGE IN REALIZED G/L	<u>100,337.80</u>	
		100,337.80
MASTER TRUST INTEREST INCOME EARNED	<u>15,986.14</u>	
		15,986.14
MASTER TRUST DIVIDEND INCOME EARNED	<u>55,891.63</u>	
		55,891.63
TOTAL RECEIPTS:		<u>529,921.78</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>0.66</u>	
		0.66
TOTAL DISBURSEMENTS:		<u>0.66</u>
NET ASSETS - END OF PERIOD		<u>8,962,883.96</u>



Statement of Change in Net Assets
Market Value
1/1/2017 - 6/30/2017

Report ID: GL8800
Base Currency: USD
Status: REVISED

PRAIRIE#2 WIS - [REDACTED]

NET ASSETS - BEGINNING OF PERIOD		<u>6,662,363.26</u>
RECEIPTS:		
INVESTMENT INCOME:		
REALIZED GAIN/LOSS	9.74	
UNREALIZED GAIN/LOSS-INVESTMENT	<u>334,869.90</u>	
		334,879.64
MASTER TRUST INVESTMENT GAIN/LOSS	<u>359.83</u>	
		359.83
MASTER TRUST ALLOCATED EXPENSES	<u>-52,645.72</u>	
		-52,645.72
MASTER TRUST CHANGE IN REALIZED G/L	<u>79,256.15</u>	
		79,256.15
MASTER TRUST INTEREST INCOME EARNED	<u>12,644.15</u>	
		12,644.15
MASTER TRUST DIVIDEND INCOME EARNED	<u>44,156.50</u>	
		44,156.50
TOTAL RECEIPTS:		<u>418,650.55</u>
DISBURSEMENTS:		
ADMINISTRATIVE EXPENSES:		
TRUSTEE/CUSTODIAN	<u>0.30</u>	
		0.30
TOTAL DISBURSEMENTS:		<u>0.30</u>
NET ASSETS - END OF PERIOD		<u>7,081,013.51</u>

Schedule F contains the calculations for the various annual accruals based on the input data. We have presented 20 accrual calculations based on varying inputs such as different radiological methods, fuel storage scenarios, license termination, and start of the new accrual. Each accrual calculation has four worksheets each and these worksheets are described below.

Accrual Comparison Worksheet

This worksheet shows the results of the annual accrual calculation using the new parameters and then comparing the results to the \$14,030,831 that was approved in the 2014 Filing. The comparison is shown for each nuclear unit.

MN Retail Summary Worksheet

This worksheet presents the resulting annual accrual by nuclear unit as well as showing many of the input data that was used in the accrual calculation. Many of the inputs shown on this worksheet are constant throughout every calculation and those that vary depending on the different radiological methods chosen, the length of the fuel storage, and the current license termination or some other operational date. Below is a brief description of the input data shown in this worksheet.

- Remaining Life is based on the current license shutdown date of each respective plant. A key assumption in determining the decommissioning accrual is the recovery period. Currently, the Company calculates the required accrual with the assumption that contributions to the Qualified Trust will cease at shutdown of each unit. The remaining recovery periods for decommissioning as of January 1, 2017 are 13.75 years for Monticello, 16.67 years for Prairie Island Unit 1, and 17.83 for Prairie Island Unit 2. Most accrual calculations use the current license shutdown. However, there are two accrual calculations that assume an early shutdown of five years before current license and two accrual calculations that assume a 20-year license extension.
- The Operational Earnings Rates and the Post-Shutdown Earnings Rates were determined by analysis completed by GSAM and are discussed in Schedule D, *External Fund Analysis / Investment Strategy*. They also are used to calculate the assumed interest on the External Fund Calculation

worksheet. The rates vary depending on the fuel storage scenario, radiological method and start of the new accrual.

- The Tax Rate for tax-effect adjustment of 27.84 percent. Since state taxes are deductible on the federal return, the Tax Rate is a composite of the Minnesota state rate of 9.80 percent and the federal Qualified Trust rate of 20 percent. The composite is calculated by taking one minus the 9.80 percent, then taking that result by 20 percent to get the federal effect with a state tax deduction, or 18.04 percent. Adding the state tax rate of 9.80 percent to the 18.04 percent results in the composite Tax Rate of 27.84 percent. This rate is constant throughout all the accrual calculations.
- The Market Value Balance is the total market fund balance as of June 30, 2017 which is equal to the Book Value plus Unrealized Gain or Loss. The Tax Effect Adjustment is a calculation of the Unrealized Gain or Loss times the Tax Rate for tax-effect adjustment. The Tax Adjusted Fund Balance is the Market Value Balance less Tax-Effect Adjustment. These balances are consistent throughout all the accrual calculations.
- The Escalation Rate (Labor) of 4.05 percent and Escalation Rate (Non-Labor) of 2.85percent were determined using long-range inflation and escalation assumptions provided by GSAM and were discussed in Schedule C, Escalation Analysis. The Escalation Rate (PIIC) is 0.00 percent since the PIIC Payment is based on a fixed settlement that will not change with inflation. These rates are the escalation factors used to calculate the future value of the TLG cost estimate. These rates are constant throughout all the accrual calculations.
- The Jurisdictional Factor of 73.4886 percent is the 2017 Minnesota Jurisdictional percent from the 2016 Electric Rate case Docket No. E,002/GR-15-826. This factor is constant throughout all the accrual calculations.

Amount to Recover Calculation

The Amount to Recover worksheet shows the jurisdictional future cost of the TLG cost estimates. This is calculated by taking the TLG Cost Estimate and separating the costs into three categories, Labor, Non-Labor and the PIIC Payment. Those amounts are then multiplied by the Jurisdiction Factor to arrive at the Minnesota Jurisdictional cost. Those amounts are then escalated

to the future cost using the escalation factor for that category. Those amounts are then added together to get the Total Jurisdictional Cost in Future dollars.

External Fund Calculation

The External Fund Calculation worksheet shows the annual roll forward of the Qualified Trust beginning with June 30, 2017 and continuing through the last year of decommissioning. The Beginning Balance equals the Tax-Adjusted Fund Balance as of June 30, 2017 shown on the MN Retail Summary worksheet. The Assumed Interest is calculated by taking the Beginning Balance plus one-half of the annuity times the earnings rate for the period. The earnings rates are shown on the MN Retail Summary, where the Operational Earning Rate is used during the years the unit is in operations and the Post-Shutdown Earnings Rate is used for the years after the unit ceases operations. The Decommissioning Payment is the Total Jurisdictional Cost in Future Dollars as calculated in the Amount to Recover worksheet, shown as a negative because these payments reduce the overall balance. It was assumed that the Decommissioning Payments occur at the end of each year. The Ending Balance is calculated by adding the Assumed Interest and the Annuity and subtracting the Decommissioning Payment to the Beginning Balance.

The current annuity as approved in the 2014 Triennial Nuclear Decommissioning Accrual Docket No. E,002/M-14-761. This approved annuity is continued until the year the new annuity calculation begins, either 2019 or 2021. The Annuity beginning in either 2019 or 2021 was calculated using the Goal Seek function in Excel such that the Ending Balance would be zero at the end of the decommissioning period. In some of the annuity calculations calculated annuity was less than zero, we are showing a solution that is below zero, however this is to demonstrate over-funding only. We would only be able to stop at zero for future contributions because of the NRC regulations on the trust funds.

Decommissioning Accruals and Supporting Schedules

2019 Accrual Calculations

- F.1 Annual Accrual 32-Year DECON
- F.2 Annual Accrual 60-Year DECON
- F.3 Annual Accrual 60-year DECON 5-year early shutdown
- F.4 Annual Accrual 60-year DECON 20-year life extension
- F.5 Annual Accrual 60-year DECON with Recasking
- F.6 Annual Accrual 100-year DECON
- F.7 Annual Accrual 200-year DECON
- F.8 Annual Accrual 60-year SAFSTOR
- F.9 Annual Accrual 60-year SAFSTOR 5-year early shutdown
- F.10 Annual Accrual 60-year SAFSTOR 20-year life extension

2021 Accrual Calculations

- F.11 Annual Accrual 32-year DECON
- F.12 Annual Accrual 60-year DECON
- F.13 Annual Accrual 60-year DECON 5-year early shutdown
- F.14 Annual Accrual 60-year DECON 20-year life extension
- F.15 Annual Accrual 60-year DECON with recasking
- F.16 Annual Accrual 100-year DECON
- F.17 Annual Accrual 200-year DECON
- F.18 Annual Accrual 60-year SAFSTOR
- F.19 Annual Accrual 60-year SAFSTOR 5-year early shutdown
- F.20 Annual Accrual 60-year SAFSTOR 20-year life extension

Other Information

- F.21 Accrual Summary of Previous Dockets

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$10,116,959	(\$3,275,267)
Prairie Island Unit 1	49,264	12,043,664	11,994,400
Prairie Island Unit 2	589,341	6,323,109	5,733,768
TOTAL	\$14,030,831	\$28,483,732	\$14,452,901

Xcel Energy
Nuclear Decommissioning Accrual
32-Year Decommissioning Period
DECON Method - No Recasking

Docket No. E002/M-17-828
Schedule F.1
Page 2 of 8
Proposed

2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2019-2021 Decommissioning Accrual
Monticello	13.75	4.99%	3.90%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	10,116,959
Prairie Island Unit 1	16.67	4.98%	3.85%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	12,043,664
Prairie Island Unit 2	17.83	5.03%	3.76%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	6,323,109
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$28,483,732

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

Proposed

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2030	\$22,828,619	\$16,776,422	1.6755	\$28,108,895	\$14,110,561	\$10,369,648	1.4410	\$14,942,662	\$0	\$0	1.0000	\$0	\$36,939,181	\$27,146,070	\$43,051,557
2031	72,399,645	53,205,452	1.7434	92,758,385	42,911,573	31,335,094	1.4820	46,735,010	0	0	1.0000	0	115,311,218	84,740,546	139,493,395
2032	78,459,767	57,658,948	1.8140	104,593,332	102,213,410	75,115,157	1.5243	114,498,034	0	0	1.0000	0	180,673,177	132,774,105	219,091,366
2033	78,071,622	57,373,706	1.8874	108,287,132	98,380,888	72,298,692	1.5677	113,342,659	0	0	1.0000	0	176,452,509	129,672,397	221,629,791
2034	66,363,782	48,769,784	1.9639	95,778,979	38,844,898	28,546,554	1.6124	46,028,463	0	0	1.0000	0	105,208,680	77,316,338	141,807,442
2035	86,863,179	63,834,494	2.0434	130,439,405	113,097,318	83,113,583	1.6584	137,835,567	0	0	1.0000	0	199,960,497	146,948,077	268,274,971
2036	50,290,909	36,958,062	2.1262	78,580,231	20,638,561	15,166,980	1.7056	25,868,801	0	0	1.0000	0	70,929,470	52,125,042	104,449,032
2037	34,606,532	25,431,840	2.2123	56,262,860	14,147,109	10,396,506	1.7542	18,237,551	0	0	1.0000	0	48,753,642	35,828,346	74,500,411
2038	29,564,886	21,726,807	2.3019	50,012,937	15,064,303	11,070,538	1.8042	19,973,465	0	0	1.0000	0	44,629,189	32,797,345	69,986,402
2039	5,908,428	4,342,018	2.3951	10,399,568	2,334,187	1,715,360	1.8556	3,183,022	0	0	1.0000	0	8,242,615	6,057,378	13,582,590
2040	5,924,615	4,353,914	2.4921	10,850,389	2,340,582	1,720,060	1.9085	3,282,734	0	0	1.0000	0	8,265,197	6,073,973	14,133,123
2041	5,908,428	4,342,018	2.5930	11,258,853	2,334,187	1,715,360	1.9629	3,367,080	0	0	1.0000	0	8,242,615	6,057,378	14,625,934
2042	6,004,114	4,412,337	2.6981	11,904,925	2,621,246	1,926,316	2.0189	3,889,038	0	0	1.0000	0	8,625,360	6,338,652	15,793,964
2043	6,195,487	4,552,974	2.8073	12,781,563	3,195,364	2,348,227	2.0764	4,875,858	0	0	1.0000	0	9,390,851	6,901,200	17,657,421
2044	6,115,988	4,494,551	2.9210	13,128,584	2,914,700	2,141,971	2.1356	4,574,392	0	0	1.0000	0	9,030,688	6,636,522	17,702,976
2045	6,099,800	4,482,655	3.0393	13,624,133	2,908,305	2,137,271	2.1964	4,694,302	0	0	1.0000	0	9,008,105	6,619,926	18,318,435
2046	6,482,546	4,763,929	3.1624	15,065,450	4,056,542	2,981,094	2.2590	6,734,291	0	0	1.0000	0	10,539,088	7,745,023	21,799,741
2047	6,386,860	4,693,611	3.2905	15,444,327	3,769,483	2,770,138	2.3234	6,436,139	0	0	1.0000	0	10,156,343	7,463,749	21,880,466
2048	7,066,692	5,193,210	3.4238	17,780,512	5,766,812	4,237,946	2.3896	10,126,997	0	0	1.0000	0	12,833,504	9,431,156	27,907,509
2049	6,386,860	4,693,611	3.5624	16,720,520	3,769,483	2,770,138	2.4577	6,808,169	0	0	1.0000	0	10,156,343	7,463,749	23,528,689
2050	6,195,487	4,552,974	3.7067	16,876,508	3,195,364	2,348,227	2.5278	5,935,847	0	0	1.0000	0	9,390,851	6,901,200	22,812,355
2051	6,099,800	4,482,655	3.8568	17,288,703	2,908,305	2,137,271	2.5998	5,556,477	0	0	1.0000	0	9,008,105	6,619,926	22,845,180
2052	6,211,674	4,564,869	4.0130	18,318,821	3,201,759	2,352,926	2.6739	6,291,489	0	0	1.0000	0	9,413,433	6,917,796	24,610,310
2053	6,099,800	4,482,655	4.1756	18,717,773	2,908,305	2,137,271	2.7501	5,877,709	0	0	1.0000	0	9,008,105	6,619,926	24,595,482
2054	6,099,800	4,482,655	4.3447	19,475,790	2,908,305	2,137,271	2.8285	6,045,271	0	0	1.0000	0	9,008,105	6,619,926	25,521,061
2055	6,195,487	4,552,974	4.5206	20,582,173	3,195,364	2,348,227	2.9091	6,831,226	0	0	1.0000	0	9,390,851	6,901,200	27,413,399
2056	6,115,988	4,494,551	4.7037	21,141,020	2,914,700	2,141,971	2.9920	6,408,776	0	0	1.0000	0	9,030,688	6,636,522	27,549,796
2057	6,099,800	4,482,655	4.8942	21,939,009	2,908,305	2,137,271	3.0773	6,577,024	0	0	1.0000	0	9,008,105	6,619,926	28,516,033
2058	6,195,487	4,552,974	5.0924	23,185,564	3,195,364	2,348,227	3.1650	7,432,137	0	0	1.0000	0	9,390,851	6,901,200	30,617,701
2059	6,291,173	4,623,292	5.2987	24,497,438	3,482,424	2,559,183	3.2552	8,330,652	0	0	1.0000	0	9,773,597	7,182,475	32,828,089
2060	6,115,988	4,494,551	5.5133	24,779,809	2,914,700	2,141,971	3.3480	7,171,318	0	0	1.0000	0	9,030,688	6,636,522	31,951,126
2061	6,291,173	4,623,292	5.7366	26,521,977	3,482,424	2,559,183	3.4434	8,812,290	0	0	1.0000	0	9,773,597	7,182,475	35,334,267
2062	6,291,173	4,623,292	5.9689	27,595,968	3,482,424	2,559,183	3.5415	9,063,346	0	0	1.0000	0	9,773,597	7,182,475	36,659,314
2063	2,248,102	1,652,098	6.2106	10,260,519	24,955,221	18,339,231	3.6425	66,800,650	0	0	1.0000	0	27,203,324	19,991,329	77,061,169
	\$670,479,691	\$492,725,829		\$1,184,962,052	\$561,072,469	\$412,324,043		\$752,568,447	\$0	\$0		\$0	\$1,231,552,159	\$905,049,872	\$1,937,530,499

AMOUNT TO RECOVER

LABOR					NON-LABOR				PIIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional
Cost	Jurisdictional		Jurisdictional		Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Estimate	Cost in	Cost in
Estimate	Cost in		Cost in		Estimate	Cost in	Factor	Cost in	Estimate	Cost in	Factor	Cost in	Nominal \$	Nominal \$	Nominal \$
Nominal \$	Nominal \$	Factor	Future \$'s		Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s			
Prairie Island Unit 1															
<i>Factors</i>	<i>2017</i>	<i>73.4886%</i>	<i>4.05%</i>				<i>2.85%</i>				<i>0.00%</i>				
2033	\$22,324,352	\$16,405,843	1.8874	\$30,964,388	\$9,448,311	\$6,943,427	1.5677	\$10,885,211	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,022,663	\$24,267,877	\$42,768,206
2034	63,582,249	46,725,675	1.9639	91,764,553	32,971,807	24,230,504	1.6124	39,069,265	1,250,000	918,607	1.0000	918,607	97,804,055	71,874,786	131,752,425
2035	66,068,657	48,552,900	2.0434	99,212,997	81,814,054	60,123,965	1.6584	99,709,584	1,250,000	918,607	1.0000	918,607	149,132,711	109,595,473	199,841,188
2036	57,950,689	42,587,123	2.1262	90,548,742	66,169,136	48,626,741	1.7056	82,937,770	1,250,000	918,607	1.0000	918,607	125,369,825	92,132,471	174,405,118
2037	38,254,474	28,112,660	2.2123	62,193,638	37,320,257	27,426,117	1.7542	48,110,895	1,250,000	918,607	1.0000	918,607	76,824,731	56,457,384	111,223,139
2038	10,524,282	7,734,143	2.3019	17,803,224	10,943,807	8,042,445	1.8042	14,510,180	1,250,000	918,607	1.0000	918,607	22,718,089	16,695,195	33,232,010
2039	35,901,875	26,383,769	2.3951	63,191,765	76,077,529	55,908,276	1.8556	103,743,397	1,250,000	918,607	1.0000	918,607	113,229,405	83,210,652	167,853,770
2040	32,068,444	23,566,636	2.4921	58,730,414	13,813,311	10,151,203	1.9085	19,373,570	1,250,000	918,607	1.0000	918,607	47,131,756	34,636,446	79,022,591
2041	19,800,405	14,551,031	2.5930	37,730,823	10,002,203	7,350,474	1.9629	14,428,246	1,250,000	918,607	1.0000	918,607	31,052,607	22,820,112	53,077,676
2042	14,925,482	10,968,521	2.6981	29,594,165	12,099,028	8,891,401	2.0189	17,950,849	1,250,000	918,607	1.0000	918,607	28,274,510	20,778,529	48,463,622
2043	8,672,291	6,373,141	2.8073	17,891,320	6,853,529	5,036,559	2.0764	10,457,912	1,250,000	918,607	1.0000	918,607	16,775,820	12,328,308	29,267,838
2044	3,150,484	2,315,245	2.9210	6,762,831	2,315,654	1,701,741	2.1356	3,634,237	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	11,315,675
2045	3,142,137	2,309,111	3.0393	7,018,081	2,306,696	1,695,158	2.1964	3,723,244	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	11,659,932
2046	3,046,451	2,238,793	3.1624	7,079,958	2,019,637	1,484,202	2.2590	3,352,812	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	11,351,378
2047	3,046,451	2,238,793	3.2905	7,366,748	2,019,637	1,484,202	2.3234	3,448,395	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	11,733,750
2048	3,054,797	2,244,926	3.4238	7,686,178	2,028,595	1,490,785	2.3896	3,562,380	1,250,000	918,607	1.0000	918,607	6,333,392	4,654,318	12,167,165
2049	3,046,451	2,238,793	3.5624	7,975,475	2,019,637	1,484,202	2.4577	3,647,723	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	12,541,806
2050	3,142,137	2,309,111	3.7067	8,559,182	2,306,696	1,695,158	2.5278	4,285,019	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	13,762,808
2051	3,142,137	2,309,111	3.8568	8,905,779	2,306,696	1,695,158	2.5998	4,407,071	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	14,231,457
2052	3,150,484	2,315,245	4.0130	9,291,079	2,315,654	1,701,741	2.6739	4,550,284	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	14,759,970
2053	3,142,137	2,309,111	4.1756	9,641,924	2,306,696	1,695,158	2.7501	4,661,853	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	15,222,384
2054	3,142,137	2,309,111	4.3447	10,032,395	2,306,696	1,695,158	2.8285	4,794,753	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	15,745,755
2055	3,142,137	2,309,111	4.5206	10,438,567	2,306,696	1,695,158	2.9091	4,931,383	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	16,288,557
2056	3,150,484	2,315,245	4.7037	10,890,219	2,315,654	1,701,741	2.9920	5,091,608	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	16,900,433
2057	3,142,137	2,309,111	4.8942	11,301,251	2,306,696	1,695,158	3.0773	5,216,508	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	17,436,366
2058	3,142,137	2,309,111	5.0924	11,758,917	2,306,696	1,695,158	3.1650	5,365,174	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	18,042,698
2059	3,142,137	2,309,111	5.2987	12,235,287	2,306,696	1,695,158	3.2552	5,518,077	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	18,671,970
2060	3,150,484	2,315,245	5.5133	12,764,641	2,315,654	1,701,741	3.3480	5,697,427	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	19,380,675
2061	3,142,137	2,309,111	5.7366	13,246,446	2,306,696	1,695,158	3.4434	5,837,105	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	20,002,159
2062	3,142,137	2,309,111	5.9689	13,782,853	2,306,696	1,695,158	3.5415	6,003,400	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	20,704,860
2063	3,142,137	2,309,111	6.2106	14,340,965	2,306,696	1,695,158	3.6425	6,174,611	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	21,434,183
2064	3,146,606	2,312,395	6.4622	14,943,162	13,948,599	10,250,624	3.7463	38,401,913	1,250,000	918,607	1.0000	918,607	18,345,206	13,481,626	54,263,681
2065	795,605	584,679	6.7239	3,931,322	4,510,695	3,314,844	3.8531	12,772,427	0	0	1.0000	0	5,306,300	3,899,523	16,703,749
	\$436,517,141	\$320,790,135		\$819,579,289	\$421,002,740	\$309,388,826		\$606,254,283	\$40,000,000	\$29,395,422		\$29,395,422	\$897,519,882	\$659,574,382	\$1,455,228,994

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in	
Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in				
Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s				Nominal \$
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2034	\$7,760,266	\$5,702,908	1.9639	\$11,199,940	\$4,479,535	\$3,291,946	1.6124	\$5,307,933	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,801	\$9,913,460	\$17,426,480
2035	47,102,812	34,615,176	2.0434	70,732,650	36,175,458	26,584,821	1.6584	44,088,268	1,250,000	918,607	1.0000	918,607	84,528,271	62,118,604	115,739,524
2036	67,705,423	49,755,737	2.1262	105,790,647	86,872,951	63,841,675	1.7056	108,888,362	1,250,000	918,607	1.0000	918,607	155,828,374	114,516,019	215,597,616
2037	71,039,578	52,205,958	2.2123	115,495,242	70,988,753	52,168,608	1.7542	91,514,172	1,250,000	918,607	1.0000	918,607	143,278,331	105,293,173	207,928,021
2038	43,919,901	32,276,100	2.3019	74,296,356	34,731,268	25,523,507	1.8042	46,049,511	1,250,000	918,607	1.0000	918,607	79,901,170	58,718,214	121,264,473
2039	40,527,011	29,782,714	2.3951	71,332,578	77,052,498	56,624,767	1.8556	105,072,917	1,250,000	918,607	1.0000	918,607	118,829,509	87,326,087	177,324,102
2040	37,548,754	27,594,036	2.4921	68,767,098	14,641,371	10,759,732	1.9085	20,534,948	1,250,000	918,607	1.0000	918,607	53,440,125	39,272,375	90,220,653
2041	23,571,483	17,322,342	2.5930	44,916,834	13,611,612	10,002,977	1.9629	19,634,844	1,250,000	918,607	1.0000	918,607	38,433,096	28,243,926	65,470,284
2042	16,800,451	12,346,409	2.6981	33,311,845	17,608,969	12,940,577	2.0189	26,125,730	1,250,000	918,607	1.0000	918,607	35,659,420	26,205,592	60,356,182
2043	9,555,838	7,022,447	2.8073	19,714,117	9,449,994	6,944,664	2.0764	14,419,900	1,250,000	918,607	1.0000	918,607	20,255,832	14,885,718	35,052,624
2044	3,150,484	2,315,245	2.9210	6,762,831	2,315,654	1,701,741	2.1356	3,634,237	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	11,315,675
2045	3,142,137	2,309,111	3.0393	7,018,081	2,306,696	1,695,158	2.1964	3,723,244	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	11,659,932
2046	3,046,451	2,238,793	3.1624	7,079,958	2,019,637	1,484,202	2.2590	3,352,812	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	11,351,378
2047	3,046,451	2,238,793	3.2905	7,366,748	2,019,637	1,484,202	2.3234	3,448,395	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	11,733,750
2048	3,054,797	2,244,926	3.4238	7,686,178	2,028,595	1,490,785	2.3896	3,562,380	1,250,000	918,607	1.0000	918,607	6,333,392	4,654,318	12,167,165
2049	3,046,451	2,238,793	3.5624	7,975,475	2,019,637	1,484,202	2.4577	3,647,723	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	12,541,806
2050	3,142,137	2,309,111	3.7067	8,559,182	2,306,696	1,695,158	2.5278	4,285,019	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	13,762,808
2051	3,142,137	2,309,111	3.8568	8,905,779	2,306,696	1,695,158	2.5998	4,407,071	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	14,231,457
2052	3,150,484	2,315,245	4.0130	9,291,079	2,315,654	1,701,741	2.6739	4,550,284	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	14,759,970
2053	3,142,137	2,309,111	4.1756	9,641,924	2,306,696	1,695,158	2.7501	4,661,853	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	15,222,384
2054	3,142,137	2,309,111	4.3447	10,032,395	2,306,696	1,695,158	2.8285	4,794,753	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	15,745,755
2055	3,142,137	2,309,111	4.5206	10,438,567	2,306,696	1,695,158	2.9091	4,931,383	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	16,288,557
2056	3,150,484	2,315,245	4.7037	10,890,219	2,315,654	1,701,741	2.9920	5,091,608	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	16,900,433
2057	3,142,137	2,309,111	4.8942	11,301,251	2,306,696	1,695,158	3.0773	5,216,508	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	17,436,366
2058	3,142,137	2,309,111	5.0924	11,758,917	2,306,696	1,695,158	3.1650	5,365,174	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	18,042,698
2059	3,142,137	2,309,111	5.2987	12,235,287	2,306,696	1,695,158	3.2552	5,518,077	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	18,671,970
2060	3,150,484	2,315,245	5.5133	12,764,641	2,315,654	1,701,741	3.3480	5,697,427	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	19,380,675
2061	3,142,137	2,309,111	5.7366	13,246,446	2,306,696	1,695,158	3.4434	5,837,105	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	20,002,159
2062	3,142,137	2,309,111	5.9689	13,782,853	2,306,696	1,695,158	3.5415	6,003,400	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	20,704,860
2063	3,142,137	2,309,111	6.2106	14,340,965	2,306,696	1,695,158	3.6425	6,174,611	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	21,434,183
2064	3,146,606	2,312,395	6.4622	14,943,162	13,948,599	10,250,624	3.7463	38,401,913	1,250,000	918,607	1.0000	918,607	18,345,206	13,481,626	54,263,681
2065	795,605	584,679	6.7239	3,931,322	4,510,695	3,314,844	3.8531	12,772,427	0	-	1.0000	-	5,306,300	3,899,523	16,703,749
	\$431,975,460	\$317,452,519		\$835,510,566	\$429,102,177	\$315,340,985		\$626,713,989	\$38,750,000	\$28,476,815		\$28,476,815	\$899,827,638	\$661,270,318	\$1,490,701,369
	\$1,538,972,292	\$1,130,968,482		\$2,840,051,907	\$1,411,177,386	\$1,037,053,854		\$1,985,536,718	\$78,750,000	\$57,872,236		\$57,872,236	\$3,028,899,678	\$2,225,894,572	\$4,883,460,862

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,644,155	-	6,696,113	646,012,450
2018	646,012,450	32,570,157	-	13,392,226	691,974,833
2019	691,974,833	34,781,962	-	10,116,959	736,873,755
2020	736,873,755	37,022,419	-	10,116,959	784,013,133
2021	784,013,133	39,374,673	-	10,116,959	833,504,765
2022	833,504,765	41,844,306	-	10,116,959	885,466,031
2023	885,466,031	44,437,173	-	10,116,959	940,020,163
2024	940,020,163	47,159,424	-	10,116,959	997,296,547
2025	997,296,547	50,017,516	-	10,116,959	1,057,431,022
2026	1,057,431,022	53,018,226	-	10,116,959	1,120,566,207
2027	1,120,566,207	56,168,672	-	10,116,959	1,186,851,838
2028	1,186,851,838	59,476,325	-	10,116,959	1,256,445,122
2029	1,256,445,122	62,949,030	-	10,116,959	1,329,511,111
2030	1,329,511,111	51,998,894	(43,051,557)	7,587,719	1,346,046,167
2031	1,346,046,167	52,495,801	(139,493,395)	-	1,259,048,573
2032	1,259,048,573	49,102,894	(219,091,366)	-	1,089,060,101
2033	1,089,060,101	42,473,344	(221,629,791)	-	909,903,654
2034	909,903,654	35,486,243	(141,807,442)	-	803,582,455
2035	803,582,455	31,339,716	(268,274,971)	-	566,647,199
2036	566,647,199	22,099,241	(104,449,032)	-	484,297,407
2037	484,297,407	18,887,599	(74,500,411)	-	428,684,596
2038	428,684,596	16,718,699	(69,986,402)	-	375,416,892
2039	375,416,892	14,641,259	(13,582,590)	-	376,475,561
2040	376,475,561	14,682,547	(14,133,123)	-	377,024,986
2041	377,024,986	14,703,974	(14,625,934)	-	377,103,026
2042	377,103,026	14,707,018	(15,793,964)	-	376,016,081
2043	376,016,081	14,664,627	(17,657,421)	-	373,023,287
2044	373,023,287	14,547,908	(17,702,976)	-	369,868,219
2045	369,868,219	14,424,861	(18,318,435)	-	365,974,645
2046	365,974,645	14,273,011	(21,799,741)	-	358,447,915
2047	358,447,915	13,979,469	(21,880,466)	-	350,546,917
2048	350,546,917	13,671,330	(27,907,509)	-	336,310,738
2049	336,310,738	13,116,119	(23,528,689)	-	325,898,168
2050	325,898,168	12,710,029	(22,812,355)	-	315,795,842
2051	315,795,842	12,316,038	(22,845,180)	-	305,266,700
2052	305,266,700	11,905,401	(24,610,310)	-	292,561,791
2053	292,561,791	11,409,910	(24,595,482)	-	279,376,218
2054	279,376,218	10,895,673	(25,521,061)	-	264,750,829
2055	264,750,829	10,325,282	(27,413,399)	-	247,662,713
2056	247,662,713	9,658,846	(27,549,796)	-	229,771,762
2057	229,771,762	8,961,099	(28,516,033)	-	210,216,827
2058	210,216,827	8,198,456	(30,617,701)	-	187,797,583
2059	187,797,583	7,324,106	(32,828,089)	-	162,293,599
2060	162,293,599	6,329,450	(31,951,126)	-	136,671,923
2061	136,671,923	5,330,205	(35,334,267)	-	106,667,861
2062	106,667,861	4,160,047	(36,659,314)	-	74,168,594
2063	74,168,594	2,892,575	(77,061,169)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,322,046	-	24,632	383,713,733
2018	383,713,733	19,110,171	-	49,264	402,873,168
2019	402,873,168	20,362,971	-	12,043,664	435,279,804
2020	435,279,804	21,976,821	-	12,043,664	469,300,289
2021	469,300,289	23,671,042	-	12,043,664	505,014,995
2022	505,014,995	25,449,634	-	12,043,664	542,508,294
2023	542,508,294	27,316,800	-	12,043,664	581,868,758
2024	581,868,758	29,276,951	-	12,043,664	623,189,374
2025	623,189,374	31,334,718	-	12,043,664	666,567,756
2026	666,567,756	33,494,961	-	12,043,664	712,106,382
2027	712,106,382	35,762,785	-	12,043,664	759,912,831
2028	759,912,831	38,143,546	-	12,043,664	810,100,042
2029	810,100,042	40,642,869	-	12,043,664	862,786,575
2030	862,786,575	43,266,659	-	12,043,664	918,096,898
2031	918,096,898	46,021,113	-	12,043,664	976,161,675
2032	976,161,675	48,912,739	-	12,043,664	1,037,118,078
2033	1,037,118,078	40,084,379	(42,768,206)	8,069,255	1,042,503,507
2034	1,042,503,507	40,136,385	(131,752,425)	-	950,887,467
2035	950,887,467	36,609,167	(199,841,188)	-	787,655,446
2036	787,655,446	30,324,735	(174,405,118)	-	643,575,063
2037	643,575,063	24,777,640	(111,223,139)	-	557,129,563
2038	557,129,563	21,449,488	(33,232,010)	-	545,347,041
2039	545,347,041	20,995,861	(167,853,770)	-	398,489,132
2040	398,489,132	15,341,832	(79,022,591)	-	334,808,373
2041	334,808,373	12,890,122	(53,077,676)	-	294,620,819
2042	294,620,819	11,342,902	(48,463,622)	-	257,500,099
2043	257,500,099	9,913,754	(29,267,838)	-	238,146,014
2044	238,146,014	9,168,622	(11,315,675)	-	235,998,961
2045	235,998,961	9,085,960	(11,659,932)	-	233,424,989
2046	233,424,989	8,986,862	(11,351,378)	-	231,060,473
2047	231,060,473	8,895,828	(11,733,750)	-	228,222,552
2048	228,222,552	8,786,568	(12,167,165)	-	224,841,955
2049	224,841,955	8,656,415	(12,541,806)	-	220,956,565
2050	220,956,565	8,506,828	(13,762,808)	-	215,700,585
2051	215,700,585	8,304,473	(14,231,457)	-	209,773,600
2052	209,773,600	8,076,284	(14,759,970)	-	203,089,914
2053	203,089,914	7,818,962	(15,222,384)	-	195,686,492
2054	195,686,492	7,533,930	(15,745,755)	-	187,474,667
2055	187,474,667	7,217,775	(16,288,557)	-	178,403,885
2056	178,403,885	6,868,550	(16,900,433)	-	168,372,001
2057	168,372,001	6,482,322	(17,436,366)	-	157,417,957
2058	157,417,957	6,060,591	(18,042,698)	-	145,435,851
2059	145,435,851	5,599,280	(18,671,970)	-	132,363,161
2060	132,363,161	5,095,982	(19,380,675)	-	118,078,467
2061	118,078,467	4,546,021	(20,002,159)	-	102,622,329
2062	102,622,329	3,950,960	(20,704,860)	-	85,868,429
2063	85,868,429	3,305,935	(21,434,183)	-	67,740,180
2064	67,740,180	2,607,997	(54,263,681)	-	16,084,496
2065	16,084,496	619,253	(16,703,749)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,571,961	-	294,670	431,075,599
2018	431,075,599	21,697,925	-	589,341	453,362,864
2019	453,362,864	22,963,178	-	6,323,109	482,649,151
2020	482,649,151	24,436,278	-	6,323,109	513,408,538
2021	513,408,538	25,983,476	-	6,323,109	545,715,122
2022	545,715,122	27,608,497	-	6,323,109	579,646,728
2023	579,646,728	29,315,257	-	6,323,109	615,285,093
2024	615,285,093	31,107,866	-	6,323,109	652,716,068
2025	652,716,068	32,990,644	-	6,323,109	692,029,821
2026	692,029,821	34,968,126	-	6,323,109	733,321,056
2027	733,321,056	37,045,075	-	6,323,109	776,689,240
2028	776,689,240	39,226,495	-	6,323,109	822,238,844
2029	822,238,844	41,517,640	-	6,323,109	870,079,592
2030	870,079,592	43,924,030	-	6,323,109	920,326,731
2031	920,326,731	46,451,461	-	6,323,109	973,101,300
2032	973,101,300	49,106,022	-	6,323,109	1,028,530,430
2033	1,028,530,430	51,894,107	-	6,323,109	1,086,747,646
2034	1,086,747,646	40,960,377	(17,426,480)	5,248,180	1,115,529,723
2035	1,115,529,723	41,943,918	(115,739,524)	-	1,041,734,116
2036	1,041,734,116	39,169,203	(215,597,616)	-	865,305,704
2037	865,305,704	32,535,494	(207,928,021)	-	689,913,177
2038	689,913,177	25,940,735	(121,264,473)	-	594,589,439
2039	594,589,439	22,356,563	(177,324,102)	-	439,621,900
2040	439,621,900	16,529,783	(90,220,653)	-	365,931,031
2041	365,931,031	13,759,007	(65,470,284)	-	314,219,753
2042	314,219,753	11,814,663	(60,356,182)	-	265,678,234
2043	265,678,234	9,989,502	(35,052,624)	-	240,615,112
2044	240,615,112	9,047,128	(11,315,675)	-	238,346,565
2045	238,346,565	8,961,831	(11,659,932)	-	235,648,464
2046	235,648,464	8,860,382	(11,351,378)	-	233,157,468
2047	233,157,468	8,766,721	(11,733,750)	-	230,190,439
2048	230,190,439	8,655,161	(12,167,165)	-	226,678,435
2049	226,678,435	8,523,109	(12,541,806)	-	222,659,739
2050	222,659,739	8,372,006	(13,762,808)	-	217,268,937
2051	217,268,937	8,169,312	(14,231,457)	-	211,206,792
2052	211,206,792	7,941,375	(14,759,970)	-	204,388,197
2053	204,388,197	7,684,996	(15,222,384)	-	196,850,810
2054	196,850,810	7,401,590	(15,745,755)	-	188,506,646
2055	188,506,646	7,087,850	(16,288,557)	-	179,305,938
2056	179,305,938	6,741,903	(16,900,433)	-	169,147,409
2057	169,147,409	6,359,943	(17,436,366)	-	158,070,985
2058	158,070,985	5,943,469	(18,042,698)	-	145,971,756
2059	145,971,756	5,488,538	(18,671,970)	-	132,788,324
2060	132,788,324	4,992,841	(19,380,675)	-	118,400,489
2061	118,400,489	4,451,858	(20,002,159)	-	102,850,189
2062	102,850,189	3,867,167	(20,704,860)	-	86,012,496
2063	86,012,496	3,234,070	(21,434,183)	-	67,812,383
2064	67,812,383	2,549,746	(54,263,681)	-	16,098,447
2065	16,098,447	605,302	(16,703,749)	-	(0)

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$21,406,585	\$8,014,359
Prairie Island Unit 1	49,264	15,064,498	15,015,234
Prairie Island Unit 2	589,341	9,122,323	8,532,982
TOTAL	\$14,030,831	\$45,593,406	\$31,562,574

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
DECON Method - No Recasking

Docket No. E002/M-17-828
Schedule F.2
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2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2019-2021 Decommissioning Accrual
Monticello	13.75	5.01%	4.43%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	21,406,585
Prairie Island Unit 1	16.67	4.99%	4.15%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	15,064,498
Prairie Island Unit 2	17.83	5.04%	4.09%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	9,122,323
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$45,593,406

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2030	\$21,103,620	\$15,508,745	1.6755	\$25,984,903	\$8,935,561	\$6,566,615	1.4410	\$9,462,492	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$35,447,395
2031	72,416,242	53,217,649	1.7434	92,779,649	42,961,353	31,571,677	1.4820	46,789,225	0	0	1.0000	0	115,377,595	84,789,326	139,568,874
2032	78,476,357	57,671,140	1.8140	104,615,448	102,263,189	75,151,739	1.5243	114,553,795	0	0	1.0000	0	180,739,546	132,822,879	219,169,243
2033	78,663,227	57,808,468	1.8874	109,107,702	100,155,666	73,602,950	1.5677	115,387,345	0	0	1.0000	0	178,818,892	131,411,418	224,495,047
2034	66,380,423	48,782,013	1.9639	95,802,994	38,894,671	28,583,132	1.6124	46,087,441	0	0	1.0000	0	105,275,094	77,365,144	141,890,436
2035	86,879,803	63,846,711	2.0434	130,464,369	113,147,091	83,150,161	1.6584	137,896,227	0	0	1.0000	0	200,026,894	146,996,872	268,360,596
2036	50,307,504	36,970,257	2.1262	78,606,161	20,688,337	15,203,559	1.7056	25,931,191	0	0	1.0000	0	70,995,841	52,173,817	104,537,352
2037	34,623,126	25,444,035	2.2123	56,289,838	14,196,883	10,433,084	1.7542	18,301,716	0	0	1.0000	0	48,820,010	35,877,119	74,591,555
2038	29,581,478	21,739,000	2.3019	50,041,005	15,098,979	11,096,021	1.8042	20,019,442	0	0	1.0000	0	44,680,457	32,835,022	70,060,446
2039	5,925,016	4,354,209	2.3951	10,428,765	2,187,162	1,607,314	1.8556	2,982,532	0	0	1.0000	0	8,112,178	5,961,523	13,411,297
2040	5,941,203	4,366,104	2.4921	10,880,768	2,193,018	1,611,617	1.9085	3,075,772	0	0	1.0000	0	8,134,221	5,977,722	13,956,540
2041	5,925,016	4,354,209	2.5930	11,290,463	2,187,162	1,607,314	1.9629	3,154,997	0	0	1.0000	0	8,112,178	5,961,523	14,445,460
2042	5,925,016	4,354,209	2.6981	11,748,090	2,187,162	1,607,314	2.0189	3,245,006	0	0	1.0000	0	8,112,178	5,961,523	14,993,096
2043	5,925,016	4,354,209	2.8073	12,223,570	2,187,162	1,607,314	2.0764	3,337,427	0	0	1.0000	0	8,112,178	5,961,523	15,560,997
2044	5,941,203	4,366,104	2.9210	12,753,390	2,193,018	1,611,617	2.1356	3,441,770	0	0	1.0000	0	8,134,221	5,977,722	16,195,160
2045	5,925,016	4,354,209	3.0393	13,233,746	2,187,162	1,607,314	2.1964	3,530,305	0	0	1.0000	0	8,112,178	5,961,523	16,764,051
2046	5,925,016	4,354,209	3.1624	13,769,749	2,187,162	1,607,314	2.2590	3,630,922	0	0	1.0000	0	8,112,178	5,961,523	17,400,672
2047	5,925,016	4,354,209	3.2905	14,327,523	2,187,162	1,607,314	2.3234	3,734,433	0	0	1.0000	0	8,112,178	5,961,523	18,061,957
2048	6,604,848	4,853,807	3.4238	16,618,465	4,183,953	3,074,727	2.3896	7,347,367	0	0	1.0000	0	10,788,801	7,928,534	23,965,832
2049	5,925,016	4,354,209	3.5624	15,511,433	2,187,162	1,607,314	2.4577	3,950,296	0	0	1.0000	0	8,112,178	5,961,523	19,461,728
2050	7,418,217	5,451,540	3.7067	20,207,225	6,666,766	4,899,310	2.5278	12,384,476	0	0	1.0000	0	14,084,983	10,350,851	32,591,701
2051	7,418,217	5,451,540	3.8568	21,025,501	6,666,766	4,899,310	2.5998	12,737,227	0	0	1.0000	0	14,084,983	10,350,851	33,762,728
2052	8,296,904	6,097,275	4.0130	24,468,364	9,260,122	6,805,130	2.6739	18,196,237	0	0	1.0000	0	17,557,026	12,902,405	42,664,601
2053	8,927,592	6,560,758	4.1756	27,395,102	11,194,891	8,226,964	2.7501	22,624,973	0	0	1.0000	0	20,122,483	14,787,722	50,020,075
2054	7,633,842	5,610,000	4.3447	24,373,767	7,313,641	5,374,689	2.8285	15,202,309	0	0	1.0000	0	14,947,483	10,984,689	39,576,076
2055	8,711,967	6,402,299	4.5206	28,942,231	10,548,016	7,751,585	2.9091	22,550,135	0	0	1.0000	0	19,259,983	14,153,883	51,492,366
2056	9,159,404	6,731,114	4.7037	31,661,139	11,847,622	8,706,646	2.9920	26,050,286	0	0	1.0000	0	21,007,026	15,437,760	57,711,424
2057	5,908,425	4,342,016	4.8942	21,250,695	2,137,389	1,570,737	3.0773	4,833,628	0	0	1.0000	0	8,045,814	5,912,753	26,084,323
2058	5,908,425	4,342,016	5.0924	22,111,283	2,137,389	1,570,737	3.1650	4,971,381	0	0	1.0000	0	8,045,814	5,912,753	27,082,664
2059	5,908,425	4,342,016	5.2987	23,007,041	2,137,389	1,570,737	3.2552	5,113,062	0	0	1.0000	0	8,045,814	5,912,753	28,120,102
2060	5,924,612	4,353,912	5.5133	24,004,421	2,143,245	1,575,040	3.3480	5,273,234	0	0	1.0000	0	8,067,857	5,928,952	29,277,655
2061	5,908,425	4,342,016	5.7366	24,908,410	2,137,389	1,570,737	3.4434	5,408,674	0	0	1.0000	0	8,045,814	5,912,753	30,317,084
2062	5,908,425	4,342,016	5.9689	25,917,060	2,137,389	1,570,737	3.5415	5,562,764	0	0	1.0000	0	8,045,814	5,912,753	31,479,823
2063	5,908,425	4,342,016	6.2106	26,966,525	2,137,389	1,570,737	3.6425	5,721,408	0	0	1.0000	0	8,045,814	5,912,753	32,687,933
2064	5,924,612	4,353,912	6.4622	28,135,848	2,143,245	1,575,040	3.7463	5,900,572	0	0	1.0000	0	8,067,857	5,928,952	34,036,420
2065	5,908,425	4,342,016	6.7239	29,195,282	2,137,389	1,570,737	3.8531	6,052,205	0	0	1.0000	0	8,045,814	5,912,753	35,247,487
2066	5,908,425	4,342,016	6.9962	30,377,613	2,137,389	1,570,737	3.9629	6,224,672	0	0	1.0000	0	8,045,814	5,912,753	36,602,285
2067	5,908,425	4,342,016	7.2795	31,607,706	2,137,389	1,570,737	4.0758	6,402,908	0	0	1.0000	0	8,045,814	5,912,753	38,009,714
2068	5,924,612	4,353,912	7.5744	32,978,269	2,143,245	1,575,040	4.1920	6,602,568	0	0	1.0000	0	8,067,857	5,928,952	39,580,836
2069	5,908,425	4,342,016	7.8811	34,219,863	2,137,389	1,570,737	4.3115	6,772,231	0	0	1.0000	0	8,045,814	5,912,753	40,992,094
2070	5,908,425	4,342,016	8.2003	35,605,835	2,137,389	1,570,737	4.4343	6,965,117	0	0	1.0000	0	8,045,814	5,912,753	42,570,952
2071	5,908,425	4,342,016	8.5324	37,047,818	2,137,389	1,570,737	4.5607	7,163,658	0	0	1.0000	0	8,045,814	5,912,753	44,211,476
2072	5,924,612	4,353,912	8.8780	38,654,028	2,143,245	1,575,040	4.6907	7,388,040	0	0	1.0000	0	8,067,857	5,928,952	46,042,068
2073	5,908,425	4,342,016	9.2375	40,109,374	2,137,389	1,570,737	4.8244	7,577,862	0	0	1.0000	0	8,045,814	5,912,753	47,687,235
2074	5,908,425	4,342,016	9.6117	41,734,156	2,137,389	1,570,737	4.9619	7,793,838	0	0	1.0000	0	8,045,814	5,912,753	49,527,994
2075	5,908,425	4,342,016	10.0009	43,424,069	2,137,389	1,570,737	5.1033	8,015,940	0	0	1.0000	0	8,045,814	5,912,753	51,440,009
2076	5,924,612	4,353,912	10.4060	45,306,805	2,143,245	1,575,040	5.2487	8,266,912	0	0	1.0000	0	8,067,857	5,928,952	53,573,717
2077	5,908,425	4,342,016	10.8274	47,012,745	2,137,389	1,570,737	5.3983	8,479,307	0	0	1.0000	0	8,045,814	5,912,753	55,492,052
2078	6,386,857	4,693,609	11.2659	52,877,728	3,557,353	2,614,247	5.5522	14,514,823	0	0	1.0000	0	9,944,210	7,307,856	67,392,551
2079	6,482,543	4,763,927	11.7222	55,843,706	3,844,412	2,825,203	5.7104	16,133,037	0	0	1.0000	0	10,326,955	7,589,130	71,976,743
2080	6,403,045	4,705,505	12.1970	57,393,047	3,563,167	2,618,520	5.8731	15,378,828	0	0	1.0000	0	9,966,212	7,324,025	72,771,874
2081	6,386,857	4,693,609	12.6909	59,566,121	3,557,353	2,614,247	6.0405	15,791,360	0	0	1.0000	0	9,944,210	7,307,856	75,357,480
2082	6,386,857	4,693,609	13.2049	61,978,635	3,557,353	2,614,247	6.2127	16,241,533	0	0	1.0000	0	9,944,210	7,307,856	78,220,169
2083	6,482,543	4,763,927	13.7397	65,454,929	3,844,412	2,825,203	6.3897	18,052,197	0	0	1.0000	0	10,326,955	7,589,130	83,507,127
2084	6,403,045	4,705,505	14.2962	67,270,843	3,563,167	2,618,520	6.5719	17,208,649	0	0	1.0000	0	9,966,212	7,324,025	84,479,492

AMOUNT TO RECOVER															
	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2085	6,386,857	4,693,609	14.8752	69,818,370	3,557,353	2,614,247	6.7592	17,670,219	0	0	1.0000	0	9,944,210	7,307,856	87,488,590
2086	6,386,857	4,693,609	15.4776	72,645,800	3,557,353	2,614,247	6.9518	18,173,723	0	0	1.0000	0	9,944,210	7,307,856	90,819,524
2087	6,482,543	4,763,927	16.1045	76,720,664	3,844,412	2,825,203	7.1499	20,199,916	0	0	1.0000	0	10,326,955	7,589,130	96,920,580
2088	7,066,689	5,193,208	16.7567	87,021,021	5,554,101	4,081,628	7.3537	30,015,070	0	0	1.0000	0	12,620,790	9,274,836	117,036,091
2089	6,386,857	4,693,609	17.4353	81,834,478	3,557,353	2,614,247	7.5633	19,772,335	0	0	1.0000	0	9,944,210	7,307,856	101,606,814
2090	6,099,798	4,482,653	18.1415	81,322,056	2,696,175	1,981,380	7.7788	15,412,758	0	0	1.0000	0	8,795,973	6,464,033	96,734,813
2091	2,034,890	1,495,411	18.8762	28,227,679	24,955,010	18,339,076	8.0005	146,721,776	0	0	1.0000	0	26,989,900	19,834,487	174,949,455
	\$851,819,402	\$625,989,760		\$2,666,101,282	\$664,030,274	\$487,986,246		\$1,223,380,650	\$0	\$0		\$0	\$1,515,849,676	\$1,113,976,006	\$3,889,481,932

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in
Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Estimate	Cost in	Cost in
Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$	Future \$'s
Prairie Island Unit 1														
Factors	2017	73.4886%	4.05%			2.85%				0.00%				
2033	\$22,324,352	\$16,405,843	1.8874	\$30,964,388	\$9,728,959	\$7,149,672	1.5677	\$11,208,540	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,303,311	\$24,474,122
2034	63,582,247	46,725,674	1.9639	91,764,550	33,397,619	24,543,427	1.6124	39,573,822	1,250,000	918,607	1.0000	918,607	98,229,866	72,187,708
2035	65,877,290	48,412,268	2.0434	98,925,629	81,239,936	59,702,054	1.6584	99,009,886	1,250,000	918,607	1.0000	918,607	148,367,226	109,032,929
2036	57,759,315	42,446,486	2.1262	90,249,718	65,595,019	48,204,831	1.7056	82,218,159	1,250,000	918,607	1.0000	918,607	124,604,334	91,569,923
2037	38,110,947	28,007,184	2.2123	61,960,292	36,889,671	27,109,686	1.7542	47,555,811	1,250,000	918,607	1.0000	918,607	76,250,618	56,035,476
2038	13,207,914	9,706,305	2.3019	22,342,944	18,994,691	13,958,924	1.8042	25,184,690	1,250,000	918,607	1.0000	918,607	33,452,605	24,583,836
2039	36,035,855	26,482,229	2.3951	63,427,586	76,476,728	56,201,641	1.8556	104,287,765	1,250,000	918,607	1.0000	918,607	113,762,582	83,602,477
2040	31,919,556	23,457,220	2.4921	58,457,738	13,365,606	9,822,190	1.9085	18,745,650	1,250,000	918,607	1.0000	918,607	46,535,162	34,198,017
2041	19,571,318	14,382,679	2.5930	37,294,286	9,445,873	6,941,635	1.9629	13,625,736	1,250,000	918,607	1.0000	918,607	30,267,191	22,242,921
2042	14,781,952	10,863,043	2.6981	29,309,575	11,668,700	8,575,159	2.0189	17,312,388	1,250,000	918,607	1.0000	918,607	27,700,652	20,356,808
2043	8,544,452	6,279,195	2.8073	17,627,583	6,492,672	4,771,371	2.0764	9,907,275	1,250,000	918,607	1.0000	918,607	16,287,125	11,969,172
2044	3,054,798	2,244,927	2.9210	6,557,431	1,939,011	1,424,951	2.1356	3,043,125	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485
2045	3,046,451	2,238,793	3.0393	6,804,363	1,930,298	1,418,548	2.1964	3,115,698	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947
2046	3,046,451	2,238,793	3.1624	7,079,958	1,930,298	1,418,548	2.2590	3,204,499	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947
2047	3,046,451	2,238,793	3.2905	7,366,748	1,930,298	1,418,548	2.3234	3,295,854	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947
2048	3,054,798	2,244,927	3.4238	7,686,181	1,939,011	1,424,951	2.3896	3,405,063	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485
2049	3,046,451	2,238,793	3.5624	7,975,475	1,930,298	1,418,548	2.4577	3,486,365	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947
2050	3,046,451	2,238,793	3.7067	8,298,533	1,930,298	1,418,548	2.5278	3,585,805	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947
2051	3,046,451	2,238,793	3.8568	8,634,576	1,930,298	1,418,548	2.5998	3,687,940	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947
2052	3,054,798	2,244,927	4.0130	9,008,892	1,939,011	1,424,951	2.6739	3,810,176	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485
2053	3,142,138	2,309,112	4.1756	9,641,927	2,217,357	1,629,503	2.7501	4,481,297	1,250,000	918,607	1.0000	918,607	6,609,495	4,857,222
2054	3,237,824	2,379,430	4.3447	10,337,910	2,504,416	1,840,459	2.8285	5,205,738	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496
2055	3,237,824	2,379,430	4.5206	10,756,451	2,504,416	1,840,459	2.9091	5,354,079	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496
2056	3,294,014	2,420,723	4.7037	11,386,356	2,656,659	1,952,340	2.9920	5,841,401	1,250,000	918,607	1.0000	918,607	7,200,673	5,291,670
2057	3,189,981	2,344,271	4.8942	11,473,331	2,360,887	1,734,981	3.0773	5,339,058	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859
2058	3,333,510	2,449,748	5.0924	12,475,098	2,791,475	2,051,414	3.1650	6,492,726	1,250,000	918,607	1.0000	918,607	7,374,985	5,419,769
2059	3,189,981	2,344,271	5.2987	12,421,588	2,360,887	1,734,981	3.2552	5,647,711	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859
2060	3,150,484	2,315,245	5.5133	12,764,641	2,226,070	1,635,906	3.3480	5,477,015	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758
2061	3,237,824	2,379,430	5.7366	13,649,838	2,504,416	1,840,459	3.4434	6,337,436	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496
2062	3,237,824	2,379,430	5.9689	14,202,580	2,504,416	1,840,459	3.5415	6,517,985	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496
2063	3,189,981	2,344,271	6.2106	14,559,329	2,360,887	1,734,981	3.6425	6,319,670	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859
2064	3,246,170	2,385,563	6.4622	15,415,988	2,513,129	1,846,862	3.7463	6,918,899	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032
2065	3,237,824	2,379,430	6.7239	15,999,050	2,504,416	1,840,459	3.8531	7,091,472	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496
2066	3,189,981	2,344,271	6.9962	16,400,988	2,360,887	1,734,981	3.9629	6,875,558	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859
2067	3,237,824	2,379,430	7.2795	17,321,061	2,504,416	1,840,459	4.0758	7,501,342	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496
2068	3,246,170	2,385,563	7.5744	18,069,211	2,513,129	1,846,862	4.1920	7,742,045	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032
2069	3,189,981	2,344,271	7.8811	18,475,433	2,360,887	1,734,981	4.3115	7,480,372	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859
2070	3,237,824	2,379,430	8.2003	19,512,040	2,504,416	1,840,459	4.4343	8,161,146	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496
2071	3,237,824	2,379,430	8.5324	20,302,249	2,504,416	1,840,459	4.5607	8,393,780	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496
2072	3,246,170	2,385,563	8.8780	21,179,032	2,513,129	1,846,862	4.6907	8,663,075	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032
2073	3,237,824	2,379,430	9.2375	21,979,985	2,504,416	1,840,459	4.8244	8,879,109	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496
2074	3,237,824	2,379,430	9.6117	22,870,368	2,504,416	1,840,459	4.9619	9,132,172	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496
2075	3,569,646	2,623,281	10.0009	26,235,173	3,499,884	2,572,014	5.1033	13,125,758	1,250,000	918,607	1.0000	918,607	8,319,530	6,113,902
2076	3,246,170	2,385,563	10.4060	24,824,173	2,513,129	1,846,862	5.2487	9,693,624	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032
2077	3,237,974	2,379,540	10.8274	25,764,234	14,152,775	10,400,669	5.3983	56,145,933	1,250,000	918,607	1.0000	918,607	18,640,749	13,698,817
2078	832,743	611,971	11.2659	6,894,405	4,620,063	3,395,217	5.5522	18,850,925	0	0	1.0000	0	5,452,806	4,007,188
\$481,031,633	\$353,503,191		\$1,096,648,885	\$459,759,673	\$337,870,735		\$746,933,573	\$56,250,000	\$41,337,312		\$41,337,312	\$997,041,305	\$732,711,237	\$1,884,919,770

AMOUNT TO RECOVER															
LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$s	
Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$s				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2034	\$7,760,265	\$5,702,906	1.9639	\$11,199,938	\$4,479,535	\$3,291,946	1.6124	\$5,307,933	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459	\$17,426,478
2035	46,911,429	34,474,531	2.0434	70,445,256	35,601,339	26,162,909	1.6584	43,388,568	1,250,000	918,607	1.0000	918,607	83,762,768	61,556,047	114,752,433
2036	67,514,044	49,615,094	2.1262	105,491,613	86,298,832	63,419,763	1.7056	108,168,748	1,250,000	918,607	1.0000	918,607	155,062,875	113,953,465	214,578,969
2037	70,896,041	52,100,475	2.2123	115,261,881	70,558,163	51,852,174	1.7542	90,959,083	1,250,000	918,607	1.0000	918,607	142,704,204	104,871,256	207,139,571
2038	46,603,528	34,248,259	2.3019	78,836,068	42,782,149	31,439,982	1.8042	56,724,016	1,250,000	918,607	1.0000	918,607	90,635,677	66,606,848	136,478,691
2039	40,663,625	29,883,110	2.3951	71,573,036	77,452,618	56,918,809	1.8556	105,618,542	1,250,000	918,607	1.0000	918,607	119,366,242	87,720,525	178,110,184
2040	37,417,177	27,497,343	2.4921	68,526,127	14,193,501	10,430,599	1.9085	19,906,798	1,250,000	918,607	1.0000	918,607	52,860,679	38,846,548	89,351,532
2041	23,327,583	17,143,103	2.5930	44,452,067	13,070,130	9,605,049	1.9629	18,853,752	1,250,000	918,607	1.0000	918,607	37,647,713	27,666,760	64,224,426
2042	16,656,921	12,240,930	2.6981	33,027,253	17,178,640	12,624,334	2.0189	25,487,268	1,250,000	918,607	1.0000	918,607	35,085,561	25,783,871	59,433,129
2043	9,422,862	6,924,725	2.8073	19,439,782	9,074,042	6,668,382	2.0764	13,846,228	1,250,000	918,607	1.0000	918,607	19,746,904	14,511,714	34,204,617
2044	3,054,798	2,244,927	2.9210	6,557,431	1,939,011	1,424,951	2.1356	3,043,125	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	10,519,163
2045	3,046,451	2,238,793	3.0393	6,804,363	1,930,298	1,418,548	2.1964	3,115,698	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	10,838,668
2046	3,046,451	2,238,793	3.1624	7,079,958	1,930,298	1,418,548	2.2590	3,204,499	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	11,203,065
2047	3,046,451	2,238,793	3.2905	7,366,748	1,930,298	1,418,548	2.3234	3,295,854	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	11,581,280
2048	3,054,798	2,244,927	3.4238	7,686,181	1,939,011	1,424,951	2.3896	3,405,063	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	12,009,850
2049	3,046,451	2,238,793	3.5624	7,975,475	1,930,298	1,418,548	2.4577	3,486,365	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	12,380,447
2050	3,046,451	2,238,793	3.7067	8,298,533	1,930,298	1,418,548	2.5278	3,585,805	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	12,802,945
2051	3,046,451	2,238,793	3.8568	8,634,576	1,930,298	1,418,548	2.5998	3,687,940	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	13,241,123
2052	3,054,798	2,244,927	4.0130	9,008,892	1,939,011	1,424,951	2.6739	3,810,176	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	13,737,675
2053	3,142,138	2,309,112	4.1756	9,641,927	2,217,358	1,629,504	2.7501	4,481,299	1,250,000	918,607	1.0000	918,607	6,609,496	4,857,223	15,041,833
2054	3,237,824	2,379,430	4.3447	10,337,910	2,504,416	1,840,459	2.8285	5,205,738	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	16,462,254
2055	3,237,824	2,379,430	4.5206	10,756,451	2,504,416	1,840,459	2.9091	5,354,079	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	17,029,137
2056	3,294,014	2,420,723	4.7037	11,386,356	2,656,659	1,952,340	2.9920	5,841,401	1,250,000	918,607	1.0000	918,607	7,200,673	5,291,670	18,146,364
2057	3,189,981	2,344,271	4.8942	11,473,331	2,360,887	1,734,981	3.0773	5,339,058	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	17,730,996
2058	3,333,510	2,449,748	5.0924	12,475,098	2,791,475	2,051,414	3.1650	6,492,726	1,250,000	918,607	1.0000	918,607	7,374,985	5,419,769	19,886,431
2059	3,189,981	2,344,271	5.2987	12,421,588	2,360,887	1,734,981	3.2552	5,647,711	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	18,987,907
2060	3,150,484	2,315,245	5.5133	12,764,641	2,226,070	1,635,906	3.3480	5,477,015	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758	19,160,263
2061	3,237,824	2,379,430	5.7366	13,649,838	2,504,416	1,840,459	3.4434	6,337,436	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	20,905,881
2062	3,237,824	2,379,430	5.9689	14,202,580	2,504,416	1,840,459	3.5415	6,517,985	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	21,639,172
2063	3,189,981	2,344,271	6.2106	14,559,329	2,360,887	1,734,981	3.6425	6,319,670	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	21,797,605
2064	3,246,170	2,385,563	6.4622	15,415,988	2,513,129	1,846,862	3.7463	6,918,899	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	23,253,493
2065	3,237,824	2,379,430	6.7239	15,999,050	2,504,416	1,840,459	3.8531	7,091,472	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	24,009,128
2066	3,189,981	2,344,271	6.9962	16,400,988	2,360,887	1,734,981	3.9629	6,875,558	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	24,195,153
2067	3,237,824	2,379,430	7.2795	17,321,061	2,504,416	1,840,459	4.0758	7,501,342	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	25,741,010
2068	3,246,170	2,385,563	7.5744	18,069,211	2,513,129	1,846,862	4.1920	7,742,045	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	26,729,863
2069	3,189,981	2,344,271	7.8811	18,475,433	2,360,887	1,734,981	4.3115	7,480,372	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	26,874,413
2070	3,237,824	2,379,430	8.2003	19,512,040	2,504,416	1,840,459	4.4343	8,161,146	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	28,591,793
2071	3,237,824	2,379,430	8.5324	20,302,249	2,504,416	1,840,459	4.5607	8,393,780	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	29,614,636
2072	3,246,170	2,385,563	8.8780	21,179,032	2,513,129	1,846,862	4.6907	8,663,075	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	30,760,714
2073	3,237,824	2,379,430	9.2375	21,979,985	2,504,416	1,840,459	4.8244	8,879,109	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	31,777,701
2074	3,237,824	2,379,430	9.6117	22,870,368	2,504,416	1,840,459	4.9619	9,132,172	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	32,921,147
2075	3,569,646	2,623,281	10.0009	26,235,173	3,499,884	2,572,014	5.1033	13,125,758	1,250,000	918,607	1.0000	918,607	8,319,530	6,113,902	40,279,538
2076	3,246,170	2,385,563	10.4060	24,824,173	2,513,129	1,846,862	5.2487	9,693,624	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	35,436,404
2077	3,237,824	2,379,430	10.8274	25,763,042	14,152,675	10,400,596	5.3983	56,145,536	1,250,000	918,607	1.0000	918,607	18,640,499	13,698,633	82,827,186
2078	832,743	611,971	11.2659	6,894,405	4,620,063	3,395,217	5.5522	18,850,925	0	-	1.0000	-	5,452,806	4,007,188	25,745,329
	\$476,489,759	\$350,165,433		\$1,112,576,425	\$467,153,049	\$343,304,020		\$766,564,392	\$55,000,000	\$40,418,705		\$40,418,705	\$998,642,807	\$733,888,158	\$1,919,559,522
	\$1,809,340,794	\$1,329,658,384		\$4,875,326,592	\$1,590,942,995	\$1,169,161,000		\$2,736,878,615	\$111,250,000	\$81,756,016		\$81,756,016	\$3,511,533,789	\$2,580,575,401	\$7,693,961,224

EXTERNAL FUND CALCULATION

Monticello

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,706,857	-	6,696,113	646,075,152
2018	646,075,152	32,703,840	-	13,392,226	692,171,218
2019	692,171,218	35,214,013	-	21,406,585	748,791,816
2020	748,791,816	38,050,705	-	21,406,585	808,249,105
2021	808,249,105	41,029,515	-	21,406,585	870,685,205
2022	870,685,205	44,157,564	-	21,406,585	936,249,353
2023	936,249,353	47,442,328	-	21,406,585	1,005,098,265
2024	1,005,098,265	50,891,658	-	21,406,585	1,077,396,508
2025	1,077,396,508	54,513,800	-	21,406,585	1,153,316,892
2026	1,153,316,892	58,317,411	-	21,406,585	1,233,040,888
2027	1,233,040,888	62,311,583	-	21,406,585	1,316,759,056
2028	1,316,759,056	66,505,864	-	21,406,585	1,404,671,504
2029	1,404,671,504	70,910,277	-	21,406,585	1,496,988,366
2030	1,496,988,366	66,672,202	(35,447,395)	16,054,938	1,544,268,112
2031	1,544,268,112	68,411,077	(139,568,874)	-	1,473,110,315
2032	1,473,110,315	65,258,787	(219,169,243)	-	1,319,199,858
2033	1,319,199,858	58,440,554	(224,495,047)	-	1,153,145,365
2034	1,153,145,365	51,084,340	(141,890,436)	-	1,062,339,269
2035	1,062,339,269	47,061,630	(268,360,596)	-	841,040,302
2036	841,040,302	37,258,085	(104,537,352)	-	773,761,036
2037	773,761,036	34,277,614	(74,591,555)	-	733,447,095
2038	733,447,095	32,491,706	(70,060,446)	-	695,878,355
2039	695,878,355	30,827,411	(13,411,297)	-	713,294,470
2040	713,294,470	31,598,945	(13,956,540)	-	730,936,875
2041	730,936,875	32,380,504	(14,445,460)	-	748,871,919
2042	748,871,919	33,175,026	(14,993,096)	-	767,053,848
2043	767,053,848	33,980,485	(15,560,997)	-	785,473,337
2044	785,473,337	34,796,469	(16,195,160)	-	804,074,645
2045	804,074,645	35,620,507	(16,764,051)	-	822,931,101
2046	822,931,101	36,455,848	(17,400,672)	-	841,986,278
2047	841,986,278	37,299,992	(18,061,957)	-	861,224,313
2048	861,224,313	38,152,237	(23,965,832)	-	875,410,718
2049	875,410,718	38,780,695	(19,461,728)	-	894,729,684
2050	894,729,684	39,636,525	(32,591,701)	-	901,774,508
2051	901,774,508	39,948,611	(33,762,728)	-	907,960,391
2052	907,960,391	40,222,645	(42,664,601)	-	905,518,436
2053	905,518,436	40,114,467	(50,020,075)	-	895,612,827
2054	895,612,827	39,675,648	(39,576,076)	-	895,712,399

External Levelized

EXTERNAL FUND CALCULATION

2055	895,712,399	39,680,059	(51,492,366)	-	883,900,092
2056	883,900,092	39,156,774	(57,711,424)	-	865,345,442
2057	865,345,442	38,334,803	(26,084,323)	-	877,595,922
2058	877,595,922	38,877,499	(27,082,664)	-	889,390,758
2059	889,390,758	39,400,011	(28,120,102)	-	900,670,666
2060	900,670,666	39,899,710	(29,277,655)	-	911,292,721
2061	911,292,721	40,370,268	(30,317,084)	-	921,345,905
2062	921,345,905	40,815,624	(31,479,823)	-	930,681,705
2063	930,681,705	41,229,200	(32,687,933)	-	939,222,972
2064	939,222,972	41,607,578	(34,036,420)	-	946,794,129
2065	946,794,129	41,942,980	(35,247,487)	-	953,489,622
2066	953,489,622	42,239,590	(36,602,285)	-	959,126,927
2067	959,126,927	42,489,323	(38,009,714)	-	963,606,536
2068	963,606,536	42,687,770	(39,580,836)	-	966,713,469
2069	966,713,469	42,825,407	(40,992,094)	-	968,546,782
2070	968,546,782	42,906,622	(42,570,952)	-	968,882,453
2071	968,882,453	42,921,493	(44,211,476)	-	967,592,469
2072	967,592,469	42,864,346	(46,042,068)	-	964,414,747
2073	964,414,747	42,723,573	(47,687,235)	-	959,451,086
2074	959,451,086	42,503,683	(49,527,994)	-	952,426,775
2075	952,426,775	42,192,506	(51,440,009)	-	943,179,272
2076	943,179,272	41,782,842	(53,573,717)	-	931,388,397
2077	931,388,397	41,260,506	(55,492,052)	-	917,156,851
2078	917,156,851	40,630,048	(67,392,551)	-	890,394,348
2079	890,394,348	39,444,470	(71,976,743)	-	857,862,074
2080	857,862,074	38,003,290	(72,771,874)	-	823,093,490
2081	823,093,490	36,463,042	(75,357,480)	-	784,199,051
2082	784,199,051	34,740,018	(78,220,169)	-	740,718,900
2083	740,718,900	32,813,847	(83,507,127)	-	690,025,621
2084	690,025,621	30,568,135	(84,479,492)	-	636,114,264
2085	636,114,264	28,179,862	(87,488,590)	-	576,805,536
2086	576,805,536	25,552,485	(90,819,524)	-	511,538,498
2087	511,538,498	22,661,155	(96,920,580)	-	437,279,073
2088	437,279,073	19,371,463	(117,036,091)	-	339,614,445
2089	339,614,445	15,044,920	(101,606,814)	-	253,052,551
2090	253,052,551	11,210,228	(96,734,813)	-	167,527,966
2091	167,527,966	7,421,489	(174,949,455)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,340,765	-	24,632	383,732,452
2018	383,732,452	19,149,479	-	49,264	402,931,195
2019	402,931,195	20,482,126	-	15,064,498	438,477,820
2020	438,477,820	22,255,902	-	15,064,498	475,798,220
2021	475,798,220	24,118,190	-	15,064,498	514,980,909
2022	514,980,909	26,073,407	-	15,064,498	556,118,814
2023	556,118,814	28,126,188	-	15,064,498	599,309,501
2024	599,309,501	30,281,403	-	15,064,498	644,655,402
2025	644,655,402	32,544,164	-	15,064,498	692,264,064
2026	692,264,064	34,919,836	-	15,064,498	742,248,399
2027	742,248,399	37,414,054	-	15,064,498	794,726,952
2028	794,726,952	40,032,734	-	15,064,498	849,824,184
2029	849,824,184	42,782,086	-	15,064,498	907,670,768
2030	907,670,768	45,668,631	-	15,064,498	968,403,897
2031	968,403,897	48,699,214	-	15,064,498	1,032,167,610
2032	1,032,167,610	51,881,023	-	15,064,498	1,099,113,131
2033	1,099,113,131	45,822,629	(43,091,536)	10,093,214	1,111,937,438
2034	1,111,937,438	46,145,404	(132,256,979)	-	1,025,825,863
2035	1,025,825,863	42,571,773	(198,854,122)	-	869,543,514
2036	869,543,514	36,086,056	(173,386,484)	-	732,243,086
2037	732,243,086	30,388,088	(110,434,710)	-	652,196,464
2038	652,196,464	27,066,153	(48,446,241)	-	630,816,377
2039	630,816,377	26,178,880	(168,633,958)	-	488,361,298
2040	488,361,298	20,266,994	(78,121,996)	-	430,506,296
2041	430,506,296	17,866,011	(51,838,628)	-	396,533,679
2042	396,533,679	16,456,148	(47,540,570)	-	365,449,257
2043	365,449,257	15,166,144	(28,453,465)	-	352,161,936
2044	352,161,936	14,614,720	(10,519,163)	-	356,257,493
2045	356,257,493	14,784,686	(10,838,668)	-	360,203,511
2046	360,203,511	14,948,446	(11,203,065)	-	363,948,892
2047	363,948,892	15,103,879	(11,581,208)	-	367,471,563
2048	367,471,563	15,250,070	(12,009,850)	-	370,711,783
2049	370,711,783	15,384,539	(12,380,447)	-	373,715,875
2050	373,715,875	15,509,209	(12,802,945)	-	376,422,138
2051	376,422,138	15,621,519	(13,241,123)	-	378,802,534
2052	378,802,534	15,720,305	(13,737,675)	-	380,785,164
2053	380,785,164	15,802,584	(15,041,831)	-	381,545,917
2054	381,545,917	15,834,156	(16,462,254)	-	380,917,819
2055	380,917,819	15,808,089	(17,029,137)	-	379,696,771

EXTERNAL FUND CALCULATION

2056	379,696,771	15,757,416	(18,146,364)	-	377,307,823
2057	377,307,823	15,658,275	(17,730,996)	-	375,235,102
2058	375,235,102	15,572,257	(19,886,431)	-	370,920,928
2059	370,920,928	15,393,218	(18,987,907)	-	367,326,240
2060	367,326,240	15,244,039	(19,160,263)	-	363,410,016
2061	363,410,016	15,081,516	(20,905,881)	-	357,585,651
2062	357,585,651	14,839,805	(21,639,172)	-	350,786,284
2063	350,786,284	14,557,631	(21,797,605)	-	343,546,309
2064	343,546,309	14,257,172	(23,253,493)	-	334,549,987
2065	334,549,987	13,883,824	(24,009,128)	-	324,424,684
2066	324,424,684	13,463,624	(24,195,153)	-	313,693,155
2067	313,693,155	13,018,266	(25,741,010)	-	300,970,412
2068	300,970,412	12,490,272	(26,729,863)	-	286,730,820
2069	286,730,820	11,899,329	(26,874,413)	-	271,755,737
2070	271,755,737	11,277,863	(28,591,793)	-	254,441,807
2071	254,441,807	10,559,335	(29,614,636)	-	235,386,506
2072	235,386,506	9,768,540	(30,760,714)	-	214,394,332
2073	214,394,332	8,897,365	(31,777,701)	-	191,513,995
2074	191,513,995	7,947,831	(32,921,147)	-	166,540,679
2075	166,540,679	6,911,438	(40,279,538)	-	133,172,579
2076	133,172,579	5,526,662	(35,436,404)	-	103,262,838
2077	103,262,838	4,285,408	(82,828,774)	-	24,719,471
2078	24,719,471	1,025,858	(25,745,329)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,592,979	-	294,670	431,096,616
2018	431,096,616	21,742,121	-	589,341	453,428,078
2019	453,428,078	23,082,658	-	9,122,323	485,633,058
2020	485,633,058	24,705,789	-	9,122,323	519,461,170
2021	519,461,170	26,410,725	-	9,122,323	554,994,218
2022	554,994,218	28,201,591	-	9,122,323	592,318,132
2023	592,318,132	30,082,716	-	9,122,323	631,523,171
2024	631,523,171	32,058,650	-	9,122,323	672,704,144
2025	672,704,144	34,134,171	-	9,122,323	715,960,638
2026	715,960,638	36,314,299	-	9,122,323	761,397,259
2027	761,397,259	38,604,304	-	9,122,323	809,123,886
2028	809,123,886	41,009,726	-	9,122,323	859,255,935
2029	859,255,935	43,536,382	-	9,122,323	911,914,639
2030	911,914,639	46,190,380	-	9,122,323	967,227,342
2031	967,227,342	48,978,141	-	9,122,323	1,025,327,805
2032	1,025,327,805	51,906,404	-	9,122,323	1,086,356,532
2033	1,086,356,532	54,982,252	-	9,122,323	1,150,461,106
2034	1,150,461,106	47,208,697	(17,426,478)	7,571,528	1,187,814,854
2035	1,187,814,854	48,581,628	(114,752,431)	-	1,121,644,050
2036	1,121,644,050	45,875,242	(214,578,969)	-	952,940,323
2037	952,940,323	38,975,259	(207,139,571)	-	784,776,011
2038	784,776,011	32,097,339	(136,478,691)	-	680,394,659
2039	680,394,659	27,828,142	(178,110,184)	-	530,112,616
2040	530,112,616	21,681,606	(89,351,532)	-	462,442,690
2041	462,442,690	18,913,906	(64,224,426)	-	417,132,170
2042	417,132,170	17,060,706	(59,433,129)	-	374,759,747
2043	374,759,747	15,327,674	(34,204,617)	-	355,882,804
2044	355,882,804	14,555,607	(10,519,163)	-	359,919,247
2045	359,919,247	14,720,697	(10,838,668)	-	363,801,277
2046	363,801,277	14,879,472	(11,203,065)	-	367,477,684
2047	367,477,684	15,029,837	(11,581,208)	-	370,926,313
2048	370,926,313	15,170,886	(12,009,850)	-	374,087,349
2049	374,087,349	15,300,173	(12,380,447)	-	377,007,075
2050	377,007,075	15,419,589	(12,802,945)	-	379,623,719
2051	379,623,719	15,526,610	(13,241,123)	-	381,909,206
2052	381,909,206	15,620,087	(13,737,675)	-	383,791,617
2053	383,791,617	15,697,077	(15,041,833)	-	384,446,862
2054	384,446,862	15,723,877	(16,462,254)	-	383,708,484

EXTERNAL FUND CALCULATION

2055	383,708,484	15,693,677	(17,029,137)	-	382,373,024
2056	382,373,024	15,639,057	(18,146,364)	-	379,865,717
2057	379,865,717	15,536,508	(17,730,996)	-	377,671,229
2058	377,671,229	15,446,753	(19,886,431)	-	373,231,551
2059	373,231,551	15,265,170	(18,987,907)	-	369,508,815
2060	369,508,815	15,112,911	(19,160,263)	-	365,461,463
2061	365,461,463	14,947,374	(20,905,881)	-	359,502,955
2062	359,502,955	14,703,671	(21,639,172)	-	352,567,455
2063	352,567,455	14,420,009	(21,797,605)	-	345,189,858
2064	345,189,858	14,118,265	(23,253,493)	-	336,054,630
2065	336,054,630	13,744,634	(24,009,128)	-	325,790,136
2066	325,790,136	13,324,817	(24,195,153)	-	314,919,800
2067	314,919,800	12,880,220	(25,741,010)	-	302,059,010
2068	302,059,010	12,354,214	(26,729,863)	-	287,683,360
2069	287,683,360	11,766,249	(26,874,413)	-	272,575,197
2070	272,575,197	11,148,326	(28,591,793)	-	255,131,730
2071	255,131,730	10,434,888	(29,614,636)	-	235,951,981
2072	235,951,981	9,650,436	(30,760,714)	-	214,841,703
2073	214,841,703	8,787,026	(31,777,701)	-	191,851,028
2074	191,851,028	7,846,707	(32,921,147)	-	166,776,588
2075	166,776,588	6,821,162	(40,279,538)	-	133,318,213
2076	133,318,213	5,452,715	(35,436,404)	-	103,334,524
2077	103,334,524	4,226,382	(82,827,186)	-	24,733,720
2078	24,733,720	1,011,609	(25,745,329)	-	0

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$44,081,384	\$30,689,158
Prairie Island Unit 1	49,264	25,969,989	25,920,725
Prairie Island Unit 2	589,341	17,105,727	16,516,386
TOTAL	\$14,030,831	\$87,157,100	\$73,126,269

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
DECON Method - No Recasking
5-Year Early Shutdown

Docket No. E002/M-17-828
Schedule F.3
Page 2 of 12
Proposed

2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2019-2021 Decommissioning Accrual
Monticello	8.75	5.01%	4.43%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	44,081,384
Prairie Island Unit 1	11.67	4.99%	4.15%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	25,969,989
Prairie Island Unit 2	12.83	5.04%	4.09%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	17,105,727
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$87,157,100

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIHC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional
	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Estimate	Cost in	Cost in
	Estimate	Cost in	Factor	Cost in	Estimate	Cost in	Factor	Cost in	Estimate	Cost in	Factor	Cost in	Nominal \$	Nominal \$	Nominal \$
	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2025	\$21,103,620	\$15,508,745	1.3738	\$21,305,914	\$8,935,561	\$6,566,615	1.2521	\$8,222,059	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$29,527,973
2026	72,416,242	53,217,649	1.4295	76,074,629	42,961,353	31,571,677	1.2878	40,658,006	0	0	1.0000	0	115,377,595	84,789,326	116,732,635
2027	78,476,357	57,671,140	1.4874	85,780,054	102,263,189	75,151,739	1.3245	99,538,478	0	0	1.0000	0	180,739,546	132,822,879	185,318,532
2028	78,663,227	57,808,468	1.5476	89,464,385	100,155,666	73,602,950	1.3622	100,261,939	0	0	1.0000	0	178,818,892	131,411,418	189,726,324
2029	66,380,423	48,782,013	1.6103	78,553,675	38,894,671	28,583,132	1.4010	40,044,967	0	0	1.0000	0	105,275,094	77,365,144	118,598,642
2030	86,879,803	63,846,711	1.6755	106,975,164	113,147,091	83,150,161	1.4410	119,819,382	0	0	1.0000	0	200,026,894	146,996,872	226,794,546
2031	50,307,504	36,970,257	1.7434	64,453,946	20,688,337	15,203,559	1.4820	22,531,675	0	0	1.0000	0	70,995,841	52,173,817	86,985,621
2032	34,623,126	25,444,035	1.8140	46,155,479	14,196,883	10,433,084	1.5243	15,903,150	0	0	1.0000	0	48,820,010	35,877,119	62,058,629
2033	29,581,478	21,739,000	1.8874	41,030,189	15,098,979	11,096,021	1.5677	17,395,233	0	0	1.0000	0	44,680,457	32,835,022	58,425,422
2034	5,925,016	4,354,209	1.9639	8,551,230	2,187,162	1,607,314	1.6124	2,591,633	0	0	1.0000	0	8,112,178	5,961,523	11,142,863
2035	5,941,203	4,366,104	2.0434	8,921,697	2,193,018	1,611,617	1.6584	2,672,706	0	0	1.0000	0	8,134,221	5,977,722	11,594,404
2036	5,925,016	4,354,209	2.1262	9,257,918	2,187,162	1,607,314	1.7056	2,741,435	0	0	1.0000	0	8,112,178	5,961,523	11,999,353
2037	5,925,016	4,354,209	2.2123	9,632,816	2,187,162	1,607,314	1.7542	2,819,550	0	0	1.0000	0	8,112,178	5,961,523	12,452,366
2038	5,925,016	4,354,209	2.3019	10,022,953	2,187,162	1,607,314	1.8042	2,899,916	0	0	1.0000	0	8,112,178	5,961,523	12,922,869
2039	5,941,203	4,366,104	2.3951	10,457,256	2,193,018	1,611,617	1.8556	2,990,517	0	0	1.0000	0	8,134,221	5,977,722	13,447,773
2040	5,925,016	4,354,209	2.4921	10,851,123	2,187,162	1,607,314	1.9085	3,067,559	0	0	1.0000	0	8,112,178	5,961,523	13,918,682
2041	5,925,016	4,354,209	2.5930	11,290,463	2,187,162	1,607,314	1.9629	3,154,997	0	0	1.0000	0	8,112,178	5,961,523	14,445,460
2042	5,925,016	4,354,209	2.6981	11,748,090	2,187,162	1,607,314	2.0189	3,245,006	0	0	1.0000	0	8,112,178	5,961,523	14,993,096
2043	6,604,848	4,853,807	2.8073	13,626,093	4,183,953	3,074,727	2.0764	6,384,363	0	0	1.0000	0	10,788,801	7,928,534	20,010,456
2044	5,925,016	4,354,209	2.9210	12,718,643	2,187,162	1,607,314	2.1356	3,432,580	0	0	1.0000	0	8,112,178	5,961,523	16,151,223
2045	7,418,217	5,451,540	3.0393	16,568,867	6,666,766	4,899,310	2.1964	10,760,845	0	0	1.0000	0	14,084,983	10,350,851	27,329,712
2046	7,418,217	5,451,540	3.1624	17,239,951	6,666,766	4,899,310	2.2590	11,067,542	0	0	1.0000	0	14,084,983	10,350,851	28,307,493
2047	8,296,904	6,097,275	3.2905	20,063,083	9,260,122	6,805,130	2.3234	15,811,039	0	0	1.0000	0	17,557,026	12,902,405	35,874,122
2048	8,927,592	6,560,758	3.4238	22,462,724	11,194,891	8,226,964	2.3896	19,659,153	0	0	1.0000	0	20,122,483	14,787,722	42,121,877
2049	7,633,842	5,610,000	3.5624	19,985,064	7,313,641	5,374,689	2.4577	13,209,374	0	0	1.0000	0	14,947,483	10,984,689	33,194,438
2050	8,711,967	6,402,299	3.7067	23,731,400	10,548,016	7,751,585	2.5278	19,594,456	0	0	1.0000	0	19,259,983	14,153,883	43,325,856
2051	9,159,404	6,731,114	3.8568	25,960,559	11,847,622	8,706,646	2.5998	22,635,539	0	0	1.0000	0	21,067,026	15,437,760	48,596,098
2052	5,908,425	4,342,016	4.0130	17,424,511	2,137,389	1,570,737	2.6739	4,199,993	0	0	1.0000	0	8,045,814	5,912,753	21,624,503
2053	5,908,425	4,342,016	4.1756	18,130,522	2,137,389	1,570,737	2.7501	4,319,683	0	0	1.0000	0	8,045,814	5,912,753	22,450,205
2054	5,908,425	4,342,016	4.3447	18,864,757	2,137,389	1,570,737	2.8285	4,442,828	0	0	1.0000	0	8,045,814	5,912,753	23,307,586
2055	5,924,612	4,353,912	4.5206	19,682,293	2,143,245	1,575,040	2.9091	4,581,949	0	0	1.0000	0	8,067,857	5,928,952	24,264,242
2056	5,908,425	4,342,016	4.7037	20,423,541	2,137,389	1,570,737	2.9920	4,699,644	0	0	1.0000	0	8,045,814	5,912,753	25,123,185
2057	5,908,425	4,342,016	4.8942	21,250,695	2,137,389	1,570,737	3.0773	4,833,628	0	0	1.0000	0	8,045,814	5,912,753	26,084,323
2058	5,908,425	4,342,016	5.0924	22,111,283	2,137,389	1,570,737	3.1650	4,971,381	0	0	1.0000	0	8,045,814	5,912,753	27,082,664
2059	5,924,612	4,353,912	5.2987	23,070,072	2,143,245	1,575,040	3.2552	5,127,070	0	0	1.0000	0	8,067,857	5,928,952	28,197,142
2060	5,908,425	4,342,016	5.5133	23,938,837	2,137,389	1,570,737	3.3480	5,258,826	0	0	1.0000	0	8,045,814	5,912,753	29,197,663
2061	5,908,425	4,342,016	5.7366	24,908,410	2,137,389	1,570,737	3.4434	5,408,674	0	0	1.0000	0	8,045,814	5,912,753	30,317,084
2062	5,908,425	4,342,016	5.9689	25,917,060	2,137,389	1,570,737	3.5415	5,562,764	0	0	1.0000	0	8,045,814	5,912,753	31,479,823
2063	5,924,612	4,353,912	6.2106	27,040,404	2,143,245	1,575,040	3.6425	5,737,083	0	0	1.0000	0	8,067,857	5,928,952	32,777,487
2064	5,908,425	4,342,016	6.4622	28,058,976	2,137,389	1,570,737	3.7463	5,884,450	0	0	1.0000	0	8,045,814	5,912,753	33,943,427
2065	5,908,425	4,342,016	6.7239	29,195,282	2,137,389	1,570,737	3.8531	6,052,205	0	0	1.0000	0	8,045,814	5,912,753	35,247,487
2066	5,908,425	4,342,016	6.9962	30,377,613	2,137,389	1,570,737	3.9629	6,224,672	0	0	1.0000	0	8,045,814	5,912,753	36,602,285
2067	5,924,612	4,353,912	7.2795	31,694,300	2,143,245	1,575,040	4.0758	6,419,548	0	0	1.0000	0	8,067,857	5,928,952	38,113,848
2068	5,908,425	4,342,016	7.5744	32,888,167	2,137,389	1,570,737	4.1920	6,584,528	0	0	1.0000	0	8,045,814	5,912,753	39,472,694
2069	5,908,425	4,342,016	7.8811	34,219,863	2,137,389	1,570,737	4.3115	6,772,231	0	0	1.0000	0	8,045,814	5,912,753	40,992,094
2070	5,908,425	4,342,016	8.2003	35,605,835	2,137,389	1,570,737	4.4343	6,965,117	0	0	1.0000	0	8,045,814	5,912,753	42,570,952
2071	5,924,612	4,353,912	8.5324	37,149,316	2,143,245	1,575,040	4.5607	7,183,285	0	0	1.0000	0	8,067,857	5,928,952	44,332,601
2072	5,908,425	4,342,016	8.8780	38,548,419	2,137,389	1,570,737	4.6907	7,367,854	0	0	1.0000	0	8,045,814	5,912,753	45,916,273
2073	6,386,857	4,693,609	9.2375	43,357,212	3,557,353	2,614,247	4.8244	12,612,174	0	0	1.0000	0	9,944,210	7,307,856	55,969,386
2074	6,482,543	4,763,927	9.6117	45,789,438	3,844,412	2,825,203	4.9619	14,018,373	0	0	1.0000	0	10,326,955	7,589,130	59,807,811
2075	6,403,045	4,705,505	10.0009	47,059,287	3,563,167	2,618,520	5.1033	13,363,091	0	0	1.0000	0	9,966,212	7,324,025	60,422,378
2076	6,386,857	4,693,609	10.4060	48,841,694	3,557,353	2,614,247	5.2487	13,721,399	0	0	1.0000	0	9,944,210	7,307,856	62,563,093
2077	6,386,857	4,693,609	10.8274	50,819,580	3,557,353	2,614,247	5.3983	14,112,490	0	0	1.0000	0	9,944,210	7,307,856	64,932,071
2078	6,482,543	4,763,927	11.2659	53,669,926	3,844,412	2,825,203	5.5522	15,686,090	0	0	1.0000	0	10,326,955	7,589,130	69,356,016
2079	6,403,045	4,705,505	11.7222	55,158,873	3,563,167	2,618,520	5.7104	14,952,795	0	0	1.0000	0	9,966,212	7,324,025	70,111,667

AMOUNT TO RECOVER															
	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2080	6,386,857	4,693,609	12.1970	57,247,947	3,557,353	2,614,247	5.8731	15,353,735	0	0	1.0000	0	9,944,210	7,307,856	72,601,682
2081	6,386,857	4,693,609	12.6909	59,566,121	3,557,353	2,614,247	6.0405	15,791,360	0	0	1.0000	0	9,944,210	7,307,856	75,357,480
2082	6,482,543	4,763,927	13.2049	62,907,181	3,844,412	2,825,203	6.2127	17,552,136	0	0	1.0000	0	10,326,955	7,589,130	80,459,317
2083	7,066,689	5,193,208	13.7397	71,353,114	5,554,101	4,081,628	6.3897	26,080,380	0	0	1.0000	0	12,620,790	9,274,836	97,433,494
2084	6,386,857	4,693,609	14.2962	67,100,771	3,557,353	2,614,247	6.5719	17,180,571	0	0	1.0000	0	9,944,210	7,307,856	84,281,342
2085	6,099,798	4,482,653	14.8752	66,680,365	2,696,175	1,981,380	6.7592	13,392,543	0	0	1.0000	0	8,795,973	6,464,033	80,072,908
2086	2,034,890	1,495,411	15.4776	23,145,375	24,955,010	18,339,076	6.9518	127,489,587	0	0	1.0000	0	26,989,900	19,834,487	150,634,962
	\$851,819,402	\$625,989,760		\$2,186,080,404	\$664,030,274	\$487,986,246		\$1,063,017,234	\$0	\$0		\$0	\$1,515,849,676	\$1,113,976,006	\$3,249,097,637

Xcel Energy

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s	
Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2029	\$7,760,265	\$5,702,906	1.6103	\$9,183,390	\$4,479,535	\$3,291,946	1.4010	\$4,612,016	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459	\$14,714,013
2030	\$6,911,429	\$4,474,531	1.6755	\$7,762,076	\$5,601,339	\$2,162,909	1.4410	\$7,700,752	1,250,000	918,607	1.0000	918,607	\$3,762,768	61,556,047	96,381,435
2031	\$7,514,044	\$49,615,094	1.7434	\$6,498,955	\$6,298,832	\$3,419,763	1.4820	\$3,988,089	1,250,000	918,607	1.0000	918,607	\$155,062,875	113,923,465	181,405,652
2032	\$7,896,041	\$52,100,475	1.8140	\$4,510,262	\$7,558,163	\$1,852,174	1.5243	\$7,038,268	1,250,000	918,607	1.0000	918,607	\$142,704,204	104,871,256	174,467,137
2033	\$46,603,528	\$34,248,259	1.8874	\$6,640,164	\$4,782,149	\$1,439,982	1.5677	\$4,288,460	1,250,000	918,607	1.0000	918,607	\$90,635,677	66,606,848	114,847,231
2034	\$40,663,625	\$29,883,110	1.9639	\$8,687,439	\$7,452,618	\$6,918,809	1.6124	\$1,775,887	1,250,000	918,607	1.0000	918,607	\$119,366,242	87,720,525	151,381,933
2035	\$7,417,177	\$27,497,343	2.0434	\$6,188,070	\$14,193,501	\$10,430,599	1.6584	\$17,298,105	1,250,000	918,607	1.0000	918,607	\$52,860,679	38,846,548	74,404,782
2036	\$23,327,583	\$17,143,103	2.1262	\$6,449,666	\$13,070,130	\$9,605,049	1.7056	\$16,382,372	1,250,000	918,607	1.0000	918,607	\$37,647,713	27,666,760	53,750,646
2037	\$16,656,921	\$12,240,930	2.2123	\$27,080,609	\$17,178,640	\$12,624,334	1.7542	\$22,145,607	1,250,000	918,607	1.0000	918,607	\$35,085,561	25,783,871	50,144,824
2038	\$9,422,862	\$6,924,725	2.3019	\$15,940,025	\$9,074,042	\$6,668,382	1.8042	\$12,031,095	1,250,000	918,607	1.0000	918,607	\$19,746,904	14,511,714	28,889,727
2039	\$3,054,798	\$2,444,927	2.3951	\$5,376,824	\$1,939,011	\$1,424,951	1.8556	\$2,644,139	1,250,000	918,607	1.0000	918,607	\$6,243,809	4,588,485	8,939,570
2040	\$3,046,451	\$2,238,793	2.4921	\$5,729,295	\$1,930,298	\$1,418,548	1.9085	\$2,707,298	1,250,000	918,607	1.0000	918,607	\$6,226,749	4,575,947	9,205,201
2041	\$3,046,451	\$2,238,793	2.5930	\$5,805,190	\$1,930,298	\$1,418,548	1.9629	\$2,784,467	1,250,000	918,607	1.0000	918,607	\$6,226,749	4,575,947	9,508,264
2042	\$3,046,451	\$2,238,793	2.6981	\$6,040,487	\$1,930,298	\$1,418,548	2.0189	\$2,863,906	1,250,000	918,607	1.0000	918,607	\$6,226,749	4,575,947	9,823,000
2043	\$3,054,798	\$2,444,927	2.8073	\$6,302,183	\$1,939,011	\$1,424,951	2.0764	\$2,958,768	1,250,000	918,607	1.0000	918,607	\$6,243,809	4,588,485	10,179,558
2044	\$3,046,451	\$2,238,793	2.9210	\$6,539,514	\$1,930,298	\$1,418,548	2.1356	\$3,029,451	1,250,000	918,607	1.0000	918,607	\$6,226,749	4,575,947	10,487,571
2045	\$3,046,451	\$2,238,793	3.0393	\$6,804,363	\$1,930,298	\$1,418,548	2.1964	\$3,115,698	1,250,000	918,607	1.0000	918,607	\$6,226,749	4,575,947	10,838,668
2046	\$3,046,451	\$2,238,793	3.1624	\$7,079,958	\$1,930,298	\$1,418,548	2.2590	\$3,204,499	1,250,000	918,607	1.0000	918,607	\$6,226,749	4,575,947	11,203,065
2047	\$3,054,798	\$2,444,927	3.2905	\$7,386,932	\$1,939,011	\$1,424,951	2.3234	\$3,310,731	1,250,000	918,607	1.0000	918,607	\$6,243,809	4,588,485	11,616,270
2048	\$3,142,138	\$2,309,112	3.4238	\$7,905,937	\$2,217,358	\$1,620,504	2.3896	\$3,893,863	1,250,000	918,607	1.0000	918,607	\$6,609,496	4,857,223	12,718,407
2049	\$3,237,824	\$2,379,430	3.5624	\$8,476,482	\$2,504,416	\$1,840,459	2.4577	\$4,523,295	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	13,918,384
2050	\$3,237,824	\$2,379,430	3.7067	\$8,819,833	\$2,504,416	\$1,840,459	2.5278	\$4,652,312	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	14,390,752
2051	\$3,294,014	\$2,420,723	3.8568	\$9,336,245	\$2,656,659	\$1,952,340	2.5998	\$5,075,694	1,250,000	918,607	1.0000	918,607	\$7,200,673	5,291,670	15,330,546
2052	\$3,189,981	\$2,344,271	4.0130	\$9,407,559	\$2,360,887	\$1,734,981	2.6739	\$4,639,167	1,250,000	918,607	1.0000	918,607	\$8,800,868	4,997,859	14,965,333
2053	\$3,333,510	\$2,449,748	4.1756	\$10,229,169	\$2,791,475	\$2,051,414	2.7501	\$5,641,594	1,250,000	918,607	1.0000	918,607	\$7,374,985	5,419,769	16,789,370
2054	\$3,189,981	\$2,344,271	4.3447	\$10,185,154	\$2,360,887	\$1,734,981	2.8285	\$4,907,395	1,250,000	918,607	1.0000	918,607	\$8,800,868	4,997,859	16,011,156
2055	\$3,150,484	\$2,315,245	4.5206	\$10,466,297	\$2,226,070	\$1,635,906	2.9091	\$4,759,015	1,250,000	918,607	1.0000	918,607	\$6,626,554	4,869,758	16,143,919
2056	\$3,237,824	\$2,379,430	4.7037	\$11,192,125	\$2,504,416	\$1,840,459	2.9920	\$5,506,653	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	17,617,385
2057	\$3,237,824	\$2,379,430	4.8942	\$11,645,406	\$2,504,416	\$1,840,459	3.0773	\$5,663,644	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	18,227,657
2058	\$3,189,981	\$2,344,271	5.0924	\$11,937,965	\$2,360,887	\$1,734,981	3.1650	\$5,491,216	1,250,000	918,607	1.0000	918,607	\$6,800,868	4,997,859	18,347,788
2059	\$3,246,170	\$2,385,563	5.2987	\$12,640,385	\$2,513,129	\$1,846,862	3.2552	\$6,011,905	1,250,000	918,607	1.0000	918,607	\$7,009,299	5,151,032	19,570,897
2060	\$3,237,824	\$2,379,430	5.5133	\$13,118,512	\$2,504,416	\$1,840,459	3.3480	\$6,161,856	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	20,198,974
2061	\$3,189,981	\$2,344,271	5.7366	\$13,448,144	\$2,360,887	\$1,734,981	3.4434	\$5,974,235	1,250,000	918,607	1.0000	918,607	\$8,800,868	4,997,859	20,340,986
2062	\$3,237,824	\$2,379,430	5.9689	\$14,202,580	\$2,504,416	\$1,840,459	3.5415	\$6,517,985	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	21,639,172
2063	\$3,246,170	\$2,385,563	6.2106	\$14,815,780	\$2,513,129	\$1,846,862	3.6425	\$6,727,195	1,250,000	918,607	1.0000	918,607	\$7,009,299	5,151,032	22,461,581
2064	\$3,189,981	\$2,344,271	6.4622	\$15,149,147	\$2,360,887	\$1,734,981	3.7463	\$6,499,761	1,250,000	918,607	1.0000	918,607	\$8,800,868	4,997,859	22,567,515
2065	\$3,237,824	\$2,379,430	6.7239	\$15,999,050	\$2,504,416	\$1,840,459	3.8531	\$7,091,472	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	24,009,128
2066	\$3,237,824	\$2,379,430	6.9962	\$16,646,968	\$2,504,416	\$1,840,459	3.9629	\$7,293,554	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	24,859,129
2067	\$3,246,170	\$2,385,563	7.2795	\$17,365,709	\$2,513,129	\$1,846,862	4.0758	\$7,527,440	1,250,000	918,607	1.0000	918,607	\$7,009,299	5,151,032	25,811,755
2068	\$3,237,824	\$2,379,430	7.5744	\$18,022,755	\$2,504,416	\$1,840,459	4.1920	\$7,715,203	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	26,656,565
2069	\$3,237,824	\$2,379,430	7.8811	\$18,752,526	\$2,504,416	\$1,840,459	4.3115	\$7,935,138	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	27,606,271
2070	\$3,569,646	\$2,623,281	8.2003	\$21,511,693	\$3,499,884	\$2,572,014	4.4343	\$11,405,081	1,250,000	918,607	1.0000	918,607	\$8,319,530	6,113,902	33,835,381
2071	\$3,246,170	\$2,385,563	8.5324	\$20,354,581	\$2,513,129	\$1,846,862	4.5607	\$8,422,983	1,250,000	918,607	1.0000	918,607	\$7,009,299	5,151,032	29,696,171
2072	\$3,237,824	\$2,379,430	8.8780	\$21,124,581	\$4,152,675	\$10,400,596	4.6907	\$8,786,075	1,250,000	918,607	1.0000	918,607	\$18,640,499	13,698,633	70,829,263
2073	\$32,743	611,971	9.2375	\$5,653,083	\$4,620,063	\$3,395,217	4.8244	\$16,379,886	0	-	1.0000	-	\$5,452,806	4,007,188	22,032,968
	\$476,489,759	\$350,165,433		\$912,633,071	\$467,153,049	\$343,304,020		\$666,083,223	\$55,000,000	\$40,418,705		\$40,418,705	\$998,642,807	\$733,888,158	\$1,618,764,999
	\$1,809,340,794	\$1,329,658,384		\$3,997,547,341	\$1,590,942,995	\$1,169,161,000		\$2,378,124,263	\$111,250,000	\$81,756,016		\$81,756,016	\$3,511,533,789	\$2,580,575,401	\$6,457,427,620

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,706,857	-	6,696,113	646,075,152
2018	646,075,152	32,703,840	-	13,392,226	692,171,218
2019	692,171,218	35,782,017	-	44,081,384	772,034,619
2020	772,034,619	39,783,173	-	44,081,384	855,899,176
2021	855,899,176	43,984,787	-	44,081,384	943,965,347
2022	943,965,347	48,396,903	-	44,081,384	1,036,443,633
2023	1,036,443,633	53,030,065	-	44,081,384	1,133,555,082
2024	1,133,555,082	57,895,348	-	44,081,384	1,235,531,814
2025	1,235,531,814	55,466,361	(29,527,973)	33,061,038	1,294,531,240
2026	1,294,531,240	57,347,734	(116,732,635)	-	1,235,146,340
2027	1,235,146,340	54,716,983	(185,318,532)	-	1,104,544,791
2028	1,104,544,791	48,931,334	(189,726,324)	-	963,749,802
2029	963,749,802	42,694,116	(118,598,642)	-	887,845,276
2030	887,845,276	39,331,546	(226,794,546)	-	700,382,276
2031	700,382,276	31,026,935	(86,985,621)	-	644,423,589
2032	644,423,589	28,547,965	(62,058,629)	-	610,912,925
2033	610,912,925	27,063,443	(58,425,422)	-	579,550,945
2034	579,550,945	25,674,107	(11,142,863)	-	594,082,189
2035	594,082,189	26,317,841	(11,594,404)	-	608,805,626
2036	608,805,626	26,970,089	(11,999,353)	-	623,776,362
2037	623,776,362	27,633,293	(12,452,366)	-	638,957,289
2038	638,957,289	28,305,808	(12,922,869)	-	654,340,229
2039	654,340,229	28,987,272	(13,447,773)	-	669,879,727
2040	669,879,727	29,675,672	(13,918,682)	-	685,636,717
2041	685,636,717	30,373,707	(14,445,460)	-	701,564,964
2042	701,564,964	31,079,328	(14,993,096)	-	717,651,196
2043	717,651,196	31,791,948	(20,010,456)	-	729,432,688
2044	729,432,688	32,313,868	(16,151,223)	-	745,595,333
2045	745,595,333	33,029,873	(27,329,712)	-	751,295,494
2046	751,295,494	33,282,390	(28,307,493)	-	756,270,391
2047	756,270,391	33,502,778	(35,874,122)	-	753,899,048
2048	753,899,048	33,397,728	(42,121,877)	-	745,174,899
2049	745,174,899	33,011,248	(33,194,438)	-	744,991,709
2050	744,991,709	33,003,133	(43,325,856)	-	734,668,986
2051	734,668,986	32,545,836	(48,596,098)	-	718,618,724
2052	718,618,724	31,834,809	(21,624,503)	-	728,829,031
2053	728,829,031	32,287,126	(22,450,205)	-	738,665,952
2054	738,665,952	32,722,902	(23,307,586)	-	748,081,267

EXTERNAL FUND CALCULATION

2055	748,081,267	33,140,000	(24,264,242)	-	756,957,026
2056	756,957,026	33,533,196	(25,123,185)	-	765,367,037
2057	765,367,037	33,905,760	(26,084,323)	-	773,188,474
2058	773,188,474	34,252,249	(27,082,664)	-	780,358,059
2059	780,358,059	34,569,862	(28,197,142)	-	786,730,780
2060	786,730,780	34,852,174	(29,197,663)	-	792,385,290
2061	792,385,290	35,102,668	(30,317,084)	-	797,170,874
2062	797,170,874	35,314,670	(31,479,823)	-	801,005,721
2063	801,005,721	35,484,553	(32,777,487)	-	803,712,787
2064	803,712,787	35,604,476	(33,943,427)	-	805,373,837
2065	805,373,837	35,678,061	(35,247,487)	-	805,804,411
2066	805,804,411	35,697,135	(36,602,285)	-	804,899,261
2067	804,899,261	35,657,037	(38,113,848)	-	802,442,450
2068	802,442,450	35,548,201	(39,472,694)	-	798,517,956
2069	798,517,956	35,374,345	(40,992,094)	-	792,900,208
2070	792,900,208	35,125,479	(42,570,952)	-	785,454,736
2071	785,454,736	34,795,645	(44,332,601)	-	775,917,780
2072	775,917,780	34,373,158	(45,916,273)	-	764,374,664
2073	764,374,664	33,861,798	(55,969,386)	-	742,267,076
2074	742,267,076	32,882,431	(59,807,811)	-	715,341,697
2075	715,341,697	31,689,637	(60,422,378)	-	686,608,956
2076	686,608,956	30,416,777	(62,563,093)	-	654,462,640
2077	654,462,640	28,992,695	(64,932,071)	-	618,523,264
2078	618,523,264	27,400,581	(69,356,016)	-	576,567,828
2079	576,567,828	25,541,955	(70,111,667)	-	531,998,116
2080	531,998,116	23,567,517	(72,601,682)	-	482,963,950
2081	482,963,950	21,395,303	(75,357,480)	-	429,001,773
2082	429,001,773	19,004,779	(80,459,317)	-	367,547,234
2083	367,547,234	16,282,342	(97,433,494)	-	286,396,083
2084	286,396,083	12,687,346	(84,281,342)	-	214,802,088
2085	214,802,088	9,515,732	(80,072,908)	-	144,244,912
2086	144,244,912	6,390,050	(150,634,962)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,340,765	-	24,632	383,732,452
2018	383,732,452	19,149,479	-	49,264	402,931,195
2019	402,931,195	20,754,218	-	25,969,989	449,655,402
2020	449,655,402	23,085,756	-	25,969,989	498,711,148
2021	498,711,148	25,533,637	-	25,969,989	550,214,774
2022	550,214,774	28,103,668	-	25,969,989	604,288,432
2023	604,288,432	30,801,944	-	25,969,989	661,060,366
2024	661,060,366	33,634,863	-	25,969,989	720,665,218
2025	720,665,218	36,609,146	-	25,969,989	783,244,353
2026	783,244,353	39,731,844	-	25,969,989	848,946,187
2027	848,946,187	43,010,366	-	25,969,989	917,926,542
2028	917,926,542	38,454,999	(36,047,572)	17,399,893	937,733,862
2029	937,733,862	38,915,955	(110,546,301)	-	866,103,517
2030	866,103,517	35,943,296	(168,064,022)	-	733,982,791
2031	733,982,791	30,460,286	(146,359,369)	-	618,083,707
2032	618,083,707	25,650,474	(93,046,932)	-	550,687,249
2033	550,687,249	22,853,521	(41,121,692)	-	532,419,078
2034	532,419,078	22,095,392	(143,546,582)	-	410,967,888
2035	410,967,888	17,055,167	(65,140,211)	-	362,882,844
2036	362,882,844	15,059,638	(43,338,711)	-	334,603,771
2037	334,603,771	13,886,057	(39,993,460)	-	308,496,368
2038	308,496,368	12,802,599	(23,981,192)	-	297,317,775
2039	297,317,775	12,338,688	(8,939,570)	-	300,716,892
2040	300,716,892	12,479,751	(9,205,201)	-	303,991,443
2041	303,991,443	12,615,645	(9,508,264)	-	307,098,823
2042	307,098,823	12,744,601	(9,823,000)	-	310,020,425
2043	310,020,425	12,865,848	(10,179,558)	-	312,706,714
2044	312,706,714	12,977,329	(10,487,571)	-	315,196,472
2045	315,196,472	13,080,654	(10,838,668)	-	317,438,457
2046	317,438,457	13,173,696	(11,203,065)	-	319,409,089
2047	319,409,089	13,255,477	(11,616,270)	-	321,048,296
2048	321,048,296	13,323,504	(12,718,405)	-	321,653,396
2049	321,653,396	13,348,616	(13,918,384)	-	321,083,628
2050	321,083,628	13,324,971	(14,390,752)	-	320,017,846
2051	320,017,846	13,280,741	(15,330,546)	-	317,968,041
2052	317,968,041	13,195,674	(14,965,333)	-	316,198,382
2053	316,198,382	13,122,233	(16,789,370)	-	312,531,245
2054	312,531,245	12,970,047	(16,011,156)	-	309,490,136
2055	309,490,136	12,843,841	(16,143,919)	-	306,190,057

EXTERNAL FUND CALCULATION

2056	306,190,057	12,706,887	(17,617,385)	-	301,279,560
2057	301,279,560	12,503,102	(18,227,657)	-	295,555,004
2058	295,555,004	12,265,533	(18,347,788)	-	289,472,749
2059	289,472,749	12,013,119	(19,570,897)	-	281,914,971
2060	281,914,971	11,699,471	(20,198,974)	-	273,415,468
2061	273,415,468	11,346,742	(20,340,986)	-	264,421,224
2062	264,421,224	10,973,481	(21,639,172)	-	253,755,533
2063	253,755,533	10,530,855	(22,461,581)	-	241,824,806
2064	241,824,806	10,035,729	(22,567,515)	-	229,293,021
2065	229,293,021	9,515,660	(24,009,128)	-	214,799,553
2066	214,799,553	8,914,181	(24,859,129)	-	198,854,605
2067	198,854,605	8,252,466	(25,811,755)	-	181,295,316
2068	181,295,316	7,523,756	(26,656,565)	-	162,162,507
2069	162,162,507	6,729,744	(27,606,271)	-	141,285,980
2070	141,285,980	5,863,368	(33,835,381)	-	113,313,967
2071	113,313,967	4,702,530	(29,696,171)	-	88,320,326
2072	88,320,326	3,665,294	(70,830,585)	-	21,155,034
2073	21,155,034	877,934	(22,032,968)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,592,979	-	294,670	431,096,616
2018	431,096,616	21,742,121	-	589,341	453,428,078
2019	453,428,078	23,283,839	-	17,105,727	493,817,644
2020	493,817,644	25,319,474	-	17,105,727	536,242,845
2021	536,242,845	27,457,704	-	17,105,727	580,806,275
2022	580,806,275	29,703,701	-	17,105,727	627,615,703
2023	627,615,703	32,062,896	-	17,105,727	676,784,325
2024	676,784,325	34,540,994	-	17,105,727	728,431,047
2025	728,431,047	37,143,989	-	17,105,727	782,680,763
2026	782,680,763	39,878,175	-	17,105,727	839,664,664
2027	839,664,664	42,750,163	-	17,105,727	899,520,554
2028	899,520,554	45,766,900	-	17,105,727	962,393,181
2029	962,393,181	39,652,225	(14,714,013)	14,197,753	1,001,529,147
2030	1,001,529,147	40,962,542	(96,381,435)	-	946,110,254
2031	946,110,254	38,695,909	(181,405,652)	-	803,400,512
2032	803,400,512	32,859,081	(174,467,137)	-	661,792,456
2033	661,792,456	27,067,311	(114,847,231)	-	574,012,536
2034	574,012,536	23,477,113	(151,381,933)	-	446,107,716
2035	446,107,716	18,245,806	(74,404,782)	-	389,948,739
2036	389,948,739	15,948,903	(53,750,646)	-	352,146,997
2037	352,146,997	14,402,812	(50,144,824)	-	316,404,985
2038	316,404,985	12,940,964	(28,889,727)	-	300,456,222
2039	300,456,222	12,288,659	(8,939,570)	-	303,805,312
2040	303,805,312	12,425,637	(9,205,201)	-	307,025,748
2041	307,025,748	12,557,353	(9,508,264)	-	310,074,837
2042	310,074,837	12,682,061	(9,823,000)	-	312,933,898
2043	312,933,898	12,798,996	(10,179,558)	-	315,553,337
2044	315,553,337	12,906,131	(10,487,571)	-	317,971,897
2045	317,971,897	13,005,051	(10,838,668)	-	320,138,279
2046	320,138,279	13,093,656	(11,203,065)	-	322,028,870
2047	322,028,870	13,170,981	(11,616,270)	-	323,583,582
2048	323,583,582	13,234,568	(12,718,407)	-	324,099,744
2049	324,099,744	13,255,680	(13,918,384)	-	323,437,039
2050	323,437,039	13,228,575	(14,390,752)	-	322,274,862
2051	322,274,862	13,181,042	(15,330,546)	-	320,125,358
2052	320,125,358	13,093,127	(14,965,333)	-	318,253,152
2053	318,253,152	13,016,554	(16,789,370)	-	314,480,336
2054	314,480,336	12,862,246	(16,011,156)	-	311,331,426

EXTERNAL FUND CALCULATION

2055	311,331,426	12,733,455	(16,143,919)	-	307,920,962
2056	307,920,962	12,593,967	(17,617,385)	-	302,897,545
2057	302,897,545	12,388,510	(18,227,657)	-	297,058,397
2058	297,058,397	12,149,688	(18,347,788)	-	290,860,298
2059	290,860,298	11,896,186	(19,570,897)	-	283,185,587
2060	283,185,587	11,582,291	(20,198,974)	-	274,568,904
2061	274,568,904	11,229,868	(20,340,986)	-	265,457,785
2062	265,457,785	10,857,223	(21,639,172)	-	254,675,837
2063	254,675,837	10,416,242	(22,461,581)	-	242,630,498
2064	242,630,498	9,923,587	(22,567,515)	-	229,986,570
2065	229,986,570	9,406,451	(24,009,128)	-	215,383,892
2066	215,383,892	8,809,201	(24,859,129)	-	199,333,964
2067	199,333,964	8,152,759	(25,811,755)	-	181,674,968
2068	181,674,968	7,430,506	(26,656,565)	-	162,448,909
2069	162,448,909	6,644,160	(27,606,271)	-	141,486,799
2070	141,486,799	5,786,810	(33,835,381)	-	113,438,228
2071	113,438,228	4,639,624	(29,696,171)	-	88,381,681
2072	88,381,681	3,614,811	(70,829,263)	-	21,167,228
2073	21,167,228	865,740	(22,032,968)	-	0

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	(\$838,566)	(\$14,230,792)
Prairie Island Unit 1	49,264	1,282,107	1,232,843
Prairie Island Unit 2	589,341	(2,292,979)	(2,882,320)
TOTAL	\$14,030,831	(\$1,849,439)	(\$15,880,270)

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
DECON Method - No Recasking
20-Year Life Extension

Docket No. E002/M-17-828
Schedule F.4
Page 2 of 13
Proposed

2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2019-2021 Decommissioning Accrual
Monticello	33.75	5.01%	4.43%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	(838,566)
Prairie Island Unit 1	36.67	4.99%	4.15%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	1,282,107
Prairie Island Unit 2	37.83	5.04%	4.09%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	(2,292,979)
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	(\$1,849,439)

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIHC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2050	\$21,103,620	\$15,508,745	3.7067	\$57,486,266	\$8,935,561	\$6,566,615	2.5278	\$16,599,089	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$74,085,355
2051	72,416,242	53,217,649	3.8568	205,249,828	42,961,353	31,571,677	2.5998	82,080,046	0	0	1.0000	0	115,377,595	84,789,326	287,329,874
2052	78,476,357	57,671,140	4.0130	231,434,285	102,263,189	75,151,739	2.6739	200,948,234	0	0	1.0000	0	180,739,546	132,822,879	432,382,519
2053	78,663,227	57,808,468	4.1756	241,385,038	100,155,666	73,602,950	2.7501	202,415,473	0	0	1.0000	0	178,818,892	131,411,418	443,800,512
2054	66,380,423	48,782,013	4.3447	211,943,210	38,894,671	28,583,132	2.8285	80,847,388	0	0	1.0000	0	105,275,094	77,365,144	292,790,598
2055	86,879,803	63,846,711	4.5206	288,625,441	113,147,091	83,150,161	2.9091	241,892,133	0	0	1.0000	0	200,026,894	146,996,872	530,517,574
2056	50,307,504	36,970,257	4.7037	173,896,999	20,688,337	15,203,559	2.9920	45,489,050	0	0	1.0000	0	70,995,841	52,173,817	219,386,048
2057	34,623,126	25,444,035	4.8942	124,528,195	14,196,883	10,433,084	3.0773	32,105,730	0	0	1.0000	0	48,820,010	35,877,119	156,633,925
2058	29,581,478	21,739,000	5.0924	110,703,685	15,098,979	11,096,021	3.1650	35,118,908	0	0	1.0000	0	44,680,457	32,835,022	145,822,593
2059	5,925,016	4,354,209	5.2987	23,071,645	2,187,162	1,607,314	3.2552	5,232,129	0	0	1.0000	0	8,112,178	5,961,523	28,303,774
2060	5,941,203	4,366,104	5.5133	24,071,642	2,193,018	1,611,617	3.3480	5,395,695	0	0	1.0000	0	8,134,221	5,977,722	29,467,337
2061	5,925,016	4,354,209	5.7366	24,978,353	2,187,162	1,607,314	3.4434	5,534,625	0	0	1.0000	0	8,112,178	5,961,523	30,512,978
2062	5,925,016	4,354,209	5.9689	25,989,836	2,187,162	1,607,314	3.5415	5,692,303	0	0	1.0000	0	8,112,178	5,961,523	31,682,138
2063	5,925,016	4,354,209	6.2106	27,042,248	2,187,162	1,607,314	3.6425	5,854,641	0	0	1.0000	0	8,112,178	5,961,523	32,896,889
2064	5,941,203	4,366,104	6.4622	28,214,638	2,193,018	1,611,617	3.7463	6,037,602	0	0	1.0000	0	8,134,221	5,977,722	34,252,241
2065	5,925,016	4,354,209	6.7239	29,277,263	2,187,162	1,607,314	3.8531	6,193,142	0	0	1.0000	0	8,112,178	5,961,523	35,470,405
2066	5,925,016	4,354,209	6.9962	30,462,914	2,187,162	1,607,314	3.9629	6,369,625	0	0	1.0000	0	8,112,178	5,961,523	36,832,539
2067	5,925,016	4,354,209	7.2795	31,696,461	2,187,162	1,607,314	4.0758	6,551,091	0	0	1.0000	0	8,112,178	5,961,523	38,247,552
2068	6,604,848	4,853,807	7.5744	36,764,678	4,183,953	3,074,727	4.1920	12,889,255	0	0	1.0000	0	10,788,801	7,928,534	49,653,932
2069	5,925,016	4,354,209	7.8811	34,315,953	2,187,162	1,607,314	4.3115	6,929,934	0	0	1.0000	0	8,112,178	5,961,523	41,245,888
2070	7,418,217	5,451,540	8.2003	44,704,267	6,666,766	4,899,310	4.4343	21,725,011	0	0	1.0000	0	14,084,983	10,350,851	66,429,278
2071	7,418,217	5,451,540	8.5324	46,514,723	6,666,766	4,899,310	4.5607	22,344,284	0	0	1.0000	0	14,084,983	10,350,851	68,859,007
2072	8,296,904	6,097,275	8.8780	54,131,605	9,260,122	6,805,130	4.6907	31,920,823	0	0	1.0000	0	17,557,026	12,902,405	86,052,428
2073	8,927,592	6,560,758	9.2375	60,605,004	11,194,891	8,226,964	4.8244	39,690,164	0	0	1.0000	0	20,122,483	14,787,722	100,295,169
2074	7,633,842	5,610,000	9.6117	53,921,638	7,313,641	5,374,689	4.9619	26,668,671	0	0	1.0000	0	14,947,483	10,984,689	80,590,309
2075	8,711,967	6,402,299	10.0009	64,028,748	10,548,016	7,751,585	5.1033	39,558,662	0	0	1.0000	0	19,259,983	14,153,883	103,587,410
2076	9,159,404	6,731,114	10.4060	70,043,968	11,847,622	8,706,646	5.2487	45,698,574	0	0	1.0000	0	21,007,026	15,437,760	115,742,542
2077	5,908,425	4,342,016	10.8274	47,012,745	2,137,389	1,570,737	5.3983	8,479,307	0	0	1.0000	0	8,045,814	5,912,753	55,492,052
2078	5,908,425	4,342,016	11.2659	48,916,719	2,137,389	1,570,737	5.5522	8,721,044	0	0	1.0000	0	8,045,814	5,912,753	57,637,763
2079	5,908,425	4,342,016	11.7222	50,897,981	2,137,389	1,570,737	5.7104	8,969,534	0	0	1.0000	0	8,045,814	5,912,753	59,867,515
2080	5,924,612	4,353,912	12.1970	53,104,661	2,143,245	1,575,040	5.8731	9,250,367	0	0	1.0000	0	8,067,857	5,928,952	62,355,028
2081	5,908,425	4,342,016	12.6909	55,104,092	2,137,389	1,570,737	6.0405	9,488,034	0	0	1.0000	0	8,045,814	5,912,753	64,592,126
2082	5,908,425	4,342,016	13.2049	57,335,888	2,137,389	1,570,737	6.2127	9,758,515	0	0	1.0000	0	8,045,814	5,912,753	67,094,403
2083	5,908,425	4,342,016	13.7397	59,657,998	2,137,389	1,570,737	6.3897	10,036,535	0	0	1.0000	0	8,045,814	5,912,753	69,694,534
2084	5,924,612	4,353,912	14.2962	62,244,392	2,143,245	1,575,040	6.5719	10,351,005	0	0	1.0000	0	8,067,857	5,928,952	72,595,397
2085	5,908,425	4,342,016	14.8752	64,588,358	2,137,389	1,570,737	6.7592	10,616,923	0	0	1.0000	0	8,045,814	5,912,753	75,205,280
2086	5,908,425	4,342,016	15.4776	67,203,988	2,137,389	1,570,737	6.9518	10,919,447	0	0	1.0000	0	8,045,814	5,912,753	78,123,435
2087	5,908,425	4,342,016	16.1045	69,925,998	2,137,389	1,570,737	7.1499	11,230,609	0	0	1.0000	0	8,045,814	5,912,753	81,156,608
2088	5,924,612	4,353,912	16.7567	72,957,192	2,143,245	1,575,040	7.3537	11,582,371	0	0	1.0000	0	8,067,857	5,928,952	84,539,563
2089	5,908,425	4,342,016	17.4353	75,704,353	2,137,389	1,570,737	7.5633	11,879,952	0	0	1.0000	0	8,045,814	5,912,753	87,584,305
2090	5,908,425	4,342,016	18.1415	78,770,685	2,137,389	1,570,737	7.7788	12,218,446	0	0	1.0000	0	8,045,814	5,912,753	90,989,131
2091	5,908,425	4,342,016	18.8762	81,960,764	2,137,389	1,570,737	8.0005	12,566,678	0	0	1.0000	0	8,045,814	5,912,753	94,527,442
2092	5,924,612	4,353,912	19.6407	85,513,873	2,143,245	1,575,040	8.2285	12,960,216	0	0	1.0000	0	8,067,857	5,928,952	98,474,090
2093	5,908,425	4,342,016	20.4361	88,733,875	2,137,389	1,570,737	8.4630	13,293,144	0	0	1.0000	0	8,045,814	5,912,753	102,027,019
2094	5,908,425	4,342,016	21.2638	92,327,762	2,137,389	1,570,737	8.7042	13,672,005	0	0	1.0000	0	8,045,814	5,912,753	105,999,767
2095	5,908,425	4,342,016	22.1250	96,067,106	2,137,389	1,570,737	8.9523	14,061,705	0	0	1.0000	0	8,045,814	5,912,753	110,128,811
2096	5,924,612	4,353,912	23.0210	100,231,401	2,143,245	1,575,040	9.2075	14,502,180	0	0	1.0000	0	8,067,857	5,928,952	114,733,581
2097	5,908,425	4,342,016	23.9534	104,006,048	2,137,389	1,570,737	9.4699	14,874,718	0	0	1.0000	0	8,045,814	5,912,753	118,880,766
2098	6,386,857	4,693,609	24.9235	116,981,160	3,557,353	2,614,247	9.7398	25,462,244	0	0	1.0000	0	9,944,210	7,307,856	142,443,404
2099	6,482,543	4,763,927	25.9329	123,542,445	3,844,412	2,825,203	10.0173	28,300,922	0	0	1.0000	0	10,326,955	7,589,130	151,843,348
2100	6,403,045	4,705,505	26.9832	126,969,587	3,563,167	2,618,520	10.3028	26,978,084	0	0	1.0000	0	9,966,212	7,324,025	153,947,671
2101	6,386,857	4,693,609	28.0760	131,777,762	3,557,353	2,614,247	10.5965	27,701,870	0	0	1.0000	0	9,944,210	7,307,856	159,479,632
2102	6,386,857	4,693,609	29.2131	137,114,865	3,557,353	2,614,247	10.8985	28,491,372	0	0	1.0000	0	9,944,210	7,307,856	165,606,237
2103	6,482,543	4,763,927	30.3962	144,805,281	3,844,412	2,825,203	11.2091	31,667,979	0	0	1.0000	0	10,326,955	7,589,130	176,473,260
2104	6,403,045	4,705,505	31.6272	148,821,953	3,563,167	2,618,520	11.5285	30,187,604	0	0	1.0000	0	9,966,212	7,324,025	179,009,557

AMOUNT TO RECOVER															
	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2105	6,386,857	4,693,609	32.9081	154,457,749	3,557,353	2,614,247	11.8571	30,997,390	0	0	1.0000	0	9,944,210	7,307,856	185,455,139
2106	6,386,857	4,693,609	34.2409	160,713,391	3,557,353	2,614,247	12.1950	31,880,744	0	0	1.0000	0	9,944,210	7,307,856	192,594,135
2107	6,482,543	4,763,927	35.6277	169,727,766	3,844,412	2,825,203	12.5426	35,435,387	0	0	1.0000	0	10,326,955	7,589,130	205,163,152
2108	7,066,689	5,193,208	37.0706	192,515,320	5,554,101	4,081,628	12.9000	52,653,004	0	0	1.0000	0	12,620,790	9,274,836	245,168,324
2109	6,386,857	4,693,609	38.5720	181,041,880	3,557,353	2,614,247	13.2677	34,685,047	0	0	1.0000	0	9,944,210	7,307,856	215,726,927
2110	6,099,798	4,482,653	40.1341	179,907,257	2,696,175	1,981,380	13.6458	27,037,513	0	0	1.0000	0	8,795,973	6,464,033	206,944,771
2111	2,034,890	1,495,411	41.7596	62,447,769	24,955,010	18,339,076	14.0347	257,383,427	0	0	1.0000	0	26,989,900	19,834,487	319,831,196
	\$851,819,402	\$625,989,760		\$5,898,178,598	\$664,030,274	\$487,986,246		\$2,146,077,587	\$0	\$0		\$0	\$1,515,849,676	\$1,113,976,006	\$8,044,256,184

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional	
Cost Estimate	Jurisdictional	Cost in	Escalation	Jurisdictional	Cost Estimate	Jurisdictional	Escalation	Jurisdictional	Cost Estimate	Jurisdictional	Escalation	Jurisdictional	Estimate	Cost in	Cost in
Nominal \$	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Future \$'s
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%					0.00%			
2053	\$22,324,352	\$16,405,843	4.1756	\$68,504,239	\$9,728,959	\$7,149,672	2.7501	\$19,662,312	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,303,311	\$24,474,122	\$89,085,158
2054	63,582,247	46,725,674	4.3447	203,009,034	33,397,619	24,543,427	2.8285	69,421,084	1,250,000	918,607	1.0000	918,607	98,229,866	72,187,708	273,348,725
2055	65,877,290	48,412,268	4.5206	218,852,499	81,239,936	59,702,054	2.9091	173,679,245	1,250,000	918,607	1.0000	918,607	148,367,226	109,032,929	393,450,351
2056	57,759,315	42,446,486	4.7037	199,655,534	65,595,019	48,204,831	2.9920	144,228,854	1,250,000	918,607	1.0000	918,607	124,604,334	91,569,923	344,802,995
2057	38,110,947	28,007,184	4.8942	137,072,758	36,889,671	27,109,686	3.0773	83,424,636	1,250,000	918,607	1.0000	918,607	76,250,618	56,035,476	221,416,001
2058	13,207,914	9,706,305	5.0924	49,428,388	18,994,691	13,958,924	3.1650	44,179,994	1,250,000	918,607	1.0000	918,607	33,452,605	24,583,836	94,526,988
2059	36,035,855	26,482,229	5.2987	140,321,385	76,476,728	56,201,641	3.2552	182,947,582	1,250,000	918,607	1.0000	918,607	113,762,582	83,602,477	324,187,574
2060	31,919,556	23,457,220	5.5133	129,326,692	13,365,606	9,822,190	3.3480	32,884,693	1,250,000	918,607	1.0000	918,607	46,535,162	34,198,017	163,129,992
2061	19,571,318	14,382,679	5.7366	82,507,674	9,445,873	6,941,635	3.4434	23,902,826	1,250,000	918,607	1.0000	918,607	30,267,191	22,242,921	107,329,108
2062	14,781,952	10,863,043	5.9689	64,840,415	11,668,700	8,575,159	3.5415	30,368,925	1,250,000	918,607	1.0000	918,607	27,700,652	20,356,808	96,127,947
2063	8,544,452	6,279,195	6.2106	38,997,566	6,492,672	4,771,371	3.6425	17,379,719	1,250,000	918,607	1.0000	918,607	16,287,125	11,969,172	57,295,891
2064	3,054,798	2,244,927	6.4622	14,507,166	1,939,011	1,424,951	3.7463	5,338,294	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	20,764,067
2065	3,046,451	2,238,793	6.7239	15,053,419	1,930,298	1,418,548	3.8531	5,465,806	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	21,437,832
2066	3,046,451	2,238,793	6.9962	15,663,042	1,930,298	1,418,548	3.9629	5,621,563	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	22,203,212
2067	3,046,451	2,238,793	7.2795	16,297,292	1,930,298	1,418,548	4.0758	5,781,717	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	22,997,616
2068	3,054,798	2,244,927	7.5744	17,003,974	1,939,011	1,424,951	4.1920	5,973,394	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	23,895,975
2069	3,046,451	2,238,793	7.8811	17,644,150	1,930,298	1,418,548	4.3115	6,116,069	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	24,678,825
2070	3,046,451	2,238,793	8.2003	18,358,772	1,930,298	1,418,548	4.4343	6,290,266	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	25,567,646
2071	3,046,451	2,238,793	8.5324	19,102,276	1,930,298	1,418,548	4.5607	6,469,571	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	26,490,453
2072	3,054,798	2,244,927	8.8780	19,930,461	1,939,011	1,424,951	4.6907	6,684,017	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	27,533,085
2073	3,142,138	2,309,112	9.2375	21,330,420	2,217,357	1,629,503	4.8244	7,861,375	1,250,000	918,607	1.0000	918,607	6,609,495	4,857,222	30,110,402
2074	3,237,824	2,379,430	9.6117	22,870,368	2,504,416	1,840,459	4.9619	9,132,172	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	32,921,147
2075	3,237,824	2,379,430	10.0009	23,796,442	2,504,416	1,840,459	5.1033	9,392,413	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	34,107,462
2076	3,294,014	2,420,723	10.4060	25,190,046	2,656,659	1,952,340	5.2487	10,247,247	1,250,000	918,607	1.0000	918,607	7,200,673	5,291,670	36,355,900
2077	3,189,981	2,344,271	10.8274	25,382,359	2,360,887	1,734,981	5.3983	9,365,950	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	35,666,916
2078	3,333,510	2,449,748	11.2659	27,598,619	2,791,475	2,051,414	5.5522	11,389,862	1,250,000	918,607	1.0000	918,607	7,374,985	5,419,769	39,907,088
2079	3,189,981	2,344,271	11.7222	27,480,012	2,360,887	1,734,981	5.7104	9,907,438	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	38,306,057
2080	3,150,484	2,315,245	12.1970	28,239,045	2,226,070	1,635,906	5.8731	9,607,842	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758	38,765,494
2081	3,237,824	2,379,430	12.6909	30,197,109	2,504,416	1,840,459	6.0405	11,117,291	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	42,233,007
2082	3,237,824	2,379,430	13.2049	31,420,136	2,504,416	1,840,459	6.2127	11,434,218	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	43,772,961
2083	3,189,981	2,344,271	13.7397	32,209,579	2,360,887	1,734,981	6.3897	11,086,010	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	44,214,196
2084	3,246,170	2,385,563	14.2962	34,104,491	2,513,129	1,846,862	6.5719	12,137,392	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	47,160,490
2085	3,237,824	2,379,430	14.8752	35,394,498	2,504,416	1,840,459	6.7592	12,440,029	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	48,753,133
2086	3,189,981	2,344,271	15.4776	36,283,687	2,360,887	1,734,981	6.9518	12,061,243	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	49,263,538
2087	3,237,824	2,379,430	16.1045	38,319,531	2,504,416	1,840,459	7.1499	13,159,096	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	52,397,234
2088	3,246,170	2,385,563	16.7567	39,974,170	2,513,129	1,846,862	7.3537	13,581,268	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	54,474,045
2089	3,189,981	2,344,271	17.4353	40,873,067	2,360,887	1,734,981	7.5633	13,122,185	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	54,913,858
2090	3,237,824	2,379,430	18.1415	43,166,430	2,504,416	1,840,459	7.7788	14,316,561	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	58,401,597
2091	3,237,824	2,379,430	18.8762	44,914,597	2,504,416	1,840,459	8.0005	14,724,590	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	60,557,794
2092	3,246,170	2,385,563	19.6407	46,854,135	2,513,129	1,846,862	8.2285	15,196,903	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	62,969,645
2093	3,237,824	2,379,430	20.4361	48,626,270	2,504,416	1,840,459	8.4630	15,575,802	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	65,120,679
2094	3,237,824	2,379,430	21.2638	50,595,724	2,504,416	1,840,459	8.7042	16,019,721	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	67,534,052
2095	3,569,646	2,623,281	22.1250	58,040,097	3,499,884	2,572,014	8.9523	23,025,439	1,250,000	918,607	1.0000	918,607	8,319,530	6,113,902	81,984,143
2096	3,246,170	2,385,563	23.0210	54,918,055	2,513,129	1,846,862	9.2075	17,004,981	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	72,841,643
2097	3,237,974	2,379,540	23.9534	56,998,080	14,152,775	10,400,669	9.4699	98,493,298	1,250,000	918,607	1.0000	918,607	18,640,749	13,698,817	156,409,985
2098	832,743	611,971	24.9235	15,252,461	4,620,063	3,395,217	9.7398	33,068,736	0	0	1.0000	0	5,452,806	4,007,188	48,321,196
	\$481,031,633	\$353,503,191		\$2,426,106,164	\$459,759,673	\$337,870,735		\$1,310,289,630	\$56,250,000	\$41,337,312		\$41,337,312	\$997,041,305	\$732,711,237	\$3,777,733,106

AMOUNT TO RECOVER															
LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s	
Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2054	\$7,760,265	\$5,702,906	4.3447	\$24,777,417	\$4,479,535	\$3,291,946	2.8285	\$9,311,268	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459	\$35,007,292
2055	46,911,429	34,474,531	4.5206	155,845,564	35,601,339	26,162,099	2.9091	76,110,519	1,250,000	918,607	1.0000	918,607	83,762,768	61,556,047	232,874,689
2056	67,514,044	49,615,094	4.7037	286,298,832	49,615,094	36,298,745	2.9920	189,751,932	1,250,000	918,607	1.0000	918,607	155,062,875	113,953,465	424,045,058
2057	70,896,041	52,100,475	4.8942	254,990,145	70,558,163	51,852,174	3.0773	159,564,694	1,250,000	918,607	1.0000	918,607	142,704,204	104,871,256	415,473,446
2058	46,603,528	34,248,259	5.0924	174,405,835	42,782,149	31,439,982	3.1650	99,507,544	1,250,000	918,607	1.0000	918,607	90,635,677	66,606,848	274,831,986
2059	40,663,625	29,883,110	5.2987	158,341,633	77,452,618	56,918,809	3.2552	185,282,106	1,250,000	918,607	1.0000	918,607	119,366,242	87,220,525	344,542,346
2060	37,417,177	27,497,343	5.5133	151,601,099	14,193,501	10,430,599	3.3480	34,921,645	1,250,000	918,607	1.0000	918,607	52,860,679	38,846,548	187,441,351
2061	23,327,583	17,143,103	5.7366	98,343,127	13,070,130	9,605,049	3.4434	33,074,027	1,250,000	918,607	1.0000	918,607	37,647,713	27,666,740	132,335,761
2062	16,656,921	12,240,930	5.9689	73,064,887	17,178,640	12,624,334	3.5415	44,709,080	1,250,000	918,607	1.0000	918,607	35,085,561	25,783,871	118,692,574
2063	9,422,862	6,924,725	6.2106	43,006,699	9,074,042	6,668,382	3.6425	24,289,581	1,250,000	918,607	1.0000	918,607	19,746,904	14,511,714	68,214,888
2064	3,054,798	2,244,927	6.4622	14,507,166	1,939,011	1,424,951	3.7463	5,338,294	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	20,764,067
2065	3,046,451	2,238,793	6.7239	15,053,419	1,930,298	1,418,548	3.8531	5,465,806	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	21,437,832
2066	3,046,451	2,238,793	6.9962	15,663,042	1,930,298	1,418,548	3.9629	5,621,563	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	22,203,212
2067	3,046,451	2,238,793	7.2795	16,297,292	1,930,298	1,418,548	4.0758	5,781,717	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	22,997,616
2068	3,054,798	2,244,927	7.5744	17,003,974	1,939,011	1,424,951	4.1920	5,973,394	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	23,895,975
2069	3,046,451	2,238,793	7.8811	17,644,150	1,930,298	1,418,548	4.3115	6,116,069	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	24,678,825
2070	3,046,451	2,238,793	8.2003	18,358,772	1,930,298	1,418,548	4.4343	6,290,266	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	25,567,646
2071	3,046,451	2,238,793	8.5324	19,102,276	1,930,298	1,418,548	4.5607	6,469,571	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	26,490,453
2072	3,054,798	2,244,927	8.8780	19,930,461	1,939,011	1,424,951	4.6907	6,684,017	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	27,533,085
2073	3,142,138	2,309,112	9.2375	21,330,420	2,217,358	1,629,504	4.8244	7,861,379	1,250,000	918,607	1.0000	918,607	6,609,496	4,857,223	30,110,406
2074	3,237,824	2,379,430	9.6117	22,870,368	2,504,416	1,840,459	4.9619	9,132,172	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	32,921,147
2075	3,237,824	2,379,430	10.0009	23,796,442	2,504,416	1,840,459	5.1033	9,392,413	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	34,107,462
2076	3,294,014	2,420,723	10.4060	25,190,046	2,656,659	1,952,340	5.2487	10,247,247	1,250,000	918,607	1.0000	918,607	7,200,673	5,291,670	36,355,900
2077	3,189,981	2,344,271	10.8274	25,382,359	2,360,887	1,734,981	5.3983	9,365,950	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	35,666,916
2078	3,333,510	2,449,748	11.2659	27,598,619	2,791,475	2,051,414	5.5522	11,389,862	1,250,000	918,607	1.0000	918,607	7,374,985	5,419,769	39,907,088
2079	3,189,981	2,344,271	11.7222	27,480,012	2,360,887	1,734,981	5.7104	9,907,438	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	38,306,057
2080	3,150,484	2,315,245	12.1970	28,239,045	2,226,070	1,635,906	5.8731	9,607,842	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758	38,765,494
2081	3,237,824	2,379,430	12.6909	30,197,109	2,504,416	1,840,459	6.0405	11,117,291	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	42,233,007
2082	3,237,824	2,379,430	13.2049	31,420,136	2,504,416	1,840,459	6.2127	11,434,218	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	43,772,961
2083	3,189,981	2,344,271	13.7397	32,209,579	2,360,887	1,734,981	6.3897	11,086,010	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	44,214,196
2084	3,246,170	2,385,563	14.2962	34,104,491	2,513,129	1,846,862	6.5719	12,137,392	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	47,160,490
2085	3,237,824	2,379,430	14.8752	35,394,498	2,504,416	1,840,459	6.7592	12,440,029	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	48,753,133
2086	3,189,981	2,344,271	15.4776	36,283,687	2,360,887	1,734,981	6.9518	12,061,243	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	49,263,538
2087	3,237,824	2,379,430	16.1045	38,319,531	2,504,416	1,840,459	7.1499	13,159,096	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	52,397,234
2088	3,246,170	2,385,563	16.7567	39,974,170	2,513,129	1,846,862	7.3537	13,581,268	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	54,474,045
2089	3,189,981	2,344,271	17.4353	40,873,067	2,360,887	1,734,981	7.5633	13,122,185	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	54,913,858
2090	3,237,824	2,379,430	18.1415	43,166,430	2,504,416	1,840,459	7.7788	14,316,561	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	58,401,597
2091	3,237,824	2,379,430	18.8762	44,914,597	2,504,416	1,840,459	8.0005	14,724,590	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	60,557,794
2092	3,246,170	2,385,563	19.6407	46,854,135	2,513,129	1,846,862	8.2285	15,196,903	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	62,969,645
2093	3,237,824	2,379,430	20.4361	48,626,270	2,504,416	1,840,459	8.4630	15,575,802	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	65,120,679
2094	3,237,824	2,379,430	21.2638	50,595,724	2,504,416	1,840,459	8.7042	16,019,721	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	67,534,052
2095	3,569,466	2,623,281	22.1250	58,040,097	3,499,884	2,572,014	8.9523	23,025,439	1,250,000	918,607	1.0000	918,607	8,319,530	6,113,902	81,984,143
2096	3,246,170	2,385,563	23.0210	54,918,055	2,513,129	1,846,862	9.2075	17,004,981	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	72,841,643
2097	3,237,824	2,379,430	23.9534	56,995,443	14,152,675	10,400,596	9.4699	98,492,602	1,250,000	918,607	1.0000	918,607	18,640,499	13,698,633	156,406,652
2098	832,743	611,971	24.9235	15,252,461	4,620,063	3,395,217	9.7398	33,068,736	0	-	1.0000	-	5,452,806	4,007,188	48,321,196
	\$476,489,759	\$350,165,433		\$2,461,338,267	\$467,153,049	\$343,304,020		\$1,344,731,465	\$55,000,000	\$40,418,705		\$40,418,705	\$998,642,807	\$733,888,158	\$3,846,488,437
	\$1,809,340,794	\$1,329,658,384		\$10,785,623,029	\$1,590,942,995	\$1,169,161,000		\$4,801,098,682	\$111,250,000	\$81,756,016		\$81,756,016	\$3,511,533,789	\$2,580,575,401	\$15,668,477,727

EXTERNAL FUND CALCULATION

Monticello

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,706,857	-	6,696,113	646,075,152
2018	646,075,152	32,703,840	-	13,392,226	692,171,218
2019	692,171,218	34,656,772	-	(838,566)	725,989,424
2020	725,989,424	36,351,064	-	(838,566)	761,501,922
2021	761,501,922	38,130,240	-	(838,566)	798,793,597
2022	798,793,597	39,998,553	-	(838,566)	837,953,584
2023	837,953,584	41,960,468	-	(838,566)	879,075,486
2024	879,075,486	44,020,676	-	(838,566)	922,257,596
2025	922,257,596	46,184,099	-	(838,566)	967,603,129
2026	967,603,129	48,455,911	-	(838,566)	1,015,220,474
2027	1,015,220,474	50,841,540	-	(838,566)	1,065,223,447
2028	1,065,223,447	53,346,689	-	(838,566)	1,117,731,570
2029	1,117,731,570	55,977,346	-	(838,566)	1,172,870,350
2030	1,172,870,350	58,739,798	-	(838,566)	1,230,771,582
2031	1,230,771,582	61,640,650	-	(838,566)	1,291,573,666
2032	1,291,573,666	64,686,835	-	(838,566)	1,355,421,935
2033	1,355,421,935	67,885,633	-	(838,566)	1,422,469,002
2034	1,422,469,002	71,244,691	-	(838,566)	1,492,875,126
2035	1,492,875,126	74,772,038	-	(838,566)	1,566,808,598
2036	1,566,808,598	78,476,105	-	(838,566)	1,644,446,137
2037	1,644,446,137	82,365,745	-	(838,566)	1,725,973,316
2038	1,725,973,316	86,450,257	-	(838,566)	1,811,585,007
2039	1,811,585,007	90,739,403	-	(838,566)	1,901,485,844
2040	1,901,485,844	95,243,435	-	(838,566)	1,995,890,712
2041	1,995,890,712	99,973,119	-	(838,566)	2,095,025,265
2042	2,095,025,265	104,939,760	-	(838,566)	2,199,126,459
2043	2,199,126,459	110,155,229	-	(838,566)	2,308,443,122
2044	2,308,443,122	115,631,994	-	(838,566)	2,423,236,550
2045	2,423,236,550	121,383,145	-	(838,566)	2,543,781,129
2046	2,543,781,129	127,422,429	-	(838,566)	2,670,364,992
2047	2,670,364,992	133,764,280	-	(838,566)	2,803,290,706
2048	2,803,290,706	140,423,858	-	(838,566)	2,942,875,998
2049	2,942,875,998	147,417,081	-	(838,566)	3,089,454,513
2050	3,089,454,513	136,848,904	(74,085,355)	(628,925)	3,151,589,138
2051	3,151,589,138	139,615,399	(287,329,874)	-	3,003,874,664
2052	3,003,874,664	133,071,648	(432,382,519)	-	2,704,563,792
2053	2,704,563,792	119,812,176	(443,800,512)	-	2,380,575,456
2054	2,380,575,456	105,459,493	(292,790,598)	-	2,193,244,352

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2055	2,193,244,352	97,160,725	(530,517,574)	-	1,759,887,502
	2056	1,759,887,502	77,963,016	(219,386,048)	-	1,618,464,470
	2057	1,618,464,470	71,697,976	(156,633,925)	-	1,533,528,521
	2058	1,533,528,521	67,935,313	(145,822,593)	-	1,455,641,241
	2059	1,455,641,241	64,484,907	(28,303,774)	-	1,491,822,375
	2060	1,491,822,375	66,087,731	(29,467,337)	-	1,528,442,769
	2061	1,528,442,769	67,710,015	(30,512,978)	-	1,565,639,805
	2062	1,565,639,805	69,357,843	(31,682,138)	-	1,603,315,511
	2063	1,603,315,511	71,026,877	(32,896,889)	-	1,641,445,499
	2064	1,641,445,499	72,716,036	(34,252,241)	-	1,679,909,293
	2065	1,679,909,293	74,419,982	(35,470,405)	-	1,718,858,870
	2066	1,718,858,870	76,145,448	(36,832,539)	-	1,758,171,780
	2067	1,758,171,780	77,887,010	(38,247,552)	-	1,797,811,238
	2068	1,797,811,238	79,643,038	(49,653,932)	-	1,827,800,343
	2069	1,827,800,343	80,971,555	(41,245,888)	-	1,867,526,010
	2070	1,867,526,010	82,731,402	(66,429,278)	-	1,883,828,135
	2071	1,883,828,135	83,453,586	(68,859,007)	-	1,898,422,713
	2072	1,898,422,713	84,100,126	(86,052,428)	-	1,896,470,411
	2073	1,896,470,411	84,013,639	(100,295,169)	-	1,880,188,882
	2074	1,880,188,882	83,292,367	(80,590,309)	-	1,882,890,941
	2075	1,882,890,941	83,412,069	(103,587,410)	-	1,862,715,599
	2076	1,862,715,599	82,518,301	(115,742,542)	-	1,829,491,358
	2077	1,829,491,358	81,046,467	(55,492,052)	-	1,855,045,773
	2078	1,855,045,773	82,178,528	(57,637,763)	-	1,879,586,538
	2079	1,879,586,538	83,265,684	(59,867,515)	-	1,902,984,707
	2080	1,902,984,707	84,302,223	(62,355,028)	-	1,924,931,901
	2081	1,924,931,901	85,274,483	(64,592,126)	-	1,945,614,258
	2082	1,945,614,258	86,190,712	(67,094,403)	-	1,964,710,567
	2083	1,964,710,567	87,036,678	(69,694,534)	-	1,982,052,711
	2084	1,982,052,711	87,804,935	(72,595,397)	-	1,997,262,248
	2085	1,997,262,248	88,478,718	(75,205,280)	-	2,010,535,686
	2086	2,010,535,686	89,066,731	(78,123,435)	-	2,021,478,982
	2087	2,021,478,982	89,551,519	(81,156,608)	-	2,029,873,893
	2088	2,029,873,893	89,923,413	(84,539,563)	-	2,035,257,743
	2089	2,035,257,743	90,161,918	(87,584,305)	-	2,037,835,356
	2090	2,037,835,356	90,276,106	(90,989,131)	-	2,037,122,332
	2091	2,037,122,332	90,244,519	(94,527,442)	-	2,032,839,409
	2092	2,032,839,409	90,054,786	(98,474,090)	-	2,024,420,106
	2093	2,024,420,106	89,681,811	(102,027,019)	-	2,012,074,898
	2094	2,012,074,898	89,134,918	(105,999,767)	-	1,995,210,049
	2095	1,995,210,049	88,387,805	(110,128,811)	-	1,973,469,043
	2096	1,973,469,043	87,424,679	(114,733,581)	-	1,946,160,140
	2097	1,946,160,140	86,214,894	(118,880,766)	-	1,913,494,268
	2098	1,913,494,268	84,767,796	(142,443,404)	-	1,855,818,659
	2099	1,855,818,659	82,212,767	(151,843,348)	-	1,786,188,078

EXTERNAL FUND CALCULATION

2100	1,786,188,078	79,128,132	(153,947,671)	-	1,711,368,539
2101	1,711,368,539	75,813,626	(159,479,632)	-	1,627,702,533
2102	1,627,702,533	72,107,222	(165,606,237)	-	1,534,203,519
2103	1,534,203,519	67,965,216	(176,473,260)	-	1,425,695,474
2104	1,425,695,474	63,158,310	(179,009,557)	-	1,309,844,227
2105	1,309,844,227	58,026,099	(185,455,139)	-	1,182,415,187
2106	1,182,415,187	52,380,993	(192,594,135)	-	1,042,202,045
2107	1,042,202,045	46,169,551	(205,163,152)	-	883,208,443
2108	883,208,443	39,126,134	(245,168,324)	-	677,166,253
2109	677,166,253	29,998,465	(215,726,927)	-	491,437,791
2110	491,437,791	21,770,694	(206,944,771)	-	306,263,714
2111	306,263,714	13,567,483	(319,831,196)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,340,765	-	24,632	383,732,452
2018	383,732,452	19,149,479	-	49,264	402,931,195
2019	402,931,195	20,138,255	-	1,282,107	424,351,557
2020	424,351,557	21,207,131	-	1,282,107	446,840,796
2021	446,840,796	22,329,344	-	1,282,107	470,452,247
2022	470,452,247	23,507,556	-	1,282,107	495,241,910
2023	495,241,910	24,744,560	-	1,282,107	521,268,577
2024	521,268,577	26,043,291	-	1,282,107	548,593,974
2025	548,593,974	27,406,828	-	1,282,107	577,282,909
2026	577,282,909	28,838,406	-	1,282,107	607,403,422
2027	607,403,422	30,341,419	-	1,282,107	639,026,948
2028	639,026,948	31,919,433	-	1,282,107	672,228,488
2029	672,228,488	33,576,190	-	1,282,107	707,086,786
2030	707,086,786	35,315,619	-	1,282,107	743,684,512
2031	743,684,512	37,141,846	-	1,282,107	782,108,465
2032	782,108,465	39,059,201	-	1,282,107	822,449,773
2033	822,449,773	41,072,232	-	1,282,107	864,804,112
2034	864,804,112	43,185,714	-	1,282,107	909,271,933
2035	909,271,933	45,404,658	-	1,282,107	955,958,698
2036	955,958,698	47,734,328	-	1,282,107	1,004,975,132
2037	1,004,975,132	50,180,248	-	1,282,107	1,056,437,487
2038	1,056,437,487	52,748,219	-	1,282,107	1,110,467,813
2039	1,110,467,813	55,444,332	-	1,282,107	1,167,194,252
2040	1,167,194,252	58,274,982	-	1,282,107	1,226,751,341
2041	1,226,751,341	61,246,880	-	1,282,107	1,289,280,329
2042	1,289,280,329	64,367,077	-	1,282,107	1,354,929,513
2043	1,354,929,513	67,642,971	-	1,282,107	1,423,854,591
2044	1,423,854,591	71,082,333	-	1,282,107	1,496,219,031
2045	1,496,219,031	74,693,318	-	1,282,107	1,572,194,456
2046	1,572,194,456	78,484,492	-	1,282,107	1,651,961,055
2047	1,651,961,055	82,464,845	-	1,282,107	1,735,708,007
2048	1,735,708,007	86,643,818	-	1,282,107	1,823,633,932
2049	1,823,633,932	91,031,322	-	1,282,107	1,915,947,361
2050	1,915,947,361	95,637,762	-	1,282,107	2,012,867,230
2051	2,012,867,230	100,474,063	-	1,282,107	2,114,623,400
2052	2,114,623,400	105,551,696	-	1,282,107	2,221,457,203
2053	2,221,457,203	92,208,298	(89,085,158)	859,012	2,225,439,356
2054	2,225,439,356	92,355,733	(273,348,725)	-	2,044,446,364
2055	2,044,446,364	84,844,524	(393,450,351)	-	1,735,840,537

EXTERNAL FUND CALCULATION

2056	1,735,840,537	72,037,382	(344,802,995)	-	1,463,074,925
2057	1,463,074,925	60,717,609	(221,416,001)	-	1,302,376,533
2058	1,302,376,533	54,048,626	(94,526,988)	-	1,261,898,170
2059	1,261,898,170	52,368,774	(324,187,574)	-	990,079,371
2060	990,079,371	41,088,294	(163,129,992)	-	868,037,672
2061	868,037,672	36,023,563	(107,329,108)	-	796,732,128
2062	796,732,128	33,064,383	(96,127,947)	-	733,668,564
2063	733,668,564	30,447,245	(57,295,891)	-	706,819,918
2064	706,819,918	29,333,027	(20,764,067)	-	715,388,878
2065	715,388,878	29,688,638	(21,437,832)	-	723,639,684
2066	723,639,684	30,031,047	(22,203,212)	-	731,467,519
2067	731,467,519	30,355,902	(22,997,616)	-	738,825,805
2068	738,825,805	30,661,271	(23,895,975)	-	745,591,101
2069	745,591,101	30,942,031	(24,678,825)	-	751,854,306
2070	751,854,306	31,201,954	(25,567,646)	-	757,488,615
2071	757,488,615	31,435,778	(26,490,453)	-	762,433,939
2072	762,433,939	31,641,008	(27,533,085)	-	766,541,863
2073	766,541,863	31,811,487	(30,110,402)	-	768,242,947
2074	768,242,947	31,882,082	(32,921,147)	-	767,203,883
2075	767,203,883	31,838,961	(34,107,462)	-	764,935,382
2076	764,935,382	31,744,818	(36,355,900)	-	760,324,300
2077	760,324,300	31,553,458	(35,666,916)	-	756,210,843
2078	756,210,843	31,382,750	(39,907,088)	-	747,686,505
2079	747,686,505	31,028,990	(38,306,057)	-	740,409,438
2080	740,409,438	30,726,992	(38,765,494)	-	732,370,935
2081	732,370,935	30,393,394	(42,233,007)	-	720,531,323
2082	720,531,323	29,902,050	(43,772,961)	-	706,660,412
2083	706,660,412	29,326,407	(44,214,196)	-	691,772,623
2084	691,772,623	28,708,564	(47,160,490)	-	673,320,696
2085	673,320,696	27,942,809	(48,753,133)	-	652,510,372
2086	652,510,372	27,079,180	(49,263,538)	-	630,326,015
2087	630,326,015	26,158,530	(52,397,234)	-	604,087,310
2088	604,087,310	25,069,623	(54,474,045)	-	574,682,888
2089	574,682,888	23,849,340	(54,913,858)	-	543,618,370
2090	543,618,370	22,560,162	(58,401,597)	-	507,776,935
2091	507,776,935	21,072,743	(60,557,794)	-	468,291,883
2092	468,291,883	19,434,113	(62,969,645)	-	424,756,351
2093	424,756,351	17,627,389	(65,120,679)	-	377,263,061
2094	377,263,061	15,656,417	(67,534,052)	-	325,385,425
2095	325,385,425	13,503,495	(81,984,143)	-	256,904,777
2096	256,904,777	10,661,548	(72,841,643)	-	194,724,683
2097	194,724,683	8,081,074	(156,409,985)	-	46,395,772
2098	46,395,772	1,925,425	(48,321,196)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,592,979	-	294,670	431,096,616
2018	431,096,616	21,742,121	-	589,341	453,428,078
2019	453,428,078	22,794,992	-	(2,292,979)	473,930,091
2020	473,930,091	23,828,293	-	(2,292,979)	495,465,405
2021	495,465,405	24,913,673	-	(2,292,979)	518,086,099
2022	518,086,099	26,053,756	-	(2,292,979)	541,846,875
2023	541,846,875	27,251,299	-	(2,292,979)	566,805,195
2024	566,805,195	28,509,199	-	(2,292,979)	593,021,415
2025	593,021,415	29,830,496	-	(2,292,979)	620,558,931
2026	620,558,931	31,218,387	-	(2,292,979)	649,484,339
2027	649,484,339	32,676,228	-	(2,292,979)	679,867,587
2028	679,867,587	34,207,543	-	(2,292,979)	711,782,151
2029	711,782,151	35,816,037	-	(2,292,979)	745,305,209
2030	745,305,209	37,505,599	-	(2,292,979)	780,517,829
2031	780,517,829	39,280,315	-	(2,292,979)	817,505,165
2032	817,505,165	41,144,477	-	(2,292,979)	856,356,662
2033	856,356,662	43,102,593	-	(2,292,979)	897,166,275
2034	897,166,275	45,159,397	-	(2,292,979)	940,032,693
2035	940,032,693	47,319,865	-	(2,292,979)	985,059,578
2036	985,059,578	49,589,220	-	(2,292,979)	1,032,355,818
2037	1,032,355,818	51,972,950	-	(2,292,979)	1,082,035,789
2038	1,082,035,789	54,476,821	-	(2,292,979)	1,134,219,630
2039	1,134,219,630	57,106,886	-	(2,292,979)	1,189,033,537
2040	1,189,033,537	59,869,507	-	(2,292,979)	1,246,610,065
2041	1,246,610,065	62,771,364	-	(2,292,979)	1,307,088,450
2042	1,307,088,450	65,819,475	-	(2,292,979)	1,370,614,945
2043	1,370,614,945	69,021,210	-	(2,292,979)	1,437,343,175
2044	1,437,343,175	72,384,313	-	(2,292,979)	1,507,434,509
2045	1,507,434,509	75,916,916	-	(2,292,979)	1,581,058,446
2046	1,581,058,446	79,627,563	-	(2,292,979)	1,658,393,029
2047	1,658,393,029	83,525,226	-	(2,292,979)	1,739,625,275
2048	1,739,625,275	87,619,331	-	(2,292,979)	1,824,951,626
2049	1,824,951,626	91,919,779	-	(2,292,979)	1,914,578,425
2050	1,914,578,425	96,436,970	-	(2,292,979)	2,008,722,416
2051	2,008,722,416	101,181,827	-	(2,292,979)	2,107,611,263
2052	2,107,611,263	106,165,825	-	(2,292,979)	2,211,484,108
2053	2,211,484,108	111,401,016	-	(2,292,979)	2,320,592,144
2054	2,320,592,144	94,873,299	(35,007,292)	(1,903,173)	2,378,554,978

EXTERNAL FUND CALCULATION

2055	2,378,554,978	97,282,899	(232,874,689)	-	2,242,963,188
2056	2,242,963,188	91,737,194	(424,045,058)	-	1,910,655,324
2057	1,910,655,324	78,145,803	(415,473,446)	-	1,573,327,681
2058	1,573,327,681	64,349,102	(274,831,986)	-	1,362,844,797
2059	1,362,844,797	55,740,352	(344,542,346)	-	1,074,042,803
2060	1,074,042,803	43,928,351	(187,441,351)	-	930,529,803
2061	930,529,803	38,058,669	(132,335,761)	-	836,252,711
2062	836,252,711	34,202,736	(118,692,574)	-	751,762,873
2063	751,762,873	30,747,101	(68,214,888)	-	714,295,087
2064	714,295,087	29,214,669	(20,764,067)	-	722,745,689
2065	722,745,689	29,560,299	(21,437,832)	-	730,868,155
2066	730,868,155	29,892,508	(22,203,212)	-	738,557,451
2067	738,557,451	30,207,000	(22,997,616)	-	745,766,835
2068	745,766,835	30,501,864	(23,895,975)	-	752,372,723
2069	752,372,723	30,772,044	(24,678,825)	-	758,465,942
2070	758,465,942	31,021,257	(25,567,646)	-	763,919,554
2071	763,919,554	31,244,310	(26,490,453)	-	768,673,410
2072	768,673,410	31,438,742	(27,533,085)	-	772,579,068
2073	772,579,068	31,598,484	(30,110,406)	-	774,067,146
2074	774,067,146	31,659,346	(32,921,147)	-	772,805,345
2075	772,805,345	31,607,739	(34,107,462)	-	770,305,622
2076	770,305,622	31,505,500	(36,355,900)	-	765,455,222
2077	765,455,222	31,307,119	(35,666,916)	-	761,095,425
2078	761,095,425	31,128,803	(39,907,088)	-	752,317,139
2079	752,317,139	30,769,771	(38,306,057)	-	744,780,853
2080	744,780,853	30,461,537	(38,765,494)	-	736,476,896
2081	736,476,896	30,121,905	(42,233,007)	-	724,365,795
2082	724,365,795	29,626,561	(43,772,961)	-	710,219,395
2083	710,219,395	29,047,973	(44,214,196)	-	695,053,172
2084	695,053,172	28,427,675	(47,160,490)	-	676,320,357
2085	676,320,357	27,661,503	(48,753,133)	-	655,228,726
2086	655,228,726	26,798,855	(49,263,538)	-	632,764,043
2087	632,764,043	25,880,049	(52,397,234)	-	606,246,858
2088	606,246,858	24,795,497	(54,474,045)	-	576,568,309
2089	576,568,309	23,581,644	(54,913,858)	-	545,236,095
2090	545,236,095	22,300,156	(58,401,597)	-	509,134,654
2091	509,134,654	20,823,607	(60,557,794)	-	469,400,467
2092	469,400,467	19,198,479	(62,969,645)	-	425,629,301
2093	425,629,301	17,408,238	(65,120,679)	-	377,916,860
2094	377,916,860	15,456,800	(67,534,052)	-	325,839,607
2095	325,839,607	13,326,840	(81,984,143)	-	257,182,304
2096	257,182,304	10,518,756	(72,841,643)	-	194,859,418
2097	194,859,418	7,969,750	(156,406,652)	-	46,422,516
2098	46,422,516	1,898,681	(48,321,196)	-	(0)

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$25,304,645	\$11,912,419
Prairie Island Unit 1	49,264	18,867,378	18,818,114
Prairie Island Unit 2	589,341	12,760,253	12,170,912
TOTAL	\$14,030,831	\$56,932,276	\$42,901,445

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
DECON Method - with Recasking

Docket No. E002/M-17-828

Schedule F.5

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Proposed

2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2019-2021 Decommissioning Accrual
Monticello	13.75	5.01%	4.46%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	25,304,645
Prairie Island Unit 1	16.67	5.00%	4.19%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	18,867,378
Prairie Island Unit 2	17.83	5.05%	4.13%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	12,760,253
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$56,932,276

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIHC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2030	\$21,103,620	\$15,508,745	1.6755	\$25,984,903	\$8,935,561	\$6,566,615	1.4410	\$9,462,492	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$35,447,395
2031	72,416,235	53,217,644	1.7434	92,779,641	42,961,344	31,571,670	1.4820	46,789,215	0	0	1.0000	0	115,377,579	84,789,314	139,568,856
2032	81,871,153	60,165,927	1.8140	109,140,991	112,447,587	82,636,106	1.5243	125,962,216	0	0	1.0000	0	194,318,741	142,802,033	235,103,207
2033	78,663,227	57,808,468	1.8874	109,107,702	100,155,666	73,602,950	1.5677	115,387,345	0	0	1.0000	0	178,818,892	131,411,418	224,495,047
2034	66,380,423	48,782,013	1.9639	95,802,994	38,894,671	28,583,132	1.6124	46,087,441	0	0	1.0000	0	105,275,094	77,365,144	141,890,436
2035	86,879,803	63,846,711	2.0434	130,464,369	113,147,091	83,150,161	1.6584	137,896,227	0	0	1.0000	0	200,026,894	146,996,872	268,360,596
2036	50,307,504	36,970,257	2.1262	78,606,161	20,688,337	15,203,559	1.7056	25,931,191	0	0	1.0000	0	70,995,841	52,173,817	104,537,352
2037	34,623,126	25,444,035	2.2123	56,289,838	14,196,883	10,433,084	1.7542	18,301,716	0	0	1.0000	0	48,820,010	35,877,119	74,591,555
2038	29,581,478	21,739,000	2.3019	50,041,005	15,098,979	11,096,021	1.8042	20,019,442	0	0	1.0000	0	44,680,457	32,835,022	70,060,446
2039	5,925,017	4,354,209	2.3951	10,428,767	2,187,162	1,607,314	1.8556	2,982,532	0	0	1.0000	0	8,112,179	5,961,523	13,411,299
2040	5,941,204	4,366,105	2.4921	10,880,770	2,193,018	1,611,617	1.9085	3,075,772	0	0	1.0000	0	8,134,222	5,977,722	13,956,542
2041	5,925,017	4,354,209	2.5930	11,290,465	2,187,162	1,607,314	1.9629	3,154,997	0	0	1.0000	0	8,112,179	5,961,523	14,445,461
2042	5,925,017	4,354,209	2.6981	11,748,092	2,187,162	1,607,314	2.0189	3,245,006	0	0	1.0000	0	8,112,179	5,961,523	14,993,098
2043	5,925,017	4,354,209	2.8073	12,223,572	2,187,162	1,607,314	2.0764	3,337,427	0	0	1.0000	0	8,112,179	5,961,523	15,560,999
2044	5,941,204	4,366,105	2.9210	12,753,392	2,193,018	1,611,617	2.1356	3,441,770	0	0	1.0000	0	8,134,222	5,977,722	16,195,163
2045	5,925,017	4,354,209	3.0393	13,233,748	2,187,162	1,607,314	2.1964	3,530,305	0	0	1.0000	0	8,112,179	5,961,523	16,764,053
2046	5,925,017	4,354,209	3.1624	13,769,752	2,187,162	1,607,314	2.2590	3,630,922	0	0	1.0000	0	8,112,179	5,961,523	17,400,674
2047	5,925,017	4,354,209	3.2905	14,327,526	2,187,162	1,607,314	2.3234	3,734,433	0	0	1.0000	0	8,112,179	5,961,523	18,061,959
2048	6,604,849	4,853,808	3.4238	16,618,468	4,183,955	3,074,728	2.3896	7,347,371	0	0	1.0000	0	10,788,804	7,928,536	23,965,838
2049	5,925,017	4,354,209	3.5624	15,511,435	2,187,159	1,607,312	2.4577	3,950,290	0	0	1.0000	0	8,112,176	5,961,521	19,461,726
2050	7,418,218	5,451,541	3.7067	20,207,228	6,666,765	4,899,309	2.5278	12,384,475	0	0	1.0000	0	14,084,983	10,350,851	32,591,702
2051	7,418,218	5,451,541	3.8568	21,025,504	6,666,765	4,899,309	2.5998	12,737,225	0	0	1.0000	0	14,084,983	10,350,851	33,762,729
2052	8,296,905	6,097,276	4.0130	24,468,367	9,260,121	6,805,129	2.6739	18,196,235	0	0	1.0000	0	17,557,026	12,902,405	42,664,602
2053	8,927,593	6,560,759	4.1756	27,395,105	11,194,890	8,226,963	2.7501	22,624,971	0	0	1.0000	0	20,122,483	14,787,722	50,020,076
2054	7,633,843	5,610,001	4.3447	24,373,771	7,313,640	5,374,689	2.8285	15,202,307	0	0	1.0000	0	14,947,483	10,984,689	39,576,077
2055	8,711,968	6,402,299	4.5206	28,942,234	10,548,015	7,751,584	2.9091	22,550,133	0	0	1.0000	0	19,259,983	14,153,883	51,492,367
2056	9,159,405	6,731,114	4.7037	31,661,142	11,847,621	8,706,646	2.9920	26,050,283	0	0	1.0000	0	21,007,026	15,437,760	57,711,426
2057	5,908,426	4,342,017	4.8942	21,250,699	2,137,389	1,570,737	3.0773	4,833,628	0	0	1.0000	0	8,045,815	5,912,753	26,084,326
2058	12,004,811	8,822,162	5.0924	44,925,978	20,426,543	15,011,171	3.1650	47,510,357	0	0	1.0000	0	32,431,354	23,833,333	92,436,335
2059	5,908,426	4,342,017	5.2987	23,007,045	2,137,389	1,570,737	3.2552	5,113,062	0	0	1.0000	0	8,045,815	5,912,753	28,120,106
2060	5,924,613	4,353,912	5.5133	24,004,425	2,143,245	1,575,040	3.3480	5,273,234	0	0	1.0000	0	8,067,858	5,928,952	29,277,659
2061	5,908,426	4,342,017	5.7366	24,908,414	2,137,389	1,570,737	3.4434	5,408,674	0	0	1.0000	0	8,045,815	5,912,753	30,317,088
2062	5,908,426	4,342,017	5.9689	25,917,064	2,137,389	1,570,737	3.5415	5,562,764	0	0	1.0000	0	8,045,815	5,912,753	31,479,828
2063	5,908,426	4,342,017	6.2106	26,966,530	2,137,389	1,570,737	3.6425	5,721,408	0	0	1.0000	0	8,045,815	5,912,753	32,687,938
2064	5,924,613	4,353,912	6.4622	28,135,853	2,143,245	1,575,040	3.7463	5,900,572	0	0	1.0000	0	8,067,858	5,928,952	34,036,425
2065	5,908,426	4,342,017	6.7239	29,195,287	2,137,389	1,570,737	3.8531	6,052,205	0	0	1.0000	0	8,045,815	5,912,753	35,247,492
2066	9,566,257	7,030,104	6.9962	49,184,013	13,110,882	9,634,998	3.9629	38,182,533	0	0	1.0000	0	22,677,139	16,665,102	87,366,546
2067	5,908,426	4,342,017	7.2795	31,607,711	2,137,389	1,570,737	4.0758	6,402,008	0	0	1.0000	0	8,045,815	5,912,753	38,009,720
2068	14,459,552	10,626,116	7.5744	80,486,450	27,748,061	20,391,649	4.1920	85,481,792	0	0	1.0000	0	42,207,613	31,017,765	165,968,243
2069	5,908,426	4,342,017	7.8811	34,219,869	2,137,389	1,570,737	4.3115	6,772,231	0	0	1.0000	0	8,045,815	5,912,753	40,992,100
2070	5,908,426	4,342,017	8.2003	35,605,841	2,137,389	1,570,737	4.4343	6,965,117	0	0	1.0000	0	8,045,815	5,912,753	42,570,958
2071	5,908,426	4,342,017	8.5324	37,047,824	2,137,389	1,570,737	4.5607	7,163,658	0	0	1.0000	0	8,045,815	5,912,753	44,211,483
2072	5,924,613	4,353,912	8.8780	38,654,034	2,143,245	1,575,040	4.6907	7,388,040	0	0	1.0000	0	8,067,858	5,928,952	46,042,074
2073	5,908,426	4,342,017	9.2375	40,109,380	2,137,389	1,570,737	4.8244	7,577,862	0	0	1.0000	0	8,045,815	5,912,753	47,687,242
2074	5,908,426	4,342,017	9.6117	41,734,163	2,137,389	1,570,737	4.9619	7,793,838	0	0	1.0000	0	8,045,815	5,912,753	49,528,001
2075	5,908,426	4,342,017	10.0009	43,424,076	2,137,389	1,570,737	5.1033	8,015,940	0	0	1.0000	0	8,045,815	5,912,753	51,440,016
2076	5,924,613	4,353,912	10.4060	45,306,813	2,143,245	1,575,040	5.2487	8,266,912	0	0	1.0000	0	8,067,858	5,928,952	53,573,725
2077	5,908,426	4,342,017	10.8274	47,012,753	2,137,389	1,570,737	5.3983	8,479,307	0	0	1.0000	0	8,045,815	5,912,753	55,492,060
2078	6,386,857	4,693,609	11.2659	52,877,728	3,557,353	2,614,247	5.5522	14,514,823	0	0	1.0000	0	9,944,210	7,307,856	67,392,551
2079	6,482,543	4,763,927	11.7222	55,843,706	3,844,412	2,825,203	5.7104	16,133,037	0	0	1.0000	0	10,326,955	7,589,130	71,976,743
2080	6,403,045	4,705,505	12.1970	57,393,047	3,563,167	2,618,520	5.8731	15,378,828	0	0	1.0000	0	9,966,212	7,324,025	72,771,874
2081	6,386,857	4,693,609	12.6909	59,566,121	3,557,353	2,614,247	6.0405	15,791,360	0	0	1.0000	0	9,944,210	7,307,856	75,357,480
2082	6,386,857	4,693,609	13.2049	61,978,635	3,557,353	2,614,247	6.2127	16,241,533	0	0	1.0000	0	9,944,210	7,307,856	78,220,169
2083	6,482,543	4,763,927	13.7397	65,454,929	3,844,412	2,825,203	6.3897	18,052,197	0	0	1.0000	0	10,326,955	7,589,130	83,507,127
2084	6,403,045	4,705,505	14.2962	67,270,843	3,563,167	2,618,520	6.5719	17,208,649	0	0	1.0000	0	9,966,212	7,324,025	84,479,492

AMOUNT TO RECOVER															
	LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2085	6,386,857	4,693,609	14.8752	69,818,370	3,557,353	2,614,247	6.7592	17,670,219	0	0	1.0000	0	9,944,210	7,307,856	87,488,590
2086	6,386,857	4,693,609	15.4776	72,645,800	3,557,353	2,614,247	6.9518	18,173,723	0	0	1.0000	0	9,944,210	7,307,856	90,819,524
2087	6,482,543	4,763,927	16.1045	76,720,664	3,844,412	2,825,203	7.1499	20,199,916	0	0	1.0000	0	10,326,955	7,589,130	96,920,580
2088	7,066,689	5,193,208	16.7567	87,021,021	5,554,101	4,081,628	7.3537	30,015,070	0	0	1.0000	0	12,620,790	9,274,836	117,036,091
2089	6,386,857	4,693,609	17.4353	81,834,478	3,557,353	2,614,247	7.5633	19,772,335	0	0	1.0000	0	9,944,210	7,307,856	101,606,814
2090	6,099,798	4,482,653	18.1415	81,322,056	11,895,081	8,741,523	7.7788	67,998,558	0	0	1.0000	0	17,994,879	13,224,176	149,320,614
2091	2,067,326	1,519,248	18.8762	28,677,630	15,798,591	11,610,156	8.0005	92,887,054	0	0	1.0000	0	17,865,917	13,129,404	121,564,684
	\$873,535,822	\$641,948,844		\$2,760,206,192	\$729,124,605	\$535,823,128		\$1,386,916,184	\$0	\$0		\$0	\$1,602,660,427	\$1,177,771,972	\$4,147,122,376

LABOR				NON-LABOR				PIIC Payment				Total Estimate Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s	
Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s				
Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s				
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2033	\$22,324,352	\$16,405,843	1.8874	\$30,964,388	\$9,448,311	\$6,943,427	1.5677	\$10,885,211	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,022,663	\$24,267,877	\$42,768,206
2034	\$63,582,247	46,725,674	1.9639	91,764,550	\$32,971,808	24,230,505	1.6124	39,069,266	1,250,000	918,607	1.0000	918,607	97,804,054	71,874,785	131,752,423
2035	\$65,877,290	48,412,268	2.0434	98,925,629	\$1,239,936	59,702,054	1.6584	99,009,886	1,250,000	918,607	1.0000	918,607	148,367,226	109,032,929	198,854,122
2036	\$57,759,315	42,446,486	2.1262	90,249,718	\$65,595,018	48,204,830	1.7056	82,218,158	1,250,000	918,607	1.0000	918,607	124,604,333	91,569,923	173,386,483
2037	\$39,808,345	29,254,577	2.2123	64,719,901	\$41,981,871	30,851,870	1.7542	54,120,350	1,250,000	918,607	1.0000	918,607	\$3,040,216	61,025,054	119,758,858
2038	\$13,207,909	9,706,302	2.3019	22,342,936	\$18,994,691	13,958,923	1.8042	25,184,690	1,250,000	918,607	1.0000	918,607	\$33,452,600	24,583,832	48,446,232
2039	\$36,035,851	26,482,226	2.3951	63,427,579	\$76,476,727	56,201,641	1.8556	104,287,765	1,250,000	918,607	1.0000	918,607	113,762,578	83,601,474	168,633,951
2040	\$31,919,556	23,457,220	2.4921	58,457,738	\$13,365,606	9,822,190	1.9085	18,745,650	1,250,000	918,607	1.0000	918,607	46,535,162	34,198,017	78,121,996
2041	\$19,571,318	14,382,679	2.5930	37,294,286	\$9,445,873	6,941,635	1.9629	13,625,736	1,250,000	918,607	1.0000	918,607	\$30,267,191	22,242,921	51,838,628
2042	\$14,781,952	10,863,043	2.6981	29,309,575	\$11,668,700	8,575,159	2.0189	17,312,388	1,250,000	918,607	1.0000	918,607	27,700,652	20,356,808	47,540,570
2043	\$8,544,452	6,279,195	2.8073	17,627,583	\$6,492,672	4,771,371	2.0764	9,907,275	1,250,000	918,607	1.0000	918,607	16,287,125	11,969,172	28,453,465
2044	\$3,054,798	2,244,927	2.9210	6,557,431	\$1,939,011	1,424,951	2.1356	3,043,125	1,250,000	918,607	1.0000	918,607	\$6,243,809	4,588,485	10,519,163
2045	\$5,353,318	3,934,076	3.0393	11,956,837	\$8,850,896	6,504,395	2.1964	14,286,253	1,250,000	918,607	1.0000	918,607	15,454,214	11,357,078	27,161,698
2046	\$4,584,362	3,368,981	3.1624	10,654,067	\$6,544,030	4,809,113	2.2590	10,863,786	1,250,000	918,607	1.0000	918,607	12,378,392	9,096,701	22,436,459
2047	\$4,584,362	3,368,981	3.2905	11,085,633	\$6,544,030	4,809,113	2.3234	11,173,492	1,250,000	918,607	1.0000	918,607	12,378,392	9,096,701	23,177,732
2048	\$3,054,798	2,244,927	3.4238	7,686,181	\$1,939,011	1,424,951	2.3896	3,405,063	1,250,000	918,607	1.0000	918,607	\$6,243,809	4,588,485	12,009,850
2049	\$4,584,362	3,368,981	3.5624	12,001,659	\$6,544,030	4,809,113	2.4577	11,819,356	1,250,000	918,607	1.0000	918,607	12,378,392	9,096,701	24,739,622
2050	\$5,353,318	3,934,076	3.7067	14,582,439	\$8,850,896	6,504,395	2.5278	16,441,810	1,250,000	918,607	1.0000	918,607	15,454,214	11,357,078	31,942,856
2051	\$5,159,362	3,791,541	3.8568	14,623,213	\$8,269,028	6,076,789	2.5998	15,798,435	1,250,000	918,607	1.0000	918,607	14,678,390	10,786,936	31,340,256
2052	\$5,361,664	3,940,209	4.0130	15,812,060	\$8,859,611	6,510,800	2.6739	17,409,227	1,250,000	918,607	1.0000	918,607	15,471,275	11,369,616	34,139,894
2053	\$3,142,138	2,309,112	4.1756	9,641,927	\$2,217,357	1,629,503	2.7501	4,481,297	1,250,000	918,607	1.0000	918,607	6,609,495	4,857,222	15,041,831
2054	\$3,237,824	2,379,430	4.3447	10,337,910	\$2,504,416	1,840,459	2.8285	5,205,738	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	16,462,254
2055	\$5,544,690	4,074,712	4.5206	18,420,145	\$9,425,014	6,926,306	2.9091	20,149,317	1,250,000	918,607	1.0000	918,607	16,219,704	11,919,626	39,488,069
2056	\$4,831,925	3,550,912	4.7037	16,702,424	\$7,270,391	5,342,905	2.9920	15,985,972	1,250,000	918,607	1.0000	918,607	13,352,316	9,812,424	33,607,002
2057	\$5,302,892	3,897,019	4.8942	19,072,789	\$8,699,619	6,393,224	3.0773	19,673,868	1,250,000	918,607	1.0000	918,607	15,252,511	11,208,849	39,665,263
2058	\$3,333,511	2,449,749	5.0924	12,475,102	\$2,791,475	2,051,414	3.1650	6,492,726	1,250,000	918,607	1.0000	918,607	7,374,986	5,419,770	19,886,435
2059	\$3,189,981	2,344,271	5.2987	12,421,588	\$2,360,887	1,734,981	3.2552	5,647,711	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	18,987,907
2060	\$3,150,484	2,315,245	5.5133	12,764,641	\$2,226,070	1,635,906	3.3480	5,477,015	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758	19,160,263
2061	\$3,237,824	2,379,430	5.7366	13,649,838	\$2,504,416	1,840,459	3.4434	6,337,436	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	20,905,881
2062	\$3,237,824	2,379,430	5.9689	14,202,580	\$2,504,416	1,840,459	3.5415	6,517,985	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	21,639,172
2063	\$3,189,981	2,344,271	6.2106	14,559,329	\$2,360,887	1,734,981	3.6425	6,319,670	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	21,797,605
2064	\$3,246,171	2,385,564	6.4622	15,415,592	\$2,513,129	1,846,862	3.7463	6,918,899	1,250,000	918,607	1.0000	918,607	7,009,300	5,151,033	23,253,498
2065	\$3,237,824	2,379,430	6.7239	15,999,050	\$2,504,416	1,840,459	3.8531	7,091,472	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	24,009,128
2066	\$3,189,981	2,344,271	6.9962	16,400,988	\$2,360,887	1,734,981	3.9629	6,875,558	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	24,195,153
2067	\$3,237,824	2,379,430	7.2795	17,321,061	\$2,504,416	1,840,459	4.0758	7,501,342	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	25,741,010
2068	\$3,246,171	2,385,564	7.5744	18,069,217	\$2,513,129	1,846,862	4.1920	7,742,045	1,250,000	918,607	1.0000	918,607	7,009,300	5,151,033	26,729,869
2069	\$3,189,981	2,344,271	7.8811	18,475,433	\$2,360,887	1,734,981	4.3115	7,480,372	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	26,874,413
2070	\$3,237,824	2,379,430	8.2003	19,512,040	\$2,504,416	1,840,459	4.4343	8,161,146	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	28,591,793
2071	\$3,237,824	2,379,430	8.5324	20,302,249	\$2,504,416	1,840,459	4.5607	8,393,780	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	29,614,636
2072	\$3,246,171	2,385,564	8.8780	21,179,038	\$2,513,129	1,846,862	4.6907	8,663,075	1,250,000	918,607	1.0000	918,607	7,009,300	5,151,033	30,760,720
2073	\$3,237,824	2,379,430	9.2375	21,979,985	\$2,504,416	1,840,459	4.8244	8,879,109	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	31,777,701
2074	\$3,237,824	2,379,430	9.6117	22,870,368	\$2,504,416	1,840,459	4.9619	9,132,172	1,250,000	918,607	1.0000	918,607	\$6,992,240	5,138,496	32,921,147
2075	\$3,569,647	2,623,282	10.0009	26,235,181	\$3,499,884	2,572,014	5.1033	13,125,758	1,250,000	918,607	1.0000	918,607	8,319,531	6,113,903	40,279,545
2076	\$3,246,171	2,385,564	10.4060	24,824,180	\$2,513,129	1,846,862	5.2487	9,693,624	1,250,000	918,607	1.0000	918,607	7,009,300	5,151,033	35,436,411
2077	\$3,237,824	2,379,430	10.8274	25,763,042	\$1,152,682	10,400,601	5.3983	56,145,565	1,250,000	918,607	1.0000	918,607	\$18,640,506	13,698,638	82,827,125
2078	\$82,878	722,303	11.2659	8,137,390	\$5,148,901	3,783,853	5.5522	21,008,709	0	0	1.0000	0	\$6,131,779	\$4,506,156	29,246,099
	\$502,483,945	\$369,268,185		\$1,156,776,892	\$523,488,941	\$384,704,452		\$867,708,282	\$56,250,000	\$41,337,312		\$41,337,312	\$1,082,222,886	\$795,309,949	\$2,065,822,485

Xcel Energy

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,706,857	-	6,696,113	646,075,152
2018	646,075,152	32,703,840	-	13,392,226	692,171,218
2019	692,171,218	35,311,659	-	25,304,645	752,787,523
2020	752,787,523	38,348,536	-	25,304,645	816,440,704
2021	816,440,704	41,537,561	-	25,304,645	883,282,909
2022	883,282,909	44,886,355	-	25,304,645	953,473,909
2023	953,473,909	48,402,924	-	25,304,645	1,027,181,478
2024	1,027,181,478	52,095,673	-	25,304,645	1,104,581,796
2025	1,104,581,796	55,973,429	-	25,304,645	1,185,859,871
2026	1,185,859,871	60,045,461	-	25,304,645	1,271,209,976
2027	1,271,209,976	64,321,501	-	25,304,645	1,360,836,122
2028	1,360,836,122	68,811,771	-	25,304,645	1,454,952,538
2029	1,454,952,538	73,527,004	-	25,304,645	1,553,784,186
2030	1,553,784,186	69,721,995	(35,447,395)	18,978,484	1,607,037,270
2031	1,607,037,270	71,673,862	(139,568,856)	-	1,539,142,277
2032	1,539,142,277	68,645,746	(235,103,207)	-	1,372,684,815
2033	1,372,684,815	61,221,743	(224,495,047)	-	1,209,411,511
2034	1,209,411,511	53,939,753	(141,890,436)	-	1,121,460,828
2035	1,121,460,828	50,017,153	(268,360,596)	-	903,117,385
2036	903,117,385	40,279,035	(104,537,352)	-	838,859,069
2037	838,859,069	37,413,114	(74,591,555)	-	801,680,629
2038	801,680,629	35,754,956	(70,060,446)	-	767,375,138
2039	767,375,138	34,224,931	(13,411,299)	-	788,188,771
2040	788,188,771	35,153,219	(13,956,542)	-	809,385,448
2041	809,385,448	36,098,591	(14,445,461)	-	831,038,578
2042	831,038,578	37,064,321	(14,993,098)	-	853,109,800
2043	853,109,800	38,048,697	(15,560,999)	-	875,597,498
2044	875,597,498	39,051,648	(16,195,163)	-	898,453,984
2045	898,453,984	40,071,048	(16,764,053)	-	921,760,979
2046	921,760,979	41,110,540	(17,400,674)	-	945,470,845
2047	945,470,845	42,168,000	(18,061,959)	-	969,576,885
2048	969,576,885	43,243,129	(23,965,838)	-	988,854,176
2049	988,854,176	44,102,896	(19,461,726)	-	1,013,495,347
2050	1,013,495,347	45,201,892	(32,591,702)	-	1,026,105,537
2051	1,026,105,537	45,764,307	(33,762,729)	-	1,038,107,115
2052	1,038,107,115	46,299,577	(42,664,602)	-	1,041,742,091
2053	1,041,742,091	46,461,697	(50,020,076)	-	1,038,183,712
2054	1,038,183,712	46,302,994	(39,576,077)	-	1,044,910,628

EXTERNAL FUND CALCULATION

2055	1,044,910,628	46,603,014	(51,492,367)	-	1,040,021,275
2056	1,040,021,275	46,384,949	(57,711,426)	-	1,028,694,798
2057	1,028,694,798	45,879,788	(26,084,326)	-	1,048,490,260
2058	1,048,490,260	46,762,666	(92,436,335)	-	1,002,816,590
2059	1,002,816,590	44,725,620	(28,120,106)	-	1,019,422,104
2060	1,019,422,104	45,466,226	(29,277,659)	-	1,035,610,671
2061	1,035,610,671	46,188,236	(30,317,088)	-	1,051,481,818
2062	1,051,481,818	46,896,089	(31,479,828)	-	1,066,898,080
2063	1,066,898,080	47,583,654	(32,687,938)	-	1,081,793,796
2064	1,081,793,796	48,248,003	(34,036,425)	-	1,096,005,375
2065	1,096,005,375	48,881,840	(35,247,492)	-	1,109,639,722
2066	1,109,639,722	49,489,932	(87,366,546)	-	1,071,763,108
2067	1,071,763,108	47,800,635	(38,009,720)	-	1,081,554,023
2068	1,081,554,023	48,237,309	(165,968,243)	-	963,823,089
2069	963,823,089	42,986,510	(40,992,100)	-	965,817,499
2070	965,817,499	43,075,460	(42,570,958)	-	966,322,002
2071	966,322,002	43,097,961	(44,211,483)	-	965,208,481
2072	965,208,481	43,048,298	(46,042,074)	-	962,214,705
2073	962,214,705	42,914,776	(47,687,242)	-	957,442,239
2074	957,442,239	42,701,924	(49,528,001)	-	950,616,161
2075	950,616,161	42,397,481	(51,440,016)	-	941,573,626
2076	941,573,626	41,994,184	(53,573,725)	-	929,994,085
2077	929,994,085	41,477,736	(55,492,060)	-	915,979,761
2078	915,979,761	40,852,697	(67,392,551)	-	889,439,908
2079	889,439,908	39,669,020	(71,976,743)	-	857,132,184
2080	857,132,184	38,228,095	(72,771,874)	-	822,588,405
2081	822,588,405	36,687,443	(75,357,480)	-	783,918,367
2082	783,918,367	34,962,759	(78,220,169)	-	740,660,958
2083	740,660,958	33,033,479	(83,507,127)	-	690,187,310
2084	690,187,310	30,782,354	(84,479,492)	-	636,490,172
2085	636,490,172	28,387,462	(87,488,590)	-	577,389,044
2086	577,389,044	25,751,551	(90,819,524)	-	512,321,072
2087	512,321,072	22,849,520	(96,920,580)	-	438,250,011
2088	438,250,011	19,545,951	(117,036,091)	-	340,759,871
2089	340,759,871	15,197,890	(101,606,814)	-	254,350,948
2090	254,350,948	11,344,052	(149,320,614)	-	116,374,386
2091	116,374,386	5,190,298	(121,564,684)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,359,484	-	24,632	383,751,171
2018	383,751,171	19,188,790	-	49,264	402,989,226
2019	402,989,226	20,621,146	-	18,867,378	442,477,750
2020	442,477,750	22,595,572	-	18,867,378	483,940,700
2021	483,940,700	24,668,719	-	18,867,378	527,476,798
2022	527,476,798	26,845,524	-	18,867,378	573,189,701
2023	573,189,701	29,131,170	-	18,867,378	621,188,249
2024	621,188,249	31,531,097	-	18,867,378	671,586,724
2025	671,586,724	34,051,021	-	18,867,378	724,505,123
2026	724,505,123	36,696,941	-	18,867,378	780,069,442
2027	780,069,442	39,475,157	-	18,867,378	838,411,977
2028	838,411,977	42,392,283	-	18,867,378	899,671,639
2029	899,671,639	45,455,266	-	18,867,378	963,994,284
2030	963,994,284	48,671,399	-	18,867,378	1,031,533,061
2031	1,031,533,061	52,048,338	-	18,867,378	1,102,448,777
2032	1,102,448,777	55,594,123	-	18,867,378	1,176,910,279
2033	1,176,910,279	49,577,373	(42,768,206)	12,641,144	1,196,360,589
2034	1,196,360,589	50,127,509	(131,752,423)	-	1,114,735,675
2035	1,114,735,675	46,707,425	(198,854,122)	-	962,588,978
2036	962,588,978	40,332,478	(173,386,483)	-	829,534,973
2037	829,534,973	34,757,515	(119,758,858)	-	744,533,631
2038	744,533,631	31,195,959	(48,446,232)	-	727,283,357
2039	727,283,357	30,473,173	(168,633,951)	-	589,122,579
2040	589,122,579	24,684,236	(78,121,996)	-	535,684,820
2041	535,684,820	22,445,194	(51,838,628)	-	506,291,385
2042	506,291,385	21,213,609	(47,540,570)	-	479,964,424
2043	479,964,424	20,110,509	(28,453,465)	-	471,621,469
2044	471,621,469	19,760,940	(10,519,163)	-	480,863,245
2045	480,863,245	20,148,170	(27,161,698)	-	473,849,717
2046	473,849,717	19,854,303	(22,436,459)	-	471,267,562
2047	471,267,562	19,746,111	(23,177,732)	-	467,835,940
2048	467,835,940	19,602,326	(12,009,850)	-	475,428,416
2049	475,428,416	19,920,451	(24,739,622)	-	470,609,244
2050	470,609,244	19,718,527	(31,942,856)	-	458,384,915
2051	458,384,915	19,206,328	(31,340,256)	-	446,250,987
2052	446,250,987	18,697,916	(34,139,894)	-	430,809,009
2053	430,809,009	18,050,897	(15,041,831)	-	433,818,076
2054	433,818,076	18,176,977	(16,462,254)	-	435,532,799
2055	435,532,799	18,248,824	(39,488,069)	-	414,293,554

EXTERNAL FUND CALCULATION

2056	414,293,554	17,358,900	(33,607,002)	-	398,045,451
2057	398,045,451	16,678,104	(39,665,263)	-	375,058,292
2058	375,058,292	15,714,942	(19,886,435)	-	370,886,800
2059	370,886,800	15,540,157	(18,987,907)	-	367,439,050
2060	367,439,050	15,395,696	(19,160,263)	-	363,674,484
2061	363,674,484	15,237,961	(20,905,881)	-	358,006,564
2062	358,006,564	15,000,475	(21,639,172)	-	351,367,867
2063	351,367,867	14,722,314	(21,797,605)	-	344,292,575
2064	344,292,575	14,425,859	(23,253,498)	-	335,464,936
2065	335,464,936	14,055,981	(24,009,128)	-	325,511,789
2066	325,511,789	13,638,944	(24,195,153)	-	314,955,580
2067	314,955,580	13,196,639	(25,741,010)	-	302,411,209
2068	302,411,209	12,671,030	(26,729,869)	-	288,352,370
2069	288,352,370	12,081,964	(26,874,413)	-	273,559,921
2070	273,559,921	11,462,161	(28,591,793)	-	256,430,289
2071	256,430,289	10,744,429	(29,614,636)	-	237,560,082
2072	237,560,082	9,953,767	(30,760,720)	-	216,753,129
2073	216,753,129	9,081,956	(31,777,701)	-	194,057,384
2074	194,057,384	8,131,004	(32,921,147)	-	169,267,242
2075	169,267,242	7,092,297	(40,279,545)	-	136,079,994
2076	136,079,994	5,701,752	(35,436,411)	-	106,345,334
2077	106,345,334	4,455,869	(82,827,215)	-	27,973,989
2078	27,973,989	1,172,110	(29,146,099)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,613,997	-	294,670	431,117,634
2018	431,117,634	21,786,321	-	589,341	453,493,297
2019	453,493,297	23,223,608	-	12,760,253	489,477,157
2020	489,477,157	25,040,793	-	12,760,253	527,278,202
2021	527,278,202	26,949,746	-	12,760,253	566,988,200
2022	566,988,200	28,955,100	-	12,760,253	608,703,553
2023	608,703,553	31,061,726	-	12,760,253	652,525,532
2024	652,525,532	33,274,736	-	12,760,253	698,560,520
2025	698,560,520	35,599,503	-	12,760,253	746,920,275
2026	746,920,275	38,041,670	-	12,760,253	797,722,198
2027	797,722,198	40,607,167	-	12,760,253	851,089,618
2028	851,089,618	43,302,222	-	12,760,253	907,152,092
2029	907,152,092	46,133,377	-	12,760,253	966,045,722
2030	966,045,722	49,107,505	-	12,760,253	1,027,913,480
2031	1,027,913,480	52,231,827	-	12,760,253	1,092,905,559
2032	1,092,905,559	55,513,927	-	12,760,253	1,161,179,739
2033	1,161,179,739	58,961,773	-	12,760,253	1,232,901,765
2034	1,232,901,765	51,137,547	(17,426,478)	10,591,010	1,277,203,844
2035	1,277,203,844	52,748,519	(114,752,431)	-	1,215,199,931
2036	1,215,199,931	50,187,757	(214,578,923)	-	1,050,808,766
2037	1,050,808,766	43,398,402	(216,463,726)	-	877,743,442
2038	877,743,442	36,250,804	(136,478,692)	-	777,515,555
2039	777,515,555	32,111,392	(178,110,184)	-	631,516,763
2040	631,516,763	26,081,642	(89,351,532)	-	568,246,873
2041	568,246,873	23,468,596	(64,224,426)	-	527,491,043
2042	527,491,043	21,785,380	(59,433,129)	-	489,843,294
2043	489,843,294	20,230,528	(34,204,617)	-	475,869,206
2044	475,869,206	19,653,398	(10,519,163)	-	485,003,440
2045	485,003,440	20,030,642	(27,161,698)	-	477,872,385
2046	477,872,385	19,736,129	(22,436,459)	-	475,172,055
2047	475,172,055	19,624,606	(23,177,732)	-	471,618,929
2048	471,618,929	19,477,862	(12,009,850)	-	479,086,941
2049	479,086,941	19,786,291	(24,739,622)	-	474,133,609
2050	474,133,609	19,581,718	(31,942,856)	-	461,772,471
2051	461,772,471	19,071,203	(31,340,260)	-	449,503,414
2052	449,503,414	18,564,491	(34,139,891)	-	433,928,014
2053	433,928,014	17,921,227	(15,041,831)	-	436,807,411
2054	436,807,411	18,040,146	(16,462,254)	-	438,385,302

Proposed

EXTERNAL FUND CALCULATION

2055	438,385,302	18,105,313	(39,488,069)	-	417,002,546
2056	417,002,546	17,222,205	(33,607,002)	-	400,617,749
2057	400,617,749	16,545,513	(39,665,263)	-	377,497,998
2058	377,497,998	15,590,667	(19,886,435)	-	373,202,231
2059	373,202,231	15,413,252	(18,987,907)	-	369,627,576
2060	369,627,576	15,265,619	(19,160,263)	-	365,732,933
2061	365,732,933	15,104,770	(20,905,881)	-	359,931,822
2062	359,931,822	14,865,184	(21,639,172)	-	353,157,835
2063	353,157,835	14,585,419	(21,797,605)	-	345,945,648
2064	345,945,648	14,287,555	(23,253,498)	-	336,979,705
2065	336,979,705	13,917,262	(24,009,128)	-	326,887,838
2066	326,887,838	13,500,468	(24,195,153)	-	316,193,153
2067	316,193,153	13,058,777	(25,741,010)	-	303,510,921
2068	303,510,921	12,535,001	(26,729,869)	-	289,316,053
2069	289,316,053	11,948,753	(26,874,413)	-	274,390,394
2070	274,390,394	11,332,323	(28,591,793)	-	257,130,923
2071	257,130,923	10,619,507	(29,614,636)	-	238,135,795
2072	238,135,795	9,835,008	(30,760,720)	-	217,210,083
2073	217,210,083	8,970,776	(31,777,701)	-	194,403,158
2074	194,403,158	8,028,850	(32,921,147)	-	169,510,861
2075	169,510,861	7,000,799	(40,279,545)	-	136,232,115
2076	136,232,115	5,626,386	(35,436,411)	-	106,422,090
2077	106,422,090	4,395,232	(82,827,215)	-	27,990,107
2078	27,990,107	1,155,991	(29,146,099)	-	(0)

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$48,876,564	\$35,484,338
Prairie Island Unit 1	49,264	32,632,158	32,582,894
Prairie Island Unit 2	589,341	25,930,172	25,340,831
TOTAL	\$14,030,831	\$107,438,894	\$93,408,063

Xcel Energy
Nuclear Decommissioning Accrual
100-Year Decommissioning Period
DECON Method

Docket No. E002/M-17-828

Schedule F.6

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Proposed

2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2019-2021 Decommissioning Accrual
Monticello	13.75	5.03%	4.79%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	48,876,564
Prairie Island Unit 1	16.67	5.04%	4.71%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	32,632,158
Prairie Island Unit 2	17.83	5.07%	4.69%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	25,930,172
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$107,438,894

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%					0.00%			
2030	\$21,103,620	\$15,508,745	1.6755	\$25,984,903	\$8,935,561	\$6,566,615	1.4410	\$9,462,492	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$35,447,395
2031	72,416,235	53,217,644	1.7434	92,779,641	42,961,344	31,571,670	1.4820	46,789,215	0	0	1.0000	0	115,377,579	84,789,314	139,568,856
2032	81,871,153	60,165,927	1.8140	109,140,991	112,447,587	82,636,106	1.5243	125,962,216	0	0	1.0000	0	194,318,741	142,802,033	235,103,207
2033	78,663,227	57,808,468	1.8874	109,107,702	100,155,666	73,602,950	1.5677	115,387,345	0	0	1.0000	0	178,818,892	131,411,418	224,495,047
2034	66,380,423	48,782,013	1.9639	95,802,994	38,894,671	28,583,132	1.6124	46,087,441	0	0	1.0000	0	105,275,094	77,365,144	141,890,436
2035	86,879,803	63,846,711	2.0434	130,464,369	113,147,091	83,150,161	1.6584	137,896,227	0	0	1.0000	0	200,026,894	146,996,872	268,360,596
2036	50,307,504	36,970,257	2.1262	78,606,161	20,688,337	15,203,559	1.7056	25,931,191	0	0	1.0000	0	70,995,841	52,173,817	104,537,352
2037	34,755,723	25,541,478	2.2123	56,505,412	14,196,883	10,433,084	1.7542	18,301,716	0	0	1.0000	0	48,952,606	35,974,562	74,807,128
2038	29,827,529	21,919,820	2.3019	50,457,233	15,094,222	11,092,525	1.8042	20,013,134	0	0	1.0000	0	44,921,751	33,012,345	70,470,367
2039	7,164,563	5,265,134	2.3951	12,610,522	2,125,149	1,561,742	1.8556	2,897,968	0	0	1.0000	0	9,289,712	6,826,875	15,508,490
2040	7,184,147	5,279,526	2.4921	13,157,106	2,130,835	1,565,920	1.9085	2,988,559	0	0	1.0000	0	9,314,982	6,845,446	16,145,665
2041	7,164,563	5,265,134	2.5930	13,652,492	2,125,149	1,561,742	1.9629	3,065,343	0	0	1.0000	0	9,289,712	6,826,875	16,718,034
2042	7,164,563	5,265,134	2.6981	14,205,857	2,125,149	1,561,742	2.0189	3,153,000	0	0	1.0000	0	9,289,712	6,826,875	17,358,857
2043	7,164,563	5,265,134	2.8073	14,780,810	2,125,149	1,561,742	2.0764	3,242,800	0	0	1.0000	0	9,289,712	6,826,875	18,023,610
2044	7,184,147	5,279,526	2.9210	15,421,495	2,130,835	1,565,920	2.1356	3,344,179	0	0	1.0000	0	9,314,982	6,845,446	18,765,674
2045	7,164,563	5,265,134	3.0393	16,002,321	2,125,149	1,561,742	2.1964	3,430,209	0	0	1.0000	0	9,289,712	6,826,875	19,432,530
2046	7,164,563	5,265,134	3.1624	16,650,459	2,125,149	1,561,742	2.2590	3,527,974	0	0	1.0000	0	9,289,712	6,826,875	20,178,433
2047	7,164,563	5,265,134	3.2905	17,324,923	2,125,149	1,561,742	2.3234	3,628,550	0	0	1.0000	0	9,289,712	6,826,875	20,953,473
2048	7,847,792	5,767,229	3.4238	19,745,838	4,121,769	3,029,029	2.3896	7,238,167	0	0	1.0000	0	11,969,561	8,796,258	26,984,005
2049	7,164,563	5,265,134	3.5624	18,756,512	2,125,149	1,561,742	2.4577	3,838,292	0	0	1.0000	0	9,289,712	6,826,875	22,594,805
2050	8,657,764	6,362,466	3.7067	23,583,751	6,604,752	4,853,737	2.5278	12,269,277	0	0	1.0000	0	15,262,516	11,216,203	35,853,028
2051	8,657,764	6,362,466	3.8568	24,538,757	6,604,752	4,853,737	2.5998	12,618,746	0	0	1.0000	0	15,262,516	11,216,203	37,157,503
2052	8,677,348	6,376,858	4.0130	25,590,329	6,610,438	4,857,916	2.6739	12,989,580	0	0	1.0000	0	15,287,786	11,234,773	38,579,910
2053	8,657,764	6,362,466	4.1756	26,567,111	6,604,752	4,853,737	2.7501	13,348,262	0	0	1.0000	0	15,262,516	11,216,203	39,915,373
2054	8,657,764	6,362,466	4.3447	27,643,004	6,604,752	4,853,737	2.8285	13,728,755	0	0	1.0000	0	15,262,516	11,216,203	41,371,799
2055	8,657,764	6,362,466	4.5206	28,762,162	6,604,752	4,853,737	2.9091	14,120,006	0	0	1.0000	0	15,262,516	11,216,203	42,882,168
2056	8,677,348	6,376,858	4.7037	29,994,825	6,610,438	4,857,916	2.9920	14,534,883	0	0	1.0000	0	15,287,786	11,234,773	44,529,708
2057	8,657,764	6,362,466	4.8942	31,139,179	6,604,752	4,853,737	3.0773	14,936,405	0	0	1.0000	0	15,262,516	11,216,203	46,075,584
2058	14,754,149	10,842,611	5.0924	55,214,911	24,893,906	18,294,172	3.1650	57,901,054	0	0	1.0000	0	39,648,055	29,136,783	113,115,965
2059	8,657,764	6,362,466	5.2987	33,712,796	6,604,752	4,853,737	3.2552	15,799,885	0	0	1.0000	0	15,262,516	11,216,203	49,512,681
2060	8,677,348	6,376,858	5.5133	35,157,529	6,610,438	4,857,916	3.3480	16,264,301	0	0	1.0000	0	15,287,786	11,234,773	51,421,830
2061	8,657,764	6,362,466	5.7366	36,498,920	6,604,752	4,853,737	3.4434	16,713,358	0	0	1.0000	0	15,262,516	11,216,203	53,212,278
2062	8,657,764	6,362,466	5.9689	37,976,921	6,604,752	4,853,737	3.5415	17,189,510	0	0	1.0000	0	15,262,516	11,216,203	55,166,430
2063	8,657,764	6,362,466	6.2106	39,514,729	6,604,752	4,853,737	3.6425	17,679,737	0	0	1.0000	0	15,262,516	11,216,203	57,194,466
2064	8,677,348	6,376,858	6.4622	41,208,529	6,610,438	4,857,916	3.7463	18,199,209	0	0	1.0000	0	15,287,786	11,234,773	59,407,738
2065	8,657,764	6,362,466	6.7239	42,780,582	6,604,752	4,853,737	3.8531	18,701,934	0	0	1.0000	0	15,262,516	11,216,203	61,482,516
2066	12,315,595	9,050,553	6.9962	63,319,477	17,578,245	12,917,998	3.9629	51,192,736	0	0	1.0000	0	29,893,840	21,968,551	114,512,212
2067	8,657,764	6,362,466	7.2795	46,315,568	6,604,752	4,853,737	4.0758	19,782,861	0	0	1.0000	0	15,262,516	11,216,203	66,098,430
2068	17,212,287	12,649,061	7.5744	95,809,046	32,215,254	23,674,525	4.1920	99,243,607	0	0	1.0000	0	49,427,541	36,323,585	195,052,653
2069	8,657,764	6,362,466	7.8811	50,143,227	6,604,752	4,853,737	4.3115	20,926,887	0	0	1.0000	0	15,262,516	11,216,203	71,070,115
2070	8,657,764	6,362,466	8.2003	52,174,126	6,604,752	4,853,737	4.4343	21,522,926	0	0	1.0000	0	15,262,516	11,216,203	73,697,053
2071	8,657,764	6,362,466	8.5324	54,287,101	6,604,752	4,853,737	4.5607	22,136,439	0	0	1.0000	0	15,262,516	11,216,203	76,423,540
2072	8,677,348	6,376,858	8.8780	56,613,741	6,610,438	4,857,916	4.6907	22,787,025	0	0	1.0000	0	15,287,786	11,234,773	79,400,766
2073	8,657,764	6,362,466	9.2375	58,773,276	6,604,752	4,853,737	4.8244	23,416,369	0	0	1.0000	0	15,262,516	11,216,203	82,189,645
2074	8,657,764	6,362,466	9.6117	61,154,110	6,604,752	4,853,737	4.9619	24,083,758	0	0	1.0000	0	15,262,516	11,216,203	85,237,868
2075	8,657,764	6,362,466	10.0009	63,630,382	6,604,752	4,853,737	5.1033	24,770,076	0	0	1.0000	0	15,262,516	11,216,203	88,400,458
2076	8,677,348	6,376,858	10.4060	66,357,580	6,610,438	4,857,916	5.2487	25,497,742	0	0	1.0000	0	15,287,786	11,234,773	91,855,321
2077	8,657,764	6,362,466	10.8274	68,888,960	6,604,752	4,853,737	5.3983	26,201,929	0	0	1.0000	0	15,262,516	11,216,203	95,090,888
2078	8,657,764	6,362,466	11.2659	71,678,901	6,604,752	4,853,737	5.5522	26,948,919	0	0	1.0000	0	15,262,516	11,216,203	98,627,820
2079	8,657,764	6,362,466	11.7222	74,582,094	6,604,752	4,853,737	5.7104	27,716,780	0	0	1.0000	0	15,262,516	11,216,203	102,298,874
2080	8,677,348	6,376,858	12.1970	77,778,532	6,610,438	4,857,916	5.8731	28,531,024	0	0	1.0000	0	15,287,786	11,234,773	106,309,556
2081	8,657,764	6,362,466	12.6909	80,745,414	6,604,752	4,853,737	6.0405	29,318,999	0	0	1.0000	0	15,262,516	11,216,203	110,064,413
2082	8,657,764	6,362,466	13.2049	84,015,722	6,604,752	4,853,737	6.2127	30,154,812	0	0	1.0000	0	15,262,516	11,216,203	114,170,534
2083	8,657,764	6,362,466	13.7397	87,418,368	6,604,752	4,853,737	6.3897	31,013,924	0	0	1.0000	0	15,262,516	11,216,203	118,432,292
2084	8,677,348	6,376,858	14.2962	91,164,831	6,610,438	4,857,916	6.5719	31,925,735	0	0	1.0000	0	15,287,786	11,234,773	123,090,567

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2085	8,657,764	6,362,466	14.8752	94,642,948	6,604,752	4,853,737	6.7592	32,807,380	0	0	1.0000	0	15,262,516	11,216,203	127,450,327
2086	8,657,764	6,362,466	15.4776	98,475,697	6,604,752	4,853,737	6.9518	33,742,209	0	0	1.0000	0	15,262,516	11,216,203	132,217,906
2087	8,657,764	6,362,466	16.1045	102,464,327	6,604,752	4,853,737	7.1499	34,703,735	0	0	1.0000	0	15,262,516	11,216,203	137,168,061
2088	9,340,993	6,864,561	16.7567	115,027,384	8,601,373	6,321,025	7.3537	46,482,921	0	0	1.0000	0	17,942,366	13,185,586	161,510,305
2089	8,657,764	6,362,466	17.4353	110,931,496	6,604,752	4,853,737	7.5633	36,710,269	0	0	1.0000	0	15,262,516	11,216,203	147,641,765
2090	8,657,764	6,362,466	18.1415	115,424,669	6,604,752	4,853,737	7.7788	37,756,250	0	0	1.0000	0	15,262,516	11,216,203	153,180,919
2091	8,657,764	6,362,466	18.8762	120,099,172	6,604,752	4,853,737	8.0005	38,832,323	0	0	1.0000	0	15,262,516	11,216,203	158,931,496
2092	9,539,848	7,010,696	19.6407	137,694,984	9,197,938	6,759,432	8.2285	55,619,986	0	0	1.0000	0	18,737,786	13,770,128	193,314,969
2093	10,167,139	7,471,683	20.4361	152,692,070	11,132,877	8,181,391	8.4630	69,239,109	0	0	1.0000	0	21,300,016	15,653,074	221,931,179
2094	8,873,389	6,520,925	21.2638	138,659,650	7,251,627	5,329,116	8.7042	46,385,693	0	0	1.0000	0	16,125,016	11,850,041	185,045,343
2095	31,288,861	22,993,731	22.1250	508,736,309	83,569,860	61,414,281	8.9523	549,799,071	0	0	1.0000	0	114,858,721	84,408,013	1,058,535,380
2096	10,402,348	7,644,535	23.0210	175,984,843	11,785,438	8,660,948	9.2075	79,745,681	0	0	1.0000	0	22,187,786	16,305,483	255,730,524
2097	7,147,972	5,252,941	23.9534	125,825,803	2,075,375	1,525,163	9.4699	14,443,145	0	0	1.0000	0	9,223,347	6,778,105	140,268,948
2098	7,147,972	5,252,941	24.9235	130,921,681	2,075,375	1,525,163	9.7398	14,854,786	0	0	1.0000	0	9,223,347	6,778,105	145,776,468
2099	7,147,972	5,252,941	25.9329	136,224,000	2,075,375	1,525,163	10.0173	15,278,019	0	0	1.0000	0	9,223,347	6,778,105	151,502,020
2100	7,147,972	5,252,941	26.9832	141,741,164	2,075,375	1,525,163	10.3028	15,713,453	0	0	1.0000	0	9,223,347	6,778,105	157,454,618
2101	7,147,972	5,252,941	28.0760	147,481,579	2,075,375	1,525,163	10.5965	16,161,394	0	0	1.0000	0	9,223,347	6,778,105	163,642,973
2102	7,147,972	5,252,941	29.2131	153,454,698	2,075,375	1,525,163	10.8985	16,621,993	0	0	1.0000	0	9,223,347	6,778,105	170,076,691
2103	7,147,972	5,252,941	30.3962	159,669,453	2,075,375	1,525,163	11.2091	17,095,709	0	0	1.0000	0	9,223,347	6,778,105	176,765,162
2104	7,167,556	5,267,333	31.6272	166,591,002	2,081,061	1,529,342	11.5285	17,631,018	0	0	1.0000	0	9,248,617	6,796,675	184,222,021
2105	7,147,972	5,252,941	32.9081	172,864,316	2,075,375	1,525,163	11.8571	18,084,015	0	0	1.0000	0	9,223,347	6,778,105	190,948,331
2106	7,147,972	5,252,941	34.2409	179,865,436	2,075,375	1,525,163	12.1950	18,599,368	0	0	1.0000	0	9,223,347	6,778,105	198,464,804
2107	7,147,972	5,252,941	35.6277	187,150,215	2,075,375	1,525,163	12.5426	19,129,514	0	0	1.0000	0	9,223,347	6,778,105	206,279,730
2108	13,263,941	9,747,478	37.0706	361,344,874	20,370,216	14,969,777	12.9000	193,110,129	0	0	1.0000	0	33,634,157	24,717,256	554,455,003
2109	7,147,972	5,252,941	38.5720	202,616,450	2,075,375	1,525,163	13.2677	20,235,410	0	0	1.0000	0	9,223,347	6,778,105	222,851,861
2110	7,147,972	5,252,941	40.1341	210,822,070	2,075,375	1,525,163	13.6458	20,812,075	0	0	1.0000	0	9,223,347	6,778,105	231,634,144
2111	7,147,972	5,252,941	41.7596	219,360,726	2,075,375	1,525,163	14.0347	21,405,211	0	0	1.0000	0	9,223,347	6,778,105	240,765,936
2112	7,167,556	5,267,333	43.4508	228,869,844	2,081,061	1,529,342	14.4347	22,075,592	0	0	1.0000	0	9,248,617	6,796,675	250,945,436
2113	7,147,972	5,252,941	45.2106	237,488,626	11,274,281	8,285,306	14.8461	123,004,487	0	0	1.0000	0	18,422,253	13,538,248	360,493,113
2114	7,147,972	5,252,941	47.0416	247,106,761	2,075,375	1,525,163	15.2692	23,288,025	0	0	1.0000	0	9,223,347	6,778,105	270,394,786
2115	7,147,972	5,252,941	48.9468	257,114,665	2,075,375	1,525,163	15.7044	23,951,776	0	0	1.0000	0	9,223,347	6,778,105	281,066,441
2116	10,825,387	7,955,420	50.9291	405,162,399	13,054,554	9,593,603	16.1520	154,955,880	0	0	1.0000	0	23,879,941	17,549,024	560,118,279
2117	7,147,972	5,252,941	52.9918	278,362,812	2,075,375	1,525,163	16.6123	25,336,472	0	0	1.0000	0	9,223,347	6,778,105	303,699,284
2118	14,921,796	10,965,812	55.1379	604,631,851	29,162,169	21,430,856	17.0857	366,161,179	0	0	1.0000	0	44,083,965	32,396,668	970,793,029
2119	6,482,543	4,763,927	57.3710	273,311,262	3,844,412	2,825,203	17.5727	49,646,438	0	0	1.0000	0	10,326,955	7,589,130	322,957,700
2120	6,403,045	4,705,505	59.6946	280,893,249	3,563,167	2,618,520	18.0735	47,325,815	0	0	1.0000	0	9,966,212	7,324,025	328,219,064
2121	6,386,857	4,693,609	62.1122	291,530,372	3,557,353	2,614,247	18.5886	48,595,194	0	0	1.0000	0	9,944,210	7,307,856	340,125,566
2122	6,386,857	4,693,609	64.6277	303,337,145	3,557,353	2,614,247	19.1184	49,980,222	0	0	1.0000	0	9,944,210	7,307,856	353,317,367
2123	6,482,543	4,763,927	67.2451	320,350,755	3,844,412	2,825,203	19.6633	55,552,807	0	0	1.0000	0	10,326,955	7,589,130	375,903,562
2124	6,403,045	4,705,505	69.9686	329,237,609	3,563,167	2,618,520	20.2237	52,956,156	0	0	1.0000	0	9,966,212	7,324,025	382,193,765
2125	6,386,857	4,693,609	72.8023	341,705,519	3,557,353	2,614,247	20.8000	54,376,340	0	0	1.0000	0	9,944,210	7,307,856	396,081,860
2126	6,386,857	4,693,609	75.7508	355,544,625	3,557,353	2,614,247	21.3928	55,926,066	0	0	1.0000	0	9,944,210	7,307,856	411,470,691
2127	6,482,543	4,763,927	78.8187	375,486,541	3,844,412	2,825,203	22.0025	62,161,521	0	0	1.0000	0	10,326,955	7,589,130	437,648,062
2128	7,066,689	5,193,208	82.0109	425,899,625	5,554,101	4,081,628	22.6296	92,365,615	0	0	1.0000	0	12,620,790	9,274,836	518,265,240
2129	6,386,857	4,693,609	85.3323	400,516,438	3,557,353	2,614,247	23.2745	60,845,295	0	0	1.0000	0	9,944,210	7,307,856	461,361,733
2130	6,099,798	4,482,653	88.7883	398,007,170	2,696,175	1,981,380	23.9379	47,430,073	0	0	1.0000	0	8,795,673	6,464,033	445,437,243
2131	2,028,079	1,490,406	92.3842	137,689,966	5,022,573	3,691,016	24.6201	90,873,191	0	0	1.0000	0	7,050,652	5,181,422	228,563,157
	\$1,309,028,449	\$961,986,078		\$13,824,906,481	\$1,110,107,131	\$815,801,677		\$4,468,161,723	\$0	\$0		\$0	\$2,419,135,581	\$1,777,787,755	\$18,293,068,204

AMOUNT TO RECOVER

LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in	
Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in				
Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s				Nominal \$
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2033	\$22,324,352	\$16,405,843	1.8874	\$30,964,388	\$9,448,311	\$6,943,427	1.5677	\$10,885,211	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,022,663	\$24,267,877	\$42,768,206
2034	\$63,582,247	\$46,725,674	1.9639	\$91,764,550	\$32,971,808	\$24,230,505	1.6124	\$39,069,266	\$1,250,000	\$918,607	1.0000	\$918,607	\$97,804,054	\$71,874,785	\$131,752,423
2035	\$65,877,290	\$48,412,268	2.0434	\$98,925,629	\$81,239,936	\$59,702,054	1.6584	\$99,009,886	\$1,250,000	\$918,607	1.0000	\$918,607	\$148,367,226	\$109,032,929	\$198,854,122
2036	\$57,759,315	\$42,446,486	2.1262	\$90,249,718	\$65,595,018	\$48,204,830	1.7056	\$82,218,158	\$1,250,000	\$918,607	1.0000	\$918,607	\$124,604,333	\$91,569,923	\$173,386,483
2037	\$39,808,345	\$29,254,577	2.2123	\$64,719,901	\$41,981,870	\$30,851,869	1.7542	\$54,120,349	\$1,250,000	\$918,607	1.0000	\$918,607	\$83,040,216	\$61,025,054	\$119,758,858
2038	\$13,207,909	\$9,706,302	2.3019	\$22,342,936	\$18,994,690	\$13,958,923	1.8042	\$25,184,688	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,452,599	\$24,583,831	\$48,446,231
2039	\$35,713,289	\$26,245,180	2.3951	\$62,859,831	\$75,509,036	\$55,490,499	1.8556	\$102,968,170	\$1,250,000	\$918,607	1.0000	\$918,607	\$112,472,326	\$82,654,286	\$166,746,607
2040	\$31,919,562	\$23,457,225	2.4921	\$58,457,750	\$13,365,605	\$9,822,190	1.9085	\$18,745,649	\$1,250,000	\$918,607	1.0000	\$918,607	\$46,535,167	\$34,198,022	\$78,122,006
2041	\$19,624,628	\$14,421,855	2.5930	\$37,395,870	\$9,445,873	\$6,941,635	1.9629	\$13,625,736	\$1,250,000	\$918,607	1.0000	\$918,607	\$30,320,500	\$22,282,097	\$51,940,213
2042	\$14,863,703	\$10,923,120	2.6981	\$29,471,671	\$11,668,700	\$8,575,159	2.0189	\$17,312,388	\$1,250,000	\$918,607	1.0000	\$918,607	\$27,782,403	\$20,416,886	\$47,702,666
2043	\$8,912,167	\$6,549,423	2.8073	\$18,386,194	\$6,470,357	\$4,754,972	2.0764	\$9,873,223	\$1,250,000	\$918,607	1.0000	\$918,607	\$16,632,524	\$12,223,001	\$29,178,024
2044	\$3,676,270	\$2,701,638	2.9210	\$7,891,484	\$1,896,910	\$1,394,012	2.1356	\$2,977,052	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,823,180	\$5,014,256	\$11,787,142
2045	\$5,973,091	\$4,389,538	3.0393	\$13,341,123	\$8,808,910	\$6,473,541	2.1964	\$14,218,485	\$1,250,000	\$918,607	1.0000	\$918,607	\$16,032,001	\$11,781,686	\$28,478,215
2046	\$5,204,136	\$3,824,444	3.1624	\$12,094,423	\$6,502,044	\$4,778,258	2.2590	\$10,794,085	\$1,250,000	\$918,607	1.0000	\$918,607	\$12,956,180	\$9,521,309	\$23,807,115
2047	\$5,204,136	\$3,824,444	3.2905	\$12,584,334	\$6,502,044	\$4,778,258	2.3234	\$11,101,805	\$1,250,000	\$918,607	1.0000	\$918,607	\$12,956,180	\$9,521,309	\$24,604,746
2048	\$3,676,270	\$2,701,638	3.4238	\$9,249,867	\$1,896,910	\$1,394,012	2.3896	\$3,331,131	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,823,180	\$5,014,256	\$13,499,605
2049	\$5,204,136	\$3,824,444	3.5624	\$13,624,200	\$6,502,044	\$4,778,258	2.4577	\$11,743,525	\$1,250,000	\$918,607	1.0000	\$918,607	\$12,956,180	\$9,521,309	\$26,286,332
2050	\$5,973,091	\$4,389,538	3.7067	\$16,270,701	\$8,808,910	\$6,473,541	2.5278	\$16,363,816	\$1,250,000	\$918,607	1.0000	\$918,607	\$16,032,001	\$11,781,686	\$33,553,124
2051	\$5,779,136	\$4,247,003	3.8568	\$16,379,843	\$8,227,044	\$6,045,936	2.5998	\$15,718,224	\$1,250,000	\$918,607	1.0000	\$918,607	\$15,256,180	\$11,211,546	\$33,016,674
2052	\$5,983,136	\$4,396,920	4.0130	\$17,644,840	\$8,817,508	\$6,479,859	2.6739	\$17,326,496	\$1,250,000	\$918,607	1.0000	\$918,607	\$16,050,644	\$11,795,386	\$35,889,943
2053	\$3,666,225	\$2,694,256	4.1756	\$11,250,134	\$1,888,312	\$1,387,693	2.7501	\$3,816,295	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$15,985,036
2054	\$3,666,225	\$2,694,256	4.3447	\$11,705,733	\$1,888,312	\$1,387,693	2.8285	\$3,925,090	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$16,549,430
2055	\$5,973,091	\$4,389,538	4.5206	\$19,843,346	\$8,808,910	\$6,473,541	2.9091	\$18,832,177	\$1,250,000	\$918,607	1.0000	\$918,607	\$16,032,001	\$11,781,686	\$39,594,130
2056	\$5,214,180	\$3,831,825	4.7037	\$18,023,758	\$6,510,642	\$4,784,577	2.9920	\$14,315,454	\$1,250,000	\$918,607	1.0000	\$918,607	\$12,974,822	\$9,535,009	\$33,257,818
2057	\$5,204,136	\$3,824,444	4.8942	\$18,717,595	\$6,502,044	\$4,778,258	3.0773	\$14,704,134	\$1,250,000	\$918,607	1.0000	\$918,607	\$12,956,180	\$9,521,309	\$34,340,336
2058	\$3,666,225	\$2,694,256	5.0924	\$13,720,228	\$1,888,312	\$1,387,693	3.1650	\$4,392,049	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$19,030,884
2059	\$5,010,180	\$3,681,909	5.2987	\$19,509,330	\$5,920,178	\$4,350,653	3.2552	\$14,162,246	\$1,250,000	\$918,607	1.0000	\$918,607	\$12,180,358	\$8,951,169	\$34,590,184
2060	\$5,214,180	\$3,831,825	5.5133	\$21,126,003	\$6,510,642	\$4,784,577	3.3480	\$16,018,763	\$1,250,000	\$918,607	1.0000	\$918,607	\$12,974,822	\$9,535,009	\$38,063,373
2061	\$5,204,136	\$3,824,444	5.7366	\$21,939,307	\$6,502,044	\$4,778,258	3.4434	\$16,453,454	\$1,250,000	\$918,607	1.0000	\$918,607	\$12,956,180	\$9,521,309	\$39,311,368
2062	\$3,666,225	\$2,694,256	5.9689	\$16,081,743	\$1,888,312	\$1,387,693	3.5415	\$4,914,516	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$21,914,866
2063	\$8,279,957	\$6,084,821	6.2106	\$37,790,387	\$15,729,508	\$11,559,388	3.6425	\$42,105,071	\$1,250,000	\$918,607	1.0000	\$918,607	\$25,259,465	\$18,562,816	\$80,814,065
2064	\$6,558,136	\$4,819,479	6.4622	\$31,144,439	\$10,542,508	\$7,747,537	3.7463	\$29,024,597	\$1,250,000	\$918,607	1.0000	\$918,607	\$18,350,644	\$13,485,623	\$61,087,643
2065	\$5,204,136	\$3,824,444	6.7239	\$25,715,181	\$6,502,044	\$4,778,258	3.8531	\$18,411,107	\$1,250,000	\$918,607	1.0000	\$918,607	\$12,956,180	\$9,521,309	\$45,044,894
2066	\$3,666,225	\$2,694,256	6.9962	\$18,849,552	\$1,888,312	\$1,387,693	3.9629	\$5,499,289	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$25,267,448
2067	\$3,666,225	\$2,694,256	7.2795	\$19,612,835	\$1,888,312	\$1,387,693	4.0758	\$5,655,960	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$26,187,402
2068	\$6,752,091	\$4,962,014	7.5744	\$37,584,279	\$11,124,374	\$8,175,142	4.1920	\$34,270,194	\$1,250,000	\$918,607	1.0000	\$918,607	\$19,126,465	\$14,055,763	\$72,773,080
2069	\$5,973,091	\$4,389,538	7.8811	\$34,594,389	\$8,808,910	\$6,473,541	4.3115	\$27,910,670	\$1,250,000	\$918,607	1.0000	\$918,607	\$16,032,001	\$11,781,686	\$63,423,667
2070	\$3,666,225	\$2,694,256	8.2003	\$22,093,705	\$1,888,312	\$1,387,693	4.4343	\$6,153,448	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$29,165,760
2071	\$3,666,225	\$2,694,256	8.5324	\$22,988,468	\$1,888,312	\$1,387,693	4.5607	\$6,328,853	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$30,235,927
2072	\$7,327,091	\$5,384,573	8.8780	\$47,804,241	\$12,849,374	\$9,442,819	4.6907	\$44,293,432	\$1,250,000	\$918,607	1.0000	\$918,607	\$21,426,465	\$15,745,999	\$93,016,280
2073	\$3,666,225	\$2,694,256	9.2375	\$24,888,187	\$1,888,312	\$1,387,693	4.8244	\$6,694,787	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$32,501,581
2074	\$3,666,225	\$2,694,256	9.6117	\$25,896,378	\$1,888,312	\$1,387,693	4.9619	\$6,885,595	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$33,700,580
2075	\$7,842,824	\$5,763,578	10.0009	\$57,640,967	\$14,418,110	\$10,595,661	5.1033	\$54,072,835	\$1,250,000	\$918,607	1.0000	\$918,607	\$23,510,934	\$17,277,845	\$112,632,408
2076	\$3,676,270	\$2,701,638	10.4060	\$28,113,241	\$1,896,910	\$1,394,012	5.2487	\$7,316,750	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,823,180	\$5,014,256	\$36,348,598
2077	\$3,666,225	\$2,694,256	10.8274	\$29,171,785	\$1,888,312	\$1,387,693	5.3983	\$7,491,184	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000,556	\$37,581,576
2078	\$7,511,002	\$5,519,727	11.2659	\$62,184,690	\$13,422,642	\$9,864,106	5.5522	\$54,767,487	\$1,250,000	\$918,607	1.0000	\$918,607	\$22,183,644	\$16,302,439	\$117,870,783
2079	\$3,666,225	\$2,694,256	11.7222	\$31,582,605	\$1,888,312	\$1,387,693	5.7104	\$7,924,283	\$1,250,000	\$918,607	1.0000	\$918,607	\$6,804,537	\$5,000	

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2088	3,676,270	2,701,638	16.7567	45,270,532	1,896,910	1,394,012	7.3537	10,251,145	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	56,440,284
2089	26,815,724	19,706,488	17.4353	343,588,526	73,271,240	53,845,975	7.5633	407,253,263	1,250,000	918,607	1.0000	918,607	101,336,964	74,471,070	751,760,396
2090	3,666,225	2,694,256	18.1415	48,877,840	1,888,312	1,387,693	7.7788	10,794,588	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	60,591,035
2091	3,666,225	2,694,256	18.8762	50,857,310	1,888,312	1,387,693	8.0005	11,102,240	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	62,878,157
2092	3,676,270	2,701,638	19.6407	53,062,055	1,896,910	1,394,012	8.2285	11,470,627	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	65,451,288
2093	3,050,095	2,241,471	20.4361	45,806,920	1,970,565	1,448,140	8.4630	12,255,605	1,250,000	918,607	1.0000	918,607	6,270,660	4,608,217	58,981,132
2094	3,145,781	2,311,789	21.2638	49,157,418	2,257,624	1,659,095	8.7042	14,441,095	1,250,000	918,607	1.0000	918,607	6,653,405	4,889,491	64,517,121
2095	5,452,647	4,007,071	22.1250	88,656,455	9,178,222	6,744,942	8.9523	60,382,748	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	149,957,811
2096	4,739,629	3,483,085	23.0210	80,184,095	7,022,923	5,161,044	9.2075	47,520,316	1,250,000	918,607	1.0000	918,607	13,012,552	9,562,736	128,623,019
2097	4,635,849	3,406,818	23.9534	81,604,884	6,727,827	4,944,183	9.4699	46,820,915	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	129,344,406
2098	3,241,467	2,382,107	24.9235	59,370,449	2,544,683	1,870,051	9.7398	18,213,919	1,250,000	918,607	1.0000	918,607	7,036,150	5,170,765	78,502,975
2099	3,097,938	2,276,630	25.9329	59,039,614	2,114,095	1,553,618	10.0173	15,563,055	1,250,000	918,607	1.0000	918,607	6,462,033	4,748,854	75,521,275
2100	5,356,961	3,936,753	26.9832	106,226,198	8,891,163	6,533,987	10.3028	67,318,361	1,250,000	918,607	1.0000	918,607	15,498,124	11,389,347	174,463,166
2101	5,452,647	4,007,071	28.0760	112,502,537	9,178,222	6,744,942	10.5965	71,472,783	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	184,893,927
2102	5,452,647	4,007,071	29.2131	117,058,978	9,178,222	6,744,942	10.8985	73,509,756	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	191,487,341
2103	3,097,938	2,276,630	30.3962	69,200,896	2,114,095	1,553,618	11.2091	17,414,656	1,250,000	918,607	1.0000	918,607	6,462,033	4,748,854	87,534,159
2104	3,153,875	2,317,737	31.6272	73,303,536	2,265,661	1,665,001	11.5285	19,194,968	1,250,000	918,607	1.0000	918,607	6,669,536	4,901,345	93,417,111
2105	5,452,647	4,007,071	32.9081	131,865,107	9,178,222	6,744,942	11.8571	79,975,457	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	212,759,172
2106	4,635,849	3,406,818	34.2409	116,652,528	6,727,827	4,944,183	12.1950	60,294,307	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	177,865,442
2107	4,683,692	3,441,978	35.6277	122,629,742	6,871,356	5,049,660	12.5426	63,335,866	1,250,000	918,607	1.0000	918,607	12,805,048	9,410,244	186,884,215
2108	3,153,875	2,317,737	37.0706	85,919,906	2,265,661	1,665,001	12.9000	21,478,518	1,250,000	918,607	1.0000	918,607	6,669,536	4,901,345	108,317,031
2109	4,635,849	3,406,818	38.5720	131,407,799	6,727,827	4,944,183	13.2677	65,597,932	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	197,924,338
2110	4,676,515	3,436,703	40.1341	137,928,992	6,849,827	5,033,839	13.6458	68,690,756	1,250,000	918,607	1.0000	918,607	12,776,342	9,389,149	207,538,354
2111	4,669,339	3,431,430	41.7596	143,295,132	6,828,297	5,018,017	14.0347	70,426,357	1,250,000	918,607	1.0000	918,607	12,747,636	9,368,053	214,640,096
2112	3,139,522	2,307,189	43.4508	100,249,222	2,222,602	1,633,358	14.4347	23,577,032	1,250,000	918,607	1.0000	918,607	6,612,124	4,859,154	124,744,860
2113	7,745,160	5,691,806	45.2106	257,329,968	16,055,761	11,799,146	14.8461	175,171,308	1,250,000	918,607	1.0000	918,607	25,050,921	18,409,559	433,419,883
2114	6,207,249	4,561,618	47.0416	214,585,787	11,442,029	8,408,581	15.2692	128,392,313	1,250,000	918,607	1.0000	918,607	18,899,278	13,888,806	343,896,707
2115	5,001,161	3,675,281	48.9468	179,893,239	7,823,765	5,749,572	15.7044	90,293,572	1,250,000	918,607	1.0000	918,607	14,074,926	10,343,459	271,105,418
2116	3,139,522	2,307,189	50.9291	117,503,075	13,878,680	10,199,241	16.1520	164,738,142	1,250,000	918,607	1.0000	918,607	18,268,202	13,425,037	283,159,824
2117	3,127,840	2,298,604	52.9918	121,807,184	2,203,801	1,619,541	16.6123	26,904,307	1,250,000	918,607	1.0000	918,607	6,581,641	4,836,753	149,630,097
2118	1,058,128	777,603	55.1379	42,875,395	2,284,593	1,678,914	17.0857	28,685,429	0	0	1.0000	0	3,342,721	2,456,517	71,560,824
	\$740,716,704	\$544,341,994		\$5,178,979,867	\$854,501,635	\$627,960,894		\$3,154,984,274	\$106,250,000	\$78,081,589		\$78,081,589	\$1,701,468,338	\$1,250,384,477	\$8,412,045,730

Proposed

AMOUNT TO RECOVER

LABOR				NON-LABOR				PHIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional	
Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in	
Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Future \$'s	
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2034	\$7,760,265	\$5,702,906	1.9639	\$11,199,938	\$4,479,535	\$3,291,946	1.6124	\$5,307,933	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459	\$17,426,478
2035	46,911,429	34,474,531	2.0434	70,445,256	35,601,339	26,162,909	1.6584	43,388,568	1,250,000	918,607	1.0000	918,607	83,762,768	61,556,047	114,752,431
2036	67,514,041	49,615,092	2.1262	105,491,609	86,298,834	63,419,765	1.7056	108,168,751	1,250,000	918,607	1.0000	918,607	155,062,874	113,953,464	214,578,967
2037	72,593,441	53,347,870	2.2123	118,021,492	75,650,363	55,594,358	1.7542	97,523,623	1,250,000	918,607	1.0000	918,607	149,493,804	109,860,835	216,463,722
2038	46,603,525	34,248,257	2.3019	78,836,063	42,782,150	31,439,983	1.8042	56,724,017	1,250,000	918,607	1.0000	918,607	90,635,675	66,606,847	136,478,687
2039	40,341,063	29,646,064	2.3951	71,005,287	76,484,927	56,207,667	1.8556	104,298,947	1,250,000	918,607	1.0000	918,607	118,075,990	86,772,338	176,222,841
2040	37,417,178	27,497,343	2.4921	68,526,129	14,193,500	10,430,598	1.9085	19,906,796	1,250,000	918,607	1.0000	918,607	52,860,678	38,846,548	89,351,532
2041	23,380,886	17,182,275	2.5930	44,553,639	13,070,130	9,605,049	1.9629	18,853,752	1,250,000	918,607	1.0000	918,607	37,701,016	27,705,931	64,325,998
2042	16,738,669	12,301,006	2.6981	33,189,343	17,178,640	12,624,334	2.0189	25,487,268	1,250,000	918,607	1.0000	918,607	35,167,309	25,843,947	59,595,219
2043	9,790,576	7,194,952	2.8073	20,198,390	9,051,726	6,651,983	2.0764	13,812,177	1,250,000	918,607	1.0000	918,607	20,092,302	14,765,542	34,929,174
2044	3,676,270	2,701,638	2.9210	7,891,484	1,896,910	1,394,012	2.1356	2,977,052	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	11,787,142
2045	5,973,091	4,389,538	3.0393	13,341,123	8,808,910	6,473,541	2.1964	14,218,485	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	28,478,215
2046	5,204,136	3,824,444	3.1624	12,094,423	6,502,044	4,778,258	2.2590	10,794,085	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	23,807,115
2047	5,204,136	3,824,444	3.2905	12,584,334	6,502,044	4,778,258	2.3234	11,101,805	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	24,604,746
2048	3,676,270	2,701,638	3.4238	9,249,867	1,896,910	1,394,012	2.3896	3,331,131	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	13,499,605
2049	5,204,136	3,824,444	3.5624	13,624,200	6,502,044	4,778,258	2.4577	11,743,525	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	26,286,332
2050	5,973,091	4,389,538	3.7067	16,270,701	8,808,910	6,473,541	2.5278	16,363,816	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	33,553,124
2051	5,779,136	4,247,003	3.8568	16,379,843	8,227,044	6,045,936	2.5998	15,718,224	1,250,000	918,607	1.0000	918,607	15,256,180	11,211,546	33,016,674
2052	5,983,136	4,396,920	4.0130	17,644,840	8,817,508	6,479,859	2.6739	17,326,496	1,250,000	918,607	1.0000	918,607	16,050,444	11,795,386	35,889,943
2053	3,666,225	2,694,256	4.1756	11,250,134	1,888,312	1,387,693	2.7501	3,816,295	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	15,985,036
2054	3,666,225	2,694,256	4.3447	11,705,733	1,888,312	1,387,693	2.8285	3,925,090	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	16,549,430
2055	5,973,091	4,389,538	4.5206	19,843,346	8,808,910	6,473,541	2.9091	18,832,177	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	39,594,130
2056	5,214,180	3,831,825	4.7037	18,023,758	6,510,642	4,784,577	2.9920	14,315,454	1,250,000	918,607	1.0000	918,607	12,974,822	9,535,009	33,257,818
2057	5,204,136	3,824,444	4.8942	18,717,595	6,502,044	4,778,258	3.0773	14,704,134	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	34,340,336
2058	3,666,225	2,694,256	5.0924	13,720,228	1,888,312	1,387,693	3.1650	4,392,049	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	19,030,884
2059	5,010,180	3,681,909	5.2987	19,509,330	5,920,178	4,350,653	3.2552	14,162,246	1,250,000	918,607	1.0000	918,607	12,180,358	8,951,169	34,590,184
2060	5,214,180	3,831,825	5.5133	21,126,003	6,510,642	4,784,577	3.3480	16,018,763	1,250,000	918,607	1.0000	918,607	12,974,822	9,535,009	38,063,373
2061	5,204,136	3,824,444	5.7366	21,939,307	6,502,044	4,778,258	3.4434	16,453,454	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	39,311,368
2062	3,666,225	2,694,256	5.9689	16,081,743	1,888,312	1,387,693	3.5415	4,914,516	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	21,914,866
2063	8,279,957	6,084,821	6.2106	37,790,387	15,729,508	11,559,388	3.6425	42,105,071	1,250,000	918,607	1.0000	918,607	25,259,465	18,562,816	80,814,065
2064	6,558,136	4,819,479	6.4622	31,144,439	10,542,508	7,747,537	3.7463	29,024,597	1,250,000	918,607	1.0000	918,607	18,350,444	13,485,623	61,087,643
2065	5,204,136	3,824,444	6.7239	25,715,181	6,502,044	4,778,258	3.8531	18,411,107	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	45,044,894
2066	3,666,225	2,694,256	6.9962	18,849,552	1,888,312	1,387,693	3.9629	5,499,289	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	25,267,448
2067	3,666,225	2,694,256	7.2795	19,612,835	1,888,312	1,387,693	4.0758	5,655,960	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	26,187,402
2068	6,752,091	4,962,014	7.5744	37,584,279	11,124,374	8,175,142	4.1920	34,270,194	1,250,000	918,607	1.0000	918,607	19,126,465	14,055,763	72,773,080
2069	5,973,091	4,389,538	7.8811	34,594,389	8,808,910	6,473,541	4.3115	27,910,670	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	63,423,667
2070	3,666,225	2,694,256	8.2003	22,093,705	1,888,312	1,387,693	4.4343	6,153,448	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	29,165,760
2071	3,666,225	2,694,256	8.5324	22,988,468	1,888,312	1,387,693	4.5607	6,328,853	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	30,235,927
2072	7,327,091	5,384,573	8.8780	47,804,241	12,849,374	9,442,819	4.6907	44,293,432	1,250,000	918,607	1.0000	918,607	21,426,465	15,745,999	93,016,280
2073	3,666,225	2,694,256	9.2375	24,888,187	1,888,312	1,387,693	4.8244	6,694,787	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	32,501,581
2074	3,666,225	2,694,256	9.6117	25,896,378	1,888,312	1,387,693	4.9619	6,885,595	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	33,700,580
2075	7,842,824	5,763,578	10.0009	57,640,967	14,418,110	10,595,661	5.1033	54,072,835	1,250,000	918,607	1.0000	918,607	23,510,934	17,277,845	112,632,408
2076	3,676,270	2,701,638	10.4060	28,113,241	1,896,910	1,394,012	5.2487	7,316,750	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	36,348,598
2077	3,666,225	2,694,256	10.8274	29,171,785	1,888,312	1,387,693	5.3983	7,491,184	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	37,581,576
2078	7,511,002	5,519,727	11.2659	62,184,690	13,422,642	9,864,106	5.5522	54,767,487	1,250,000	918,607	1.0000	918,607	22,183,644	16,302,439	117,870,783
2079	3,666,225	2,694,256	11.7222	31,582,605	1,888,312	1,387,693	5.7104	7,924,283	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	40,425,495
2080	3,676,270	2,701,638	12.1970	32,951,875	1,896,910	1,394,012	5.8731	8,187,171	1,250,000	918,607	1.0000	918,607	6,823,180</		

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2089	26,815,724	19,706,488	17.4353	343,588,526	71,336,809	52,424,389	7.5633	396,501,384	1,250,000	918,607	1.0000	918,607	99,402,533	73,049,484	741,008,517
2090	3,666,225	2,694,256	18.1415	48,877,840	3,822,743	2,809,279	7.7788	21,852,819	1,250,000	918,607	1.0000	918,607	8,738,968	6,422,142	71,649,266
2091	3,666,225	2,694,256	18.8762	50,857,310	1,888,312	1,387,693	8.0005	11,102,240	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	62,878,157
2092	3,676,270	2,701,638	19.6407	53,062,055	1,896,910	1,394,012	8.2285	11,470,627	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	65,451,288
2093	3,050,095	2,241,471	20.4361	45,806,920	1,970,568	1,448,142	8.4630	12,255,624	1,250,000	918,607	1.0000	918,607	6,270,663	4,608,219	58,981,150
2094	3,145,781	2,311,789	21.2638	49,157,418	2,257,624	1,659,095	8.7042	14,441,095	1,250,000	918,607	1.0000	918,607	6,653,405	4,889,491	64,517,121
2095	5,452,647	4,007,071	22.1250	88,656,455	9,178,222	6,744,942	8.9523	60,382,748	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	149,957,811
2096	4,739,629	3,483,085	23.0210	80,184,095	7,022,923	5,161,044	9.2075	47,520,316	1,250,000	918,607	1.0000	918,607	13,012,552	9,562,736	128,623,019
2097	4,635,849	3,406,818	23.9534	81,604,884	6,727,827	4,944,183	9.4699	46,820,915	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	129,344,406
2098	3,241,467	2,382,107	24.9235	59,370,449	2,544,683	1,870,051	9.7398	18,213,919	1,250,000	918,607	1.0000	918,607	7,036,150	5,170,765	78,502,975
2099	3,097,938	2,276,630	25.9329	59,039,614	2,114,095	1,553,618	10.0173	15,563,055	1,250,000	918,607	1.0000	918,607	6,462,033	4,748,854	75,521,275
2100	5,356,961	3,936,753	26.9832	106,226,198	8,891,163	6,533,987	10.3028	67,318,361	1,250,000	918,607	1.0000	918,607	15,498,124	11,389,347	174,463,166
2101	5,452,647	4,007,071	28.0760	112,502,537	9,178,222	6,744,942	10.5965	71,472,783	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	184,893,927
2102	5,452,647	4,007,071	29.2131	117,058,978	9,178,222	6,744,942	10.8985	73,509,756	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	191,487,341
2103	3,097,938	2,276,630	30.3962	69,200,896	2,114,095	1,553,618	11.2091	17,414,656	1,250,000	918,607	1.0000	918,607	6,462,033	4,748,854	87,534,159
2104	3,153,875	2,317,737	31.6272	73,303,536	2,265,661	1,665,001	11.5285	19,194,968	1,250,000	918,607	1.0000	918,607	6,669,536	4,901,345	93,417,111
2105	5,452,647	4,007,071	32.9081	131,865,107	9,178,222	6,744,942	11.8571	79,975,457	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	212,759,172
2106	4,635,849	3,406,818	34.2409	116,652,528	6,727,827	4,944,183	12.1950	60,294,307	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	177,865,442
2107	4,683,692	3,441,978	35.6277	122,629,742	6,871,356	5,049,660	12.5426	63,335,866	1,250,000	918,607	1.0000	918,607	12,805,048	9,410,244	186,884,215
2108	3,153,875	2,317,737	37.0706	85,919,906	2,265,661	1,665,001	12.9000	21,478,518	1,250,000	918,607	1.0000	918,607	6,669,536	4,901,345	108,317,031
2109	4,635,849	3,406,818	38.5720	131,407,799	6,727,827	4,944,183	13.2677	65,597,932	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	197,924,338
2110	4,676,515	3,436,703	40.1341	137,928,992	6,849,827	5,033,839	13.6458	68,690,756	1,250,000	918,607	1.0000	918,607	12,776,342	9,389,149	207,538,354
2111	4,669,339	3,431,430	41.7596	143,295,132	6,828,297	5,018,017	14.0347	70,426,357	1,250,000	918,607	1.0000	918,607	12,747,636	9,368,053	214,640,096
2112	3,139,522	2,307,189	43.4508	100,249,222	2,222,602	1,633,358	14.4347	23,577,032	1,250,000	918,607	1.0000	918,607	6,612,124	4,859,154	124,744,860
2113	7,745,160	5,691,806	45.2106	257,329,968	16,055,761	11,799,146	14.8461	175,171,308	1,250,000	918,607	1.0000	918,607	25,050,921	18,409,559	433,419,883
2114	6,207,249	4,561,618	47.0416	214,585,787	11,442,029	8,408,581	15.2692	128,392,313	1,250,000	918,607	1.0000	918,607	18,899,278	13,888,806	343,896,707
2115	5,001,161	3,675,281	48.9468	179,893,239	7,823,765	5,749,572	15.7044	90,293,572	1,250,000	918,607	1.0000	918,607	14,074,926	10,343,459	271,105,418
2116	3,139,522	2,307,189	50.9291	117,503,075	13,878,680	10,199,241	16.1520	164,738,142	1,250,000	918,607	1.0000	918,607	18,268,202	13,425,037	283,159,824
2117	3,127,840	2,298,604	52.9918	121,807,184	2,203,801	1,619,541	16.6123	26,904,307	1,250,000	918,607	1.0000	918,607	6,581,641	4,836,753	149,630,097
2118	1,058,128	777,603	55.1379	42,875,395	2,284,593	1,678,914	17.0857	28,685,429	0	-	1.0000	-	3,342,721	2,456,517	71,560,824
	\$736,174,967	\$541,004,338		\$5,194,908,576	\$862,601,579	\$633,913,426		\$3,175,749,753	\$105,000,000	\$77,162,982		\$77,162,982	\$1,703,776,546	\$1,252,080,745	\$8,447,821,310
	\$2,785,920,120	\$2,047,332,409		\$24,198,794,924	\$2,827,210,344	\$2,077,675,998		\$10,798,895,750	\$211,250,000	\$155,244,570		\$155,244,570	\$5,824,380,465	\$4,280,252,977	\$35,152,935,244

EXTERNAL FUND CALCULATION

Monticello

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,769,559	-	6,696,113	646,137,854
2018	646,137,854	32,837,549	-	13,392,226	692,367,629
2019	692,367,629	36,055,337	-	48,876,564	777,299,530
2020	777,299,530	40,327,412	-	48,876,564	866,503,505
2021	866,503,505	44,814,372	-	48,876,564	960,194,440
2022	960,194,440	49,527,026	-	48,876,564	1,058,598,030
2023	1,058,598,030	54,476,726	-	48,876,564	1,161,951,320
2024	1,161,951,320	59,675,397	-	48,876,564	1,270,503,281
2025	1,270,503,281	65,135,561	-	48,876,564	1,384,515,405
2026	1,384,515,405	70,870,370	-	48,876,564	1,504,262,339
2027	1,504,262,339	76,893,641	-	48,876,564	1,630,032,544
2028	1,630,032,544	83,219,883	-	48,876,564	1,762,128,990
2029	1,762,128,990	89,864,334	-	48,876,564	1,900,869,887
2030	1,900,869,887	91,929,613	(35,447,395)	36,657,423	1,994,009,528
2031	1,994,009,528	95,513,056	(139,568,856)	-	1,949,953,728
2032	1,949,953,728	93,402,784	(235,103,207)	-	1,808,253,305
2033	1,808,253,305	86,615,333	(224,495,047)	-	1,670,373,591
2034	1,670,373,591	80,010,895	(141,890,436)	-	1,608,494,050
2035	1,608,494,050	77,046,865	(268,360,596)	-	1,417,180,319
2036	1,417,180,319	67,882,937	(104,537,352)	-	1,380,525,905
2037	1,380,525,905	66,127,191	(74,807,128)	-	1,371,845,968
2038	1,371,845,968	65,711,422	(70,470,367)	-	1,367,087,023
2039	1,367,087,023	65,483,468	(15,508,490)	-	1,417,062,002
2040	1,417,062,002	67,877,270	(16,145,665)	-	1,468,793,607
2041	1,468,793,607	70,355,214	(16,718,034)	-	1,522,430,787
2042	1,522,430,787	72,924,435	(17,358,857)	-	1,577,996,364
2043	1,577,996,364	75,586,026	(18,023,610)	-	1,635,558,779
2044	1,635,558,779	78,343,266	(18,765,674)	-	1,695,136,371
2045	1,695,136,371	81,197,032	(19,432,530)	-	1,756,900,873
2046	1,756,900,873	84,155,552	(20,178,433)	-	1,820,877,992
2047	1,820,877,992	87,220,056	(20,953,473)	-	1,887,144,575
2048	1,887,144,575	90,394,225	(26,984,005)	-	1,950,554,795
2049	1,950,554,795	93,431,575	(22,594,805)	-	2,021,391,565
2050	2,021,391,565	96,824,656	(35,853,028)	-	2,082,363,193
2051	2,082,363,193	99,745,197	(37,157,503)	-	2,144,950,887
2052	2,144,950,887	102,743,147	(38,579,910)	-	2,209,114,125
2053	2,209,114,125	105,816,567	(39,915,373)	-	2,275,015,318
2054	2,275,015,318	108,973,234	(41,371,799)	-	2,342,616,752
2055	2,342,616,752	112,211,342	(42,882,168)	-	2,411,945,926
2056	2,411,945,926	115,532,210	(44,529,708)	-	2,482,948,428

EXTERNAL FUND CALCULATION

External Levelized

2057	2,482,948,428	118,933,230	(46,075,584)	-	2,555,806,073
2058	2,555,806,073	122,423,111	(113,115,965)	-	2,565,113,219
2059	2,565,113,219	122,868,923	(49,512,681)	-	2,638,469,461
2060	2,638,469,461	126,382,687	(51,421,830)	-	2,713,430,318
2061	2,713,430,318	129,973,312	(53,212,278)	-	2,790,191,353
2062	2,790,191,353	133,650,166	(55,166,430)	-	2,868,675,088
2063	2,868,675,088	137,409,537	(57,194,466)	-	2,948,890,159
2064	2,948,890,159	141,251,839	(59,407,738)	-	3,030,734,259
2065	3,030,734,259	145,172,171	(61,482,516)	-	3,114,423,914
2066	3,114,423,914	149,180,905	(114,512,212)	-	3,149,092,607
2067	3,149,092,607	150,841,536	(66,098,430)	-	3,233,835,713
2068	3,233,835,713	154,900,731	(195,052,653)	-	3,193,683,791
2069	3,193,683,791	152,977,454	(71,070,115)	-	3,275,591,130
2070	3,275,591,130	156,900,815	(73,697,053)	-	3,358,794,892
2071	3,358,794,892	160,886,275	(76,423,540)	-	3,443,257,628
2072	3,443,257,628	164,932,040	(79,400,766)	-	3,528,788,902
2073	3,528,788,902	169,028,988	(82,189,645)	-	3,615,628,246
2074	3,615,628,246	173,188,593	(85,237,868)	-	3,703,578,971
2075	3,703,578,971	177,401,433	(88,400,458)	-	3,792,579,945
2076	3,792,579,945	181,664,579	(91,855,321)	-	3,882,389,203
2077	3,882,389,203	185,966,443	(95,090,888)	-	3,973,264,758
2078	3,973,264,758	190,319,382	(98,627,820)	-	4,064,956,320
2079	4,064,956,320	194,711,408	(102,298,874)	-	4,157,368,854
2080	4,157,368,854	199,137,968	(106,309,556)	-	4,250,197,266
2081	4,250,197,266	203,584,449	(110,064,413)	-	4,343,717,302
2082	4,343,717,302	208,064,059	(114,170,534)	-	4,437,610,827
2083	4,437,610,827	212,561,559	(118,432,292)	-	4,531,740,094
2084	4,531,740,094	217,070,351	(123,090,567)	-	4,625,719,878
2085	4,625,719,878	221,571,982	(127,450,327)	-	4,719,841,533
2086	4,719,841,533	226,080,409	(132,217,906)	-	4,813,704,036
2087	4,813,704,036	230,576,423	(137,168,061)	-	4,907,112,398
2088	4,907,112,398	235,050,684	(161,510,305)	-	4,980,652,777
2089	4,980,652,777	238,573,268	(147,641,765)	-	5,071,584,280
2090	5,071,584,280	242,928,887	(153,180,919)	-	5,161,332,248
2091	5,161,332,248	247,227,815	(158,931,496)	-	5,249,628,567
2092	5,249,628,567	251,457,208	(193,314,969)	-	5,307,770,806
2093	5,307,770,806	254,242,222	(221,931,179)	-	5,340,081,849
2094	5,340,081,849	255,789,921	(185,045,343)	-	5,410,826,427
2095	5,410,826,427	259,178,586	(1,058,535,380)	-	4,611,469,633
2096	4,611,469,633	220,889,395	(255,730,524)	-	4,576,628,504
2097	4,576,628,504	219,220,505	(140,268,948)	-	4,655,580,062
2098	4,655,580,062	223,002,285	(145,776,468)	-	4,732,805,879
2099	4,732,805,879	226,701,402	(151,502,020)	-	4,808,005,261
2100	4,808,005,261	230,303,452	(157,454,618)	-	4,880,854,095
2101	4,880,854,095	233,792,911	(163,642,973)	-	4,951,004,033
2102	4,951,004,033	237,153,093	(170,076,691)	-	5,018,080,435

EXTERNAL FUND CALCULATION

2103	5,018,080,435	240,366,053	(176,765,162)	-	5,081,681,326
2104	5,081,681,326	243,412,535	(184,222,021)	-	5,140,871,840
2105	5,140,871,840	246,247,761	(190,948,331)	-	5,196,171,270
2106	5,196,171,270	248,896,604	(198,464,804)	-	5,246,603,070
2107	5,246,603,070	251,312,287	(206,279,730)	-	5,291,635,628
2108	5,291,635,628	253,469,347	(554,455,003)	-	4,990,649,971
2109	4,990,649,971	239,052,134	(222,851,861)	-	5,006,850,244
2110	5,006,850,244	239,828,127	(231,634,144)	-	5,015,044,227
2111	5,015,044,227	240,220,618	(240,765,936)	-	5,014,498,909
2112	5,014,498,909	240,194,498	(250,945,436)	-	5,003,747,971
2113	5,003,747,971	239,679,528	(360,493,113)	-	4,882,934,386
2114	4,882,934,386	233,892,557	(270,394,786)	-	4,846,432,156
2115	4,846,432,156	232,144,100	(281,066,441)	-	4,797,509,816
2116	4,797,509,816	229,800,720	(560,118,279)	-	4,467,192,257
2117	4,467,192,257	213,978,509	(303,699,284)	-	4,377,471,482
2118	4,377,471,482	209,680,884	(970,793,029)	-	3,616,359,336
2119	3,616,359,336	173,223,612	(322,957,700)	-	3,466,625,248
2120	3,466,625,248	166,051,349	(328,219,064)	-	3,304,457,533
2121	3,304,457,533	158,283,516	(340,125,566)	-	3,122,615,484
2122	3,122,615,484	149,573,282	(353,317,367)	-	2,918,871,398
2123	2,918,871,398	139,813,940	(375,903,562)	-	2,682,781,777
2124	2,682,781,777	128,505,247	(382,193,765)	-	2,429,093,258
2125	2,429,093,258	116,353,567	(396,081,860)	-	2,149,364,966
2126	2,149,364,966	102,954,582	(411,470,691)	-	1,840,848,856
2127	1,840,848,856	88,176,660	(437,648,062)	-	1,491,377,454
2128	1,491,377,454	71,436,980	(518,265,240)	-	1,044,549,194
2129	1,044,549,194	50,033,906	(461,361,733)	-	633,221,367
2130	633,221,367	30,331,303	(445,437,243)	-	218,115,428
2131	218,115,428	10,447,729	(228,563,157)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,434,360	-	24,632	383,826,047
2018	383,826,047	19,346,074	-	49,264	403,221,386
2019	403,221,386	21,144,688	-	32,632,158	456,998,232
2020	456,998,232	23,855,041	-	32,632,158	513,485,432
2021	513,485,432	26,701,996	-	32,632,158	572,819,587
2022	572,819,587	29,692,438	-	32,632,158	635,144,183
2023	635,144,183	32,833,597	-	32,632,158	700,609,938
2024	700,609,938	36,133,071	-	32,632,158	769,375,168
2025	769,375,168	39,598,839	-	32,632,158	841,606,165
2026	841,606,165	43,239,281	-	32,632,158	917,477,605
2027	917,477,605	47,063,202	-	32,632,158	997,172,965
2028	997,172,965	51,079,848	-	32,632,158	1,080,884,971
2029	1,080,884,971	55,298,933	-	32,632,158	1,168,816,062
2030	1,168,816,062	59,730,660	-	32,632,158	1,261,178,881
2031	1,261,178,881	64,385,746	-	32,632,158	1,358,196,785
2032	1,358,196,785	69,275,448	-	32,632,158	1,460,104,392
2033	1,460,104,392	69,285,803	(42,768,206)	21,863,546	1,508,485,535
2034	1,508,485,535	71,049,669	(131,752,423)	-	1,447,782,781
2035	1,447,782,781	68,190,569	(198,854,122)	-	1,317,119,228
2036	1,317,119,228	62,036,316	(173,386,483)	-	1,205,769,061
2037	1,205,769,061	56,791,723	(119,758,858)	-	1,142,801,927
2038	1,142,801,927	53,825,971	(48,446,231)	-	1,148,181,666
2039	1,148,181,666	54,079,356	(166,746,607)	-	1,035,514,416
2040	1,035,514,416	48,772,729	(78,122,006)	-	1,006,165,138
2041	1,006,165,138	47,390,378	(51,940,213)	-	1,001,615,304
2042	1,001,615,304	47,176,081	(47,702,666)	-	1,001,088,718
2043	1,001,088,718	47,151,279	(29,178,024)	-	1,019,061,973
2044	1,019,061,973	47,997,819	(11,787,142)	-	1,055,272,649
2045	1,055,272,649	49,703,342	(28,478,215)	-	1,076,497,776
2046	1,076,497,776	50,703,045	(23,807,115)	-	1,103,393,707
2047	1,103,393,707	51,969,844	(24,604,746)	-	1,130,758,804
2048	1,130,758,804	53,258,740	(13,499,605)	-	1,170,517,939
2049	1,170,517,939	55,131,395	(26,286,332)	-	1,199,363,002
2050	1,199,363,002	56,489,997	(33,553,124)	-	1,222,299,875
2051	1,222,299,875	57,570,324	(33,016,674)	-	1,246,853,526
2052	1,246,853,526	58,726,801	(35,889,943)	-	1,269,690,384
2053	1,269,690,384	59,802,417	(15,985,036)	-	1,313,507,765
2054	1,313,507,765	61,866,216	(16,549,430)	-	1,358,824,550
2055	1,358,824,550	64,000,636	(39,594,130)	-	1,383,231,056
2056	1,383,231,056	65,150,183	(33,257,818)	-	1,415,123,421

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	1,415,123,421	66,652,313	(34,340,336)	-	1,447,435,398
	2058	1,447,435,398	68,174,207	(19,030,884)	-	1,496,578,721
	2059	1,496,578,721	70,488,858	(34,590,184)	-	1,532,477,395
	2060	1,532,477,395	72,179,685	(38,063,373)	-	1,566,593,707
	2061	1,566,593,707	73,786,564	(39,311,368)	-	1,601,068,903
	2062	1,601,068,903	75,410,345	(21,914,866)	-	1,654,564,383
	2063	1,654,564,383	77,929,982	(80,814,065)	-	1,651,680,300
	2064	1,651,680,300	77,794,142	(61,087,643)	-	1,668,386,799
	2065	1,668,386,799	78,581,018	(45,044,894)	-	1,701,922,923
	2066	1,701,922,923	80,160,570	(25,267,448)	-	1,756,816,044
	2067	1,756,816,044	82,746,036	(26,187,402)	-	1,813,374,678
	2068	1,813,374,678	85,409,947	(72,773,080)	-	1,826,011,545
	2069	1,826,011,545	86,005,144	(63,423,667)	-	1,848,593,022
	2070	1,848,593,022	87,068,731	(29,165,760)	-	1,906,495,993
	2071	1,906,495,993	89,795,961	(30,235,927)	-	1,966,056,028
	2072	1,966,056,028	92,601,239	(93,016,280)	-	1,965,640,986
	2073	1,965,640,986	92,581,690	(32,501,581)	-	2,025,721,095
	2074	2,025,721,095	95,411,464	(33,700,580)	-	2,087,431,979
	2075	2,087,431,979	98,318,046	(112,632,408)	-	2,073,117,617
	2076	2,073,117,617	97,643,840	(36,348,598)	-	2,134,412,858
	2077	2,134,412,858	100,530,846	(37,581,576)	-	2,197,362,128
	2078	2,197,362,128	103,495,756	(117,870,783)	-	2,182,987,101
	2079	2,182,987,101	102,818,692	(40,425,495)	-	2,245,380,298
	2080	2,245,380,298	105,757,412	(42,057,653)	-	2,309,080,058
	2081	2,309,080,058	108,757,671	(43,493,498)	-	2,374,344,231
	2082	2,374,344,231	111,831,613	(126,011,290)	-	2,360,164,554
	2083	2,360,164,554	111,163,750	(46,803,816)	-	2,424,524,489
	2084	2,424,524,489	114,195,103	(48,703,066)	-	2,490,016,526
	2085	2,490,016,526	117,279,778	(50,375,896)	-	2,556,920,409
	2086	2,556,920,409	120,430,951	(52,266,185)	-	2,625,085,175
	2087	2,625,085,175	123,641,512	(54,230,116)	-	2,694,496,570
	2088	2,694,496,570	126,910,788	(56,440,284)	-	2,764,967,075
	2089	2,764,967,075	130,229,949	(751,760,396)	-	2,143,436,628
	2090	2,143,436,628	100,955,865	(60,591,035)	-	2,183,801,458
	2091	2,183,801,458	102,857,049	(62,878,157)	-	2,223,780,350
	2092	2,223,780,350	104,740,054	(65,451,288)	-	2,263,069,116
	2093	2,263,069,116	106,590,555	(58,981,132)	-	2,310,678,540
	2094	2,310,678,540	108,832,959	(64,517,121)	-	2,354,994,378
	2095	2,354,994,378	110,920,235	(149,957,811)	-	2,315,956,803
	2096	2,315,956,803	109,081,565	(128,623,019)	-	2,296,415,349
	2097	2,296,415,349	108,161,163	(129,344,406)	-	2,275,232,107
	2098	2,275,232,107	107,163,432	(78,502,975)	-	2,303,892,564
	2099	2,303,892,564	108,513,340	(75,521,275)	-	2,336,884,628
	2100	2,336,884,628	110,067,266	(174,463,166)	-	2,272,488,728
	2101	2,272,488,728	107,034,219	(184,893,927)	-	2,194,629,020
	2102	2,194,629,020	103,367,027	(191,487,341)	-	2,106,508,706

EXTERNAL FUND CALCULATION

2103	2,106,508,706	99,216,560	(87,534,159)	-	2,118,191,107
2104	2,118,191,107	99,766,801	(93,417,111)	-	2,124,540,798
2105	2,124,540,798	100,065,872	(212,759,172)	-	2,011,847,497
2106	2,011,847,497	94,758,017	(177,865,442)	-	1,928,740,073
2107	1,928,740,073	90,843,657	(186,884,215)	-	1,832,699,515
2108	1,832,699,515	86,320,147	(108,317,031)	-	1,810,702,632
2109	1,810,702,632	85,284,094	(197,924,338)	-	1,698,062,388
2110	1,698,062,388	79,978,738	(207,538,354)	-	1,570,502,772
2111	1,570,502,772	73,970,681	(214,640,096)	-	1,429,833,357
2112	1,429,833,357	67,345,151	(124,744,860)	-	1,372,433,648
2113	1,372,433,648	64,641,625	(433,419,883)	-	1,003,655,390
2114	1,003,655,390	47,272,169	(343,896,707)	-	707,030,852
2115	707,030,852	33,301,153	(271,105,418)	-	469,226,587
2116	469,226,587	22,100,572	(283,159,824)	-	208,167,335
2117	208,167,335	9,804,681	(149,630,097)	-	68,341,919
2118	68,341,919	3,218,904	(71,560,824)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,656,032	-	294,670	431,159,670
2018	431,159,670	21,874,735	-	589,341	453,623,746
2019	453,623,746	23,656,054	-	25,930,172	503,209,972
2020	503,209,972	26,170,075	-	25,930,172	555,310,219
2021	555,310,219	28,811,558	-	25,930,172	610,051,949
2022	610,051,949	31,586,964	-	25,930,172	667,569,084
2023	667,569,084	34,503,082	-	25,930,172	728,002,339
2024	728,002,339	37,567,048	-	25,930,172	791,499,559
2025	791,499,559	40,786,358	-	25,930,172	858,216,089
2026	858,216,089	44,168,886	-	25,930,172	928,315,146
2027	928,315,146	47,722,908	-	25,930,172	1,001,968,226
2028	1,001,968,226	51,457,119	-	25,930,172	1,079,355,517
2029	1,079,355,517	55,380,655	-	25,930,172	1,160,666,343
2030	1,160,666,343	59,503,113	-	25,930,172	1,246,099,629
2031	1,246,099,629	63,834,581	-	25,930,172	1,335,864,382
2032	1,335,864,382	68,385,654	-	25,930,172	1,430,180,208
2033	1,430,180,208	73,167,466	-	25,930,172	1,529,277,846
2034	1,529,277,846	72,227,823	(17,426,478)	21,522,043	1,605,601,234
2035	1,605,601,234	75,302,698	(114,752,431)	-	1,566,151,500
2036	1,566,151,500	73,452,505	(214,578,967)	-	1,425,025,039
2037	1,425,025,039	66,833,674	(216,463,722)	-	1,275,394,992
2038	1,275,394,992	59,816,025	(136,478,687)	-	1,198,732,330
2039	1,198,732,330	56,220,546	(176,222,841)	-	1,078,730,035
2040	1,078,730,035	50,592,439	(89,351,532)	-	1,039,970,942
2041	1,039,970,942	48,774,637	(64,325,998)	-	1,024,419,581
2042	1,024,419,581	48,045,278	(59,595,219)	-	1,012,869,641
2043	1,012,869,641	47,503,586	(34,929,174)	-	1,025,444,053
2044	1,025,444,053	48,093,326	(11,787,142)	-	1,061,750,237
2045	1,061,750,237	49,796,086	(28,478,215)	-	1,083,068,108
2046	1,083,068,108	50,795,894	(23,807,115)	-	1,110,056,888
2047	1,110,056,888	52,061,668	(24,604,746)	-	1,137,513,810
2048	1,137,513,810	53,349,398	(13,499,605)	-	1,177,363,603
2049	1,177,363,603	55,218,353	(26,286,332)	-	1,206,295,623
2050	1,206,295,623	56,575,265	(33,553,124)	-	1,229,317,764
2051	1,229,317,764	57,655,003	(33,016,674)	-	1,253,956,094
2052	1,253,956,094	58,810,541	(35,889,943)	-	1,276,876,691
2053	1,276,876,691	59,885,517	(15,985,036)	-	1,320,777,172
2054	1,320,777,172	61,944,449	(16,549,430)	-	1,366,172,191
2055	1,366,172,191	64,073,476	(39,594,130)	-	1,390,651,536
2056	1,390,651,536	65,221,557	(33,257,818)	-	1,422,615,275

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	1,422,615,275	66,720,656	(34,340,336)	-	1,454,995,596
	2058	1,454,995,596	68,239,293	(19,030,884)	-	1,504,204,005
	2059	1,504,204,005	70,547,168	(34,590,184)	-	1,540,160,989
	2060	1,540,160,989	72,233,550	(38,063,373)	-	1,574,331,166
	2061	1,574,331,166	73,836,132	(39,311,368)	-	1,608,855,930
	2062	1,608,855,930	75,455,343	(21,914,866)	-	1,662,396,408
	2063	1,662,396,408	77,966,392	(80,814,065)	-	1,659,548,734
	2064	1,659,548,734	77,832,836	(61,087,643)	-	1,676,293,927
	2065	1,676,293,927	78,618,185	(45,044,894)	-	1,709,867,217
	2066	1,709,867,217	80,192,772	(25,267,448)	-	1,764,792,541
	2067	1,764,792,541	82,768,770	(26,187,402)	-	1,821,373,910
	2068	1,821,373,910	85,422,436	(72,773,080)	-	1,834,023,266
	2069	1,834,023,266	86,015,691	(63,423,667)	-	1,856,615,291
	2070	1,856,615,291	87,075,257	(29,165,760)	-	1,914,524,787
	2071	1,914,524,787	89,791,213	(30,235,927)	-	1,974,080,073
	2072	1,974,080,073	92,584,355	(93,016,280)	-	1,973,648,148
	2073	1,973,648,148	92,564,098	(32,501,581)	-	2,033,710,665
	2074	2,033,710,665	95,381,030	(33,700,580)	-	2,095,391,115
	2075	2,095,391,115	98,273,843	(112,632,408)	-	2,081,032,550
	2076	2,081,032,550	97,600,427	(36,348,598)	-	2,142,284,378
	2077	2,142,284,378	100,473,137	(37,581,576)	-	2,205,175,940
	2078	2,205,175,940	103,422,752	(117,870,783)	-	2,190,727,908
	2079	2,190,727,908	102,745,139	(40,425,495)	-	2,253,047,552
	2080	2,253,047,552	105,667,930	(42,057,653)	-	2,316,657,830
	2081	2,316,657,830	108,651,252	(43,493,498)	-	2,381,815,584
	2082	2,381,815,584	111,707,151	(126,011,290)	-	2,367,511,445
	2083	2,367,511,445	111,036,287	(46,803,816)	-	2,431,743,916
	2084	2,431,743,916	114,048,790	(48,703,066)	-	2,497,089,640
	2085	2,497,089,640	117,113,504	(50,375,896)	-	2,563,827,248
	2086	2,563,827,248	120,243,498	(52,266,185)	-	2,631,804,561
	2087	2,631,804,561	123,431,634	(54,230,116)	-	2,701,006,078
	2088	2,701,006,078	126,677,185	(56,440,284)	-	2,771,242,980
	2089	2,771,242,980	129,971,296	(741,008,517)	-	2,160,205,758
	2090	2,160,205,758	101,313,650	(71,649,266)	-	2,189,870,142
	2091	2,189,870,142	102,704,910	(62,878,157)	-	2,229,696,895
	2092	2,229,696,895	104,572,784	(65,451,288)	-	2,268,818,391
	2093	2,268,818,391	106,407,583	(58,981,150)	-	2,316,244,823
	2094	2,316,244,823	108,631,882	(64,517,121)	-	2,360,359,585
	2095	2,360,359,585	110,700,865	(149,957,811)	-	2,321,102,639
	2096	2,321,102,639	108,859,714	(128,623,019)	-	2,301,339,333
	2097	2,301,339,333	107,932,815	(129,344,406)	-	2,279,927,743
	2098	2,279,927,743	106,928,611	(78,502,975)	-	2,308,353,379
	2099	2,308,353,379	108,261,773	(75,521,275)	-	2,341,093,877
	2100	2,341,093,877	109,797,303	(174,463,166)	-	2,276,428,014
	2101	2,276,428,014	106,764,474	(184,893,927)	-	2,198,298,560
	2102	2,198,298,560	103,100,202	(191,487,341)	-	2,109,911,422

EXTERNAL FUND CALCULATION

2103	2,109,911,422	98,954,846	(87,534,159)	-	2,121,332,109
2104	2,121,332,109	99,490,476	(93,417,111)	-	2,127,405,474
2105	2,127,405,474	99,775,317	(212,759,172)	-	2,014,421,619
2106	2,014,421,619	94,476,374	(177,865,442)	-	1,931,032,551
2107	1,931,032,551	90,565,427	(186,884,215)	-	1,834,713,763
2108	1,834,713,763	86,048,075	(108,317,031)	-	1,812,444,808
2109	1,812,444,808	85,003,661	(197,924,338)	-	1,699,524,131
2110	1,699,524,131	79,707,682	(207,538,354)	-	1,571,693,459
2111	1,571,693,459	73,712,423	(214,640,096)	-	1,430,765,786
2112	1,430,765,786	67,102,915	(124,744,860)	-	1,373,123,841
2113	1,373,123,841	64,399,508	(433,419,883)	-	1,004,103,467
2114	1,004,103,467	47,092,453	(343,896,707)	-	707,299,213
2115	707,299,213	33,172,333	(271,105,418)	-	469,366,127
2116	469,366,127	22,013,271	(283,159,824)	-	208,219,574
2117	208,219,574	9,765,498	(149,630,097)	-	68,354,975
2118	68,354,975	3,205,848	(71,560,824)	-	0

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$68,679,001	\$55,286,775
Prairie Island Unit 1	49,264	42,821,016	42,771,751
Prairie Island Unit 2	589,341	35,556,474	34,967,133
TOTAL	\$14,030,831	\$147,056,491	\$133,025,660

2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2019-2021 Decommissioning Accrual
Monticello	13.75	5.05%	4.97%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	68,679,001
Prairie Island Unit 1	16.67	5.05%	4.94%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	42,821,016
Prairie Island Unit 2	17.83	5.09%	4.93%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	35,556,474
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$147,056,491

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional
	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Estimate	Cost in	Cost in
	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s	Nominal \$s	Nominal \$s	Future \$'s
Monticello															
Factors	2017	73.4886%	4.05%			2.85%					0.00%				
2030	\$21,103,620	\$15,508,745	1.6755	\$25,984,903	\$8,935,561	\$6,566,615	1.4410	\$9,462,492	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$35,447,395
2031	72,416,235	53,217,644	1.7434	92,779,641	42,961,344	31,571,670	1.4820	46,789,215	0	0	1.0000	0	115,377,579	84,789,314	139,568,856
2032	81,871,155	60,165,928	1.8140	109,140,994	112,447,584	82,636,104	1.5243	125,962,213	0	0	1.0000	0	194,318,740	142,802,032	235,103,206
2033	78,663,227	57,808,468	1.8874	109,107,702	100,155,663	73,602,948	1.5677	115,387,342	0	0	1.0000	0	178,818,889	131,411,416	224,495,044
2034	66,380,422	48,782,012	1.9639	95,802,993	38,894,668	28,583,129	1.6124	46,087,438	0	0	1.0000	0	105,275,090	77,365,141	141,890,431
2035	86,879,799	63,846,708	2.0434	130,464,363	113,147,093	83,150,162	1.6584	137,896,229	0	0	1.0000	0	200,026,892	146,996,870	268,360,592
2036	50,307,501	36,970,255	2.1262	78,606,156	20,688,341	15,203,562	1.7056	25,931,196	0	0	1.0000	0	70,995,842	52,173,817	104,537,352
2037	34,755,725	25,541,479	2.2123	56,505,415	14,196,879	10,433,081	1.7542	18,301,711	0	0	1.0000	0	48,952,604	35,974,561	74,807,126
2038	29,827,531	21,919,821	2.3019	50,457,236	15,091,277	11,090,361	1.8042	20,009,230	0	0	1.0000	0	44,918,808	33,010,182	70,466,465
2039	7,164,560	5,265,132	2.3951	12,610,517	2,086,795	1,533,555	1.8556	2,845,665	0	0	1.0000	0	9,251,355	6,798,687	15,456,182
2040	7,184,150	5,279,528	2.4921	13,157,112	2,092,376	1,537,657	1.9085	2,934,618	0	0	1.0000	0	9,276,526	6,817,185	16,091,729
2041	7,164,560	5,265,132	2.5930	13,652,486	2,086,795	1,533,555	1.9629	3,010,216	0	0	1.0000	0	9,251,355	6,798,687	16,662,702
2042	7,164,560	5,265,132	2.6981	14,205,851	2,086,795	1,533,555	2.0189	3,096,095	0	0	1.0000	0	9,251,355	6,798,687	17,301,946
2043	7,164,560	5,265,132	2.8073	14,780,804	2,086,795	1,533,555	2.0764	3,184,274	0	0	1.0000	0	9,251,355	6,798,687	17,965,078
2044	7,184,150	5,279,528	2.9210	15,421,501	2,092,376	1,537,657	2.1356	3,283,820	0	0	1.0000	0	9,276,526	6,817,185	18,705,321
2045	7,164,560	5,265,132	3.0393	16,002,314	2,086,795	1,533,555	2.1964	3,368,301	0	0	1.0000	0	9,251,355	6,798,687	19,370,615
2046	7,164,560	5,265,132	3.1624	16,650,452	2,086,795	1,533,555	2.2590	3,464,302	0	0	1.0000	0	9,251,355	6,798,687	20,114,754
2047	7,164,560	5,265,132	3.2905	17,324,915	2,086,795	1,533,555	2.3234	3,563,063	0	0	1.0000	0	9,251,355	6,798,687	20,887,978
2048	7,847,790	5,767,227	3.4238	19,745,833	4,083,316	3,000,770	2.3896	7,170,639	0	0	1.0000	0	11,931,106	8,767,997	26,916,472
2049	7,164,560	5,265,132	3.5624	18,756,505	2,086,795	1,533,555	2.4577	3,769,019	0	0	1.0000	0	9,251,355	6,798,687	22,525,524
2050	8,657,770	6,362,470	3.7067	23,583,767	6,566,405	4,825,556	2.5278	12,198,040	0	0	1.0000	0	15,224,175	11,188,026	35,781,808
2051	8,657,770	6,362,470	3.8568	24,538,774	6,566,405	4,825,556	2.5998	12,545,480	0	0	1.0000	0	15,224,175	11,188,026	37,084,255
2052	8,677,350	6,376,859	4.0130	25,590,335	6,571,986	4,829,657	2.6739	12,914,021	0	0	1.0000	0	15,249,336	11,206,516	38,504,356
2053	8,657,770	6,362,470	4.1756	26,567,130	6,566,405	4,825,556	2.7501	13,270,762	0	0	1.0000	0	15,224,175	11,188,026	39,837,891
2054	8,657,770	6,362,470	4.3447	27,643,023	6,566,405	4,825,556	2.8285	13,649,085	0	0	1.0000	0	15,224,175	11,188,026	41,292,108
2055	8,657,770	6,362,470	4.5206	28,762,182	6,566,405	4,825,556	2.9091	14,038,025	0	0	1.0000	0	15,224,175	11,188,026	42,800,207
2056	8,677,350	6,376,859	4.7037	29,994,832	6,571,986	4,829,657	2.9920	14,450,335	0	0	1.0000	0	15,249,336	11,206,516	44,445,167
2057	8,657,770	6,362,470	4.8942	31,139,201	6,566,405	4,825,556	3.0773	14,849,683	0	0	1.0000	0	15,224,175	11,188,026	45,988,884
2058	14,754,150	10,842,611	5.0924	55,214,915	24,855,555	18,265,988	3.1650	57,811,852	0	0	1.0000	0	39,609,705	29,108,599	113,026,766
2059	8,657,770	6,362,470	5.2987	33,712,820	6,566,405	4,825,556	3.2552	15,708,150	0	0	1.0000	0	15,224,175	11,188,026	49,420,970
2060	8,677,350	6,376,859	5.5133	35,157,537	6,571,986	4,829,657	3.3480	16,169,693	0	0	1.0000	0	15,249,336	11,206,516	51,327,230
2061	8,657,770	6,362,470	5.7366	36,498,945	6,566,405	4,825,556	3.4434	16,616,320	0	0	1.0000	0	15,224,175	11,188,026	53,115,265
2062	8,657,770	6,362,470	5.9689	37,976,947	6,566,405	4,825,556	3.5415	17,089,707	0	0	1.0000	0	15,224,175	11,188,026	55,066,654
2063	8,657,770	6,362,470	6.2106	39,514,756	6,566,405	4,825,556	3.6425	17,577,088	0	0	1.0000	0	15,224,175	11,188,026	57,091,844
2064	8,677,350	6,376,859	6.4622	41,208,538	6,571,986	4,829,657	3.7463	18,093,345	0	0	1.0000	0	15,249,336	11,206,516	59,301,884
2065	8,657,770	6,362,470	6.7239	42,780,612	6,566,405	4,825,556	3.8531	18,593,350	0	0	1.0000	0	15,224,175	11,188,026	61,373,962
2066	12,315,600	9,050,556	6.9962	63,319,502	17,539,895	12,889,815	3.9629	51,081,048	0	0	1.0000	0	29,855,495	21,940,371	114,400,551
2067	8,657,770	6,362,470	7.2795	46,315,600	6,566,405	4,825,556	4.0758	19,668,001	0	0	1.0000	0	15,224,175	11,188,026	65,983,601
2068	17,212,290	12,649,063	7.5744	95,809,063	32,176,796	23,646,262	4.1920	99,125,130	0	0	1.0000	0	49,389,086	36,295,325	194,934,193
2069	8,657,770	6,362,470	7.8811	50,143,262	6,566,405	4,825,556	4.3115	20,805,385	0	0	1.0000	0	15,224,175	11,188,026	70,948,647
2070	8,657,770	6,362,470	8.2003	52,174,163	6,566,405	4,825,556	4.4343	21,397,963	0	0	1.0000	0	15,224,175	11,188,026	73,572,125
2071	8,657,770	6,362,470	8.5324	54,287,139	6,566,405	4,825,556	4.5607	22,007,913	0	0	1.0000	0	15,224,175	11,188,026	76,295,052
2072	8,677,350	6,376,859	8.8780	56,613,754	6,571,986	4,829,657	4.6907	22,654,474	0	0	1.0000	0	15,249,336	11,206,516	79,268,228
2073	8,657,770	6,362,470	9.2375	58,773,316	6,566,405	4,825,556	4.8244	23,280,412	0	0	1.0000	0	15,224,175	11,188,026	82,053,729
2074	8,657,770	6,362,470	9.6117	61,154,153	6,566,405	4,825,556	4.9619	23,943,926	0	0	1.0000	0	15,224,175	11,188,026	85,098,079
2075	8,657,770	6,362,470	10.0009	63,630,426	6,566,405	4,825,556	5.1033	24,626,260	0	0	1.0000	0	15,224,175	11,188,026	88,256,686
2076	8,677,350	6,376,859	10.4060	66,357,595	6,571,986	4,829,657	5.2487	25,349,422	0	0	1.0000	0	15,249,336	11,206,516	91,707,017
2077	8,657,770	6,362,470	10.8274	68,889,007	6,566,405	4,825,556	5.3983	26,049,799	0	0	1.0000	0	15,224,175	11,188,026	94,938,806
2078	8,657,770	6,362,470	11.2659	71,678,950	6,566,405	4,825,556	5.5522	26,792,452	0	0	1.0000	0	15,224,175	11,188,026	98,471,402
2079	8,657,770	6,362,470	11.7222	74,582,146	6,566,405	4,825,556	5.7104	27,555,855	0	0	1.0000	0	15,224,175	11,188,026	102,138,001
2080	8,677,350	6,376,859	12.1970	77,778,550	6,571,986	4,829,657	5.8731	28,365,060	0	0	1.0000	0	15,249,336	11,206,516	106,143,610
2081	8,657,770	6,362,470	12.6909	80,745,470	6,566,405	4,825,556	6.0405	29,148,771	0	0	1.0000	0	15,224,175	11,188,026	109,894,241
2082	8,657,770	6,362,470	13.2049	84,015,780	6,566,405	4,825,556	6.2127	29,979,732	0	0	1.0000	0	15,224,175	11,188,026	113,995,512
2083	8,657,770	6,362,470	13.7397	87,418,429	6,566,405	4,825,556	6.3897	30,833,855	0	0	1.0000	0	15,224,175	11,188,026	118,252,284
2084	8,677,350	6,376,859	14.2962	91,164,852	6,571,986	4,829,657	6.5719	31,740,025	0	0	1.0000	0	15,249,336	11,206,516	122,904,877

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2085	8,657,770	6,362,470	14.8752	94,643,013	6,566,405	4,825,556	6.7592	32,616,898	0	0	1.0000	0	15,224,175	11,188,026	127,259,911
2086	8,657,770	6,362,470	15.4776	98,475,765	6,566,405	4,825,556	6.9518	33,546,300	0	0	1.0000	0	15,224,175	11,188,026	132,022,065
2087	8,657,770	6,362,470	16.1045	102,464,398	6,566,405	4,825,556	7.1499	34,502,243	0	0	1.0000	0	15,224,175	11,188,026	136,966,641
2088	9,340,990	6,864,558	16.7567	115,027,347	8,562,916	6,292,763	7.3537	46,275,091	0	0	1.0000	0	17,903,906	13,157,321	161,302,438
2089	8,657,770	6,362,470	17.4353	110,931,573	6,566,405	4,825,556	7.5633	36,497,128	0	0	1.0000	0	15,224,175	11,188,026	147,428,700
2090	8,657,770	6,362,470	18.1415	115,424,749	6,566,405	4,825,556	7.7788	37,537,035	0	0	1.0000	0	15,224,175	11,188,026	152,961,784
2091	8,657,770	6,362,470	18.8762	120,099,256	6,566,405	4,825,556	8.0005	38,606,861	0	0	1.0000	0	15,224,175	11,188,026	158,706,116
2092	8,677,350	6,376,859	19.6407	125,245,975	6,571,986	4,829,657	8.2285	39,740,835	0	0	1.0000	0	15,249,336	11,206,516	164,986,810
2093	8,657,770	6,362,470	20.4361	130,024,073	6,566,405	4,825,556	8.4630	40,838,680	0	0	1.0000	0	15,224,175	11,188,026	170,862,753
2094	8,657,770	6,362,470	21.2638	135,290,289	6,566,405	4,825,556	8.7042	42,002,605	0	0	1.0000	0	15,224,175	11,188,026	177,292,894
2095	29,995,110	22,042,973	22.1250	487,700,768	79,650,261	58,533,825	8.9523	524,012,362	0	0	1.0000	0	109,645,371	80,576,798	1,011,713,130
2096	8,677,350	6,376,859	23.0210	146,801,672	6,571,986	4,829,657	9.2075	44,469,070	0	0	1.0000	0	15,249,336	11,206,516	191,270,742
2097	8,657,770	6,362,470	23.9534	152,402,788	6,566,405	4,825,556	9.4699	45,697,533	0	0	1.0000	0	15,224,175	11,188,026	198,100,321
2098	8,657,770	6,362,470	24.9235	158,575,020	6,566,405	4,825,556	9.7398	46,999,950	0	0	1.0000	0	15,224,175	11,188,026	205,574,971
2099	8,657,770	6,362,470	25.9329	164,997,298	6,566,405	4,825,556	10.0173	48,339,042	0	0	1.0000	0	15,224,175	11,188,026	213,336,340
2100	8,657,770	6,362,470	26.9832	171,679,800	6,566,405	4,825,556	10.3028	49,716,738	0	0	1.0000	0	15,224,175	11,188,026	221,396,538
2101	8,657,770	6,362,470	28.0760	178,632,707	6,566,405	4,825,556	10.5965	51,134,004	0	0	1.0000	0	15,224,175	11,188,026	229,776,711
2102	8,657,770	6,362,470	29.2131	185,867,472	6,566,405	4,825,556	10.8985	52,591,322	0	0	1.0000	0	15,224,175	11,188,026	238,458,794
2103	8,657,770	6,362,470	30.3962	193,394,910	6,566,405	4,825,556	11.2091	54,090,140	0	0	1.0000	0	15,224,175	11,188,026	247,485,050
2104	8,677,350	6,376,859	31.6272	201,682,196	6,571,986	4,829,657	11.5285	55,678,704	0	0	1.0000	0	15,249,336	11,206,516	257,360,900
2105	8,657,770	6,362,470	32.9081	209,376,798	6,566,405	4,825,556	11.8571	57,217,100	0	0	1.0000	0	15,224,175	11,188,026	266,593,898
2106	8,657,770	6,362,470	34.2409	217,856,698	6,566,405	4,825,556	12.1950	58,847,655	0	0	1.0000	0	15,224,175	11,188,026	276,704,354
2107	8,657,770	6,362,470	35.6277	226,680,171	6,566,405	4,825,556	12.5426	60,525,019	0	0	1.0000	0	15,224,175	11,188,026	287,205,190
2108	14,773,730	10,857,001	37.0706	402,475,524	24,861,136	18,270,089	12.9000	235,684,150	0	0	1.0000	0	39,634,866	29,127,090	638,159,674
2109	8,657,770	6,362,470	38.5720	245,413,192	6,566,405	4,825,556	13.2677	64,024,029	0	0	1.0000	0	15,224,175	11,188,026	309,437,221
2110	8,657,770	6,362,470	40.1341	255,352,006	6,566,405	4,825,556	13.6458	65,848,572	0	0	1.0000	0	15,224,175	11,188,026	321,200,578
2111	8,657,770	6,362,470	41.7596	265,694,201	6,566,405	4,825,556	14.0347	67,725,231	0	0	1.0000	0	15,224,175	11,188,026	333,419,432
2112	8,677,350	6,376,859	43.4508	277,079,626	6,571,986	4,829,657	14.4347	69,714,654	0	0	1.0000	0	15,249,336	11,206,516	346,794,281
2113	8,657,770	6,362,470	45.2106	287,651,085	6,566,405	4,825,556	14.8461	71,640,687	0	0	1.0000	0	15,224,175	11,188,026	359,291,772
2114	8,657,770	6,362,470	47.0416	299,300,767	6,566,405	4,825,556	15.2692	73,682,380	0	0	1.0000	0	15,224,175	11,188,026	372,983,147
2115	8,657,770	6,362,470	48.9468	311,422,545	6,566,405	4,825,556	15.7044	75,782,462	0	0	1.0000	0	15,224,175	11,188,026	387,205,007
2116	12,335,180	9,064,945	50.9291	461,669,511	17,545,476	12,893,916	16.1520	208,262,538	0	0	1.0000	0	29,880,656	21,958,862	669,932,049
2117	8,657,770	6,362,470	52.9918	337,158,736	6,566,405	4,825,556	16.6123	80,163,584	0	0	1.0000	0	15,224,175	11,188,026	417,322,320
2118	17,192,700	12,634,667	55.1379	696,648,984	32,171,215	23,642,161	17.0857	403,942,863	0	0	1.0000	0	49,363,915	36,276,827	1,100,591,847
2119	8,657,770	6,362,470	57.3710	365,021,265	6,566,405	4,825,556	17.5727	84,798,048	0	0	1.0000	0	15,224,175	11,188,026	449,819,313
2120	8,677,350	6,376,859	59.6946	380,664,049	6,571,986	4,829,657	18.0735	87,288,812	0	0	1.0000	0	15,249,336	11,206,516	467,952,861
2121	8,657,770	6,362,470	62.1122	395,187,007	6,566,405	4,825,556	18.5886	89,700,330	0	0	1.0000	0	15,224,175	11,188,026	484,887,338
2122	8,657,770	6,362,470	64.6277	411,191,801	6,566,405	4,825,556	19.1184	92,256,910	0	0	1.0000	0	15,224,175	11,188,026	503,448,710
2123	8,657,770	6,362,470	67.2451	427,844,930	6,566,405	4,825,556	19.6633	94,886,355	0	0	1.0000	0	15,224,175	11,188,026	522,731,285
2124	8,677,350	6,376,859	69.9686	446,179,899	6,571,986	4,829,657	20.2237	97,673,541	0	0	1.0000	0	15,249,336	11,206,516	543,853,439
2125	8,657,770	6,362,470	72.8023	463,202,448	6,566,405	4,825,556	20.8000	100,371,565	0	0	1.0000	0	15,224,175	11,188,026	563,574,012
2126	8,657,770	6,362,470	75.7508	481,962,190	6,566,405	4,825,556	21.3928	103,232,154	0	0	1.0000	0	15,224,175	11,188,026	585,194,345
2127	8,657,770	6,362,470	78.8187	501,481,612	6,566,405	4,825,556	22.0025	106,174,296	0	0	1.0000	0	15,224,175	11,188,026	607,655,908
2128	9,340,990	6,864,558	82.0109	562,968,618	8,562,916	6,292,763	22.6296	142,402,709	0	0	1.0000	0	17,903,906	13,157,321	705,371,327
2129	8,657,770	6,362,470	85.3323	542,924,196	6,566,405	4,825,556	23.2745	112,312,403	0	0	1.0000	0	15,224,175	11,188,026	655,236,600
2130	8,657,770	6,362,470	88.7883	564,912,893	6,566,405	4,825,556	23.9379	115,513,677	0	0	1.0000	0	15,224,175	11,188,026	680,426,570
2131	8,657,770	6,362,470	92.3842	587,791,698	6,566,405	4,825,556	24.6201	118,805,671	0	0	1.0000	0	15,224,175	11,188,026	706,597,370
2132	8,677,350	6,376,859	96.1257	612,980,038	6,571,986	4,829,657	25.3218	122,295,617	0	0	1.0000	0	15,249,336	11,206,516	735,275,655
2133	8,657,770	6,362,470	100.0188	636,366,612	6,566,405	4,825,556	26.0434	125,673,885	0	0	1.0000	0	15,224,175	11,188,026	762,040,497
2134	8,657,770	6,362,470	104.0696	662,139,705	6,566,405	4,825,556	26.7857	129,255,895	0	0	1.0000	0	15,224,175	11,188,026	791,395,600
2135	8,657,770	6,362,470	108.2844	688,956,243	6,566,405	4,825,556	27.5491	132,939,725	0	0	1.0000	0	15,224,175	11,188,026	821,895,968
2136	8,677,350	6,376,859	112.6699	718,480,609	6,571,986	4,829,657	28.3342	136,844,476	0	0	1.0000	0	15,249,336	11,206,516	855,324,546
2137	8,657,770	6,362,470	117.2331	745,892,078	6,566,405	4,825,556	29.1417	140,624,905	0	0	1.0000	0	15,224,175	11,188,026	886,516,984
2138	8,657,770	6,362,470	121.9810	776,100,450	6,566,405	4,825,556	29.9723	144,633,012	0	0	1.0000	0	15,224,175	11,188,026	920,733,462
2139	8,657,770	6,362,470	126.9212	807,532,324	6,566,405	4,825,556	30.8265	148,755,002	0	0	1.0000	0	15,224,175	11,188,026	956,287,326
2140	8,677,350	6,376,859	132.0616	842,138,207	6,571,986	4,829,657	31.7050	153,124,285	0	0	1.0000	0	15,249,336	11,206,516	995,262,492
2141	8,657,770	6,362,470	137.4100	874,266,999	6,566,405	4,825,556	32.6086	157,354,625	0	0	1.0000	0	15,224,175	11,188,026	1,031,621,624

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2142	8,657,770	6,362,470	142.9752	909,675,417	6,566,405	4,825,556	33.5380	161,839,497	0	0	1.0000	0	15,224,175	11,188,026	1,071,514,914
2143	8,657,770	6,362,470	148.7656	946,516,663	6,566,405	4,825,556	34.4938	166,451,764	0	0	1.0000	0	15,224,175	11,188,026	1,112,968,427
2144	8,677,350	6,376,859	154.7907	987,078,473	6,571,986	4,829,657	35.4769	171,341,270	0	0	1.0000	0	15,249,336	11,206,516	1,158,419,743
2145	29,995,110	22,042,973	161.0597	3,550,234,550	70,578,445	51,867,079	36.4880	1,892,525,961	0	0	1.0000	0	100,573,555	73,910,051	5,442,760,511
2146	8,657,770	6,362,470	167.5826	1,066,239,260	6,566,405	4,825,556	37.5279	181,092,983	0	0	1.0000	0	15,224,175	11,188,026	1,247,332,243
2147	8,657,770	6,362,470	174.3697	1,109,421,980	6,566,405	4,825,556	38.5974	186,253,915	0	0	1.0000	0	15,224,175	11,188,026	1,295,675,896
2148	8,677,350	6,376,859	181.4317	1,156,964,375	6,571,986	4,829,657	39.6975	191,725,321	0	0	1.0000	0	15,249,336	11,206,516	1,348,689,696
2149	8,657,770	6,362,470	188.7796	1,201,104,536	6,566,405	4,825,556	40.8288	197,021,661	0	0	1.0000	0	15,224,175	11,188,026	1,398,126,197
2150	8,657,770	6,362,470	196.4252	1,249,749,437	6,566,405	4,825,556	41.9925	202,637,160	0	0	1.0000	0	15,224,175	11,188,026	1,452,386,597
2151	8,657,770	6,362,470	204.3804	1,300,364,158	6,566,405	4,825,556	43.1893	208,412,386	0	0	1.0000	0	15,224,175	11,188,026	1,508,776,544
2152	8,677,350	6,376,859	212.6578	1,356,088,812	6,571,986	4,829,657	44.4201	214,533,861	0	0	1.0000	0	15,249,336	11,206,516	1,570,622,673
2153	8,657,770	6,362,470	221.2705	1,407,826,912	6,566,405	4,825,556	45.6861	220,460,834	0	0	1.0000	0	15,224,175	11,188,026	1,628,287,746
2154	8,657,770	6,362,470	230.2319	1,464,843,550	6,566,405	4,825,556	46.9882	226,744,191	0	0	1.0000	0	15,224,175	11,188,026	1,691,587,741
2155	8,657,770	6,362,470	239.5563	1,524,169,765	6,566,405	4,825,556	48.3273	233,206,093	0	0	1.0000	0	15,224,175	11,188,026	1,757,375,858
2156	8,677,350	6,376,859	249.2584	1,589,485,679	6,571,986	4,829,657	49.7047	240,056,668	0	0	1.0000	0	15,249,336	11,206,516	1,829,542,347
2157	8,657,770	6,362,470	259.3533	1,650,127,583	6,566,405	4,825,556	51.1212	246,688,214	0	0	1.0000	0	15,224,175	11,188,026	1,896,815,797
2158	14,754,150	10,842,611	269.8571	2,925,955,689	24,855,555	18,265,988	52.5782	960,392,763	0	0	1.0000	0	39,609,705	29,108,599	3,886,348,451
2159	8,657,770	6,362,470	280.7864	1,786,495,039	6,566,405	4,825,556	54.0767	260,950,144	0	0	1.0000	0	15,224,175	11,188,026	2,047,445,183
2160	8,677,350	6,376,859	292.1582	1,863,051,656	6,571,986	4,829,657	55.6179	268,615,398	0	0	1.0000	0	15,249,336	11,206,516	2,131,667,054
2161	8,657,770	6,362,470	303.9906	1,934,131,064	6,566,405	4,825,556	57.2030	276,036,280	0	0	1.0000	0	15,224,175	11,188,026	2,210,167,344
2162	8,657,770	6,362,470	316.3022	2,012,463,250	6,566,405	4,825,556	58.8333	283,903,384	0	0	1.0000	0	15,224,175	11,188,026	2,296,366,634
2163	8,657,770	6,362,470	329.1125	2,093,968,399	6,566,405	4,825,556	60.5100	291,994,394	0	0	1.0000	0	15,224,175	11,188,026	2,385,962,792
2164	8,677,350	6,376,859	342.4415	2,183,701,172	6,571,986	4,829,657	62.2345	300,571,308	0	0	1.0000	0	15,249,336	11,206,516	2,484,272,480
2165	8,657,770	6,362,470	356.3104	2,267,014,221	6,566,405	4,825,556	64.0082	308,875,154	0	0	1.0000	0	15,224,175	11,188,026	2,575,889,374
2166	12,315,600	9,050,556	370.7410	3,355,412,309	17,539,895	12,889,815	65.8325	848,568,754	0	0	1.0000	0	29,855,495	21,940,371	4,203,981,063
2167	8,657,770	6,362,470	385.7560	2,454,360,967	6,566,405	4,825,556	67.7087	326,732,124	0	0	1.0000	0	15,224,175	11,188,026	2,781,093,090
2168	17,875,930	13,136,762	401.3791	5,272,821,890	34,167,736	25,109,375	69.6384	1,748,576,695	0	0	1.0000	0	52,043,666	38,246,137	7,021,398,585
2169	8,657,770	6,362,470	417.6350	2,657,190,147	6,566,405	4,825,556	71.6231	345,621,280	0	0	1.0000	0	15,224,175	11,188,026	3,002,811,427
2170	8,657,770	6,362,470	434.5492	2,764,806,236	6,566,405	4,825,556	73.6643	355,471,205	0	0	1.0000	0	15,224,175	11,188,026	3,120,277,441
2171	8,657,770	6,362,470	452.1484	2,876,780,618	6,566,405	4,825,556	75.7638	365,602,460	0	0	1.0000	0	15,224,175	11,188,026	3,242,383,078
2172	8,677,350	6,376,859	470.4604	3,000,059,650	6,571,986	4,829,657	77.9230	376,341,387	0	0	1.0000	0	15,249,336	11,206,516	3,376,401,038
2173	8,657,770	6,362,470	489.5141	3,114,518,762	6,566,405	4,825,556	80.1438	386,738,395	0	0	1.0000	0	15,224,175	11,188,026	3,501,257,157
2174	8,657,770	6,362,470	509.3394	3,240,656,638	6,566,405	4,825,556	82.4279	397,760,448	0	0	1.0000	0	15,224,175	11,188,026	3,638,417,086
2175	8,657,770	6,362,470	529.9676	3,371,902,941	6,566,405	4,825,556	84.7771	409,096,644	0	0	1.0000	0	15,224,175	11,188,026	3,780,999,585
2176	8,677,350	6,376,859	551.4313	3,516,399,665	6,571,986	4,829,657	87.1933	421,113,759	0	0	1.0000	0	15,249,336	11,206,516	3,937,513,425
2177	8,657,770	6,362,470	573.7643	3,650,558,130	6,566,405	4,825,556	89.6783	432,747,659	0	0	1.0000	0	15,224,175	11,188,026	4,083,305,789
2178	8,657,770	6,362,470	597.0018	3,798,406,026	6,566,405	4,825,556	92.2341	445,080,815	0	0	1.0000	0	15,224,175	11,188,026	4,243,486,841
2179	8,657,770	6,362,470	621.1803	3,952,241,006	6,566,405	4,825,556	94.8628	457,765,754	0	0	1.0000	0	15,224,175	11,188,026	4,410,006,760
2180	8,677,350	6,376,859	646.3381	4,121,606,950	6,571,986	4,829,657	97.5664	471,212,278	0	0	1.0000	0	15,249,336	11,206,516	4,592,819,228
2181	8,657,770	6,362,470	672.5148	4,278,855,221	6,566,405	4,825,556	100.3470	484,230,068	0	0	1.0000	0	15,224,175	11,188,026	4,763,085,289
2182	8,657,770	6,362,470	699.7517	4,452,149,179	6,566,405	4,825,556	103.2069	498,030,676	0	0	1.0000	0	15,224,175	11,188,026	4,950,179,855
2183	8,657,770	6,362,470	728.0916	4,632,460,942	6,566,405	4,825,556	106.1483	512,224,566	0	0	1.0000	0	15,224,175	11,188,026	5,144,685,508
2184	8,677,350	6,376,859	757.5793	4,830,976,401	6,571,986	4,829,657	109.1736	527,271,076	0	0	1.0000	0	15,249,336	11,206,516	5,358,247,477
2185	8,657,770	6,362,470	788.2613	5,015,288,851	6,566,405	4,825,556	112.2850	541,837,556	0	0	1.0000	0	15,224,175	11,188,026	5,557,126,407
2186	8,657,770	6,362,470	820.1859	5,218,408,160	6,566,405	4,825,556	115.4851	557,279,817	0	0	1.0000	0	15,224,175	11,188,026	5,775,687,978
2187	8,657,770	6,362,470	853.4034	5,429,753,507	6,566,405	4,825,556	118.7764	573,162,170	0	0	1.0000	0	15,224,175	11,188,026	6,002,915,676
2188	8,677,350	6,376,859	887.9662	5,662,435,282	6,571,986	4,829,657	122.1616	589,998,665	0	0	1.0000	0	15,249,336	11,206,516	6,252,433,947
2189	8,657,770	6,362,470	923.9289	5,878,469,883	6,566,405	4,825,556	125.6432	606,298,298	0	0	1.0000	0	15,224,175	11,188,026	6,484,768,180
2190	8,657,770	6,362,470	961.3480	6,116,547,783	6,566,405	4,825,556	129.2240	623,577,649	0	0	1.0000	0	15,224,175	11,188,026	6,740,125,432
2191	8,657,770	6,362,													

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2199	7,147,970	5,252,940	1,374.2299	7,218,746,916	2,037,025	1,496,980	166.4109	249,113,812	0	0	1.0000	0	9,184,995	6,749,920	7,467,860,728
2200	7,147,970	5,252,940	1,429.8862	7,511,106,109	2,037,025	1,496,980	171.1537	256,213,690	0	0	1.0000	0	9,184,995	6,749,920	7,767,319,798
2201	7,147,970	5,252,940	1,487.7966	7,815,305,953	2,037,025	1,496,980	176.0315	263,515,660	0	0	1.0000	0	9,184,995	6,749,920	8,078,821,612
2202	7,147,970	5,252,940	1,548.0523	8,131,825,517	2,037,025	1,496,980	181.0484	271,025,859	0	0	1.0000	0	9,184,995	6,749,920	8,402,851,376
2203	7,147,970	5,252,940	1,610.7485	8,461,164,880	2,037,025	1,496,980	186.2083	278,750,127	0	0	1.0000	0	9,184,995	6,749,920	8,739,915,007
2204	7,167,560	5,267,336	1,675.9838	8,827,970,129	2,042,606	1,501,081	191.5152	287,479,915	0	0	1.0000	0	9,210,166	6,768,418	9,115,450,044
2205	7,147,970	5,252,940	1,743.8611	9,160,397,352	2,037,025	1,496,980	196.9734	294,865,268	0	0	1.0000	0	9,184,995	6,749,920	9,455,262,620
2206	7,147,970	5,252,940	1,814.4875	9,531,393,579	2,037,025	1,496,980	202.5872	303,269,015	0	0	1.0000	0	9,184,995	6,749,920	9,834,662,594
2207	7,147,970	5,252,940	1,887.9742	9,917,414,789	2,037,025	1,496,980	208.3609	311,912,129	0	0	1.0000	0	9,184,995	6,749,920	10,229,326,918
2208	13,927,590	10,235,184	1,964.4372	20,106,377,146	22,322,696	16,404,626	214.2992	3,515,498,298	0	0	1.0000	0	36,250,286	26,639,811	23,621,875,444
2209	7,147,970	5,252,940	2,043.9969	10,736,992,637	2,037,025	1,496,980	220.4067	329,944,453	0	0	1.0000	0	9,184,995	6,749,920	11,066,937,090
2210	7,147,970	5,252,940	2,126.7788	11,171,840,973	2,037,025	1,496,980	226.6883	339,347,883	0	0	1.0000	0	9,184,995	6,749,920	11,511,188,856
2211	7,147,970	5,252,940	2,212.9133	11,624,300,315	2,037,025	1,496,980	233.1489	349,019,273	0	0	1.0000	0	9,184,995	6,749,920	11,973,319,588
2212	7,167,560	5,267,336	2,302.5363	12,128,232,789	2,042,606	1,501,081	239.7937	359,949,876	0	0	1.0000	0	9,210,166	6,768,418	12,488,182,665
2213	7,147,970	5,252,940	2,395.7890	12,584,935,356	11,235,929	8,257,122	246.6278	2,036,435,750	0	0	1.0000	0	18,383,899	13,510,061	14,621,371,106
2214	7,147,970	5,252,940	2,492.8185	13,094,625,476	2,037,025	1,496,980	253.6567	379,719,042	0	0	1.0000	0	9,184,995	6,749,920	13,474,344,519
2215	7,147,970	5,252,940	2,593.7776	13,624,957,550	2,037,025	1,496,980	260.8859	390,541,011	0	0	1.0000	0	9,184,995	6,749,920	14,015,498,561
2216	10,825,390	7,955,423	2,698.8256	21,470,298,074	13,016,096	9,565,341	268.3212	2,566,583,660	0	0	1.0000	0	23,841,486	17,520,763	24,036,881,734
2217	7,147,970	5,252,940	2,808.1281	14,750,927,819	2,037,025	1,496,980	275.9683	413,119,064	0	0	1.0000	0	9,184,995	6,749,920	15,164,046,883
2218	14,921,800	10,965,815	2,921.8572	32,040,545,612	29,162,168	21,430,855	283.8334	6,082,792,505	0	0	1.0000	0	44,083,968	32,396,670	38,123,338,117
2219	6,482,540	4,763,925	3,040.1925	14,483,248,755	3,844,408	2,825,200	291.9227	824,739,875	0	0	1.0000	0	10,326,948	7,589,124	15,307,988,630
2220	6,403,050	4,705,509	3,163.3203	14,885,031,666	3,563,171	2,618,523	300.2424	786,191,677	0	0	1.0000	0	9,966,221	7,324,032	15,671,223,343
2221	6,386,860	4,693,611	3,291.4347	15,448,714,288	3,557,358	2,614,251	308.7994	807,279,028	0	0	1.0000	0	9,944,218	7,307,862	16,255,993,316
2222	6,386,860	4,693,611	3,424.7378	16,074,387,191	3,557,358	2,614,251	317.6001	830,286,263	0	0	1.0000	0	9,944,218	7,307,862	16,904,673,455
2223	6,482,540	4,763,925	3,563.4397	16,975,959,121	3,844,408	2,825,200	326.6517	922,856,229	0	0	1.0000	0	10,326,948	7,589,124	17,898,815,350
2224	6,403,050	4,705,509	3,707.7590	17,446,892,787	3,563,171	2,618,523	335.9613	879,722,443	0	0	1.0000	0	9,966,221	7,324,032	18,326,615,231
2225	6,386,860	4,693,611	3,857.9233	18,107,591,442	3,557,358	2,614,251	345.5362	903,318,231	0	0	1.0000	0	9,944,218	7,307,862	19,010,909,673
2226	6,386,860	4,693,611	4,014.1692	18,840,948,925	3,557,358	2,614,251	355.3840	929,062,848	0	0	1.0000	0	9,944,218	7,307,862	19,770,011,773
2227	6,482,540	4,763,925	4,176.7430	19,897,689,984	3,844,408	2,825,200	365.5124	1,032,645,461	0	0	1.0000	0	10,326,948	7,589,124	20,930,335,445
2228	6,403,050	4,705,509	4,345.9011	20,449,676,086	3,563,171	2,618,523	375.9295	984,380,100	0	0	1.0000	0	9,966,221	7,324,032	21,434,056,187
2229	6,386,860	4,693,611	4,521.9101	21,224,087,226	3,557,358	2,614,251	386.6435	1,010,783,016	0	0	1.0000	0	9,944,218	7,307,862	22,234,870,241
2230	6,099,800	4,482,655	4,705.0475	21,091,103,808	2,696,178	1,981,382	397.6629	787,922,075	0	0	1.0000	0	8,795,978	6,464,037	21,879,025,883
2231	2,028,079	1,490,406	4,895.6019	7,296,434,457	5,022,573	3,691,016	408.9963	1,509,612,017	0	0	1.0000	0	7,050,652	5,181,422	8,806,046,474
	\$2,255,855,813	\$1,657,795,815		\$717,266,338,345	\$2,005,587,868	\$1,473,877,521		\$73,233,079,006	\$0	\$0		\$0	\$4,261,443,682	\$3,131,673,337	\$790,499,417,350

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional
Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Estimate	Cost in	Cost in
Estimate	Cost in		Cost in	Estimate	Cost in		Cost in	Estimate	Cost in		Cost in	Estimate	Cost in	Cost in
Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Future \$'s
Prairie Island Unit 1														
Factors	2017	73.4886%	4.05%				2.85%				0.00%			
2033	\$22,324,352	\$16,405,843	1.8874	\$30,964,388	\$9,448,311	\$6,943,427	1.5677	\$10,885,211	\$1,250,000	\$918,607	\$918,607	\$33,022,663	\$24,267,877	\$42,768,206
2034	63,582,247	46,725,674	1.9639	91,764,550	32,971,808	24,230,505	1.6124	39,069,266	1,250,000	918,607	918,607	97,804,054	71,874,785	131,752,423
2035	65,877,294	48,412,271	2.0434	98,925,635	81,239,940	59,702,057	1.6584	99,009,891	1,250,000	918,607	918,607	148,367,234	109,032,935	198,854,133
2036	57,759,315	42,446,486	2.1262	90,249,718	65,595,019	48,204,831	1.7056	82,218,159	1,250,000	918,607	918,607	124,604,334	91,569,923	173,386,484
2037	39,808,349	29,254,580	2.2123	64,719,908	41,981,869	30,851,869	1.7542	54,120,348	1,250,000	918,607	918,607	83,040,219	61,025,056	119,758,863
2038	13,207,909	9,706,302	2.3019	22,342,936	18,994,690	13,958,923	1.8042	25,184,688	1,250,000	918,607	918,607	33,452,599	24,583,831	48,446,231
2039	35,713,293	26,245,183	2.3951	62,859,838	75,509,032	55,490,496	1.8556	102,968,164	1,250,000	918,607	918,607	112,472,326	82,654,286	166,746,609
2040	31,919,565	23,457,227	2.4921	58,457,756	13,365,605	9,822,190	1.9085	18,745,649	1,250,000	918,607	918,607	46,535,170	34,198,024	78,122,012
2041	19,624,629	14,421,856	2.5930	37,395,872	9,445,873	6,941,635	1.9629	13,625,736	1,250,000	918,607	918,607	30,320,501	22,282,098	51,940,215
2042	14,863,700	10,923,118	2.6981	29,471,665	11,668,700	8,575,159	2.0189	17,312,388	1,250,000	918,607	918,607	27,782,400	20,416,884	47,702,660
2043	8,912,163	6,549,420	2.8073	18,386,186	6,432,175	4,726,912	2.0764	9,814,961	1,250,000	918,607	918,607	16,594,338	12,194,939	29,119,754
2044	3,676,270	2,701,638	2.9210	7,891,484	1,824,877	1,341,076	2.1356	2,864,001	1,250,000	918,607	918,607	6,751,147	4,961,320	11,674,091
2045	5,973,090	4,389,537	3.0393	13,341,121	8,737,075	6,420,750	2.1964	14,102,536	1,250,000	918,607	918,607	15,960,165	11,728,895	28,362,264
2046	5,204,130	3,824,440	3.1624	12,094,409	6,430,205	4,725,465	2.2590	10,674,825	1,250,000	918,607	918,607	12,884,335	9,468,512	23,687,841
2047	5,204,130	3,824,440	3.2905	12,584,319	6,430,205	4,725,465	2.3234	10,979,145	1,250,000	918,607	918,607	12,884,335	9,468,512	24,482,072
2048	3,676,270	2,701,638	3.4238	9,249,867	1,824,877	1,341,076	2.3896	3,204,634	1,250,000	918,607	918,607	6,751,147	4,961,320	13,373,108
2049	5,204,130	3,824,440	3.5624	13,624,185	6,430,205	4,725,465	2.4577	11,613,775	1,250,000	918,607	918,607	12,884,335	9,468,512	26,156,567
2050	5,973,090	4,389,537	3.7067	16,270,699	8,737,075	6,420,750	2.5278	16,230,373	1,250,000	918,607	918,607	15,960,165	11,728,895	33,419,678
2051	5,779,130	4,246,999	3.8568	16,379,826	8,155,205	5,993,143	2.5998	15,580,972	1,250,000	918,607	918,607	15,184,335	11,158,749	32,879,405
2052	5,983,130	4,396,916	4.0130	17,644,823	8,745,477	6,426,924	2.6739	17,184,953	1,250,000	918,607	918,607	15,978,607	11,742,447	35,748,383
2053	3,666,220	2,694,252	4.1756	11,250,119	1,816,475	1,334,902	2.7501	3,671,113	1,250,000	918,607	918,607	6,732,695	4,947,761	15,839,839
2054	3,666,220	2,694,252	4.3447	11,705,717	1,816,475	1,334,902	2.8285	3,775,769	1,250,000	918,607	918,607	6,732,695	4,947,761	16,400,093
2055	5,973,090	4,389,537	4.5206	19,843,343	8,737,075	6,420,750	2.9091	18,678,605	1,250,000	918,607	918,607	15,960,165	11,728,895	39,440,555
2056	5,214,180	3,831,825	4.7037	18,023,758	6,438,607	4,731,639	2.9920	14,157,064	1,250,000	918,607	918,607	12,902,787	9,482,071	33,099,428
2057	5,204,130	3,824,440	4.8942	18,717,574	6,430,205	4,725,465	3.0773	14,541,673	1,250,000	918,607	918,607	12,884,335	9,468,512	34,177,854
2058	3,666,220	2,694,252	5.0924	13,720,209	1,816,475	1,334,902	3.1650	4,224,963	1,250,000	918,607	918,607	6,732,695	4,947,761	18,863,779
2059	5,010,180	3,681,909	5.2987	19,509,330	5,848,345	4,297,864	3.2552	13,990,408	1,250,000	918,607	918,607	12,108,525	8,898,380	34,418,346
2060	5,214,180	3,831,825	5.5133	21,126,003	6,438,607	4,731,639	3.3480	15,841,527	1,250,000	918,607	918,607	12,902,787	9,482,071	37,886,138
2061	5,204,130	3,824,440	5.7366	21,939,282	6,430,205	4,725,465	3.4434	16,271,666	1,250,000	918,607	918,607	12,884,335	9,468,512	39,129,555
2062	3,666,220	2,694,252	5.9689	16,081,721	1,816,475	1,334,902	3.5415	4,727,554	1,250,000	918,607	918,607	6,732,695	4,947,761	21,727,882
2063	8,279,960	6,084,823	6.2106	37,790,401	15,657,675	11,506,599	3.6425	41,912,788	1,250,000	918,607	918,607	25,187,635	18,510,029	80,621,796
2064	6,558,130	4,819,475	6.4622	31,144,411	10,470,477	7,694,602	3.7463	28,826,287	1,250,000	918,607	918,607	18,278,607	13,432,684	60,889,305
2065	5,204,130	3,824,440	6.7239	25,715,151	6,430,205	4,725,465	3.8531	18,207,689	1,250,000	918,607	918,607	12,884,335	9,468,512	44,841,447
2066	3,666,220	2,694,252	6.9962	18,849,526	1,816,475	1,334,902	3.9629	5,290,081	1,250,000	918,607	918,607	6,732,695	4,947,761	25,058,214
2067	3,666,220	2,694,252	7.2795	19,612,808	1,816,475	1,334,902	4.0758	5,440,792	1,250,000	918,607	918,607	6,732,695	4,947,761	25,972,206
2068	6,752,090	4,962,013	7.5744	37,584,274	11,052,337	8,122,202	4.1920	34,048,273	1,250,000	918,607	918,607	19,054,427	14,002,823	72,551,153
2069	5,973,090	4,389,537	7.8811	34,594,384	8,737,075	6,420,750	4.3115	27,683,065	1,250,000	918,607	918,607	15,960,165	11,728,895	63,196,056
2070	3,666,220	2,694,252	8.2003	22,093,675	1,816,475	1,334,902	4.4343	5,919,354	1,250,000	918,607	918,607	6,732,695	4,947,761	28,931,636
2071	3,666,220	2,694,252	8.5324	22,988,436	1,816,475	1,334,902	4.5607	6,088,085	1,250,000	918,607	918,607	6,732,695	4,947,761	29,995,129
2072	7,327,090	5,384,572	8.8780	47,804,235	12,777,337	9,389,880	4.6907	44,045,110	1,250,000	918,607	918,607	21,354,427	15,693,059	92,767,952
2073	3,666,220	2,694,252	9.2375	24,888,153	1,816,475	1,334,902	4.8244	6,440,099	1,250,000	918,607	918,607	6,732,695	4,947,761	32,246,859
2074	3,666,220	2,694,252	9.6117	25,896,343	1,816,475	1,334,902	4.9619	6,623,648	1,250,000	918,607	918,607	6,732,695	4,947,761	33,438,597
2075	7,842,820	5,763,575	10.0009	57,640,937	14,346,275	10,542,870	5.1033	53,803,430	1,250,000	918,607	918,607	23,439,095	17,225,052	112,362,974
2076	3,676,270	2,701,638	10.4060	28,113,241	1,824,877	1,341,076	5.2487	7,038,993	1,250,000	918,607	918,607	6,751,147	4,961,320	36,070,752
2077	3,666,220	2,694,252	10.8274	29,171,745	1,816,475	1,334,902	5.3983	7,206,199	1,250,000	918,607	918,607	6,732,695	4,947,761	37,296,551
2078	7,511,000	5,519,725	11.2659	62,184,673	13,350,805	9,811,314	5.5522	54,474,377	1,250,000	918,607	918,607	22,111,805	16,249,646	117,577,657
2079	3,666,220	2,694,252	11.7222	31,582,562	1,816,475	1,334,902	5.7104	7,622,822	1,250,000	918,607	918,607	6,732,695	4,947,761	40,123,990
2080	3,676,270	2,701,638	12.1970	32,951,875	1,824,877	1,341,076	5.8731	7,876,271	1,250,000	918,607	918,607	6,751,147	4,961,320	41,746,752
2081	3,666,220	2,694,252	12.6909	34,192,483	1,816,475	1,334,902	6.0405	8,063,473	1,250,000	918,607	918,607	6,732,695	4,947,761	43,174,563
2082	7,123,090	5,234,656	13.2049	69,123,107	12,187,075	8,956,105	6.2127	55,641,597	1,250,000	918,607	918,607	20,560,165	15,109,368	125,083,310
2083	3,666,220	2,694,252	13.7397	37,018,215	1,816,475	1,334,902	6.3897	8,529,620	1,250,000	918,607	918,607	6,732,695	4,947,761	46,466,442
2084	3,676,270	2,701,638	14.2962	38,623,152	1,824,877	1,341,076	6.5719	8,813,410	1,250,000	918,607	918,607	6,751,147	4,961,320	48,355,173
2085	3,666,220	2,694,252	14.8752	40,077,538	1,816,475	1,334,902	6.7592	9,022,866	1,250,000	918,607	918,607	6,732,695	4,947,761	50,019,012
2086	3,666,220	2,694,252	15.4776	41,700,556	1,816,475	1,334,902	6.9518	9,279,968	1,250,000	918,607	918,607	6,732,695	4,947,761	51,899,131
2087	3,666,220	2,694,252	16.1045	43,389,582	1,816,475	1,334,902	7.1499	9,544,412	1,250,000	918,607	918,607	6,732,695	4,947,761	53,852,602

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2088	3,676,270	2,701,638	16.7567	45,270,532	1,824,877	1,341,076	7.3537	9,861,867	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	56,051,006
2089	26,770,050	19,672,923	17.4353	343,003,308	73,210,048	53,801,006	7.5633	406,913,146	1,250,000	918,607	1.0000	918,607	101,230,098	74,392,535	750,835,061
2090	3,666,220	2,694,252	18.1415	48,877,774	1,816,475	1,334,902	7.7788	10,383,932	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	60,180,313
2091	3,666,220	2,694,252	18.8762	50,857,241	1,816,475	1,334,902	8.0005	10,679,880	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	62,455,727
2092	3,676,270	2,701,638	19.6407	53,062,055	1,824,877	1,341,076	8.2285	11,035,040	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	65,015,702
2093	3,666,220	2,694,252	20.4361	55,060,005	1,816,475	1,334,902	8.4630	11,297,272	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	67,275,883
2094	3,666,220	2,694,252	21.2638	57,290,037	1,816,475	1,334,902	8.7042	11,619,250	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	69,827,894
2095	5,973,090	4,389,537	22.1250	97,118,516	8,737,075	6,420,750	8.9523	57,480,484	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	155,517,607
2096	5,214,180	3,831,825	23.0210	88,212,454	6,438,607	4,731,639	9.2075	43,566,566	1,250,000	918,607	1.0000	918,607	12,902,787	9,482,071	132,697,627
2097	5,204,130	3,824,440	23.9534	91,608,338	6,430,205	4,725,465	9.4699	44,749,681	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	137,276,626
2098	3,666,220	2,694,252	24.9235	67,150,191	1,816,475	1,334,902	9.7398	13,001,674	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	81,070,472
2099	3,666,220	2,694,252	25.9329	69,869,769	1,816,475	1,334,902	10.0173	13,372,109	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	84,160,485
2100	5,973,090	4,389,537	26.9832	118,443,767	8,737,075	6,420,750	10.3028	66,151,707	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	185,514,081
2101	5,973,090	4,389,537	28.0760	123,240,654	8,737,075	6,420,750	10.5965	68,037,482	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	192,196,742
2102	5,973,090	4,389,537	29.2131	128,231,997	8,737,075	6,420,750	10.8985	69,976,548	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	199,127,152
2103	3,666,220	2,694,252	30.3962	81,895,024	1,816,475	1,334,902	11.2091	14,963,045	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	97,776,676
2104	3,676,270	2,701,638	31.6272	85,445,235	1,824,877	1,341,076	11.5285	15,460,589	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	101,824,431
2105	5,973,090	4,389,537	32.9081	144,451,338	8,737,075	6,420,750	11.8571	76,131,479	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	221,501,424
2106	5,204,130	3,824,440	34.2409	130,952,263	6,430,205	4,725,465	12.1950	57,627,046	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	189,497,916
2107	5,204,130	3,824,440	35.6277	136,255,997	6,430,205	4,725,465	12.5426	59,269,617	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	196,444,221
2108	3,676,270	2,701,638	37.0706	100,151,329	1,824,877	1,341,076	12.9000	17,299,874	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	118,369,810
2109	5,204,130	3,824,440	38.5720	147,516,295	6,430,205	4,725,465	13.2677	62,696,052	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	211,130,954
2110	5,204,130	3,824,440	40.1341	153,490,453	6,430,205	4,725,465	13.6458	64,482,750	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	218,891,810
2111	5,204,130	3,824,440	41.7596	159,707,080	6,430,205	4,725,465	14.0347	66,320,483	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	226,946,170
2112	3,676,270	2,701,638	43.4508	117,388,318	1,824,877	1,341,076	14.4347	19,358,023	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	137,664,947
2113	8,279,960	6,084,823	45.2106	275,098,493	15,657,675	11,506,599	14.8461	170,828,123	1,250,000	918,607	1.0000	918,607	25,187,635	18,510,029	446,845,223
2114	6,742,050	4,954,635	47.0416	233,073,960	11,043,935	8,116,028	15.2692	123,925,262	1,250,000	918,607	1.0000	918,607	19,035,985	13,989,270	357,917,829
2115	5,535,960	4,068,297	48.9468	199,130,117	7,425,675	5,457,021	15.7044	85,699,248	1,250,000	918,607	1.0000	918,607	14,211,635	10,443,925	285,747,972
2116	3,676,270	2,701,638	50.9291	137,591,975	1,824,877	1,341,076	16.1520	21,661,052	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	160,171,633
2117	3,666,220	2,694,252	52.9918	142,773,266	1,816,475	1,334,902	16.6123	22,175,785	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	165,867,658
2118	6,742,050	4,954,635	55.1379	273,188,172	11,043,935	8,116,028	17.0857	138,668,027	1,250,000	918,607	1.0000	918,607	19,035,985	13,989,270	412,774,806
2119	5,973,090	4,389,537	57.3710	251,832,154	8,737,075	6,420,750	17.5727	112,829,920	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	365,580,681
2120	3,676,270	2,701,638	59.6946	161,273,179	1,824,877	1,341,076	18.0735	24,237,929	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	186,429,715
2121	3,666,220	2,694,252	62.1122	167,345,923	1,816,475	1,334,902	18.5886	24,813,951	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	193,078,480
2122	7,511,000	5,519,725	64.6277	356,727,150	13,350,805	9,811,314	19.1184	187,576,623	1,250,000	918,607	1.0000	918,607	22,111,805	16,249,646	545,222,379
2123	3,666,220	2,694,252	67.2451	181,175,249	1,816,475	1,334,902	19.6633	26,248,569	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	208,342,425
2124	3,676,270	2,701,638	69.9686	189,029,805	1,824,877	1,341,076	20.2237	27,121,509	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	217,069,921
2125	7,511,000	5,519,725	72.8023	401,848,696	13,350,805	9,811,314	20.8000	204,075,328	1,250,000	918,607	1.0000	918,607	22,111,805	16,249,646	606,842,631
2126	3,666,220	2,694,252	75.7508	204,091,749	1,816,475	1,334,902	21.3928	28,557,281	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	233,567,637
2127	3,666,220	2,694,252	78.8187	212,357,445	1,816,475	1,334,902	22.0025	29,371,171	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	242,647,223
2128	7,521,050	5,527,111	82.0109	453,283,338	13,359,207	9,817,488	22.6296	222,165,823	1,250,000	918,607	1.0000	918,607	22,130,257	16,263,206	676,367,768
2129	3,666,220	2,694,252	85.3323	229,906,725	1,816,475	1,334,902	23.2745	31,069,166	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	261,894,498
2130	3,666,220	2,694,252	88.7883	239,218,060	1,816,475	1,334,902	23.9379	31,954,739	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	272,091,406
2131	3,666,220	2,694,252	92.3842	248,906,321	1,816,475	1,334,902	24.6201	32,865,409	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	282,690,337
2132	7,521,050	5,527,111	96.1257	531,297,403	13,359,207	9,817,488	25.3218	248,596,464	1,250,000	918,607	1.0000	918,607	22,130,257	16,263,206	780,812,473
2133	3,666,220	2,694,252	100.0188	269,475,858	1,816,475	1,334,902	26.0434	34,765,375	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	305,159,839
2134	3,666,220	2,694,252	104.0696	280,389,734	1,816,475	1,334,902	26.7857	35,756,272							

Proposed

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2145	5,973,090	4,389,537	161.0597	706,977,587	8,737,075	6,420,750	36.4880	234,280,340	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	942,176,534
2146	5,204,130	3,824,440	167.5826	640,909,579	6,430,205	4,725,465	37.5279	177,336,778	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	819,164,963
2147	5,204,130	3,824,440	174.3697	666,866,434	6,430,205	4,725,465	38.5974	182,390,662	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	850,175,704
2148	3,676,270	2,701,638	181.4317	490,162,713	1,824,877	1,341,076	39.6975	53,237,346	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	544,318,666
2149	3,666,220	2,694,252	188.7796	508,619,826	1,816,475	1,334,902	40.8288	54,502,428	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	564,040,861
2150	5,973,090	4,389,537	196.4252	862,215,774	8,737,075	6,420,750	41.9925	269,623,361	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	1,132,757,742
2151	5,973,090	4,389,537	204.3804	897,135,423	8,737,075	6,420,750	43.1893	277,307,715	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	1,175,361,744
2152	5,983,130	4,396,916	212.6578	935,038,423	8,745,477	6,426,924	44.4201	285,484,624	1,250,000	918,607	1.0000	918,607	15,978,607	11,742,447	1,221,441,653
2153	3,666,220	2,694,252	221.2705	596,158,501	1,816,475	1,334,902	45.6861	60,986,445	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	658,063,552
2154	3,666,220	2,694,252	230.2319	620,302,771	1,816,475	1,334,902	46.9882	62,724,620	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	683,945,998
2155	6,304,910	4,633,387	239.5563	1,109,957,090	9,732,545	7,152,307	48.3273	345,651,681	1,250,000	918,607	1.0000	918,607	17,287,455	12,704,301	1,456,527,378
2156	5,214,180	3,831,825	249.2584	955,114,688	6,438,607	4,731,639	49.7047	235,184,696	1,250,000	918,607	1.0000	918,607	12,902,787	9,482,071	1,191,217,991
2157	5,204,130	3,824,440	259.3533	991,881,103	6,430,205	4,725,465	51.1212	241,571,441	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	1,234,371,151
2158	3,666,220	2,694,252	269.8571	727,063,048	1,816,475	1,334,902	52.5782	70,186,720	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	798,168,374
2159	5,204,130	3,824,440	280.7864	1,073,850,706	6,430,205	4,725,465	54.0767	255,537,553	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	1,330,306,865
2160	5,214,180	3,831,825	292.1582	1,119,499,235	6,438,607	4,731,639	55.6179	263,163,824	1,250,000	918,607	1.0000	918,607	12,902,787	9,482,071	1,383,581,665
2161	5,204,130	3,824,440	303.9906	1,162,593,774	6,430,205	4,725,465	57.2030	270,310,774	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	1,433,823,154
2162	3,666,220	2,694,252	316.3022	852,197,854	1,816,475	1,334,902	58.8333	78,536,662	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	931,653,123
2163	8,279,960	6,084,823	329.1125	2,002,591,266	15,657,675	11,506,599	60.5100	696,264,321	1,250,000	918,607	1.0000	918,607	25,187,635	18,510,029	2,699,774,193
2164	6,752,090	4,962,013	342.4415	1,699,199,277	11,052,337	8,122,202	62.2345	505,481,208	1,250,000	918,607	1.0000	918,607	19,054,427	14,002,823	2,205,599,092
2165	5,204,130	3,824,440	356.3104	1,362,687,703	6,430,205	4,725,465	64.0082	302,468,508	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	1,666,074,818
2166	3,666,220	2,694,252	370.7410	998,869,703	1,816,475	1,334,902	65.8325	87,879,905	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,087,668,215
2167	3,666,220	2,694,252	385.7560	1,039,323,898	1,816,475	1,334,902	67.7087	90,384,447	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,130,626,952
2168	6,752,090	4,962,013	401.3791	1,991,648,432	11,052,337	8,122,202	69.6384	565,617,182	1,250,000	918,607	1.0000	918,607	19,054,427	14,002,823	2,558,184,221
2169	5,973,090	4,389,537	417.6350	1,833,224,479	8,737,075	6,420,750	71.6231	459,874,047	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	2,294,017,133
2170	3,666,220	2,694,252	434.5492	1,170,785,077	1,816,475	1,334,902	73.6643	98,334,587	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,270,038,271
2171	3,666,220	2,694,252	452.1484	1,218,201,758	1,816,475	1,334,902	75.7638	101,137,213	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,320,257,578
2172	7,521,050	5,527,111	470.4604	2,600,286,797	13,359,207	9,817,488	77.9230	765,008,105	1,250,000	918,607	1.0000	918,607	22,130,257	16,263,206	3,366,213,509
2173	3,666,220	2,694,252	489.5141	1,318,874,373	1,816,475	1,334,902	80.1438	106,984,081	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,426,777,061
2174	3,666,220	2,694,252	509.3394	1,372,288,728	1,816,475	1,334,902	82.4279	110,033,130	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,483,240,465
2175	7,511,000	5,519,725	529.9676	2,925,275,561	13,350,805	9,811,314	84.7771	831,774,735	1,250,000	918,607	1.0000	918,607	22,111,805	16,249,646	3,757,968,903
2176	3,676,270	2,701,638	551.4313	1,489,767,567	1,824,877	1,341,076	87.1933	116,932,801	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	1,607,618,975
2177	3,666,220	2,694,252	573.7643	1,545,865,647	1,816,475	1,334,902	89.6783	119,711,700	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,666,495,954
2178	7,511,000	5,519,725	597.0018	3,295,285,929	13,350,805	9,811,314	92.2341	904,937,703	1,250,000	918,607	1.0000	918,607	22,111,805	16,249,646	4,201,142,239
2179	3,666,220	2,694,252	621.1803	1,673,616,303	1,816,475	1,334,902	94.8628	126,632,497	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,801,167,407
2180	3,676,270	2,701,638	646.3381	1,746,171,352	1,824,877	1,341,076	97.5664	130,843,911	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	1,877,933,870
2181	3,666,220	2,694,252	672.5148	1,811,924,386	1,816,475	1,334,902	100.3470	133,953,364	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,946,796,356
2182	7,511,000	5,519,725	699.7517	3,862,437,150	13,350,805	9,811,314	103.2069	1,012,595,287	1,250,000	918,607	1.0000	918,607	22,111,805	16,249,646	4,875,951,044
2183	3,666,220	2,694,252	728.0916	1,961,662,293	1,816,475	1,334,902	106.1483	141,697,528	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	2,104,278,428
2184	3,676,270	2,701,638	757.5793	2,046,704,767	1,824,877	1,341,076	109.1736	146,410,043	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	2,194,033,417
2185	3,666,220	2,694,252	788.2613	2,123,774,632	1,816,475	1,334,902	112.2850	149,889,418	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	2,274,582,657
2186	3,666,220	2,694,252	820.1859	2,209,787,551	1,816,475	1,334,902	115.4851	154,161,237	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	2,364,867,395
2187	3,666,220	2,694,252	853.4034	2,299,283,869	1,816,475	1,334,902	118.7764	158,554,798	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	2,458,757,274
2188	3,676,270	2,701,638	887.9662	2,398,962,927	1,824,877	1,341,076	122.1616	163,827,932	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	2,563,709,466
2189	26,780,760	19,680,793	923.9289	18,183,653,653	71,160,065	52,294,503	125.6432	6,570,448,704	1,250,000	918,607	1.0000	918,607	99,190,825	72,893,903	24,755,020,964
2190	3,666,220	2,694,252	961.3480	2,590,113,830	1,816,475	1,334,902	129.2240								

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s			
2202	5,452,650	4,007,074	1,548.0523	6,203,159,555	9,178,228	6,744,947	181.0484	1,221,161,841	1,250,000	918,607	1.0000	918,607	15,880,878	11,670,627	7,425,240,003
2203	3,097,940	2,276,631	1,610.7485	3,667,080,462	2,114,098	1,553,620	186.2083	289,296,920	1,250,000	918,607	1.0000	918,607	6,462,038	4,748,858	3,957,295,989
2204	3,153,870	2,317,733	1,675.9838	3,884,483,723	2,265,665	1,665,004	191.5152	318,873,632	1,250,000	918,607	1.0000	918,607	6,669,535	4,901,345	4,204,275,961
2205	5,452,650	4,007,074	1,743.8611	6,987,779,835	9,178,228	6,744,947	196.9734	1,328,575,120	1,250,000	918,607	1.0000	918,607	15,880,878	11,670,627	8,317,273,562
2206	4,635,850	3,406,819	1,814.4875	6,181,630,718	6,727,828	4,944,183	202.5872	1,001,628,263	1,250,000	918,607	1.0000	918,607	12,613,678	9,269,609	7,184,177,587
2207	4,683,690	3,441,976	1,887.9742	6,498,361,979	6,871,358	5,049,661	208.3609	1,052,152,010	1,250,000	918,607	1.0000	918,607	12,805,048	9,410,244	7,551,432,596
2208	3,153,870	2,317,733	1,964.4372	4,553,041,818	2,265,665	1,665,004	214.2992	356,809,090	1,250,000	918,607	1.0000	918,607	6,669,535	4,901,345	4,910,769,515
2209	4,635,850	3,406,819	2,043.9969	6,963,527,731	6,727,828	4,944,183	220.4067	1,089,731,138	1,250,000	918,607	1.0000	918,607	12,613,678	9,269,609	8,054,177,476
2210	4,676,510	3,436,700	2,126.7788	7,309,099,791	6,849,828	5,033,839	226.6883	1,141,112,494	1,250,000	918,607	1.0000	918,607	12,776,338	9,389,146	8,451,130,892
2211	4,669,340	3,431,430	2,212.9133	7,593,458,063	6,828,298	5,018,017	233.1489	1,169,945,215	1,250,000	918,607	1.0000	918,607	12,747,638	9,368,055	8,764,321,886
2212	3,139,520	2,307,188	2,302.5363	5,312,383,769	2,222,605	1,633,360	239.7937	391,669,469	1,250,000	918,607	1.0000	918,607	6,612,125	4,859,155	5,704,971,845
2213	7,745,160	5,691,806	2,395.7890	13,636,366,398	16,055,768	11,799,152	246.6278	2,909,998,794	1,250,000	918,607	1.0000	918,607	25,050,928	18,409,565	16,547,283,798
2214	6,207,250	4,561,618	2,492.8185	11,371,286,392	11,442,028	8,408,581	253.6567	2,132,892,848	1,250,000	918,607	1.0000	918,607	18,899,278	13,888,806	13,505,097,847
2215	4,669,340	3,431,430	2,593.7776	8,900,367,417	6,828,298	5,018,017	260.8859	1,309,129,961	1,250,000	918,607	1.0000	918,607	12,747,638	9,368,055	10,210,415,985
2216	3,139,520	2,307,188	2,698.8256	6,226,697,626	13,878,683	10,199,243	268.3212	2,736,673,199	1,250,000	918,607	1.0000	918,607	18,268,203	13,425,038	8,964,289,432
2217	3,145,780	2,311,788	2,808.1281	6,491,797,491	2,257,628	1,659,098	275.9683	457,858,460	1,250,000	918,607	1.0000	918,607	6,653,408	4,889,493	6,950,574,559
2218	1,058,128	777,603	2,921.8572	2,272,044,845	2,283,531	1,678,134	283.8334	476,310,374	0	0	1.0000	0	3,341,659	2,455,737	2,748,355,219
	\$1,259,022,756	\$925,237,616		\$257,498,187,414	\$1,487,265,430	\$1,092,969,857		\$50,395,864,825	\$231,250,000	\$169,942,281		\$169,942,281	\$2,977,538,186	\$2,188,149,754	\$308,063,994,519

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s	
Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional				
Estimate	Cost in		Estimate	Cost in	Estimate		Cost in	Estimate	Cost in						
Nominal \$s	Nominal \$s		Nominal \$s	Nominal \$s	Nominal \$s		Nominal \$s	Nominal \$s	Nominal \$s						
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2034	\$7,760,265	\$5,702,906	1.9639	\$11,199,938	\$4,479,535	\$3,291,946	1.6124	\$5,307,933	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459	\$17,426,478
2035	46,911,429	34,474,531	2.0434	70,445,256	35,601,336	26,162,907	1.6584	43,388,565	1,250,000	918,607	1.0000	918,607	83,762,765	61,556,044	114,752,428
2036	67,514,041	49,615,092	2.1262	105,491,609	86,298,834	63,419,765	1.7056	108,168,751	1,250,000	918,607	1.0000	918,607	155,062,874	113,953,464	214,578,967
2037	72,593,441	53,347,870	2.2123	118,021,492	75,650,363	55,594,358	1.7542	97,523,623	1,250,000	918,607	1.0000	918,607	149,493,804	109,860,835	216,463,722
2038	46,603,525	34,248,257	2.3019	78,836,063	42,782,150	31,439,983	1.8042	56,724,017	1,250,000	918,607	1.0000	918,607	90,635,675	66,606,847	136,478,687
2039	40,341,063	29,646,064	2.3951	71,005,287	76,484,927	56,207,667	1.8556	104,298,947	1,250,000	918,607	1.0000	918,607	118,075,990	86,772,338	176,222,841
2040	37,417,178	27,497,343	2.4921	68,526,129	14,193,500	10,430,598	1.9085	19,906,796	1,250,000	918,607	1.0000	918,607	52,860,678	38,846,548	89,351,532
2041	23,380,886	17,182,275	2.5930	44,553,639	13,070,130	9,605,049	1.9629	18,853,752	1,250,000	918,607	1.0000	918,607	37,701,016	27,705,931	64,325,998
2042	16,738,669	12,301,006	2.6981	33,189,343	17,178,640	12,624,334	2.0189	25,487,268	1,250,000	918,607	1.0000	918,607	35,167,309	25,843,947	59,595,219
2043	9,790,575	7,194,952	2.8073	20,198,388	9,014,069	6,624,309	2.0764	13,754,715	1,250,000	918,607	1.0000	918,607	20,054,644	14,737,868	34,871,710
2044	3,676,269	2,701,637	2.9210	7,891,481	1,825,866	1,341,803	2.1356	2,865,554	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	11,675,642
2045	5,973,090	4,389,537	3.0393	13,341,121	8,738,060	6,421,474	2.1964	14,104,126	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	28,363,854
2046	5,204,135	3,824,444	3.1624	12,094,420	6,431,194	4,726,192	2.2590	10,676,467	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	23,689,494
2047	5,204,135	3,824,444	3.2905	12,584,332	6,431,194	4,726,192	2.3234	10,980,834	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	24,483,772
2048	3,676,269	2,701,637	3.4238	9,249,865	1,825,866	1,341,803	2.3896	3,206,372	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	13,374,843
2049	5,204,135	3,824,444	3.5624	13,624,198	6,431,194	4,726,192	2.4577	11,615,561	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	26,158,366
2050	5,973,090	4,389,537	3.7067	16,270,699	8,738,060	6,421,474	2.5278	16,232,202	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	33,421,508
2051	5,779,135	4,247,003	3.8568	16,379,840	8,156,192	5,993,868	2.5998	15,582,857	1,250,000	918,607	1.0000	918,607	15,185,327	11,159,477	32,881,304
2052	5,983,135	4,396,919	4.0130	17,644,838	8,746,464	6,427,650	2.6739	17,186,894	1,250,000	918,607	1.0000	918,607	15,979,599	11,743,176	35,750,338
2053	3,666,224	2,694,255	4.1756	11,250,131	1,817,462	1,335,627	2.7501	3,673,107	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	15,841,845
2054	3,666,224	2,694,255	4.3447	11,705,730	1,817,462	1,335,627	2.8285	3,777,820	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	16,402,157
2055	5,973,090	4,389,537	4.5206	19,843,343	8,738,060	6,421,474	2.9091	18,680,710	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	39,442,660
2056	5,214,179	3,831,825	4.7037	18,023,754	6,439,598	4,732,368	2.9920	14,159,244	1,250,000	918,607	1.0000	918,607	12,903,777	9,482,799	33,101,605
2057	5,204,135	3,824,444	4.8942	18,717,592	6,431,194	4,726,192	3.0773	14,543,910	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	34,180,108
2058	3,666,224	2,694,255	5.0924	13,720,224	1,817,462	1,335,627	3.1650	4,227,259	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	18,866,090
2059	5,010,180	3,681,909	5.2987	19,509,330	5,849,328	4,298,587	3.2552	13,992,760	1,250,000	918,607	1.0000	918,607	12,109,508	8,899,102	34,420,697
2060	5,214,179	3,831,825	5.5133	21,125,999	6,439,598	4,732,368	3.3480	15,843,967	1,250,000	918,607	1.0000	918,607	12,903,777	9,482,799	37,888,573
2061	5,204,135	3,824,444	5.7366	21,939,303	6,431,194	4,726,192	3.4434	16,274,168	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	39,132,078
2062	3,666,224	2,694,255	5.9689	16,081,739	1,817,462	1,335,627	3.5415	4,730,122	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	21,730,468
2063	8,279,956	6,084,820	6.2106	37,790,383	15,658,658	11,507,322	3.6425	41,915,419	1,250,000	918,607	1.0000	918,607	25,188,614	18,510,748	80,624,408
2064	6,558,135	4,819,479	6.4622	31,144,434	10,471,464	7,695,328	3.7463	28,829,006	1,250,000	918,607	1.0000	918,607	18,279,599	13,433,413	60,892,047
2065	5,204,135	3,824,444	6.7239	25,715,176	6,431,194	4,726,192	3.8531	18,210,489	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	44,844,272
2066	3,666,224	2,694,255	6.9962	18,849,547	1,817,462	1,335,627	3.9629	5,292,955	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	25,061,109
2067	3,666,224	2,694,255	7.2795	19,612,829	1,817,462	1,335,627	4.0758	5,443,747	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	25,975,184
2068	6,752,090	4,962,013	7.5744	37,584,274	11,053,330	8,122,933	4.1920	34,051,333	1,250,000	918,607	1.0000	918,607	19,055,420	14,003,553	72,554,214
2069	5,973,090	4,389,537	7.8811	34,594,384	8,738,060	6,421,474	4.3115	27,686,186	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	63,199,176
2070	3,666,224	2,694,255	8.2003	22,093,699	1,817,462	1,335,627	4.4343	5,922,570	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	28,934,876
2071	3,666,224	2,694,255	8.5324	22,988,461	1,817,462	1,335,627	4.5607	6,091,393	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	29,998,461
2072	7,327,090	5,384,572	8.8780	47,804,235	12,778,330	9,390,610	4.6907	44,048,535	1,250,000	918,607	1.0000	918,607	21,355,420	15,693,790	92,771,376
2073	3,666,224	2,694,255	9.2375	24,888,181	1,817,462	1,335,627	4.8244	6,443,598	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	32,250,385
2074	3,666,224	2,694,255	9.6117	25,896,371	1,817,462	1,335,627	4.9619	6,627,246	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	33,442,224
2075	7,842,823	5,763,577	10.0009	57,640,959	14,347,260	10,543,594	5.1033	53,807,124	1,250,000	918,607	1.0000	918,607	23,440,083	17,225,778	112,366,690
2076	3,676,269	2,701,637	10.4060	28,113,234	1,825,866	1,341,803	5.2487	7,042,720	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	36,074,561
2077	3,666,224	2,694,255	10.8274	29,171,777	1,817,462	1,335,627	5.3983	7,210,114	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	37,300,497
2078	7,511,001	5,519,726	11.2659	62,184,681	13,351,792	9,812,039	5.5522	54,478,403	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	117,581,691
2079	3,666,224	2,694,255	11.7222	31,582,596	1,817,462	1,335,627	5.7104	7,626,963	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	40,128,166
2080	3,676,269	2,701,637</													

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2089	26,770,052	19,672,924	17.4353	343,003,333	73,063,378	53,693,220	7.5633	406,097,928	1,250,000	918,607	1.0000	918,607	101,083,430	74,284,751	750,019,869
2090	3,666,224	2,694,255	18.1415	48,877,827	1,817,462	1,335,627	7.7788	10,389,573	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	60,186,007
2091	3,666,224	2,694,255	18.8762	50,857,296	1,817,462	1,335,627	8.0005	10,685,682	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	62,461,585
2092	3,676,269	2,701,637	19.6407	53,062,040	1,825,866	1,341,803	8.2285	11,041,024	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	65,021,671
2093	3,666,224	2,694,255	20.4361	55,060,065	1,817,462	1,335,627	8.4630	11,303,409	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	67,282,081
2094	3,666,224	2,694,255	21.2638	57,290,099	1,817,462	1,335,627	8.7042	11,625,562	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	69,834,269
2095	5,973,090	4,389,537	22.1250	97,118,516	8,738,060	6,421,474	8.9523	57,486,963	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	155,524,086
2096	5,214,179	3,831,825	23.0210	88,212,437	6,439,598	4,732,368	9.2075	43,573,275	1,250,000	918,607	1.0000	918,607	12,903,777	9,482,799	132,704,319
2097	5,204,135	3,824,444	23.9534	91,608,426	6,431,194	4,726,192	9.4699	44,756,562	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	137,283,595
2098	3,666,224	2,694,255	24.9235	67,150,264	1,817,462	1,335,627	9.7398	13,008,737	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	81,077,609
2099	3,666,224	2,694,255	25.9329	69,869,845	1,817,462	1,335,627	10.0173	13,379,374	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	84,167,826
2100	5,973,090	4,389,537	26.9832	118,443,767	8,738,060	6,421,474	10.3028	66,159,164	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	185,521,538
2101	5,973,090	4,389,537	28.0760	123,240,654	8,738,060	6,421,474	10.5965	68,045,150	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	192,204,411
2102	5,973,090	4,389,537	29.2131	128,231,997	8,738,060	6,421,474	10.8985	69,984,436	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	199,135,039
2103	3,666,224	2,694,255	30.3962	81,895,114	1,817,462	1,335,627	11.2091	14,971,174	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	97,784,894
2104	3,676,269	2,701,637	31.6272	85,445,211	1,825,866	1,341,803	11.5285	15,468,973	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	101,832,791
2105	5,973,090	4,389,537	32.9081	144,451,338	8,738,060	6,421,474	11.8571	76,140,061	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	221,510,005
2106	5,204,135	3,824,444	34.2409	130,952,389	6,431,194	4,726,192	12.1950	57,635,907	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	189,506,903
2107	5,204,135	3,824,444	35.6277	136,256,128	6,431,194	4,726,192	12.5426	59,278,731	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	196,453,466
2108	3,676,269	2,701,637	37.0706	100,151,302	1,825,866	1,341,803	12.9000	17,309,255	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	118,379,164
2109	5,204,135	3,824,444	38.5720	147,516,437	6,431,194	4,726,192	13.2677	62,705,693	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	211,140,737
2110	5,204,135	3,824,444	40.1341	153,490,600	6,431,194	4,726,192	13.6458	64,492,666	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	218,901,873
2111	5,204,135	3,824,444	41.7596	159,707,233	6,431,194	4,726,192	14.0347	66,330,682	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	226,956,522
2112	3,676,269	2,701,637	43.4508	117,388,286	1,825,866	1,341,803	14.4347	19,368,520	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	137,675,412
2113	8,279,956	6,084,820	45.2106	275,098,360	15,658,658	11,507,322	14.8461	170,838,846	1,250,000	918,607	1.0000	918,607	25,188,614	18,510,748	446,855,813
2114	6,742,046	4,954,632	47.0416	233,073,822	11,044,926	8,116,757	15.2692	123,936,380	1,250,000	918,607	1.0000	918,607	19,036,972	13,989,996	357,928,808
2115	5,535,957	4,068,295	48.9468	199,130,009	7,426,662	5,457,747	15.7044	85,710,637	1,250,000	918,607	1.0000	918,607	14,212,619	10,444,648	285,759,253
2116	3,676,269	2,701,637	50.9291	137,591,937	1,825,866	1,341,803	16.1520	21,672,797	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	160,183,341
2117	3,666,224	2,694,255	52.9918	142,773,422	1,817,462	1,335,627	16.6123	22,187,832	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	165,879,861
2118	6,742,046	4,954,632	55.1379	273,188,010	11,044,926	8,116,757	17.0857	138,680,468	1,250,000	918,607	1.0000	918,607	19,036,972	13,989,996	412,787,085
2119	5,973,090	4,389,537	57.3710	251,832,154	8,738,060	6,421,474	17.5727	112,842,638	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	365,593,399
2120	3,676,269	2,701,637	59.6946	161,273,136	1,825,866	1,341,803	18.0735	24,251,071	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	186,442,814
2121	3,666,224	2,694,255	62.1122	167,346,105	1,817,462	1,335,627	18.5886	24,827,431	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	193,092,143
2122	7,511,001	5,519,726	64.6277	356,727,197	13,351,792	9,812,039	19.1184	187,590,487	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	545,236,291
2123	3,666,224	2,694,255	67.2451	181,175,447	1,817,462	1,335,627	19.6633	26,262,829	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	208,356,883
2124	3,676,269	2,701,637	69.9686	189,029,753	1,825,866	1,341,803	20.2237	27,136,215	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	217,084,576
2125	7,511,001	5,519,726	72.8023	401,848,749	13,351,792	9,812,039	20.8000	204,090,412	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	606,857,768
2126	3,666,224	2,694,255	75.7508	204,091,972	1,817,462	1,335,627	21.3928	28,572,795	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	233,583,374
2127	3,666,224	2,694,255	78.8187	212,357,677	1,817,462	1,335,627	22.0025	29,387,127	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	242,663,411
2128	7,521,045	5,527,107	82.0109	453,283,037	13,360,196	9,818,215	22.6296	222,182,279	1,250,000	918,607	1.0000	918,607	22,131,241	16,263,929	676,383,922
2129	3,666,224	2,694,255	85.3323	229,906,976	1,817,462	1,335,627	23.2745	31,086,044	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	261,911,627
2130	3,666,224	2,694,255	88.7883	239,218,321	1,817,462	1,335,627	23.9379	31,972,099	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	272,109,027
2131	3,666,224	2,694,255	92.3842	248,906,593	1,817,462	1,335,627	24.6201	32,883,264	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	282,708,463
2132	7,521,045	5,527,107	96.1257	531,297,049	13,360,196	9,818,215	25.3218	248,614,877	1,250,000	918,607	1.0000	918,607	22,131,241	16,263,929	780,830,534
2133	3,666,224	2,694,255	100.0188	269,476,152	1,817,462	1,335,627	26.0434	34,784,261	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	305,179,020
2134	3,666,224	2,694,255	104.0696	280,390,040	1,817,462	1,335,627	26.7857	35,775,697	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	317,084,344
2135	3,666,224	2,694,255	108.2844	291,745,786	1,817,462	1,335,627	27.5491	36,79							

Proposed

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2146	5,204,135	3,824,444	167.5826	640,910,194	6,431,194	4,726,192	37.5279	177,364,048	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	819,192,849
2147	5,204,135	3,824,444	174.3697	666,867,075	6,431,194	4,726,192	38.5974	182,418,710	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	850,204,392
2148	3,676,269	2,701,637	181.4317	490,162,580	1,825,866	1,341,803	39.6975	53,266,213	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	544,347,400
2149	3,666,224	2,694,255	188.7796	508,620,381	1,817,462	1,335,627	40.8288	54,532,036	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	564,071,025
2150	5,973,090	4,389,537	196.4252	862,215,774	8,738,060	6,421,474	41.9925	269,653,752	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	1,132,788,133
2151	5,973,090	4,389,537	204.3804	897,135,423	8,738,060	6,421,474	43.1893	277,338,972	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	1,175,393,002
2152	5,983,135	4,396,919	212.6578	935,039,204	8,746,464	6,427,650	44.4201	285,516,860	1,250,000	918,607	1.0000	918,607	15,979,599	11,743,176	1,221,474,671
2153	3,666,224	2,694,255	221.2705	596,159,151	1,817,462	1,335,627	45.6861	61,019,576	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	658,097,334
2154	3,666,224	2,694,255	230.2319	620,303,448	1,817,462	1,335,627	46.9882	62,758,696	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	683,980,750
2155	6,304,913	4,633,389	239.5563	1,109,957,618	9,733,528	7,153,029	48.3273	345,686,586	1,250,000	918,607	1.0000	918,607	17,288,441	12,705,025	1,456,562,811
2156	5,214,179	3,831,825	249.2584	955,114,505	6,439,598	4,732,368	49.7047	235,220,914	1,250,000	918,607	1.0000	918,607	12,903,777	9,482,799	1,191,254,025
2157	5,204,135	3,824,444	259.3533	991,882,056	6,431,194	4,726,192	51.1212	241,608,589	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	1,234,409,252
2158	3,666,224	2,694,255	269.8571	727,063,841	1,817,462	1,335,627	52.5782	70,224,849	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	798,207,297
2159	5,204,135	3,824,444	280.7864	1,073,851,738	6,431,194	4,726,192	54.0767	255,576,848	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	1,330,347,193
2160	5,214,179	3,831,825	292.1582	1,119,499,020	6,439,598	4,732,368	55.6179	263,204,350	1,250,000	918,607	1.0000	918,607	12,903,777	9,482,799	1,383,621,977
2161	5,204,135	3,824,444	303.9906	1,162,594,891	6,431,194	4,726,192	57.2030	270,352,341	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	1,433,865,839
2162	3,666,224	2,694,255	316.3022	852,198,784	1,817,462	1,335,627	58.8333	78,579,328	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	931,696,719
2163	8,279,956	6,084,820	329.1125	2,002,590,298	15,658,658	11,507,322	60.5100	696,308,024	1,250,000	918,607	1.0000	918,607	25,188,614	18,510,748	2,699,816,930
2164	6,752,090	4,962,013	342.4415	1,699,199,277	11,053,330	8,122,933	62.2345	505,526,647	1,250,000	918,607	1.0000	918,607	19,055,420	14,003,553	2,205,644,530
2165	5,204,135	3,824,444	356.3104	1,362,689,012	6,431,194	4,726,192	64.0082	302,515,021	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	1,666,122,640
2166	3,666,224	2,694,255	370.7410	998,870,793	1,817,462	1,335,627	65.8325	87,927,646	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,087,717,046
2167	3,666,224	2,694,255	385.7560	1,039,325,032	1,817,462	1,335,627	67.7087	90,433,549	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,130,677,188
2168	6,752,090	4,962,013	401.3791	1,991,648,432	11,053,330	8,122,933	69.6384	565,668,027	1,250,000	918,607	1.0000	918,607	19,055,420	14,003,553	2,558,235,066
2169	5,973,090	4,389,537	417.6350	1,833,224,479	8,738,060	6,421,474	71.6231	459,925,883	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	2,294,068,968
2170	3,666,224	2,694,255	434.5492	1,170,786,355	1,817,462	1,335,627	73.6643	98,388,008	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,270,092,970
2171	3,666,224	2,694,255	452.1484	1,218,203,087	1,817,462	1,335,627	75.7638	101,192,156	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,320,313,851
2172	7,521,045	5,527,107	470.4604	2,600,285,068	13,360,196	9,818,215	77.9230	765,064,770	1,250,000	918,607	1.0000	918,607	22,131,241	16,263,929	3,366,268,444
2173	3,666,224	2,694,255	489.5141	1,318,875,811	1,817,462	1,335,627	80.1438	107,042,201	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,426,836,620
2174	3,666,224	2,694,255	509.3394	1,372,290,225	1,817,462	1,335,627	82.4279	110,092,906	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,483,301,738
2175	7,511,001	5,519,726	529.9676	2,925,275,950	13,351,792	9,812,039	84.7771	831,836,215	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	3,758,030,772
2176	3,676,269	2,701,637	551.4313	1,489,767,162	1,825,866	1,341,803	87.1933	116,996,206	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	1,607,681,975
2177	3,666,224	2,694,255	573.7643	1,545,867,334	1,817,462	1,335,627	89.6783	119,776,734	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,666,562,675
2178	7,511,001	5,519,726	597.0018	3,295,286,368	13,351,792	9,812,039	92.2341	905,004,590	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	4,201,209,565
2179	3,666,224	2,694,255	621.1803	1,673,618,129	1,817,462	1,335,627	94.8628	126,701,291	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,801,238,027
2180	3,676,269	2,701,637	646.3381	1,746,170,877	1,825,866	1,341,803	97.5664	130,914,860	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	1,878,004,344
2181	3,666,224	2,694,255	672.5148	1,811,926,362	1,817,462	1,335,627	100.3470	134,026,135	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,946,871,104
2182	7,511,001	5,519,726	699.7517	3,862,437,664	13,351,792	9,812,039	103.2069	1,012,670,132	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	4,876,026,404
2183	3,666,224	2,694,255	728.0916	1,961,664,434	1,817,462	1,335,627	106.1483	141,774,506	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,104,357,547
2184	3,676,269	2,701,637	757.5793	2,046,704,211	1,825,866	1,341,803	109.1736	146,489,432	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	2,194,112,250
2185	3,666,224	2,694,255	788.2613	2,123,776,949	1,817,462	1,335,627	112.2850	149,970,847	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,274,666,403
2186	3,666,224	2,694,255	820.1859	2,209,789,962	1,817,462	1,335,627	115.4851	154,244,986	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,364,953,555
2187	3,666,224	2,694,255	853.4034	2,299,286,377	1,817,462	1,335,627	118.7764	158,640,934	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,458,845,919
2188	3,676,269	2,701,637	887.9662	2,398,962,274	1,825,866	1,341,803	122.1616	163,916,766	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	2,563,797,647
2189	26,780,755	19,680,790	923.9289	18,183,650,259	71,161,056	52,295,231	125.6432	6,570,540,189	1,250,000	918,607	1.0000	918,607	99,191,811	72,894,628	24,755,109,055
2190	3,666,224	2,694,255	961.3480	2,590,116,656	1,817,462	1,335,627	129.2240	172,595,028	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,763,630,291
2191	3,666,224	2,694,255	1,000.2826	2											

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2203	3,097,936	2,276,628	1,610.7485	3,667,075,727	2,114,098	1,553,620	186.2083	289,296,920	1,250,000	918,607	1.0000	918,607	6,462,034	4,748,855	3,957,291,254
2204	3,153,874	2,317,736	1,675.9838	3,884,488,649	2,265,664	1,665,004	191.5152	318,873,491	1,250,000	918,607	1.0000	918,607	6,669,538	4,901,347	4,204,280,747
2205	5,452,645	4,007,070	1,743.8611	6,987,773,427	9,178,225	6,744,945	196.9734	1,328,574,686	1,250,000	918,607	1.0000	918,607	15,880,870	11,670,622	8,317,266,720
2206	4,635,847	3,406,817	1,814.4875	6,181,626,718	6,727,830	4,944,185	202.5872	1,001,628,560	1,250,000	918,607	1.0000	918,607	12,613,677	9,269,609	7,184,173,885
2207	4,683,690	3,441,976	1,887.9742	6,498,361,979	6,871,359	5,049,662	208.3609	1,052,152,164	1,250,000	918,607	1.0000	918,607	12,805,049	9,410,245	7,551,432,749
2208	3,153,874	2,317,736	1,964.4372	4,553,047,592	2,265,664	1,665,004	214.2992	356,808,932	1,250,000	918,607	1.0000	918,607	6,669,538	4,901,347	4,910,775,132
2209	4,635,847	3,406,817	2,043.9969	6,963,523,225	6,727,830	4,944,185	220.4067	1,089,731,462	1,250,000	918,607	1.0000	918,607	12,613,677	9,269,609	8,054,173,294
2210	4,676,514	3,436,703	2,126.7788	7,309,106,042	6,849,830	5,033,841	226.6883	1,141,112,828	1,250,000	918,607	1.0000	918,607	12,776,344	9,389,150	8,451,137,477
2211	4,669,337	3,431,428	2,212.9133	7,593,453,185	6,828,301	5,018,020	233.1489	1,169,945,729	1,250,000	918,607	1.0000	918,607	12,747,638	9,368,055	8,764,317,521
2212	3,139,521	2,307,189	2,302.5363	5,312,385,461	2,222,606	1,633,361	239.7937	391,669,645	1,250,000	918,607	1.0000	918,607	6,612,127	4,859,156	5,704,973,713
2213	7,745,159	5,691,805	2,395.7890	13,636,364,637	16,055,764	11,799,149	246.6278	2,909,998,069	1,250,000	918,607	1.0000	918,607	25,050,923	18,409,561	16,547,281,313
2214	6,207,248	4,561,617	2,492.8185	11,371,282,728	11,442,033	8,408,584	253.6567	2,132,893,780	1,250,000	918,607	1.0000	918,607	18,899,281	13,888,808	13,505,095,115
2215	4,669,337	3,431,428	2,593.7776	8,900,361,698	6,828,301	5,018,020	260.8859	1,309,130,537	1,250,000	918,607	1.0000	918,607	12,747,638	9,368,055	10,210,410,842
2216	3,139,521	2,307,189	2,698.8256	6,226,699,609	13,878,684	10,199,244	268.3212	2,736,673,397	1,250,000	918,607	1.0000	918,607	18,268,205	13,425,040	8,964,291,613
2217	3,145,779	2,311,787	2,808.1281	6,491,795,428	2,257,627	1,659,097	275.9683	457,858,258	1,250,000	918,607	1.0000	918,607	6,653,406	4,889,492	6,950,572,292
2218	1,058,128	777,603	2,921.8572	2,272,044,845	2,283,531	1,678,134	283.8334	476,310,374	-	-	1.0000	-	3,341,659	2,455,737	2,748,355,219
	\$1,254,481,263	\$921,900,139		\$257,514,109,402	\$1,495,365,399	\$1,098,922,407		\$50,419,031,894	\$230,000,000	\$169,023,674		\$169,023,674	\$2,979,846,662	\$2,189,846,220	\$308,102,164,970
	\$4,769,359,832	\$3,504,933,570		\$1,232,278,635,160	\$4,988,218,698	\$3,665,769,786		\$174,047,975,724	\$461,250,000	\$338,965,955		\$338,965,955	\$10,218,828,530	\$7,509,669,311	\$1,406,665,576,839

EXTERNAL FUND CALCULATION

Monticello

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,832,261	-	6,696,113	646,200,556
2018	646,200,556	32,971,282	-	13,392,226	692,564,064
2019	692,564,064	36,708,630	-	68,679,001	797,951,695
2020	797,951,695	42,030,705	-	68,679,001	908,661,402
2021	908,661,402	47,621,546	-	68,679,001	1,024,961,949
2022	1,024,961,949	53,494,723	-	68,679,001	1,147,135,674
2023	1,147,135,674	59,664,496	-	68,679,001	1,275,479,171
2024	1,275,479,171	66,145,843	-	68,679,001	1,410,304,016
2025	1,410,304,016	72,954,498	-	68,679,001	1,551,937,515
2026	1,551,937,515	80,106,989	-	68,679,001	1,700,723,505
2027	1,700,723,505	87,620,682	-	68,679,001	1,857,023,188
2028	1,857,023,188	95,513,816	-	68,679,001	2,021,216,006
2029	2,021,216,006	103,805,553	-	68,679,001	2,193,700,560
2030	2,193,700,560	110,306,923	(35,447,395)	51,509,251	2,320,069,339
2031	2,320,069,339	115,307,446	(139,568,856)	-	2,295,807,930
2032	2,295,807,930	114,101,654	(235,103,206)	-	2,174,806,377
2033	2,174,806,377	108,087,877	(224,495,044)	-	2,058,399,210
2034	2,058,399,210	102,302,441	(141,890,431)	-	2,018,811,220
2035	2,018,811,220	100,334,918	(268,360,592)	-	1,850,785,546
2036	1,850,785,546	91,984,042	(104,537,352)	-	1,838,232,235
2037	1,838,232,235	91,360,142	(74,807,126)	-	1,854,785,251
2038	1,854,785,251	92,182,827	(70,466,465)	-	1,876,501,613
2039	1,876,501,613	93,262,130	(15,456,182)	-	1,954,307,561
2040	1,954,307,561	97,129,086	(16,091,729)	-	2,035,344,917
2041	2,035,344,917	101,156,642	(16,662,702)	-	2,119,838,858
2042	2,119,838,858	105,355,991	(17,301,946)	-	2,207,892,903
2043	2,207,892,903	109,732,277	(17,965,078)	-	2,299,660,102
2044	2,299,660,102	114,293,107	(18,705,321)	-	2,395,247,888
2045	2,395,247,888	119,043,820	(19,370,615)	-	2,494,921,093
2046	2,494,921,093	123,997,578	(20,114,754)	-	2,598,803,918
2047	2,598,803,918	129,160,555	(20,887,978)	-	2,707,076,494
2048	2,707,076,494	134,541,702	(26,916,472)	-	2,814,701,724
2049	2,814,701,724	139,890,676	(22,525,524)	-	2,932,066,876
2050	2,932,066,876	145,723,724	(35,781,808)	-	3,042,008,791
2051	3,042,008,791	151,187,837	(37,084,255)	-	3,156,112,374
2052	3,156,112,374	156,858,785	(38,504,356)	-	3,274,466,803
2053	3,274,466,803	162,741,000	(39,837,891)	-	3,397,369,912
2054	3,397,369,912	168,849,285	(41,292,108)	-	3,524,927,088
2055	3,524,927,088	175,188,876	(42,800,207)	-	3,657,315,757
2056	3,657,315,757	181,768,593	(44,445,167)	-	3,794,639,184

EXTERNAL FUND CALCULATION

2057	3,794,639,184	188,593,567	(45,988,884)	-	3,937,243,867
2058	3,937,243,867	195,681,020	(113,026,766)	-	4,019,898,121
2059	4,019,898,121	199,788,937	(49,420,970)	-	4,170,266,088
2060	4,170,266,088	207,262,225	(51,327,230)	-	4,326,201,083
2061	4,326,201,083	215,012,194	(53,115,265)	-	4,488,098,012
2062	4,488,098,012	223,058,471	(55,066,654)	-	4,656,089,830
2063	4,656,089,830	231,407,665	(57,091,844)	-	4,830,405,651
2064	4,830,405,651	240,071,161	(59,301,884)	-	5,011,174,928
2065	5,011,174,928	249,055,394	(61,373,962)	-	5,198,856,360
2066	5,198,856,360	258,383,161	(114,400,551)	-	5,342,838,971
2067	5,342,838,971	265,539,097	(65,983,601)	-	5,542,394,466
2068	5,542,394,466	275,457,005	(194,934,193)	-	5,622,917,278
2069	5,622,917,278	279,458,989	(70,948,647)	-	5,831,427,620
2070	5,831,427,620	289,821,953	(73,572,125)	-	6,047,677,448
2071	6,047,677,448	300,569,569	(76,295,052)	-	6,271,951,965
2072	6,271,951,965	311,716,013	(79,268,228)	-	6,504,399,749
2073	6,504,399,749	323,268,668	(82,053,729)	-	6,745,614,688
2074	6,745,614,688	335,257,050	(85,098,079)	-	6,995,773,659
2075	6,995,773,659	347,689,951	(88,256,686)	-	7,255,206,924
2076	7,255,206,924	360,583,784	(91,707,017)	-	7,524,083,691
2077	7,524,083,691	373,946,959	(94,938,806)	-	7,803,091,844
2078	7,803,091,844	387,813,665	(98,471,402)	-	8,092,434,106
2079	8,092,434,106	402,193,975	(102,138,001)	-	8,392,490,081
2080	8,392,490,081	417,106,757	(106,143,610)	-	8,703,453,228
2081	8,703,453,228	432,561,625	(109,894,241)	-	9,026,120,612
2082	9,026,120,612	448,598,194	(113,995,512)	-	9,360,723,295
2083	9,360,723,295	465,227,948	(118,252,284)	-	9,707,698,959
2084	9,707,698,959	482,472,638	(122,904,877)	-	10,067,266,720
2085	10,067,266,720	500,343,156	(127,259,911)	-	10,440,349,964
2086	10,440,349,964	518,885,393	(132,022,065)	-	10,827,213,292
2087	10,827,213,292	538,112,501	(136,966,641)	-	11,228,359,152
2088	11,228,359,152	558,049,450	(161,302,438)	-	11,625,106,164
2089	11,625,106,164	577,767,776	(147,428,700)	-	12,055,445,240
2090	12,055,445,240	599,155,628	(152,961,784)	-	12,501,639,084
2091	12,501,639,084	621,331,462	(158,706,116)	-	12,964,264,430
2092	12,964,264,430	644,323,942	(164,986,810)	-	13,443,601,562
2093	13,443,601,562	668,146,998	(170,862,753)	-	13,940,885,807
2094	13,940,885,807	692,862,025	(177,292,894)	-	14,456,454,938
2095	14,456,454,938	718,485,810	(1,011,713,130)	-	14,163,227,618
2096	14,163,227,618	703,912,413	(191,270,742)	-	14,675,869,289
2097	14,675,869,289	729,390,704	(198,100,321)	-	15,207,159,672
2098	15,207,159,672	755,795,836	(205,574,971)	-	15,757,380,537
2099	15,757,380,537	783,141,813	(213,336,340)	-	16,327,186,010
2100	16,327,186,010	811,461,145	(221,396,538)	-	16,917,250,616
2101	16,917,250,616	840,787,356	(229,766,711)	-	17,528,271,261
2102	17,528,271,261	871,155,082	(238,458,794)	-	18,160,967,549

Proposed

EXTERNAL FUND CALCULATION

External Levelized

2103	18,160,967,549	902,600,087	(247,485,050)	-	18,816,082,586
2104	18,816,082,586	935,159,305	(257,360,900)	-	19,493,880,991
2105	19,493,880,991	968,845,885	(266,593,898)	-	20,196,132,978
2106	20,196,132,978	1,003,747,809	(276,704,354)	-	20,923,176,433
2107	20,923,176,433	1,039,881,869	(287,205,190)	-	21,675,853,112
2108	21,675,853,112	1,077,289,900	(638,159,674)	-	22,114,983,337
2109	22,114,983,337	1,099,114,672	(309,437,221)	-	22,904,660,788
2110	22,904,660,788	1,138,361,641	(321,200,578)	-	23,721,821,851
2111	23,721,821,851	1,178,974,546	(333,419,432)	-	24,567,376,965
2112	24,567,376,965	1,220,998,635	(346,794,281)	-	25,441,581,319
2113	25,441,581,319	1,264,446,592	(359,291,772)	-	26,346,736,139
2114	26,346,736,139	1,309,432,786	(372,983,147)	-	27,283,185,778
2115	27,283,185,778	1,355,974,333	(387,205,007)	-	28,251,955,104
2116	28,251,955,104	1,404,122,169	(669,932,049)	-	28,986,145,224
2117	28,986,145,224	1,440,611,418	(417,322,320)	-	30,009,434,321
2118	30,009,434,321	1,491,468,886	(1,100,591,847)	-	30,400,311,360
2119	30,400,311,360	1,510,895,475	(449,819,313)	-	31,461,387,522
2120	31,461,387,522	1,563,630,960	(467,952,861)	-	32,557,065,621
2121	32,557,065,621	1,618,086,161	(484,887,338)	-	33,690,264,444
2122	33,690,264,444	1,674,406,143	(503,448,710)	-	34,861,221,877
2123	34,861,221,877	1,732,602,727	(522,731,285)	-	36,071,093,319
2124	36,071,093,319	1,792,733,338	(543,853,439)	-	37,319,973,218
2125	37,319,973,218	1,854,802,669	(563,574,012)	-	38,611,201,874
2126	38,611,201,874	1,918,976,733	(585,194,345)	-	39,944,984,263
2127	39,944,984,263	1,985,265,718	(607,655,908)	-	41,322,594,072
2128	41,322,594,072	2,053,732,925	(705,371,327)	-	42,670,955,670
2129	42,670,955,670	2,120,746,497	(655,236,600)	-	44,136,465,568
2130	44,136,465,568	2,193,582,339	(680,426,570)	-	45,649,621,337
2131	45,649,621,337	2,268,786,180	(706,597,370)	-	47,211,810,147
2132	47,211,810,147	2,346,426,964	(735,275,655)	-	48,822,961,457
2133	48,822,961,457	2,426,501,184	(762,040,497)	-	50,487,422,145
2134	50,487,422,145	2,509,224,881	(791,395,600)	-	52,205,251,425
2135	52,205,251,425	2,594,600,996	(821,895,968)	-	53,977,956,452
2136	53,977,956,452	2,682,704,436	(855,324,546)	-	55,805,336,342
2137	55,805,336,342	2,773,525,216	(886,516,984)	-	57,692,344,575
2138	57,692,344,575	2,867,309,525	(920,733,462)	-	59,638,920,638
2139	59,638,920,638	2,964,054,356	(956,287,326)	-	61,646,687,668
2140	61,646,687,668	3,063,840,377	(995,262,492)	-	63,715,265,553
2141	63,715,265,553	3,166,648,698	(1,031,621,624)	-	65,850,292,627
2142	65,850,292,627	3,272,759,544	(1,071,514,914)	-	68,051,537,256
2143	68,051,537,256	3,382,161,402	(1,112,968,427)	-	70,320,730,232
2144	70,320,730,232	3,494,940,293	(1,158,419,743)	-	72,657,250,781
2145	72,657,250,781	3,611,065,364	(5,442,760,511)	-	70,825,555,634
2146	70,825,555,634	3,520,030,115	(1,247,332,243)	-	73,098,253,506
2147	73,098,253,506	3,632,983,199	(1,295,675,896)	-	75,435,560,809
2148	75,435,560,809	3,749,147,372	(1,348,689,696)	-	77,836,018,485

EXTERNAL FUND CALCULATION

2149	77,836,018,485	3,868,450,119	(1,398,126,197)	-	80,306,342,407
2150	80,306,342,407	3,991,225,218	(1,452,386,597)	-	82,845,181,027
2151	82,845,181,027	4,117,405,497	(1,508,776,544)	-	85,453,809,981
2152	85,453,809,981	4,247,054,356	(1,570,622,673)	-	88,130,241,663
2153	88,130,241,663	4,380,073,011	(1,628,287,746)	-	90,882,026,928
2154	90,882,026,928	4,516,836,738	(1,691,587,741)	-	93,707,275,925
2155	93,707,275,925	4,657,251,613	(1,757,375,858)	-	96,607,151,681
2156	96,607,151,681	4,801,375,439	(1,829,542,347)	-	99,578,984,772
2157	99,578,984,772	4,949,075,543	(1,896,815,797)	-	102,631,244,519
2158	102,631,244,519	5,100,772,853	(3,886,348,451)	-	103,845,668,920
2159	103,845,668,920	5,161,129,745	(2,047,445,183)	-	106,959,353,482
2160	106,959,353,482	5,315,879,868	(2,131,667,054)	-	110,143,566,297
2161	110,143,566,297	5,474,135,245	(2,210,167,344)	-	113,407,534,197
2162	113,407,534,197	5,636,354,450	(2,296,366,634)	-	116,747,522,013
2163	116,747,522,013	5,802,351,844	(2,385,962,792)	-	120,163,911,065
2164	120,163,911,065	5,972,146,380	(2,484,272,480)	-	123,651,784,965
2165	123,651,784,965	6,145,493,713	(2,575,889,374)	-	127,221,389,303
2166	127,221,389,303	6,322,903,048	(4,203,981,063)	-	129,340,311,289
2167	129,340,311,289	6,428,213,471	(2,781,093,090)	-	132,987,431,670
2168	132,987,431,670	6,609,475,354	(7,021,398,585)	-	132,575,508,439
2169	132,575,508,439	6,589,002,769	(3,002,811,427)	-	136,161,699,782
2170	136,161,699,782	6,767,236,479	(3,120,277,441)	-	139,808,658,820
2171	139,808,658,820	6,948,490,343	(3,242,383,078)	-	143,514,766,085
2172	143,514,766,085	7,132,683,874	(3,376,401,038)	-	147,271,048,922
2173	147,271,048,922	7,319,371,131	(3,501,257,157)	-	151,089,162,896
2174	151,089,162,896	7,509,131,396	(3,638,417,086)	-	154,959,877,206
2175	154,959,877,206	7,701,505,897	(3,780,999,585)	-	158,880,383,519
2176	158,880,383,519	7,896,355,061	(3,937,513,425)	-	162,839,225,155
2177	162,839,225,155	8,093,109,490	(4,083,305,789)	-	166,849,028,856
2178	166,849,028,856	8,292,396,734	(4,243,486,841)	-	170,897,938,750
2179	170,897,938,750	8,493,627,556	(4,410,006,760)	-	174,981,559,546
2180	174,981,559,546	8,696,583,509	(4,592,819,228)	-	179,085,323,828
2181	179,085,323,828	8,900,540,594	(4,763,085,289)	-	183,222,779,133
2182	183,222,779,133	9,106,172,123	(4,950,179,855)	-	187,378,771,401
2183	187,378,771,401	9,312,724,939	(5,144,685,508)	-	191,546,810,832
2184	191,546,810,832	9,519,876,498	(5,358,247,477)	-	195,708,439,853
2185	195,708,439,853	9,726,709,461	(5,557,126,407)	-	199,878,022,907
2186	199,878,022,907	9,933,937,738	(5,775,687,978)	-	204,036,272,667
2187	204,036,272,667	10,140,602,752	(6,002,915,676)	-	208,173,959,742
2188	208,173,959,742	10,346,245,799	(6,252,433,947)	-	212,267,771,595
2189	212,267,771,595	10,549,708,248	(6,484,768,180)	-	216,332,711,663
2190	216,332,711,663	10,751,735,770	(6,740,125,432)	-	220,344,322,001
2191	220,344,322,001	10,951,112,803	(7,005,617,695)	-	224,289,817,109
2192	224,289,817,109	11,147,203,910	(8,216,807,977)	-	227,220,213,042
2193	227,220,213,042	11,292,844,588	(9,237,695,262)	-	229,275,362,369
2194	229,275,362,369	11,394,985,510	(8,114,316,172)	-	232,556,031,706

EXTERNAL FUND CALCULATION

2195	232,556,031,706	11,558,034,776	(35,096,569,593)	-	209,017,496,888
2196	209,017,496,888	10,388,169,595	(10,646,190,792)	-	208,759,475,691
2197	208,759,475,691	10,375,345,942	(6,903,223,641)	-	212,231,597,992
2198	212,231,597,992	10,547,910,420	(7,179,978,104)	-	215,599,530,308
2199	215,599,530,308	10,715,296,656	(7,467,860,728)	-	218,846,966,236
2200	218,846,966,236	10,876,694,222	(7,767,319,798)	-	221,956,340,659
2201	221,956,340,659	11,031,230,131	(8,078,821,612)	-	224,908,749,178
2202	224,908,749,178	11,177,964,834	(8,402,851,376)	-	227,683,862,636
2203	227,683,862,636	11,315,887,973	(8,739,915,007)	-	230,259,835,602
2204	230,259,835,602	11,443,913,829	(9,115,450,044)	-	232,588,299,388
2205	232,588,299,388	11,559,638,480	(9,455,262,620)	-	234,692,675,247
2206	234,692,675,247	11,664,225,960	(9,834,662,594)	-	236,522,238,613
2207	236,522,238,613	11,755,155,259	(10,229,326,918)	-	238,048,066,953
2208	238,048,066,953	11,830,988,928	(23,621,875,444)	-	226,257,180,437
2209	226,257,180,437	11,244,981,868	(11,066,937,090)	-	226,435,225,215
2210	226,435,225,215	11,253,830,693	(11,511,188,856)	-	226,177,867,052
2211	226,177,867,052	11,241,039,992	(11,973,319,588)	-	225,445,587,456
2212	225,445,587,456	11,204,645,697	(12,488,182,665)	-	224,162,050,487
2213	224,162,050,487	11,140,853,909	(14,621,371,106)	-	220,681,533,291
2214	220,681,533,291	10,967,872,205	(13,474,344,519)	-	218,175,060,976
2215	218,175,060,976	10,843,300,531	(14,015,498,561)	-	215,002,862,946
2216	215,002,862,946	10,685,642,288	(24,036,881,734)	-	201,651,623,501
2217	201,651,623,501	10,022,085,688	(15,164,046,883)	-	196,509,662,306
2218	196,509,662,306	9,766,530,217	(38,123,338,117)	-	168,152,854,406
2219	168,152,854,406	8,357,196,864	(15,307,988,630)	-	161,202,062,639
2220	161,202,062,639	8,011,742,513	(15,671,223,343)	-	153,542,581,810
2221	153,542,581,810	7,631,066,316	(16,255,993,316)	-	144,917,654,810
2222	144,917,654,810	7,202,407,444	(16,904,673,455)	-	135,215,388,799
2223	135,215,388,799	6,720,204,823	(17,898,815,350)	-	124,036,778,272
2224	124,036,778,272	6,164,627,880	(18,326,615,231)	-	111,874,790,922
2225	111,874,790,922	5,560,177,109	(19,010,909,673)	-	98,424,058,358
2226	98,424,058,358	4,891,675,700	(19,770,011,773)	-	83,545,722,285
2227	83,545,722,285	4,152,222,398	(20,930,335,445)	-	66,767,609,238
2228	66,767,609,238	3,318,350,179	(21,434,056,187)	-	48,651,903,230
2229	48,651,903,230	2,417,999,591	(22,234,870,241)	-	28,835,032,579
2230	28,835,032,579	1,433,101,119	(21,879,025,883)	-	8,389,107,815
2231	8,389,107,815	416,938,658	(8,806,046,474)	-	0

Proposed

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,453,079	-	24,632	383,844,766
2018	383,844,766	19,385,405	-	49,264	403,279,435
2019	403,279,435	21,446,842	-	42,821,016	467,547,293
2020	467,547,293	24,692,369	-	42,821,016	535,060,678
2021	535,060,678	28,101,795	-	42,821,016	605,983,488
2022	605,983,488	31,683,397	-	42,821,016	680,487,900
2023	680,487,900	35,445,870	-	42,821,016	758,754,786
2024	758,754,786	39,398,347	-	42,821,016	840,974,149
2025	840,974,149	43,550,425	-	42,821,016	927,345,590
2026	927,345,590	47,912,183	-	42,821,016	1,018,078,788
2027	1,018,078,788	52,494,209	-	42,821,016	1,113,394,013
2028	1,113,394,013	57,307,628	-	42,821,016	1,213,522,657
2029	1,213,522,657	62,364,125	-	42,821,016	1,318,707,798
2030	1,318,707,798	67,675,974	-	42,821,016	1,429,204,788
2031	1,429,204,788	73,256,072	-	42,821,016	1,545,281,876
2032	1,545,281,876	79,117,965	-	42,821,016	1,667,220,857
2033	1,667,220,857	83,069,355	(42,768,206)	28,690,080	1,736,212,087
2034	1,736,212,087	85,768,877	(131,752,423)	-	1,690,228,541
2035	1,690,228,541	83,497,290	(198,854,133)	-	1,574,871,698
2036	1,574,871,698	77,798,662	(173,386,484)	-	1,479,283,876
2037	1,479,283,876	73,076,623	(119,758,863)	-	1,432,601,637
2038	1,432,601,637	70,770,521	(48,446,231)	-	1,454,925,926
2039	1,454,925,926	71,873,341	(166,746,609)	-	1,360,052,659
2040	1,360,052,659	67,186,601	(78,122,012)	-	1,349,117,248
2041	1,349,117,248	66,646,392	(51,940,215)	-	1,363,823,426
2042	1,363,823,426	67,372,877	(47,702,660)	-	1,383,493,643
2043	1,383,493,643	68,344,586	(29,119,754)	-	1,422,718,475
2044	1,422,718,475	70,282,293	(11,674,091)	-	1,481,326,676
2045	1,481,326,676	73,177,538	(28,362,264)	-	1,526,141,949
2046	1,526,141,949	75,391,412	(23,687,841)	-	1,577,845,521
2047	1,577,845,521	77,945,569	(24,482,072)	-	1,631,309,018
2048	1,631,309,018	80,586,665	(13,373,108)	-	1,698,522,575
2049	1,698,522,575	83,907,015	(26,156,567)	-	1,756,273,023
2050	1,756,273,023	86,759,887	(33,419,678)	-	1,809,613,232
2051	1,809,613,232	89,394,894	(32,879,405)	-	1,866,128,721
2052	1,866,128,721	92,186,759	(35,748,383)	-	1,922,567,097
2053	1,922,567,097	94,974,815	(15,839,839)	-	2,001,702,073
2054	2,001,702,073	98,884,082	(16,400,093)	-	2,084,186,063
2055	2,084,186,063	102,958,792	(39,440,555)	-	2,147,704,300
2056	2,147,704,300	106,096,592	(33,099,428)	-	2,220,701,464

Proposed

EXTERNAL FUND CALCULATION

2057	2,220,701,464	109,702,652	(34,177,854)	-	2,296,226,262
2058	2,296,226,262	113,433,577	(18,863,779)	-	2,390,796,060
2059	2,390,796,060	118,105,325	(34,418,346)	-	2,474,483,039
2060	2,474,483,039	122,239,462	(37,886,138)	-	2,558,836,364
2061	2,558,836,364	126,406,516	(39,129,555)	-	2,646,113,325
2062	2,646,113,325	130,717,998	(21,727,882)	-	2,755,103,442
2063	2,755,103,442	136,102,110	(80,621,796)	-	2,810,583,756
2064	2,810,583,756	138,842,838	(60,889,305)	-	2,888,537,289
2065	2,888,537,289	142,693,742	(44,841,447)	-	2,986,389,584
2066	2,986,389,584	147,527,645	(25,058,214)	-	3,108,859,015
2067	3,108,859,015	153,577,635	(25,972,206)	-	3,236,464,444
2068	3,236,464,444	159,881,344	(72,551,153)	-	3,323,794,634
2069	3,323,794,634	164,195,455	(63,196,056)	-	3,424,794,033
2070	3,424,794,033	169,184,825	(28,931,636)	-	3,565,047,222
2071	3,565,047,222	176,113,333	(29,995,129)	-	3,711,165,426
2072	3,711,165,426	183,331,572	(92,767,952)	-	3,801,729,047
2073	3,801,729,047	187,805,415	(32,246,859)	-	3,957,287,603
2074	3,957,287,603	195,490,008	(33,438,597)	-	4,119,339,013
2075	4,119,339,013	203,495,347	(112,362,974)	-	4,210,471,386
2076	4,210,471,386	207,997,286	(36,070,752)	-	4,382,397,921
2077	4,382,397,921	216,490,457	(37,296,551)	-	4,561,591,827
2078	4,561,591,827	225,342,636	(117,577,657)	-	4,669,356,807
2079	4,669,356,807	230,666,226	(40,123,990)	-	4,859,899,043
2080	4,859,899,043	240,079,013	(41,746,752)	-	5,058,231,304
2081	5,058,231,304	249,876,626	(43,174,563)	-	5,264,933,367
2082	5,264,933,367	260,087,708	(125,683,310)	-	5,399,337,765
2083	5,399,337,765	266,727,286	(46,466,442)	-	5,619,598,608
2084	5,619,598,608	277,608,171	(48,355,173)	-	5,848,851,606
2085	5,848,851,606	288,933,269	(50,019,012)	-	6,087,765,864
2086	6,087,765,864	300,735,634	(51,899,131)	-	6,336,602,366
2087	6,336,602,366	313,028,157	(53,852,602)	-	6,595,777,921
2088	6,595,777,921	325,831,429	(56,051,006)	-	6,865,558,345
2089	6,865,558,345	339,158,582	(750,835,061)	-	6,453,881,866
2090	6,453,881,866	318,821,764	(60,180,313)	-	6,712,523,318
2091	6,712,523,318	331,598,652	(62,455,727)	-	6,981,666,242
2092	6,981,666,242	344,894,312	(65,015,702)	-	7,261,544,853
2093	7,261,544,853	358,720,316	(67,275,883)	-	7,552,989,285
2094	7,552,989,285	373,117,671	(69,827,894)	-	7,856,279,062
2095	7,856,279,062	388,100,186	(155,517,607)	-	8,088,861,641
2096	8,088,861,641	399,589,765	(132,697,627)	-	8,355,753,779
2097	8,355,753,779	412,774,237	(137,276,626)	-	8,631,251,390
2098	8,631,251,390	426,383,819	(81,070,472)	-	8,976,564,736
2099	8,976,564,736	443,442,298	(84,160,485)	-	9,335,846,549
2100	9,335,846,549	461,190,820	(185,514,081)	-	9,611,523,287
2101	9,611,523,287	474,809,250	(192,196,742)	-	9,894,135,795
2102	9,894,135,795	488,770,308	(199,127,152)	-	10,183,778,951

Proposed

EXTERNAL FUND CALCULATION

External Levelized

2103	10,183,778,951	503,078,680	(97,776,676)	-	10,589,080,955
2104	10,589,080,955	523,100,599	(101,824,431)	-	11,010,357,124
2105	11,010,357,124	543,911,642	(221,501,424)	-	11,332,767,342
2106	11,332,767,342	559,838,707	(189,497,916)	-	11,703,108,132
2107	11,703,108,132	578,133,542	(196,444,221)	-	12,084,797,453
2108	12,084,797,453	596,988,994	(118,369,810)	-	12,563,416,637
2109	12,563,416,637	620,632,782	(211,130,954)	-	12,972,918,465
2110	12,972,918,465	640,862,172	(218,891,810)	-	13,394,888,828
2111	13,394,888,828	661,707,508	(226,946,170)	-	13,829,650,166
2112	13,829,650,166	683,184,718	(137,664,947)	-	14,375,169,937
2113	14,375,169,937	710,133,395	(446,845,223)	-	14,638,458,109
2114	14,638,458,109	723,139,831	(357,917,829)	-	15,003,680,111
2115	15,003,680,111	741,181,797	(285,747,972)	-	15,459,113,936
2116	15,459,113,936	763,680,228	(160,171,633)	-	16,062,622,531
2117	16,062,622,531	793,493,553	(165,867,658)	-	16,690,248,426
2118	16,690,248,426	824,498,272	(412,774,806)	-	17,101,971,893
2119	17,101,971,893	844,837,412	(365,580,681)	-	17,581,228,623
2120	17,581,228,623	868,512,694	(186,429,715)	-	18,263,311,602
2121	18,263,311,602	902,207,593	(193,078,480)	-	18,972,440,715
2122	18,972,440,715	937,238,571	(545,222,379)	-	19,364,456,907
2123	19,364,456,907	956,604,171	(208,342,425)	-	20,112,718,653
2124	20,112,718,653	993,568,301	(217,069,921)	-	20,889,217,033
2125	20,889,217,033	1,031,927,321	(606,842,631)	-	21,314,301,724
2126	21,314,301,724	1,052,926,505	(233,567,637)	-	22,133,660,592
2127	22,133,660,592	1,093,402,833	(242,647,223)	-	22,984,416,202
2128	22,984,416,202	1,135,430,160	(676,367,768)	-	23,443,478,595
2129	23,443,478,595	1,158,107,843	(261,894,498)	-	24,339,691,940
2130	24,339,691,940	1,202,380,782	(272,091,406)	-	25,269,981,315
2131	25,269,981,315	1,248,337,077	(282,690,337)	-	26,235,628,055
2132	26,235,628,055	1,296,040,026	(780,812,473)	-	26,750,855,608
2133	26,750,855,608	1,321,492,267	(305,159,839)	-	27,767,188,035
2134	27,767,188,035	1,371,699,089	(317,064,613)	-	28,821,822,511
2135	28,821,822,511	1,423,798,032	(329,439,410)	-	29,916,181,133
2136	29,916,181,133	1,477,859,348	(343,310,154)	-	31,050,730,327
2137	31,050,730,327	1,533,906,078	(355,675,428)	-	32,228,960,977
2138	32,228,960,977	1,592,110,672	(369,576,237)	-	33,451,495,412
2139	33,451,495,412	1,652,503,873	(4,110,885,000)	-	30,993,114,285
2140	30,993,114,285	1,531,059,846	(400,219,998)	-	32,123,954,133
2141	32,123,954,133	1,586,923,334	(414,665,053)	-	33,296,212,414
2142	33,296,212,414	1,644,832,893	(430,899,762)	-	34,510,145,546
2143	34,510,145,546	1,704,801,190	(447,776,458)	-	35,767,170,278
2144	35,767,170,278	1,766,898,212	(466,684,194)	-	37,067,384,296
2145	37,067,384,296	1,831,128,784	(942,176,534)	-	37,956,336,546
2146	37,956,336,546	1,875,043,025	(819,164,963)	-	39,012,214,609
2147	39,012,214,609	1,927,203,402	(850,175,704)	-	40,089,242,307
2148	40,089,242,307	1,980,408,570	(544,318,666)	-	41,525,332,210

Proposed

EXTERNAL FUND CALCULATION

2149	41,525,332,210	2,051,351,411	(564,040,861)	-	43,012,642,761
2150	43,012,642,761	2,124,824,552	(1,132,757,742)	-	44,004,709,571
2151	44,004,709,571	2,173,832,653	(1,175,361,744)	-	45,003,180,480
2152	45,003,180,480	2,223,157,116	(1,221,441,653)	-	46,004,895,942
2153	46,004,895,942	2,272,641,860	(658,063,552)	-	47,619,474,249
2154	47,619,474,249	2,352,402,028	(683,945,998)	-	49,287,930,279
2155	49,287,930,279	2,434,823,756	(1,456,527,378)	-	50,266,226,657
2156	50,266,226,657	2,483,151,597	(1,191,217,991)	-	51,558,160,263
2157	51,558,160,263	2,546,973,117	(1,234,371,151)	-	52,870,762,229
2158	52,870,762,229	2,611,815,654	(798,168,374)	-	54,684,409,508
2159	54,684,409,508	2,701,409,830	(1,330,306,865)	-	56,055,512,473
2160	56,055,512,473	2,769,142,316	(1,383,581,665)	-	57,441,073,124
2161	57,441,073,124	2,837,589,012	(1,433,823,154)	-	58,844,838,982
2162	58,844,838,982	2,906,935,046	(931,653,123)	-	60,820,120,904
2163	60,820,120,904	3,004,513,973	(2,699,774,193)	-	61,124,860,684
2164	61,124,860,684	3,019,568,118	(2,205,599,092)	-	61,938,829,710
2165	61,938,829,710	3,059,778,188	(1,666,074,818)	-	63,332,533,079
2166	63,332,533,079	3,128,627,134	(1,087,668,215)	-	65,373,491,998
2167	65,373,491,998	3,229,450,505	(1,130,626,952)	-	67,472,315,551
2168	67,472,315,551	3,333,132,388	(2,558,184,221)	-	68,247,263,718
2169	68,247,263,718	3,371,414,828	(2,294,017,133)	-	69,324,661,413
2170	69,324,661,413	3,424,638,274	(1,270,038,271)	-	71,479,261,415
2171	71,479,261,415	3,531,075,514	(1,320,257,578)	-	73,690,079,352
2172	73,690,079,352	3,640,289,920	(3,366,213,509)	-	73,964,155,763
2173	73,964,155,763	3,653,829,295	(1,426,777,061)	-	76,191,207,997
2174	76,191,207,997	3,763,845,675	(1,483,240,465)	-	78,471,813,207
2175	78,471,813,207	3,876,507,572	(3,757,968,903)	-	78,590,351,877
2176	78,590,351,877	3,882,363,383	(1,607,618,975)	-	80,865,096,285
2177	80,865,096,285	3,994,735,756	(1,666,495,954)	-	83,193,336,087
2178	83,193,336,087	4,109,750,803	(4,201,142,239)	-	83,101,944,651
2179	83,101,944,651	4,105,236,066	(1,801,167,407)	-	85,406,013,310
2180	85,406,013,310	4,219,057,058	(1,877,933,870)	-	87,747,136,497
2181	87,747,136,497	4,334,708,543	(1,946,796,356)	-	90,135,048,684
2182	90,135,048,684	4,452,671,405	(4,875,951,044)	-	89,711,769,045
2183	89,711,769,045	4,431,761,391	(2,104,278,428)	-	92,039,252,007
2184	92,039,252,007	4,546,739,049	(2,194,033,417)	-	94,391,957,639
2185	94,391,957,639	4,662,962,707	(2,274,582,657)	-	96,780,337,689
2186	96,780,337,689	4,780,948,682	(2,364,867,395)	-	99,196,418,976
2187	99,196,418,976	4,900,303,097	(2,458,757,274)	-	101,637,964,800
2188	101,637,964,800	5,020,915,461	(2,563,709,466)	-	104,095,170,795
2189	104,095,170,795	5,142,301,437	(24,755,020,964)	-	84,482,451,268
2190	84,482,451,268	4,173,433,093	(2,763,533,752)	-	85,892,350,609
2191	85,892,350,609	4,243,082,120	(2,873,349,687)	-	87,262,083,042
2192	87,262,083,042	4,310,746,902	(2,996,084,790)	-	88,576,745,154
2193	88,576,745,154	4,375,691,211	(2,631,901,790)	-	90,320,534,575
2194	90,320,534,575	4,461,834,408	(2,845,755,560)	-	91,936,613,423

Proposed

EXTERNAL FUND CALCULATION

2195	91,936,613,423	4,541,668,703	(6,096,768,388)	-	90,381,513,738
2196	90,381,513,738	4,464,846,779	(5,039,439,321)	-	89,806,921,195
2197	89,806,921,195	4,436,461,907	(5,103,102,785)	-	89,140,280,318
2198	89,140,280,318	4,403,529,848	(3,449,639,793)	-	90,094,170,372
2199	90,094,170,372	4,450,652,016	(3,388,072,705)	-	91,156,749,684
2200	91,156,749,684	4,503,143,434	(6,748,343,262)	-	88,911,549,856
2201	88,911,549,856	4,392,230,563	(7,149,952,252)	-	86,153,828,167
2202	86,153,828,167	4,255,999,111	(7,425,240,003)	-	82,984,587,275
2203	82,984,587,275	4,099,438,611	(3,957,295,989)	-	83,126,729,898
2204	83,126,729,898	4,106,460,457	(4,204,275,961)	-	83,028,914,393
2205	83,028,914,393	4,101,628,371	(8,317,273,562)	-	78,813,269,203
2206	78,813,269,203	3,893,375,499	(7,184,177,587)	-	75,522,467,114
2207	75,522,467,114	3,730,809,875	(7,551,432,596)	-	71,701,844,393
2208	71,701,844,393	3,542,071,113	(4,910,769,515)	-	70,333,145,992
2209	70,333,145,992	3,474,457,412	(8,054,177,476)	-	65,753,425,928
2210	65,753,425,928	3,248,219,241	(8,451,130,892)	-	60,550,514,276
2211	60,550,514,276	2,991,195,405	(8,764,321,886)	-	54,777,387,796
2212	54,777,387,796	2,706,002,957	(5,704,971,845)	-	51,778,418,908
2213	51,778,418,908	2,557,853,894	(16,547,283,798)	-	37,788,989,004
2214	37,788,989,004	1,866,776,057	(13,505,097,847)	-	26,150,667,214
2215	26,150,667,214	1,291,842,960	(10,210,415,985)	-	17,232,094,189
2216	17,232,094,189	851,265,453	(8,964,289,432)	-	9,119,070,210
2217	9,119,070,210	450,482,068	(6,950,574,559)	-	2,618,977,720
2218	2,618,977,720	129,377,499	(2,748,355,219)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,698,068	-	294,670	431,201,705
2018	431,201,705	21,963,166	-	589,341	453,754,212
2019	453,754,212	24,001,002	-	35,556,474	513,311,688
2020	513,311,688	27,032,477	-	35,556,474	575,900,639
2021	575,900,639	30,218,255	-	35,556,474	641,675,369
2022	641,675,369	33,566,189	-	35,556,474	710,798,031
2023	710,798,031	37,084,532	-	35,556,474	783,439,038
2024	783,439,038	40,781,959	-	35,556,474	859,777,471
2025	859,777,471	44,667,586	-	35,556,474	940,001,531
2026	940,001,531	48,750,990	-	35,556,474	1,024,308,996
2027	1,024,308,996	53,042,240	-	35,556,474	1,112,907,710
2028	1,112,907,710	57,551,915	-	35,556,474	1,206,016,099
2029	1,206,016,099	62,291,132	-	35,556,474	1,303,863,705
2030	1,303,863,705	67,271,575	-	35,556,474	1,406,691,755
2031	1,406,691,755	72,505,523	-	35,556,474	1,514,753,751
2032	1,514,753,751	78,005,878	-	35,556,474	1,628,316,104
2033	1,628,316,104	83,786,202	-	35,556,474	1,747,658,780
2034	1,747,658,780	86,887,046	(17,426,478)	29,511,874	1,846,631,222
2035	1,846,631,222	91,038,919	(114,752,428)	-	1,822,917,714
2036	1,822,917,714	89,869,843	(214,578,967)	-	1,698,208,590
2037	1,698,208,590	83,721,683	(216,463,722)	-	1,565,466,552
2038	1,565,466,552	77,177,501	(136,478,687)	-	1,506,165,366
2039	1,506,165,366	74,253,953	(176,222,841)	-	1,404,196,477
2040	1,404,196,477	69,226,886	(89,351,532)	-	1,384,071,832
2041	1,384,071,832	68,234,741	(64,325,998)	-	1,387,980,575
2042	1,387,980,575	68,427,442	(59,595,219)	-	1,396,812,799
2043	1,396,812,799	68,862,871	(34,871,710)	-	1,430,803,960
2044	1,430,803,960	70,538,635	(11,675,642)	-	1,489,666,953
2045	1,489,666,953	73,440,581	(28,363,854)	-	1,534,743,680
2046	1,534,743,680	75,662,863	(23,689,494)	-	1,586,717,049
2047	1,586,717,049	78,225,151	(24,483,772)	-	1,640,458,427
2048	1,640,458,427	80,874,600	(13,374,843)	-	1,707,958,185
2049	1,707,958,185	84,202,339	(26,158,366)	-	1,766,002,157
2050	1,766,002,157	87,063,906	(33,421,508)	-	1,819,644,556
2051	1,819,644,556	89,708,477	(32,881,304)	-	1,876,471,728
2052	1,876,471,728	92,510,056	(35,750,338)	-	1,933,231,446
2053	1,933,231,446	95,308,310	(15,841,845)	-	2,012,697,911
2054	2,012,697,911	99,226,007	(16,402,157)	-	2,095,521,762
2055	2,095,521,762	103,309,223	(39,442,660)	-	2,159,388,324
2056	2,159,388,324	106,457,844	(33,101,605)	-	2,232,744,564

Proposed

EXTERNAL FUND CALCULATION

2057	2,232,744,564	110,074,307	(34,180,108)	-	2,308,638,762
2058	2,308,638,762	113,815,891	(18,866,090)	-	2,403,588,564
2059	2,403,588,564	118,496,916	(34,420,697)	-	2,487,664,783
2060	2,487,664,783	122,641,874	(37,888,573)	-	2,572,418,084
2061	2,572,418,084	126,820,212	(39,132,078)	-	2,660,106,217
2062	2,660,106,217	131,143,237	(21,730,468)	-	2,769,518,986
2063	2,769,518,986	136,537,286	(80,624,408)	-	2,825,431,864
2064	2,825,431,864	139,293,791	(60,892,047)	-	2,903,833,608
2065	2,903,833,608	143,158,997	(44,844,272)	-	3,002,148,332
2066	3,002,148,332	148,005,913	(25,061,109)	-	3,125,093,136
2067	3,125,093,136	154,067,092	(25,975,184)	-	3,253,185,044
2068	3,253,185,044	160,382,023	(72,554,214)	-	3,341,012,853
2069	3,341,012,853	164,711,934	(63,199,176)	-	3,442,525,611
2070	3,442,525,611	169,716,513	(28,934,876)	-	3,583,307,247
2071	3,583,307,247	176,657,047	(29,998,461)	-	3,729,965,834
2072	3,729,965,834	183,887,316	(92,771,376)	-	3,821,081,773
2073	3,821,081,773	188,379,331	(32,250,385)	-	3,977,210,719
2074	3,977,210,719	196,076,488	(33,442,224)	-	4,139,844,984
2075	4,139,844,984	204,094,358	(112,366,690)	-	4,231,572,651
2076	4,231,572,651	208,616,532	(36,074,561)	-	4,404,114,623
2077	4,404,114,623	217,122,851	(37,300,497)	-	4,583,936,976
2078	4,583,936,976	225,988,093	(117,581,691)	-	4,692,343,378
2079	4,692,343,378	231,332,529	(40,128,166)	-	4,883,547,740
2080	4,883,547,740	240,758,904	(41,751,014)	-	5,082,555,630
2081	5,082,555,630	250,569,993	(43,178,981)	-	5,289,946,642
2082	5,289,946,642	260,794,369	(125,687,807)	-	5,425,053,204
2083	5,425,053,204	267,455,123	(46,471,116)	-	5,646,037,211
2084	5,646,037,211	278,349,635	(48,359,942)	-	5,876,026,904
2085	5,876,026,904	289,688,126	(50,023,957)	-	6,115,691,073
2086	6,115,691,073	301,503,570	(51,904,218)	-	6,365,290,425
2087	6,365,290,425	313,808,818	(53,857,834)	-	6,625,241,409
2088	6,625,241,409	326,624,401	(56,056,341)	-	6,895,809,469
2089	6,895,809,469	339,963,407	(750,019,869)	-	6,485,753,007
2090	6,485,753,007	319,747,623	(60,186,007)	-	6,745,314,623
2091	6,745,314,623	332,544,011	(62,461,585)	-	7,015,397,049
2092	7,015,397,049	345,859,075	(65,021,671)	-	7,296,234,453
2093	7,296,234,453	359,704,359	(67,282,081)	-	7,588,656,731
2094	7,588,656,731	374,120,777	(69,834,269)	-	7,892,943,239
2095	7,892,943,239	389,122,102	(155,524,086)	-	8,126,541,255
2096	8,126,541,255	400,638,484	(132,704,319)	-	8,394,475,420
2097	8,394,475,420	413,847,638	(137,283,595)	-	8,671,039,462
2098	8,671,039,462	427,482,245	(81,077,609)	-	9,017,444,099
2099	9,017,444,099	444,559,994	(84,167,826)	-	9,377,836,267
2100	9,377,836,267	462,327,328	(185,521,538)	-	9,654,642,057
2101	9,654,642,057	475,973,853	(192,204,411)	-	9,938,411,500
2102	9,938,411,500	489,963,687	(199,135,039)	-	10,229,240,147

EXTERNAL FUND CALCULATION

External Levelized

2103	10,229,240,147	504,301,539	(97,784,894)	-	10,635,756,792
2104	10,635,756,792	524,342,810	(101,832,791)	-	11,058,266,811
2105	11,058,266,811	545,172,554	(221,510,005)	-	11,381,929,359
2106	11,381,929,359	561,129,117	(189,506,903)	-	11,753,551,573
2107	11,753,551,573	579,450,093	(196,453,466)	-	12,136,548,200
2108	12,136,548,200	598,331,826	(118,379,164)	-	12,616,500,863
2109	12,616,500,863	621,993,493	(211,140,737)	-	13,027,353,618
2110	13,027,353,618	642,248,533	(218,901,873)	-	13,450,700,279
2111	13,450,700,279	663,119,524	(226,956,522)	-	13,886,863,281
2112	13,886,863,281	684,622,360	(137,675,412)	-	14,433,810,228
2113	14,433,810,228	711,586,844	(446,855,813)	-	14,698,541,260
2114	14,698,541,260	724,638,084	(357,928,808)	-	15,065,250,536
2115	15,065,250,536	742,716,851	(285,759,253)	-	15,522,208,134
2116	15,522,208,134	765,244,861	(160,183,341)	-	16,127,269,653
2117	16,127,269,653	795,074,394	(165,879,861)	-	16,756,464,186
2118	16,756,464,186	826,093,684	(412,787,085)	-	17,169,770,786
2119	17,169,770,786	846,469,700	(365,593,399)	-	17,650,647,087
2120	17,650,647,087	870,176,901	(186,442,814)	-	18,334,381,175
2121	18,334,381,175	903,884,992	(193,092,143)	-	19,045,174,023
2122	19,045,174,023	938,927,079	(545,236,291)	-	19,438,864,811
2123	19,438,864,811	958,336,035	(208,356,883)	-	20,188,843,964
2124	20,188,843,964	995,310,007	(217,084,576)	-	20,967,069,395
2125	20,967,069,395	1,033,676,521	(606,857,768)	-	21,393,888,148
2126	21,393,888,148	1,054,718,686	(233,583,374)	-	22,215,023,460
2127	22,215,023,460	1,095,200,657	(242,663,411)	-	23,067,560,706
2128	23,067,560,706	1,137,230,743	(676,383,922)	-	23,528,407,526
2129	23,528,407,526	1,159,950,491	(261,911,627)	-	24,426,446,390
2130	24,426,446,390	1,204,223,807	(272,109,027)	-	25,358,561,170
2131	25,358,561,170	1,250,177,066	(282,708,463)	-	26,326,029,773
2132	26,326,029,773	1,297,873,268	(780,830,534)	-	26,843,072,507
2133	26,843,072,507	1,323,363,475	(305,179,020)	-	27,861,256,962
2134	27,861,256,962	1,373,559,968	(317,084,344)	-	28,917,732,586
2135	28,917,732,586	1,425,644,216	(329,459,707)	-	30,013,917,095
2136	30,013,917,095	1,479,686,113	(343,330,675)	-	31,150,272,533
2137	31,150,272,533	1,535,708,436	(355,696,906)	-	32,330,284,062
2138	32,330,284,062	1,593,883,004	(369,598,331)	-	33,554,568,735
2139	33,554,568,735	1,654,240,239	(4,110,906,980)	-	31,097,901,994
2140	31,097,901,994	1,533,126,568	(400,242,957)	-	32,230,785,606
2141	32,230,785,606	1,588,977,730	(414,689,104)	-	33,405,074,232
2142	33,405,074,232	1,646,870,160	(430,924,504)	-	34,621,019,888
2143	34,621,019,888	1,706,816,280	(447,801,910)	-	35,880,034,259
2144	35,880,034,259	1,768,885,689	(466,709,878)	-	37,182,210,070
2145	37,182,210,070	1,833,082,956	(942,202,942)	-	38,073,090,085
2146	38,073,090,085	1,877,003,341	(819,192,849)	-	39,130,900,577
2147	39,130,900,577	1,929,153,398	(850,204,392)	-	40,209,849,583
2148	40,209,849,583	1,982,345,584	(544,347,400)	-	41,647,847,768

Proposed

EXTERNAL FUND CALCULATION

2149	41,647,847,768	2,053,238,895	(564,071,025)	-	43,137,015,638
2150	43,137,015,638	2,126,654,871	(1,132,788,133)	-	44,130,882,376
2151	44,130,882,376	2,175,652,501	(1,175,393,002)	-	45,131,141,876
2152	45,131,141,876	2,224,965,294	(1,221,474,671)	-	46,134,632,499
2153	46,134,632,499	2,274,437,382	(658,097,334)	-	47,750,972,547
2154	47,750,972,547	2,354,122,947	(683,980,750)	-	49,421,114,743
2155	49,421,114,743	2,436,460,957	(1,456,562,811)	-	50,401,012,889
2156	50,401,012,889	2,484,769,935	(1,191,254,025)	-	51,694,528,799
2157	51,694,528,799	2,548,540,270	(1,234,409,252)	-	53,008,659,817
2158	53,008,659,817	2,613,326,929	(798,207,297)	-	54,823,779,449
2159	54,823,779,449	2,702,812,327	(1,330,347,193)	-	56,196,244,583
2160	56,196,244,583	2,770,474,858	(1,383,621,977)	-	57,583,097,464
2161	57,583,097,464	2,838,846,705	(1,433,865,839)	-	58,988,078,330
2162	58,988,078,330	2,908,112,262	(931,696,719)	-	60,964,493,873
2163	60,964,493,873	3,005,549,548	(2,699,816,930)	-	61,270,226,492
2164	61,270,226,492	3,020,622,166	(2,205,644,530)	-	62,085,204,127
2165	62,085,204,127	3,060,800,563	(1,666,122,640)	-	63,479,882,051
2166	63,479,882,051	3,129,558,185	(1,087,717,046)	-	65,521,723,190
2167	65,521,723,190	3,230,220,953	(1,130,677,188)	-	67,621,266,955
2168	67,621,266,955	3,333,728,461	(2,558,235,066)	-	68,396,760,350
2169	68,396,760,350	3,371,960,285	(2,294,068,968)	-	69,474,651,667
2170	69,474,651,667	3,425,100,327	(1,270,092,970)	-	71,629,659,024
2171	71,629,659,024	3,531,342,190	(1,320,313,851)	-	73,840,687,364
2172	73,840,687,364	3,640,345,887	(3,366,268,444)	-	74,114,764,806
2173	74,114,764,806	3,653,857,905	(1,426,836,620)	-	76,341,786,092
2174	76,341,786,092	3,763,650,054	(1,483,301,738)	-	78,622,134,408
2175	78,622,134,408	3,876,071,226	(3,758,030,772)	-	78,740,174,862
2176	78,740,174,862	3,881,890,621	(1,607,681,975)	-	81,014,383,508
2177	81,014,383,508	3,994,009,107	(1,666,562,675)	-	83,341,829,939
2178	83,341,829,939	4,108,752,216	(4,201,209,565)	-	83,249,372,590
2179	83,249,372,590	4,104,194,069	(1,801,238,027)	-	85,552,328,632
2180	85,552,328,632	4,217,729,802	(1,878,004,344)	-	87,892,054,089
2181	87,892,054,089	4,333,078,267	(1,946,871,104)	-	90,278,261,251
2182	90,278,261,251	4,450,718,280	(4,876,026,404)	-	89,852,953,127
2183	89,852,953,127	4,429,750,589	(2,104,357,547)	-	92,178,346,169
2184	92,178,346,169	4,544,392,466	(2,194,112,250)	-	94,528,626,386
2185	94,528,626,386	4,660,261,281	(2,274,666,403)	-	96,914,221,264
2186	96,914,221,264	4,777,871,108	(2,364,953,555)	-	99,327,138,817
2187	99,327,138,817	4,896,827,944	(2,458,845,919)	-	101,765,120,842
2188	101,765,120,842	5,017,020,458	(2,563,797,647)	-	104,218,343,653
2189	104,218,343,653	5,137,964,342	(24,755,109,055)	-	84,601,198,940
2190	84,601,198,940	4,170,839,108	(2,763,630,291)	-	86,008,407,757
2191	86,008,407,757	4,240,214,502	(2,873,449,011)	-	87,375,173,249
2192	87,375,173,249	4,307,596,041	(2,996,183,428)	-	88,686,585,862
2193	88,686,585,862	4,372,248,683	(2,631,904,177)	-	90,426,930,368
2194	90,426,930,368	4,458,047,667	(2,845,754,626)	-	92,039,223,409

Proposed

EXTERNAL FUND CALCULATION

2195	92,039,223,409	4,537,533,714	(6,096,767,211)	-	90,479,989,912
2196	90,479,989,912	4,460,663,503	(5,039,437,641)	-	89,901,215,775
2197	89,901,215,775	4,432,129,938	(5,103,100,217)	-	89,230,245,495
2198	89,230,245,495	4,399,051,103	(3,449,635,792)	-	90,179,660,806
2199	90,179,660,806	4,445,857,278	(3,388,068,666)	-	91,237,449,418
2200	91,237,449,418	4,498,006,256	(6,748,341,960)	-	88,987,113,715
2201	88,987,113,715	4,387,064,706	(7,149,946,397)	-	86,224,232,024
2202	86,224,232,024	4,250,854,639	(7,425,233,915)	-	83,049,852,747
2203	83,049,852,747	4,094,357,740	(3,957,291,254)	-	83,186,919,233
2204	83,186,919,233	4,101,115,118	(4,204,280,747)	-	83,083,753,604
2205	83,083,753,604	4,096,029,053	(8,317,266,720)	-	78,862,515,937
2206	78,862,515,937	3,887,922,036	(7,184,173,885)	-	75,566,264,088
2207	75,566,264,088	3,725,416,820	(7,551,432,749)	-	71,740,248,158
2208	71,740,248,158	3,536,794,234	(4,910,775,132)	-	70,366,267,261
2209	70,366,267,261	3,469,056,976	(8,054,173,294)	-	65,781,150,943
2210	65,781,150,943	3,243,010,741	(8,451,137,477)	-	60,573,024,208
2211	60,573,024,208	2,986,250,093	(8,764,317,521)	-	54,794,956,780
2212	54,794,956,780	2,701,391,369	(5,704,973,713)	-	51,791,374,436
2213	51,791,374,436	2,553,314,760	(16,547,281,313)	-	37,797,407,883
2214	37,797,407,883	1,863,412,209	(13,505,095,115)	-	26,155,724,977
2215	26,155,724,977	1,289,477,241	(10,210,410,842)	-	17,234,791,376
2216	17,234,791,376	849,675,215	(8,964,291,613)	-	9,120,174,978
2217	9,120,174,978	449,624,626	(6,950,572,292)	-	2,619,227,312
2218	2,619,227,312	129,127,906	(2,748,355,219)	-	0

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$10,433,064	(\$2,959,162)
Prairie Island Unit 1	49,264	11,200,807	11,151,543
Prairie Island Unit 2	589,341	3,262,942	2,673,601
TOTAL	\$14,030,831	\$24,896,813	\$10,865,982

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
SAFSTOR Method

Docket No. E002/M-17-828

Schedule F.8

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Proposed

2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2019-2021 Decommissioning Accrual
Monticello	13.75	5.10%	4.83%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	10,433,064
Prairie Island Unit 1	16.67	5.13%	4.82%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	11,200,807
Prairie Island Unit 2	17.83	5.14%	4.83%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	3,262,942
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$24,896,813

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2030	\$17,759,328	\$13,051,073	1.6755	\$21,867,073	\$8,763,593	\$6,440,238	1.4410	\$9,280,383	\$0	\$0	1.0000	\$0	\$26,522,921	\$19,491,311	\$31,147,456
2031	63,231,064	46,467,594	1.7434	81,011,604	46,823,276	34,409,748	1.4820	50,995,247	0	0	1.0000	0	110,054,340	80,877,343	132,006,851
2032	30,098,747	22,119,134	1.8140	40,124,109	21,963,833	16,140,903	1.5243	24,603,579	0	0	1.0000	0	52,062,580	38,260,037	64,727,688
2033	30,011,960	22,055,355	1.8874	41,627,277	35,867,567	26,358,556	1.5677	41,322,308	0	0	1.0000	0	65,879,526	48,413,911	82,949,586
2034	24,261,956	17,829,760	1.9639	35,015,866	18,617,567	13,681,781	1.6124	22,060,503	0	0	1.0000	0	42,879,522	31,511,541	57,076,369
2035	43,935,865	32,287,832	2.0434	65,976,955	88,132,650	64,767,410	1.6584	107,410,272	0	0	1.0000	0	132,068,514	97,055,241	173,387,228
2036	8,481,485	6,232,921	2.1262	13,252,436	4,523,995	3,324,618	1.7056	5,670,469	0	0	1.0000	0	13,005,479	9,557,539	18,922,905
2037	8,458,357	6,215,924	2.2123	13,751,489	4,511,770	3,315,635	1.7542	5,816,286	0	0	1.0000	0	12,970,127	9,531,559	19,567,775
2038	8,458,357	6,215,924	2.3019	14,308,436	4,511,770	3,315,635	1.8042	5,982,068	0	0	1.0000	0	12,970,127	9,531,559	20,290,504
2039	8,458,357	6,215,924	2.3951	14,887,760	4,511,770	3,315,635	1.8556	6,152,491	0	0	1.0000	0	12,970,127	9,531,559	21,040,251
2040	8,481,485	6,232,921	2.4921	15,533,061	4,523,995	3,324,618	1.9085	6,345,034	0	0	1.0000	0	13,005,479	9,557,539	21,878,095
2041	8,458,357	6,215,924	2.5930	16,117,891	4,511,770	3,315,635	1.9629	6,508,259	0	0	1.0000	0	12,970,127	9,531,559	22,626,150
2042	8,458,357	6,215,924	2.6981	16,771,185	4,511,770	3,315,635	2.0189	6,693,935	0	0	1.0000	0	12,970,127	9,531,559	23,465,119
2043	8,458,357	6,215,924	2.8073	17,449,964	4,511,770	3,315,635	2.0764	6,884,584	0	0	1.0000	0	12,970,127	9,531,559	24,334,547
2044	8,481,485	6,232,921	2.9210	18,206,361	4,523,995	3,324,618	2.1356	7,100,055	0	0	1.0000	0	13,005,479	9,557,539	25,306,416
2045	8,458,357	6,215,924	3.0393	18,892,058	4,511,770	3,315,635	2.1964	7,282,460	0	0	1.0000	0	12,970,127	9,531,559	26,174,518
2046	8,458,357	6,215,924	3.1624	19,657,238	4,511,770	3,315,635	2.2590	7,490,018	0	0	1.0000	0	12,970,127	9,531,559	27,147,257
2047	8,458,357	6,215,924	3.2905	20,453,498	4,511,770	3,315,635	2.3234	7,703,545	0	0	1.0000	0	12,970,127	9,531,559	28,157,044
2048	9,145,130	6,720,624	3.4238	23,010,071	6,514,932	4,787,729	2.3896	11,440,757	0	0	1.0000	0	15,660,061	11,508,353	34,450,829
2049	8,458,357	6,215,924	3.5624	22,143,608	4,511,767	3,315,632	2.4577	8,148,830	0	0	1.0000	0	12,970,124	9,531,556	30,292,438
2050	9,951,558	7,313,256	3.7067	27,108,046	8,991,374	6,607,631	2.5278	16,702,769	0	0	1.0000	0	18,942,932	13,920,887	43,810,815
2051	9,951,558	7,313,256	3.8568	28,205,765	8,991,374	6,607,631	2.5998	17,178,518	0	0	1.0000	0	18,942,932	13,920,887	45,384,284
2052	10,837,186	7,964,091	4.0130	31,959,898	11,591,099	8,518,131	2.6739	22,776,630	0	0	1.0000	0	22,428,284	16,482,222	54,736,528
2053	11,460,933	8,422,474	4.1756	35,168,881	13,519,499	9,935,284	2.7501	27,323,025	0	0	1.0000	0	24,980,432	18,357,758	62,491,907
2054	10,167,183	7,471,716	4.3447	32,462,363	9,638,249	7,083,010	2.8285	20,034,293	0	0	1.0000	0	19,805,432	14,554,725	52,496,656
2055	11,245,308	8,264,014	4.5206	37,358,302	12,872,624	9,459,905	2.9091	27,519,810	0	0	1.0000	0	24,117,932	17,723,919	64,878,112
2056	11,699,686	8,597,930	4.7037	40,442,083	14,178,599	10,419,647	2.9920	31,175,584	0	0	1.0000	0	25,878,284	19,017,577	71,617,667
2057	8,441,765	6,203,731	4.8942	30,362,300	4,461,997	3,279,057	3.0773	10,090,642	0	0	1.0000	0	12,903,762	9,482,788	40,452,942
2058	8,441,765	6,203,731	5.0924	31,591,879	4,461,997	3,279,057	3.1650	10,378,216	0	0	1.0000	0	12,903,762	9,482,788	41,970,095
2059	8,441,765	6,203,731	5.2987	32,871,709	4,461,997	3,279,057	3.2552	10,673,987	0	0	1.0000	0	12,903,762	9,482,788	43,545,695
2060	8,464,894	6,220,728	5.5133	34,296,740	4,474,222	3,288,041	3.3480	11,008,361	0	0	1.0000	0	12,939,115	9,508,769	45,305,101
2061	8,441,765	6,203,731	5.7366	35,588,322	4,461,997	3,279,057	3.4434	11,291,105	0	0	1.0000	0	12,903,762	9,482,788	46,879,428
2062	8,441,765	6,203,731	5.9689	37,029,449	4,461,997	3,279,057	3.5415	11,612,781	0	0	1.0000	0	12,903,762	9,482,788	48,442,230
2063	8,441,765	6,203,731	6.2106	38,528,891	4,461,997	3,279,057	3.6425	11,943,965	0	0	1.0000	0	12,903,762	9,482,788	50,472,856
2064	8,464,894	6,220,728	6.4622	40,199,589	4,474,222	3,288,041	3.7463	12,317,987	0	0	1.0000	0	12,939,115	9,508,769	52,517,576
2065	8,441,765	6,203,731	6.7239	41,713,266	4,461,997	3,279,057	3.8531	12,634,535	0	0	1.0000	0	12,903,762	9,482,788	54,347,801
2066	8,441,765	6,203,731	6.9962	43,402,542	4,461,997	3,279,057	3.9629	12,994,575	0	0	1.0000	0	12,903,762	9,482,788	56,397,117
2067	8,441,765	6,203,731	7.2795	45,160,059	4,461,997	3,279,057	4.0758	13,364,781	0	0	1.0000	0	12,903,762	9,482,788	58,524,840
2068	8,464,894	6,220,728	7.5744	47,118,282	4,474,222	3,288,041	4.1920	13,783,467	0	0	1.0000	0	12,939,115	9,508,769	60,901,750
2069	8,441,765	6,203,731	7.8811	48,892,223	4,461,997	3,279,057	4.3115	14,137,655	0	0	1.0000	0	12,903,762	9,482,788	63,029,878
2070	8,441,765	6,203,731	8.2003	50,872,454	4,461,997	3,279,057	4.4343	14,540,323	0	0	1.0000	0	12,903,762	9,482,788	65,412,777
2071	8,441,765	6,203,731	8.5324	52,932,713	4,461,997	3,279,057	4.5607	14,954,796	0	0	1.0000	0	12,903,762	9,482,788	67,887,509
2072	8,464,894	6,220,728	8.8780	55,227,624	4,474,222	3,288,041	4.6907	15,425,213	0	0	1.0000	0	12,939,115	9,508,769	70,650,837
2073	8,441,765	6,203,731	9.2375	57,306,964	4,461,997	3,279,057	4.8244	15,819,483	0	0	1.0000	0	12,903,762	9,482,788	73,126,447
2074	8,441,765	6,203,731	9.6117	59,628,400	4,461,997	3,279,057	4.9619	16,270,353	0	0	1.0000	0	12,903,762	9,482,788	75,898,753
2075	8,441,765	6,203,731	10.0009	62,042,892	4,461,997	3,279,057	5.1033	16,734,012	0	0	1.0000	0	12,903,762	9,482,788	78,776,904
2076	8,464,894	6,220,728	10.4060	64,732,896	4,474,222	3,288,041	5.2487	17,257,940	0	0	1.0000	0	12,939,115	9,508,769	81,990,836
2077	8,441,765	6,203,731	10.8274	67,170,276	4,461,997	3,279,057	5.3983	17,701,334	0	0	1.0000	0	12,903,762	9,482,788	84,871,609
2078	8,920,197	6,555,324	11.2659	73,851,620	5,897,293	4,333,835	5.5522	24,062,321	0	0	1.0000	0	14,817,490	10,889,159	97,913,941
2079	9,015,884	6,625,643	11.7222	77,667,108	6,184,352	4,544,791	5.7104	25,952,574	0	0	1.0000	0	15,200,236	11,170,433	103,619,682
2080	8,943,325	6,572,320	12.1970	80,162,588	5,909,518	4,342,819	5.8731	25,505,811	0	0	1.0000	0	14,852,842	10,915,139	105,668,399
2081	8,920,197	6,555,324	12.6909	83,192,957	5,897,293	4,333,835	6.0405	26,178,533	0	0	1.0000	0	14,817,490	10,889,159	109,371,489
2082	8,920,197	6,555,324	13.2049	86,562,393	5,897,293	4,333,835	6.2127	26,924,819	0	0	1.0000	0	14,817,490	10,889,159	113,487,212
2083	9,015,884	6,625,643	13.7397	91,034,342	6,184,352	4,544,791	6.3897	29,039,850	0	0	1.0000	0	15,200,236	11,170,433	120,074,192
2084	8,943,325	6,572,320	14.2962	93,959,202	5,909,518	4,342,819	6.5719	28,540,573	0	0	1.0000	0	14,852,842	10,915,139	122,499,775

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2085	46,126,149	33,897,440	14.8752	504,231,201	12,314,062	9,049,426	6.7592	61,166,882	0	0	1.0000	0	58,440,212	42,946,866	565,398,083
2086	53,631,139	39,412,748	15.4776	610,014,753	46,945,385	34,499,485	6.9518	239,833,517	0	0	1.0000	0	100,576,524	73,912,233	849,848,270
2087	57,419,114	42,196,476	16.1045	679,553,153	80,273,242	58,991,645	7.1499	421,784,362	0	0	1.0000	0	137,692,356	101,188,121	1,101,337,516
2088	52,652,752	38,693,746	16.7567	648,379,491	33,214,319	24,408,722	7.3537	179,494,423	0	0	1.0000	0	85,867,070	63,102,468	827,873,914
2089	50,913,638	37,415,697	17.4353	652,353,896	30,841,715	22,665,130	7.5633	171,423,181	0	0	1.0000	0	81,755,354	60,080,827	823,777,077
2090	32,667,889	24,007,160	18.1415	435,525,885	23,001,023	16,903,119	7.7788	131,485,985	0	0	1.0000	0	55,668,913	40,910,279	567,011,870
2091	21,071,356	15,485,035	18.8762	292,298,617	16,131,940	11,855,130	8.0005	94,846,965	0	0	1.0000	0	37,203,297	27,340,165	387,145,582
2092	8,832,651	6,490,987	19.6407	127,487,533	6,762,156	4,969,411	8.2285	40,890,795	0	0	1.0000	0	15,594,807	11,460,398	168,378,328
	\$967,171,883	\$710,760,631		\$6,275,707,486	\$750,282,438	\$551,371,714		\$2,329,665,815	\$0	\$0		\$0	\$1,717,454,322	\$1,262,132,345	\$8,605,373,301

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional			
	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s			
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2033	\$18,446,908	\$13,556,366	1.8874	\$25,586,285	\$4,190,856	\$3,079,799	1.5677	\$4,828,201	\$1,250,000	\$918,607	1.0000	\$918,607	\$23,887,764	\$17,554,772	\$31,333,093
2034	46,142,627	33,909,549	1.9639	66,594,964	29,162,161	21,430,850	1.6124	34,555,103	1,250,000	918,607	1.0000	918,607	76,554,787	56,259,006	102,068,673
2035	16,398,923	12,051,331	2.0434	24,625,691	15,491,742	11,384,657	1.6584	18,880,315	1,250,000	918,607	1.0000	918,607	33,140,665	24,354,595	44,424,613
2036	12,659,656	9,303,398	2.1262	19,780,886	13,774,811	10,122,909	1.7056	17,265,634	1,250,000	918,607	1.0000	918,607	27,684,467	20,344,915	37,965,127
2037	12,625,333	9,278,174	2.2123	20,526,103	13,734,545	10,093,318	1.7542	17,705,699	1,250,000	918,607	1.0000	918,607	27,609,877	20,290,100	39,150,411
2038	15,404,499	11,320,543	2.3019	26,058,758	22,072,045	16,220,427	1.8042	29,264,894	1,250,000	918,607	1.0000	918,607	38,726,543	28,459,577	56,242,259
2039	32,688,492	24,022,300	2.3951	57,535,811	76,524,027	56,236,401	1.8556	104,352,265	1,250,000	918,607	1.0000	918,607	110,462,519	81,177,308	162,806,683
2040	4,604,176	3,383,542	2.4921	8,432,126	4,477,123	3,290,173	1.9085	6,279,295	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	15,630,028
2041	4,591,596	3,374,297	2.5930	8,749,553	4,461,475	3,278,674	1.9629	6,435,709	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	16,103,868
2042	4,591,596	3,374,297	2.6981	9,104,191	4,461,475	3,278,674	2.0189	6,619,314	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	16,642,112
2043	4,591,596	3,374,297	2.8073	9,472,665	4,461,475	3,278,674	2.0764	6,807,838	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	17,199,109
2044	4,604,176	3,383,542	2.9210	9,883,328	4,477,123	3,290,173	2.1356	7,026,494	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	17,828,428
2045	4,591,596	3,374,297	3.0393	10,255,502	4,461,475	3,278,674	2.1964	7,201,279	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	18,375,387
2046	4,591,596	3,374,297	3.1624	10,670,878	4,461,475	3,278,674	2.2590	7,406,524	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	18,996,008
2047	4,591,596	3,374,297	3.2905	11,103,125	4,461,475	3,278,674	2.3234	7,617,670	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	19,639,402
2048	4,604,176	3,383,542	3.4238	11,584,573	4,477,123	3,290,173	2.3896	7,862,198	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	20,365,377
2049	4,591,596	3,374,297	3.5624	12,020,596	4,461,475	3,278,674	2.4577	8,057,996	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	20,997,200
2050	4,591,596	3,374,297	3.7067	12,507,507	4,461,475	3,278,674	2.5278	8,287,831	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	21,713,946
2051	4,591,596	3,374,297	3.8568	13,013,990	4,461,475	3,278,674	2.5998	8,523,896	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	22,456,492
2052	4,604,176	3,383,542	4.0130	13,578,156	4,477,123	3,290,173	2.6739	8,797,594	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	23,294,357
2053	4,687,283	3,444,616	4.1756	14,383,339	4,748,534	3,489,629	2.7501	9,596,829	1,250,000	918,607	1.0000	918,607	10,685,817	7,852,852	24,898,776
2054	4,782,969	3,514,934	4.3447	15,271,336	5,035,593	3,700,585	2.8285	10,467,104	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	26,657,046
2055	4,782,969	3,514,934	4.5206	15,889,613	5,035,593	3,700,585	2.9091	10,765,371	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	27,573,591
2056	4,843,392	3,559,339	4.7037	16,742,062	5,194,771	3,817,562	2.9920	11,422,146	1,250,000	918,607	1.0000	918,607	11,288,163	8,295,508	29,082,815
2057	4,735,126	3,479,775	4.8942	17,030,716	4,892,064	3,595,107	3.0773	11,063,224	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	29,012,547
2058	4,878,656	3,585,253	5.0924	18,257,545	5,322,652	3,911,540	3.1650	12,380,025	1,250,000	918,607	1.0000	918,607	11,451,308	8,415,401	31,556,176
2059	4,735,126	3,479,775	5.2987	18,438,286	4,892,064	3,595,107	3.2552	11,702,793	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	31,059,686
2060	4,699,862	3,453,861	5.5133	19,042,170	4,764,182	3,501,129	3.3480	11,721,778	1,250,000	918,607	1.0000	918,607	10,714,044	7,873,596	31,682,556
2061	4,782,969	3,514,934	5.7366	20,163,773	5,035,593	3,700,585	3.4434	12,742,593	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	33,824,973
2062	4,782,969	3,514,934	5.9689	20,980,292	5,035,593	3,700,585	3.5415	13,105,621	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	35,004,520
2063	4,735,126	3,479,775	6.2106	21,611,493	4,892,064	3,595,107	3.6425	13,095,178	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	35,625,278
2064	4,795,548	3,524,179	6.4622	22,773,949	5,051,241	3,712,084	3.7463	13,906,581	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	37,599,137
2065	4,782,969	3,514,934	6.7239	23,634,068	5,035,593	3,700,585	3.8531	14,258,723	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	38,811,398
2066	4,735,126	3,479,775	6.9962	24,345,204	4,892,064	3,595,107	3.9629	14,247,051	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	39,510,862
2067	4,782,969	3,514,934	7.2795	25,586,965	5,035,593	3,700,585	4.0758	15,082,843	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	41,588,415
2068	4,795,548	3,524,179	7.5744	26,693,541	5,051,241	3,712,084	4.1920	15,561,056	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	43,173,205
2069	4,735,126	3,479,775	7.8811	27,424,457	4,892,064	3,595,107	4.3115	15,500,305	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	43,843,369
2070	4,782,969	3,514,934	8.2003	28,823,517	5,035,593	3,700,585	4.4343	16,409,503	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	46,151,627
2071	4,782,969	3,514,934	8.5324	29,990,827	5,035,593	3,700,585	4.5607	16,877,257	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	47,786,690
2072	4,795,548	3,524,179	8.8780	31,287,661	5,051,241	3,712,084	4.6907	17,412,273	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	49,618,541
2073	4,782,969	3,514,934	9.2375	32,469,207	5,035,593	3,700,585	4.8244	17,853,101	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	51,240,915
2074	4,782,969	3,514,934	9.6117	33,784,496	5,035,593	3,700,585	4.9619	18,361,931	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	53,065,034
2075	5,114,792	3,758,786	10.0009	37,591,247	6,031,061	4,432,140	5.1033	22,618,539	1,250,000	918,607	1.0000	918,607	12,395,853	9,109,533	61,128,392
2076	4,795,548	3,524,179	10.4060	36,672,606	5,051,241	3,712,084	5.2487	19,483,616	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	57,074,829
2077	4,782,969	3,514,934	10.8274	38,057,601	5,035,593	3,700,585	5.3983	19,976,866	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	58,953,075
2078	3,942,348	2,897,174	11.2659	32,639,275	3,256,582	2,393,215	5.5522	13,287,607	0	0	1.0000	0	7,198,929	5,290,389	45,926,882
2079	3,942,348	2,897,174	11.7222	33,961,256	3,256,582	2,393,215	5.7104	13,666,214	0	0	1.0000	0	7,198,929	5,290,389	47,627,470
2080	3,953,149	2,905,112	12.1970	35,433,647	3,265,504	2,399,772	5.8731	14,094,099	0	0	1.0000	0			

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s			
2088	45,111,220	33,151,584	16.7567	555,511,141	11,805,071	8,675,376	7.3537	63,796,110	0	0	1.0000	0	56,916,291	41,826,959	619,307,251
2089	51,818,304	38,080,522	17.4353	663,945,327	62,277,980	45,767,187	7.5633	346,150,962	0	0	1.0000	0	114,096,283	83,847,709	1,010,096,289
2090	44,187,860	32,473,019	18.1415	589,109,275	56,754,748	41,708,244	7.7788	324,440,085	0	0	1.0000	0	100,942,608	74,181,263	913,549,360
2091	35,668,367	26,212,167	18.8762	494,786,111	31,834,151	23,394,458	8.0005	187,167,358	0	0	1.0000	0	67,502,519	49,606,625	681,953,469
2092	13,715,750	10,079,506	19.6407	197,968,561	10,259,487	7,539,548	8.2285	62,039,173	0	0	1.0000	0	23,975,237	17,619,055	260,007,735
2093	18,089,191	13,293,485	20.4361	271,666,992	6,228,187	4,577,005	8.4630	38,735,191	0	0	1.0000	0	24,317,379	17,870,490	310,402,183
2094	12,584,719	9,248,328	21.2638	196,654,598	9,264,588	6,808,412	8.7042	59,261,777	0	0	1.0000	0	21,849,307	16,056,740	255,916,375
2095	9,102,372	6,689,202	22.1250	147,998,586	6,700,962	4,924,440	8.9523	44,085,066	0	0	1.0000	0	15,803,334	11,613,642	192,083,653
	\$611,385,166	\$449,298,117		\$4,601,690,206	\$588,533,792	\$432,504,973		\$1,975,329,908	\$56,250,000	\$41,337,312		\$41,337,312	\$1,256,168,958	\$923,140,402	\$6,618,357,426

Proposed

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s	
Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2034	\$7,248,794	\$5,327,034	1.9639	\$10,461,762	\$2,826,485	\$2,077,143	1.6124	\$3,349,185	\$1,250,000	\$918,607	1.0000	\$918,607	\$11,325,279	\$8,322,784	\$14,729,554
2035	44,817,806	32,935,958	2.0434	67,301,336	32,275,248	23,718,613	1.6584	39,334,948	1,250,000	918,607	1.0000	918,607	78,343,054	57,573,177	107,554,890
2036	23,021,476	16,918,150	2.1262	35,971,370	19,944,127	14,656,651	1.7056	24,998,384	1,250,000	918,607	1.0000	918,607	44,215,603	32,493,407	61,888,360
2037	10,761,111	7,908,185	2.2123	17,495,278	12,388,936	9,104,450	1.7542	15,971,026	1,250,000	918,607	1.0000	918,607	24,400,047	17,931,242	34,384,910
2038	13,540,277	9,950,554	2.3019	22,905,180	20,726,436	15,231,558	1.8042	27,480,777	1,250,000	918,607	1.0000	918,607	35,516,713	26,100,719	51,304,564
2039	31,160,880	22,899,680	2.3951	54,847,024	75,415,818	55,421,994	1.8556	102,841,052	1,250,000	918,607	1.0000	918,607	107,826,698	79,240,281	158,606,683
2040	4,659,832	3,424,443	2.4921	8,534,055	4,485,457	3,296,297	1.9085	6,290,984	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	15,743,645
2041	4,647,099	3,415,086	2.5930	8,855,319	4,469,786	3,284,781	1.9629	6,447,697	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	16,221,623
2042	4,647,099	3,415,086	2.6981	9,214,244	4,469,786	3,284,781	2.0189	6,631,645	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	16,764,496
2043	4,647,099	3,415,086	2.8073	9,587,172	4,469,786	3,284,781	2.0764	6,820,520	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	17,326,298
2044	4,659,832	3,424,443	2.9210	10,002,799	4,485,457	3,296,297	2.1356	7,039,573	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	17,960,978
2045	4,647,099	3,415,086	3.0393	10,379,472	4,469,786	3,284,781	2.1964	7,214,693	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	18,512,772
2046	4,647,099	3,415,086	3.1624	10,799,869	4,469,786	3,284,781	2.2590	7,420,321	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	19,138,796
2047	4,647,099	3,415,086	3.2905	11,237,341	4,469,786	3,284,781	2.3234	7,631,861	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	19,787,809
2048	4,659,832	3,424,443	3.4238	11,724,609	4,485,457	3,296,297	2.3896	7,876,832	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	20,520,048
2049	4,647,099	3,415,086	3.5624	12,165,903	4,469,786	3,284,781	2.4577	8,073,007	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	21,157,517
2050	4,647,099	3,415,086	3.7067	12,658,700	4,469,786	3,284,781	2.5278	8,303,270	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	21,880,577
2051	4,647,099	3,415,086	3.8568	13,171,304	4,469,786	3,284,781	2.5998	8,539,774	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	22,629,686
2052	4,659,832	3,424,443	4.0130	13,742,291	4,485,457	3,296,297	2.6739	8,813,970	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	23,474,867
2053	4,742,786	3,485,405	4.1756	14,553,658	4,756,846	3,917,648	2.7501	9,613,628	1,250,000	918,607	1.0000	918,607	10,749,633	7,899,750	25,085,893
2054	4,838,472	3,555,723	4.3447	15,448,552	5,043,904	3,706,692	2.8285	10,484,379	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	26,851,538
2055	4,838,472	3,555,723	4.5206	16,074,003	5,043,904	3,706,692	2.9091	10,783,138	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	27,775,749
2056	4,899,048	3,600,240	4.7037	16,934,447	5,203,105	3,823,687	2.9920	11,440,470	1,250,000	918,607	1.0000	918,607	11,352,153	8,342,533	29,293,524
2057	4,790,629	3,520,564	4.8942	17,230,346	4,900,375	3,601,215	3.0773	11,082,018	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	29,230,971
2058	4,934,159	3,626,042	5.0924	18,465,259	5,330,963	3,917,648	3.1650	12,399,355	1,250,000	918,607	1.0000	918,607	11,515,123	8,462,297	31,783,221
2059	4,790,629	3,520,564	5.2987	18,654,414	4,900,375	3,601,215	3.2552	11,722,675	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	31,295,696
2060	4,755,518	3,494,761	5.5133	19,267,668	4,772,516	3,507,253	3.3480	11,742,283	1,250,000	918,607	1.0000	918,607	10,778,034	7,920,621	31,928,558
2061	4,838,472	3,555,723	5.7366	20,397,763	5,043,904	3,706,692	3.4434	12,763,624	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	34,079,994
2062	4,838,472	3,555,723	5.9689	21,223,758	5,043,904	3,706,692	3.5415	13,127,251	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	35,269,615
2063	4,790,629	3,520,564	6.2106	21,864,817	4,900,375	3,601,215	3.6425	13,117,425	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	35,900,849
2064	4,851,204	3,565,080	6.4622	23,038,258	5,059,575	3,718,208	3.7463	13,929,524	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	37,886,389
2065	4,838,472	3,555,723	6.7239	23,908,329	5,043,904	3,706,692	3.8531	14,282,256	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	39,109,192
2066	4,790,629	3,520,564	6.9962	24,630,572	4,900,375	3,601,215	3.9629	14,271,254	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	39,820,433
2067	4,838,472	3,555,723	7.2795	25,883,889	5,043,904	3,706,692	4.0758	15,107,736	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	41,910,232
2068	4,851,204	3,565,080	7.5744	27,003,340	5,059,575	3,718,208	4.1920	15,586,730	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	43,508,676
2069	4,790,629	3,520,564	7.8811	27,745,920	4,900,375	3,601,215	4.3115	15,526,638	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	44,191,164
2070	4,838,472	3,555,723	8.2003	29,157,999	5,043,904	3,706,692	4.4343	16,436,585	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	46,513,191
2071	4,838,472	3,555,723	8.5324	30,338,855	5,043,904	3,706,692	4.5607	16,905,111	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	48,162,573
2072	4,851,204	3,565,080	8.8780	31,650,778	5,059,575	3,718,208	4.6907	17,441,000	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	50,010,385
2073	4,838,472	3,555,723	9.2375	32,845,995	5,043,904	3,706,692	4.8244	17,882,566	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	51,647,168
2074	4,838,472	3,555,723	9.6117	34,176,547	5,043,904	3,706,692	4.9619	18,392,236	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	53,487,390
2075	5,170,295	3,799,575	10.0009	37,999,173	6,039,372	4,438,247	5.1033	22,649,707	1,250,000	918,607	1.0000	918,607	12,459,668	9,156,430	61,567,488
2076	4,851,204	3,565,080	10.4060	37,098,220	5,059,575	3,718,208	5.2487	19,515,760	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	57,532,587
2077	4,838,472	3,555,723	10.8274	38,499,240	5,043,904	3,706,692	5.3983	20,009,837	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	59,427,684
2078	823,359	605,074	11.2659	6,816,708	3,272,479	2,404,897	5.5522	13,352,471	0	-	1.0000	-	4,095,838	3,009,972	20,169,179
2079	823,359	605,074	11.7222	7,092,804	3,272,479	2,404,897	5.7104	13,732,926	0	-	1.0000	-	4,095,838	3,009,972	20,825,729
2080	825,615	606,732	12.1970	7,400,312	3,281,444	2,411,486	5.8731	14,162,899	0	-	1.0000	-	4,107,059	3,018,218	21,563,211
2081	823,359	605,074	12.6909	7,678,939	3,272,479	2,404,897	6.0								

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2089	29,172,411	21,438,383	17.4353	373,784,641	10,590,974	7,783,154	7.5633	58,866,327	0	-	1.0000	-	39,763,385	29,221,537	432,650,967
2090	57,665,154	42,377,288	18.1415	768,787,572	90,528,180	66,527,851	7.7788	517,506,845	0	-	1.0000	-	148,193,335	108,905,139	1,286,294,416
2091	55,538,057	40,814,115	18.8762	770,415,403	42,217,329	31,024,904	8.0005	248,214,748	0	-	1.0000	-	97,755,386	71,839,020	1,018,630,150
2092	51,408,076	37,779,052	19.6407	742,007,025	32,588,487	23,948,808	8.2285	197,062,766	0	-	1.0000	-	83,996,563	61,727,860	939,069,791
2093	23,223,558	17,066,657	20.4361	348,775,903	8,238,061	6,054,032	8.4630	51,235,271	0	-	1.0000	-	31,461,619	23,120,689	400,011,174
2094	14,460,844	10,627,065	21.2638	225,971,787	14,186,680	10,425,586	8.7042	90,746,385	0	-	1.0000	-	28,647,524	21,052,651	316,718,172
2095	10,459,350	7,686,425	22.1250	170,062,157	10,261,051	7,540,698	8.9523	67,506,588	-	-	1.0000	-	20,720,401	15,227,123	237,568,746
	\$573,536,674	\$421,483,808		\$4,595,865,805	\$595,414,118	\$437,561,225		\$2,092,889,180	\$55,000,000	\$40,418,705		\$40,418,705	\$1,223,950,791	\$899,463,737	\$6,729,173,689
	\$2,152,093,723	\$1,581,542,556		\$15,473,263,497	\$1,934,230,348	\$1,421,437,911		\$6,397,884,902	\$111,250,000	\$81,756,016		\$81,756,016	\$4,197,574,071	\$3,084,736,483	\$21,952,904,416

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,989,016	-	6,696,113	646,357,311
2018	646,357,311	33,305,725	-	13,392,226	693,055,262
2019	693,055,262	35,611,861	-	10,433,064	739,100,187
2020	739,100,187	37,960,153	-	10,433,064	787,493,404
2021	787,493,404	40,428,207	-	10,433,064	838,354,675
2022	838,354,675	43,022,132	-	10,433,064	891,809,871
2023	891,809,871	45,748,347	-	10,433,064	947,991,282
2024	947,991,282	48,613,598	-	10,433,064	1,007,037,944
2025	1,007,037,944	51,624,978	-	10,433,064	1,069,095,987
2026	1,069,095,987	54,789,938	-	10,433,064	1,134,318,989
2027	1,134,318,989	58,116,312	-	10,433,064	1,202,868,365
2028	1,202,868,365	61,612,330	-	10,433,064	1,274,913,759
2029	1,274,913,759	65,286,645	-	10,433,064	1,350,633,468
2030	1,350,633,468	65,424,565	(31,147,456)	7,824,798	1,392,735,375
2031	1,392,735,375	67,269,119	(132,006,851)	-	1,327,997,643
2032	1,327,997,643	64,142,286	(64,727,688)	-	1,327,412,241
2033	1,327,412,241	64,114,011	(82,949,586)	-	1,308,576,666
2034	1,308,576,666	63,204,253	(57,076,369)	-	1,314,704,550
2035	1,314,704,550	63,500,230	(173,387,228)	-	1,204,817,552
2036	1,204,817,552	58,192,688	(18,922,905)	-	1,244,087,335
2037	1,244,087,335	60,089,418	(19,567,775)	-	1,284,608,979
2038	1,284,608,979	62,046,614	(20,290,504)	-	1,326,365,089
2039	1,326,365,089	64,063,434	(21,040,251)	-	1,369,388,271
2040	1,369,388,271	66,141,454	(21,878,095)	-	1,413,651,630
2041	1,413,651,630	68,279,374	(22,626,150)	-	1,459,304,853
2042	1,459,304,853	70,484,424	(23,465,119)	-	1,506,324,158
2043	1,506,324,158	72,755,457	(24,334,547)	-	1,554,745,068
2044	1,554,745,068	75,094,187	(25,306,416)	-	1,604,532,839
2045	1,604,532,839	77,498,936	(26,174,518)	-	1,655,857,257
2046	1,655,857,257	79,977,906	(27,147,257)	-	1,708,687,906
2047	1,708,687,906	82,529,626	(28,157,044)	-	1,763,060,488
2048	1,763,060,488	85,155,822	(34,450,829)	-	1,813,765,481
2049	1,813,765,481	87,604,873	(30,292,438)	-	1,871,077,916
2050	1,871,077,916	90,373,063	(43,810,815)	-	1,917,640,165
2051	1,917,640,165	92,622,020	(45,384,284)	-	1,964,877,901
2052	1,964,877,901	94,903,603	(54,736,528)	-	2,005,044,976
2053	2,005,044,976	96,843,672	(62,491,907)	-	2,039,396,741
2054	2,039,396,741	98,502,863	(52,496,656)	-	2,085,402,948
2055	2,085,402,948	100,724,962	(64,878,112)	-	2,121,249,798
2056	2,121,249,798	102,456,365	(71,617,667)	-	2,152,088,496

EXTERNAL FUND CALCULATION

2057	2,152,088,496	103,945,874	(40,452,942)	-	2,215,581,428
2058	2,215,581,428	107,012,583	(41,970,095)	-	2,280,623,917
2059	2,280,623,917	110,154,135	(43,545,695)	-	2,347,232,356
2060	2,347,232,356	113,371,323	(45,305,101)	-	2,415,298,579
2061	2,415,298,579	116,658,921	(46,879,428)	-	2,485,078,072
2062	2,485,078,072	120,029,271	(48,642,230)	-	2,556,465,113
2063	2,556,465,113	123,477,265	(50,472,856)	-	2,629,469,522
2064	2,629,469,522	127,003,378	(52,517,576)	-	2,703,955,324
2065	2,703,955,324	130,601,042	(54,347,801)	-	2,780,208,565
2066	2,780,208,565	134,284,074	(56,397,117)	-	2,858,095,521
2067	2,858,095,521	138,046,014	(58,524,840)	-	2,937,616,695
2068	2,937,616,695	141,886,886	(60,901,750)	-	3,018,601,832
2069	3,018,601,832	145,798,468	(63,029,878)	-	3,101,370,423
2070	3,101,370,423	149,796,191	(65,412,777)	-	3,185,753,837
2071	3,185,753,837	153,871,910	(67,887,509)	-	3,271,738,238
2072	3,271,738,238	158,024,957	(70,650,837)	-	3,359,112,359
2073	3,359,112,359	162,245,127	(73,126,447)	-	3,448,231,039
2074	3,448,231,039	166,549,559	(75,898,753)	-	3,538,881,845
2075	3,538,881,845	170,927,993	(78,776,904)	-	3,631,032,934
2076	3,631,032,934	175,378,891	(81,990,836)	-	3,724,420,988
2077	3,724,420,988	179,889,534	(84,871,609)	-	3,819,438,913
2078	3,819,438,913	184,478,899	(97,913,941)	-	3,906,003,871
2079	3,906,003,871	188,659,987	(103,619,682)	-	3,991,044,176
2080	3,991,044,176	192,767,434	(105,668,399)	-	4,078,143,211
2081	4,078,143,211	196,974,317	(109,371,489)	-	4,165,746,039
2082	4,165,746,039	201,205,534	(113,487,212)	-	4,253,464,361
2083	4,253,464,361	205,442,329	(120,074,192)	-	4,338,832,498
2084	4,338,832,498	209,565,610	(122,499,775)	-	4,425,898,332
2085	4,425,898,332	213,770,889	(565,398,083)	-	4,074,271,139
2086	4,074,271,139	196,787,296	(849,848,270)	-	3,421,210,166
2087	3,421,210,166	165,244,451	(1,101,337,516)	-	2,485,117,101
2088	2,485,117,101	120,031,156	(827,873,914)	-	1,777,274,343
2089	1,777,274,343	85,842,351	(823,777,077)	-	1,039,339,617
2090	1,039,339,617	50,200,104	(567,011,870)	-	522,527,851
2091	522,527,851	25,238,095	(387,145,582)	-	160,620,364
2092	160,620,364	7,757,964	(168,378,328)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,602,831	-	24,632	383,994,518
2018	383,994,518	19,700,182	-	49,264	403,743,965
2019	403,743,965	20,999,366	-	11,200,807	435,944,138
2020	435,944,138	22,651,235	-	11,200,807	469,796,181
2021	469,796,181	24,387,845	-	11,200,807	505,384,833
2022	505,384,833	26,213,543	-	11,200,807	542,799,183
2023	542,799,183	28,132,899	-	11,200,807	582,132,889
2024	582,132,889	30,150,718	-	11,200,807	623,484,415
2025	623,484,415	32,272,051	-	11,200,807	666,957,274
2026	666,957,274	34,502,209	-	11,200,807	712,660,290
2027	712,660,290	36,846,774	-	11,200,807	760,707,871
2028	760,707,871	39,311,614	-	11,200,807	811,220,293
2029	811,220,293	41,902,902	-	11,200,807	864,324,002
2030	864,324,002	44,627,122	-	11,200,807	920,151,932
2031	920,151,932	47,491,095	-	11,200,807	978,843,834
2032	978,843,834	50,501,989	-	11,200,807	1,040,546,631
2033	1,040,546,631	50,335,207	(31,333,093)	7,504,541	1,067,053,286
2034	1,067,053,286	51,431,968	(102,068,673)	-	1,016,416,581
2035	1,016,416,581	48,991,279	(44,424,613)	-	1,020,983,247
2036	1,020,983,247	49,211,393	(37,965,127)	-	1,032,229,513
2037	1,032,229,513	49,753,463	(39,150,411)	-	1,042,832,565
2038	1,042,832,565	50,264,530	(56,242,259)	-	1,036,854,835
2039	1,036,854,835	49,976,403	(162,806,683)	-	924,024,555
2040	924,024,555	44,537,984	(15,630,028)	-	952,932,510
2041	952,932,510	45,931,347	(16,103,868)	-	982,759,989
2042	982,759,989	47,369,031	(16,642,112)	-	1,013,486,908
2043	1,013,486,908	48,850,069	(17,199,109)	-	1,045,137,867
2044	1,045,137,867	50,375,645	(17,828,428)	-	1,077,685,085
2045	1,077,685,085	51,944,421	(18,375,387)	-	1,111,254,118
2046	1,111,254,118	53,562,449	(18,996,008)	-	1,145,820,559
2047	1,145,820,559	55,228,551	(19,639,402)	-	1,181,409,707
2048	1,181,409,707	56,943,948	(20,365,377)	-	1,217,988,278
2049	1,217,988,278	58,707,035	(20,997,200)	-	1,255,698,114
2050	1,255,698,114	60,524,649	(21,713,946)	-	1,294,508,817
2051	1,294,508,817	62,395,325	(22,456,492)	-	1,334,447,650
2052	1,334,447,650	64,320,377	(23,294,357)	-	1,375,473,670
2053	1,375,473,670	66,297,831	(24,898,776)	-	1,416,872,725
2054	1,416,872,725	68,293,265	(26,657,046)	-	1,458,508,944
2055	1,458,508,944	70,300,131	(27,573,591)	-	1,501,235,485
2056	1,501,235,485	72,359,550	(29,082,815)	-	1,544,512,220

EXTERNAL FUND CALCULATION

2057	1,544,512,220	74,445,489	(29,012,547)	-	1,589,945,162
2058	1,589,945,162	76,635,357	(31,556,176)	-	1,635,024,342
2059	1,635,024,342	78,808,173	(31,059,686)	-	1,682,772,830
2060	1,682,772,830	81,109,650	(31,682,556)	-	1,732,199,925
2061	1,732,199,925	83,492,036	(33,824,973)	-	1,781,866,988
2062	1,781,866,988	85,885,989	(35,004,520)	-	1,832,748,457
2063	1,832,748,457	88,338,476	(35,625,278)	-	1,885,461,654
2064	1,885,461,654	90,879,252	(37,599,137)	-	1,938,741,769
2065	1,938,741,769	93,447,353	(38,811,398)	-	1,993,377,725
2066	1,993,377,725	96,080,806	(39,510,862)	-	2,049,947,670
2067	2,049,947,670	98,807,478	(41,588,415)	-	2,107,166,732
2068	2,107,166,732	101,565,436	(43,173,205)	-	2,165,558,964
2069	2,165,558,964	104,379,942	(43,843,369)	-	2,226,095,536
2070	2,226,095,536	107,297,805	(46,151,627)	-	2,287,241,715
2071	2,287,241,715	110,245,051	(47,786,690)	-	2,349,700,075
2072	2,349,700,075	113,255,544	(49,618,541)	-	2,413,337,078
2073	2,413,337,078	116,322,847	(51,240,915)	-	2,478,419,010
2074	2,478,419,010	119,459,796	(53,065,034)	-	2,544,813,773
2075	2,544,813,773	122,660,024	(61,128,392)	-	2,606,345,405
2076	2,606,345,405	125,625,849	(57,074,829)	-	2,674,896,424
2077	2,674,896,424	128,930,008	(58,953,075)	-	2,744,873,357
2078	2,744,873,357	132,302,896	(45,926,882)	-	2,831,249,371
2079	2,831,249,371	136,466,220	(47,627,470)	-	2,920,088,121
2080	2,920,088,121	140,748,247	(49,527,746)	-	3,011,308,622
2081	3,011,308,622	145,145,076	(51,223,963)	-	3,105,229,735
2082	3,105,229,735	149,672,073	(53,125,222)	-	3,201,776,587
2083	3,201,776,587	154,325,631	(55,098,229)	-	3,301,003,989
2084	3,301,003,989	159,108,392	(57,303,117)	-	3,402,809,265
2085	3,402,809,265	164,015,407	(59,272,264)	-	3,507,552,407
2086	3,507,552,407	169,064,026	(61,478,455)	-	3,615,137,979
2087	3,615,137,979	174,249,651	(165,701,740)	-	3,623,685,889
2088	3,623,685,889	174,661,660	(619,307,251)	-	3,179,040,298
2089	3,179,040,298	153,229,742	(1,010,096,289)	-	2,322,173,751
2090	2,322,173,751	111,928,775	(913,549,360)	-	1,520,553,166
2091	1,520,553,166	73,290,663	(681,953,469)	-	911,890,360
2092	911,890,360	43,953,115	(260,007,735)	-	695,835,741
2093	695,835,741	33,539,283	(310,402,183)	-	418,972,840
2094	418,972,840	20,194,491	(255,916,375)	-	183,250,957
2095	183,250,957	8,832,696	(192,083,653)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,803,157	-	294,670	431,306,795
2018	431,306,795	22,184,315	-	589,341	454,080,451
2019	454,080,451	23,423,593	-	3,262,942	480,766,985
2020	480,766,985	24,795,281	-	3,262,942	508,825,208
2021	508,825,208	26,237,473	-	3,262,942	538,325,623
2022	538,325,623	27,753,795	-	3,262,942	569,342,359
2023	569,342,359	29,348,055	-	3,262,942	601,953,356
2024	601,953,356	31,024,260	-	3,262,942	636,240,557
2025	636,240,557	32,786,622	-	3,262,942	672,290,121
2026	672,290,121	34,639,570	-	3,262,942	710,192,633
2027	710,192,633	36,587,759	-	3,262,942	750,043,334
2028	750,043,334	38,636,085	-	3,262,942	791,942,360
2029	791,942,360	40,789,695	-	3,262,942	835,994,997
2030	835,994,997	43,054,000	-	3,262,942	882,311,939
2031	882,311,939	45,434,691	-	3,262,942	931,009,572
2032	931,009,572	47,937,750	-	3,262,942	982,210,264
2033	982,210,264	50,569,465	-	3,262,942	1,036,042,671
2034	1,036,042,671	50,106,265	(14,729,554)	2,708,242	1,074,127,623
2035	1,074,127,623	51,880,364	(107,554,890)	-	1,018,453,097
2036	1,018,453,097	49,191,285	(61,888,360)	-	1,005,756,021
2037	1,005,756,021	48,578,016	(34,384,910)	-	1,019,949,126
2038	1,019,949,126	49,263,543	(51,304,564)	-	1,017,908,105
2039	1,017,908,105	49,164,961	(158,606,683)	-	908,466,384
2040	908,466,384	43,878,926	(15,743,645)	-	936,601,665
2041	936,601,665	45,237,860	(16,221,623)	-	965,617,903
2042	965,617,903	46,639,345	(16,764,496)	-	995,492,752
2043	995,492,752	48,082,300	(17,326,298)	-	1,026,248,754
2044	1,026,248,754	49,567,815	(17,960,978)	-	1,057,855,590
2045	1,057,855,590	51,094,425	(18,512,772)	-	1,090,437,244
2046	1,090,437,244	52,668,119	(19,138,796)	-	1,123,966,566
2047	1,123,966,566	54,287,585	(19,787,809)	-	1,158,466,342
2048	1,158,466,342	55,953,924	(20,520,048)	-	1,193,900,219
2049	1,193,900,219	57,665,381	(21,157,517)	-	1,230,408,083
2050	1,230,408,083	59,428,710	(21,880,577)	-	1,267,956,216
2051	1,267,956,216	61,242,285	(22,629,686)	-	1,306,568,816
2052	1,306,568,816	63,107,274	(23,474,867)	-	1,346,201,222
2053	1,346,201,222	65,021,519	(25,085,893)	-	1,386,136,849
2054	1,386,136,849	66,950,410	(26,851,538)	-	1,426,235,721
2055	1,426,235,721	68,887,185	(27,775,749)	-	1,467,347,158
2056	1,467,347,158	70,872,868	(29,293,524)	-	1,508,926,501

EXTERNAL FUND CALCULATION

2057	1,508,926,501	72,881,150	(29,230,971)	-	1,552,576,680
2058	1,552,576,680	74,989,454	(31,783,221)	-	1,595,782,913
2059	1,595,782,913	77,076,315	(31,295,696)	-	1,641,563,532
2060	1,641,563,532	79,287,519	(31,928,558)	-	1,688,922,493
2061	1,688,922,493	81,574,956	(34,079,994)	-	1,736,417,455
2062	1,736,417,455	83,868,963	(35,269,615)	-	1,785,016,803
2063	1,785,016,803	86,216,312	(35,900,849)	-	1,835,332,265
2064	1,835,332,265	88,646,548	(37,886,389)	-	1,886,092,425
2065	1,886,092,425	91,098,264	(39,109,192)	-	1,938,081,497
2066	1,938,081,497	93,609,336	(39,820,433)	-	1,991,870,400
2067	1,991,870,400	96,207,340	(41,910,232)	-	2,046,167,508
2068	2,046,167,508	98,829,891	(43,508,676)	-	2,101,488,722
2069	2,101,488,722	101,501,905	(44,191,164)	-	2,158,799,463
2070	2,158,799,463	104,270,014	(46,513,191)	-	2,216,556,286
2071	2,216,556,286	107,059,669	(48,162,573)	-	2,275,453,381
2072	2,275,453,381	109,904,398	(50,010,385)	-	2,335,347,395
2073	2,335,347,395	112,797,279	(51,647,168)	-	2,396,497,506
2074	2,396,497,506	115,750,830	(53,487,390)	-	2,458,760,945
2075	2,458,760,945	118,758,154	(61,567,488)	-	2,515,951,611
2076	2,515,951,611	121,520,463	(57,532,587)	-	2,579,939,487
2077	2,579,939,487	124,611,077	(59,427,684)	-	2,645,122,880
2078	2,645,122,880	127,759,435	(20,169,179)	-	2,752,713,136
2079	2,752,713,136	132,956,044	(20,825,729)	-	2,864,843,451
2080	2,864,843,451	138,371,939	(21,563,211)	-	2,981,652,179
2081	2,981,652,179	144,013,800	(22,205,721)	-	3,103,460,257
2082	3,103,460,257	149,897,130	(22,930,853)	-	3,230,426,535
2083	3,230,426,535	156,029,602	(23,680,114)	-	3,362,776,023
2084	3,362,776,023	162,422,082	(24,522,010)	-	3,500,676,095
2085	3,500,676,095	169,082,655	(25,255,785)	-	3,644,502,965
2086	3,644,502,965	176,029,493	(26,083,465)	-	3,794,448,993
2087	3,794,448,993	183,271,886	(26,939,197)	-	3,950,781,682
2088	3,950,781,682	190,822,755	(171,196,773)	-	3,970,407,664
2089	3,970,407,664	191,770,690	(432,650,967)	-	3,729,527,387
2090	3,729,527,387	180,136,173	(1,286,294,416)	-	2,623,369,144
2091	2,623,369,144	126,708,730	(1,018,630,150)	-	1,731,447,723
2092	1,731,447,723	83,628,925	(939,069,791)	-	876,006,857
2093	876,006,857	42,311,131	(400,011,174)	-	518,306,814
2094	518,306,814	25,034,219	(316,718,172)	-	226,622,861
2095	226,622,861	10,945,884	(237,568,746)	-	0

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$26,166,876	\$12,774,650
Prairie Island Unit 1	49,264	20,626,223	20,576,959
Prairie Island Unit 2	589,341	9,043,741	8,454,400
TOTAL	\$14,030,831	\$55,836,840	\$41,806,009

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
SAFSTOR Method
5-Year Early Shutdown

Docket No. E002/M-17-828
Schedule F.9
Page 2 of 14
Proposed

2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2019-2021 Decommissioning Accrual
Monticello	8.75	5.10%	4.83%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	26,166,876
Prairie Island Unit 1	11.67	5.13%	4.82%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	20,626,223
Prairie Island Unit 2	12.83	5.14%	4.83%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	9,043,741
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$55,836,840

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in			
	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2025	\$17,759,328	\$13,051,073	1.3738	\$17,929,565	\$8,763,593	\$6,440,238	1.2521	\$8,063,822	\$0	\$0	1.0000	\$0	\$26,522,921	\$19,491,311	\$25,993,386
2026	63,231,064	46,467,594	1.4295	66,425,426	46,823,276	34,409,748	1.2878	44,312,874	0	0	1.0000	0	110,054,340	80,877,343	110,738,300
2027	30,098,747	22,119,134	1.4874	32,900,000	21,963,833	16,140,903	1.3245	21,378,627	0	0	1.0000	0	52,062,580	38,260,037	54,278,627
2028	30,011,960	22,055,355	1.5476	34,132,868	35,867,567	26,358,556	1.3622	35,905,625	0	0	1.0000	0	65,879,526	48,413,911	70,038,493
2029	24,261,956	17,829,760	1.6103	28,711,263	18,617,567	13,681,781	1.4010	19,168,175	0	0	1.0000	0	42,879,522	31,511,541	47,879,438
2030	43,935,865	32,287,832	1.6755	54,098,262	88,132,650	64,767,410	1.4410	93,329,837	0	0	1.0000	0	132,068,514	97,055,241	147,428,099
2031	8,481,485	6,232,921	1.7434	10,866,474	4,523,995	3,324,618	1.4820	4,927,084	0	0	1.0000	0	13,005,479	9,557,539	15,793,558
2032	8,458,357	6,215,924	1.8140	11,275,686	4,511,770	3,315,635	1.5243	5,054,022	0	0	1.0000	0	12,970,127	9,531,559	16,329,708
2033	8,458,357	6,215,924	1.8874	11,731,935	4,511,770	3,315,635	1.5677	5,197,920	0	0	1.0000	0	12,970,127	9,531,559	16,929,855
2034	8,458,357	6,215,924	1.9639	12,207,453	4,511,770	3,315,635	1.6124	5,346,129	0	0	1.0000	0	12,970,127	9,531,559	17,553,582
2035	8,481,485	6,232,921	2.0434	12,736,350	4,523,995	3,324,618	1.6584	5,513,547	0	0	1.0000	0	13,005,479	9,557,539	18,249,897
2036	8,458,357	6,215,924	2.1262	13,216,298	4,511,770	3,315,635	1.7056	5,655,146	0	0	1.0000	0	12,970,127	9,531,559	18,871,444
2037	8,458,357	6,215,924	2.2123	13,751,489	4,511,770	3,315,635	1.7542	5,816,286	0	0	1.0000	0	12,970,127	9,531,559	19,567,775
2038	8,458,357	6,215,924	2.3019	14,308,436	4,511,770	3,315,635	1.8042	5,982,068	0	0	1.0000	0	12,970,127	9,531,559	20,290,504
2039	8,481,485	6,232,921	2.3951	14,928,468	4,523,995	3,324,618	1.8556	6,169,162	0	0	1.0000	0	13,005,479	9,557,539	21,097,630
2040	8,458,357	6,215,924	2.4921	15,490,704	4,511,770	3,315,635	1.9085	6,327,889	0	0	1.0000	0	12,970,127	9,531,559	21,818,593
2041	8,458,357	6,215,924	2.5930	16,117,891	4,511,770	3,315,635	1.9629	6,508,259	0	0	1.0000	0	12,970,127	9,531,559	22,626,150
2042	8,458,357	6,215,924	2.6981	16,771,185	4,511,770	3,315,635	2.0189	6,693,935	0	0	1.0000	0	12,970,127	9,531,559	23,465,119
2043	9,145,130	6,720,624	2.8073	18,866,807	6,514,932	4,787,729	2.0764	9,941,241	0	0	1.0000	0	15,660,061	11,508,353	28,808,047
2044	8,458,357	6,215,924	2.9210	18,156,714	4,511,767	3,315,632	2.1356	7,080,864	0	0	1.0000	0	12,970,124	9,531,556	25,237,579
2045	9,951,558	7,313,256	3.0393	22,227,179	8,991,374	6,607,631	2.1964	14,513,000	0	0	1.0000	0	18,942,932	13,920,887	36,740,179
2046	9,951,558	7,313,256	3.1624	23,127,440	8,991,374	6,607,631	2.2590	14,926,638	0	0	1.0000	0	18,942,932	13,920,887	38,054,078
2047	10,837,186	7,964,091	3.2905	26,205,842	11,591,099	8,518,131	2.3234	19,791,025	0	0	1.0000	0	22,428,284	16,482,222	45,996,867
2048	11,460,933	8,422,474	3.4238	28,836,866	13,519,499	9,935,284	2.3896	23,741,355	0	0	1.0000	0	24,980,432	18,357,758	52,578,221
2049	10,167,183	7,471,716	3.5624	26,617,240	9,638,249	7,083,010	2.4577	17,407,913	0	0	1.0000	0	19,805,432	14,554,725	44,025,153
2050	11,245,308	8,264,014	3.7067	30,632,221	12,872,624	9,459,905	2.5278	23,912,748	0	0	1.0000	0	24,117,932	17,723,919	54,544,969
2051	11,699,686	8,597,930	3.8568	33,160,496	14,178,599	10,419,647	2.5998	27,088,999	0	0	1.0000	0	25,878,284	19,017,577	60,249,495
2052	8,441,765	6,203,731	4.0130	24,895,572	4,461,997	3,279,057	2.6739	8,767,871	0	0	1.0000	0	12,903,762	9,482,788	33,663,443
2053	8,441,765	6,203,731	4.1756	25,904,299	4,461,997	3,279,057	2.7501	9,017,735	0	0	1.0000	0	12,903,762	9,482,788	34,922,034
2054	8,441,765	6,203,731	4.3447	26,953,349	4,461,997	3,279,057	2.8285	9,274,813	0	0	1.0000	0	12,903,762	9,482,788	36,228,162
2055	8,464,894	6,220,728	4.5206	28,121,423	4,474,222	3,288,041	2.9091	9,565,240	0	0	1.0000	0	12,939,115	9,508,769	37,686,663
2056	8,441,765	6,203,731	4.7037	29,180,489	4,461,997	3,279,057	2.9920	9,810,939	0	0	1.0000	0	12,903,762	9,482,788	38,991,428
2057	8,441,765	6,203,731	4.8942	30,362,300	4,461,997	3,279,057	3.0773	10,090,642	0	0	1.0000	0	12,903,762	9,482,788	40,452,942
2058	8,441,765	6,203,731	5.0924	31,591,879	4,461,997	3,279,057	3.1650	10,378,216	0	0	1.0000	0	12,903,762	9,482,788	41,970,095
2059	8,464,894	6,220,728	5.2987	32,961,772	4,474,222	3,288,041	3.2552	10,703,230	0	0	1.0000	0	12,939,115	9,508,769	43,665,002
2060	8,441,765	6,203,731	5.5133	34,203,029	4,461,997	3,279,057	3.3480	10,978,283	0	0	1.0000	0	12,903,762	9,482,788	45,181,313
2061	8,441,765	6,203,731	5.7366	35,588,322	4,461,997	3,279,057	3.4434	11,291,105	0	0	1.0000	0	12,903,762	9,482,788	46,879,428
2062	8,441,765	6,203,731	5.9689	37,029,449	4,461,997	3,279,057	3.5415	11,612,781	0	0	1.0000	0	12,903,762	9,482,788	48,642,230
2063	8,464,894	6,220,728	6.2106	38,634,454	4,474,222	3,288,041	3.6425	11,976,689	0	0	1.0000	0	12,939,115	9,508,769	50,611,142
2064	8,441,765	6,203,731	6.4622	40,089,750	4,461,997	3,279,057	3.7463	12,284,332	0	0	1.0000	0	12,903,762	9,482,788	52,374,081
2065	8,441,765	6,203,731	6.7239	41,713,266	4,461,997	3,279,057	3.8531	12,634,535	0	0	1.0000	0	12,903,762	9,482,788	54,347,801
2066	8,441,765	6,203,731	6.9962	43,402,542	4,461,997	3,279,057	3.9629	12,994,575	0	0	1.0000	0	12,903,762	9,482,788	56,397,117
2067	8,464,894	6,220,728	7.2795	45,283,790	4,474,222	3,288,041	4.0758	13,401,397	0	0	1.0000	0	12,939,115	9,508,769	58,685,187
2068	8,441,765	6,203,731	7.5744	46,989,539	4,461,997	3,279,057	4.1920	13,745,807	0	0	1.0000	0	12,903,762	9,482,788	60,735,346
2069	8,441,765	6,203,731	7.8811	48,892,223	4,461,997	3,279,057	4.3115	14,137,655	0	0	1.0000	0	12,903,762	9,482,788	63,029,878
2070	8,441,765	6,203,731	8.2003	50,872,454	4,461,997	3,279,057	4.4343	14,540,323	0	0	1.0000	0	12,903,762	9,482,788	65,412,777
2071	8,464,894	6,220,728	8.5324	53,077,740	4,474,222	3,288,041	4.5607	14,995,768	0	0	1.0000	0	12,939,115	9,508,769	68,073,508
2072	8,441,765	6,203,731	8.8780	55,076,723	4,461,997	3,279,057	4.6907	15,381,073	0	0	1.0000	0	12,903,762	9,482,788	70,457,796
2073	8,920,197	6,555,324	9.2375	60,554,802	5,897,293	4,333,835	4.8244	20,908,155	0	0	1.0000	0	14,817,490	10,889,159	81,462,957
2074	9,015,884	6,625,643	9.6117	63,683,689	6,184,352	4,544,791	4.9619	22,550,798	0	0	1.0000	0	15,200,236	11,170,433	86,234,487
2075	8,943,325	6,572,320	10.0009	65,729,116	5,909,518	4,342,819	5.1033	22,162,709	0	0	1.0000	0	14,852,842	10,915,139	87,891,824
2076	8,920,197	6,555,324	10.4060	68,214,698	5,897,293	4,333,835	5.2487	22,747,002	0	0	1.0000	0	14,817,490	10,889,159	90,961,699
2077	8,920,197	6,555,324	10.8274	70,977,111	5,897,293	4,333,835	5.3983	23,395,343	0	0	1.0000	0	14,817,490	10,889,159	94,372,454
2078	9,015,884	6,625,643	11.2659	74,643,827	6,184,352	4,544,791	5.5522	25,233,588	0	0	1.0000	0	15,200,236	11,170,433	99,877,415
2079	8,943,325	6,572,320	11.7222	77,042,050	5,909,518	4,342,819	5.7104	24,799,234	0	0	1.0000	0	14,852,842	10,915,139	101,841,284

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2080	46,126,149	33,897,440	12.1970	413,447,077	12,314,062	9,049,426	5.8731	53,148,185	0	0	1.0000	0	58,440,212	42,946,866	466,595,262
2081	53,631,139	39,412,748	12.6909	500,183,247	46,945,385	34,499,485	6.0405	208,394,136	0	0	1.0000	0	100,576,524	73,912,233	708,577,384
2082	57,419,114	42,196,476	13.2049	557,200,251	80,273,242	58,991,645	6.2127	366,497,393	0	0	1.0000	0	137,692,356	101,188,121	923,697,643
2083	52,652,752	38,693,746	13.7397	531,640,460	33,214,319	24,408,722	6.3897	155,964,414	0	0	1.0000	0	85,867,070	63,102,468	687,604,874
2084	50,913,638	37,415,697	14.2962	534,902,283	30,841,715	22,665,130	6.5719	148,952,970	0	0	1.0000	0	81,755,354	60,080,827	683,855,253
2085	32,667,889	24,007,160	14.8752	357,111,300	23,001,023	16,903,119	6.7592	114,251,564	0	0	1.0000	0	55,668,913	40,910,279	471,362,864
2086	21,071,356	15,485,035	15.4776	239,671,177	16,131,940	11,855,130	6.9518	82,414,491	0	0	1.0000	0	37,203,297	27,340,165	322,085,668
2087	8,832,651	6,490,987	16.1045	104,534,104	6,762,156	4,969,411	7.1499	35,530,788	0	0	1.0000	0	15,594,807	11,460,398	140,064,893
	\$967,171,883	\$710,760,631		\$5,145,790,110	\$750,282,438	\$551,371,714		\$2,024,287,970	\$0	\$0		\$0	\$1,717,454,322	\$1,262,132,345	\$7,170,078,080

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in			
	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s			
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2028	\$18,446,908	\$13,556,366	1.5476	\$20,979,832	\$4,190,856	\$3,079,799	1.3622	\$4,195,302	\$1,250,000	\$918,607	1.0000	\$918,607	\$23,887,764	\$17,554,772	\$26,093,741
2029	46,142,627	33,909,549	1.6103	54,604,547	29,162,161	21,430,850	1.4010	30,024,621	1,250,000	918,607	1.0000	918,607	76,554,787	56,259,006	85,547,775
2030	16,398,923	12,051,331	1.6755	20,192,006	15,491,742	11,384,657	1.4410	16,405,291	1,250,000	918,607	1.0000	918,607	33,140,665	24,354,595	37,515,903
2031	12,659,656	9,303,398	1.7434	16,219,545	13,774,811	10,122,909	1.4820	15,002,152	1,250,000	918,607	1.0000	918,607	27,684,467	20,344,915	32,140,303
2032	12,625,333	9,278,174	1.8140	16,830,608	13,734,545	10,093,318	1.5243	15,385,245	1,250,000	918,607	1.0000	918,607	27,609,877	20,290,100	33,134,460
2033	15,404,499	11,320,543	1.8874	21,366,393	22,072,045	16,220,427	1.5677	25,428,763	1,250,000	918,607	1.0000	918,607	38,726,543	28,459,577	47,713,763
2034	32,688,492	24,022,300	1.9639	47,177,395	76,524,027	56,236,401	1.6124	90,675,573	1,250,000	918,607	1.0000	918,607	110,462,519	81,177,308	138,771,575
2035	4,604,176	3,383,542	2.0434	6,913,931	4,477,123	3,290,173	1.6584	5,456,423	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	13,288,961
2036	4,591,596	3,374,297	2.1262	7,174,431	4,461,475	3,278,674	1.7056	5,592,106	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	13,685,143
2037	4,591,596	3,374,297	2.2123	7,464,958	4,461,475	3,278,674	1.7542	5,751,449	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	14,135,014
2038	4,591,596	3,374,297	2.3019	7,767,295	4,461,475	3,278,674	1.8042	5,915,383	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	14,601,285
2039	4,604,176	3,383,542	2.3951	8,103,923	4,477,123	3,290,173	1.8556	6,105,245	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	15,127,775
2040	4,591,596	3,374,297	2.4921	8,409,086	4,461,475	3,278,674	1.9085	6,257,349	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	15,585,042
2041	4,591,596	3,374,297	2.5930	8,749,553	4,461,475	3,278,674	1.9629	6,435,709	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	16,103,868
2042	4,591,596	3,374,297	2.6981	9,104,191	4,461,475	3,278,674	2.0189	6,619,314	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	16,642,112
2043	4,604,176	3,383,542	2.8073	9,498,619	4,477,123	3,290,173	2.0764	6,831,715	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	17,248,941
2044	4,591,596	3,374,297	2.9210	9,856,322	4,461,475	3,278,674	2.1356	7,001,935	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	17,776,865
2045	4,591,596	3,374,297	3.0393	10,255,502	4,461,475	3,278,674	2.1964	7,201,279	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	18,375,387
2046	4,591,596	3,374,297	3.1624	10,670,878	4,461,475	3,278,674	2.2590	7,406,524	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	18,996,008
2047	4,604,176	3,383,542	3.2905	11,133,546	4,477,123	3,290,173	2.3234	7,644,388	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	19,696,541
2048	4,687,283	3,444,616	3.4238	11,793,677	4,748,534	3,489,629	2.3896	8,338,818	1,250,000	918,607	1.0000	918,607	10,685,817	7,852,852	21,051,102
2049	4,782,969	3,514,934	3.5624	12,521,603	5,035,593	3,700,585	2.4577	9,094,927	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	22,535,136
2050	4,782,969	3,514,934	3.7067	13,028,808	5,035,593	3,700,585	2.5278	9,354,338	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	23,301,752
2051	4,843,392	3,559,339	3.8568	13,727,658	5,194,771	3,817,562	2.5998	9,924,898	1,250,000	918,607	1.0000	918,607	11,288,163	8,295,508	24,571,163
2052	4,735,126	3,479,775	4.0130	13,964,338	4,892,064	3,595,107	2.6739	9,612,957	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	24,495,903
2053	4,878,656	3,585,253	4.1756	14,970,584	5,322,652	3,911,540	2.7501	10,757,127	1,250,000	918,607	1.0000	918,607	11,451,308	8,415,401	26,646,318
2054	4,735,126	3,479,775	4.3447	15,118,580	4,892,064	3,595,107	2.8285	10,168,761	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	26,205,948
2055	4,699,862	3,453,861	4.5206	15,613,523	4,764,182	3,501,129	2.9091	10,185,133	1,250,000	918,607	1.0000	918,607	10,714,044	7,873,596	26,717,263
2056	4,782,969	3,514,934	4.7037	16,533,197	5,035,593	3,700,585	2.9920	11,072,149	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	28,523,954
2057	4,782,969	3,514,934	4.8942	17,202,792	5,035,593	3,700,585	3.0773	11,387,809	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	29,509,208
2058	4,735,126	3,479,775	5.0924	17,720,408	4,892,064	3,595,107	3.1650	11,378,515	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	30,017,529
2059	4,795,548	3,524,179	5.2987	18,673,567	5,051,241	3,712,084	3.2552	12,083,576	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	31,675,750
2060	4,782,969	3,514,934	5.5133	19,378,888	5,035,593	3,700,585	3.3480	12,389,557	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	32,687,053
2061	4,735,126	3,479,775	5.7366	19,962,079	4,892,064	3,595,107	3.4434	12,379,392	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	33,260,079
2062	4,782,969	3,514,934	5.9689	20,980,292	5,035,593	3,700,585	3.5415	13,105,621	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	35,004,520
2063	4,795,548	3,524,179	6.2106	21,887,266	5,051,241	3,712,084	3.6425	13,521,266	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	36,327,139
2064	4,735,126	3,479,775	6.4622	22,487,004	4,892,064	3,595,107	3.7463	13,468,350	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	36,873,962
2065	4,782,969	3,514,934	6.7239	23,634,068	5,035,593	3,700,585	3.8531	14,258,723	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	38,811,398
2066	4,782,969	3,514,934	6.9962	24,591,185	5,035,593	3,700,585	3.9629	14,665,047	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	40,174,838
2067	4,795,548	3,524,179	7.2795	25,654,261	5,051,241	3,712,084	4.0758	15,129,712	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	41,702,580
2068	4,782,969	3,514,934	7.5744	26,623,520	5,035,593	3,700,585	4.1920	15,512,851	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	43,054,977
2069	4,782,969	3,514,934	7.8811	27,701,550	5,035,593	3,700,585	4.3115	15,955,071	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	44,575,228
2070	5,114,792	3,758,786	8.2003	30,823,176	6,031,061	4,432,140	4.4343	19,653,437	1,250,000	918,607	1.0000	918,607	12,395,853	9,109,533	51,395,220
2071	4,795,548	3,524,179	8.5324	30,069,705	5,051,241	3,712,084	4.5607	16,929,702	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	47,918,013
2072	4,782,969	3,514,934	8.8780	31,205,588	5,035,593	3,700,585	4.6907	17,358,333	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	49,482,528
2073	3,942,348	2,897,174	9.2375	26,762,647	3,256,582	2,393,215	4.8244	11,545,826	0	0	1.0000	0	7,198,929	5,290,389	38,308,473
2074	3,942,348	2,897,174	9.6117	27,846,769	3,256,582	2,393,215	4.9619	11,874,893	0	0	1.0000	0	7,198,929	5,290,389	39,721,662
2075	3,953,149	2,905,112	10.0009	29,053,731	3,265,504	2,399,772	5.1033	12,246,754	0	0	1.0000	0			

AMOUNT TO RECOVER															
	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2083	45,111,220	33,151,584	13.7397	455,492,813	11,805,071	8,675,376	6.3897	55,433,048	0	0	1.0000	0	56,916,291	41,826,959	510,925,861
2084	51,818,304	38,080,522	14.2962	544,406,760	62,277,980	45,767,187	6.5719	300,777,373	0	0	1.0000	0	114,096,283	83,847,709	845,184,134
2085	44,187,860	32,473,019	14.8752	483,042,653	56,754,748	41,708,244	6.7592	281,914,360	0	0	1.0000	0	100,942,608	74,181,263	764,957,013
2086	35,668,367	26,212,167	15.4776	405,701,439	31,834,151	23,394,458	6.9518	162,633,590	0	0	1.0000	0	67,502,519	49,606,625	568,335,029
2087	13,715,750	10,079,506	16.1045	162,325,411	10,259,487	7,539,548	7.1499	53,907,017	0	0	1.0000	0	23,975,237	17,619,055	216,232,427
2088	18,089,191	13,293,485	16.7567	222,754,942	6,228,187	4,577,005	7.3537	33,657,920	0	0	1.0000	0	24,317,379	17,870,490	256,412,862
2089	12,584,719	9,248,328	17.4353	161,247,374	9,264,588	6,808,412	7.5633	51,494,060	0	0	1.0000	0	21,849,307	16,056,740	212,741,434
2090	9,102,372	6,689,202	18.1415	121,352,152	6,700,962	4,924,440	7.7788	38,306,236	0	0	1.0000	0	15,803,334	11,613,642	159,658,387
	\$611,385,166	\$449,298,117		\$3,773,175,957	\$588,533,792	\$432,504,973		\$1,716,403,540	\$56,250,000	\$41,337,312		\$41,337,312	\$1,256,168,958	\$923,140,402	\$5,530,916,809

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$	Cost in Nominal \$		Cost in Future \$'s	Estimate Nominal \$	Cost in Nominal \$		Cost in Future \$'s	Estimate Nominal \$	Cost in Nominal \$		Cost in Future \$'s			
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2029	\$7,248,794	\$5,327,034	1.6103	\$8,578,123	\$2,826,485	\$2,077,143	1.4010	\$2,910,077	\$1,250,000	\$918,607	1.0000	\$918,607	\$11,325,279	\$8,322,784	\$12,406,807
2030	44,817,806	32,935,958	1.6755	55,184,197	32,275,248	23,718,613	1.4410	34,178,521	1,250,000	918,607	1.0000	918,607	78,343,054	57,573,177	90,281,325
2031	23,021,476	16,918,150	1.7434	29,495,102	19,944,127	14,656,651	1.4820	21,721,156	1,250,000	918,607	1.0000	918,607	44,215,603	32,493,407	52,134,866
2032	10,761,111	7,908,185	1.8140	14,345,447	12,388,936	9,104,450	1.5243	13,877,913	1,250,000	918,607	1.0000	918,607	24,400,047	17,931,242	29,141,967
2033	13,540,277	9,950,554	1.8874	18,780,675	20,726,436	15,231,558	1.5677	23,878,514	1,250,000	918,607	1.0000	918,607	35,516,713	26,100,719	43,577,796
2034	31,160,880	22,899,680	1.9639	44,972,682	75,415,818	55,421,994	1.6124	89,362,423	1,250,000	918,607	1.0000	918,607	107,826,698	79,240,281	135,253,712
2035	4,659,832	3,424,443	2.0434	6,997,507	4,485,457	3,296,297	1.6584	5,466,580	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	13,382,694
2036	4,647,099	3,415,086	2.1262	7,261,156	4,469,786	3,284,781	1.7056	5,602,523	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	13,782,286
2037	4,647,099	3,415,086	2.2123	7,555,195	4,469,786	3,284,781	1.7542	5,762,163	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	14,235,965
2038	4,647,099	3,415,086	2.3019	7,861,187	4,469,786	3,284,781	1.8042	5,926,402	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	14,706,196
2039	4,659,832	3,424,443	2.3951	8,201,884	4,485,457	3,296,297	1.8556	6,116,609	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	15,237,100
2040	4,647,099	3,415,086	2.4921	8,510,736	4,469,786	3,284,781	1.9085	6,269,005	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	15,698,348
2041	4,647,099	3,415,086	2.5930	8,855,319	4,469,786	3,284,781	1.9629	6,447,697	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	16,221,623
2042	4,647,099	3,415,086	2.6981	9,214,244	4,469,786	3,284,781	2.0189	6,631,645	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	16,764,496
2043	4,659,832	3,424,443	2.8073	9,613,439	4,485,457	3,296,297	2.0764	6,844,432	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	17,376,478
2044	4,647,099	3,415,086	2.9210	9,975,467	4,469,786	3,284,781	2.1356	7,014,979	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	17,909,053
2045	4,647,099	3,415,086	3.0393	10,379,472	4,469,786	3,284,781	2.1964	7,214,693	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	18,512,772
2046	4,647,099	3,415,086	3.1624	10,799,869	4,469,786	3,284,781	2.2590	7,420,321	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	19,138,796
2047	4,659,832	3,424,443	3.2905	11,268,130	4,485,457	3,296,297	2.3234	7,658,617	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	19,845,355
2048	4,742,786	3,485,405	3.4238	11,933,330	4,756,846	3,495,737	2.3896	8,353,414	1,250,000	918,607	1.0000	918,607	10,749,633	7,899,750	21,205,352
2049	4,838,472	3,555,723	3.5624	12,666,909	5,043,904	3,706,692	2.4577	9,109,938	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	22,695,454
2050	4,838,472	3,555,723	3.7067	13,180,000	5,043,904	3,706,692	2.5278	9,369,777	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	23,468,384
2051	4,899,048	3,600,240	3.8568	13,885,404	5,203,105	3,823,687	2.5998	9,940,820	1,250,000	918,607	1.0000	918,607	11,352,153	8,342,533	24,744,831
2052	4,790,629	3,520,564	4.0130	14,128,025	4,900,375	3,601,215	2.6739	9,629,288	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	24,675,920
2053	4,934,159	3,626,042	4.1756	15,140,903	5,330,963	3,917,648	2.7501	10,773,923	1,250,000	918,607	1.0000	918,607	11,515,123	8,462,297	26,833,433
2054	4,790,629	3,520,564	4.3447	15,295,796	4,900,375	3,601,215	2.8285	10,186,036	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	26,400,439
2055	4,755,518	3,494,761	4.5206	15,798,419	4,772,516	3,507,253	2.9091	10,202,949	1,250,000	918,607	1.0000	918,607	10,778,034	7,920,621	26,919,975
2056	4,838,472	3,555,723	4.7037	16,725,056	5,043,904	3,706,692	2.9920	11,090,423	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	28,734,087
2057	4,838,472	3,555,723	4.8942	17,402,422	5,043,904	3,706,692	3.0773	11,406,604	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	29,727,633
2058	4,790,629	3,520,564	5.0924	17,928,122	4,900,375	3,601,215	3.1650	11,397,845	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	30,244,574
2059	4,851,204	3,565,080	5.2987	18,890,288	5,059,575	3,718,208	3.2552	12,103,512	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	31,912,407
2060	4,838,472	3,555,723	5.5133	19,603,770	5,043,904	3,706,692	3.3480	12,410,006	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	32,932,383
2061	4,790,629	3,520,564	5.7366	20,196,069	4,900,375	3,601,215	3.4434	12,400,423	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	33,515,100
2062	4,838,472	3,555,723	5.9689	21,223,758	5,043,904	3,706,692	3.5415	13,127,251	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	35,269,615
2063	4,851,204	3,565,080	6.2106	22,141,284	5,059,575	3,718,208	3.6425	13,543,574	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	36,603,465
2064	4,790,629	3,520,564	6.4622	22,750,591	4,900,375	3,601,215	3.7463	13,491,231	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	37,160,429
2065	4,838,472	3,555,723	6.7239	23,908,329	5,043,904	3,706,692	3.8531	14,282,256	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	39,109,192
2066	4,838,472	3,555,723	6.9962	24,876,552	5,043,904	3,706,692	3.9629	14,689,251	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	40,484,410
2067	4,851,204	3,565,080	7.2795	25,951,998	5,059,575	3,718,208	4.0758	15,154,674	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	42,025,278
2068	4,838,472	3,555,723	7.5744	26,932,472	5,043,904	3,706,692	4.1920	15,538,454	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	43,389,533
2069	4,838,472	3,555,723	7.8811	28,023,012	5,043,904	3,706,692	4.3115	15,981,404	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	44,923,023
2070	5,170,295	3,799,575	8.2003	31,157,658	6,039,372	4,438,247	4.4343	19,680,520	1,250,000	918,607	1.0000	918,607	12,459,668	9,156,430	51,756,785
2071	4,851,204	3,565,080	8.5324	30,418,686	5,059,575	3,718,208	4.5607	16,957,633	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	48,294,926
2072	4,838,472	3,555,723	8.8780	31,567,713	5,043,904	3,706,692	4.6907	17,386,981	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	49,873,301
2073	823,359	605,074	9.2375	5,589,375	3,272,479	2,404,897	4.8244	11,602,187	0	-	1.0000	-	4,095,838	3,009,972	17,191,562
2074	823,359	605,074	9.6117	5,815,794	3,272,479	2,404,897	4.9619	11,932,860	0	-	1.0000	-	4,095,838	3,009,972	17,748,654
2075	825,615	606,732	10.0009	6,067,868	3,281,444	2,411,486	5.1033	12,306,537	0	-	1.0000	-	4,107,059	3,018,218	18,374,405
2076	823,359	605,074	10.4060	6,296,405	3,272,479	2,404,897	5.2487	12,622,585	0	-	1.0000	-	4,095,838	3,009,972	18,918,989
2077	823,359	6													

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s			
2084	29,172,411	21,438,383	14.2962	306,487,412	10,590,974	7,783,154	6.5719	51,150,108	0	-	1.0000	-	39,763,385	29,221,537	357,637,520
2085	57,665,154	42,377,288	14.8752	630,370,636	90,528,180	66,527,851	6.7592	449,675,048	0	-	1.0000	-	148,193,335	108,905,139	1,080,045,684
2086	55,538,057	40,814,115	15.4776	631,704,550	42,217,329	31,024,904	6.9518	215,678,931	0	-	1.0000	-	97,755,386	71,839,020	847,383,481
2087	51,408,076	37,779,052	16.1045	608,412,741	32,588,487	23,948,808	7.1499	171,231,582	0	-	1.0000	-	83,996,563	61,727,860	779,644,323
2088	23,223,558	17,066,657	16.7567	285,980,846	8,238,061	6,054,032	7.3537	44,519,534	0	-	1.0000	-	31,461,619	23,120,689	330,500,380
2089	14,460,844	10,627,065	17.4353	185,286,068	14,186,680	10,425,586	7.5633	78,851,834	0	-	1.0000	-	28,647,524	21,052,651	264,137,902
2090	10,459,350	7,686,425	18.1415	139,443,282	10,261,051	7,540,698	7.7788	58,657,580	-	-	1.0000	-	20,720,401	15,227,123	198,100,862
	\$573,536,674	\$421,483,808		\$3,768,401,389	\$595,414,118	\$437,561,225		\$1,818,555,225	\$55,000,000	\$40,418,705		\$40,418,705	\$1,223,950,791	\$899,463,737	\$5,627,375,318
	\$2,152,093,723	\$1,581,542,556		\$12,687,367,456	\$1,934,230,348	\$1,421,437,911		\$5,559,246,735	\$111,250,000	\$81,756,016		\$81,756,016	\$4,197,574,071	\$3,084,736,483	\$18,328,370,207

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,989,016	-	6,696,113	646,357,311
2018	646,357,311	33,305,725	-	13,392,226	693,055,262
2019	693,055,262	36,013,074	-	26,166,876	755,235,212
2020	755,235,212	39,184,251	-	26,166,876	820,586,339
2021	820,586,339	42,517,159	-	26,166,876	889,270,373
2022	889,270,373	46,020,044	-	26,166,876	961,457,294
2023	961,457,294	49,701,577	-	26,166,876	1,037,325,747
2024	1,037,325,747	53,570,868	-	26,166,876	1,117,063,492
2025	1,117,063,492	54,428,114	(25,993,386)	19,625,157	1,165,123,377
2026	1,165,123,377	56,275,459	(110,738,300)	-	1,110,660,536
2027	1,110,660,536	53,644,904	(54,278,627)	-	1,110,026,813
2028	1,110,026,813	53,614,295	(70,038,493)	-	1,093,602,616
2029	1,093,602,616	52,821,006	(47,879,438)	-	1,098,544,184
2030	1,098,544,184	53,059,684	(147,428,099)	-	1,004,175,769
2031	1,004,175,769	48,501,690	(15,793,558)	-	1,036,883,900
2032	1,036,883,900	50,081,492	(16,329,708)	-	1,070,635,685
2033	1,070,635,685	51,711,704	(16,929,855)	-	1,105,417,533
2034	1,105,417,533	53,391,667	(17,553,582)	-	1,141,255,617
2035	1,141,255,617	55,122,646	(18,249,897)	-	1,178,128,367
2036	1,178,128,367	56,903,600	(18,871,444)	-	1,216,160,523
2037	1,216,160,523	58,740,553	(19,567,775)	-	1,255,333,301
2038	1,255,333,301	60,632,598	(20,290,504)	-	1,295,675,396
2039	1,295,675,396	62,581,122	(21,097,630)	-	1,337,158,888
2040	1,337,158,888	64,584,774	(21,818,593)	-	1,379,925,069
2041	1,379,925,069	66,650,381	(22,626,150)	-	1,423,949,300
2042	1,423,949,300	68,776,751	(23,465,119)	-	1,469,260,932
2043	1,469,260,932	70,965,303	(28,808,047)	-	1,511,418,187
2044	1,511,418,187	73,001,498	(25,237,579)	-	1,559,182,107
2045	1,559,182,107	75,308,496	(36,740,179)	-	1,597,750,424
2046	1,597,750,424	77,171,345	(38,054,078)	-	1,636,867,691
2047	1,636,867,691	79,060,709	(45,996,867)	-	1,669,931,534
2048	1,669,931,534	80,657,693	(52,578,221)	-	1,698,011,006
2049	1,698,011,006	82,013,932	(44,025,153)	-	1,735,999,784
2050	1,735,999,784	83,848,790	(54,544,969)	-	1,765,303,604
2051	1,765,303,604	85,264,164	(60,249,495)	-	1,790,318,274
2052	1,790,318,274	86,472,373	(33,663,443)	-	1,843,127,204
2053	1,843,127,204	89,023,044	(34,922,034)	-	1,897,228,214
2054	1,897,228,214	91,636,123	(36,228,162)	-	1,952,636,174
2055	1,952,636,174	94,312,327	(37,686,663)	-	2,009,261,839
2056	2,009,261,839	97,047,347	(38,991,428)	-	2,067,317,758

EXTERNAL FUND CALCULATION

2057	2,067,317,758	99,851,448	(40,452,942)	-	2,126,716,264
2058	2,126,716,264	102,720,396	(41,970,095)	-	2,187,466,565
2059	2,187,466,565	105,654,635	(43,665,002)	-	2,249,456,198
2060	2,249,456,198	108,648,734	(45,181,313)	-	2,312,923,619
2061	2,312,923,619	111,714,211	(46,879,428)	-	2,377,758,402
2062	2,377,758,402	114,845,731	(48,642,230)	-	2,443,961,903
2063	2,443,961,903	118,043,360	(50,611,142)	-	2,511,394,121
2064	2,511,394,121	121,300,336	(52,374,081)	-	2,580,320,376
2065	2,580,320,376	124,629,474	(54,347,801)	-	2,650,602,049
2066	2,650,602,049	128,024,079	(56,397,117)	-	2,722,229,011
2067	2,722,229,011	131,483,661	(58,685,187)	-	2,795,027,486
2068	2,795,027,486	134,999,828	(60,735,346)	-	2,869,291,967
2069	2,869,291,967	138,586,802	(63,029,878)	-	2,944,848,891
2070	2,944,848,891	142,236,201	(65,412,777)	-	3,021,672,315
2071	3,021,672,315	145,946,773	(68,073,508)	-	3,099,545,580
2072	3,099,545,580	149,708,052	(70,457,796)	-	3,178,795,836
2073	3,178,795,836	153,535,839	(81,462,957)	-	3,250,868,718
2074	3,250,868,718	157,016,959	(86,234,487)	-	3,321,651,190
2075	3,321,651,190	160,435,752	(87,891,824)	-	3,394,195,118
2076	3,394,195,118	163,939,624	(90,961,699)	-	3,467,173,043
2077	3,467,173,043	167,464,458	(94,372,454)	-	3,540,265,046
2078	3,540,265,046	170,994,802	(99,877,415)	-	3,611,382,433
2079	3,611,382,433	174,429,772	(101,841,284)	-	3,683,970,920
2080	3,683,970,920	177,935,795	(466,595,262)	-	3,395,311,454
2081	3,395,311,454	163,993,543	(708,577,384)	-	2,850,727,613
2082	2,850,727,613	137,690,144	(923,697,643)	-	2,064,720,113
2083	2,064,720,113	99,725,981	(687,604,874)	-	1,476,841,221
2084	1,476,841,221	71,331,431	(683,855,253)	-	864,317,399
2085	864,317,399	41,746,530	(471,362,864)	-	434,701,065
2086	434,701,065	20,996,061	(322,085,668)	-	133,611,459
2087	133,611,459	6,453,433	(140,064,893)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,602,831	-	24,632	383,994,518
2018	383,994,518	19,700,182	-	49,264	403,743,965
2019	403,743,965	21,241,128	-	20,626,223	445,611,316
2020	445,611,316	23,388,923	-	20,626,223	489,626,462
2021	489,626,462	25,646,900	-	20,626,223	535,899,585
2022	535,899,585	28,020,711	-	20,626,223	584,546,519
2023	584,546,519	30,516,299	-	20,626,223	635,689,041
2024	635,689,041	33,139,910	-	20,626,223	689,455,175
2025	689,455,175	35,898,113	-	20,626,223	745,979,511
2026	745,979,511	38,797,812	-	20,626,223	805,403,545
2027	805,403,545	41,846,264	-	20,626,223	867,876,032
2028	867,876,032	42,164,676	(26,093,741)	13,819,569	897,766,537
2029	897,766,537	43,272,347	(85,547,775)	-	855,491,109
2030	855,491,109	41,234,671	(37,515,903)	-	859,209,877
2031	859,209,877	41,413,916	(32,140,303)	-	868,483,490
2032	868,483,490	41,860,904	(33,134,460)	-	877,209,934
2033	877,209,934	42,281,519	(47,713,763)	-	871,777,690
2034	871,777,690	42,019,685	(138,771,575)	-	775,025,800
2035	775,025,800	37,356,244	(13,288,961)	-	799,093,082
2036	799,093,082	38,516,287	(13,685,143)	-	823,924,226
2037	823,924,226	39,713,148	(14,135,014)	-	849,502,359
2038	849,502,359	40,946,014	(14,601,285)	-	875,847,088
2039	875,847,088	42,215,830	(15,127,775)	-	902,935,143
2040	902,935,143	43,521,474	(15,585,042)	-	930,871,576
2041	930,871,576	44,868,010	(16,103,868)	-	959,635,717
2042	959,635,717	46,254,442	(16,642,112)	-	989,248,047
2043	989,248,047	47,681,756	(17,248,941)	-	1,019,680,861
2044	1,019,680,861	49,148,618	(17,776,865)	-	1,051,052,614
2045	1,051,052,614	50,660,736	(18,375,387)	-	1,083,337,963
2046	1,083,337,963	52,216,890	(18,996,008)	-	1,116,558,845
2047	1,116,558,845	53,818,136	(19,696,541)	-	1,150,680,440
2048	1,150,680,440	55,462,797	(21,051,102)	-	1,185,092,135
2049	1,185,092,135	57,121,441	(22,535,136)	-	1,219,678,439
2050	1,219,678,439	58,788,501	(23,301,752)	-	1,255,165,188
2051	1,255,165,188	60,498,962	(24,571,163)	-	1,291,092,987
2052	1,291,092,987	62,230,682	(24,495,903)	-	1,328,827,766
2053	1,328,827,766	64,049,498	(26,646,318)	-	1,366,230,946
2054	1,366,230,946	65,852,332	(26,205,948)	-	1,405,877,330
2055	1,405,877,330	67,763,287	(26,717,263)	-	1,446,923,355
2056	1,446,923,355	69,741,706	(28,523,954)	-	1,488,141,107

EXTERNAL FUND CALCULATION

2057	1,488,141,107	71,728,401	(29,509,208)	-	1,530,360,300
2058	1,530,360,300	73,763,366	(30,017,529)	-	1,574,106,137
2059	1,574,106,137	75,871,916	(31,675,750)	-	1,618,302,302
2060	1,618,302,302	78,002,171	(32,687,053)	-	1,663,617,421
2061	1,663,617,421	80,186,360	(33,260,079)	-	1,710,543,702
2062	1,710,543,702	82,448,206	(35,004,520)	-	1,757,987,389
2063	1,757,987,389	84,734,992	(36,327,139)	-	1,806,395,242
2064	1,806,395,242	87,068,251	(36,873,962)	-	1,856,589,531
2065	1,856,589,531	89,487,615	(38,811,398)	-	1,907,265,748
2066	1,907,265,748	91,930,209	(40,174,838)	-	1,959,021,119
2067	1,959,021,119	94,424,818	(41,702,580)	-	2,011,743,357
2068	2,011,743,357	96,966,030	(43,054,977)	-	2,065,654,409
2069	2,065,654,409	99,564,543	(44,575,228)	-	2,120,643,724
2070	2,120,643,724	102,215,028	(51,395,220)	-	2,171,463,532
2071	2,171,463,532	104,664,542	(47,918,013)	-	2,228,210,060
2072	2,228,210,060	107,399,725	(49,482,528)	-	2,286,127,258
2073	2,286,127,258	110,191,334	(38,308,473)	-	2,358,010,119
2074	2,358,010,119	113,656,088	(39,721,662)	-	2,431,944,544
2075	2,431,944,544	117,219,727	(41,300,486)	-	2,507,863,786
2076	2,507,863,786	120,879,034	(42,709,262)	-	2,586,033,559
2077	2,586,033,559	124,646,818	(44,288,156)	-	2,666,392,220
2078	2,666,392,220	128,520,105	(45,926,882)	-	2,748,985,443
2079	2,748,985,443	132,501,098	(47,757,956)	-	2,833,728,585
2080	2,833,728,585	136,585,718	(49,392,424)	-	2,920,921,879
2081	2,920,921,879	140,788,435	(51,223,963)	-	3,010,486,351
2082	3,010,486,351	145,105,442	(137,141,374)	-	3,018,450,419
2083	3,018,450,419	145,489,310	(510,925,861)	-	2,653,013,868
2084	2,653,013,868	127,875,268	(845,184,134)	-	1,935,705,003
2085	1,935,705,003	93,300,981	(764,957,013)	-	1,264,048,971
2086	1,264,048,971	60,927,160	(568,335,029)	-	756,641,102
2087	756,641,102	36,470,101	(216,232,427)	-	576,878,776
2088	576,878,776	27,805,557	(256,412,862)	-	348,271,470
2089	348,271,470	16,786,685	(212,741,434)	-	152,316,721
2090	152,316,721	7,341,666	(159,658,387)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,803,157	-	294,670	431,306,795
2018	431,306,795	22,184,315	-	589,341	454,080,451
2019	454,080,451	23,572,159	-	9,043,741	486,696,351
2020	486,696,351	25,248,617	-	9,043,741	520,988,709
2021	520,988,709	27,011,244	-	9,043,741	557,043,694
2022	557,043,694	28,864,470	-	9,043,741	594,951,905
2023	594,951,905	30,812,952	-	9,043,741	634,808,598
2024	634,808,598	32,861,586	-	9,043,741	676,713,926
2025	676,713,926	35,015,520	-	9,043,741	720,773,187
2026	720,773,187	37,280,166	-	9,043,741	767,097,094
2027	767,097,094	39,661,215	-	9,043,741	815,802,050
2028	815,802,050	42,164,649	-	9,043,741	867,010,440
2029	867,010,440	42,057,882	(12,406,807)	7,506,305	904,167,820
2030	904,167,820	43,671,306	(90,281,325)	-	857,557,801
2031	857,557,801	41,420,042	(52,134,866)	-	846,842,977
2032	846,842,977	40,902,516	(29,141,967)	-	858,603,525
2033	858,603,525	41,470,550	(43,577,796)	-	856,496,280
2034	856,496,280	41,368,770	(135,253,712)	-	762,611,338
2035	762,611,338	36,834,128	(13,382,694)	-	786,062,772
2036	786,062,772	37,966,832	(13,782,286)	-	810,247,318
2037	810,247,318	39,134,945	(14,235,965)	-	835,146,298
2038	835,146,298	40,337,566	(14,706,196)	-	860,777,668
2039	860,777,668	41,575,561	(15,237,100)	-	887,116,129
2040	887,116,129	42,847,709	(15,698,348)	-	914,265,490
2041	914,265,490	44,159,023	(16,221,623)	-	942,202,891
2042	942,202,891	45,508,400	(16,764,496)	-	970,946,794
2043	970,946,794	46,896,730	(17,376,478)	-	1,000,467,046
2044	1,000,467,046	48,322,558	(17,909,053)	-	1,030,880,552
2045	1,030,880,552	49,791,531	(18,512,772)	-	1,062,159,311
2046	1,062,159,311	51,302,295	(19,138,796)	-	1,094,322,809
2047	1,094,322,809	52,855,792	(19,845,355)	-	1,127,333,246
2048	1,127,333,246	54,450,196	(21,205,352)	-	1,160,578,091
2049	1,160,578,091	56,055,922	(22,695,454)	-	1,193,938,559
2050	1,193,938,559	57,667,232	(23,468,384)	-	1,228,137,407
2051	1,228,137,407	59,319,037	(24,744,831)	-	1,262,711,613
2052	1,262,711,613	60,988,971	(24,675,920)	-	1,299,024,664
2053	1,299,024,664	62,742,891	(26,833,433)	-	1,334,934,122
2054	1,334,934,122	64,477,318	(26,400,439)	-	1,373,011,002
2055	1,373,011,002	66,316,431	(26,919,975)	-	1,412,407,458
2056	1,412,407,458	68,219,280	(28,734,087)	-	1,451,892,652

EXTERNAL FUND CALCULATION

2057	1,451,892,652	70,126,415	(29,727,633)	-	1,492,291,434
2058	1,492,291,434	72,077,676	(30,244,574)	-	1,534,124,536
2059	1,534,124,536	74,098,215	(31,912,407)	-	1,576,310,345
2060	1,576,310,345	76,135,790	(32,932,383)	-	1,619,513,752
2061	1,619,513,752	78,222,514	(33,515,100)	-	1,664,221,166
2062	1,664,221,166	80,381,882	(35,269,615)	-	1,709,333,434
2063	1,709,333,434	82,560,805	(36,603,465)	-	1,755,290,773
2064	1,755,290,773	84,780,544	(37,160,429)	-	1,802,910,889
2065	1,802,910,889	87,080,596	(39,109,192)	-	1,850,882,293
2066	1,850,882,293	89,397,615	(40,484,410)	-	1,899,795,497
2067	1,899,795,497	91,760,123	(42,025,278)	-	1,949,530,341
2068	1,949,530,341	94,162,315	(43,389,533)	-	2,000,303,124
2069	2,000,303,124	96,614,641	(44,923,023)	-	2,051,994,743
2070	2,051,994,743	99,111,346	(51,756,785)	-	2,099,349,304
2071	2,099,349,304	101,398,571	(48,294,926)	-	2,152,452,949
2072	2,152,452,949	103,963,477	(49,873,301)	-	2,206,543,125
2073	2,206,543,125	106,576,033	(17,191,562)	-	2,295,927,596
2074	2,295,927,596	110,893,303	(17,748,654)	-	2,389,072,245
2075	2,389,072,245	115,392,189	(18,374,405)	-	2,486,090,030
2076	2,486,090,030	120,078,148	(18,918,989)	-	2,587,249,189
2077	2,587,249,189	124,964,136	(19,533,740)	-	2,692,679,585
2078	2,692,679,585	130,056,424	(20,169,179)	-	2,802,566,830
2079	2,802,566,830	135,363,978	(20,882,786)	-	2,917,048,022
2080	2,917,048,022	140,893,419	(21,504,295)	-	3,036,437,146
2081	3,036,437,146	146,659,914	(22,205,721)	-	3,160,891,338
2082	3,160,891,338	152,671,052	(22,930,853)	-	3,290,631,537
2083	3,290,631,537	158,937,503	(141,957,420)	-	3,307,611,620
2084	3,307,611,620	159,757,641	(357,637,520)	-	3,109,731,741
2085	3,109,731,741	150,200,043	(1,080,045,684)	-	2,179,886,100
2086	2,179,886,100	105,288,499	(847,383,481)	-	1,437,791,118
2087	1,437,791,118	69,445,311	(779,644,323)	-	727,592,106
2088	727,592,106	35,142,699	(330,500,380)	-	432,234,424
2089	432,234,424	20,876,923	(264,137,902)	-	188,973,445
2090	188,973,445	9,127,417	(198,100,862)	-	(0)

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	(\$5,964,498)	(\$19,356,724)
Prairie Island Unit 1	49,264	(1,034,991)	(1,084,255)
Prairie Island Unit 2	589,341	(5,516,417)	(6,105,758)
TOTAL	\$14,030,831	(\$12,515,906)	(\$26,546,737)

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
SAFSTOR Method
20-Year Life Extension

Docket No. E002/M-17-828
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Proposed

2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2019-2021 Decommissioning Accrual
Monticello	33.75	5.10%	4.83%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	(5,964,498)
Prairie Island Unit 1	36.67	5.13%	4.82%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	(1,034,991)
Prairie Island Unit 2	37.83	5.14%	4.83%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	(5,516,417)
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	(\$12,515,906)

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2050	\$17,759,328	\$13,051,073	3.7067	\$48,376,414	\$8,763,593	\$6,440,238	2.5278	\$16,279,633	\$0	\$0	1.0000	\$0	\$26,522,921	\$19,491,311	\$64,656,047
2051	63,231,064	46,467,594	3.8568	179,216,218	46,823,276	34,409,748	2.5998	89,458,463	0	0	1.0000	0	110,054,340	80,877,343	268,674,682
2052	30,098,747	22,119,134	4.0130	88,764,085	21,963,833	16,140,903	2.6739	43,159,162	0	0	1.0000	0	52,062,580	38,260,037	131,923,246
2053	30,011,960	22,055,355	4.1756	92,094,341	35,867,567	26,358,556	2.7501	72,488,665	0	0	1.0000	0	65,879,526	48,413,911	164,583,006
2054	24,261,956	17,829,760	4.3447	77,464,960	18,617,567	13,681,781	2.8285	38,698,916	0	0	1.0000	0	42,879,522	31,511,541	116,163,876
2055	43,935,865	32,287,832	4.5206	145,960,372	88,132,650	64,767,410	2.9091	188,414,872	0	0	1.0000	0	132,068,514	97,055,241	334,375,244
2056	8,481,485	6,232,921	4.7037	29,317,788	4,523,995	3,324,618	2.9920	9,947,258	0	0	1.0000	0	13,005,479	9,557,539	39,265,046
2057	8,458,357	6,215,924	4.8942	30,421,976	4,511,770	3,315,635	3.0773	10,203,202	0	0	1.0000	0	12,970,127	9,531,559	40,625,178
2058	8,458,357	6,215,924	5.0924	31,653,972	4,511,770	3,315,635	3.1650	10,493,983	0	0	1.0000	0	12,970,127	9,531,559	42,147,955
2059	8,458,357	6,215,924	5.2987	32,936,317	4,511,770	3,315,635	3.2552	10,793,053	0	0	1.0000	0	12,970,127	9,531,559	43,729,371
2060	8,481,485	6,232,921	5.5133	34,363,961	4,523,995	3,324,618	3.3480	11,130,822	0	0	1.0000	0	13,005,479	9,557,539	45,494,783
2061	8,458,357	6,215,924	5.7366	35,658,270	4,511,770	3,315,635	3.4434	11,417,056	0	0	1.0000	0	12,970,127	9,531,559	47,075,326
2062	8,458,357	6,215,924	5.9689	37,102,229	4,511,770	3,315,635	3.5415	11,742,320	0	0	1.0000	0	12,970,127	9,531,559	48,844,549
2063	8,458,357	6,215,924	6.2106	38,604,618	4,511,770	3,315,635	3.6425	12,077,199	0	0	1.0000	0	12,970,127	9,531,559	50,681,817
2064	8,481,485	6,232,921	6.4622	40,278,379	4,523,995	3,324,618	3.7463	12,455,017	0	0	1.0000	0	13,005,479	9,557,539	52,733,396
2065	8,458,357	6,215,924	6.7239	41,795,252	4,511,770	3,315,635	3.8531	12,775,472	0	0	1.0000	0	12,970,127	9,531,559	54,570,723
2066	8,458,357	6,215,924	6.9962	43,487,848	4,511,770	3,315,635	3.9629	13,139,528	0	0	1.0000	0	12,970,127	9,531,559	56,627,376
2067	8,458,357	6,215,924	7.2795	45,248,819	4,511,770	3,315,635	4.0758	13,513,863	0	0	1.0000	0	12,970,127	9,531,559	58,762,683
2068	9,145,130	6,720,624	7.5744	50,904,692	6,514,932	4,787,729	4.1920	20,070,160	0	0	1.0000	0	15,660,061	11,508,353	70,974,852
2069	8,458,357	6,215,924	7.8811	48,988,319	4,511,767	3,315,632	4.3115	14,295,349	0	0	1.0000	0	12,970,124	9,531,556	63,283,668
2070	9,951,558	7,313,256	8.2003	59,970,892	8,991,374	6,607,631	4.4343	29,300,217	0	0	1.0000	0	18,942,932	13,920,887	89,271,109
2071	9,951,558	7,313,256	8.5324	62,399,625	8,991,374	6,607,631	4.5607	30,135,422	0	0	1.0000	0	18,942,932	13,920,887	92,535,046
2072	10,837,186	7,964,091	8.8780	70,705,201	11,591,099	8,518,131	4.6907	39,955,996	0	0	1.0000	0	22,428,284	16,482,222	110,661,197
2073	11,460,933	8,422,474	9.2375	77,802,601	13,519,499	9,935,284	4.8244	47,931,786	0	0	1.0000	0	24,980,432	18,357,758	125,734,387
2074	10,167,183	7,471,716	9.6117	71,815,889	9,638,249	7,083,010	4.9619	35,145,187	0	0	1.0000	0	19,805,432	14,554,725	106,961,075
2075	11,245,308	8,264,014	10.0009	82,647,578	12,872,624	9,459,905	5.1033	48,276,734	0	0	1.0000	0	24,117,932	17,723,919	130,924,313
2076	11,699,686	8,597,930	10.4060	89,470,059	14,178,599	10,419,647	5.2487	54,689,602	0	0	1.0000	0	25,878,284	19,017,577	144,159,660
2077	8,441,765	6,203,731	10.8274	67,170,276	4,461,997	3,279,057	5.3983	17,701,334	0	0	1.0000	0	12,903,762	9,482,788	84,871,660
2078	8,441,765	6,203,731	11.2659	69,890,612	4,461,997	3,279,057	5.5522	18,205,981	0	0	1.0000	0	12,903,762	9,482,788	88,096,592
2079	8,441,765	6,203,731	11.7222	72,721,374	4,461,997	3,279,057	5.7104	18,724,728	0	0	1.0000	0	12,903,762	9,482,788	91,446,102
2080	8,464,894	6,220,728	12.1970	75,874,220	4,474,222	3,288,041	5.8731	19,310,993	0	0	1.0000	0	12,939,115	9,508,769	95,185,212
2081	8,441,765	6,203,731	12.6909	78,730,928	4,461,997	3,279,057	6.0405	19,807,144	0	0	1.0000	0	12,903,762	9,482,788	98,538,072
2082	8,441,765	6,203,731	13.2049	81,919,646	4,461,997	3,279,057	6.2127	20,371,798	0	0	1.0000	0	12,903,762	9,482,788	102,291,444
2083	8,441,765	6,203,731	13.7397	85,237,401	4,461,997	3,279,057	6.3897	20,952,191	0	0	1.0000	0	12,903,762	9,482,788	106,189,592
2084	8,464,894	6,220,728	14.2962	88,932,772	4,474,222	3,288,041	6.5719	21,608,675	0	0	1.0000	0	12,939,115	9,508,769	110,541,448
2085	8,441,765	6,203,731	14.8752	92,281,737	4,461,997	3,279,057	6.7592	22,163,803	0	0	1.0000	0	12,903,762	9,482,788	114,445,540
2086	8,441,765	6,203,731	15.4776	96,018,865	4,461,997	3,279,057	6.9518	22,795,349	0	0	1.0000	0	12,903,762	9,482,788	118,814,214
2087	8,441,765	6,203,731	16.1045	99,907,984	4,461,997	3,279,057	7.1499	23,444,930	0	0	1.0000	0	12,903,762	9,482,788	123,352,914
2088	8,464,894	6,220,728	16.7567	104,238,874	4,474,222	3,288,041	7.3537	24,179,266	0	0	1.0000	0	12,939,115	9,508,769	128,418,139
2089	8,441,765	6,203,731	17.4353	108,163,909	4,461,997	3,279,057	7.5633	24,800,493	0	0	1.0000	0	12,903,762	9,482,788	132,964,401
2090	8,441,765	6,203,731	18.1415	112,544,983	4,461,997	3,279,057	7.7788	25,507,129	0	0	1.0000	0	12,903,762	9,482,788	138,052,113
2091	8,441,765	6,203,731	18.8762	117,102,865	4,461,997	3,279,057	8.0005	26,234,096	0	0	1.0000	0	12,903,762	9,482,788	143,336,961
2092	8,464,894	6,220,728	19.6407	122,179,453	4,474,222	3,288,041	8.2285	27,055,644	0	0	1.0000	0	12,939,115	9,508,769	149,235,097
2093	8,441,765	6,203,731	20.4361	126,780,064	4,461,997	3,279,057	8.4630	27,750,660	0	0	1.0000	0	12,903,762	9,482,788	154,530,725
2094	8,441,765	6,203,731	21.2638	131,914,892	4,461,997	3,279,057	8.7042	28,541,569	0	0	1.0000	0	12,903,762	9,482,788	160,456,461
2095	8,441,765	6,203,731	22.1250	137,257,545	4,461,997	3,279,057	8.9523	29,355,103	0	0	1.0000	0	12,903,762	9,482,788	166,612,648
2096	8,464,894	6,220,728	23.0210	143,207,380	4,474,222	3,288,041	9.2075	30,274,636	0	0	1.0000	0	12,939,115	9,508,769	173,482,016
2097	8,441,765	6,203,731	23.9534	148,600,447	4,461,997	3,279,057	9.4699	31,052,343	0	0	1.0000	0	12,903,762	9,482,788	179,652,790
2098	8,920,197	6,555,324	24.9235	163,381,608	5,897,293	4,333,835	9.7398	42,210,690	0	0	1.0000	0	14,817,490	10,889,159	205,592,298
2099	9,015,884	6,625,643	25.9329	171,822,127	6,184,352	4,544,791	10.0173	45,526,534	0	0	1.0000	0	15,200,236	11,170,433	217,348,661
2100	8,943,325	6,572,320	26.9832	177,342,227	5,909,518	4,342,819	10.3028	44,743,197	0	0	1.0000	0	14,852,842	10,915,139	222,085,423
2101	8,920,197	6,555,324	28.0760	184,047,266	5,897,293	4,333,835	10.5965	45,923,487	0	0	1.0000	0	14,817,490	10,889,159	229,970,753
2102	8,920,197	6,555,324	29.2131	191,501,325	5,897,293	4,333,835	10.8985	47,232,305	0	0	1.0000	0	14,817,490	10,889,159	238,733,629
2103	9,015,884	6,625,643	30.3962	201,394,358	6,184,352	4,544,791	11.2091	50,943,015	0	0	1.0000	0	15,200,236	11,170,433	252,337,374
2104	8,943,325	6,572,320	31.6272	207,864,081	5,909,518	4,342,819	11.5285	50,066,190	0	0	1.0000	0	14,852,842	10,915,139	257,930,271

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2105	46,126,149	33,897,440	32.9081	1,115,500,348	12,314,062	9,049,426	11.8571	107,299,952	0	0	1.0000	0	58,440,212	42,946,866	1,222,800,300
2106	53,631,139	39,412,748	34.2409	1,349,527,973	46,945,385	34,499,485	12.1950	420,721,214	0	0	1.0000	0	100,576,524	73,912,233	1,770,249,187
2107	57,419,114	42,196,476	35.6277	1,503,363,401	80,273,242	58,991,645	12.5426	739,908,606	0	0	1.0000	0	137,692,356	101,188,121	2,243,272,007
2108	52,652,752	38,693,746	37.0706	1,434,400,375	33,214,319	24,408,722	12.9000	314,872,520	0	0	1.0000	0	85,867,070	63,102,468	1,749,272,895
2109	50,913,638	37,415,697	38.5720	1,443,198,252	30,841,715	22,665,130	13.2677	300,714,150	0	0	1.0000	0	81,755,354	60,080,827	1,743,912,402
2110	32,667,889	24,007,160	40.1341	963,505,742	23,001,023	16,903,119	13.6458	230,656,586	0	0	1.0000	0	55,668,913	40,910,279	1,194,162,328
2111	21,071,356	15,485,035	41.7596	646,648,865	16,131,940	11,855,130	14.0347	166,383,189	0	0	1.0000	0	37,203,297	27,340,165	813,032,054
2112	8,832,651	6,490,987	43.4508	282,038,589	6,762,156	4,969,411	14.4347	71,731,950	0	0	1.0000	0	15,594,807	11,460,398	353,770,539
	\$967,171,883	\$710,760,631		\$13,883,663,437	\$750,282,438	\$551,371,714		\$4,086,760,388	\$0	\$0		\$0	\$1,717,454,322	\$1,262,132,345	\$17,970,423,825

AMOUNT TO RECOVER

LABOR					NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
Cost Estimate	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s				
Nominal \$	Nominal \$			Nominal \$	Nominal \$			Nominal \$	Nominal \$						
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2053	\$18,446,908	\$13,556,366	4.1756	\$56,605,961	\$4,190,856	\$3,079,799	2.7501	\$8,469,756	\$1,250,000	\$918,607	1.0000	\$918,607	\$23,887,764	\$17,554,772	\$65,994,324
2054	46,142,627	33,909,549	4.3447	147,326,818	29,162,161	21,430,850	2.8285	60,617,159	1,250,000	918,607	1.0000	918,607	76,554,787	56,259,006	208,862,585
2055	16,398,923	12,051,331	4.5206	54,479,249	15,491,742	11,384,657	2.9091	33,119,105	1,250,000	918,607	1.0000	918,607	33,140,665	24,354,595	88,516,961
2056	12,659,656	9,303,398	4.7037	43,760,395	13,774,811	10,122,909	2.9920	30,287,745	1,250,000	918,607	1.0000	918,607	27,684,467	20,344,915	74,966,746
2057	12,625,333	9,278,174	4.8942	45,409,241	13,734,545	10,093,318	3.0773	31,060,169	1,250,000	918,607	1.0000	918,607	27,609,877	20,290,100	77,388,016
2058	15,404,499	11,320,543	5.0924	57,648,734	22,072,045	16,220,427	3.1650	51,337,650	1,250,000	918,607	1.0000	918,607	38,726,543	28,459,577	109,904,991
2059	32,688,492	24,022,300	5.2987	127,286,962	76,524,027	56,236,401	3.2552	183,060,732	1,250,000	918,607	1.0000	918,607	110,462,519	81,177,308	311,266,301
2060	4,604,176	3,383,542	5.5133	18,654,485	4,477,123	3,290,173	3.3480	11,015,499	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	30,588,591
2061	4,591,596	3,374,297	5.7366	19,356,993	4,461,475	3,278,674	3.4434	11,289,785	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	31,565,385
2062	4,591,596	3,374,297	5.9689	20,140,843	4,461,475	3,278,674	3.5415	11,611,423	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	32,670,872
2063	4,591,596	3,374,297	6.2106	20,956,410	4,461,475	3,278,674	3.6425	11,942,569	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	33,817,586
2064	4,604,176	3,383,542	6.4622	21,865,128	4,477,123	3,290,173	3.7463	12,325,975	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	35,109,710
2065	4,591,596	3,374,297	6.7239	22,688,437	4,461,475	3,278,674	3.8531	12,633,057	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	36,240,101
2066	4,591,596	3,374,297	6.9962	23,607,258	4,461,475	3,278,674	3.9629	12,993,056	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	37,518,921
2067	4,591,596	3,374,297	7.2795	24,563,197	4,461,475	3,278,674	4.0758	13,363,218	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	38,845,022
2068	4,604,176	3,383,542	7.5744	25,628,304	4,477,123	3,290,173	4.1920	13,792,405	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	40,339,316
2069	4,591,596	3,374,297	7.8811	26,593,174	4,461,475	3,278,674	4.3115	14,136,001	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	41,647,782
2070	4,591,596	3,374,297	8.2003	27,670,249	4,461,475	3,278,674	4.4343	14,538,623	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	43,127,479
2071	4,591,596	3,374,297	8.5324	28,790,854	4,461,475	3,278,674	4.5607	14,953,407	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	44,662,507
2072	4,604,176	3,383,542	8.8780	30,039,090	4,477,123	3,290,173	4.6907	15,433,215	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	46,390,912
2073	4,687,283	3,444,616	9.2375	31,819,642	4,748,534	3,489,629	4.8244	16,835,367	1,250,000	918,607	1.0000	918,607	10,685,817	7,852,852	49,573,616
2074	4,782,969	3,514,934	9.6117	33,784,496	5,035,593	3,700,585	4.9619	18,361,931	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	53,065,034
2075	4,782,969	3,514,934	10.0009	35,152,508	5,035,593	3,700,585	5.1033	18,885,194	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	54,956,309
2076	4,843,392	3,559,339	10.4060	37,038,480	5,194,771	3,817,562	5.2487	20,037,239	1,250,000	918,607	1.0000	918,607	11,288,163	8,295,508	57,994,326
2077	4,735,126	3,479,775	10.8274	37,676,920	4,892,064	3,595,107	5.3983	19,407,468	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	58,002,994
2078	4,878,656	3,585,253	11.2659	40,391,107	5,322,652	3,911,540	5.5522	21,717,653	1,250,000	918,607	1.0000	918,607	11,451,308	8,415,401	63,027,367
2079	4,735,126	3,479,775	11.7222	40,790,622	4,892,064	3,595,107	5.7104	20,529,501	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	62,238,730
2080	4,699,862	3,453,861	12.1970	42,126,739	4,764,182	3,501,129	5.8731	20,562,478	1,250,000	918,607	1.0000	918,607	10,714,044	7,873,596	63,607,824
2081	4,782,969	3,514,934	12.6909	44,607,682	5,035,593	3,700,585	6.0405	22,353,382	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	67,879,670
2082	4,782,969	3,514,934	13.2049	46,414,358	5,035,593	3,700,585	6.2127	22,990,622	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	70,323,587
2083	4,735,126	3,479,775	13.7397	47,811,069	4,892,064	3,595,107	6.3897	22,971,657	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	71,701,333
2084	4,795,548	3,524,179	14.2962	50,382,367	5,051,241	3,712,084	6.5719	24,395,445	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	75,696,420
2085	4,782,969	3,514,934	14.8752	52,285,353	5,035,593	3,700,585	6.7592	25,012,992	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	78,216,952
2086	4,735,126	3,479,775	15.4776	53,858,571	4,892,064	3,595,107	6.9518	24,992,467	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	79,769,645
2087	4,782,969	3,514,934	16.1045	56,606,262	5,035,593	3,700,585	7.1499	26,458,810	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	83,983,679
2088	4,795,548	3,524,179	16.7567	59,053,610	5,051,241	3,712,084	7.3537	27,297,553	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	87,269,769
2089	4,735,126	3,479,775	17.4353	60,670,927	4,892,064	3,595,107	7.5633	27,190,875	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	88,780,409
2090	4,782,969	3,514,934	18.1415	63,766,184	5,035,593	3,700,585	7.7788	28,786,108	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	93,470,899
2091	4,782,969	3,514,934	18.8762	66,348,606	5,035,593	3,700,585	8.0005	29,606,528	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	96,873,741
2092	4,795,548	3,524,179	19.6407	69,217,342	5,051,241	3,712,084	8.2285	30,544,884	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	100,680,833
2093	4,782,969	3,514,934	20.4361	71,831,552	5,035,593	3,700,585	8.4630	31,318,048	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	104,068,207
2094	4,782,969	3,514,934	21.2638	74,740,864	5,035,593	3,700,585	8.7042	32,210,629	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	107,870,100
2095	5,114,792	3,758,786	22.1250	83,163,149	6,031,061	4,432,140	8.9523	39,677,844	1,250,000	918,607	1.0000	918,607	12,395,853	9,109,533	123,759,600
2096	4,795,548	3,524,179	23.0210	81,130,124	5,051,241	3,712,084	9.2075	34,179,014	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	116,227,745
2097	4,782,969	3,514,934	23.9534	84,194,631	5,035,593	3,700,585	9.4699	35,044,167	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	120,157,405
2098	3,942,348	2,897,174	24.9235	72,207,722	3,256,582	2,393,215	9.7398	23,309,434	0	0	1.0000	0	7,198,929	5,290,389	95,517,156
2099	3,942,348	2,897,174	25.9329	75,132,129	3,256,582	2,393,215	10.0173	23,973,551	0	0	1.0000	0	7,198,929	5,290,389	99,105,680

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2108	45,111,220	33,151,584	37.0706	1,228,949,094	11,805,071	8,675,376	12.9000	111,912,347	0	0	1.0000	0	56,916,291	41,826,959	1,340,861,441
2109	51,818,304	38,080,522	38.5720	1,468,841,899	62,277,980	45,767,187	13.2677	607,225,301	0	0	1.0000	0	114,096,283	83,847,709	2,076,067,200
2110	44,187,860	32,473,019	40.1341	1,303,275,394	56,754,748	41,708,244	13.6458	569,142,350	0	0	1.0000	0	100,942,608	74,181,263	1,872,417,744
2111	35,668,367	26,212,167	41.7596	1,094,609,618	31,834,151	23,394,458	14.0347	328,334,194	0	0	1.0000	0	67,502,519	49,606,625	1,422,943,812
2112	13,715,750	10,079,506	43.4508	437,962,617	10,259,487	7,539,548	14.4347	108,831,118	0	0	1.0000	0	23,975,237	17,619,055	546,793,735
2113	18,089,191	13,293,485	45.2106	601,006,439	6,228,187	4,577,005	14.8461	67,950,670	0	0	1.0000	0	24,317,379	17,870,490	668,957,109
2114	12,584,719	9,248,328	47.0416	435,056,148	9,264,588	6,808,412	15.2692	103,959,000	0	0	1.0000	0	21,849,307	16,056,740	539,015,148
2115	9,102,372	6,689,202	48.9468	327,415,015	6,700,962	4,924,440	15.7044	77,335,379	0	0	1.0000	0	15,803,334	11,613,642	404,750,394
	\$611,385,166	\$449,298,117		\$10,180,264,092	\$588,533,792	\$432,504,973		\$3,465,181,777	\$56,250,000	\$41,337,312		\$41,337,312	\$1,256,168,958	\$923,140,402	\$13,686,783,181

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s	
Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in				
Nominal \$s	Nominal \$s		Future \$'s	Nominal \$s	Nominal \$s		Future \$'s	Nominal \$s	Nominal \$s		Future \$'s				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2054	\$7,248,794	\$5,327,034	4.3447	\$23,144,365	\$2,826,485	\$2,077,143	2.8285	\$5,875,198	\$1,250,000	\$918,607	1.0000	\$918,607	\$11,325,279	\$8,322,784	\$29,938,170
2055	44,817,806	32,935,958	4.5206	148,890,290	32,275,248	23,718,613	2.9091	68,999,817	1,250,000	918,607	1.0000	918,607	78,343,054	57,573,177	218,808,713
2056	23,021,476	16,918,150	4.7037	79,577,901	19,944,127	14,656,651	2.9920	43,852,699	1,250,000	918,607	1.0000	918,607	44,215,603	32,493,407	124,349,207
2057	10,761,111	7,908,185	4.8942	38,704,239	12,388,936	9,104,450	3.0773	28,017,124	1,250,000	918,607	1.0000	918,607	24,400,047	17,931,242	67,639,969
2058	13,540,277	9,950,554	5.0924	50,672,200	20,726,436	15,231,558	3.1650	48,207,881	1,250,000	918,607	1.0000	918,607	35,516,713	26,100,719	99,798,689
2059	31,160,880	22,899,680	5.2987	121,338,533	75,415,818	55,421,994	3.2552	180,409,674	1,250,000	918,607	1.0000	918,607	107,826,698	79,240,281	302,666,816
2060	4,659,832	3,424,443	5.5133	18,879,983	4,485,457	3,296,297	3.3480	11,036,004	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	30,834,593
2061	4,647,099	3,415,086	5.7366	19,590,984	4,469,786	3,284,781	3.4434	11,310,816	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	31,820,406
2062	4,647,099	3,415,086	5.9689	20,384,308	4,469,786	3,284,781	3.5415	11,633,053	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	32,935,968
2063	4,647,099	3,415,086	6.2106	21,209,734	4,469,786	3,284,781	3.6425	11,964,816	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	34,093,157
2064	4,659,832	3,424,443	6.4622	22,129,437	4,485,457	3,296,297	3.7463	12,348,919	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	35,396,963
2065	4,647,099	3,415,086	6.7239	22,962,698	4,469,786	3,284,781	3.8531	12,656,591	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	36,537,896
2066	4,647,099	3,415,086	6.9962	23,892,626	4,469,786	3,284,781	3.9629	13,017,260	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	37,828,493
2067	4,647,099	3,415,086	7.2795	24,860,120	4,469,786	3,284,781	4.0758	13,388,111	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	39,166,838
2068	4,659,832	3,424,443	7.5744	25,938,103	4,485,457	3,296,297	4.1920	13,818,079	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	40,674,788
2069	4,647,099	3,415,086	7.8811	26,914,636	4,469,786	3,284,781	4.3115	14,162,334	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	41,995,577
2070	4,647,099	3,415,086	8.2003	28,004,731	4,469,786	3,284,781	4.4343	14,565,705	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	43,489,044
2071	4,647,099	3,415,086	8.5324	29,138,882	4,469,786	3,284,781	4.5607	14,980,902	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	45,038,390
2072	4,659,832	3,424,443	8.8780	30,402,207	4,485,457	3,296,297	4.6907	15,461,942	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	46,782,756
2073	4,742,786	3,485,405	9.2375	32,196,431	4,756,846	3,495,737	4.8244	16,864,836	1,250,000	918,607	1.0000	918,607	10,749,633	7,899,750	49,979,873
2074	4,838,472	3,555,723	9.6117	34,176,547	5,043,904	3,706,692	4.9619	18,392,236	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	53,487,390
2075	4,838,472	3,555,723	10.0009	35,560,435	5,043,904	3,706,692	5.1033	18,916,363	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	55,395,404
2076	4,899,048	3,600,240	10.4060	37,464,093	5,203,105	3,823,687	5.2487	20,069,383	1,250,000	918,607	1.0000	918,607	11,352,153	8,342,533	58,452,083
2077	4,790,629	3,520,564	10.8274	38,118,558	4,900,375	3,601,215	5.3983	19,440,438	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	58,477,603
2078	4,934,159	3,626,042	11.2659	40,850,632	5,330,963	3,917,648	5.5522	21,751,564	1,250,000	918,607	1.0000	918,607	11,515,123	8,462,297	63,520,802
2079	4,790,629	3,520,564	11.7222	41,268,759	4,900,375	3,601,215	5.7104	20,564,377	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	62,751,743
2080	4,755,518	3,494,761	12.1970	42,625,606	4,772,516	3,507,253	5.8731	20,598,447	1,250,000	918,607	1.0000	918,607	10,778,034	7,920,621	64,142,659
2081	4,838,472	3,555,723	12.6909	45,125,331	5,043,904	3,706,692	6.0405	22,390,275	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	68,434,212
2082	4,838,472	3,555,723	13.2049	46,952,973	5,043,904	3,706,692	6.2127	23,028,567	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	70,900,147
2083	4,790,629	3,520,564	13.7397	48,371,498	4,900,375	3,601,215	6.3897	23,010,683	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	72,300,787
2084	4,851,204	3,565,080	14.2962	50,967,093	5,059,575	3,718,208	6.5719	24,435,694	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	76,321,393
2085	4,838,472	3,555,723	14.8752	52,892,098	5,043,904	3,706,692	6.7592	25,054,274	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	78,864,979
2086	4,790,629	3,520,564	15.4776	54,489,887	4,900,375	3,601,215	6.9518	25,034,925	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	80,443,419
2087	4,838,472	3,555,723	16.1045	57,263,148	5,043,904	3,706,692	7.1499	26,502,479	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	84,684,234
2088	4,851,204	3,565,080	16.7567	59,738,971	5,059,575	3,718,208	7.3537	27,342,589	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	88,000,167
2089	4,790,629	3,520,564	17.4353	61,382,095	4,900,375	3,601,215	7.5633	27,237,068	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	89,537,771
2090	4,838,472	3,555,723	18.1415	64,506,157	5,043,904	3,706,692	7.7788	28,833,618	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	94,258,382
2091	4,838,472	3,555,723	18.8762	67,118,547	5,043,904	3,706,692	8.0005	29,655,391	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	97,692,545
2092	4,851,204	3,565,080	19.6407	70,020,661	5,059,575	3,718,208	8.2285	30,595,278	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	101,534,546
2093	4,838,472	3,555,723	20.4361	72,665,120	5,043,904	3,706,692	8.4630	31,369,736	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	104,953,464
2094	4,838,472	3,555,723	21.2638	75,608,193	5,043,904	3,706,692	8.7042	32,263,791	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	108,790,590
2095	5,170,295	3,799,575	22.1250	84,065,605	6,039,372	4,438,247	8.9523	39,732,521	1,250,000	918,607	1.0000	918,607	12,459,668	9,156,430	124,716,733
2096	4,851,204	3,565,080	23.0210	82,071,700	5,059,575	3,718,208	9.2075	34,235,404	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	117,225,711
2097	4,838,472	3,555,723	23.9534	85,171,666	5,043,904	3,706,692	9.4699	35,102,005	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	121,192,278
2098	823,359	605,074	24.9235	15,080,573	3,272,479	2,404,897	9.7398	23,423,219	0	-	1.0000	-	4,095,838	3,009,972	38,503,792
2099	823,359	605,074	25.9329	15,691,335	3,272,479	2,404,897	10.0173	24,090,578	0	-	1.0000	-	4,095,838	3,009,972	39,781,913
2100	825,615	606,732	26.9832	16,371,576	3,281,444	2,411,486	10.3028	24,845,059	0	-	1.0000	-	4,107,059	3,018,218	41,216,634
2101	823,359	605,074	28.0760	16,988,070	3,272,479	2,404,897									

AMOUNT TO RECOVER																
	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s	
	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in				
	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s				
2109	29,172,411	21,438,383	38.5720	826,921,313	10,590,974	7,783,154	13.2677	103,264,549	0	-	1.0000	-	39,763,385	29,221,537	930,185,861	
2110	57,665,154	42,377,288	40.1341	1,700,774,317	90,528,180	66,527,851	13.6458	907,825,744	0	-	1.0000	-	148,193,335	108,905,139	2,608,600,062	
2111	55,538,057	40,814,115	41.7596	1,704,381,128	42,217,329	31,024,904	14.0347	435,425,226	0	-	1.0000	-	97,755,386	71,839,020	2,139,806,354	
2112	51,408,076	37,779,052	43.4508	1,641,530,028	32,588,487	23,948,808	14.4347	345,693,858	0	-	1.0000	-	83,996,563	61,727,860	1,987,223,886	
2113	23,223,558	17,066,657	45.2106	771,593,789	8,238,061	6,054,032	14.8461	89,878,762	0	-	1.0000	-	31,461,619	23,120,689	861,472,551	
2114	14,460,844	10,627,065	47.0416	499,914,146	14,186,680	10,425,586	15.2692	159,190,356	0	-	1.0000	-	28,647,524	21,052,651	659,104,503	
2115	10,459,350	7,686,425	48.9468	376,225,916	10,261,051	7,540,698	15.7044	118,422,134	0	-	1.0000	-	20,720,401	14,648,050		
	\$573,536,674	\$421,483,808		\$10,167,374,423	\$595,414,118	\$437,561,225		\$3,671,409,774	\$55,000,000	\$40,418,705		\$40,418,705	\$1,223,950,791	\$899,463,737	\$13,879,202,902	
	\$2,152,093,723	\$1,581,542,556		\$34,231,301,951	\$1,934,230,348	\$1,421,437,911		\$11,223,351,940	\$111,250,000	\$81,756,016		\$81,756,016	\$4,197,574,071	\$3,084,736,483	\$45,536,409,907	

EXTERNAL FUND CALCULATION

Monticello

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	\$623,672,182	15,989,016	-	6,696,113	646,357,311
2018	646,357,311	33,305,725	-	13,392,226	693,055,262
2019	693,055,262	35,193,724	-	(5,964,498)	722,284,487
2020	722,284,487	36,684,414	-	(5,964,498)	753,004,404
2021	753,004,404	38,251,130	-	(5,964,498)	785,291,036
2022	785,291,036	39,897,748	-	(5,964,498)	819,224,286
2023	819,224,286	41,628,344	-	(5,964,498)	854,888,132
2024	854,888,132	43,447,200	-	(5,964,498)	892,370,834
2025	892,370,834	45,358,818	-	(5,964,498)	931,765,153
2026	931,765,153	47,367,928	-	(5,964,498)	973,168,584
2027	973,168,584	49,479,503	-	(5,964,498)	1,016,683,589
2028	1,016,683,589	51,698,768	-	(5,964,498)	1,062,417,859
2029	1,062,417,859	54,031,216	-	(5,964,498)	1,110,484,577
2030	1,110,484,577	56,482,619	-	(5,964,498)	1,161,002,698
2031	1,161,002,698	59,059,043	-	(5,964,498)	1,214,097,243
2032	1,214,097,243	61,766,865	-	(5,964,498)	1,269,899,610
2033	1,269,899,610	64,612,785	-	(5,964,498)	1,328,547,897
2034	1,328,547,897	67,603,848	-	(5,964,498)	1,390,187,247
2035	1,390,187,247	70,747,455	-	(5,964,498)	1,454,970,204
2036	1,454,970,204	74,051,386	-	(5,964,498)	1,523,057,092
2037	1,523,057,092	77,523,817	-	(5,964,498)	1,594,616,411
2038	1,594,616,411	81,173,342	-	(5,964,498)	1,669,825,255
2039	1,669,825,255	85,008,993	-	(5,964,498)	1,748,869,750
2040	1,748,869,750	89,040,263	-	(5,964,498)	1,831,945,515
2041	1,831,945,515	93,277,127	-	(5,964,498)	1,919,258,143
2042	1,919,258,143	97,730,071	-	(5,964,498)	2,011,023,716
2043	2,011,023,716	102,410,115	-	(5,964,498)	2,107,469,333
2044	2,107,469,333	107,328,841	-	(5,964,498)	2,208,833,676
2045	2,208,833,676	112,498,423	-	(5,964,498)	2,315,367,601
2046	2,315,367,601	117,931,653	-	(5,964,498)	2,427,334,756
2047	2,427,334,756	123,641,978	-	(5,964,498)	2,545,012,236
2048	2,545,012,236	129,643,529	-	(5,964,498)	2,668,691,267
2049	2,668,691,267	135,951,160	-	(5,964,498)	2,798,677,929
2050	2,798,677,929	135,068,112	(\$64,656,047)	(4,473,373)	2,864,616,621
2051	2,864,616,621	138,360,983	(268,674,682)	-	2,734,302,922
2052	2,734,302,922	132,066,831	(131,923,246)	-	2,734,446,507
2053	2,734,446,507	132,073,766	(164,583,006)	-	2,701,937,267
2054	2,701,937,267	130,503,570	(116,163,876)	-	2,716,276,961
2055	2,716,276,961	131,196,177	(334,375,244)	-	2,513,097,894
2056	2,513,097,894	121,382,628	(39,265,046)	-	2,595,215,476

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	2,595,215,476	125,348,908	(40,625,178)	-	2,679,939,206
	2058	2,679,939,206	129,441,064	(42,147,955)	-	2,767,232,314
	2059	2,767,232,314	133,657,321	(43,729,371)	-	2,857,160,265
	2060	2,857,160,265	138,000,841	(45,494,783)	-	2,949,666,323
	2061	2,949,666,323	142,468,883	(47,075,326)	-	3,045,059,880
	2062	3,045,059,880	147,076,392	(48,844,549)	-	3,143,291,723
	2063	3,143,291,723	151,820,990	(50,681,817)	-	3,244,430,896
	2064	3,244,430,896	156,706,012	(52,733,396)	-	3,348,403,512
	2065	3,348,403,512	161,727,890	(54,570,723)	-	3,455,560,678
	2066	3,455,560,678	166,903,581	(56,627,376)	-	3,565,836,883
	2067	3,565,836,883	172,229,921	(58,762,683)	-	3,679,304,122
	2068	3,679,304,122	177,710,389	(70,974,852)	-	3,786,039,659
	2069	3,786,039,659	182,865,716	(63,283,668)	-	3,905,621,706
	2070	3,905,621,706	188,641,528	(89,271,109)	-	4,004,992,125
	2071	4,004,992,125	193,441,120	(92,535,046)	-	4,105,898,198
	2072	4,105,898,198	198,314,883	(110,661,197)	-	4,193,551,884
	2073	4,193,551,884	202,548,556	(125,734,387)	-	4,270,366,053
	2074	4,270,366,053	206,258,680	(106,961,075)	-	4,369,663,658
	2075	4,369,663,658	211,054,755	(130,924,313)	-	4,449,794,100
	2076	4,449,794,100	214,925,055	(144,159,660)	-	4,520,559,494
	2077	4,520,559,494	218,343,024	(84,871,609)	-	4,654,030,909
	2078	4,654,030,909	224,789,693	(88,096,592)	-	4,790,724,009
	2079	4,790,724,009	231,391,970	(91,446,102)	-	4,930,669,877
	2080	4,930,669,877	238,151,355	(95,185,212)	-	5,073,636,020
	2081	5,073,636,020	245,056,620	(98,538,072)	-	5,220,154,567
	2082	5,220,154,567	252,133,466	(102,291,444)	-	5,369,996,589
	2083	5,369,996,589	259,370,835	(106,189,592)	-	5,523,177,832
	2084	5,523,177,832	266,769,489	(110,541,448)	-	5,679,405,874
	2085	5,679,405,874	274,315,304	(114,445,540)	-	5,839,275,637
	2086	5,839,275,637	282,037,013	(118,814,214)	-	6,002,498,437
	2087	6,002,498,437	289,920,674	(123,352,914)	-	6,169,066,197
	2088	6,169,066,197	297,965,897	(128,418,139)	-	6,338,613,955
	2089	6,338,613,955	306,155,054	(132,964,401)	-	6,511,804,608
	2090	6,511,804,608	314,520,163	(138,052,113)	-	6,688,272,658
	2091	6,688,272,658	323,043,569	(143,336,961)	-	6,867,979,266
	2092	6,867,979,266	331,723,399	(149,235,097)	-	7,050,467,568
	2093	7,050,467,568	340,537,584	(154,530,725)	-	7,236,474,427
	2094	7,236,474,427	349,521,715	(160,456,461)	-	7,425,539,680
	2095	7,425,539,680	358,653,567	(166,612,648)	-	7,617,580,599
	2096	7,617,580,599	367,929,143	(173,482,016)	-	7,812,027,726
	2097	7,812,027,726	377,320,939	(179,652,790)	-	8,009,695,875
	2098	8,009,695,875	386,868,311	(205,592,298)	-	8,190,971,888
	2099	8,190,971,888	395,623,942	(217,348,661)	-	8,369,247,169
	2100	8,369,247,169	404,234,638	(222,085,423)	-	8,551,396,384
	2101	8,551,396,384	413,032,445	(229,970,753)	-	8,734,458,077
	2102	8,734,458,077	421,874,325	(238,733,629)	-	8,917,598,772

EXTERNAL FUND CALCULATION

2103	8,917,598,772	430,720,021	(252,337,374)	-	9,095,981,420
2104	9,095,981,420	439,335,903	(257,930,271)	-	9,277,387,051
2105	9,277,387,051	448,097,795	(1,222,800,300)	-	8,502,684,546
2106	8,502,684,546	410,679,664	(1,770,249,187)	-	7,143,115,022
2107	7,143,115,022	345,012,456	(2,243,272,007)	-	5,244,855,471
2108	5,244,855,471	253,326,519	(1,749,272,895)	-	3,748,909,095
2109	3,748,909,095	181,072,309	(1,743,912,402)	-	2,186,069,003
2110	2,186,069,003	105,587,133	(1,194,162,328)	-	1,097,493,808
2111	1,097,493,808	53,008,951	(813,032,054)	-	337,470,704
2112	337,470,704	16,299,835	(353,770,539)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,602,831	-	24,632	383,994,518
2018	383,994,518	19,700,182	-	49,264	403,743,965
2019	403,743,965	20,685,518	-	(1,034,991)	423,394,491
2020	423,394,491	21,693,590	-	(1,034,991)	444,053,090
2021	444,053,090	22,753,376	-	(1,034,991)	465,771,475
2022	465,771,475	23,867,529	-	(1,034,991)	488,604,013
2023	488,604,013	25,038,838	-	(1,034,991)	512,607,860
2024	512,607,860	26,270,236	-	(1,034,991)	537,843,105
2025	537,843,105	27,564,804	-	(1,034,991)	564,372,917
2026	564,372,917	28,925,783	-	(1,034,991)	592,263,709
2027	592,263,709	30,356,581	-	(1,034,991)	621,585,299
2028	621,585,299	31,860,778	-	(1,034,991)	652,411,086
2029	652,411,086	33,442,141	-	(1,034,991)	684,818,236
2030	684,818,236	35,104,628	-	(1,034,991)	718,887,873
2031	718,887,873	36,852,400	-	(1,034,991)	754,705,282
2032	754,705,282	38,689,833	-	(1,034,991)	792,360,125
2033	792,360,125	40,621,527	-	(1,034,991)	831,946,660
2034	831,946,660	42,652,316	-	(1,034,991)	873,563,985
2035	873,563,985	44,787,285	-	(1,034,991)	917,316,279
2036	917,316,279	47,031,778	-	(1,034,991)	963,313,066
2037	963,313,066	49,391,413	-	(1,034,991)	1,011,669,487
2038	1,011,669,487	51,872,097	-	(1,034,991)	1,062,506,593
2039	1,062,506,593	54,480,041	-	(1,034,991)	1,115,951,643
2040	1,115,951,643	57,221,772	-	(1,034,991)	1,172,138,424
2041	1,172,138,424	60,104,154	-	(1,034,991)	1,231,207,586
2042	1,231,207,586	63,134,402	-	(1,034,991)	1,293,306,996
2043	1,293,306,996	66,320,101	-	(1,034,991)	1,358,592,107
2044	1,358,592,107	69,669,228	-	(1,034,991)	1,427,226,343
2045	1,427,226,343	73,190,164	-	(1,034,991)	1,499,381,516
2046	1,499,381,516	76,891,724	-	(1,034,991)	1,575,238,249
2047	1,575,238,249	80,783,175	-	(1,034,991)	1,654,986,433
2048	1,654,986,433	84,874,256	-	(1,034,991)	1,738,825,698
2049	1,738,825,698	89,175,211	-	(1,034,991)	1,826,965,917
2050	1,826,965,917	93,696,804	-	(1,034,991)	1,919,627,730
2051	1,919,627,730	98,450,355	-	(1,034,991)	2,017,043,094
2052	2,017,043,094	103,447,763	-	(1,034,991)	2,119,455,866
2053	2,119,455,866	102,141,061	(\$65,994,324)	(693,444)	2,154,909,159
2054	2,154,909,159	103,866,621	(208,862,585)	-	2,049,913,196
2055	2,049,913,196	98,805,816	(88,516,961)	-	2,060,202,050
2056	2,060,202,050	99,301,739	(74,966,746)	-	2,084,537,043

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	2,084,537,043	100,474,685	(77,388,016)	-	2,107,623,712
	2058	2,107,623,712	101,587,463	(109,904,991)	-	2,099,306,183
	2059	2,099,306,183	101,186,558	(311,266,301)	-	1,889,226,441
	2060	1,889,226,441	91,060,714	(30,588,591)	-	1,949,698,564
	2061	1,949,698,564	93,975,471	(31,565,385)	-	2,012,108,650
	2062	2,012,108,650	96,983,637	(32,670,872)	-	2,076,421,414
	2063	2,076,421,414	100,083,512	(33,817,586)	-	2,142,687,341
	2064	2,142,687,341	103,277,530	(35,109,710)	-	2,210,855,160
	2065	2,210,855,160	106,563,219	(36,240,101)	-	2,281,178,277
	2066	2,281,178,277	109,952,793	(37,518,921)	-	2,353,612,149
	2067	2,353,612,149	113,444,106	(38,845,022)	-	2,428,211,233
	2068	2,428,211,233	117,039,781	(40,339,316)	-	2,504,911,698
	2069	2,504,911,698	120,736,744	(41,647,782)	-	2,584,000,660
	2070	2,584,000,660	124,548,832	(43,127,479)	-	2,665,422,013
	2071	2,665,422,013	128,473,341	(44,662,507)	-	2,749,232,847
	2072	2,749,232,847	132,513,023	(46,390,912)	-	2,835,354,958
	2073	2,835,354,958	136,664,109	(49,573,616)	-	2,922,445,451
	2074	2,922,445,451	140,861,871	(53,065,034)	-	3,010,242,288
	2075	3,010,242,288	145,093,678	(54,956,309)	-	3,100,379,658
	2076	3,100,379,658	149,438,299	(57,994,326)	-	3,191,823,632
	2077	3,191,823,632	153,845,899	(58,002,994)	-	3,287,666,537
	2078	3,287,666,537	158,465,527	(63,027,367)	-	3,383,104,696
	2079	3,383,104,696	163,065,646	(62,238,730)	-	3,483,931,613
	2080	3,483,931,613	167,925,504	(63,607,824)	-	3,588,249,292
	2081	3,588,249,292	172,953,616	(67,879,670)	-	3,693,323,238
	2082	3,693,323,238	178,018,180	(70,323,587)	-	3,801,017,830
	2083	3,801,017,830	183,209,059	(71,701,333)	-	3,912,525,556
	2084	3,912,525,556	188,583,732	(75,696,420)	-	4,025,412,868
	2085	4,025,412,868	194,024,900	(78,216,952)	-	4,141,220,817
	2086	4,141,220,817	199,606,843	(79,769,645)	-	4,261,058,016
	2087	4,261,058,016	205,382,996	(83,983,679)	-	4,382,457,332
	2088	4,382,457,332	211,234,443	(87,269,769)	-	4,506,422,007
	2089	4,506,422,007	217,209,541	(88,780,409)	-	4,634,851,138
	2090	4,634,851,138	223,399,825	(93,470,899)	-	4,764,780,065
	2091	4,764,780,065	229,662,399	(96,873,741)	-	4,897,568,723
	2092	4,897,568,723	236,062,812	(100,680,833)	-	5,032,950,703
	2093	5,032,950,703	242,588,224	(104,068,207)	-	5,171,470,720
	2094	5,171,470,720	249,264,889	(107,870,100)	-	5,312,865,509
	2095	5,312,865,509	256,080,118	(123,759,600)	-	5,445,186,026
	2096	5,445,186,026	262,457,966	(116,227,745)	-	5,591,416,247
	2097	5,591,416,247	269,506,263	(120,157,405)	-	5,740,765,105
	2098	5,740,765,105	276,704,878	(95,517,156)	-	5,921,952,828
	2099	5,921,952,828	285,438,126	(99,105,680)	-	6,108,285,274
	2100	6,108,285,274	294,419,350	(103,113,576)	-	6,299,591,048
	2101	6,299,591,048	303,640,289	(106,700,764)	-	6,496,530,572
	2102	6,496,530,572	313,132,774	(110,717,892)	-	6,698,945,453

EXTERNAL FUND CALCULATION

2103	6,698,945,453	322,889,171	(114,888,871)	-	6,906,945,753
2104	6,906,945,753	332,914,785	(119,546,315)	-	7,120,314,223
2105	7,120,314,223	343,199,146	(123,717,087)	-	7,339,796,282
2106	7,339,796,282	353,778,181	(128,387,108)	-	7,565,187,355
2107	7,565,187,355	364,642,031	(354,661,844)	-	7,575,167,542
2108	7,575,167,542	365,123,076	(1,340,861,441)	-	6,599,429,176
2109	6,599,429,176	318,092,486	(2,076,067,200)	-	4,841,454,463
2110	4,841,454,463	233,358,105	(1,872,417,744)	-	3,202,394,824
2111	3,202,394,824	154,355,431	(1,422,943,812)	-	1,933,806,442
2112	1,933,806,442	93,209,471	(546,793,735)	-	1,480,222,178
2113	1,480,222,178	71,346,709	(668,957,109)	-	882,611,778
2114	882,611,778	42,541,888	(539,015,148)	-	386,138,518
2115	386,138,518	18,611,877	(404,750,394)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,803,157	-	294,670	431,306,795
2018	431,306,795	22,184,315	-	589,341	454,080,451
2019	454,080,451	23,197,963	-	(5,516,417)	471,761,997
2020	471,761,997	24,106,795	-	(5,516,417)	490,352,374
2021	490,352,374	25,062,340	-	(5,516,417)	509,898,297
2022	509,898,297	26,067,001	-	(5,516,417)	530,448,881
2023	530,448,881	27,123,301	-	(5,516,417)	552,055,764
2024	552,055,764	28,233,894	-	(5,516,417)	574,773,241
2025	574,773,241	29,401,573	-	(5,516,417)	598,658,397
2026	598,658,397	30,629,270	-	(5,516,417)	623,771,250
2027	623,771,250	31,920,070	-	(5,516,417)	650,174,903
2028	650,174,903	33,277,218	-	(5,516,417)	677,935,704
2029	677,935,704	34,704,123	-	(5,516,417)	707,123,410
2030	707,123,410	36,204,371	-	(5,516,417)	737,811,364
2031	737,811,364	37,781,732	-	(5,516,417)	770,076,679
2032	770,076,679	39,440,169	-	(5,516,417)	804,000,431
2033	804,000,431	41,183,850	-	(5,516,417)	839,667,864
2034	839,667,864	43,017,156	-	(5,516,417)	877,168,603
2035	877,168,603	44,944,694	-	(5,516,417)	916,596,881
2036	916,596,881	46,971,308	-	(5,516,417)	958,051,771
2037	958,051,771	49,102,089	-	(5,516,417)	1,001,637,443
2038	1,001,637,443	51,342,393	-	(5,516,417)	1,047,463,419
2039	1,047,463,419	53,697,848	-	(5,516,417)	1,095,644,849
2040	1,095,644,849	56,174,373	-	(5,516,417)	1,146,302,805
2041	1,146,302,805	58,778,192	-	(5,516,417)	1,199,564,581
2042	1,199,564,581	61,515,848	-	(5,516,417)	1,255,564,011
2043	1,255,564,011	64,394,218	-	(5,516,417)	1,314,441,812
2044	1,314,441,812	67,420,537	-	(5,516,417)	1,376,345,932
2045	1,376,345,932	70,602,409	-	(5,516,417)	1,441,431,924
2046	1,441,431,924	73,947,829	-	(5,516,417)	1,509,863,336
2047	1,509,863,336	77,465,204	-	(5,516,417)	1,581,812,122
2048	1,581,812,122	81,163,371	-	(5,516,417)	1,657,459,076
2049	1,657,459,076	85,051,625	-	(5,516,417)	1,736,994,284
2050	1,736,994,284	89,139,734	-	(5,516,417)	1,820,617,601
2051	1,820,617,601	93,437,973	-	(5,516,417)	1,908,539,156
2052	1,908,539,156	97,957,141	-	(5,516,417)	2,000,979,880
2053	2,000,979,880	102,708,594	-	(5,516,417)	2,098,172,057
2054	2,098,172,057	101,231,137	(\$29,938,170)	(4,578,626)	2,164,886,397
2055	2,164,886,397	104,564,013	(218,808,713)	-	2,050,641,696
2056	2,050,641,696	99,045,994	(124,349,207)	-	2,025,338,483

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	2,025,338,483	97,823,849	(67,639,969)	-	2,055,522,362
	2058	2,055,522,362	99,281,730	(99,798,689)	-	2,055,005,404
	2059	2,055,005,404	99,256,761	(302,666,816)	-	1,851,595,349
	2060	1,851,595,349	89,432,055	(30,834,593)	-	1,910,192,811
	2061	1,910,192,811	92,262,313	(31,820,406)	-	1,970,634,717
	2062	1,970,634,717	95,181,657	(32,935,968)	-	2,032,880,406
	2063	2,032,880,406	98,188,124	(34,093,157)	-	2,096,975,373
	2064	2,096,975,373	101,283,911	(35,396,963)	-	2,162,862,321
	2065	2,162,862,321	104,466,250	(36,537,896)	-	2,230,790,675
	2066	2,230,790,675	107,747,190	(37,828,493)	-	2,300,709,372
	2067	2,300,709,372	111,124,263	(39,166,838)	-	2,372,666,797
	2068	2,372,666,797	114,599,806	(40,674,788)	-	2,446,591,815
	2069	2,446,591,815	118,170,385	(41,995,577)	-	2,522,766,623
	2070	2,522,766,623	121,849,628	(43,489,044)	-	2,601,127,207
	2071	2,601,127,207	125,634,444	(45,038,390)	-	2,681,723,260
	2072	2,681,723,260	129,527,233	(46,782,756)	-	2,764,467,738
	2073	2,764,467,738	133,523,792	(49,979,873)	-	2,848,011,657
	2074	2,848,011,657	137,558,963	(53,487,390)	-	2,932,083,229
	2075	2,932,083,229	141,619,620	(55,395,404)	-	3,018,307,445
	2076	3,018,307,445	145,784,250	(58,452,083)	-	3,105,639,611
	2077	3,105,639,611	150,002,393	(58,477,603)	-	3,197,164,401
	2078	3,197,164,401	154,423,041	(63,520,802)	-	3,288,066,639
	2079	3,288,066,639	158,813,619	(62,751,743)	-	3,384,128,514
	2080	3,384,128,514	163,453,407	(64,142,659)	-	3,483,439,262
	2081	3,483,439,262	168,250,116	(68,434,212)	-	3,583,255,166
	2082	3,583,255,166	173,071,225	(70,900,147)	-	3,685,426,244
	2083	3,685,426,244	178,006,088	(72,300,787)	-	3,791,131,545
	2084	3,791,131,545	183,111,654	(76,321,393)	-	3,897,921,805
	2085	3,897,921,805	188,269,623	(78,864,979)	-	4,007,326,449
	2086	4,007,326,449	193,553,867	(80,443,419)	-	4,120,436,898
	2087	4,120,436,898	199,017,102	(84,684,234)	-	4,234,769,766
	2088	4,234,769,766	204,539,380	(88,000,167)	-	4,351,308,978
	2089	4,351,308,978	210,168,224	(89,537,771)	-	4,471,939,431
	2090	4,471,939,431	215,994,675	(94,258,382)	-	4,593,675,724
	2091	4,593,675,724	221,874,537	(97,692,545)	-	4,717,857,716
	2092	4,717,857,716	227,872,528	(101,534,546)	-	4,844,195,698
	2093	4,844,195,698	233,974,652	(104,953,464)	-	4,973,216,886
	2094	4,973,216,886	240,206,376	(108,790,590)	-	5,104,632,672
	2095	5,104,632,672	246,553,758	(124,716,733)	-	5,226,469,697
	2096	5,226,469,697	252,438,486	(117,225,711)	-	5,361,682,472
	2097	5,361,682,472	258,969,263	(121,192,278)	-	5,499,459,457
	2098	5,499,459,457	265,623,892	(38,503,792)	-	5,726,579,557
	2099	5,726,579,557	276,593,793	(39,781,913)	-	5,963,391,437
	2100	5,963,391,437	288,031,806	(41,216,634)	-	6,210,206,609
	2101	6,210,206,609	299,952,979	(42,471,564)	-	6,467,688,024
	2102	6,467,688,024	312,389,332	(43,885,874)	-	6,736,191,482

EXTERNAL FUND CALCULATION

2103	6,736,191,482	325,358,049	(45,348,698)	-	7,016,200,832
2104	7,016,200,832	338,882,500	(46,990,057)	-	7,308,093,275
2105	7,308,093,275	352,980,905	(48,426,958)	-	7,612,647,222
2106	7,612,647,222	367,690,861	(50,046,016)	-	7,930,292,067
2107	7,930,292,067	383,033,107	(51,721,076)	-	8,261,604,098
2108	8,261,604,098	399,035,478	(363,913,701)	-	8,296,725,875
2109	8,296,725,875	400,731,860	(930,185,861)	-	7,767,271,873
2110	7,767,271,873	375,159,231	(2,608,600,062)	-	5,533,831,043
2111	5,533,831,043	267,284,039	(2,139,806,354)	-	3,661,308,729
2112	3,661,308,729	176,841,212	(1,987,223,886)	-	1,850,926,054
2113	1,850,926,054	89,399,728	(861,472,551)	-	1,078,853,232
2114	1,078,853,232	52,108,611	(659,104,503)	-	471,857,340
2115	471,857,340	22,790,710	(494,648,050)	-	0

2021 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$9,230,535	(\$4,161,691)
Prairie Island Unit 1	49,264	14,706,995	14,657,730
Prairie Island Unit 2	589,341	7,523,104	6,933,763
TOTAL	\$14,030,831	\$31,460,634	\$17,429,803

Xcel Energy
Nuclear Decommissioning Accrual
32-Year Decommissioning Period
DECON Method - No Recasking

Docket No. E002/M-17-828
Schedule F.11
Page 2 of 11
Proposed

2021 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2021 Decommissioning Accrual
Monticello	13.75	4.99%	3.90%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	9,230,535
Prairie Island Unit 1	16.67	4.98%	3.85%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	14,706,995
Prairie Island Unit 2	17.83	5.03%	3.76%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	7,523,104
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$31,460,634

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

Proposed

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in Future \$'s			
	Nominal \$s	Nominal \$s			Nominal \$s	Nominal \$s			Nominal \$s	Nominal \$s					
Monticello															
<i>Factors</i>	<i>2017</i>	<i>73.4886%</i>	<i>4.05%</i>				<i>2.85%</i>				<i>0.00%</i>				
2030	\$22,828,619	\$16,776,422	1.6755	\$28,108,895	\$14,110,561	\$10,369,648	1.4410	\$14,942,662	\$0	\$0	1.0000	\$0	\$36,939,181	\$27,146,070	\$43,051,557
2031	72,399,645	53,205,452	1.7434	92,758,385	42,911,573	31,335,094	1.4820	46,735,010	0	0	1.0000	0	115,311,218	84,740,546	139,493,395
2032	78,459,767	57,658,948	1.8140	104,593,332	102,213,410	75,115,157	1.5243	114,498,034	0	0	1.0000	0	180,673,177	132,774,105	219,091,366
2033	78,071,622	57,373,706	1.8874	108,287,132	98,380,888	72,298,692	1.5677	113,342,659	0	0	1.0000	0	176,452,509	129,672,397	221,629,791
2034	66,363,782	48,769,784	1.9639	95,778,979	38,844,898	28,546,554	1.6124	46,028,463	0	0	1.0000	0	105,208,680	77,316,338	141,807,442
2035	86,863,179	63,834,494	2.0434	130,439,405	113,097,318	83,113,583	1.6584	137,835,567	0	0	1.0000	0	199,960,497	146,948,077	268,274,971
2036	50,290,909	36,958,062	2.1262	78,580,231	20,638,561	15,166,980	1.7056	25,868,801	0	0	1.0000	0	70,929,470	52,125,042	104,449,032
2037	34,606,532	25,431,840	2.2123	56,262,860	14,147,109	10,396,506	1.7542	18,237,551	0	0	1.0000	0	48,753,642	35,828,346	74,500,411
2038	29,564,886	21,726,807	2.3019	50,012,937	15,064,303	11,070,538	1.8042	19,973,465	0	0	1.0000	0	44,629,189	32,797,345	69,986,402
2039	5,908,428	4,342,018	2.3951	10,399,568	2,334,187	1,715,360	1.8556	3,183,022	0	0	1.0000	0	8,242,615	6,057,378	13,582,590
2040	5,924,615	4,353,914	2.4921	10,850,389	2,340,582	1,720,060	1.9085	3,282,734	0	0	1.0000	0	8,265,197	6,073,973	14,133,123
2041	5,908,428	4,342,018	2.5930	11,258,853	2,334,187	1,715,360	1.9629	3,367,080	0	0	1.0000	0	8,242,615	6,057,378	14,625,934
2042	6,004,114	4,412,337	2.6981	11,904,925	2,621,246	1,926,316	2.0189	3,889,038	0	0	1.0000	0	8,625,360	6,338,652	15,793,964
2043	6,195,487	4,552,974	2.8073	12,781,563	3,195,364	2,348,227	2.0764	4,875,858	0	0	1.0000	0	9,390,851	6,901,200	17,657,421
2044	6,115,988	4,494,551	2.9210	13,128,584	2,914,700	2,141,971	2.1356	4,574,392	0	0	1.0000	0	9,030,688	6,636,522	17,702,976
2045	6,099,800	4,482,655	3.0393	13,624,133	2,908,305	2,137,271	2.1964	4,694,302	0	0	1.0000	0	9,008,105	6,619,926	18,318,435
2046	6,482,546	4,763,929	3.1624	15,065,450	4,056,542	2,981,094	2.2590	6,734,291	0	0	1.0000	0	10,539,088	7,745,023	21,799,741
2047	6,386,860	4,693,611	3.2905	15,444,327	3,769,483	2,770,138	2.3234	6,436,139	0	0	1.0000	0	10,156,343	7,463,749	21,880,466
2048	7,066,692	5,193,210	3.4238	17,780,512	5,766,812	4,237,946	2.3896	10,126,997	0	0	1.0000	0	12,833,504	9,431,156	27,907,509
2049	6,386,860	4,693,611	3.5624	16,720,520	3,769,483	2,770,138	2.4577	6,808,169	0	0	1.0000	0	10,156,343	7,463,749	23,528,689
2050	6,195,487	4,552,974	3.7067	16,876,508	3,195,364	2,348,227	2.5278	5,935,847	0	0	1.0000	0	9,390,851	6,901,200	22,812,355
2051	6,099,800	4,482,655	3.8568	17,288,703	2,908,305	2,137,271	2.5998	5,556,477	0	0	1.0000	0	9,008,105	6,619,926	22,845,180
2052	6,211,674	4,564,869	4.0130	18,318,821	3,201,759	2,352,926	2.6739	6,291,489	0	0	1.0000	0	9,413,433	6,917,796	24,610,310
2053	6,099,800	4,482,655	4.1756	18,717,773	2,908,305	2,137,271	2.7501	5,877,709	0	0	1.0000	0	9,008,105	6,619,926	24,595,482
2054	6,099,800	4,482,655	4.3447	19,475,790	2,908,305	2,137,271	2.8285	6,045,271	0	0	1.0000	0	9,008,105	6,619,926	25,521,061
2055	6,195,487	4,552,974	4.5206	20,582,173	3,195,364	2,348,227	2.9091	6,831,226	0	0	1.0000	0	9,390,851	6,901,200	27,413,399
2056	6,115,988	4,494,551	4.7037	21,141,020	2,914,700	2,141,971	2.9920	6,408,776	0	0	1.0000	0	9,030,688	6,636,522	27,549,796
2057	6,099,800	4,482,655	4.8942	21,939,009	2,908,305	2,137,271	3.0773	6,577,024	0	0	1.0000	0	9,008,105	6,619,926	28,516,033
2058	6,195,487	4,552,974	5.0924	23,185,564	3,195,364	2,348,227	3.1650	7,432,137	0	0	1.0000	0	9,390,851	6,901,200	30,617,701
2059	6,291,173	4,623,292	5.2987	24,497,438	3,482,424	2,559,183	3.2552	8,330,652	0	0	1.0000	0	9,773,597	7,182,475	32,828,089
2060	6,115,988	4,494,551	5.5133	24,779,809	2,914,700	2,141,971	3.3480	7,171,318	0	0	1.0000	0	9,030,688	6,636,522	31,951,126
2061	6,291,173	4,623,292	5.7366	26,521,977	3,482,424	2,559,183	3.4434	8,812,290	0	0	1.0000	0	9,773,597	7,182,475	35,334,267
2062	6,291,173	4,623,292	5.9689	27,595,968	3,482,424	2,559,183	3.5415	9,063,346	0	0	1.0000	0	9,773,597	7,182,475	36,659,314
2063	2,248,102	1,652,098	6.2106	10,260,519	24,955,221	18,339,231	3.6425	66,800,650	0	0	1.0000	0	27,203,324	19,991,329	77,061,169
	\$670,479,691	\$492,725,829		\$1,184,962,052	\$561,072,469	\$412,324,043		\$752,568,447	\$0	\$0		\$0	\$1,231,552,159	\$905,049,872	\$1,937,530,499

Proposed

AMOUNT TO RECOVER

LABOR					NON-LABOR				PIIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional
Cost	Jurisdictional		Jurisdictional		Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Estimate	Cost in	Cost in
Estimate	Cost in		Cost in		Estimate	Cost in	Factor	Cost in	Estimate	Cost in	Factor	Cost in	Nominal \$	Nominal \$	Nominal \$
Nominal \$	Nominal \$	Escalation	Future \$'s		Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s			
		Factor													
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2033	\$22,324,352	\$16,405,843	1.8874	\$30,964,388	\$9,448,311	\$6,943,427	1.5677	\$10,885,211	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,022,663	\$24,267,877	\$42,768,206
2034	63,582,249	46,725,675	1.9639	91,764,553	32,971,807	24,230,504	1.6124	39,069,265	1,250,000	918,607	1.0000	918,607	97,804,055	71,874,786	131,752,425
2035	66,068,657	48,552,900	2.0434	99,212,997	81,814,054	60,123,965	1.6584	99,709,584	1,250,000	918,607	1.0000	918,607	149,132,711	109,595,473	199,841,188
2036	57,950,689	42,587,123	2.1262	90,548,742	66,169,136	48,626,741	1.7056	82,937,770	1,250,000	918,607	1.0000	918,607	125,369,825	92,132,471	174,405,118
2037	38,254,474	28,112,660	2.2123	62,193,638	37,320,257	27,426,117	1.7542	48,110,895	1,250,000	918,607	1.0000	918,607	76,824,731	56,457,384	111,223,139
2038	10,524,282	7,734,143	2.3019	17,803,224	10,943,807	8,042,445	1.8042	14,510,180	1,250,000	918,607	1.0000	918,607	22,718,089	16,695,195	33,232,010
2039	35,901,875	26,383,769	2.3951	63,191,765	76,077,529	55,908,276	1.8556	103,743,397	1,250,000	918,607	1.0000	918,607	113,229,405	83,210,652	167,853,770
2040	32,068,444	23,566,636	2.4921	58,730,414	13,813,311	10,151,203	1.9085	19,373,570	1,250,000	918,607	1.0000	918,607	47,131,756	34,636,446	79,022,591
2041	19,800,405	14,551,031	2.5930	37,730,823	10,002,203	7,350,474	1.9629	14,428,246	1,250,000	918,607	1.0000	918,607	31,052,607	22,820,112	53,077,676
2042	14,925,482	10,968,521	2.6981	29,594,165	12,099,028	8,891,401	2.0189	17,950,849	1,250,000	918,607	1.0000	918,607	28,274,510	20,778,529	48,463,622
2043	8,672,291	6,373,141	2.8073	17,891,320	6,853,529	5,036,559	2.0764	10,457,912	1,250,000	918,607	1.0000	918,607	16,775,820	12,328,308	29,267,838
2044	3,150,484	2,315,245	2.9210	6,762,831	2,315,654	1,701,741	2.1356	3,634,237	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	11,315,675
2045	3,142,137	2,309,111	3.0393	7,018,081	2,306,696	1,695,158	2.1964	3,723,244	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	11,659,932
2046	3,046,451	2,238,793	3.1624	7,079,958	2,019,637	1,484,202	2.2590	3,352,812	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	11,351,378
2047	3,046,451	2,238,793	3.2905	7,366,748	2,019,637	1,484,202	2.3234	3,448,395	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	11,733,750
2048	3,054,797	2,244,926	3.4238	7,686,178	2,028,595	1,490,785	2.3896	3,562,380	1,250,000	918,607	1.0000	918,607	6,333,392	4,654,318	12,167,165
2049	3,046,451	2,238,793	3.5624	7,975,475	2,019,637	1,484,202	2.4577	3,647,723	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	12,541,806
2050	3,142,137	2,309,111	3.7067	8,559,182	2,306,696	1,695,158	2.5278	4,285,019	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	13,762,808
2051	3,142,137	2,309,111	3.8568	8,905,779	2,306,696	1,695,158	2.5998	4,407,071	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	14,231,457
2052	3,150,484	2,315,245	4.0130	9,291,079	2,315,654	1,701,741	2.6739	4,550,284	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	14,759,970
2053	3,142,137	2,309,111	4.1756	9,641,924	2,306,696	1,695,158	2.7501	4,661,853	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	15,222,384
2054	3,142,137	2,309,111	4.3447	10,032,395	2,306,696	1,695,158	2.8285	4,794,753	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	15,745,755
2055	3,142,137	2,309,111	4.5206	10,438,567	2,306,696	1,695,158	2.9091	4,931,383	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	16,288,557
2056	3,150,484	2,315,245	4.7037	10,890,219	2,315,654	1,701,741	2.9920	5,091,608	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	16,900,433
2057	3,142,137	2,309,111	4.8942	11,301,251	2,306,696	1,695,158	3.0773	5,216,508	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	17,436,366
2058	3,142,137	2,309,111	5.0924	11,758,917	2,306,696	1,695,158	3.1650	5,365,174	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	18,042,698
2059	3,142,137	2,309,111	5.2987	12,235,287	2,306,696	1,695,158	3.2552	5,518,077	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	18,671,970
2060	3,150,484	2,315,245	5.5133	12,764,641	2,315,654	1,701,741	3.3480	5,697,427	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	19,380,675
2061	3,142,137	2,309,111	5.7366	13,246,446	2,306,696	1,695,158	3.4434	5,837,105	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	20,002,159
2062	3,142,137	2,309,111	5.9689	13,782,853	2,306,696	1,695,158	3.5415	6,003,400	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	20,704,860
2063	3,142,137	2,309,111	6.2106	14,340,965	2,306,696	1,695,158	3.6425	6,174,611	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	21,434,183
2064	3,146,606	2,312,395	6.4622	14,943,162	13,948,599	10,250,624	3.7463	38,401,913	1,250,000	918,607	1.0000	918,607	18,345,206	13,481,626	54,263,681
2065	795,605	584,679	6.7239	3,931,322	4,510,695	3,314,844	3.8531	12,772,427	0	0	1.0000	0	5,306,300	3,899,523	16,703,749
	\$436,517,141	\$320,790,135		\$819,579,289	\$421,002,740	\$309,388,826		\$606,254,283	\$40,000,000	\$29,395,422		\$29,395,422	\$897,519,882	\$659,574,382	\$1,455,228,994

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s	
Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in				
Nominal \$s	Nominal \$s		Future \$'s	Nominal \$s	Nominal \$s		Future \$'s	Nominal \$s	Nominal \$s		Future \$'s				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2034	\$7,760,266	\$5,702,908	1.9639	\$11,199,940	\$4,479,535	\$3,291,946	1.6124	\$5,307,933	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,801	\$9,913,460	\$17,426,480
2035	47,102,812	34,615,176	2.0434	70,732,650	36,175,458	26,584,821	1.6584	44,088,268	1,250,000	918,607	1.0000	918,607	84,528,271	62,118,604	115,739,524
2036	67,705,423	49,755,737	2.1262	105,790,647	86,872,951	63,841,675	1.7056	108,888,362	1,250,000	918,607	1.0000	918,607	155,828,374	114,516,019	215,597,616
2037	71,039,578	52,205,958	2.2123	115,495,242	70,988,753	52,168,608	1.7542	91,514,172	1,250,000	918,607	1.0000	918,607	143,278,331	105,293,173	207,928,021
2038	43,919,901	32,276,100	2.3019	74,296,356	34,731,268	25,523,507	1.8042	46,049,511	1,250,000	918,607	1.0000	918,607	79,901,170	58,718,214	121,264,473
2039	40,527,011	29,782,714	2.3951	71,332,578	77,052,498	56,624,767	1.8556	105,072,917	1,250,000	918,607	1.0000	918,607	118,829,509	87,326,087	177,324,102
2040	37,548,754	27,594,036	2.4921	68,767,098	14,641,371	10,759,732	1.9085	20,534,948	1,250,000	918,607	1.0000	918,607	53,440,125	39,272,375	90,220,653
2041	23,571,483	17,322,342	2.5930	44,916,834	13,611,612	10,002,977	1.9629	19,634,844	1,250,000	918,607	1.0000	918,607	38,433,096	28,243,926	65,470,284
2042	16,800,451	12,346,409	2.6981	33,311,845	17,608,969	12,940,577	2.0189	26,125,730	1,250,000	918,607	1.0000	918,607	35,659,420	26,205,592	60,356,182
2043	9,555,838	7,022,447	2.8073	19,714,117	9,449,994	6,944,664	2.0764	14,419,900	1,250,000	918,607	1.0000	918,607	20,255,832	14,885,718	35,052,624
2044	3,150,484	2,315,245	2.9210	6,762,831	2,315,654	1,701,741	2.1356	3,634,237	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	11,315,675
2045	3,142,137	2,309,111	3.0393	7,018,081	2,306,696	1,695,158	2.1964	3,723,244	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	11,659,932
2046	3,046,451	2,238,793	3.1624	7,079,958	2,019,637	1,484,202	2.2590	3,352,812	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	11,351,378
2047	3,046,451	2,238,793	3.2905	7,366,748	2,019,637	1,484,202	2.3234	3,448,395	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	11,733,750
2048	3,054,797	2,244,926	3.4238	7,686,178	2,028,595	1,490,785	2.3896	3,562,380	1,250,000	918,607	1.0000	918,607	6,333,392	4,654,318	12,167,165
2049	3,046,451	2,238,793	3.5624	7,975,475	2,019,637	1,484,202	2.4577	3,647,723	1,250,000	918,607	1.0000	918,607	6,316,088	4,641,602	12,541,806
2050	3,142,137	2,309,111	3.7067	8,559,182	2,306,696	1,695,158	2.5278	4,285,019	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	13,762,808
2051	3,142,137	2,309,111	3.8568	8,905,779	2,306,696	1,695,158	2.5998	4,407,071	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	14,231,457
2052	3,150,484	2,315,245	4.0130	9,291,079	2,315,654	1,701,741	2.6739	4,550,284	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	14,759,970
2053	3,142,137	2,309,111	4.1756	9,641,924	2,306,696	1,695,158	2.7501	4,661,853	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	15,222,384
2054	3,142,137	2,309,111	4.3447	10,032,395	2,306,696	1,695,158	2.8285	4,794,753	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	15,745,755
2055	3,142,137	2,309,111	4.5206	10,438,567	2,306,696	1,695,158	2.9091	4,931,383	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	16,288,557
2056	3,150,484	2,315,245	4.7037	10,890,219	2,315,654	1,701,741	2.9920	5,091,608	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	16,900,433
2057	3,142,137	2,309,111	4.8942	11,301,251	2,306,696	1,695,158	3.0773	5,216,508	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	17,436,366
2058	3,142,137	2,309,111	5.0924	11,758,917	2,306,696	1,695,158	3.1650	5,365,174	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	18,042,698
2059	3,142,137	2,309,111	5.2987	12,235,287	2,306,696	1,695,158	3.2552	5,518,077	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	18,671,970
2060	3,150,484	2,315,245	5.5133	12,764,641	2,315,654	1,701,741	3.3480	5,697,427	1,250,000	918,607	1.0000	918,607	6,716,138	4,935,593	19,380,675
2061	3,142,137	2,309,111	5.7366	13,246,446	2,306,696	1,695,158	3.4434	5,837,105	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	20,002,159
2062	3,142,137	2,309,111	5.9689	13,782,853	2,306,696	1,695,158	3.5415	6,003,400	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	20,704,860
2063	3,142,137	2,309,111	6.2106	14,340,965	2,306,696	1,695,158	3.6425	6,174,611	1,250,000	918,607	1.0000	918,607	6,698,833	4,922,875	21,434,183
2064	3,146,606	2,312,395	6.4622	14,943,162	13,948,599	10,250,624	3.7463	38,401,913	1,250,000	918,607	1.0000	918,607	18,345,206	13,481,626	54,263,681
2065	795,605	584,679	6.7239	3,931,322	4,510,695	3,314,844	3.8531	12,772,427	0	-	1.0000	-	5,306,300	3,899,523	16,703,749
	\$431,975,460	\$317,452,519		\$835,510,566	\$429,102,177	\$315,340,985		\$626,713,989	\$38,750,000	\$28,476,815		\$28,476,815	\$899,827,638	\$661,270,318	\$1,490,701,369
	\$1,538,972,292	\$1,130,968,482		\$2,840,051,907	\$1,411,177,386	\$1,037,053,854		\$1,985,536,718	\$78,750,000	\$57,872,236		\$57,872,236	\$3,028,899,678	\$2,225,894,572	\$4,883,460,862

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,644,155	-	6,696,113	646,012,450
2018	646,012,450	32,570,157	-	13,392,226	691,974,833
2019	691,974,833	34,863,680	-	13,392,226	740,230,740
2020	740,230,740	37,271,650	-	13,392,226	790,894,616
2021	790,894,616	39,695,943	-	9,230,535	839,821,094
2022	839,821,094	42,137,374	-	9,230,535	891,189,004
2023	891,189,004	44,700,633	-	9,230,535	945,120,173
2024	945,120,173	47,391,798	-	9,230,535	1,001,742,507
2025	1,001,742,507	50,217,253	-	9,230,535	1,061,190,295
2026	1,061,190,295	53,183,698	-	9,230,535	1,123,604,528
2027	1,123,604,528	56,298,168	-	9,230,535	1,189,133,231
2028	1,189,133,231	59,568,050	-	9,230,535	1,257,931,817
2029	1,257,931,817	63,001,100	-	9,230,535	1,330,163,452
2030	1,330,163,452	52,011,371	(43,051,557)	6,922,902	1,346,046,167
2031	1,346,046,167	52,495,801	(139,493,395)	-	1,259,048,573
2032	1,259,048,573	49,102,894	(219,091,366)	-	1,089,060,101
2033	1,089,060,101	42,473,344	(221,629,791)	-	909,903,654
2034	909,903,654	35,486,243	(141,807,442)	-	803,582,455
2035	803,582,455	31,339,716	(268,274,971)	-	566,647,199
2036	566,647,199	22,099,241	(104,449,032)	-	484,297,407
2037	484,297,407	18,887,599	(74,500,411)	-	428,684,596
2038	428,684,596	16,718,699	(69,986,402)	-	375,416,892
2039	375,416,892	14,641,259	(13,582,590)	-	376,475,561
2040	376,475,561	14,682,547	(14,133,123)	-	377,024,986
2041	377,024,986	14,703,974	(14,625,934)	-	377,103,026
2042	377,103,026	14,707,018	(15,793,964)	-	376,016,081
2043	376,016,081	14,664,627	(17,657,421)	-	373,023,287
2044	373,023,287	14,547,908	(17,702,976)	-	369,868,219
2045	369,868,219	14,424,861	(18,318,435)	-	365,974,645
2046	365,974,645	14,273,011	(21,799,741)	-	358,447,915
2047	358,447,915	13,979,469	(21,880,466)	-	350,546,917
2048	350,546,917	13,671,330	(27,907,509)	-	336,310,738
2049	336,310,738	13,116,119	(23,528,689)	-	325,898,168
2050	325,898,168	12,710,029	(22,812,355)	-	315,795,842
2051	315,795,842	12,316,038	(22,845,180)	-	305,266,700
2052	305,266,700	11,905,401	(24,610,310)	-	292,561,791
2053	292,561,791	11,409,910	(24,595,482)	-	279,376,218
2054	279,376,218	10,895,673	(25,521,061)	-	264,750,829
2055	264,750,829	10,325,282	(27,413,399)	-	247,662,713
2056	247,662,713	9,658,846	(27,549,796)	-	229,771,762

Proposed

EXTERNAL FUND CALCULATION

2057	229,771,762	8,961,099	(28,516,033)	-	210,216,827
2058	210,216,827	8,198,456	(30,617,701)	-	187,797,583
2059	187,797,583	7,324,106	(32,828,089)	-	162,293,599
2060	162,293,599	6,329,450	(31,951,126)	-	136,671,923
2061	136,671,923	5,330,205	(35,334,267)	-	106,667,861
2062	106,667,861	4,160,047	(36,659,314)	-	74,168,594
2063	74,168,594	2,892,575	(77,061,169)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,322,046	-	24,632	383,713,733
2018	383,713,733	19,110,171	-	49,264	402,873,168
2019	402,873,168	20,064,310	-	49,264	422,986,743
2020	422,986,743	21,065,966	-	49,264	444,101,974
2021	444,101,974	22,482,482	-	14,706,995	481,291,451
2022	481,291,451	24,334,518	-	14,706,995	520,332,964
2023	520,332,964	26,278,786	-	14,706,995	561,318,744
2024	561,318,744	28,319,878	-	14,706,995	604,345,617
2025	604,345,617	30,462,616	-	14,706,995	649,515,227
2026	649,515,227	32,712,062	-	14,706,995	696,934,284
2027	696,934,284	35,073,532	-	14,706,995	746,714,811
2028	746,714,811	37,552,602	-	14,706,995	798,974,407
2029	798,974,407	40,155,130	-	14,706,995	853,836,531
2030	853,836,531	42,887,263	-	14,706,995	911,430,789
2031	911,430,789	45,755,457	-	14,706,995	971,893,242
2032	971,893,242	48,766,488	-	14,706,995	1,035,366,724
2033	1,035,366,724	40,051,302	(42,768,206)	9,853,686	1,042,503,507
2034	1,042,503,507	40,136,385	(131,752,425)	-	950,887,467
2035	950,887,467	36,609,167	(199,841,188)	-	787,655,446
2036	787,655,446	30,324,735	(174,405,118)	-	643,575,063
2037	643,575,063	24,777,640	(111,223,139)	-	557,129,563
2038	557,129,563	21,449,488	(33,232,010)	-	545,347,041
2039	545,347,041	20,995,861	(167,853,770)	-	398,489,132
2040	398,489,132	15,341,832	(79,022,591)	-	334,808,373
2041	334,808,373	12,890,122	(53,077,676)	-	294,620,819
2042	294,620,819	11,342,902	(48,463,622)	-	257,500,099
2043	257,500,099	9,913,754	(29,267,838)	-	238,146,014
2044	238,146,014	9,168,622	(11,315,675)	-	235,998,961
2045	235,998,961	9,085,960	(11,659,932)	-	233,424,989
2046	233,424,989	8,986,862	(11,351,378)	-	231,060,473
2047	231,060,473	8,895,828	(11,733,750)	-	228,222,552
2048	228,222,552	8,786,568	(12,167,165)	-	224,841,955
2049	224,841,955	8,656,415	(12,541,806)	-	220,956,565
2050	220,956,565	8,506,828	(13,762,808)	-	215,700,585
2051	215,700,585	8,304,473	(14,231,457)	-	209,773,600
2052	209,773,600	8,076,284	(14,759,970)	-	203,089,914
2053	203,089,914	7,818,962	(15,222,384)	-	195,686,492
2054	195,686,492	7,533,930	(15,745,755)	-	187,474,667
2055	187,474,667	7,217,775	(16,288,557)	-	178,403,885
2056	178,403,885	6,868,550	(16,900,433)	-	168,372,001

Proposed

EXTERNAL FUND CALCULATION

2057	168,372,001	6,482,322	(17,436,366)	-	157,417,957
2058	157,417,957	6,060,591	(18,042,698)	-	145,435,851
2059	145,435,851	5,599,280	(18,671,970)	-	132,363,161
2060	132,363,161	5,095,982	(19,380,675)	-	118,078,467
2061	118,078,467	4,546,021	(20,002,159)	-	102,622,329
2062	102,622,329	3,950,960	(20,704,860)	-	85,868,429
2063	85,868,429	3,305,935	(21,434,183)	-	67,740,180
2064	67,740,180	2,607,997	(54,263,681)	-	16,084,496
2065	16,084,496	619,253	(16,703,749)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,571,961	-	294,670	431,075,599
2018	431,075,599	21,697,925	-	589,341	453,362,864
2019	453,362,864	22,818,974	-	589,341	476,771,179
2020	476,771,179	23,996,412	-	589,341	501,356,932
2021	501,356,932	25,407,460	-	7,523,104	534,287,496
2022	534,287,496	27,063,867	-	7,523,104	568,874,467
2023	568,874,467	28,803,592	-	7,523,104	605,201,164
2024	605,201,164	30,630,825	-	7,523,104	643,355,092
2025	643,355,092	32,549,967	-	7,523,104	683,428,164
2026	683,428,164	34,565,643	-	7,523,104	725,516,911
2027	725,516,911	36,682,707	-	7,523,104	769,722,722
2028	769,722,722	38,906,259	-	7,523,104	816,152,085
2029	816,152,085	41,241,656	-	7,523,104	864,916,846
2030	864,916,846	43,694,523	-	7,523,104	916,134,473
2031	916,134,473	46,270,770	-	7,523,104	969,928,348
2032	969,928,348	48,976,602	-	7,523,104	1,026,428,054
2033	1,026,428,054	51,818,537	-	7,523,104	1,085,769,695
2034	1,085,769,695	40,942,331	(17,426,480)	6,244,177	1,115,529,723
2035	1,115,529,723	41,943,918	(115,739,524)	-	1,041,734,116
2036	1,041,734,116	39,169,203	(215,597,616)	-	865,305,704
2037	865,305,704	32,535,494	(207,928,021)	-	689,913,177
2038	689,913,177	25,940,735	(121,264,473)	-	594,589,439
2039	594,589,439	22,356,563	(177,324,102)	-	439,621,900
2040	439,621,900	16,529,783	(90,220,653)	-	365,931,031
2041	365,931,031	13,759,007	(65,470,284)	-	314,219,753
2042	314,219,753	11,814,663	(60,356,182)	-	265,678,234
2043	265,678,234	9,989,502	(35,052,624)	-	240,615,112
2044	240,615,112	9,047,128	(11,315,675)	-	238,346,565
2045	238,346,565	8,961,831	(11,659,932)	-	235,648,464
2046	235,648,464	8,860,382	(11,351,378)	-	233,157,468
2047	233,157,468	8,766,721	(11,733,750)	-	230,190,439
2048	230,190,439	8,655,161	(12,167,165)	-	226,678,435
2049	226,678,435	8,523,109	(12,541,806)	-	222,659,739
2050	222,659,739	8,372,006	(13,762,808)	-	217,268,937
2051	217,268,937	8,169,312	(14,231,457)	-	211,206,792
2052	211,206,792	7,941,375	(14,759,970)	-	204,388,197
2053	204,388,197	7,684,996	(15,222,384)	-	196,850,810
2054	196,850,810	7,401,590	(15,745,755)	-	188,506,646
2055	188,506,646	7,087,850	(16,288,557)	-	179,305,938
2056	179,305,938	6,741,903	(16,900,433)	-	169,147,409

Proposed

EXTERNAL FUND CALCULATION

2057	169,147,409	6,359,943	(17,436,366)	-	158,070,985
2058	158,070,985	5,943,469	(18,042,698)	-	145,971,756
2059	145,971,756	5,488,538	(18,671,970)	-	132,788,324
2060	132,788,324	4,992,841	(19,380,675)	-	118,400,489
2061	118,400,489	4,451,858	(20,002,159)	-	102,850,189
2062	102,850,189	3,867,167	(20,704,860)	-	86,012,496
2063	86,012,496	3,234,070	(21,434,183)	-	67,812,383
2064	67,812,383	2,549,746	(54,263,681)	-	16,098,447
2065	16,098,447	605,302	(16,703,749)	-	(0)

2019 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$23,708,908	\$10,316,682
Prairie Island Unit 1	49,264	18,400,907	18,351,643
Prairie Island Unit 2	589,341	10,909,487	10,320,146
TOTAL	\$14,030,831	\$53,019,302	\$38,988,471

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
DECON Method - No Recasking

Docket No. E002/M-17-828
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Proposed

2019 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2021 Decommissioning Accrual
Monticello	13.75	5.00%	4.43%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	23,708,908
Prairie Island Unit 1	16.67	4.99%	4.15%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	18,400,907
Prairie Island Unit 2	17.83	5.04%	4.09%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	10,909,487
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$53,019,302

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIHC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2030	\$21,103,620	\$15,508,745	1.6755	\$25,984,903	\$8,935,561	\$6,566,615	1.4410	\$9,462,492	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$35,447,395
2031	72,416,242	53,217,649	1.7434	92,779,649	42,961,353	31,571,677	1.4820	46,789,225	0	0	1.0000	0	115,377,595	84,789,326	139,568,874
2032	78,476,357	57,671,140	1.8140	104,615,448	102,263,189	75,151,739	1.5243	114,553,795	0	0	1.0000	0	180,739,546	132,822,879	219,169,243
2033	78,663,227	57,808,468	1.8874	109,107,702	100,155,666	73,602,950	1.5677	115,387,345	0	0	1.0000	0	178,818,892	131,411,418	224,495,047
2034	66,380,423	48,782,013	1.9639	95,802,994	38,894,671	28,583,132	1.6124	46,087,441	0	0	1.0000	0	105,275,094	77,365,144	141,890,436
2035	86,879,803	63,846,711	2.0434	130,464,369	113,147,091	83,150,161	1.6584	137,896,227	0	0	1.0000	0	200,026,894	146,996,872	268,360,596
2036	50,307,504	36,970,257	2.1262	78,606,161	20,688,337	15,203,559	1.7056	25,931,191	0	0	1.0000	0	70,995,841	52,173,817	104,537,352
2037	34,623,126	25,444,035	2.2123	56,289,838	14,196,883	10,433,084	1.7542	18,301,716	0	0	1.0000	0	48,820,010	35,877,119	74,591,555
2038	29,581,478	21,739,000	2.3019	50,041,005	15,098,979	11,096,021	1.8042	20,019,442	0	0	1.0000	0	44,680,457	32,835,022	70,060,446
2039	5,925,016	4,354,209	2.3951	10,428,765	2,187,162	1,607,314	1.8556	2,982,532	0	0	1.0000	0	8,112,178	5,961,523	13,411,297
2040	5,941,203	4,366,104	2.4921	10,880,768	2,193,018	1,611,617	1.9085	3,075,772	0	0	1.0000	0	8,134,221	5,977,722	13,956,540
2041	5,925,016	4,354,209	2.5930	11,290,463	2,187,162	1,607,314	1.9629	3,154,997	0	0	1.0000	0	8,112,178	5,961,523	14,445,460
2042	5,925,016	4,354,209	2.6981	11,748,090	2,187,162	1,607,314	2.0189	3,245,006	0	0	1.0000	0	8,112,178	5,961,523	14,993,096
2043	5,925,016	4,354,209	2.8073	12,223,570	2,187,162	1,607,314	2.0764	3,337,427	0	0	1.0000	0	8,112,178	5,961,523	15,560,997
2044	5,941,203	4,366,104	2.9210	12,753,390	2,193,018	1,611,617	2.1356	3,441,770	0	0	1.0000	0	8,134,221	5,977,722	16,195,160
2045	5,925,016	4,354,209	3.0393	13,233,746	2,187,162	1,607,314	2.1964	3,530,305	0	0	1.0000	0	8,112,178	5,961,523	16,764,051
2046	5,925,016	4,354,209	3.1624	13,769,749	2,187,162	1,607,314	2.2590	3,630,922	0	0	1.0000	0	8,112,178	5,961,523	17,400,672
2047	5,925,016	4,354,209	3.2905	14,327,523	2,187,162	1,607,314	2.3234	3,734,433	0	0	1.0000	0	8,112,178	5,961,523	18,061,957
2048	6,604,848	4,853,807	3.4238	16,618,465	4,183,953	3,074,727	2.3896	7,347,367	0	0	1.0000	0	10,788,801	7,928,534	23,965,832
2049	5,925,016	4,354,209	3.5624	15,511,433	2,187,162	1,607,314	2.4577	3,950,296	0	0	1.0000	0	8,112,178	5,961,523	19,461,728
2050	7,418,217	5,451,540	3.7067	20,207,225	6,666,766	4,899,310	2.5278	12,384,476	0	0	1.0000	0	14,084,983	10,350,851	32,591,701
2051	7,418,217	5,451,540	3.8568	21,025,501	6,666,766	4,899,310	2.5998	12,737,227	0	0	1.0000	0	14,084,983	10,350,851	33,762,728
2052	8,296,904	6,097,275	4.0130	24,468,364	9,260,122	6,805,130	2.6739	18,196,237	0	0	1.0000	0	17,557,026	12,902,405	42,664,601
2053	8,927,592	6,560,758	4.1756	27,395,102	11,194,891	8,226,964	2.7501	22,624,973	0	0	1.0000	0	20,122,483	14,787,722	50,020,075
2054	7,633,842	5,610,000	4.3447	24,373,767	7,313,641	5,374,689	2.8285	15,202,309	0	0	1.0000	0	14,947,483	10,984,689	39,576,076
2055	8,711,967	6,402,299	4.5206	28,942,231	10,548,016	7,751,585	2.9091	22,550,135	0	0	1.0000	0	19,259,983	14,153,883	51,492,366
2056	9,159,404	6,731,114	4.7037	31,661,139	11,847,622	8,706,646	2.9920	26,050,286	0	0	1.0000	0	21,007,026	15,437,760	57,711,424
2057	5,908,425	4,342,016	4.8942	21,250,695	2,137,389	1,570,737	3.0773	4,833,628	0	0	1.0000	0	8,045,814	5,912,753	26,084,323
2058	5,908,425	4,342,016	5.0924	22,111,283	2,137,389	1,570,737	3.1650	4,971,381	0	0	1.0000	0	8,045,814	5,912,753	27,082,664
2059	5,908,425	4,342,016	5.2987	23,007,041	2,137,389	1,570,737	3.2552	5,113,062	0	0	1.0000	0	8,045,814	5,912,753	28,120,102
2060	5,924,612	4,353,912	5.5133	24,004,421	2,143,245	1,575,040	3.3480	5,273,234	0	0	1.0000	0	8,067,857	5,928,952	29,277,655
2061	5,908,425	4,342,016	5.7366	24,908,410	2,137,389	1,570,737	3.4434	5,408,674	0	0	1.0000	0	8,045,814	5,912,753	30,317,084
2062	5,908,425	4,342,016	5.9689	25,917,060	2,137,389	1,570,737	3.5415	5,562,764	0	0	1.0000	0	8,045,814	5,912,753	31,479,823
2063	5,908,425	4,342,016	6.2106	26,966,525	2,137,389	1,570,737	3.6425	5,721,408	0	0	1.0000	0	8,045,814	5,912,753	32,687,933
2064	5,924,612	4,353,912	6.4622	28,135,848	2,143,245	1,575,040	3.7463	5,900,572	0	0	1.0000	0	8,067,857	5,928,952	34,036,420
2065	5,908,425	4,342,016	6.7239	29,195,282	2,137,389	1,570,737	3.8531	6,052,205	0	0	1.0000	0	8,045,814	5,912,753	35,247,487
2066	5,908,425	4,342,016	6.9962	30,377,613	2,137,389	1,570,737	3.9629	6,224,672	0	0	1.0000	0	8,045,814	5,912,753	36,602,285
2067	5,908,425	4,342,016	7.2795	31,607,706	2,137,389	1,570,737	4.0758	6,402,908	0	0	1.0000	0	8,045,814	5,912,753	38,009,714
2068	5,924,612	4,353,912	7.5744	32,978,269	2,143,245	1,575,040	4.1920	6,602,568	0	0	1.0000	0	8,067,857	5,928,952	39,580,836
2069	5,908,425	4,342,016	7.8811	34,219,863	2,137,389	1,570,737	4.3115	6,772,231	0	0	1.0000	0	8,045,814	5,912,753	40,992,094
2070	5,908,425	4,342,016	8.2003	35,605,835	2,137,389	1,570,737	4.4343	6,965,117	0	0	1.0000	0	8,045,814	5,912,753	42,570,952
2071	5,908,425	4,342,016	8.5324	37,047,818	2,137,389	1,570,737	4.5607	7,163,658	0	0	1.0000	0	8,045,814	5,912,753	44,211,476
2072	5,924,612	4,353,912	8.8780	38,654,028	2,143,245	1,575,040	4.6907	7,388,040	0	0	1.0000	0	8,067,857	5,928,952	46,042,068
2073	5,908,425	4,342,016	9.2375	40,109,374	2,137,389	1,570,737	4.8244	7,577,862	0	0	1.0000	0	8,045,814	5,912,753	47,687,235
2074	5,908,425	4,342,016	9.6117	41,734,156	2,137,389	1,570,737	4.9619	7,793,838	0	0	1.0000	0	8,045,814	5,912,753	49,527,994
2075	5,908,425	4,342,016	10.0009	43,424,069	2,137,389	1,570,737	5.1033	8,015,940	0	0	1.0000	0	8,045,814	5,912,753	51,440,009
2076	5,924,612	4,353,912	10.4060	45,306,805	2,143,245	1,575,040	5.2487	8,266,912	0	0	1.0000	0	8,067,857	5,928,952	53,573,717
2077	5,908,425	4,342,016	10.8274	47,012,745	2,137,389	1,570,737	5.3983	8,479,307	0	0	1.0000	0	8,045,814	5,912,753	55,492,052
2078	6,386,857	4,693,609	11.2659	52,877,728	3,557,353	2,614,247	5.5522	14,514,823	0	0	1.0000	0	9,944,210	7,307,856	67,392,551
2079	6,482,543	4,763,927	11.7222	55,843,706	3,844,412	2,825,203	5.7104	16,133,037	0	0	1.0000	0	10,326,955	7,589,130	71,976,743
2080	6,403,045	4,705,505	12.1970	57,393,047	3,563,167	2,618,520	5.8731	15,378,828	0	0	1.0000	0	9,966,212	7,324,025	72,771,874
2081	6,386,857	4,693,609	12.6909	59,566,121	3,557,353	2,614,247	6.0405	15,791,360	0	0	1.0000	0	9,944,210	7,307,856	75,357,480
2082	6,386,857	4,693,609	13.2049	61,978,635	3,557,353	2,614,247	6.2127	16,241,533	0	0	1.0000	0	9,944,210	7,307,856	78,220,169
2083	6,482,543	4,763,927	13.7397	65,454,929	3,844,412	2,825,203	6.3897	18,052,197	0	0	1.0000	0	10,326,955	7,589,130	83,507,127
2084	6,403,045	4,705,505	14.2962	67,270,843	3,563,167	2,618,520	6.5719	17,208,649	0	0	1.0000	0	9,966,212	7,324,025	84,479,492

AMOUNT TO RECOVER															
	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2085	6,386,857	4,693,609	14.8752	69,818,370	3,557,353	2,614,247	6.7592	17,670,219	0	0	1.0000	0	9,944,210	7,307,856	87,488,590
2086	6,386,857	4,693,609	15.4776	72,645,800	3,557,353	2,614,247	6.9518	18,173,723	0	0	1.0000	0	9,944,210	7,307,856	90,819,524
2087	6,482,543	4,763,927	16.1045	76,720,664	3,844,412	2,825,203	7.1499	20,199,916	0	0	1.0000	0	10,326,955	7,589,130	96,920,580
2088	7,066,689	5,193,208	16.7567	87,021,021	5,554,101	4,081,628	7.3537	30,015,070	0	0	1.0000	0	12,620,790	9,274,836	117,036,091
2089	6,386,857	4,693,609	17.4353	81,834,478	3,557,353	2,614,247	7.5633	19,772,335	0	0	1.0000	0	9,944,210	7,307,856	101,606,814
2090	6,099,798	4,482,653	18.1415	81,322,056	2,696,175	1,981,380	7.7788	15,412,758	0	0	1.0000	0	8,795,973	6,464,033	96,734,813
2091	2,034,890	1,495,411	18.8762	28,227,679	24,955,010	18,339,076	8.0005	146,721,776	0	0	1.0000	0	26,989,900	19,834,487	174,949,455
	\$851,819,402	\$625,989,760		\$2,666,101,282	\$664,030,274	\$487,986,246		\$1,223,380,650	\$0	\$0		\$0	\$1,515,849,676	\$1,113,976,006	\$3,889,481,932

Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%			2.85%		0.00%							
2033	\$22,324,352	\$16,405,843	1.8874	\$30,964,388	\$9,728,959	\$7,149,672	1.5677	\$11,208,540	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,303,311	\$24,474,122	\$43,091,536
2034	\$63,582,247	46,725,674	1.9639	91,764,550	33,397,619	24,543,427	1.6124	39,573,822	1,250,000	918,607	1.0000	918,607	98,229,866	72,187,708	132,256,979
2035	65,877,290	48,412,268	2.0434	98,925,629	81,239,936	59,702,054	1.6584	99,009,886	1,250,000	918,607	1.0000	918,607	148,367,226	109,032,929	198,854,122
2036	57,759,315	42,446,486	2.1262	90,249,718	65,595,019	48,204,831	1.7056	82,218,159	1,250,000	918,607	1.0000	918,607	124,604,334	91,569,923	173,386,484
2037	38,110,947	28,007,184	2.2123	61,960,292	36,889,671	27,109,686	1.7542	47,555,811	1,250,000	918,607	1.0000	918,607	76,250,618	56,035,476	110,434,710
2038	13,207,914	9,706,305	2.3019	22,342,944	18,994,691	13,958,924	1.8042	25,184,690	1,250,000	918,607	1.0000	918,607	33,452,605	24,583,836	48,446,241
2039	36,035,855	26,482,229	2.3951	63,427,586	76,476,728	56,201,641	1.8556	104,287,765	1,250,000	918,607	1.0000	918,607	113,762,582	83,602,477	168,633,958
2040	31,919,556	23,457,220	2.4921	58,457,738	13,365,606	9,822,190	1.9085	18,745,650	1,250,000	918,607	1.0000	918,607	46,535,162	34,198,017	78,121,996
2041	19,571,318	14,382,679	2.5930	37,294,286	9,445,873	6,941,635	1.9629	13,625,736	1,250,000	918,607	1.0000	918,607	30,267,191	22,242,921	51,838,628
2042	14,781,952	10,863,043	2.6981	29,309,575	11,668,700	8,575,159	2.0189	17,312,388	1,250,000	918,607	1.0000	918,607	27,700,652	20,356,808	47,540,570
2043	8,544,452	6,279,195	2.8073	17,627,583	6,492,672	4,771,371	2.0764	9,907,275	1,250,000	918,607	1.0000	918,607	16,287,125	11,969,172	28,453,465
2044	3,054,798	2,244,927	2.9210	6,557,431	1,939,011	1,424,951	2.1356	3,043,125	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	10,519,163
2045	3,046,451	2,238,793	3.0393	6,804,363	1,930,298	1,418,548	2.1964	3,115,698	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	10,838,668
2046	3,046,451	2,238,793	3.1624	7,079,958	1,930,298	1,418,548	2.2590	3,204,499	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	11,203,065
2047	3,046,451	2,238,793	3.2905	7,366,748	1,930,298	1,418,548	2.3234	3,295,854	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	11,581,280
2048	3,054,798	2,244,927	3.4238	7,686,181	1,939,011	1,424,951	2.3896	3,405,063	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	12,009,850
2049	3,046,451	2,238,793	3.5624	7,975,475	1,930,298	1,418,548	2.4577	3,486,365	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	12,380,447
2050	3,046,451	2,238,793	3.7067	8,298,533	1,930,298	1,418,548	2.5278	3,585,805	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	12,802,945
2051	3,046,451	2,238,793	3.8568	8,634,576	1,930,298	1,418,548	2.5998	3,687,940	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	13,241,123
2052	3,054,798	2,244,927	4.0130	9,008,892	1,939,011	1,424,951	2.6739	3,810,176	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	13,737,675
2053	3,142,138	2,309,112	4.1756	9,641,927	2,217,357	1,629,503	2.7501	4,481,297	1,250,000	918,607	1.0000	918,607	6,609,495	4,857,222	15,041,831
2054	3,237,824	2,379,430	4.3447	10,337,910	2,504,416	1,840,459	2.8285	5,205,738	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	16,462,254
2055	3,237,824	2,379,430	4.5206	10,756,451	2,504,416	1,840,459	2.9091	5,354,079	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	17,029,137
2056	3,294,014	2,420,723	4.7037	11,386,356	2,656,659	1,952,340	2.9920	5,841,401	1,250,000	918,607	1.0000	918,607	7,200,673	5,291,670	18,146,364
2057	3,189,981	2,344,271	4.8942	11,473,331	2,360,887	1,734,981	3.0773	5,339,058	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	17,730,996
2058	3,333,510	2,449,748	5.0924	12,475,098	2,791,475	2,051,414	3.1650	6,492,726	1,250,000	918,607	1.0000	918,607	7,374,985	5,419,769	19,886,431
2059	3,189,981	2,344,271	5.2987	12,421,588	2,360,887	1,734,981	3.2552	5,647,711	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	18,987,907
2060	3,150,484	2,315,245	5.5133	12,764,641	2,226,070	1,635,906	3.3480	5,477,015	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758	19,160,263
2061	3,237,824	2,379,430	5.7366	13,649,838	2,504,416	1,840,459	3.4434	6,337,436	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	20,905,881
2062	3,237,824	2,379,430	5.9689	14,202,580	2,504,416	1,840,459	3.5415	6,517,985	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	21,639,172
2063	3,189,981	2,344,271	6.2106	14,559,329	2,360,887	1,734,981	3.6425	6,319,670	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	21,797,605
2064	3,246,170	2,385,563	6.4622	15,415,988	2,513,129	1,846,862	3.7463	6,918,899	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	23,253,493
2065	3,237,824	2,379,430	6.7239	15,999,050	2,504,416	1,840,459	3.8531	7,091,472	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	24,009,128
2066	3,189,981	2,344,271	6.9962	16,400,988	2,360,887	1,734,981	3.9629	6,875,558	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	24,195,153
2067	3,237,824	2,379,430	7.2795	17,321,061	2,504,416	1,840,459	4.0758	7,501,342	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	25,741,010
2068	3,246,170	2,385,563	7.5744	18,069,211	2,513,129	1,846,862	4.1920	7,742,045	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	26,729,863
2069	3,189,981	2,344,271	7.8811	18,475,433	2,360,887	1,734,981	4.3115	7,480,372	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	26,874,413
2070	3,237,824	2,379,430	8.2003	19,512,040	2,504,416	1,840,459	4.4343	8,161,146	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	28,591,793
2071	3,237,824	2,379,430	8.5324	20,302,249	2,504,416	1,840,459	4.5607	8,393,780	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	29,614,636
2072	3,246,170	2,385,563	8.8780	21,179,032	2,513,129	1,846,862	4.6907	8,663,075	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	30,760,714
2073	3,237,824	2,379,430	9.2375	21,979,985	2,504,416	1,840,459	4.8244	8,879,109	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	31,777,701
2074	3,237,824	2,379,430	9.6117	22,870,368	2,504,416	1,840,459	4.9619	9,132,172	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	32,921,147
2075	3,569,646	2,623,281	10.0009	26,235,173	3,499,884	2,572,014	5.1033	13,125,758	1,250,000	918,607	1.0000	918,607	8,319,530	6,113,902	40,279,538
2076	3,246,170	2,385,563	10.4060	24,824,173	2,513,129	1,846,862	5.2487	9,693,624	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	35,436,404
2077	3,237,974	2,379,540	10.8274	25,764,234	14,152,775	10,400,669	5.3983	56,145,933	1,250,000	918,607	1.0000	918,607	18,640,749	13,698,817	82,828,774
2078	832,743	611,971	11.2659	6,894,405	4,620,063	3,395,217	5.5522	18,850,925	0	0	1.0000	0	5,452,806	4,007,188	25,745,329
	\$481,031,633	\$353,503,191		\$1,096,648,885	\$459,759,673	\$337,870,735		\$746,933,573	\$56,250,000	\$41,337,312		\$41,337,312	\$997,041,305	\$732,711,237	\$1,884,919,770

AMOUNT TO RECOVER															
LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s	
Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2034	\$7,760,265	\$5,702,906	1.9639	\$11,199,938	\$4,479,535	\$3,291,946	1.6124	\$5,307,933	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459	\$17,426,478
2035	46,911,429	34,474,531	2.0434	70,445,256	35,601,339	26,162,909	1.6584	43,388,568	1,250,000	918,607	1.0000	918,607	83,762,768	61,556,047	114,752,431
2036	67,514,044	49,615,094	2.1262	105,491,613	86,298,832	63,419,763	1.7056	108,168,748	1,250,000	918,607	1.0000	918,607	155,062,875	113,953,465	214,578,969
2037	70,896,041	52,100,475	2.2123	115,261,881	70,558,163	51,852,174	1.7542	90,959,083	1,250,000	918,607	1.0000	918,607	142,704,204	104,871,256	207,139,571
2038	46,603,528	34,248,259	2.3019	78,836,068	42,782,149	31,439,982	1.8042	56,724,016	1,250,000	918,607	1.0000	918,607	90,635,677	66,606,848	136,478,691
2039	40,663,625	29,883,110	2.3951	71,573,036	37,452,618	26,918,809	1.8556	105,618,542	1,250,000	918,607	1.0000	918,607	119,366,242	87,720,525	178,110,184
2040	37,417,177	27,497,343	2.4921	68,526,127	14,193,501	10,430,599	1.9085	19,906,798	1,250,000	918,607	1.0000	918,607	52,860,679	38,846,548	89,351,532
2041	23,327,583	17,143,103	2.5930	44,452,067	13,070,130	9,605,049	1.9629	18,853,752	1,250,000	918,607	1.0000	918,607	37,647,713	27,666,740	64,224,462
2042	16,656,921	12,240,930	2.6981	33,027,253	17,178,640	12,624,334	2.0189	25,487,268	1,250,000	918,607	1.0000	918,607	35,085,561	25,783,871	59,433,129
2043	9,422,862	6,924,725	2.8073	19,439,782	9,074,042	6,668,382	2.0764	13,846,228	1,250,000	918,607	1.0000	918,607	19,746,904	14,511,714	34,204,617
2044	3,054,798	2,244,927	2.9210	6,557,431	1,939,011	1,424,951	2.1356	3,043,125	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	10,519,163
2045	3,046,451	2,238,793	3.0393	6,804,363	1,930,298	1,418,548	2.1964	3,115,698	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	10,838,668
2046	3,046,451	2,238,793	3.1624	7,079,958	1,930,298	1,418,548	2.2590	3,204,499	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	11,203,065
2047	3,046,451	2,238,793	3.2905	7,366,748	1,930,298	1,418,548	2.3234	3,295,854	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	11,581,208
2048	3,054,798	2,244,927	3.4238	7,686,181	1,939,011	1,424,951	2.3896	3,405,063	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	12,009,850
2049	3,046,451	2,238,793	3.5624	7,975,475	1,930,298	1,418,548	2.4577	3,486,365	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	12,380,447
2050	3,046,451	2,238,793	3.7067	8,298,533	1,930,298	1,418,548	2.5278	3,585,805	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	12,802,945
2051	3,046,451	2,238,793	3.8568	8,634,576	1,930,298	1,418,548	2.5998	3,687,940	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	13,241,123
2052	3,054,798	2,244,927	4.0130	9,008,892	1,939,011	1,424,951	2.6739	3,810,176	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	13,737,675
2053	3,142,138	2,309,112	4.1756	9,641,927	2,217,358	1,629,504	2.7501	4,481,299	1,250,000	918,607	1.0000	918,607	6,609,496	4,857,223	15,041,833
2054	3,237,824	2,379,430	4.3447	10,337,910	2,504,416	1,840,459	2.8285	5,205,738	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	16,462,254
2055	3,237,824	2,379,430	4.5206	10,756,451	2,504,416	1,840,459	2.9091	5,354,079	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	17,029,137
2056	3,294,014	2,420,723	4.7037	11,386,356	2,656,659	1,952,340	2.9920	5,841,401	1,250,000	918,607	1.0000	918,607	7,200,673	5,291,670	18,146,364
2057	3,189,981	2,344,271	4.8942	11,473,331	2,360,887	1,734,981	3.0773	5,339,058	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	17,730,996
2058	3,333,510	2,449,748	5.0924	12,475,098	2,791,475	2,051,414	3.1650	6,492,726	1,250,000	918,607	1.0000	918,607	7,374,985	5,419,769	19,886,431
2059	3,189,981	2,344,271	5.2987	12,421,588	2,360,887	1,734,981	3.2552	5,647,711	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	18,987,907
2060	3,150,484	2,315,245	5.5133	12,764,641	2,226,070	1,635,906	3.3480	5,477,015	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758	19,160,263
2061	3,237,824	2,379,430	5.7366	13,649,838	2,504,416	1,840,459	3.4434	6,337,436	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	20,905,881
2062	3,237,824	2,379,430	5.9689	14,202,580	2,504,416	1,840,459	3.5415	6,517,985	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	21,639,172
2063	3,189,981	2,344,271	6.2106	14,559,329	2,360,887	1,734,981	3.6425	6,319,670	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	21,797,605
2064	3,246,170	2,385,563	6.4622	15,415,988	2,513,129	1,846,862	3.7463	6,918,899	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	23,253,493
2065	3,237,824	2,379,430	6.7239	15,999,050	2,504,416	1,840,459	3.8531	7,091,472	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	24,009,128
2066	3,189,981	2,344,271	6.9962	16,400,988	2,360,887	1,734,981	3.9629	6,875,558	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	24,195,153
2067	3,237,824	2,379,430	7.2795	17,321,061	2,504,416	1,840,459	4.0758	7,501,342	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	25,741,010
2068	3,246,170	2,385,563	7.5744	18,069,211	2,513,129	1,846,862	4.1920	7,742,045	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	26,729,863
2069	3,189,981	2,344,271	7.8811	18,475,433	2,360,887	1,734,981	4.3115	7,480,372	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	26,874,413
2070	3,237,824	2,379,430	8.2003	19,512,040	2,504,416	1,840,459	4.4343	8,161,146	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	28,591,793
2071	3,237,824	2,379,430	8.5324	20,302,249	2,504,416	1,840,459	4.5607	8,393,780	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	29,614,636
2072	3,246,170	2,385,563	8.8780	21,179,032	2,513,129	1,846,862	4.6907	8,663,075	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	30,760,714
2073	3,237,824	2,379,430	9.2375	21,979,985	2,504,416	1,840,459	4.8244	8,879,109	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	31,777,701
2074	3,237,824	2,379,430	9.6117	22,870,368	2,504,416	1,840,459	4.9619	9,132,172	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	32,921,147
2075	3,569,646	2,623,281	10.0009	26,235,173	3,499,884	2,572,014	5.1033	13,125,758	1,250,000	918,607	1.0000	918,607	8,319,530	6,113,902	40,279,538
2076	3,246,170	2,385,563	10.4060	24,824,173	2,513,129	1,846,862	5.2487	9,693,624	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	35,436,404
2077	3,237,824	2,379,430	10.8274	25,763,042	1,415,2675	10,400,596	5.3983	56,145,536	1,250,000	918,607	1.0000	918,607	18,640,499	13,698,633	82,827,186
2078	832,743	611,971	11.2659	6,894,405	4,620,063	3,395,217	5.5522	18,850,925	0	-	1.0000	-	5,452,806	4,007,188	25,745,329
	\$476,489,759	\$350,165,433		\$1,112,576,425	\$467,153,049	\$343,304,020		\$766,564,392	\$55,000,000	\$40,418,705		\$40,418,705	\$998,642,807	\$733,888,158	\$1,919,559,522
	\$1,809,340,794	\$1,329,658,384		\$4,875,326,592	\$1,590,942,995	\$1,169,161,000		\$2,736,878,615	\$111,250,000	\$81,756,016		\$81,756,016	\$3,511,533,789	\$2,580,575,401	\$7,693,961,224

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,675,506	-	6,696,113	646,043,801
2018	646,043,801	32,636,996	-	13,392,226	692,073,023
2019	692,073,023	34,938,457	-	13,392,226	740,403,706
2020	740,403,706	37,354,991	-	13,392,226	791,150,922
2021	791,150,922	40,150,269	-	23,708,908	855,010,100
2022	855,010,100	43,343,228	-	23,708,908	922,062,236
2023	922,062,236	46,695,835	-	23,708,908	992,466,979
2024	992,466,979	50,216,072	-	23,708,908	1,066,391,959
2025	1,066,391,959	53,912,321	-	23,708,908	1,144,013,188
2026	1,144,013,188	57,793,382	-	23,708,908	1,225,515,479
2027	1,225,515,479	61,868,497	-	23,708,908	1,311,092,884
2028	1,311,092,884	66,147,367	-	23,708,908	1,400,949,159
2029	1,400,949,159	70,640,181	-	23,708,908	1,495,298,248
2030	1,495,298,248	66,635,577	(35,447,395)	17,781,681	1,544,268,112
2031	1,544,268,112	68,411,077	(139,568,874)	-	1,473,110,315
2032	1,473,110,315	65,258,787	(219,169,243)	-	1,319,199,858
2033	1,319,199,858	58,440,554	(224,495,047)	-	1,153,145,365
2034	1,153,145,365	51,084,340	(141,890,436)	-	1,062,339,269
2035	1,062,339,269	47,061,630	(268,360,596)	-	841,040,302
2036	841,040,302	37,258,085	(104,537,352)	-	773,761,036
2037	773,761,036	34,277,614	(74,591,555)	-	733,447,095
2038	733,447,095	32,491,706	(70,060,446)	-	695,878,355
2039	695,878,355	30,827,411	(13,411,297)	-	713,294,470
2040	713,294,470	31,598,945	(13,956,540)	-	730,936,875
2041	730,936,875	32,380,504	(14,445,460)	-	748,871,919
2042	748,871,919	33,175,026	(14,993,096)	-	767,053,848
2043	767,053,848	33,980,485	(15,560,997)	-	785,473,337
2044	785,473,337	34,796,469	(16,195,160)	-	804,074,645
2045	804,074,645	35,620,507	(16,764,051)	-	822,931,101
2046	822,931,101	36,455,848	(17,400,672)	-	841,986,278
2047	841,986,278	37,299,992	(18,061,957)	-	861,224,313
2048	861,224,313	38,152,237	(23,965,832)	-	875,410,718
2049	875,410,718	38,780,695	(19,461,728)	-	894,729,684
2050	894,729,684	39,636,525	(32,591,701)	-	901,774,508
2051	901,774,508	39,948,611	(33,762,728)	-	907,960,391
2052	907,960,391	40,222,645	(42,664,601)	-	905,518,436
2053	905,518,436	40,114,467	(50,020,075)	-	895,612,827
2054	895,612,827	39,675,648	(39,576,076)	-	895,712,399

EXTERNAL FUND CALCULATION

2055	895,712,399	39,680,059	(51,492,366)	-	883,900,092
2056	883,900,092	39,156,774	(57,711,424)	-	865,345,442
2057	865,345,442	38,334,803	(26,084,323)	-	877,595,922
2058	877,595,922	38,877,499	(27,082,664)	-	889,390,758
2059	889,390,758	39,400,011	(28,120,102)	-	900,670,666
2060	900,670,666	39,899,710	(29,277,655)	-	911,292,721
2061	911,292,721	40,370,268	(30,317,084)	-	921,345,905
2062	921,345,905	40,815,624	(31,479,823)	-	930,681,705
2063	930,681,705	41,229,200	(32,687,933)	-	939,222,972
2064	939,222,972	41,607,578	(34,036,420)	-	946,794,129
2065	946,794,129	41,942,980	(35,247,487)	-	953,489,622
2066	953,489,622	42,239,590	(36,602,285)	-	959,126,927
2067	959,126,927	42,489,323	(38,009,714)	-	963,606,536
2068	963,606,536	42,687,770	(39,580,836)	-	966,713,469
2069	966,713,469	42,825,407	(40,992,094)	-	968,546,782
2070	968,546,782	42,906,622	(42,570,952)	-	968,882,453
2071	968,882,453	42,921,493	(44,211,476)	-	967,592,469
2072	967,592,469	42,864,346	(46,042,068)	-	964,414,747
2073	964,414,747	42,723,573	(47,687,235)	-	959,451,086
2074	959,451,086	42,503,683	(49,527,994)	-	952,426,775
2075	952,426,775	42,192,506	(51,440,009)	-	943,179,272
2076	943,179,272	41,782,842	(53,573,717)	-	931,388,397
2077	931,388,397	41,260,506	(55,492,052)	-	917,156,851
2078	917,156,851	40,630,048	(67,392,551)	-	890,394,348
2079	890,394,348	39,444,470	(71,976,743)	-	857,862,074
2080	857,862,074	38,003,290	(72,771,874)	-	823,093,490
2081	823,093,490	36,463,042	(75,357,480)	-	784,199,051
2082	784,199,051	34,740,018	(78,220,169)	-	740,718,900
2083	740,718,900	32,813,847	(83,507,127)	-	690,025,621
2084	690,025,621	30,568,135	(84,479,492)	-	636,114,264
2085	636,114,264	28,179,862	(87,488,590)	-	576,805,536
2086	576,805,536	25,552,485	(90,819,524)	-	511,538,498
2087	511,538,498	22,661,155	(96,920,580)	-	437,279,073
2088	437,279,073	19,371,463	(117,036,091)	-	339,614,445
2089	339,614,445	15,044,920	(101,606,814)	-	253,052,551
2090	253,052,551	11,210,228	(96,734,813)	-	167,527,966
2091	167,527,966	7,421,489	(174,949,455)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,340,765	-	24,632	383,732,452
2018	383,732,452	19,149,479	-	49,264	402,931,195
2019	402,931,195	20,107,496	-	49,264	423,087,955
2020	423,087,955	21,113,318	-	49,264	444,250,538
2021	444,250,538	22,627,204	-	18,400,907	485,278,649
2022	485,278,649	24,674,507	-	18,400,907	528,354,063
2023	528,354,063	26,823,970	-	18,400,907	573,578,940
2024	573,578,940	29,080,692	-	18,400,907	621,060,539
2025	621,060,539	31,450,024	-	18,400,907	670,911,469
2026	670,911,469	33,937,585	-	18,400,907	723,249,961
2027	723,249,961	36,549,276	-	18,400,907	778,200,143
2028	778,200,143	39,291,290	-	18,400,907	835,892,340
2029	835,892,340	42,170,130	-	18,400,907	896,463,377
2030	896,463,377	45,192,625	-	18,400,907	960,056,909
2031	960,056,909	48,365,942	-	18,400,907	1,026,823,758
2032	1,026,823,758	51,697,608	-	18,400,907	1,096,922,273
2033	1,096,922,273	45,778,093	(43,091,536)	12,328,608	1,111,937,438
2034	1,111,937,438	46,145,404	(132,256,979)	-	1,025,825,863
2035	1,025,825,863	42,571,773	(198,854,122)	-	869,543,514
2036	869,543,514	36,086,056	(173,386,484)	-	732,243,086
2037	732,243,086	30,388,088	(110,434,710)	-	652,196,464
2038	652,196,464	27,066,153	(48,446,241)	-	630,816,377
2039	630,816,377	26,178,880	(168,633,958)	-	488,361,298
2040	488,361,298	20,266,994	(78,121,996)	-	430,506,296
2041	430,506,296	17,866,011	(51,838,628)	-	396,533,679
2042	396,533,679	16,456,148	(47,540,570)	-	365,449,257
2043	365,449,257	15,166,144	(28,453,465)	-	352,161,936
2044	352,161,936	14,614,720	(10,519,163)	-	356,257,493
2045	356,257,493	14,784,686	(10,838,668)	-	360,203,511
2046	360,203,511	14,948,446	(11,203,065)	-	363,948,892
2047	363,948,892	15,103,879	(11,581,208)	-	367,471,563
2048	367,471,563	15,250,070	(12,009,850)	-	370,711,783
2049	370,711,783	15,384,539	(12,380,447)	-	373,715,875
2050	373,715,875	15,509,209	(12,802,945)	-	376,422,138
2051	376,422,138	15,621,519	(13,241,123)	-	378,802,534
2052	378,802,534	15,720,305	(13,737,675)	-	380,785,164
2053	380,785,164	15,802,584	(15,041,831)	-	381,545,917
2054	381,545,917	15,834,156	(16,462,254)	-	380,917,819
2055	380,917,819	15,808,089	(17,029,137)	-	379,696,771

Proposed

EXTERNAL FUND CALCULATION

2056	379,696,771	15,757,416	(18,146,364)	-	377,307,823
2057	377,307,823	15,658,275	(17,730,996)	-	375,235,102
2058	375,235,102	15,572,257	(19,886,431)	-	370,920,928
2059	370,920,928	15,393,218	(18,987,907)	-	367,326,240
2060	367,326,240	15,244,039	(19,160,263)	-	363,410,016
2061	363,410,016	15,081,516	(20,905,881)	-	357,585,651
2062	357,585,651	14,839,805	(21,639,172)	-	350,786,284
2063	350,786,284	14,557,631	(21,797,605)	-	343,546,309
2064	343,546,309	14,257,172	(23,253,493)	-	334,549,987
2065	334,549,987	13,883,824	(24,009,128)	-	324,424,684
2066	324,424,684	13,463,624	(24,195,153)	-	313,693,155
2067	313,693,155	13,018,266	(25,741,010)	-	300,970,412
2068	300,970,412	12,490,272	(26,729,863)	-	286,730,820
2069	286,730,820	11,899,329	(26,874,413)	-	271,755,737
2070	271,755,737	11,277,863	(28,591,793)	-	254,441,807
2071	254,441,807	10,559,335	(29,614,636)	-	235,386,506
2072	235,386,506	9,768,540	(30,760,714)	-	214,394,332
2073	214,394,332	8,897,365	(31,777,701)	-	191,513,995
2074	191,513,995	7,947,831	(32,921,147)	-	166,540,679
2075	166,540,679	6,911,438	(40,279,538)	-	133,172,579
2076	133,172,579	5,526,662	(35,436,404)	-	103,262,838
2077	103,262,838	4,285,408	(82,828,774)	-	24,719,471
2078	24,719,471	1,025,858	(25,745,329)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,592,979	-	294,670	431,096,616
2018	431,096,616	21,742,121	-	589,341	453,428,078
2019	453,428,078	22,867,627	-	589,341	476,885,046
2020	476,885,046	24,049,858	-	589,341	501,524,244
2021	501,524,244	25,551,741	-	10,909,487	537,985,472
2022	537,985,472	27,389,387	-	10,909,487	576,284,346
2023	576,284,346	29,319,650	-	10,909,487	616,513,483
2024	616,513,483	31,347,199	-	10,909,487	658,770,168
2025	658,770,168	33,476,936	-	10,909,487	703,156,591
2026	703,156,591	35,714,011	-	10,909,487	749,780,089
2027	749,780,089	38,063,836	-	10,909,487	798,753,411
2028	798,753,411	40,532,091	-	10,909,487	850,194,989
2029	850,194,989	43,124,747	-	10,909,487	904,229,222
2030	904,229,222	45,848,072	-	10,909,487	960,986,781
2031	960,986,781	48,708,653	-	10,909,487	1,020,604,921
2032	1,020,604,921	51,713,407	-	10,909,487	1,083,227,815
2033	1,083,227,815	54,869,601	-	10,909,487	1,149,006,903
2034	1,149,006,903	47,179,554	(17,426,478)	9,054,874	1,187,814,854
2035	1,187,814,854	48,581,628	(114,752,431)	-	1,121,644,050
2036	1,121,644,050	45,875,242	(214,578,969)	-	952,940,323
2037	952,940,323	38,975,259	(207,139,571)	-	784,776,011
2038	784,776,011	32,097,339	(136,478,691)	-	680,394,659
2039	680,394,659	27,828,142	(178,110,184)	-	530,112,616
2040	530,112,616	21,681,606	(89,351,532)	-	462,442,690
2041	462,442,690	18,913,906	(64,224,426)	-	417,132,170
2042	417,132,170	17,060,706	(59,433,129)	-	374,759,747
2043	374,759,747	15,327,674	(34,204,617)	-	355,882,804
2044	355,882,804	14,555,607	(10,519,163)	-	359,919,247
2045	359,919,247	14,720,697	(10,838,668)	-	363,801,277
2046	363,801,277	14,879,472	(11,203,065)	-	367,477,684
2047	367,477,684	15,029,837	(11,581,208)	-	370,926,313
2048	370,926,313	15,170,886	(12,009,850)	-	374,087,349
2049	374,087,349	15,300,173	(12,380,447)	-	377,007,075
2050	377,007,075	15,419,589	(12,802,945)	-	379,623,719
2051	379,623,719	15,526,610	(13,241,123)	-	381,909,206
2052	381,909,206	15,620,087	(13,737,675)	-	383,791,617
2053	383,791,617	15,697,077	(15,041,833)	-	384,446,862
2054	384,446,862	15,723,877	(16,462,254)	-	383,708,484

Proposed

EXTERNAL FUND CALCULATION

2055	383,708,484	15,693,677	(17,029,137)	-	382,373,024
2056	382,373,024	15,639,057	(18,146,364)	-	379,865,717
2057	379,865,717	15,536,508	(17,730,996)	-	377,671,229
2058	377,671,229	15,446,753	(19,886,431)	-	373,231,551
2059	373,231,551	15,265,170	(18,987,907)	-	369,508,815
2060	369,508,815	15,112,911	(19,160,263)	-	365,461,463
2061	365,461,463	14,947,374	(20,905,881)	-	359,502,955
2062	359,502,955	14,703,671	(21,639,172)	-	352,567,455
2063	352,567,455	14,420,009	(21,797,605)	-	345,189,858
2064	345,189,858	14,118,265	(23,253,493)	-	336,054,630
2065	336,054,630	13,744,634	(24,009,128)	-	325,790,136
2066	325,790,136	13,324,817	(24,195,153)	-	314,919,800
2067	314,919,800	12,880,220	(25,741,010)	-	302,059,010
2068	302,059,010	12,354,214	(26,729,863)	-	287,683,360
2069	287,683,360	11,766,249	(26,874,413)	-	272,575,197
2070	272,575,197	11,148,326	(28,591,793)	-	255,131,730
2071	255,131,730	10,434,888	(29,614,636)	-	235,951,981
2072	235,951,981	9,650,436	(30,760,714)	-	214,841,703
2073	214,841,703	8,787,026	(31,777,701)	-	191,851,028
2074	191,851,028	7,846,707	(32,921,147)	-	166,776,588
2075	166,776,588	6,821,162	(40,279,538)	-	133,318,213
2076	133,318,213	5,452,715	(35,436,404)	-	103,334,524
2077	103,334,524	4,226,382	(82,827,186)	-	24,733,720
2078	24,733,720	1,011,609	(25,745,329)	-	0

2021 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$59,441,865	\$46,049,639
Prairie Island Unit 1	49,264	34,479,626	34,430,362
Prairie Island Unit 2	589,341	21,951,682	21,362,341
TOTAL	\$14,030,831	\$115,873,173	\$101,842,342

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
DECON Method - No Recasking
5-Year Early Shutdown

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Proposed

2021 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2021 Decommissioning Accrual
Monticello	8.75	5.00%	4.43%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	59,441,865
Prairie Island Unit 1	11.67	4.99%	4.15%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	34,479,626
Prairie Island Unit 2	12.83	5.04%	4.09%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	21,951,682
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$115,873,173

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

LABOR				NON-LABOR				PHIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional
Cost Estimate	Jurisdictional	Escalation	Jurisdictional	Cost Estimate	Jurisdictional	Escalation	Jurisdictional	Cost Estimate	Jurisdictional	Escalation	Jurisdictional	Estimate	Cost in	Cost in
Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Future \$'s
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Monticello														
Factors	2017	73.4886%	4.05%				2.85%				0.00%			
2025	\$21,103,620	\$15,508,745	1.3738	\$21,305,914	\$8,935,561	\$6,566,615	1.2521	\$8,222,059	\$0	\$0	1.0000	\$30,039,182	\$22,075,360	\$29,527,973
2026	72,416,242	53,217,649	1.4295	76,074,629	42,961,353	31,571,677	1.2878	40,658,006	0	0	1.0000	115,377,595	84,789,326	116,732,635
2027	78,476,357	57,671,140	1.4874	85,780,054	102,263,189	75,151,739	1.3245	99,538,478	0	0	1.0000	180,739,546	132,822,879	185,318,532
2028	78,663,227	57,808,468	1.5476	89,464,385	100,155,666	73,602,950	1.3622	100,261,939	0	0	1.0000	178,818,892	131,411,418	189,726,324
2029	66,380,423	48,782,013	1.6103	78,553,675	38,894,671	28,583,132	1.4010	40,044,967	0	0	1.0000	105,275,094	77,365,144	118,598,642
2030	86,879,803	63,846,711	1.6755	106,975,164	113,147,091	83,150,161	1.4410	119,819,382	0	0	1.0000	200,026,894	146,996,872	226,794,546
2031	50,307,504	36,970,257	1.7434	64,453,946	20,688,337	15,203,559	1.4820	22,531,675	0	0	1.0000	70,995,841	52,173,817	86,985,621
2032	34,623,126	25,444,035	1.8140	46,155,479	14,196,883	10,433,084	1.5243	15,903,150	0	0	1.0000	48,820,010	35,877,119	62,058,629
2033	29,581,478	21,739,000	1.8874	41,030,189	15,098,979	11,096,021	1.5677	17,395,233	0	0	1.0000	44,680,457	32,835,022	58,425,422
2034	5,925,016	4,354,209	1.9639	8,551,230	2,187,162	1,607,314	1.6124	2,591,633	0	0	1.0000	8,112,178	5,961,523	11,142,863
2035	5,941,203	4,366,104	2.0434	8,921,697	2,193,018	1,611,617	1.6584	2,672,706	0	0	1.0000	8,134,221	5,977,722	11,594,404
2036	5,925,016	4,354,209	2.1262	9,257,918	2,187,162	1,607,314	1.7056	2,741,435	0	0	1.0000	8,112,178	5,961,523	11,999,353
2037	5,925,016	4,354,209	2.2123	9,632,816	2,187,162	1,607,314	1.7542	2,819,550	0	0	1.0000	8,112,178	5,961,523	12,452,366
2038	5,925,016	4,354,209	2.3019	10,022,953	2,187,162	1,607,314	1.8042	2,899,916	0	0	1.0000	8,112,178	5,961,523	12,922,869
2039	5,941,203	4,366,104	2.3951	10,457,256	2,193,018	1,611,617	1.8556	2,990,517	0	0	1.0000	8,134,221	5,977,722	13,447,773
2040	5,925,016	4,354,209	2.4921	10,851,123	2,187,162	1,607,314	1.9085	3,067,559	0	0	1.0000	8,112,178	5,961,523	13,918,682
2041	5,925,016	4,354,209	2.5930	11,290,463	2,187,162	1,607,314	1.9629	3,154,997	0	0	1.0000	8,112,178	5,961,523	14,445,460
2042	5,925,016	4,354,209	2.6981	11,748,090	2,187,162	1,607,314	2.0189	3,245,006	0	0	1.0000	8,112,178	5,961,523	14,993,096
2043	6,604,848	4,853,807	2.8073	13,626,093	4,183,953	3,074,727	2.0764	6,384,363	0	0	1.0000	10,788,801	7,928,534	20,010,456
2044	5,925,016	4,354,209	2.9210	12,718,643	2,187,162	1,607,314	2.1356	3,432,580	0	0	1.0000	8,112,178	5,961,523	16,151,223
2045	7,418,217	5,451,540	3.0393	16,568,867	6,666,766	4,899,310	2.1964	10,760,845	0	0	1.0000	14,084,983	10,350,851	27,329,712
2046	7,418,217	5,451,540	3.1624	17,239,951	6,666,766	4,899,310	2.2590	11,067,542	0	0	1.0000	14,084,983	10,350,851	28,307,493
2047	8,296,904	6,097,275	3.2905	20,063,083	9,260,122	6,805,130	2.3234	15,811,039	0	0	1.0000	17,557,026	12,902,405	35,874,122
2048	8,927,592	6,560,758	3.4238	22,462,724	11,194,891	8,226,964	2.3896	19,659,153	0	0	1.0000	20,122,483	14,787,722	42,121,877
2049	7,633,842	5,610,000	3.5624	19,985,064	7,313,641	5,374,689	2.4577	13,209,374	0	0	1.0000	14,947,483	10,984,689	33,194,438
2050	8,711,967	6,402,299	3.7067	23,731,400	10,548,016	7,751,585	2.5278	19,594,456	0	0	1.0000	19,259,983	14,153,883	43,325,856
2051	9,159,404	6,731,114	3.8568	25,960,559	11,847,622	8,706,646	2.5998	22,635,539	0	0	1.0000	21,007,026	15,437,760	48,596,098
2052	5,908,425	4,342,016	4.0130	17,424,511	2,137,389	1,570,737	2.6739	4,199,993	0	0	1.0000	8,045,814	5,912,753	21,624,503
2053	5,908,425	4,342,016	4.1756	18,130,522	2,137,389	1,570,737	2.7501	4,319,683	0	0	1.0000	8,045,814	5,912,753	22,450,205
2054	5,908,425	4,342,016	4.3447	18,864,757	2,137,389	1,570,737	2.8285	4,442,828	0	0	1.0000	8,045,814	5,912,753	23,307,586
2055	5,924,612	4,353,912	4.5206	19,682,293	2,143,245	1,575,040	2.9091	4,581,949	0	0	1.0000	8,067,857	5,928,952	24,264,242
2056	5,908,425	4,342,016	4.7037	20,423,541	2,137,389	1,570,737	2.9920	4,699,644	0	0	1.0000	8,045,814	5,912,753	25,123,185
2057	5,908,425	4,342,016	4.8942	21,250,695	2,137,389	1,570,737	3.0773	4,833,628	0	0	1.0000	8,045,814	5,912,753	26,084,323
2058	5,908,425	4,342,016	5.0924	22,111,283	2,137,389	1,570,737	3.1650	4,971,381	0	0	1.0000	8,045,814	5,912,753	27,082,664
2059	5,924,612	4,353,912	5.2987	23,070,072	2,143,245	1,575,040	3.2552	5,127,070	0	0	1.0000	8,067,857	5,928,952	28,197,142
2060	5,908,425	4,342,016	5.5133	23,938,837	2,137,389	1,570,737	3.3480	5,258,826	0	0	1.0000	8,045,814	5,912,753	29,197,663
2061	5,908,425	4,342,016	5.7366	24,908,410	2,137,389	1,570,737	3.4434	5,408,674	0	0	1.0000	8,045,814	5,912,753	30,317,084
2062	5,908,425	4,342,016	5.9689	25,917,060	2,137,389	1,570,737	3.5415	5,562,764	0	0	1.0000	8,045,814	5,912,753	31,479,823
2063	5,924,612	4,353,912	6.2106	27,040,404	2,143,245	1,575,040	3.6425	5,737,083	0	0	1.0000	8,067,857	5,928,952	32,777,487
2064	5,908,425	4,342,016	6.4622	28,058,976	2,137,389	1,570,737	3.7463	5,884,450	0	0	1.0000	8,045,814	5,912,753	33,943,427
2065	5,908,425	4,342,016	6.7239	29,195,282	2,137,389	1,570,737	3.8531	6,052,205	0	0	1.0000	8,045,814	5,912,753	35,247,487
2066	5,908,425	4,342,016	6.9962	30,377,613	2,137,389	1,570,737	3.9629	6,224,672	0	0	1.0000	8,045,814	5,912,753	36,602,285
2067	5,924,612	4,353,912	7.2795	31,694,300	2,143,245	1,575,040	4.0758	6,419,548	0	0	1.0000	8,067,857	5,928,952	38,113,848
2068	5,908,425	4,342,016	7.5744	32,888,167	2,137,389	1,570,737	4.1920	6,584,528	0	0	1.0000	8,045,814	5,912,753	39,472,694
2069	5,908,425	4,342,016	7.8811	34,219,863	2,137,389	1,570,737	4.3115	6,772,231	0	0	1.0000	8,045,814	5,912,753	40,992,094
2070	5,908,425	4,342,016	8.2003	35,605,835	2,137,389	1,570,737	4.4343	6,965,117	0	0	1.0000	8,045,814	5,912,753	42,570,952
2071	5,924,612	4,353,912	8.5324	37,149,316	2,143,245	1,575,040	4.5607	7,183,285	0	0	1.0000	8,067,857	5,928,952	44,332,601
2072	5,908,425	4,342,016	8.8780	38,548,419	2,137,389	1,570,737	4.6907	7,367,854	0	0	1.0000	8,045,814	5,912,753	45,916,273
2073	6,386,857	4,693,609	9.2375	43,357,212	3,557,353	2,614,247	4.8244	12,612,174	0	0	1.0000	9,944,210	7,307,856	55,969,386
2074	6,482,543	4,763,927	9.6117	45,789,438	3,844,412	2,825,203	4.9619	14,018,373	0	0	1.0000	10,326,955	7,589,130	59,807,811
2075	6,403,045	4,705,505	10.0009	47,059,287	3,563,167	2,618,520	5.1033	13,363,091	0	0	1.0000	9,966,212	7,324,025	60,422,378
2076	6,386,857	4,693,609	10.4060	48,841,694	3,557,353	2,614,247	5.2487	13,721,399	0	0	1.0000	9,944,210	7,307,856	62,563,093
2077	6,386,857	4,693,609	10.8274	50,819,580	3,557,353	2,614,247	5.3983	14,112,490	0	0	1.0000	9,944,210	7,307,856	64,932,071
2078	6,482,543	4,763,927	11.2659	53,669,926	3,844,412	2,825,203	5.5522	15,686,090	0	0	1.0000	10,326,955	7,589,130	69,356,016

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
2079	6,403,045	4,705,505	11.7222	55,158,873	3,563,167	2,618,520	5.7104	14,952,795	0	0	1.0000	0	9,966,212	7,324,025	70,111,667
2080	6,386,857	4,693,609	12.1970	57,247,947	3,557,353	2,614,247	5.8731	15,353,735	0	0	1.0000	0	9,944,210	7,307,856	72,601,682
2081	6,386,857	4,693,609	12.6909	59,566,121	3,557,353	2,614,247	6.0405	15,791,360	0	0	1.0000	0	9,944,210	7,307,856	75,357,480
2082	6,482,543	4,763,927	13.2049	62,907,181	3,844,412	2,825,203	6.2127	17,552,136	0	0	1.0000	0	10,326,955	7,589,130	80,459,317
2083	7,066,689	5,193,208	13.7397	71,353,114	5,554,101	4,081,628	6.3897	26,080,380	0	0	1.0000	0	12,620,790	9,274,836	97,433,494
2084	6,386,857	4,693,609	14.2962	67,100,771	3,557,353	2,614,247	6.5719	17,180,571	0	0	1.0000	0	9,944,210	7,307,856	84,281,342
2085	6,099,798	4,482,653	14.8752	66,680,365	2,696,175	1,981,380	6.7592	13,392,543	0	0	1.0000	0	8,795,973	6,464,033	80,072,908
2086	2,034,890	1,495,411	15.4776	23,145,375	24,955,010	18,339,076	6.9518	127,489,587	0	0	1.0000	0	26,989,900	19,834,487	150,634,962
	\$851,819,402	\$625,989,760		\$2,186,080,404	\$664,030,274	\$487,986,246		\$1,063,017,234	\$0	\$0		\$0	\$1,515,849,676	\$1,113,976,006	\$3,249,097,637

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**Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
DECON Method - No Recasking
5-Year Early Shutdown**

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in			
Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in						
Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s				Nominal \$	Nominal \$	Future \$'s
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)				(13)	(14)	(15)
Prairie Island Unit 2																	
Factors	2017	73.4886%	4.05%				2.85%				0.00%						
2029	\$7,760,265	\$5,702,906	1.6103	\$9,183,390	\$4,479,535	\$3,291,946	1.4010	\$4,612,016	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459	\$14,714,013		
2030	46,911,429	34,474,531	1.6755	57,762,076	35,601,339	26,162,909	1.4410	37,700,752	1,250,000	918,607	1.0000	918,607	83,762,768	61,556,407	96,381,435		
2031	67,514,044	49,615,094	1.7434	86,498,955	86,298,832	63,419,763	1.4820	93,988,089	1,250,000	918,607	1.0000	918,607	155,062,875	115,953,465	181,405,652		
2032	70,896,041	52,100,475	1.8140	94,510,262	70,558,163	51,852,174	1.5243	79,038,268	1,250,000	918,607	1.0000	918,607	142,704,204	104,871,256	174,467,137		
2033	46,603,528	34,248,259	1.8874	64,640,164	42,782,149	31,439,982	1.5677	49,288,460	1,250,000	918,607	1.0000	918,607	90,635,677	66,606,848	114,847,231		
2034	40,663,625	29,883,110	1.9639	58,687,439	77,452,618	56,918,809	1.6124	91,775,887	1,250,000	918,607	1.0000	918,607	119,366,242	87,720,525	151,381,933		
2035	37,417,177	27,497,343	2.0434	56,188,070	14,193,501	10,430,599	1.6584	17,298,105	1,250,000	918,607	1.0000	918,607	52,860,679	38,846,548	74,404,782		
2036	23,327,583	17,143,103	2.1262	36,449,666	13,070,130	9,605,049	1.7056	16,382,372	1,250,000	918,607	1.0000	918,607	37,647,713	27,666,760	53,750,646		
2037	16,656,921	12,240,930	2.2123	27,080,609	17,178,640	12,624,334	1.7542	22,145,607	1,250,000	918,607	1.0000	918,607	35,085,561	25,783,871	50,144,824		
2038	9,422,862	6,924,725	2.3019	15,940,025	9,074,042	6,668,382	1.8042	12,031,095	1,250,000	918,607	1.0000	918,607	19,746,904	14,511,714	28,889,727		
2039	3,054,798	2,244,927	2.3951	5,376,824	1,939,011	1,424,951	1.8556	2,644,139	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	8,939,570		
2040	3,046,451	2,238,793	2.4921	5,579,295	1,930,298	1,418,548	1.9085	2,707,298	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	9,205,201		
2041	3,046,451	2,238,793	2.5930	5,805,190	1,930,298	1,418,548	1.9629	2,784,467	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	9,508,264		
2042	3,046,451	2,238,793	2.6981	6,040,487	1,930,298	1,418,548	2.0189	2,863,906	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	9,823,000		
2043	3,054,798	2,244,927	2.8073	6,302,183	1,939,011	1,424,951	2.0764	2,958,768	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	10,179,558		
2044	3,046,451	2,238,793	2.9210	6,539,514	1,930,298	1,418,548	2.1356	3,029,451	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	10,487,571		
2045	3,046,451	2,238,793	3.0393	6,804,363	1,930,298	1,418,548	2.1964	3,115,698	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	10,838,668		
2046	3,046,451	2,238,793	3.1624	7,079,958	1,930,298	1,418,548	2.2590	3,204,499	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	11,203,065		
2047	3,054,798	2,244,927	3.2905	7,386,932	1,939,011	1,424,951	2.3234	3,310,731	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	11,616,270		
2048	3,142,138	2,309,112	3.4238	7,905,937	2,217,358	1,629,504	2.3896	3,893,863	1,250,000	918,607	1.0000	918,607	6,609,496	4,857,223	12,718,407		
2049	3,237,824	2,379,430	3.5624	8,476,482	2,504,416	1,840,459	2.4577	4,523,295	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	13,918,384		
2050	3,237,824	2,379,430	3.7067	8,819,833	2,504,416	1,840,459	2.5278	4,652,312	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	14,390,752		
2051	3,294,014	2,420,723	3.8568	9,336,245	2,656,659	1,952,340	2.5998	5,075,694	1,250,000	918,607	1.0000	918,607	7,200,673	5,291,670	15,330,546		
2052	3,189,981	2,344,271	4.0130	9,407,559	2,360,887	1,734,981	2.6739	4,639,167	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	14,965,333		
2053	3,333,510	2,449,748	4.1756	10,229,169	2,791,475	2,051,414	2.7501	5,641,594	1,250,000	918,607	1.0000	918,607	7,374,985	5,419,769	16,789,370		
2054	3,189,981	2,344,271	4.3447	10,185,154	2,360,887	1,734,981	2.8285	4,907,395	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	16,011,156		
2055	3,150,484	2,315,245	4.5206	10,466,297	2,226,070	1,635,906	2.9091	4,759,015	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758	16,143,919		
2056	3,237,824	2,379,430	4.7037	11,192,125	2,504,416	1,840,459	2.9920	5,506,653	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	17,617,385		
2057	3,237,824	2,379,430	4.8942	11,645,406	2,504,416	1,840,459	3.0773	5,663,644	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	18,227,657		
2058	3,189,981	2,344,271	5.0924	11,937,965	2,360,887	1,734,981	3.1650	5,491,216	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	18,347,788		
2059	3,246,170	2,385,563	5.2987	12,640,385	2,513,129	1,846,862	3.2552	6,011,905	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	19,570,897		
2060	3,237,824	2,379,430	5.5133	13,118,512	2,504,416	1,840,459	3.3480	6,161,856	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	20,198,974		
2061	3,189,981	2,344,271	5.7366	13,448,144	2,360,887	1,734,981	3.4434	5,974,235	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	20,340,986		
2062	3,237,824	2,379,430	5.9689	14,202,580	2,504,416	1,840,459	3.5415	6,517,985	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	21,639,172		
2063	3,246,170	2,385,563	6.2106	14,815,780	2,513,129	1,846,862	3.6425	6,727,195	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	22,461,581		
2064	3,189,981	2,344,271	6.4622	15,149,147	2,360,887	1,734,981	3.7463	6,499,761	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	22,567,515		
2065	3,237,824	2,379,430	6.7239	15,999,050	2,504,416	1,840,459	3.8531	7,091,472	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	24,009,128		
2066	3,237,824	2,379,430	6.9962	16,646,968	2,504,416	1,840,459	3.9629	7,293,554	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	24,859,129		
2067	3,246,170	2,385,563	7.2795	17,365,709	2,513,129	1,846,862	4.0758	7,527,440	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	25,811,755		
2068	3,237,824	2,379,430	7.5744	18,022,755	2,504,416	1,840,459	4.1920	7,715,203	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	26,656,565		
2069	3,237,824	2,379,430	7.8811	18,752,526	2,504,416	1,840,459	4.3115	7,935,138	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	27,606,271		
2070	3,569,646	2,623,281	8.2003	21,511,693	3,499,884	2,572,014	4.4343	11,405,081	1,250,000	918,607	1.0000	918,607	8,319,530	6,113,902	33,835,381		
2071	3,246,170	2,385,563	8.5324	20,354,581	2,513,129	1,846,862	4.5607	8,422,983	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	29,696,171		
2072	3,237,824	2,379,430	8.8780	21,124,581	14,152,675	10,400,596	4.6907	48,786,075	1,250,000	918,607	1.0000	918,607	18,640,499	13,698,633	70,829,263		
2073	832,743	611,071	9.2375	5,653,083	4,620,063	3,395,217	4.8244	16,379,886	0	-	1.0000	-	5,452,806	4,007,188	22,032,968		
	\$476,489,759	\$350,165,433		\$912,623,071	\$467,153,049	\$343,304,020		\$666,083,223	\$55,000,000	\$40,418,705		\$40,418,705	\$998,642,807	\$733,888,158	\$1,618,764,999		
	\$1,809,340,794	\$1,329,658,384		\$3,997,547,341	\$1,590,942,995	\$1,169,161,000		\$2,378,124,263	\$111,250,000	\$81,756,016		\$81,756,016	\$3,511,533,789	\$2,580,575,401	\$6,457,427,620		

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,675,506	-	6,696,113	646,043,801
2018	646,043,801	32,636,996	-	13,392,226	692,073,023
2019	692,073,023	34,938,457	-	13,392,226	740,403,706
2020	740,403,706	37,354,991	-	13,392,226	791,150,922
2021	791,150,922	41,043,593	-	59,441,865	891,636,380
2022	891,636,380	46,067,866	-	59,441,865	997,146,110
2023	997,146,110	51,343,352	-	59,441,865	1,107,931,327
2024	1,107,931,327	56,882,613	-	59,441,865	1,224,255,805
2025	1,224,255,805	55,222,010	(29,527,973)	44,581,398	1,294,531,240
2026	1,294,531,240	57,347,734	(116,732,635)	-	1,235,146,340
2027	1,235,146,340	54,716,983	(185,318,532)	-	1,104,544,791
2028	1,104,544,791	48,931,334	(189,726,324)	-	963,749,802
2029	963,749,802	42,694,116	(118,598,642)	-	887,845,276
2030	887,845,276	39,331,546	(226,794,546)	-	700,382,276
2031	700,382,276	31,026,935	(86,985,621)	-	644,423,589
2032	644,423,589	28,547,965	(62,058,629)	-	610,912,925
2033	610,912,925	27,063,443	(58,425,422)	-	579,550,945
2034	579,550,945	25,674,107	(11,142,863)	-	594,082,189
2035	594,082,189	26,317,841	(11,594,404)	-	608,805,626
2036	608,805,626	26,970,089	(11,999,353)	-	623,776,362
2037	623,776,362	27,633,293	(12,452,366)	-	638,957,289
2038	638,957,289	28,305,808	(12,922,869)	-	654,340,229
2039	654,340,229	28,987,272	(13,447,773)	-	669,879,727
2040	669,879,727	29,675,672	(13,918,682)	-	685,636,717
2041	685,636,717	30,373,707	(14,445,460)	-	701,564,964
2042	701,564,964	31,079,328	(14,993,096)	-	717,651,196
2043	717,651,196	31,791,948	(20,010,456)	-	729,432,688
2044	729,432,688	32,313,868	(16,151,223)	-	745,595,333
2045	745,595,333	33,029,873	(27,329,712)	-	751,295,494
2046	751,295,494	33,282,390	(28,307,493)	-	756,270,391
2047	756,270,391	33,502,778	(35,874,122)	-	753,899,048
2048	753,899,048	33,397,728	(42,121,877)	-	745,174,899
2049	745,174,899	33,011,248	(33,194,438)	-	744,991,709
2050	744,991,709	33,003,133	(43,325,856)	-	734,668,986
2051	734,668,986	32,545,836	(48,596,098)	-	718,618,724
2052	718,618,724	31,834,809	(21,624,503)	-	728,829,031
2053	728,829,031	32,287,126	(22,450,205)	-	738,665,952
2054	738,665,952	32,722,902	(23,307,586)	-	748,081,267

EXTERNAL FUND CALCULATION

2055	748,081,267	33,140,000	(24,264,242)	-	756,957,026
2056	756,957,026	33,533,196	(25,123,185)	-	765,367,037
2057	765,367,037	33,905,760	(26,084,323)	-	773,188,474
2058	773,188,474	34,252,249	(27,082,664)	-	780,358,059
2059	780,358,059	34,569,862	(28,197,142)	-	786,730,780
2060	786,730,780	34,852,174	(29,197,663)	-	792,385,290
2061	792,385,290	35,102,668	(30,317,084)	-	797,170,874
2062	797,170,874	35,314,670	(31,479,823)	-	801,005,721
2063	801,005,721	35,484,553	(32,777,487)	-	803,712,787
2064	803,712,787	35,604,476	(33,943,427)	-	805,373,837
2065	805,373,837	35,678,061	(35,247,487)	-	805,804,411
2066	805,804,411	35,697,135	(36,602,285)	-	804,899,261
2067	804,899,261	35,657,037	(38,113,848)	-	802,442,450
2068	802,442,450	35,548,201	(39,472,694)	-	798,517,956
2069	798,517,956	35,374,345	(40,992,094)	-	792,900,208
2070	792,900,208	35,125,479	(42,570,952)	-	785,454,736
2071	785,454,736	34,795,645	(44,332,601)	-	775,917,780
2072	775,917,780	34,373,158	(45,916,273)	-	764,374,664
2073	764,374,664	33,861,798	(55,969,386)	-	742,267,076
2074	742,267,076	32,882,431	(59,807,811)	-	715,341,697
2075	715,341,697	31,689,637	(60,422,378)	-	686,608,956
2076	686,608,956	30,416,777	(62,563,093)	-	654,462,640
2077	654,462,640	28,992,695	(64,932,071)	-	618,523,264
2078	618,523,264	27,400,581	(69,356,016)	-	576,567,828
2079	576,567,828	25,541,955	(70,111,667)	-	531,998,116
2080	531,998,116	23,567,517	(72,601,682)	-	482,963,950
2081	482,963,950	21,395,303	(75,357,480)	-	429,001,773
2082	429,001,773	19,004,779	(80,459,317)	-	367,547,234
2083	367,547,234	16,282,342	(97,433,494)	-	286,396,083
2084	286,396,083	12,687,346	(84,281,342)	-	214,802,088
2085	214,802,088	9,515,732	(80,072,908)	-	144,244,912
2086	144,244,912	6,390,050	(150,634,962)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,340,765	-	24,632	383,732,452
2018	383,732,452	19,149,479	-	49,264	402,931,195
2019	402,931,195	20,107,496	-	49,264	423,087,955
2020	423,087,955	21,113,318	-	49,264	444,250,538
2021	444,250,538	23,028,369	-	34,479,626	501,758,533
2022	501,758,533	25,898,017	-	34,479,626	562,136,177
2023	562,136,177	28,910,862	-	34,479,626	625,526,665
2024	625,526,665	32,074,047	-	34,479,626	692,080,339
2025	692,080,339	35,395,076	-	34,479,626	761,955,041
2026	761,955,041	38,881,823	-	34,479,626	835,316,491
2027	835,316,491	42,542,560	-	34,479,626	912,338,677
2028	912,338,677	38,341,408	(36,047,572)	23,101,350	937,733,862
2029	937,733,862	38,915,955	(110,546,301)	-	866,103,517
2030	866,103,517	35,943,296	(168,064,022)	-	733,982,791
2031	733,982,791	30,460,286	(146,359,369)	-	618,083,707
2032	618,083,707	25,650,474	(93,046,932)	-	550,687,249
2033	550,687,249	22,853,521	(41,121,692)	-	532,419,078
2034	532,419,078	22,095,392	(143,546,582)	-	410,967,888
2035	410,967,888	17,055,167	(65,140,211)	-	362,882,844
2036	362,882,844	15,059,638	(43,338,711)	-	334,603,771
2037	334,603,771	13,886,057	(39,993,460)	-	308,496,368
2038	308,496,368	12,802,599	(23,981,192)	-	297,317,775
2039	297,317,775	12,338,688	(8,939,570)	-	300,716,892
2040	300,716,892	12,479,751	(9,205,201)	-	303,991,443
2041	303,991,443	12,615,645	(9,508,264)	-	307,098,823
2042	307,098,823	12,744,601	(9,823,000)	-	310,020,425
2043	310,020,425	12,865,848	(10,179,558)	-	312,706,714
2044	312,706,714	12,977,329	(10,487,571)	-	315,196,472
2045	315,196,472	13,080,654	(10,838,668)	-	317,438,457
2046	317,438,457	13,173,696	(11,203,065)	-	319,409,089
2047	319,409,089	13,255,477	(11,616,270)	-	321,048,296
2048	321,048,296	13,323,504	(12,718,405)	-	321,653,396
2049	321,653,396	13,348,616	(13,918,384)	-	321,083,628
2050	321,083,628	13,324,971	(14,390,752)	-	320,017,846
2051	320,017,846	13,280,741	(15,330,546)	-	317,968,041
2052	317,968,041	13,195,674	(14,965,333)	-	316,198,382
2053	316,198,382	13,122,233	(16,789,370)	-	312,531,245
2054	312,531,245	12,970,047	(16,011,156)	-	309,490,136
2055	309,490,136	12,843,841	(16,143,919)	-	306,190,057

EXTERNAL FUND CALCULATION

2056	306,190,057	12,706,887	(17,617,385)	-	301,279,560
2057	301,279,560	12,503,102	(18,227,657)	-	295,555,004
2058	295,555,004	12,265,533	(18,347,788)	-	289,472,749
2059	289,472,749	12,013,119	(19,570,897)	-	281,914,971
2060	281,914,971	11,699,471	(20,198,974)	-	273,415,468
2061	273,415,468	11,346,742	(20,340,986)	-	264,421,224
2062	264,421,224	10,973,481	(21,639,172)	-	253,755,533
2063	253,755,533	10,530,855	(22,461,581)	-	241,824,806
2064	241,824,806	10,035,729	(22,567,515)	-	229,293,021
2065	229,293,021	9,515,660	(24,009,128)	-	214,799,553
2066	214,799,553	8,914,181	(24,859,129)	-	198,854,605
2067	198,854,605	8,252,466	(25,811,755)	-	181,295,316
2068	181,295,316	7,523,756	(26,656,565)	-	162,162,507
2069	162,162,507	6,729,744	(27,606,271)	-	141,285,980
2070	141,285,980	5,863,368	(33,835,381)	-	113,313,967
2071	113,313,967	4,702,530	(29,696,171)	-	88,320,326
2072	88,320,326	3,665,294	(70,830,585)	-	21,155,034
2073	21,155,034	877,934	(22,032,968)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,592,979	-	294,670	431,096,616
2018	431,096,616	21,742,121	-	589,341	453,428,078
2019	453,428,078	22,867,627	-	589,341	476,885,046
2020	476,885,046	24,049,858	-	589,341	501,524,244
2021	501,524,244	25,830,004	-	21,951,682	549,305,931
2022	549,305,931	28,238,201	-	21,951,682	599,495,814
2023	599,495,814	30,767,771	-	21,951,682	652,215,268
2024	652,215,268	33,424,832	-	21,951,682	707,591,782
2025	707,591,782	36,215,808	-	21,951,682	765,759,273
2026	765,759,273	39,147,450	-	21,951,682	826,858,405
2027	826,858,405	42,226,846	-	21,951,682	891,036,933
2028	891,036,933	45,461,444	-	21,951,682	958,450,059
2029	958,450,059	39,573,204	(14,714,013)	18,219,896	1,001,529,147
2030	1,001,529,147	40,962,542	(96,381,435)	-	946,110,254
2031	946,110,254	38,695,909	(181,405,652)	-	803,400,512
2032	803,400,512	32,859,081	(174,467,137)	-	661,792,456
2033	661,792,456	27,067,311	(114,847,231)	-	574,012,536
2034	574,012,536	23,477,113	(151,381,933)	-	446,107,716
2035	446,107,716	18,245,806	(74,404,782)	-	389,948,739
2036	389,948,739	15,948,903	(53,750,646)	-	352,146,997
2037	352,146,997	14,402,812	(50,144,824)	-	316,404,985
2038	316,404,985	12,940,964	(28,889,727)	-	300,456,222
2039	300,456,222	12,288,659	(8,939,570)	-	303,805,312
2040	303,805,312	12,425,637	(9,205,201)	-	307,025,748
2041	307,025,748	12,557,353	(9,508,264)	-	310,074,837
2042	310,074,837	12,682,061	(9,823,000)	-	312,933,898
2043	312,933,898	12,798,996	(10,179,558)	-	315,553,337
2044	315,553,337	12,906,131	(10,487,571)	-	317,971,897
2045	317,971,897	13,005,051	(10,838,668)	-	320,138,279
2046	320,138,279	13,093,656	(11,203,065)	-	322,028,870
2047	322,028,870	13,170,981	(11,616,270)	-	323,583,582
2048	323,583,582	13,234,568	(12,718,407)	-	324,099,744
2049	324,099,744	13,255,680	(13,918,384)	-	323,437,039
2050	323,437,039	13,228,575	(14,390,752)	-	322,274,862
2051	322,274,862	13,181,042	(15,330,546)	-	320,125,358
2052	320,125,358	13,093,127	(14,965,333)	-	318,253,152
2053	318,253,152	13,016,554	(16,789,370)	-	314,480,336
2054	314,480,336	12,862,246	(16,011,156)	-	311,331,426

EXTERNAL FUND CALCULATION

2055	311,331,426	12,733,455	(16,143,919)	-	307,920,962
2056	307,920,962	12,593,967	(17,617,385)	-	302,897,545
2057	302,897,545	12,388,510	(18,227,657)	-	297,058,397
2058	297,058,397	12,149,688	(18,347,788)	-	290,860,298
2059	290,860,298	11,896,186	(19,570,897)	-	283,185,587
2060	283,185,587	11,582,291	(20,198,974)	-	274,568,904
2061	274,568,904	11,229,868	(20,340,986)	-	265,457,785
2062	265,457,785	10,857,223	(21,639,172)	-	254,675,837
2063	254,675,837	10,416,242	(22,461,581)	-	242,630,498
2064	242,630,498	9,923,587	(22,567,515)	-	229,986,570
2065	229,986,570	9,406,451	(24,009,128)	-	215,383,892
2066	215,383,892	8,809,201	(24,859,129)	-	199,333,964
2067	199,333,964	8,152,759	(25,811,755)	-	181,674,968
2068	181,674,968	7,430,506	(26,656,565)	-	162,448,909
2069	162,448,909	6,644,160	(27,606,271)	-	141,486,799
2070	141,486,799	5,786,810	(33,835,381)	-	113,438,228
2071	113,438,228	4,639,624	(29,696,171)	-	88,381,681
2072	88,381,681	3,614,811	(70,829,263)	-	21,167,228
2073	21,167,228	865,740	(22,032,968)	-	(0)

2021 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	(\$2,594,535)	(\$15,986,761)
Prairie Island Unit 1	49,264	1,440,489	1,391,225
Prairie Island Unit 2	589,341	(2,660,472)	(3,249,812)
TOTAL	\$14,030,831	(\$3,814,517)	(\$17,845,349)

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
DECON Method - No Recasking
20-Year Life Extension

Docket No. E002/M-17-828
Schedule F.14
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Proposed

2021 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2021 Decommissioning Accrual
Monticello	33.75	5.00%	4.43%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	(2,594,535)
Prairie Island Unit 1	36.67	4.99%	4.15%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	1,440,489
Prairie Island Unit 2	37.83	5.04%	4.09%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	(2,660,472)
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	(\$3,814,517)

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2050	\$21,103,620	\$15,508,745	3.7067	\$57,486,266	\$8,935,561	\$6,566,615	2.5278	\$16,599,089	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$74,085,355
2051	72,416,242	53,217,649	3.8568	205,249,828	42,961,353	31,571,677	2.5998	82,080,046	0	0	1.0000	0	115,377,595	84,789,326	287,329,874
2052	78,476,357	57,671,140	4.0130	231,434,285	102,263,189	75,151,739	2.6739	200,948,234	0	0	1.0000	0	180,739,546	132,822,879	432,382,519
2053	78,663,227	57,808,468	4.1756	241,385,038	100,155,666	73,602,950	2.7501	202,415,473	0	0	1.0000	0	178,818,892	131,411,418	443,800,512
2054	66,380,423	48,782,013	4.3447	211,943,210	38,894,671	28,583,132	2.8285	80,847,388	0	0	1.0000	0	105,275,094	77,365,144	292,790,598
2055	86,879,803	63,846,711	4.5206	288,625,441	113,147,091	83,150,161	2.9091	241,892,133	0	0	1.0000	0	200,026,894	146,996,872	530,517,574
2056	50,307,504	36,970,257	4.7037	173,896,999	20,688,337	15,203,559	2.9920	45,489,050	0	0	1.0000	0	70,995,841	52,173,817	219,386,048
2057	34,623,126	25,444,035	4.8942	124,528,195	14,196,883	10,433,084	3.0773	32,105,730	0	0	1.0000	0	48,820,010	35,877,119	156,633,925
2058	29,581,478	21,739,000	5.0924	110,703,685	15,098,979	11,096,021	3.1650	35,118,908	0	0	1.0000	0	44,680,457	32,835,022	145,822,593
2059	5,925,016	4,354,209	5.2987	23,071,645	2,187,162	1,607,314	3.2552	5,232,129	0	0	1.0000	0	8,112,178	5,961,523	28,303,774
2060	5,941,203	4,366,104	5.5133	24,071,642	2,193,018	1,611,617	3.3480	5,395,695	0	0	1.0000	0	8,134,221	5,977,722	29,467,337
2061	5,925,016	4,354,209	5.7366	24,978,353	2,187,162	1,607,314	3.4434	5,534,625	0	0	1.0000	0	8,112,178	5,961,523	30,512,978
2062	5,925,016	4,354,209	5.9689	25,989,836	2,187,162	1,607,314	3.5415	5,692,303	0	0	1.0000	0	8,112,178	5,961,523	31,682,138
2063	5,925,016	4,354,209	6.2106	27,042,248	2,187,162	1,607,314	3.6425	5,854,641	0	0	1.0000	0	8,112,178	5,961,523	32,896,889
2064	5,941,203	4,366,104	6.4622	28,214,638	2,193,018	1,611,617	3.7463	6,037,602	0	0	1.0000	0	8,134,221	5,977,722	34,252,241
2065	5,925,016	4,354,209	6.7239	29,277,263	2,187,162	1,607,314	3.8531	6,193,142	0	0	1.0000	0	8,112,178	5,961,523	35,470,405
2066	5,925,016	4,354,209	6.9962	30,462,914	2,187,162	1,607,314	3.9629	6,369,625	0	0	1.0000	0	8,112,178	5,961,523	36,832,539
2067	5,925,016	4,354,209	7.2795	31,696,461	2,187,162	1,607,314	4.0758	6,551,091	0	0	1.0000	0	8,112,178	5,961,523	38,247,552
2068	6,604,848	4,853,807	7.5744	36,764,678	4,183,953	3,074,727	4.1920	12,889,255	0	0	1.0000	0	10,788,801	7,928,534	49,653,932
2069	5,925,016	4,354,209	7.8811	34,315,953	2,187,162	1,607,314	4.3115	6,929,934	0	0	1.0000	0	8,112,178	5,961,523	41,245,888
2070	7,418,217	5,451,540	8.2003	44,704,267	6,666,766	4,899,310	4.4343	21,725,011	0	0	1.0000	0	14,084,983	10,350,851	66,429,278
2071	7,418,217	5,451,540	8.5324	46,514,723	6,666,766	4,899,310	4.5607	22,344,284	0	0	1.0000	0	14,084,983	10,350,851	68,859,007
2072	8,296,904	6,097,275	8.8780	54,131,605	9,260,122	6,805,130	4.6907	31,920,823	0	0	1.0000	0	17,557,026	12,902,405	86,052,428
2073	8,927,592	6,560,758	9.2375	60,605,004	11,194,891	8,226,964	4.8244	39,690,164	0	0	1.0000	0	20,122,483	14,787,722	100,295,169
2074	7,633,842	5,610,000	9.6117	53,921,638	7,313,641	5,374,689	4.9619	26,668,671	0	0	1.0000	0	14,947,483	10,984,689	80,590,309
2075	8,711,967	6,402,299	10.0009	64,028,748	10,548,016	7,751,585	5.1033	39,558,662	0	0	1.0000	0	19,259,983	14,153,883	103,587,410
2076	9,159,404	6,731,114	10.4060	70,043,968	11,847,622	8,706,646	5.2487	45,698,574	0	0	1.0000	0	21,007,026	15,437,760	115,742,542
2077	5,908,425	4,342,016	10.8274	47,012,745	2,137,389	1,570,737	5.3983	8,479,307	0	0	1.0000	0	8,045,814	5,912,753	55,492,052
2078	5,908,425	4,342,016	11.2659	48,916,719	2,137,389	1,570,737	5.5522	8,721,044	0	0	1.0000	0	8,045,814	5,912,753	57,637,763
2079	5,908,425	4,342,016	11.7222	50,897,981	2,137,389	1,570,737	5.7104	8,969,534	0	0	1.0000	0	8,045,814	5,912,753	59,867,515
2080	5,924,612	4,353,912	12.1970	53,104,661	2,143,245	1,575,040	5.8731	9,250,367	0	0	1.0000	0	8,067,857	5,928,952	62,355,028
2081	5,908,425	4,342,016	12.6909	55,104,092	2,137,389	1,570,737	6.0405	9,488,034	0	0	1.0000	0	8,045,814	5,912,753	64,592,126
2082	5,908,425	4,342,016	13.2049	57,335,888	2,137,389	1,570,737	6.2127	9,758,515	0	0	1.0000	0	8,045,814	5,912,753	67,094,403
2083	5,908,425	4,342,016	13.7397	59,657,998	2,137,389	1,570,737	6.3897	10,036,535	0	0	1.0000	0	8,045,814	5,912,753	69,694,534
2084	5,924,612	4,353,912	14.2962	62,244,392	2,143,245	1,575,040	6.5719	10,351,005	0	0	1.0000	0	8,067,857	5,928,952	72,595,397
2085	5,908,425	4,342,016	14.8752	64,588,358	2,137,389	1,570,737	6.7592	10,616,923	0	0	1.0000	0	8,045,814	5,912,753	75,205,280
2086	5,908,425	4,342,016	15.4776	67,203,988	2,137,389	1,570,737	6.9518	10,919,447	0	0	1.0000	0	8,045,814	5,912,753	78,123,435
2087	5,908,425	4,342,016	16.1045	69,925,998	2,137,389	1,570,737	7.1499	11,230,609	0	0	1.0000	0	8,045,814	5,912,753	81,156,608
2088	5,924,612	4,353,912	16.7567	72,957,192	2,143,245	1,575,040	7.3537	11,582,371	0	0	1.0000	0	8,067,857	5,928,952	84,539,563
2089	5,908,425	4,342,016	17.4353	75,704,353	2,137,389	1,570,737	7.5633	11,879,952	0	0	1.0000	0	8,045,814	5,912,753	87,584,305
2090	5,908,425	4,342,016	18.1415	78,770,685	2,137,389	1,570,737	7.7788	12,218,446	0	0	1.0000	0	8,045,814	5,912,753	90,989,131
2091	5,908,425	4,342,016	18.8762	81,960,764	2,137,389	1,570,737	8.0005	12,566,678	0	0	1.0000	0	8,045,814	5,912,753	94,527,442
2092	5,924,612	4,353,912	19.6407	85,513,873	2,143,245	1,575,040	8.2285	12,960,216	0	0	1.0000	0	8,067,857	5,928,952	98,474,090
2093	5,908,425	4,342,016	20.4361	88,733,875	2,137,389	1,570,737	8.4630	13,293,144	0	0	1.0000	0	8,045,814	5,912,753	102,027,019
2094	5,908,425	4,342,016	21.2638	92,327,762	2,137,389	1,570,737	8.7042	13,672,005	0	0	1.0000	0	8,045,814	5,912,753	105,999,767
2095	5,908,425	4,342,016	22.1250	96,067,106	2,137,389	1,570,737	8.9523	14,061,705	0	0	1.0000	0	8,045,814	5,912,753	110,128,811
2096	5,924,612	4,353,912	23.0210	100,231,401	2,143,245	1,575,040	9.2075	14,502,180	0	0	1.0000	0	8,067,857	5,928,952	114,733,581
2097	5,908,425	4,342,016	23.9534	104,006,048	2,137,389	1,570,737	9.4699	14,874,718	0	0	1.0000	0	8,045,814	5,912,753	118,880,766
2098	6,386,857	4,693,609	24.9235	116,981,160	3,557,353	2,614,247	9.7398	25,462,244	0	0	1.0000	0	9,944,210	7,307,856	142,443,404
2099	6,482,543	4,763,927	25.9329	123,542,445	3,844,412	2,825,203	10.0173	28,300,902	0	0	1.0000	0	10,326,955	7,589,130	151,843,348
2100	6,403,045	4,705,505	26.9832	126,969,587	3,563,167	2,618,520	10.3028	26,978,084	0	0	1.0000	0	9,966,212	7,324,025	153,947,671
2101	6,386,857	4,693,609	28.0760	131,777,762	3,557,353	2,614,247	10.5965	27,701,870	0	0	1.0000	0	9,944,210	7,307,856	159,479,632
2102	6,386,857	4,693,609	29.2131	137,114,865	3,557,353	2,614,247	10.8985	28,491,372	0	0	1.0000	0	9,944,210	7,307,856	165,606,237
2103	6,482,543	4,763,927	30.3962	144,805,281	3,844,412	2,825,203	11.2091	31,667,979	0	0	1.0000	0	10,326,955	7,589,130	176,473,260
2104	6,403,045	4,705,505	31.6272	148,821,953	3,563,167	2,618,520	11.5285	30,187,604	0	0	1.0000	0	9,966,212	7,324,025	179,009,557

AMOUNT TO RECOVER															
	LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2105	6,386,857	4,693,609	32.9081	154,457,749	3,557,353	2,614,247	11.8571	30,997,390	0	0	1.0000	0	9,944,210	7,307,856	185,455,139
2106	6,386,857	4,693,609	34.2409	160,713,391	3,557,353	2,614,247	12.1950	31,880,744	0	0	1.0000	0	9,944,210	7,307,856	192,594,135
2107	6,482,543	4,763,927	35.6277	169,727,766	3,844,412	2,825,203	12.5426	35,435,387	0	0	1.0000	0	10,326,955	7,589,130	205,163,152
2108	7,066,689	5,193,208	37.0706	192,515,320	5,554,101	4,081,628	12.9000	52,653,004	0	0	1.0000	0	12,620,790	9,274,836	245,168,324
2109	6,386,857	4,693,609	38.5720	181,041,880	3,557,353	2,614,247	13.2677	34,685,047	0	0	1.0000	0	9,944,210	7,307,856	215,726,927
2110	6,099,798	4,482,653	40.1341	179,907,257	2,696,175	1,981,380	13.6458	27,037,513	0	0	1.0000	0	8,795,973	6,464,033	206,944,771
2111	2,034,890	1,495,411	41.7596	62,447,769	24,955,010	18,339,076	14.0347	257,383,427	0	0	1.0000	0	26,989,900	19,834,487	319,831,196
	\$851,819,402	\$625,989,760		\$5,898,178,598	\$664,030,274	\$487,986,246		\$2,146,077,587	\$0	\$0		\$0	\$1,515,849,676	\$1,113,976,006	\$8,044,256,184

60-Year Decommissioning Period

DECON Method - No Recasking

20-Year Life Extension

AMOUNT TO RECOVER															
LABOR				NON-LABOR				PIIC Payment				Total Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s	
Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s				
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2053	\$22,324,352	\$16,405,843	4.1756	\$68,504,239	\$9,728,959	\$7,149,672	2.7501	\$19,662,312	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,303,311	\$24,474,122	\$89,085,158
2054	63,582,247	46,725,674	4.3447	203,009,034	33,397,619	24,543,427	2.8285	69,421,084	1,250,000	918,607	1.0000	918,607	98,229,866	72,187,708	273,348,725
2055	65,877,290	48,412,268	4.5206	218,852,499	81,239,936	59,702,054	2.9091	173,679,245	1,250,000	918,607	1.0000	918,607	148,367,226	109,032,929	393,450,351
2056	57,759,315	42,446,486	4.7037	199,655,534	65,595,019	48,204,831	2.9920	144,228,854	1,250,000	918,607	1.0000	918,607	124,604,334	91,569,923	344,802,995
2057	38,110,947	28,007,184	4.8942	137,072,758	36,889,671	27,109,686	3.0773	83,424,636	1,250,000	918,607	1.0000	918,607	76,250,618	56,035,476	221,416,091
2058	13,207,914	9,706,305	5.0924	49,428,388	18,994,691	13,958,924	3.1650	44,179,994	1,250,000	918,607	1.0000	918,607	33,452,605	24,583,836	94,526,988
2059	36,035,855	26,482,229	5.2987	140,321,385	76,476,728	56,201,641	3.2552	182,947,582	1,250,000	918,607	1.0000	918,607	113,762,582	83,602,477	324,187,574
2060	31,919,556	23,457,220	5.5133	129,326,692	13,365,606	9,822,190	3.3480	32,884,693	1,250,000	918,607	1.0000	918,607	46,535,162	34,198,017	163,129,992
2061	19,571,318	14,382,679	5.7366	82,507,674	9,445,873	6,941,635	3.4434	23,902,826	1,250,000	918,607	1.0000	918,607	30,267,191	22,242,921	107,329,108
2062	14,781,952	10,863,043	5.9689	64,840,415	11,668,700	8,575,159	3.5415	30,368,925	1,250,000	918,607	1.0000	918,607	27,700,652	20,356,808	96,127,947
2063	8,544,452	6,279,195	6.2106	38,997,566	6,492,672	4,771,371	3.6425	17,379,719	1,250,000	918,607	1.0000	918,607	16,287,125	11,969,172	57,295,891
2064	3,054,798	2,244,927	6.4622	14,507,166	1,939,011	1,424,951	3.7463	5,338,294	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	20,764,067
2065	3,046,451	2,238,793	6.7239	15,053,419	1,930,298	1,418,548	3.8531	5,465,806	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	21,437,832
2066	3,046,451	2,238,793	6.9962	15,663,042	1,930,298	1,418,548	3.9629	5,621,563	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	22,203,212
2067	3,046,451	2,238,793	7.2795	16,297,292	1,930,298	1,418,548	4.0758	5,781,717	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	22,997,616
2068	3,054,798	2,244,927	7.5744	17,003,974	1,939,011	1,424,951	4.1920	5,973,394	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	23,895,975
2069	3,046,451	2,238,793	7.8811	17,644,150	1,930,298	1,418,548	4.3115	6,116,069	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	24,678,825
2070	3,046,451	2,238,793	8.2003	18,358,772	1,930,298	1,418,548	4.4343	6,290,266	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	25,567,646
2071	3,046,451	2,238,793	8.5324	19,102,276	1,930,298	1,418,548	4.5607	6,469,571	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	26,490,453
2072	3,054,798	2,244,927	8.8780	19,930,461	1,939,011	1,424,951	4.6907	6,684,017	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	27,533,085
2073	3,142,138	2,309,112	9.2375	21,330,420	2,217,357	1,629,503	4.8244	7,861,375	1,250,000	918,607	1.0000	918,607	6,609,495	4,857,222	30,110,402
2074	3,237,824	2,379,430	9.6117	22,870,368	2,504,416	1,840,459	4.9619	9,132,172	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	32,921,147
2075	3,237,824	2,379,430	10.0009	23,796,442	2,504,416	1,840,459	5.1033	9,392,413	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	34,107,462
2076	3,294,014	2,420,723	10.4060	25,190,046	2,656,659	1,952,340	5.2487	10,247,247	1,250,000	918,607	1.0000	918,607	7,200,673	5,291,670	36,355,900
2077	3,189,981	2,344,271	10.8274	25,382,359	2,360,887	1,734,981	5.3983	9,365,950	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	35,666,916
2078	3,333,510	2,449,748	11.2659	27,598,619	2,791,475	2,051,414	5.5522	11,389,862	1,250,000	918,607	1.0000	918,607	7,374,985	5,419,769	39,907,088
2079	3,189,981	2,344,271	11.7222	27,480,012	2,360,887	1,734,981	5.7104	9,907,438	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	38,306,057
2080	3,150,484	2,315,245	12.1970	28,239,045	2,226,070	1,635,906	5.8731	9,607,842	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758	38,765,494
2081	3,237,824	2,379,430	12.6909	30,197,109	2,504,416	1,840,459	6.0405	11,117,291	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	42,233,007
2082	3,237,824	2,379,430	13.2049	31,420,136	2,504,416	1,840,459	6.2127	11,434,218	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	43,772,961
2083	3,189,981	2,344,271	13.7397	32,209,579	2,360,887	1,734,981	6.3897	11,086,010	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	44,214,196
2084	3,246,170	2,385,563	14.2962	34,104,491	2,513,129	1,846,862	6.5719	12,137,392	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	47,160,490
2085	3,237,824	2,379,430	14.8752	35,394,498	2,504,416	1,840,459	6.7592	12,440,029	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	48,753,133
2086	3,189,981	2,344,271	15.4776	36,283,687	2,360,887	1,734,981	6.9518	12,061,243	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	49,263,538
2087	3,237,824	2,379,430	16.1045	38,319,531	2,504,416	1,840,459	7.1499	13,159,096	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	52,397,234
2088	3,246,170	2,385,563	16.7567	39,974,170	2,513,129	1,846,862	7.3537	13,581,268	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	54,474,045
2089	3,189,981	2,344,271	17.4353	40,873,067	2,360,887	1,734,981	7.5633	13,122,185	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	54,913,858
2090	3,237,824	2,379,430	18.1415	43,166,430	2,504,416	1,840,459	7.7788	14,316,561	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	58,401,597
2091	3,237,824	2,379,430	18.8762	44,914,597	2,504,416	1,840,459	8.0005	14,724,590	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	60,557,794
2092	3,246,170	2,385,563	19.6407	46,854,135	2,513,129	1,846,862	8.2285	15,196,903	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	62,969,645
2093	3,237,824	2,379,430	20.4361	48,626,270	2,504,416	1,840,459	8.4630	15,575,802	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	65,120,679
2094	3,237,824	2,379,430	21.2638	50,595,724	2,504,416	1,840,459	8.7042	16,019,721	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	67,534,052
2095	3,569,646	2,623,281	22.1250	58,040,097	3,499,884	2,572,014	8.9523	23,025,439	1,250,000	918,607	1.0000	918,607	8,319,530	6,113,902	81,984,143
2096	3,246,170	2,385,563	23.0210	54,918,055	2,513,129	1,846,862	9.2075	17,004,981	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	72,841,643
2097	3,237,974	2,379,540	23.9534	56,998,080	14,152,775	10,400,669	9.4699	98,493,298	1,250,000	918,607	1.0000	918,607	18,640,749	13,698,817	156,409,985
2098	832,743	611,971	24.9235	15,252,461	4,620,063	3,395,217	9.7398	33,068,736	0	0	1.0000	0	5,452,806	4,007,188	48,321,196
	\$481,031,633	\$353,503,191		\$2,426,106,164	\$459,759,673	\$337,289,735		\$1,310,289,630	\$56,250,000	\$41,337,312		\$41,337,312	\$997,041,305	\$732,711,237	\$3,777,733,106

AMOUNT TO RECOVER															
LABOR				NON-LABOR				PIIC Payment				Total Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'	
Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2054	\$7,760,265	\$5,702,906	4.3447	\$24,777,417	\$4,479,535	\$3,291,946	2.8285	\$9,311,268	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459	\$35,007,292
2055	46,911,429	34,474,531	4.5206	155,845,564	35,601,339	26,162,909	2.9091	76,110,519	1,250,000	918,607	1.0000	918,607	83,762,768	61,556,047	232,874,689
2056	67,514,044	49,615,094	4.7037	233,374,519	86,298,832	63,419,763	2.9920	189,751,932	1,250,000	918,607	1.0000	918,607	155,062,875	113,953,465	424,045,058
2057	70,896,041	52,100,475	4.8942	254,990,145	70,558,163	51,852,174	3.0773	159,564,694	1,250,000	918,607	1.0000	918,607	142,704,234	104,871,256	415,473,446
2058	46,603,528	34,248,259	5.0924	174,405,835	42,782,149	31,439,982	3.1650	99,507,544	1,250,000	918,607	1.0000	918,607	90,635,677	66,606,848	274,831,986
2059	40,663,625	29,883,110	5.2987	158,341,633	77,452,618	56,918,809	3.2552	185,282,106	1,250,000	918,607	1.0000	918,607	119,366,242	87,720,525	344,542,346
2060	37,417,177	27,497,343	5.5133	151,601,099	14,193,501	10,430,599	3.3480	34,921,645	1,250,000	918,607	1.0000	918,607	52,860,679	38,846,548	187,441,351
2061	23,327,583	17,143,103	5.7366	98,343,127	13,070,130	9,605,049	3.4434	33,074,027	1,250,000	918,607	1.0000	918,607	37,647,713	27,666,760	132,335,761
2062	16,656,921	12,240,930	5.9689	73,064,887	17,178,640	12,624,334	3.5415	44,709,080	1,250,000	918,607	1.0000	918,607	35,085,561	25,783,871	118,692,574
2063	9,422,862	6,924,725	6.2106	43,006,699	9,074,042	6,668,382	3.6425	24,289,581	1,250,000	918,607	1.0000	918,607	19,746,904	14,511,714	68,214,888
2064	3,054,798	2,244,927	6.4622	14,507,166	1,939,011	1,424,951	3.7463	5,338,294	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	20,764,067
2065	3,046,451	2,238,793	6.7239	15,053,419	1,930,298	1,418,548	3.8531	5,465,806	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	21,437,832
2066	3,046,451	2,238,793	6.9962	15,663,042	1,930,298	1,418,548	3.9629	5,621,563	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	22,203,212
2067	3,046,451	2,238,793	7.2795	16,297,292	1,930,298	1,418,548	4.0758	5,781,717	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	22,997,616
2068	3,054,798	2,244,927	7.5744	17,003,974	1,939,011	1,424,951	4.1920	5,973,394	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	23,895,975
2069	3,046,451	2,238,793	7.8811	17,644,150	1,930,298	1,418,548	4.3115	6,116,069	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	24,678,825
2070	3,046,451	2,238,793	8.2003	18,358,772	1,930,298	1,418,548	4.4343	6,290,266	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	25,567,646
2071	3,046,451	2,238,793	8.5324	19,102,276	1,930,298	1,418,548	4.5607	6,469,571	1,250,000	918,607	1.0000	918,607	6,226,749	4,575,947	26,490,453
2072	3,054,798	2,244,927	8.8780	19,930,461	1,939,011	1,424,951	4.6907	6,684,017	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	27,533,085
2073	3,142,138	2,309,112	9.2375	21,330,420	2,217,358	1,629,504	4.8244	7,861,379	1,250,000	918,607	1.0000	918,607	6,609,496	4,857,223	30,110,462
2074	3,237,824	2,379,430	9.6117	22,870,368	2,504,416	1,840,459	4.9619	9,132,172	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	32,921,147
2075	3,237,824	2,379,430	10.0009	23,796,442	2,504,416	1,840,459	5.1033	9,392,413	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	34,107,462
2076	3,294,014	2,420,723	10.4060	25,190,046	2,656,659	1,952,340	5.2487	10,247,247	1,250,000	918,607	1.0000	918,607	7,200,673	5,291,670	36,355,900
2077	3,189,981	2,344,271	10.8274	25,382,359	2,360,887	1,734,981	5.3983	9,365,950	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	35,666,916
2078	3,333,510	2,449,748	11.2659	27,598,619	2,791,475	2,051,414	5.5522	11,389,862	1,250,000	918,607	1.0000	918,607	7,374,985	5,419,769	39,907,088
2079	3,189,981	2,344,271	11.7222	27,480,012	2,360,887	1,734,981	5.7104	9,907,438	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	38,306,057
2080	3,150,484	2,315,245	12.1970	28,239,045	2,226,070	1,635,906	5.8731	9,607,842	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758	38,765,494
2081	3,237,824	2,379,430	12.6909	30,197,109	2,504,416	1,840,459	6.0405	11,117,291	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	42,233,007
2082	3,237,824	2,379,430	13.2049	31,420,136	2,504,416	1,840,459	6.2127	11,434,218	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	43,772,961
2083	3,189,981	2,344,271	13.7397	32,209,579	2,360,887	1,734,981	6.3897	11,086,010	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	44,214,196
2084	3,246,170	2,385,563	14.2962	34,104,491	2,513,129	1,846,862	6.5719	12,137,392	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	47,160,490
2085	3,237,824	2,379,430	14.8752	35,394,498	2,504,416	1,840,459	6.7592	12,440,029	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	48,753,133
2086	3,189,981	2,344,271	15.4776	36,283,687	2,360,887	1,734,981	6.9518	12,061,243	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	49,263,538
2087	3,237,824	2,379,430	16.1045	38,319,531	2,504,416	1,840,459	7.1499	13,159,096	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	52,397,234
2088	3,246,170	2,385,563	16.7567	39,974,170	2,513,129	1,846,862	7.3537	13,581,268	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	54,474,045
2089	3,189,981	2,344,271	17.4353	40,873,067	2,360,887	1,734,981	7.5633	13,122,185	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	54,913,858
2090	3,237,824	2,379,430	18.1415	43,166,430	2,504,416	1,840,459	7.7788	14,316,561	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	58,401,597
2091	3,237,824	2,379,430	18.8762	44,914,597	2,504,416	1,840,459	8.0005	14,724,590	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	60,557,794
2092	3,246,170	2,385,563	19.6407	46,854,135	2,513,129	1,846,862	8.2285	15,196,903	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	62,969,645
2093	3,237,824	2,379,430	20.4361	48,626,270	2,504,416	1,840,459	8.4630	15,575,802	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	65,120,679
2094	3,237,824	2,379,430	21.2638	50,595,724	2,504,416	1,840,459	8.7042	16,019,721	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	67,534,052
2095	3,569,646	2,623,281	22.1250	58,040,097	3,499,884	2,572,014	8.9523	23,025,439	1,250,000	918,607	1.0000	918,607	8,319,530	6,113,902	81,984,143
2096	3,246,170	2,385,563	23.0210	54,918,055	2,513,129	1,846,862	9.2075	17,004,981	1,250,000	918,607	1.0000	918,607	7,009,299	5,151,032	72,841,643
2097	3,237,824	2,379,430	23.9534	56,995,443	14,152,675	10,400,596	9.4699	98,492,602	1,250,000	918,607	1.0000	918,607	18,640,499	13,698,633	156,406,652
2098	832,743	611,971	24.9235	15,252,461	4,620,063	3,395,217	9.7398	33,068,736	0	-	1.0000	-	5,452,806	4,007,188	48,321,196
	\$476,489,759	\$350,165,433		\$2,461,338,267	\$467,153,049	\$343,304,020		\$1,344,731,465	\$55,000,000	\$40,418,705		\$40,418,705	\$998,642,807	\$733,888,158	\$3,846,488,437
	\$1,809,340,794	\$1,329,658,384		\$10,785,623,029	\$1,590,942,995	\$1,169,161,000		\$4,801,098,682	\$111,250,000	\$81,756,016		\$81,756,016	\$3,511,533,789	\$2,580,575,401	\$15,668,477,727

EXTERNAL FUND CALCULATION

Monticello

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,675,506	-	6,696,113	646,043,801
2018	646,043,801	32,636,996	-	13,392,226	692,073,023
2019	692,073,023	34,938,457	-	13,392,226	740,403,706
2020	740,403,706	37,354,991	-	13,392,226	791,150,922
2021	791,150,922	39,492,683	-	(2,594,535)	828,049,070
2022	828,049,070	41,337,590	-	(2,594,535)	866,792,125
2023	866,792,125	43,274,743	-	(2,594,535)	907,472,333
2024	907,472,333	45,308,753	-	(2,594,535)	950,186,552
2025	950,186,552	47,444,464	-	(2,594,535)	995,036,481
2026	995,036,481	49,686,961	-	(2,594,535)	1,042,128,907
2027	1,042,128,907	52,041,582	-	(2,594,535)	1,091,575,954
2028	1,091,575,954	54,513,934	-	(2,594,535)	1,143,495,353
2029	1,143,495,353	57,109,904	-	(2,594,535)	1,198,010,722
2030	1,198,010,722	59,835,673	-	(2,594,535)	1,255,251,860
2031	1,255,251,860	62,697,730	-	(2,594,535)	1,315,355,055
2032	1,315,355,055	65,702,889	-	(2,594,535)	1,378,463,409
2033	1,378,463,409	68,858,307	-	(2,594,535)	1,444,727,181
2034	1,444,727,181	72,171,496	-	(2,594,535)	1,514,304,142
2035	1,514,304,142	75,650,344	-	(2,594,535)	1,587,359,951
2036	1,587,359,951	79,303,134	-	(2,594,535)	1,664,068,550
2037	1,664,068,550	83,138,564	-	(2,594,535)	1,744,612,579
2038	1,744,612,579	87,165,766	-	(2,594,535)	1,829,183,810
2039	1,829,183,810	91,394,327	-	(2,594,535)	1,917,983,602
2040	1,917,983,602	95,834,317	-	(2,594,535)	2,011,223,384
2041	2,011,223,384	100,496,306	-	(2,594,535)	2,109,125,154
2042	2,109,125,154	105,391,394	-	(2,594,535)	2,211,922,014
2043	2,211,922,014	110,531,237	-	(2,594,535)	2,319,858,716
2044	2,319,858,716	115,928,072	-	(2,594,535)	2,433,192,254
2045	2,433,192,254	121,594,749	-	(2,594,535)	2,552,192,468
2046	2,552,192,468	127,544,760	-	(2,594,535)	2,677,142,693
2047	2,677,142,693	133,792,271	-	(2,594,535)	2,808,340,429
2048	2,808,340,429	140,352,158	-	(2,594,535)	2,946,098,052
2049	2,946,098,052	147,240,039	-	(2,594,535)	3,090,743,557
2050	3,090,743,557	136,876,838	(74,085,355)	(1,945,901)	3,151,589,138
2051	3,151,589,138	139,615,399	(287,329,874)	-	3,003,874,664
2052	3,003,874,664	133,071,648	(432,382,519)	-	2,704,563,792
2053	2,704,563,792	119,812,176	(443,800,512)	-	2,380,575,456
2054	2,380,575,456	105,459,493	(292,790,598)	-	2,193,244,352
2055	2,193,244,352	97,160,725	(530,517,574)	-	1,759,887,502

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2056	1,759,887,502	77,963,016	(219,386,048)	-	1,618,464,470
	2057	1,618,464,470	71,697,976	(156,633,925)	-	1,533,528,521
	2058	1,533,528,521	67,935,313	(145,822,593)	-	1,455,641,241
	2059	1,455,641,241	64,484,907	(28,303,774)	-	1,491,822,375
	2060	1,491,822,375	66,087,731	(29,467,337)	-	1,528,442,769
	2061	1,528,442,769	67,710,015	(30,512,978)	-	1,565,639,805
	2062	1,565,639,805	69,357,843	(31,682,138)	-	1,603,315,511
	2063	1,603,315,511	71,026,877	(32,896,889)	-	1,641,445,499
	2064	1,641,445,499	72,716,036	(34,252,241)	-	1,679,909,293
	2065	1,679,909,293	74,419,982	(35,470,405)	-	1,718,858,870
	2066	1,718,858,870	76,145,448	(36,832,539)	-	1,758,171,780
	2067	1,758,171,780	77,887,010	(38,247,552)	-	1,797,811,238
	2068	1,797,811,238	79,643,038	(49,653,932)	-	1,827,800,343
	2069	1,827,800,343	80,971,555	(41,245,888)	-	1,867,526,010
	2070	1,867,526,010	82,731,402	(66,429,278)	-	1,883,828,135
	2071	1,883,828,135	83,453,586	(68,859,007)	-	1,898,422,713
	2072	1,898,422,713	84,100,126	(86,052,428)	-	1,896,470,411
	2073	1,896,470,411	84,013,639	(100,295,169)	-	1,880,188,882
	2074	1,880,188,882	83,292,367	(80,590,309)	-	1,882,890,941
	2075	1,882,890,941	83,412,069	(103,587,410)	-	1,862,715,599
	2076	1,862,715,599	82,518,301	(115,742,542)	-	1,829,491,358
	2077	1,829,491,358	81,046,467	(55,492,052)	-	1,855,045,773
	2078	1,855,045,773	82,178,528	(57,637,763)	-	1,879,586,538
	2079	1,879,586,538	83,265,684	(59,867,515)	-	1,902,984,707
	2080	1,902,984,707	84,302,223	(62,355,028)	-	1,924,931,901
	2081	1,924,931,901	85,274,483	(64,592,126)	-	1,945,614,258
	2082	1,945,614,258	86,190,712	(67,094,403)	-	1,964,710,567
	2083	1,964,710,567	87,036,678	(69,694,534)	-	1,982,052,711
	2084	1,982,052,711	87,804,935	(72,595,397)	-	1,997,262,248
	2085	1,997,262,248	88,478,718	(75,205,280)	-	2,010,535,686
	2086	2,010,535,686	89,066,731	(78,123,435)	-	2,021,478,982
	2087	2,021,478,982	89,551,519	(81,156,608)	-	2,029,873,893
	2088	2,029,873,893	89,923,413	(84,539,563)	-	2,035,257,743
	2089	2,035,257,743	90,161,918	(87,584,305)	-	2,037,835,356
	2090	2,037,835,356	90,276,106	(90,989,131)	-	2,037,122,332
	2091	2,037,122,332	90,244,519	(94,527,442)	-	2,032,839,409
	2092	2,032,839,409	90,054,786	(98,474,090)	-	2,024,420,106
	2093	2,024,420,106	89,681,811	(102,027,019)	-	2,012,074,898
	2094	2,012,074,898	89,134,918	(105,999,767)	-	1,995,210,049
	2095	1,995,210,049	88,387,805	(110,128,811)	-	1,973,469,043
	2096	1,973,469,043	87,424,679	(114,733,581)	-	1,946,160,140
	2097	1,946,160,140	86,214,894	(118,880,766)	-	1,913,494,268
	2098	1,913,494,268	84,767,796	(142,443,404)	-	1,855,818,659
	2099	1,855,818,659	82,212,767	(151,843,348)	-	1,786,188,078
	2100	1,786,188,078	79,128,132	(153,947,671)	-	1,711,368,539

EXTERNAL FUND CALCULATION

2101	1,711,368,539	75,813,626	(159,479,632)	-	1,627,702,533
2102	1,627,702,533	72,107,222	(165,606,237)	-	1,534,203,519
2103	1,534,203,519	67,965,216	(176,473,260)	-	1,425,695,474
2104	1,425,695,474	63,158,310	(179,009,557)	-	1,309,844,227
2105	1,309,844,227	58,026,099	(185,455,139)	-	1,182,415,187
2106	1,182,415,187	52,380,993	(192,594,135)	-	1,042,202,045
2107	1,042,202,045	46,169,551	(205,163,152)	-	883,208,443
2108	883,208,443	39,126,134	(245,168,324)	-	677,166,253
2109	677,166,253	29,998,465	(215,726,927)	-	491,437,791
2110	491,437,791	21,770,694	(206,944,771)	-	306,263,714
2111	306,263,714	13,567,483	(319,831,196)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,340,765	-	24,632	383,732,452
2018	383,732,452	19,149,479	-	49,264	402,931,195
2019	402,931,195	20,107,496	-	49,264	423,087,955
2020	423,087,955	21,113,318	-	49,264	444,250,538
2021	444,250,538	22,204,042	-	1,440,489	467,895,069
2022	467,895,069	23,383,904	-	1,440,489	492,719,462
2023	492,719,462	24,622,641	-	1,440,489	518,782,593
2024	518,782,593	25,923,192	-	1,440,489	546,146,273
2025	546,146,273	27,288,639	-	1,440,489	574,875,402
2026	574,875,402	28,722,223	-	1,440,489	605,038,114
2027	605,038,114	30,227,342	-	1,440,489	636,705,945
2028	636,705,945	31,807,567	-	1,440,489	669,954,001
2029	669,954,001	33,466,645	-	1,440,489	704,861,135
2030	704,861,135	35,208,511	-	1,440,489	741,510,135
2031	741,510,135	37,037,296	-	1,440,489	779,987,920
2032	779,987,920	38,957,337	-	1,440,489	820,385,747
2033	820,385,747	40,973,189	-	1,440,489	862,799,425
2034	862,799,425	43,089,631	-	1,440,489	907,329,545
2035	907,329,545	45,311,685	-	1,440,489	954,081,719
2036	954,081,719	47,644,618	-	1,440,489	1,003,166,826
2037	1,003,166,826	50,093,965	-	1,440,489	1,054,701,280
2038	1,054,701,280	52,665,534	-	1,440,489	1,108,807,303
2039	1,108,807,303	55,365,425	-	1,440,489	1,165,613,217
2040	1,165,613,217	58,200,040	-	1,440,489	1,225,253,746
2041	1,225,253,746	61,176,102	-	1,440,489	1,287,870,337
2042	1,287,870,337	64,300,670	-	1,440,489	1,353,611,496
2043	1,353,611,496	67,581,154	-	1,440,489	1,422,633,139
2044	1,422,633,139	71,025,334	-	1,440,489	1,495,098,962
2045	1,495,098,962	74,641,378	-	1,440,489	1,571,180,830
2046	1,571,180,830	78,437,864	-	1,440,489	1,651,059,183
2047	1,651,059,183	82,423,793	-	1,440,489	1,734,923,465
2048	1,734,923,465	86,608,621	-	1,440,489	1,822,972,576
2049	1,822,972,576	91,002,272	-	1,440,489	1,915,415,337
2050	1,915,415,337	95,615,165	-	1,440,489	2,012,470,991
2051	2,012,470,991	100,458,243	-	1,440,489	2,114,369,723
2052	2,114,369,723	105,542,989	-	1,440,489	2,221,353,202
2053	2,221,353,202	92,206,184	(89,085,158)	965,128	2,225,439,356
2054	2,225,439,356	92,355,733	(273,348,725)	-	2,044,446,364
2055	2,044,446,364	84,844,524	(393,450,351)	-	1,735,840,537

EXTERNAL FUND CALCULATION

2056	1,735,840,537	72,037,382	(344,802,995)	-	1,463,074,925
2057	1,463,074,925	60,717,609	(221,416,001)	-	1,302,376,533
2058	1,302,376,533	54,048,626	(94,526,988)	-	1,261,898,170
2059	1,261,898,170	52,368,774	(324,187,574)	-	990,079,371
2060	990,079,371	41,088,294	(163,129,992)	-	868,037,672
2061	868,037,672	36,023,563	(107,329,108)	-	796,732,128
2062	796,732,128	33,064,383	(96,127,947)	-	733,668,564
2063	733,668,564	30,447,245	(57,295,891)	-	706,819,918
2064	706,819,918	29,333,027	(20,764,067)	-	715,388,878
2065	715,388,878	29,688,638	(21,437,832)	-	723,639,684
2066	723,639,684	30,031,047	(22,203,212)	-	731,467,519
2067	731,467,519	30,355,902	(22,997,616)	-	738,825,805
2068	738,825,805	30,661,271	(23,895,975)	-	745,591,101
2069	745,591,101	30,942,031	(24,678,825)	-	751,854,306
2070	751,854,306	31,201,954	(25,567,646)	-	757,488,615
2071	757,488,615	31,435,778	(26,490,453)	-	762,433,939
2072	762,433,939	31,641,008	(27,533,085)	-	766,541,863
2073	766,541,863	31,811,487	(30,110,402)	-	768,242,947
2074	768,242,947	31,882,082	(32,921,147)	-	767,203,883
2075	767,203,883	31,838,961	(34,107,462)	-	764,935,382
2076	764,935,382	31,744,818	(36,355,900)	-	760,324,300
2077	760,324,300	31,553,458	(35,666,916)	-	756,210,843
2078	756,210,843	31,382,750	(39,907,088)	-	747,686,505
2079	747,686,505	31,028,990	(38,306,057)	-	740,409,438
2080	740,409,438	30,726,992	(38,765,494)	-	732,370,935
2081	732,370,935	30,393,394	(42,233,007)	-	720,531,323
2082	720,531,323	29,902,050	(43,772,961)	-	706,660,412
2083	706,660,412	29,326,407	(44,214,196)	-	691,772,623
2084	691,772,623	28,708,564	(47,160,490)	-	673,320,696
2085	673,320,696	27,942,809	(48,753,133)	-	652,510,372
2086	652,510,372	27,079,180	(49,263,538)	-	630,326,015
2087	630,326,015	26,158,530	(52,397,234)	-	604,087,310
2088	604,087,310	25,069,623	(54,474,045)	-	574,682,888
2089	574,682,888	23,849,340	(54,913,858)	-	543,618,370
2090	543,618,370	22,560,162	(58,401,597)	-	507,776,935
2091	507,776,935	21,072,743	(60,557,794)	-	468,291,883
2092	468,291,883	19,434,113	(62,969,645)	-	424,756,351
2093	424,756,351	17,627,389	(65,120,679)	-	377,263,061
2094	377,263,061	15,656,417	(67,534,052)	-	325,385,425
2095	325,385,425	13,503,495	(81,984,143)	-	256,904,777
2096	256,904,777	10,661,548	(72,841,643)	-	194,724,683
2097	194,724,683	8,081,074	(156,409,985)	-	46,395,772
2098	46,395,772	1,925,425	(48,321,196)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,592,979	-	294,670	431,096,616
2018	431,096,616	21,742,121	-	589,341	453,428,078
2019	453,428,078	22,867,627	-	589,341	476,885,046
2020	476,885,046	24,049,858	-	589,341	501,524,244
2021	501,524,244	25,209,778	-	(2,660,472)	524,073,551
2022	524,073,551	26,346,263	-	(2,660,472)	547,759,342
2023	547,759,342	27,540,027	-	(2,660,472)	572,638,898
2024	572,638,898	28,793,957	-	(2,660,472)	598,772,383
2025	598,772,383	30,111,084	-	(2,660,472)	626,222,995
2026	626,222,995	31,494,595	-	(2,660,472)	655,057,119
2027	655,057,119	32,947,835	-	(2,660,472)	685,344,482
2028	685,344,482	34,474,318	-	(2,660,472)	717,158,328
2029	717,158,328	36,077,736	-	(2,660,472)	750,575,593
2030	750,575,593	37,761,966	-	(2,660,472)	785,677,087
2031	785,677,087	39,531,081	-	(2,660,472)	822,547,697
2032	822,547,697	41,389,360	-	(2,660,472)	861,276,585
2033	861,276,585	43,341,296	-	(2,660,472)	901,957,410
2034	901,957,410	45,391,610	-	(2,660,472)	944,688,548
2035	944,688,548	47,545,259	-	(2,660,472)	989,573,335
2036	989,573,335	49,807,452	-	(2,660,472)	1,036,720,316
2037	1,036,720,316	52,183,660	-	(2,660,472)	1,086,243,505
2038	1,086,243,505	54,679,629	-	(2,660,472)	1,138,262,662
2039	1,138,262,662	57,301,394	-	(2,660,472)	1,192,903,584
2040	1,192,903,584	60,055,297	-	(2,660,472)	1,250,298,410
2041	1,250,298,410	62,947,996	-	(2,660,472)	1,310,585,934
2042	1,310,585,934	65,986,487	-	(2,660,472)	1,373,911,950
2043	1,373,911,950	69,178,118	-	(2,660,472)	1,440,429,597
2044	1,440,429,597	72,530,608	-	(2,660,472)	1,510,299,733
2045	1,510,299,733	76,052,063	-	(2,660,472)	1,583,691,324
2046	1,583,691,324	79,750,999	-	(2,660,472)	1,660,781,851
2047	1,660,781,851	83,636,361	-	(2,660,472)	1,741,757,741
2048	1,741,757,741	87,717,546	-	(2,660,472)	1,826,814,816
2049	1,826,814,816	92,004,423	-	(2,660,472)	1,916,158,767
2050	1,916,158,767	96,507,358	-	(2,660,472)	2,010,005,653
2051	2,010,005,653	101,237,241	-	(2,660,472)	2,108,582,423
2052	2,108,582,423	106,205,510	-	(2,660,472)	2,212,127,461
2053	2,212,127,461	111,424,180	-	(2,660,472)	2,320,891,170
2054	2,320,891,170	94,879,291	(35,007,292)	(2,208,191)	2,378,554,978
2055	2,378,554,978	97,282,899	(232,874,689)	-	2,242,963,188

EXTERNAL FUND CALCULATION

2056	2,242,963,188	91,737,194	(424,045,058)	-	1,910,655,324
2057	1,910,655,324	78,145,803	(415,473,446)	-	1,573,327,681
2058	1,573,327,681	64,349,102	(274,831,986)	-	1,362,844,797
2059	1,362,844,797	55,740,352	(344,542,346)	-	1,074,042,803
2060	1,074,042,803	43,928,351	(187,441,351)	-	930,529,803
2061	930,529,803	38,058,669	(132,335,761)	-	836,252,711
2062	836,252,711	34,202,736	(118,692,574)	-	751,762,873
2063	751,762,873	30,747,101	(68,214,888)	-	714,295,087
2064	714,295,087	29,214,669	(20,764,067)	-	722,745,689
2065	722,745,689	29,560,299	(21,437,832)	-	730,868,155
2066	730,868,155	29,892,508	(22,203,212)	-	738,557,451
2067	738,557,451	30,207,000	(22,997,616)	-	745,766,835
2068	745,766,835	30,501,864	(23,895,975)	-	752,372,723
2069	752,372,723	30,772,044	(24,678,825)	-	758,465,942
2070	758,465,942	31,021,257	(25,567,646)	-	763,919,554
2071	763,919,554	31,244,310	(26,490,453)	-	768,673,410
2072	768,673,410	31,438,742	(27,533,085)	-	772,579,068
2073	772,579,068	31,598,484	(30,110,406)	-	774,067,146
2074	774,067,146	31,659,346	(32,921,147)	-	772,805,345
2075	772,805,345	31,607,739	(34,107,462)	-	770,305,622
2076	770,305,622	31,505,500	(36,355,900)	-	765,455,222
2077	765,455,222	31,307,119	(35,666,916)	-	761,095,425
2078	761,095,425	31,128,803	(39,907,088)	-	752,317,139
2079	752,317,139	30,769,771	(38,306,057)	-	744,780,853
2080	744,780,853	30,461,537	(38,765,494)	-	736,476,896
2081	736,476,896	30,121,905	(42,233,007)	-	724,365,795
2082	724,365,795	29,626,561	(43,772,961)	-	710,219,395
2083	710,219,395	29,047,973	(44,214,196)	-	695,053,172
2084	695,053,172	28,427,675	(47,160,490)	-	676,320,357
2085	676,320,357	27,661,503	(48,753,133)	-	655,228,726
2086	655,228,726	26,798,855	(49,263,538)	-	632,764,043
2087	632,764,043	25,880,049	(52,397,234)	-	606,246,858
2088	606,246,858	24,795,497	(54,474,045)	-	576,568,309
2089	576,568,309	23,581,644	(54,913,858)	-	545,236,095
2090	545,236,095	22,300,156	(58,401,597)	-	509,134,654
2091	509,134,654	20,823,607	(60,557,794)	-	469,400,467
2092	469,400,467	19,198,479	(62,969,645)	-	425,629,301
2093	425,629,301	17,408,238	(65,120,679)	-	377,916,860
2094	377,916,860	15,456,800	(67,534,052)	-	325,839,607
2095	325,839,607	13,326,840	(81,984,143)	-	257,182,304
2096	257,182,304	10,518,756	(72,841,643)	-	194,859,418
2097	194,859,418	7,969,750	(156,406,652)	-	46,422,516
2098	46,422,516	1,898,681	(48,321,196)	-	(0)

2021 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$28,665,382	\$15,273,156
Prairie Island Unit 1	49,264	23,051,488	23,002,224
Prairie Island Unit 2	589,341	15,399,724	14,810,383
TOTAL	\$14,030,831	\$67,116,594	\$53,085,763

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
DECON Method - with Recasking

Docket No. E002/M-17-828
Schedule F.15
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Proposed

2021 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2021 Decommissioning Accrual
Monticello	13.75	5.00%	4.46%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	28,665,382
Prairie Island Unit 1	16.67	5.00%	4.19%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	23,051,488
Prairie Island Unit 2	17.83	5.04%	4.13%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	15,399,724
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$67,116,594

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional
	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Estimate	Cost in	Cost in
	Estimate	Cost in	Factor	Cost in	Estimate	Cost in	Factor	Cost in	Estimate	Cost in	Factor	Cost in	Nominal \$	Nominal \$	Nominal \$
	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s			
Monticello															
<i>Factors</i>	<i>2017</i>	<i>73.4886%</i>	<i>4.05%</i>				<i>2.85%</i>					<i>0.00%</i>			
2030	\$21,103,620	\$15,508,745	1.6755	\$25,984,903	\$8,935,561	\$6,566,615	1.4410	\$9,462,492	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$35,447,395
2031	72,416,235	53,217,644	1.7434	92,779,641	42,961,344	31,571,670	1.4820	46,789,215	0	0	1.0000	0	115,377,579	84,789,314	139,568,856
2032	81,871,153	60,165,927	1.8140	109,140,991	112,447,587	82,636,106	1.5243	125,962,216	0	0	1.0000	0	194,318,741	142,802,033	235,103,207
2033	78,663,227	57,808,468	1.8874	109,107,702	100,155,666	73,602,950	1.5677	115,387,345	0	0	1.0000	0	178,818,892	131,411,418	224,495,047
2034	66,380,423	48,782,013	1.9639	95,802,994	38,894,671	28,583,132	1.6124	46,087,441	0	0	1.0000	0	105,275,094	77,365,144	141,890,436
2035	86,879,803	63,846,711	2.0434	130,464,369	113,147,091	83,150,161	1.6584	137,896,227	0	0	1.0000	0	200,026,894	146,996,872	268,360,596
2036	50,307,504	36,970,257	2.1262	78,606,161	20,688,337	15,203,559	1.7056	25,931,191	0	0	1.0000	0	70,995,841	52,173,817	104,537,352
2037	34,623,126	25,444,035	2.2123	56,289,838	14,196,883	10,433,084	1.7542	18,301,716	0	0	1.0000	0	48,820,010	35,877,119	74,591,555
2038	29,581,478	21,739,000	2.3019	50,041,005	15,098,979	11,096,021	1.8042	20,019,442	0	0	1.0000	0	44,680,457	32,835,022	70,060,446
2039	5,925,017	4,354,209	2.3951	10,428,767	2,187,162	1,607,314	1.8556	2,982,532	0	0	1.0000	0	8,112,179	5,961,523	13,411,299
2040	5,941,204	4,366,105	2.4921	10,880,770	2,193,018	1,611,617	1.9085	3,075,772	0	0	1.0000	0	8,134,222	5,977,722	13,956,542
2041	5,925,017	4,354,209	2.5930	11,290,465	2,187,162	1,607,314	1.9629	3,154,997	0	0	1.0000	0	8,112,179	5,961,523	14,445,461
2042	5,925,017	4,354,209	2.6981	11,748,092	2,187,162	1,607,314	2.0189	3,245,006	0	0	1.0000	0	8,112,179	5,961,523	14,993,098
2043	5,925,017	4,354,209	2.8073	12,223,572	2,187,162	1,607,314	2.0764	3,337,427	0	0	1.0000	0	8,112,179	5,961,523	15,560,999
2044	5,941,204	4,366,105	2.9210	12,753,392	2,193,018	1,611,617	2.1356	3,441,770	0	0	1.0000	0	8,134,222	5,977,722	16,195,163
2045	5,925,017	4,354,209	3.0393	13,233,748	2,187,162	1,607,314	2.1964	3,530,305	0	0	1.0000	0	8,112,179	5,961,523	16,764,053
2046	5,925,017	4,354,209	3.1624	13,769,752	2,187,162	1,607,314	2.2590	3,630,922	0	0	1.0000	0	8,112,179	5,961,523	17,400,674
2047	5,925,017	4,354,209	3.2905	14,327,526	2,187,162	1,607,314	2.3234	3,734,433	0	0	1.0000	0	8,112,179	5,961,523	18,061,959
2048	6,604,849	4,853,808	3.4238	16,618,468	4,183,955	3,074,728	2.3896	7,347,371	0	0	1.0000	0	10,788,804	7,928,536	23,965,838
2049	5,925,017	4,354,209	3.5624	15,511,435	2,187,159	1,607,312	2.4577	3,950,290	0	0	1.0000	0	8,112,176	5,961,521	19,461,726
2050	7,418,218	5,451,541	3.7067	20,207,228	6,666,765	4,899,309	2.5278	12,384,475	0	0	1.0000	0	14,084,983	10,350,851	32,591,702
2051	7,418,218	5,451,541	3.8568	21,025,504	6,666,765	4,899,309	2.5998	12,737,225	0	0	1.0000	0	14,084,983	10,350,851	33,762,729
2052	8,296,905	6,097,276	4.0130	24,468,367	9,260,121	6,805,129	2.6739	18,196,235	0	0	1.0000	0	17,557,026	12,902,405	42,664,602
2053	8,927,593	6,560,759	4.1756	27,395,105	11,194,890	8,226,963	2.7501	22,624,971	0	0	1.0000	0	20,122,483	14,787,722	50,020,076
2054	7,633,843	5,610,001	4.3447	24,373,771	7,313,640	5,374,689	2.8285	15,202,307	0	0	1.0000	0	14,947,483	10,984,689	39,576,077
2055	8,711,968	6,402,299	4.5206	28,942,234	10,548,015	7,751,584	2.9091	22,550,133	0	0	1.0000	0	19,259,983	14,153,883	51,492,367
2056	9,159,405	6,731,114	4.7037	31,661,142	11,847,621	8,706,646	2.9920	26,050,283	0	0	1.0000	0	21,007,026	15,437,760	57,711,426
2057	5,908,426	4,342,017	4.8942	21,250,699	2,137,389	1,570,737	3.0773	4,833,628	0	0	1.0000	0	8,045,815	5,912,753	26,084,326
2058	12,004,811	8,822,162	5.0924	44,925,978	20,426,543	15,011,171	3.1650	47,510,357	0	0	1.0000	0	32,431,354	23,833,333	92,436,335
2059	5,908,426	4,342,017	5.2987	23,007,045	2,137,389	1,570,737	3.2552	5,113,062	0	0	1.0000	0	8,045,815	5,912,753	28,120,106
2060	5,924,613	4,353,912	5.5133	24,004,425	2,143,245	1,575,040	3.3480	5,273,234	0	0	1.0000	0	8,067,858	5,928,952	29,277,659
2061	5,908,426	4,342,017	5.7366	24,908,414	2,137,389	1,570,737	3.4434	5,408,674	0	0	1.0000	0	8,045,815	5,912,753	30,317,088
2062	5,908,426	4,342,017	5.9689	25,917,064	2,137,389	1,570,737	3.5415	5,562,764	0	0	1.0000	0	8,045,815	5,912,753	31,479,828
2063	5,908,426	4,342,017	6.2106	26,966,530	2,137,389	1,570,737	3.6425	5,721,408	0	0	1.0000	0	8,045,815	5,912,753	32,687,938
2064	5,924,613	4,353,912	6.4622	28,135,853	2,143,245	1,575,040	3.7463	5,900,572	0	0	1.0000	0	8,067,858	5,928,952	34,036,425
2065	5,908,426	4,342,017	6.7239	29,195,287	2,137,389	1,570,737	3.8531	6,052,205	0	0	1.0000	0	8,045,815	5,912,753	35,247,492
2066	9,566,257	7,030,104	6.9962	49,184,013	13,110,882	9,634,998	3.9629	38,182,533	0	0	1.0000	0	22,677,139	16,665,102	87,366,546
2067	5,908,426	4,342,017	7.2795	31,607,711	2,137,389	1,570,737	4.0758	6,402,008	0	0	1.0000	0	8,045,815	5,912,753	38,009,720
2068	14,459,552	10,626,116	7.5744	80,486,450	27,748,061	20,391,649	4.1920	85,481,792	0	0	1.0000	0	42,207,613	31,017,765	165,968,243
2069	5,908,426	4,342,017	7.8811	34,219,869	2,137,389	1,570,737	4.3115	6,772,231	0	0	1.0000	0	8,045,815	5,912,753	40,992,100
2070	5,908,426	4,342,017	8.2003	35,605,841	2,137,389	1,570,737	4.4343	6,965,117	0	0	1.0000	0	8,045,815	5,912,753	42,570,958
2071	5,908,426	4,342,017	8.5324	37,047,824	2,137,389	1,570,737	4.5607	7,163,658	0	0	1.0000	0	8,045,815	5,912,753	44,211,483
2072	5,924,613	4,353,912	8.8780	38,654,034	2,143,245	1,575,040	4.6907	7,388,040	0	0	1.0000	0	8,067,858	5,928,952	46,042,074
2073	5,908,426	4,342,017	9.2375	40,109,380	2,137,389	1,570,737	4.8244	7,577,862	0	0	1.0000	0	8,045,815	5,912,753	47,687,242
2074	5,908,426	4,342,017	9.6117	41,734,163	2,137,389	1,570,737	4.9619	7,793,838	0	0	1.0000	0	8,045,815	5,912,753	49,528,001
2075	5,908,426	4,342,017	10.0009	43,424,076	2,137,389	1,570,737	5.1033	8,015,940	0	0	1.0000	0	8,045,815	5,912,753	51,440,016
2076	5,924,613	4,353,912	10.4060	45,306,813	2,143,245	1,575,040	5.2487	8,266,912	0	0	1.0000	0	8,067,858	5,928,952	53,573,725
2077	5,908,426	4,342,017	10.8274	47,012,753	2,137,389	1,570,737	5.3983	8,479,307	0	0	1.0000	0	8,045,815	5,912,753	55,492,060
2078	6,386,857	4,693,609	11.2659	52,877,728	3,557,353	2,614,247	5.5522	14,514,823	0	0	1.0000	0	9,944,210	7,307,856	67,392,551
2079	6,482,543	4,763,927	11.7222	55,843,706	3,844,412	2,825,203	5.7104	16,133,037	0	0	1.0000	0	10,326,955	7,589,130	71,976,743
2080	6,403,045	4,705,505	12.1970	57,393,047	3,563,167	2,618,520	5.8731	15,378,828	0	0	1.0000	0	9,966,212	7,324,025	72,771,874
2081	6,386,857	4,693,609	12.6909	59,566,121	3,557,353	2,614,247	6.0405	15,791,360	0	0	1.0000	0	9,944,210	7,307,856	75,357,480
2082	6,386,857	4,693,609	13.2049	61,978,635	3,557,353	2,614,247	6.2127	16,241,533	0	0	1.0000	0	9,944,210	7,307,856	78,220,169
2083	6,482,543	4,763,927	13.7397	65,454,929	3,844,412	2,825,203	6.3897	18,052,197	0	0	1.0000	0	10,326,955	7,589,130	83,507,127
2084	6,403,045	4,705,505	14.2962	67,270,843	3,563,167	2,618,520	6.5719	17,208,649	0	0	1.0000	0	9,966,212	7,324,025	84,479,492

AMOUNT TO RECOVER															
	LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2085	6,386,857	4,693,609	14.8752	69,818,370	3,557,353	2,614,247	6.7592	17,670,219	0	0	1.0000	0	9,944,210	7,307,856	87,488,590
2086	6,386,857	4,693,609	15.4776	72,645,800	3,557,353	2,614,247	6.9518	18,173,723	0	0	1.0000	0	9,944,210	7,307,856	90,819,524
2087	6,482,543	4,763,927	16.1045	76,720,664	3,844,412	2,825,203	7.1499	20,199,916	0	0	1.0000	0	10,326,955	7,589,130	96,920,580
2088	7,066,689	5,193,208	16.7567	87,021,021	5,554,101	4,081,628	7.3537	30,015,070	0	0	1.0000	0	12,620,790	9,274,836	117,036,091
2089	6,386,857	4,693,609	17.4353	81,834,478	3,557,353	2,614,247	7.5633	19,772,335	0	0	1.0000	0	9,944,210	7,307,856	101,606,814
2090	6,099,798	4,482,653	18.1415	81,322,056	11,895,081	8,741,523	7.7788	67,998,558	0	0	1.0000	0	17,994,879	13,224,176	149,320,614
2091	2,067,326	1,519,248	18.8762	28,677,630	15,798,591	11,610,156	8.0005	92,887,054	0	0	1.0000	0	17,865,917	13,129,404	121,564,684
	\$873,535,822	\$641,948,844		\$2,760,206,192	\$729,124,605	\$535,823,128		\$1,386,916,184	\$0	\$0		\$0	\$1,602,660,427	\$1,177,771,972	\$4,147,122,376

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in	
Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in				
Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s				Nominal \$
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2033	\$22,324,332	\$16,405,843	1.8874	\$30,964,388	\$9,448,311	\$6,943,427	1.5677	\$10,885,211	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,022,663	\$24,267,877	\$42,768,206
2034	63,582,247	46,725,674	1.9639	91,764,550	32,971,808	24,230,505	1.6124	39,069,266	1,250,000	918,607	1.0000	918,607	97,804,054	71,874,785	131,752,423
2035	65,877,290	48,412,268	2.0434	98,925,629	81,239,936	59,702,054	1.6584	99,009,886	1,250,000	918,607	1.0000	918,607	148,367,222	109,032,929	198,854,122
2036	57,759,315	42,446,486	2.1262	90,249,718	65,595,018	48,204,830	1.7056	82,218,158	1,250,000	918,607	1.0000	918,607	124,604,333	91,569,923	173,386,483
2037	39,808,345	29,254,577	2.2123	64,719,901	41,981,871	30,851,870	1.7542	54,120,350	1,250,000	918,607	1.0000	918,607	83,040,216	61,025,054	119,758,858
2038	13,207,909	9,706,302	2.3019	22,342,936	18,994,691	13,958,923	1.8042	25,184,690	1,250,000	918,607	1.0000	918,607	33,452,600	24,583,832	48,446,232
2039	36,035,851	26,482,226	2.3951	63,427,579	76,476,727	56,201,641	1.8556	104,287,765	1,250,000	918,607	1.0000	918,607	113,762,578	83,602,474	168,633,951
2040	31,919,556	23,457,220	2.4921	58,457,738	13,365,606	9,822,190	1.9085	18,745,650	1,250,000	918,607	1.0000	918,607	46,535,162	34,198,017	78,121,996
2041	19,571,318	14,382,679	2.5930	37,294,286	9,445,873	6,941,635	1.9629	13,625,736	1,250,000	918,607	1.0000	918,607	30,267,191	22,242,921	51,838,628
2042	14,781,952	10,863,043	2.6981	29,309,575	11,668,700	8,575,159	2.0189	17,312,388	1,250,000	918,607	1.0000	918,607	27,700,652	20,356,808	47,540,570
2043	8,544,452	6,279,195	2.8073	17,627,583	6,492,672	4,771,371	2.0764	9,907,275	1,250,000	918,607	1.0000	918,607	16,287,125	11,969,172	28,453,465
2044	3,054,798	2,244,927	2.9210	6,557,431	1,939,011	1,424,951	2.1356	3,043,125	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	10,519,163
2045	5,353,318	3,934,076	3.0393	11,956,837	8,850,896	6,504,395	2.1964	14,286,253	1,250,000	918,607	1.0000	918,607	15,454,214	11,357,078	27,161,698
2046	4,584,362	3,368,981	3.1624	10,654,067	6,544,030	4,809,113	2.2590	10,863,786	1,250,000	918,607	1.0000	918,607	12,378,392	9,096,701	22,436,459
2047	4,584,362	3,368,981	3.2905	11,085,633	6,544,030	4,809,113	2.3234	11,173,492	1,250,000	918,607	1.0000	918,607	12,378,392	9,096,701	23,177,732
2048	3,054,798	2,244,927	3.4238	7,686,181	1,939,011	1,424,951	2.3896	3,405,063	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	12,009,850
2049	4,584,362	3,368,981	3.5624	12,001,659	6,544,030	4,809,113	2.4577	11,819,356	1,250,000	918,607	1.0000	918,607	12,378,392	9,096,701	24,739

AMOUNT TO RECOVER															
LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$	
Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2034	\$7,760,265	\$5,702,906	1.9639	\$11,199,938	\$4,479,535	\$3,291,946	1.6124	\$5,307,933	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459	\$17,426,478
2035	46,911,429	34,474,531	2.0434	70,445,256	35,601,339	26,162,909	1.6584	43,388,568	1,250,000	918,607	1.0000	918,607	83,762,768	61,556,047	114,752,433
2036	67,514,013	49,615,071	2.1262	105,491,565	86,298,834	63,419,765	1.7056	108,168,751	1,250,000	918,607	1.0000	918,607	155,062,846	113,953,443	214,578,923
2037	72,593,441	53,347,870	2.2123	118,021,492	75,650,366	55,594,360	1.7542	97,523,626	1,250,000	918,607	1.0000	918,607	149,493,807	109,860,837	216,463,726
2038	46,603,527	34,248,258	2.3019	78,836,066	42,782,151	31,439,984	1.8042	56,724,019	1,250,000	918,607	1.0000	918,607	90,635,678	66,606,849	136,478,692
2039	40,663,625	29,883,110	2.3951	71,573,036	77,452,618	56,918,809	1.8556	105,618,542	1,250,000	918,607	1.0000	918,607	119,366,242	87,720,525	178,110,184
2040	37,417,177	27,497,343	2.4921	68,526,127	14,193,501	10,430,599	1.9085	19,906,798	1,250,000	918,607	1.0000	918,607	52,860,679	38,846,548	89,351,532
2041	23,327,583	17,143,103	2.5930	44,452,067	13,070,130	9,605,049	1.9629	18,853,752	1,250,000	918,607	1.0000	918,607	37,647,713	27,666,760	64,224,426
2042	16,656,921	12,240,930	2.6981	33,027,253	17,178,640	12,624,334	2.0189	25,487,268	1,250,000	918,607	1.0000	918,607	35,085,561	25,783,871	59,433,129
2043	9,422,862	6,924,725	2.8073	19,439,782	9,074,042	6,668,382	2.0764	13,846,228	1,250,000	918,607	1.0000	918,607	19,746,904	14,511,714	34,204,617
2044	3,054,798	2,244,927	2.9210	6,557,431	1,939,011	1,424,951	2.1356	3,043,125	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	10,519,163
2045	5,353,318	3,934,076	3.0393	11,956,837	8,850,896	6,504,395	2.1964	14,286,253	1,250,000	918,607	1.0000	918,607	15,454,214	11,357,078	27,161,698
2046	4,584,362	3,368,981	3.1624	10,654,067	6,544,030	4,809,113	2.2590	10,863,786	1,250,000	918,607	1.0000	918,607	12,378,392	9,096,701	22,436,459
2047	4,584,362	3,368,981	3.2905	11,085,633	6,544,030	4,809,113	2.3234	11,173,492	1,250,000	918,607	1.0000	918,607	12,378,392	9,096,701	23,177,732
2048	3,054,798	2,244,927	3.4238	7,686,181	1,939,011	1,424,951	2.3896	3,405,063	1,250,000	918,607	1.0000	918,607	6,243,809	4,588,485	12,009,850
2049	4,584,362	3,368,981	3.5624	12,001,659	6,544,030	4,809,113	2.4577	11,819,356	1,250,000	918,607	1.0000	918,607	12,378,392	9,096,701	24,739,622
2050	5,353,318	3,934,076	3.7067	14,582,439	8,850,896	6,504,395	2.5278	16,441,810	1,250,000	918,607	1.0000	918,607	15,454,214	11,357,078	31,942,856
2051	5,159,362	3,791,541	3.8568	14,623,213	8,269,030	6,076,790	2.5998	15,798,439	1,250,000	918,607	1.0000	918,607	14,678,392	10,786,938	31,340,260
2052	5,361,664	3,940,209	4.0130	15,812,060	8,859,609	6,510,798	2.6739	17,409,224	1,250,000	918,607	1.0000	918,607	15,471,273	11,369,615	34,139,891
2053	3,142,138	2,309,112	4.1756	9,641,927	2,217,357	1,629,503	2.7501	4,481,297	1,250,000	918,607	1.0000	918,607	6,609,495	4,857,222	15,041,831
2054	3,237,824	2,379,430	4.3447	10,337,910	2,504,416	1,840,459	2.8285	5,205,738	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	16,462,254
2055	5,544,600	4,074,712	4.5206	18,420,145	9,425,014	6,926,306	2.9091	20,149,317	1,250,000	918,607	1.0000	918,607	16,219,704	11,919,626	39,488,069
2056	4,831,925	3,550,912	4.7037	16,702,424	7,270,391	5,342,905	2.9920	15,985,972	1,250,000	918,607	1.0000	918,607	13,352,316	9,812,424	33,607,002
2057	5,302,892	3,897,019	4.8942	19,072,789	8,699,619	6,393,224	3.0773	19,673,868	1,250,000	918,607	1.0000	918,607	15,252,511	11,208,489	39,665,263
2058	3,333,511	2,449,749	5.0924	12,475,102	2,791,475	2,051,414	3.1650	6,492,726	1,250,000	918,607	1.0000	918,607	7,374,986	5,419,770	19,886,435
2059	3,189,981	2,344,271	5.2987	12,421,588	2,360,887	1,734,981	3.2552	5,647,711	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	18,987,907
2060	3,150,484	2,315,245	5.5133	12,764,641	2,226,070	1,635,906	3.3480	5,477,015	1,250,000	918,607	1.0000	918,607	6,626,554	4,869,758	19,160,263
2061	3,237,824	2,379,430	5.7366	13,649,838	2,504,416	1,840,459	3.4434	6,337,436	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	20,905,881
2062	3,237,824	2,379,430	5.9689	14,202,580	2,504,416	1,840,459	3.5415	6,517,985	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	21,639,172
2063	3,189,981	2,344,271	6.2106	14,559,329	2,360,887	1,734,981	3.6425	6,319,670	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	21,797,605
2064	3,246,171	2,385,564	6.4622	15,415,992	2,513,129	1,846,862	3.7463	6,918,899	1,250,000	918,607	1.0000	918,607	7,009,300	5,151,033	23,253,498
2065	3,237,824	2,379,430	6.7239	15,999,050	2,504,416	1,840,459	3.8531	7,091,472	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	24,009,128
2066	3,189,981	2,344,271	6.9962	16,400,988	2,360,887	1,734,981	3.9629	6,875,558	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	24,195,153
2067	3,237,824	2,379,430	7.2795	17,321,061	2,504,416	1,840,459	4.0758	7,501,342	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	25,741,010
2068	3,246,171	2,385,564	7.5744	18,069,217	2,513,129	1,846,862	4.1920	7,742,045	1,250,000	918,607	1.0000	918,607	7,009,300	5,151,033	26,729,869
2069	3,189,981	2,344,271	7.8811	18,475,433	2,360,887	1,734,981	4.3115	7,480,372	1,250,000	918,607	1.0000	918,607	6,800,868	4,997,859	26,874,413
2070	3,237,824	2,379,430	8.2003	19,512,040	2,504,416	1,840,459	4.4343	8,161,146	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	28,591,793
2071	3,237,824	2,379,430	8.5324	20,302,249	2,504,416	1,840,459	4.5607	8,393,780	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	29,614,636
2072	3,246,171	2,385,564	8.8780	21,179,038	2,513,129	1,846,862	4.6907	8,663,075	1,250,000	918,607	1.0000	918,607	7,009,300	5,151,033	30,760,720
2073	3,237,824	2,379,430	9.2375	21,979,985	2,504,416	1,840,459	4.8244	8,879,109	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	31,777,701
2074	3,237,824	2,379,430	9.6117	22,870,368	2,504,416	1,840,459	4.9619	9,132,172	1,250,000	918,607	1.0000	918,607	6,992,240	5,138,496	32,921,147
2075	3,569,647	2,623,282	10.0009	26,235,181	3,499,884	2,572,014	5.1033	13,125,758	1,250,000	918,607	1.0000	918,607	8,319,531	6,113,903	40,279,545
2076	3,246,171	2,385,564	10.4060	24,824,180	2,513,129	1,846,862	5.2487	9,693,624	1,250,000	918,607	1.0000	918,607	7,009,300	5,151,033	35,436,411
2077	3,237,824	2,379,430	10.8274	25,763,042	14,152,682	10,400,601	5.3983	56,145,565	1,250,000	918,607	1.0000	918,607	18,640,506	13,698,368	82,827,215
2078	982,878	722,303	11.2659	8,137,389	5,148,901	3,783,853	5.5522	21,008,709	0	-	1.0000	-	6,131,779	4,506,156	29,146,099
	\$497,942,199	\$365,930,521		\$1,172,705,590	\$531,588,885	\$390,656,984		\$888,167,393	\$55,000,000	\$40,418,705		\$40,418,705	\$1,084,531,084	\$797,006,210	\$2,101,291,688
	\$1,873,961,967	\$1,377,147,550		\$5,089,688,674	\$1,784,202,430	\$1,311,184,564		\$3,142,791,860	\$111,250,000	\$81,756,016		\$81,756,016	\$3,769,414,397	\$2,770,088,131	\$8,314,236,550

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,675,506	-	6,696,113	646,043,801
2018	646,043,801	32,636,996	-	13,392,226	692,073,023
2019	692,073,023	34,938,457	-	13,392,226	740,403,706
2020	740,403,706	37,354,991	-	13,392,226	791,150,922
2021	791,150,922	40,274,181	-	28,665,382	860,090,485
2022	860,090,485	43,721,159	-	28,665,382	932,477,026
2023	932,477,026	47,340,486	-	28,665,382	1,008,482,893
2024	1,008,482,893	51,140,779	-	28,665,382	1,088,289,054
2025	1,088,289,054	55,131,087	-	28,665,382	1,172,085,523
2026	1,172,085,523	59,320,911	-	28,665,382	1,260,071,816
2027	1,260,071,816	63,720,225	-	28,665,382	1,352,457,423
2028	1,352,457,423	68,339,506	-	28,665,382	1,449,462,310
2029	1,449,462,310	73,189,750	-	28,665,382	1,551,317,442
2030	1,551,317,442	69,668,186	(35,447,395)	21,499,036	1,607,037,270
2031	1,607,037,270	71,673,862	(139,568,856)	-	1,539,142,277
2032	1,539,142,277	68,645,746	(235,103,207)	-	1,372,684,815
2033	1,372,684,815	61,221,743	(224,495,047)	-	1,209,411,511
2034	1,209,411,511	53,939,753	(141,890,436)	-	1,121,460,828
2035	1,121,460,828	50,017,153	(268,360,596)	-	903,117,385
2036	903,117,385	40,279,035	(104,537,352)	-	838,859,069
2037	838,859,069	37,413,114	(74,591,555)	-	801,680,629
2038	801,680,629	35,754,956	(70,060,446)	-	767,375,138
2039	767,375,138	34,224,931	(13,411,299)	-	788,188,771
2040	788,188,771	35,153,219	(13,956,542)	-	809,385,448
2041	809,385,448	36,098,591	(14,445,461)	-	831,038,578
2042	831,038,578	37,064,321	(14,993,098)	-	853,109,800
2043	853,109,800	38,048,697	(15,560,999)	-	875,597,498
2044	875,597,498	39,051,648	(16,195,163)	-	898,453,984
2045	898,453,984	40,071,048	(16,764,053)	-	921,760,979
2046	921,760,979	41,110,540	(17,400,674)	-	945,470,845
2047	945,470,845	42,168,000	(18,061,959)	-	969,576,885
2048	969,576,885	43,243,129	(23,965,838)	-	988,854,176
2049	988,854,176	44,102,896	(19,461,726)	-	1,013,495,347
2050	1,013,495,347	45,201,892	(32,591,702)	-	1,026,105,537
2051	1,026,105,537	45,764,307	(33,762,729)	-	1,038,107,115
2052	1,038,107,115	46,299,577	(42,664,602)	-	1,041,742,091
2053	1,041,742,091	46,461,697	(50,020,076)	-	1,038,183,712
2054	1,038,183,712	46,302,994	(39,576,077)	-	1,044,910,628

EXTERNAL FUND CALCULATION

2055	1,044,910,628	46,603,014	(51,492,367)	-	1,040,021,275
2056	1,040,021,275	46,384,949	(57,711,426)	-	1,028,694,798
2057	1,028,694,798	45,879,788	(26,084,326)	-	1,048,490,260
2058	1,048,490,260	46,762,666	(92,436,335)	-	1,002,816,590
2059	1,002,816,590	44,725,620	(28,120,106)	-	1,019,422,104
2060	1,019,422,104	45,466,226	(29,277,659)	-	1,035,610,671
2061	1,035,610,671	46,188,236	(30,317,088)	-	1,051,481,818
2062	1,051,481,818	46,896,089	(31,479,828)	-	1,066,898,080
2063	1,066,898,080	47,583,654	(32,687,938)	-	1,081,793,796
2064	1,081,793,796	48,248,003	(34,036,425)	-	1,096,005,375
2065	1,096,005,375	48,881,840	(35,247,492)	-	1,109,639,722
2066	1,109,639,722	49,489,932	(87,366,546)	-	1,071,763,108
2067	1,071,763,108	47,800,635	(38,009,720)	-	1,081,554,023
2068	1,081,554,023	48,237,309	(165,968,243)	-	963,823,089
2069	963,823,089	42,986,510	(40,992,100)	-	965,817,499
2070	965,817,499	43,075,460	(42,570,958)	-	966,322,002
2071	966,322,002	43,097,961	(44,211,483)	-	965,208,481
2072	965,208,481	43,048,298	(46,042,074)	-	962,214,705
2073	962,214,705	42,914,776	(47,687,242)	-	957,442,239
2074	957,442,239	42,701,924	(49,528,001)	-	950,616,161
2075	950,616,161	42,397,481	(51,440,016)	-	941,573,626
2076	941,573,626	41,994,184	(53,573,725)	-	929,994,085
2077	929,994,085	41,477,736	(55,492,060)	-	915,979,761
2078	915,979,761	40,852,697	(67,392,551)	-	889,439,908
2079	889,439,908	39,669,020	(71,976,743)	-	857,132,184
2080	857,132,184	38,228,095	(72,771,874)	-	822,588,405
2081	822,588,405	36,687,443	(75,357,480)	-	783,918,367
2082	783,918,367	34,962,759	(78,220,169)	-	740,660,958
2083	740,660,958	33,033,479	(83,507,127)	-	690,187,310
2084	690,187,310	30,782,354	(84,479,492)	-	636,490,172
2085	636,490,172	28,387,462	(87,488,590)	-	577,389,044
2086	577,389,044	25,751,551	(90,819,524)	-	512,321,072
2087	512,321,072	22,849,520	(96,920,580)	-	438,250,011
2088	438,250,011	19,545,951	(117,036,091)	-	340,759,871
2089	340,759,871	15,197,890	(101,606,814)	-	254,350,948
2090	254,350,948	11,344,052	(149,320,614)	-	116,374,386
2091	116,374,386	5,190,298	(121,564,684)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,359,484	-	24,632	383,751,171
2018	383,751,171	19,188,790	-	49,264	402,989,226
2019	402,989,226	20,150,693	-	49,264	423,189,183
2020	423,189,183	21,160,691	-	49,264	444,399,138
2021	444,399,138	22,796,244	-	23,051,488	490,246,870
2022	490,246,870	25,088,631	-	23,051,488	538,386,989
2023	538,386,989	27,495,637	-	23,051,488	588,934,114
2024	588,934,114	30,022,993	-	23,051,488	642,008,595
2025	642,008,595	32,676,717	-	23,051,488	697,736,800
2026	697,736,800	35,463,127	-	23,051,488	756,251,416
2027	756,251,416	38,388,858	-	23,051,488	817,691,762
2028	817,691,762	41,460,875	-	23,051,488	882,204,125
2029	882,204,125	44,686,493	-	23,051,488	949,942,107
2030	949,942,107	48,073,393	-	23,051,488	1,021,066,988
2031	1,021,066,988	51,629,637	-	23,051,488	1,095,748,113
2032	1,095,748,113	55,363,693	-	23,051,488	1,174,163,294
2033	1,174,163,294	49,521,004	(42,768,206)	15,444,497	1,196,360,589
2034	1,196,360,589	50,127,509	(131,752,423)	-	1,114,735,675
2035	1,114,735,675	46,707,425	(198,854,122)	-	962,588,978
2036	962,588,978	40,332,478	(173,386,483)	-	829,534,973
2037	829,534,973	34,757,515	(119,758,858)	-	744,533,631
2038	744,533,631	31,195,959	(48,446,232)	-	727,283,357
2039	727,283,357	30,473,173	(168,633,951)	-	589,122,579
2040	589,122,579	24,684,236	(78,121,996)	-	535,684,820
2041	535,684,820	22,445,194	(51,838,628)	-	506,291,385
2042	506,291,385	21,213,609	(47,540,570)	-	479,964,424
2043	479,964,424	20,110,509	(28,453,465)	-	471,621,469
2044	471,621,469	19,760,940	(10,519,163)	-	480,863,245
2045	480,863,245	20,148,170	(27,161,698)	-	473,849,717
2046	473,849,717	19,854,303	(22,436,459)	-	471,267,562
2047	471,267,562	19,746,111	(23,177,732)	-	467,835,940
2048	467,835,940	19,602,326	(12,009,850)	-	475,428,416
2049	475,428,416	19,920,451	(24,739,622)	-	470,609,244
2050	470,609,244	19,718,527	(31,942,856)	-	458,384,915
2051	458,384,915	19,206,328	(31,340,256)	-	446,250,987
2052	446,250,987	18,697,916	(34,139,894)	-	430,809,009
2053	430,809,009	18,050,897	(15,041,831)	-	433,818,076
2054	433,818,076	18,176,977	(16,462,254)	-	435,532,799
2055	435,532,799	18,248,824	(39,488,069)	-	414,293,554

EXTERNAL FUND CALCULATION

2056	414,293,554	17,358,900	(33,607,002)	-	398,045,451
2057	398,045,451	16,678,104	(39,665,263)	-	375,058,292
2058	375,058,292	15,714,942	(19,886,435)	-	370,886,800
2059	370,886,800	15,540,157	(18,987,907)	-	367,439,050
2060	367,439,050	15,395,696	(19,160,263)	-	363,674,484
2061	363,674,484	15,237,961	(20,905,881)	-	358,006,564
2062	358,006,564	15,000,475	(21,639,172)	-	351,367,867
2063	351,367,867	14,722,314	(21,797,605)	-	344,292,575
2064	344,292,575	14,425,859	(23,253,498)	-	335,464,936
2065	335,464,936	14,055,981	(24,009,128)	-	325,511,789
2066	325,511,789	13,638,944	(24,195,153)	-	314,955,580
2067	314,955,580	13,196,639	(25,741,010)	-	302,411,209
2068	302,411,209	12,671,030	(26,729,869)	-	288,352,370
2069	288,352,370	12,081,964	(26,874,413)	-	273,559,921
2070	273,559,921	11,462,161	(28,591,793)	-	256,430,289
2071	256,430,289	10,744,429	(29,614,636)	-	237,560,082
2072	237,560,082	9,953,767	(30,760,720)	-	216,753,129
2073	216,753,129	9,081,956	(31,777,701)	-	194,057,384
2074	194,057,384	8,131,004	(32,921,147)	-	169,267,242
2075	169,267,242	7,092,297	(40,279,545)	-	136,079,994
2076	136,079,994	5,701,752	(35,436,411)	-	106,345,334
2077	106,345,334	4,455,869	(82,827,215)	-	27,973,989
2078	27,973,989	1,172,110	(29,146,099)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,592,979	-	294,670	431,096,616
2018	431,096,616	21,742,121	-	589,341	453,428,078
2019	453,428,078	22,867,627	-	589,341	476,885,046
2020	476,885,046	24,049,858	-	589,341	501,524,244
2021	501,524,244	25,664,895	-	15,399,724	542,588,863
2022	542,588,863	27,734,552	-	15,399,724	585,723,139
2023	585,723,139	29,908,519	-	15,399,724	631,031,382
2024	631,031,382	32,192,055	-	15,399,724	678,623,161
2025	678,623,161	34,590,680	-	15,399,724	728,613,565
2026	728,613,565	37,110,197	-	15,399,724	781,123,486
2027	781,123,486	39,756,697	-	15,399,724	836,279,906
2028	836,279,906	42,536,580	-	15,399,724	894,216,211
2029	894,216,211	45,456,570	-	15,399,724	955,072,505
2030	955,072,505	48,523,727	-	15,399,724	1,018,995,956
2031	1,018,995,956	51,745,469	-	15,399,724	1,086,141,149
2032	1,086,141,149	55,129,587	-	15,399,724	1,156,670,460
2033	1,156,670,460	58,684,264	-	15,399,724	1,230,754,448
2034	1,230,754,448	51,094,102	(17,426,478)	12,781,771	1,277,203,844
2035	1,277,203,844	52,748,519	(114,752,431)	-	1,215,199,931
2036	1,215,199,931	50,187,757	(214,578,923)	-	1,050,808,766
2037	1,050,808,766	43,398,402	(216,463,726)	-	877,743,442
2038	877,743,442	36,250,804	(136,478,692)	-	777,515,555
2039	777,515,555	32,111,392	(178,110,184)	-	631,516,763
2040	631,516,763	26,081,642	(89,351,532)	-	568,246,873
2041	568,246,873	23,468,596	(64,224,426)	-	527,491,043
2042	527,491,043	21,785,380	(59,433,129)	-	489,843,294
2043	489,843,294	20,230,528	(34,204,617)	-	475,869,206
2044	475,869,206	19,653,398	(10,519,163)	-	485,003,440
2045	485,003,440	20,030,642	(27,161,698)	-	477,872,385
2046	477,872,385	19,736,129	(22,436,459)	-	475,172,055
2047	475,172,055	19,624,606	(23,177,732)	-	471,618,929
2048	471,618,929	19,477,862	(12,009,850)	-	479,086,941
2049	479,086,941	19,786,291	(24,739,622)	-	474,133,609
2050	474,133,609	19,581,718	(31,942,856)	-	461,772,471
2051	461,772,471	19,071,203	(31,340,260)	-	449,503,414
2052	449,503,414	18,564,491	(34,139,891)	-	433,928,014
2053	433,928,014	17,921,227	(15,041,831)	-	436,807,411
2054	436,807,411	18,040,146	(16,462,254)	-	438,385,302

EXTERNAL FUND CALCULATION

2055	438,385,302	18,105,313	(39,488,069)	-	417,002,546
2056	417,002,546	17,222,205	(33,607,002)	-	400,617,749
2057	400,617,749	16,545,513	(39,665,263)	-	377,497,998
2058	377,497,998	15,590,667	(19,886,435)	-	373,202,231
2059	373,202,231	15,413,252	(18,987,907)	-	369,627,576
2060	369,627,576	15,265,619	(19,160,263)	-	365,732,933
2061	365,732,933	15,104,770	(20,905,881)	-	359,931,822
2062	359,931,822	14,865,184	(21,639,172)	-	353,157,835
2063	353,157,835	14,585,419	(21,797,605)	-	345,945,648
2064	345,945,648	14,287,555	(23,253,498)	-	336,979,705
2065	336,979,705	13,917,262	(24,009,128)	-	326,887,838
2066	326,887,838	13,500,468	(24,195,153)	-	316,193,153
2067	316,193,153	13,058,777	(25,741,010)	-	303,510,921
2068	303,510,921	12,535,001	(26,729,869)	-	289,316,053
2069	289,316,053	11,948,753	(26,874,413)	-	274,390,394
2070	274,390,394	11,332,323	(28,591,793)	-	257,130,923
2071	257,130,923	10,619,507	(29,614,636)	-	238,135,795
2072	238,135,795	9,835,008	(30,760,720)	-	217,210,083
2073	217,210,083	8,970,776	(31,777,701)	-	194,403,158
2074	194,403,158	8,028,850	(32,921,147)	-	169,510,861
2075	169,510,861	7,000,799	(40,279,545)	-	136,232,115
2076	136,232,115	5,626,386	(35,436,411)	-	106,422,090
2077	106,422,090	4,395,232	(82,827,215)	-	27,990,107
2078	27,990,107	1,155,991	(29,146,099)	-	0

2021 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$58,502,632	\$45,110,406
Prairie Island Unit 1	49,264	39,989,727	39,940,463
Prairie Island Unit 2	589,341	31,249,066	30,659,725
TOTAL	\$14,030,831	\$129,741,425	\$115,710,594

Xcel Energy
Nuclear Decommissioning Accrual
100-Year Decommissioning Period
DECON Method

Docket No. E002/M-17-828
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Proposed

2021 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2021 Decommissioning Accrual
Monticello	13.75	5.03%	4.79%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	58,502,632
Prairie Island Unit 1	16.67	5.03%	4.71%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	39,989,727
Prairie Island Unit 2	17.83	5.07%	4.69%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	31,249,066
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$129,741,425

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2030	\$21,103,620	\$15,508,745	1.6755	\$25,984,903	\$8,935,561	\$6,566,615	1.4410	\$9,462,492	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$35,447,395
2031	72,416,235	53,217,644	1.7434	92,779,641	42,961,344	31,571,670	1.4820	46,789,215	0	0	1.0000	0	115,377,579	84,789,314	139,568,856
2032	81,871,153	60,165,927	1.8140	109,140,991	112,447,587	82,636,106	1.5243	125,962,216	0	0	1.0000	0	194,318,741	142,802,033	235,103,207
2033	78,663,227	57,808,468	1.8874	109,107,702	100,155,666	73,602,950	1.5677	115,387,345	0	0	1.0000	0	178,818,892	131,411,418	224,495,047
2034	66,380,423	48,782,013	1.9639	95,802,994	38,894,671	28,583,132	1.6124	46,087,441	0	0	1.0000	0	105,275,094	77,365,144	141,890,436
2035	86,879,803	63,846,711	2.0434	130,464,369	113,147,091	83,150,161	1.6584	137,896,227	0	0	1.0000	0	200,026,894	146,996,872	268,360,596
2036	50,307,504	36,970,257	2.1262	78,606,161	20,688,337	15,203,559	1.7056	25,931,191	0	0	1.0000	0	70,995,841	52,173,817	104,537,352
2037	34,755,723	25,541,478	2.2123	56,505,412	14,196,883	10,433,084	1.7542	18,301,716	0	0	1.0000	0	48,952,606	35,974,562	74,807,128
2038	29,827,529	21,919,820	2.3019	50,457,233	15,094,222	11,092,525	1.8042	20,013,134	0	0	1.0000	0	44,921,751	33,012,345	70,470,367
2039	7,164,563	5,265,134	2.3951	12,610,522	2,125,149	1,561,742	1.8556	2,897,968	0	0	1.0000	0	9,289,712	6,826,875	15,508,490
2040	7,184,147	5,279,526	2.4921	13,157,106	2,130,835	1,565,920	1.9085	2,988,559	0	0	1.0000	0	9,314,982	6,845,446	16,145,665
2041	7,164,563	5,265,134	2.5930	13,652,492	2,125,149	1,561,742	1.9629	3,065,343	0	0	1.0000	0	9,289,712	6,826,875	16,718,034
2042	7,164,563	5,265,134	2.6981	14,205,857	2,125,149	1,561,742	2.0189	3,153,000	0	0	1.0000	0	9,289,712	6,826,875	17,358,857
2043	7,164,563	5,265,134	2.8073	14,780,810	2,125,149	1,561,742	2.0764	3,242,800	0	0	1.0000	0	9,289,712	6,826,875	18,023,610
2044	7,184,147	5,279,526	2.9210	15,421,495	2,130,835	1,565,920	2.1356	3,344,179	0	0	1.0000	0	9,314,982	6,845,446	18,765,674
2045	7,164,563	5,265,134	3.0393	16,002,321	2,125,149	1,561,742	2.1964	3,430,209	0	0	1.0000	0	9,289,712	6,826,875	19,432,530
2046	7,164,563	5,265,134	3.1624	16,650,459	2,125,149	1,561,742	2.2590	3,527,974	0	0	1.0000	0	9,289,712	6,826,875	20,178,433
2047	7,164,563	5,265,134	3.2905	17,324,923	2,125,149	1,561,742	2.3234	3,628,550	0	0	1.0000	0	9,289,712	6,826,875	20,953,473
2048	7,847,792	5,767,229	3.4238	19,745,838	4,121,769	3,029,029	2.3896	7,238,167	0	0	1.0000	0	11,969,561	8,796,258	26,984,005
2049	7,164,563	5,265,134	3.5624	18,756,512	2,125,149	1,561,742	2.4577	3,838,292	0	0	1.0000	0	9,289,712	6,826,875	22,594,805
2050	8,657,764	6,362,466	3.7067	23,583,751	6,604,752	4,853,737	2.5278	12,269,277	0	0	1.0000	0	15,262,516	11,216,203	35,853,028
2051	8,657,764	6,362,466	3.8568	24,538,757	6,604,752	4,853,737	2.5998	12,618,746	0	0	1.0000	0	15,262,516	11,216,203	37,157,503
2052	8,677,348	6,376,858	4.0130	25,590,329	6,610,438	4,857,916	2.6739	12,989,580	0	0	1.0000	0	15,287,786	11,234,773	38,579,910
2053	8,657,764	6,362,466	4.1756	26,567,111	6,604,752	4,853,737	2.7501	13,348,262	0	0	1.0000	0	15,262,516	11,216,203	39,915,373
2054	8,657,764	6,362,466	4.3447	27,643,004	6,604,752	4,853,737	2.8285	13,728,755	0	0	1.0000	0	15,262,516	11,216,203	41,371,799
2055	8,657,764	6,362,466	4.5206	28,762,162	6,604,752	4,853,737	2.9091	14,120,006	0	0	1.0000	0	15,262,516	11,216,203	42,882,168
2056	8,677,348	6,376,858	4.7037	29,994,825	6,610,438	4,857,916	2.9920	14,534,883	0	0	1.0000	0	15,287,786	11,234,773	44,529,708
2057	8,657,764	6,362,466	4.8942	31,139,179	6,604,752	4,853,737	3.0773	14,936,405	0	0	1.0000	0	15,262,516	11,216,203	46,075,584
2058	14,754,149	10,842,611	5.0924	55,214,911	24,893,906	18,294,172	3.1650	57,901,054	0	0	1.0000	0	39,648,055	29,136,783	113,115,965
2059	8,657,764	6,362,466	5.2987	33,712,796	6,604,752	4,853,737	3.2552	15,799,885	0	0	1.0000	0	15,262,516	11,216,203	49,512,681
2060	8,677,348	6,376,858	5.5133	35,157,529	6,610,438	4,857,916	3.3480	16,264,301	0	0	1.0000	0	15,287,786	11,234,773	51,421,830
2061	8,657,764	6,362,466	5.7366	36,498,920	6,604,752	4,853,737	3.4434	16,713,358	0	0	1.0000	0	15,262,516	11,216,203	53,212,278
2062	8,657,764	6,362,466	5.9689	37,976,921	6,604,752	4,853,737	3.5415	17,189,510	0	0	1.0000	0	15,262,516	11,216,203	55,166,430
2063	8,657,764	6,362,466	6.2106	39,514,729	6,604,752	4,853,737	3.6425	17,679,737	0	0	1.0000	0	15,262,516	11,216,203	57,194,466
2064	8,677,348	6,376,858	6.4622	41,208,529	6,610,438	4,857,916	3.7463	18,199,209	0	0	1.0000	0	15,287,786	11,234,773	59,407,738
2065	8,657,764	6,362,466	6.7239	42,780,582	6,604,752	4,853,737	3.8531	18,701,934	0	0	1.0000	0	15,262,516	11,216,203	61,482,516
2066	12,315,595	9,050,553	6.9962	63,319,477	17,578,245	12,917,998	3.9629	51,192,736	0	0	1.0000	0	29,893,840	21,968,551	114,512,212
2067	8,657,764	6,362,466	7.2795	46,315,568	6,604,752	4,853,737	4.0758	19,782,861	0	0	1.0000	0	15,262,516	11,216,203	66,098,430
2068	17,212,287	12,649,061	7.5744	95,809,046	32,215,254	23,674,525	4.1920	99,243,607	0	0	1.0000	0	49,427,541	36,323,585	195,052,653
2069	8,657,764	6,362,466	7.8811	50,143,227	6,604,752	4,853,737	4.3115	20,926,887	0	0	1.0000	0	15,262,516	11,216,203	71,070,115
2070	8,657,764	6,362,466	8.2003	52,174,126	6,604,752	4,853,737	4.4343	21,522,926	0	0	1.0000	0	15,262,516	11,216,203	73,697,053
2071	8,657,764	6,362,466	8.5324	54,287,101	6,604,752	4,853,737	4.5607	22,136,439	0	0	1.0000	0	15,262,516	11,216,203	76,423,540
2072	8,677,348	6,376,858	8.8780	56,613,741	6,610,438	4,857,916	4.6907	22,787,025	0	0	1.0000	0	15,287,786	11,234,773	79,400,766
2073	8,657,764	6,362,466	9.2375	58,773,276	6,604,752	4,853,737	4.8244	23,416,369	0	0	1.0000	0	15,262,516	11,216,203	82,189,645
2074	8,657,764	6,362,466	9.6117	61,154,110	6,604,752	4,853,737	4.9619	24,083,758	0	0	1.0000	0	15,262,516	11,216,203	85,237,868
2075	8,657,764	6,362,466	10.0009	63,630,382	6,604,752	4,853,737	5.1033	24,770,076	0	0	1.0000	0	15,262,516	11,216,203	88,400,458
2076	8,677,348	6,376,858	10.4060	66,357,580	6,610,438	4,857,916	5.2487	25,497,742	0	0	1.0000	0	15,287,786	11,234,773	91,855,321
2077	8,657,764	6,362,466	10.8274	68,888,960	6,604,752	4,853,737	5.3983	26,201,929	0	0	1.0000	0	15,262,516	11,216,203	95,090,888
2078	8,657,764	6,362,466	11.2659	71,678,901	6,604,752	4,853,737	5.5522	26,948,919	0	0	1.0000	0	15,262,516	11,216,203	98,627,820
2079	8,657,764	6,362,466	11.7222	74,582,094	6,604,752	4,853,737	5.7104	27,716,780	0	0	1.0000	0	15,262,516	11,216,203	102,298,874
2080	8,677,348	6,376,858	12.1970	77,778,532	6,610,438	4,857,916	5.8731	28,531,024	0	0	1.0000	0	15,287,786	11,234,773	106,309,556
2081	8,657,764	6,362,466	12.6909	80,745,414	6,604,752	4,853,737	6.0405	29,318,999	0	0	1.0000	0	15,262,516	11,216,203	110,064,413
2082	8,657,764	6,362,466	13.2049	84,015,722	6,604,752	4,853,737	6.2127	30,154,812	0	0	1.0000	0	15,262,516	11,216,203	114,170,534
2083	8,657,764	6,362,466	13.7397	87,418,368	6,604,752	4,853,737	6.3897	31,013,924	0	0	1.0000	0	15,262,516	11,216,203	118,432,292
2084	8,677,348	6,376,858	14.2962	91,164,831	6,610,438	4,857,916	6.5719	31,925,735	0	0	1.0000	0	15,287,786	11,234,773	123,090,567

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2085	8,657,764	6,362,466	14.8752	94,642,948	6,604,752	4,853,737	6.7592	32,807,380	0	0	1.0000	0	15,262,516	11,216,203	127,450,327
2086	8,657,764	6,362,466	15.4776	98,475,697	6,604,752	4,853,737	6.9518	33,742,209	0	0	1.0000	0	15,262,516	11,216,203	132,217,906
2087	8,657,764	6,362,466	16.1045	102,464,327	6,604,752	4,853,737	7.1499	34,703,735	0	0	1.0000	0	15,262,516	11,216,203	137,168,061
2088	9,340,993	6,864,561	16.7567	115,027,384	8,601,373	6,321,025	7.3537	46,482,921	0	0	1.0000	0	17,942,366	13,185,586	161,510,305
2089	8,657,764	6,362,466	17.4353	110,931,496	6,604,752	4,853,737	7.5633	36,710,269	0	0	1.0000	0	15,262,516	11,216,203	147,641,765
2090	8,657,764	6,362,466	18.1415	115,424,669	6,604,752	4,853,737	7.7788	37,756,250	0	0	1.0000	0	15,262,516	11,216,203	153,180,919
2091	8,657,764	6,362,466	18.8762	120,099,172	6,604,752	4,853,737	8.0005	38,832,323	0	0	1.0000	0	15,262,516	11,216,203	158,931,496
2092	9,539,848	7,010,696	19.6407	137,694,984	9,197,938	6,759,432	8.2285	55,619,986	0	0	1.0000	0	18,737,786	13,770,128	193,314,969
2093	10,167,139	7,471,683	20.4361	152,692,070	11,132,877	8,181,391	8.4630	69,239,109	0	0	1.0000	0	21,300,016	15,653,074	221,931,179
2094	8,873,389	6,520,925	21.2638	138,659,650	7,251,627	5,329,116	8.7042	46,385,693	0	0	1.0000	0	16,125,016	11,850,041	185,045,343
2095	31,288,861	22,993,731	22.1250	508,736,309	83,569,860	61,414,281	8.9523	549,799,071	0	0	1.0000	0	114,858,721	84,408,013	1,058,535,380
2096	10,402,348	7,644,535	23.0210	175,984,843	11,785,438	8,660,948	9.2075	79,745,681	0	0	1.0000	0	22,187,786	16,305,483	255,730,524
2097	7,147,972	5,252,941	23.9534	125,825,803	2,075,375	1,525,163	9.4699	14,443,145	0	0	1.0000	0	9,223,347	6,778,105	140,268,948
2098	7,147,972	5,252,941	24.9235	130,921,681	2,075,375	1,525,163	9.7398	14,854,786	0	0	1.0000	0	9,223,347	6,778,105	145,776,468
2099	7,147,972	5,252,941	25.9329	136,224,000	2,075,375	1,525,163	10.0173	15,278,019	0	0	1.0000	0	9,223,347	6,778,105	151,502,020
2100	7,147,972	5,252,941	26.9832	141,741,164	2,075,375	1,525,163	10.3028	15,713,453	0	0	1.0000	0	9,223,347	6,778,105	157,454,618
2101	7,147,972	5,252,941	28.0760	147,481,579	2,075,375	1,525,163	10.5965	16,161,394	0	0	1.0000	0	9,223,347	6,778,105	163,642,973
2102	7,147,972	5,252,941	29.2131	153,454,698	2,075,375	1,525,163	10.8985	16,621,993	0	0	1.0000	0	9,223,347	6,778,105	170,076,691
2103	7,147,972	5,252,941	30.3962	159,669,453	2,075,375	1,525,163	11.2091	17,095,709	0	0	1.0000	0	9,223,347	6,778,105	176,765,162
2104	7,167,556	5,267,333	31.6272	166,591,002	2,081,061	1,529,342	11.5285	17,631,018	0	0	1.0000	0	9,248,617	6,796,675	184,222,021
2105	7,147,972	5,252,941	32.9081	172,864,316	2,075,375	1,525,163	11.8571	18,084,015	0	0	1.0000	0	9,223,347	6,778,105	190,948,331
2106	7,147,972	5,252,941	34.2409	179,865,436	2,075,375	1,525,163	12.1950	18,599,368	0	0	1.0000	0	9,223,347	6,778,105	198,464,804
2107	7,147,972	5,252,941	35.6277	187,150,215	2,075,375	1,525,163	12.5426	19,129,514	0	0	1.0000	0	9,223,347	6,778,105	206,279,730
2108	13,263,941	9,747,478	37.0706	361,344,874	20,370,216	14,969,777	12.9000	193,110,129	0	0	1.0000	0	33,634,157	24,717,256	554,455,003
2109	7,147,972	5,252,941	38.5720	202,616,450	2,075,375	1,525,163	13.2677	20,235,410	0	0	1.0000	0	9,223,347	6,778,105	222,851,861
2110	7,147,972	5,252,941	40.1341	210,822,070	2,075,375	1,525,163	13.6458	20,812,075	0	0	1.0000	0	9,223,347	6,778,105	231,634,144
2111	7,147,972	5,252,941	41.7596	219,360,726	2,075,375	1,525,163	14.0347	21,405,211	0	0	1.0000	0	9,223,347	6,778,105	240,765,936
2112	7,167,556	5,267,333	43.4508	228,869,844	2,081,061	1,529,342	14.4347	22,075,592	0	0	1.0000	0	9,248,617	6,796,675	250,945,436
2113	7,147,972	5,252,941	45.2106	237,488,626	11,274,281	8,285,306	14.8461	123,004,487	0	0	1.0000	0	18,422,253	13,538,248	360,493,113
2114	7,147,972	5,252,941	47.0416	247,106,761	2,075,375	1,525,163	15.2692	23,288,025	0	0	1.0000	0	9,223,347	6,778,105	270,394,786
2115	7,147,972	5,252,941	48.9468	257,114,665	2,075,375	1,525,163	15.7044	23,951,776	0	0	1.0000	0	9,223,347	6,778,105	281,066,441
2116	10,825,387	7,955,420	50.9291	405,162,399	13,054,554	9,593,603	16.1520	154,955,880	0	0	1.0000	0	23,879,941	17,549,024	560,118,279
2117	7,147,972	5,252,941	52.9918	278,362,812	2,075,375	1,525,163	16.6123	25,336,472	0	0	1.0000	0	9,223,347	6,778,105	303,699,284
2118	14,921,796	10,965,812	55.1379	604,631,851	29,162,169	21,430,856	17.0857	366,161,179	0	0	1.0000	0	44,083,965	32,396,668	970,793,029
2119	6,482,543	4,763,927	57.3710	273,311,262	3,844,412	2,825,203	17.5727	49,646,438	0	0	1.0000	0	10,326,955	7,589,130	322,957,700
2120	6,403,045	4,705,505	59.6946	280,893,249	3,563,167	2,618,520	18.0735	47,325,815	0	0	1.0000	0	9,966,212	7,324,025	328,219,064
2121	6,386,857	4,693,609	62.1122	291,530,372	3,557,353	2,614,247	18.5886	48,595,194	0	0	1.0000	0	9,944,210	7,307,856	340,125,566
2122	6,386,857	4,693,609	64.6277	303,337,145	3,557,353	2,614,247	19.1184	49,980,222	0	0	1.0000	0	9,944,210	7,307,856	353,317,367
2123	6,482,543	4,763,927	67.2451	320,350,755	3,844,412	2,825,203	19.6633	55,552,807	0	0	1.0000	0	10,326,955	7,589,130	375,903,562
2124	6,403,045	4,705,505	69.9686	329,237,609	3,563,167	2,618,520	20.2237	52,956,156	0	0	1.0000	0	9,966,212	7,324,025	382,193,765
2125	6,386,857	4,693,609	72.8023	341,705,519	3,557,353	2,614,247	20.8000	54,376,340	0	0	1.0000	0	9,944,210	7,307,856	396,081,860
2126	6,386,857	4,693,609	75.7508	355,544,625	3,557,353	2,614,247	21.3928	55,926,066	0	0	1.0000	0	9,944,210	7,307,856	411,470,691
2127	6,482,543	4,763,927	78.8187	375,486,541	3,844,412	2,825,203	22.0025	62,161,521	0	0	1.0000	0	10,326,955	7,589,130	437,648,062
2128	7,066,689	5,193,208	82.0109	425,899,625	5,554,101	4,081,628	22.6296	92,365,615	0	0	1.0000	0	12,620,790	9,274,836	518,265,240
2129	6,386,857	4,693,609	85.3323	400,516,438	3,557,353	2,614,247	23.2745	60,845,295	0	0	1.0000	0	9,944,210	7,307,856	461,361,733
2130	6,099,798	4,482,653	88.7883	398,007,170	2,696,175	1,981,380	23.9379	47,430,073	0	0	1.0000	0	8,795,673	6,464,033	445,437,243
2131	2,028,079	1,490,406	92.3842	137,689,966	5,022,573	3,691,016	24.6201	90,873,191	0	0	1.0000	0	7,050,652	5,181,422	228,563,157
	\$1,309,028,449	\$961,986,078		\$13,824,906,481	\$1,110,107,131	\$815,801,677		\$4,468,161,723	\$0	\$0		\$0	\$2,419,135,581	\$1,777,787,755	\$18,293,068,204

AMOUNT TO RECOVER

LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in	
Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in				
Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s				Nominal \$
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2033	\$22,324,352	\$16,405,843	1.8874	\$30,964,388	\$9,448,311	\$6,943,427	1.5677	\$10,885,211	\$1,250,000	\$918,607	1.0000	\$918,607	\$33,022,663	\$24,267,877	\$42,768,206
2034	63,582,247	46,725,674	1.9639	91,764,550	32,971,808	24,230,505	1.6124	39,069,266	1,250,000	918,607	1.0000	918,607	97,804,054	71,874,785	131,752,423
2035	65,877,290	48,412,268	2.0434	98,925,629	81,239,936	59,702,054	1.6584	99,009,886	1,250,000	918,607	1.0000	918,607	148,367,226	109,032,929	198,854,122
2036	57,759,315	42,446,486	2.1262	90,249,718	65,595,018	48,204,830	1.7056	82,218,158	1,250,000	918,607	1.0000	918,607	124,604,333	91,569,923	173,386,483
2037	39,808,345	29,254,577	2.2123	64,719,901	41,981,870	30,851,869	1.7542	54,120,349	1,250,000	918,607	1.0000	918,607	83,040,216	61,025,054	119,758,858
2038	13,207,909	9,706,302	2.3019	22,342,936	18,994,690	13,958,923	1.8042	25,184,688	1,250,000	918,607	1.0000	918,607	33,452,599	24,583,831	48,446,231
2039	35,713,289	26,245,180	2.3951	62,859,831	75,509,036	55,490,499	1.8556	102,968,170	1,250,000	918,607	1.0000	918,607	112,472,326	82,654,286	166,746,607
2040	31,919,562	23,457,225	2.4921	58,457,750	13,365,605	9,822,190	1.9085	18,745,649	1,250,000	918,607	1.0000	918,607	46,535,167	34,198,022	78,122,006
2041	19,624,628	14,421,855	2.5930	37,395,870	9,445,873	6,941,635	1.9629	13,625,736	1,250,000	918,607	1.0000	918,607	30,320,500	22,282,097	51,940,213
2042	14,863,703	10,923,120	2.6981	29,471,671	11,668,700	8,575,159	2.0189	17,312,388	1,250,000	918,607	1.0000	918,607	27,782,403	20,416,886	47,702,666
2043	8,912,167	6,549,423	2.8073	18,386,194	6,470,357	4,754,972	2.0764	9,873,223	1,250,000	918,607	1.0000	918,607	16,632,524	12,223,001	29,178,024
2044	3,676,270	2,701,638	2.9210	7,891,484	1,896,910	1,394,012	2.1356	2,977,052	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	11,787,142
2045	5,973,091	4,389,538	3.0393	13,341,123	8,808,910	6,473,541	2.1964	14,218,485	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	28,478,215
2046	5,204,136	3,824,444	3.1624	12,094,423	6,502,044	4,778,258	2.2590	10,794,085	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	23,807,115
2047	5,204,136	3,824,444	3.2905	12,584,334	6,502,044	4,778,258	2.3234	11,101,805	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	24,604,746
2048	3,676,270	2,701,638	3.4238	9,249,867	1,896,910	1,394,012	2.3896	3,331,131	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	13,499,605
2049	5,204,136	3,824,444	3.5624	13,624,200	6,502,044	4,778,258	2.4577	11,743,525	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	26,286,332
2050	5,973,091	4,389,538	3.7067	16,270,701	8,808,910	6,473,541	2.5278	16,363,816	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	33,553,124
2051	5,779,136	4,247,003	3.8568	16,379,843	8,227,044	6,045,936	2.5998	15,718,224	1,250,000	918,607	1.0000	918,607	15,256,180	11,211,546	33,016,674
2052	5,983,136	4,396,920	4.0130	17,644,840	8,817,508	6,479,859	2.6739	17,326,496	1,250,000	918,607	1.0000	918,607	16,050,644	11,795,386	35,889,943
2053	3,666,225	2,694,256	4.1756	11,250,134	1,888,312	1,387,693	2.7501	3,816,295	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	15,985,036
2054	3,666,225	2,694,256	4.3447	11,705,733	1,888,312	1,387,693	2.8285	3,925,090	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	16,549,430
2055	5,973,091	4,389,538	4.5206	19,843,346	8,808,910	6,473,541	2.9091	18,832,177	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	39,594,130
2056	5,214,180	3,831,825	4.7037	18,023,758	6,510,642	4,784,577	2.9920	14,315,454	1,250,000	918,607	1.0000	918,607	12,974,822	9,535,009	33,257,818
2057	5,204,136	3,824,444	4.8942	18,717,595	6,502,044	4,778,258	3.0773	14,704,134	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	34,340,336
2058	3,666,225	2,694,256	5.0924	13,720,228	1,888,312	1,387,693	3.1650	4,392,049	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	19,030,884
2059	5,010,180	3,681,909	5.2987	19,509,330	5,920,178	4,350,653	3.2552	14,162,246	1,250,000	918,607	1.0000	918,607	12,180,358	8,951,169	34,590,184
2060	5,214,180	3,831,825	5.5133	21,126,003	6,510,642	4,784,577	3.3480	16,018,763	1,250,000	918,607	1.0000	918,607	12,974,822	9,535,009	38,063,373
2061	5,204,136	3,824,444	5.7366	21,939,307	6,502,044	4,778,258	3.4434	16,453,454	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	39,311,368
2062	3,666,225	2,694,256	5.9689	16,081,743	1,888,312	1,387,693	3.5415	4,914,516	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	21,914,866
2063	8,279,957	6,084,821	6.2106	37,790,387	15,729,508	11,559,388	3.6425	42,105,071	1,250,000	918,607	1.0000	918,607	25,259,465	18,562,816	80,814,065
2064	6,558,136	4,819,479	6.4622	31,144,439	10,542,508	7,747,537	3.7463	29,024,597	1,250,000	918,607	1.0000	918,607	18,350,644	13,485,623	61,087,643
2065	5,204,136	3,824,444	6.7239	25,715,181	6,502,044	4,778,258	3.8531	18,411,107	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	45,044,894
2066	3,666,225	2,694,256	6.9962	18,849,552	1,888,312	1,387,693	3.9629	5,499,289	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	25,267,448
2067	3,666,225	2,694,256	7.2795	19,612,835	1,888,312	1,387,693	4.0758	5,655,960	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	26,187,402
2068	6,752,091	4,962,014	7.5744	37,584,279	11,124,374	8,175,142	4.1920	34,270,194	1,250,000	918,607	1.0000	918,607	19,126,465	14,055,763	72,773,080
2069	5,973,091	4,389,538	7.8811	34,594,389	8,808,910	6,473,541	4.3115	27,910,670	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	63,423,667
2070	3,666,225	2,694,256	8.2003	22,093,705	1,888,312	1,387,693	4.4343	6,153,448	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	29,165,760
2071	3,666,225	2,694,256	8.5324	22,988,468	1,888,312	1,387,693	4.5607	6,328,853	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	30,235,927
2072	7,327,091	5,384,573	8.8780	47,804,241	12,849,374	9,442,819	4.6907	44,293,432	1,250,000	918,607	1.0000	918,607	21,426,465	15,745,999	93,016,280
2073	3,666,225	2,694,256	9.2375	24,888,187	1,888,312	1,387,693	4.8244	6,694,787	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	32,501,581
2074	3,666,225	2,694,256	9.6117	25,896,378	1,888,312	1,387,693	4.9619	6,885,595	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	33,700,580
2075	7,842,824	5,763,578	10.0009	57,640,967	14,418,110	10,595,661	5.1033	54,072,835	1,250,000	918,607	1.0000	918,607	23,510,934	17,277,845	112,632,408
2076	3,676,270	2,701,638	10.4060	28,113,241	1,896,910	1,394,012	5.2487	7,316,750	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	36,348,598
2077	3,666,225	2,694,256	10.8274	29,171,785	1,888,312	1,387,693	5.3983	7,491,184	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	37,581,576
2078	7,511,002	5,519,727	11.2659	62,184,690	13,422,642	9,864,106	5.5522	54,767,487	1,250,000	918,607	1.0000	918,607	22,183,644	16,302,439	117,870,783
2079	3,666,225	2,694,256	11.7222	31,582,605	1,888,312	1,387,693	5.7104	7,924,283	1,250,000	918,607	1.0000	918,607	6,804,53		

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$			
2088	3,676,270	2,701,638	16.7567	45,270,532	1,896,910	1,394,012	7.3537	10,251,145	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	56,440,284
2089	26,815,724	19,706,488	17.4353	343,588,526	73,271,240	53,845,975	7.5633	407,253,263	1,250,000	918,607	1.0000	918,607	101,336,964	74,471,070	751,760,396
2090	3,666,225	2,694,256	18.1415	48,877,840	1,888,312	1,387,693	7.7788	10,794,588	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	60,591,035
2091	3,666,225	2,694,256	18.8762	50,857,310	1,888,312	1,387,693	8.0005	11,102,240	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	62,878,157
2092	3,676,270	2,701,638	19.6407	53,062,055	1,896,910	1,394,012	8.2285	11,470,627	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	65,451,288
2093	3,050,095	2,241,471	20.4361	45,806,920	1,970,565	1,448,140	8.4630	12,255,605	1,250,000	918,607	1.0000	918,607	6,270,660	4,608,217	58,981,132
2094	3,145,781	2,311,789	21.2638	49,157,418	2,257,624	1,659,095	8.7042	14,441,095	1,250,000	918,607	1.0000	918,607	6,653,405	4,889,491	64,517,121
2095	5,452,647	4,007,071	22.1250	88,656,455	9,178,222	6,744,942	8.9523	60,382,748	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	149,957,811
2096	4,739,629	3,483,085	23.0210	80,184,095	7,022,923	5,161,044	9.2075	47,520,316	1,250,000	918,607	1.0000	918,607	13,012,552	9,562,736	128,623,019
2097	4,635,849	3,406,818	23.9534	81,604,884	6,727,827	4,944,183	9.4699	46,820,915	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	129,344,406
2098	3,241,467	2,382,107	24.9235	59,370,449	2,544,683	1,870,051	9.7398	18,213,919	1,250,000	918,607	1.0000	918,607	7,036,150	5,170,765	78,502,975
2099	3,097,938	2,276,630	25.9329	59,039,614	2,114,095	1,553,618	10.0173	15,563,055	1,250,000	918,607	1.0000	918,607	6,462,033	4,748,854	75,521,275
2100	5,356,961	3,936,753	26.9832	106,226,198	8,891,163	6,533,987	10.3028	67,318,361	1,250,000	918,607	1.0000	918,607	15,498,124	11,389,347	174,463,166
2101	5,452,647	4,007,071	28.0760	112,502,537	9,178,222	6,744,942	10.5965	71,472,783	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	184,893,927
2102	5,452,647	4,007,071	29.2131	117,058,978	9,178,222	6,744,942	10.8985	73,509,756	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	191,487,341
2103	3,097,938	2,276,630	30.3962	69,200,896	2,114,095	1,553,618	11.2091	17,414,656	1,250,000	918,607	1.0000	918,607	6,462,033	4,748,854	87,534,159
2104	3,153,875	2,317,737	31.6272	73,303,536	2,265,661	1,665,001	11.5285	19,194,968	1,250,000	918,607	1.0000	918,607	6,669,536	4,901,345	93,417,111
2105	5,452,647	4,007,071	32.9081	131,865,107	9,178,222	6,744,942	11.8571	79,975,457	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	212,759,172
2106	4,635,849	3,406,818	34.2409	116,652,528	6,727,827	4,944,183	12.1950	60,294,307	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	177,865,442
2107	4,683,692	3,441,978	35.6277	122,629,742	6,871,356	5,049,660	12.5426	63,335,866	1,250,000	918,607	1.0000	918,607	12,805,048	9,410,244	186,884,215
2108	3,153,875	2,317,737	37.0706	85,919,906	2,265,661	1,665,001	12.9000	21,478,518	1,250,000	918,607	1.0000	918,607	6,669,536	4,901,345	108,317,031
2109	4,635,849	3,406,818	38.5720	131,407,799	6,727,827	4,944,183	13.2677	65,597,932	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	197,924,338
2110	4,676,515	3,436,703	40.1341	137,928,992	6,849,827	5,033,839	13.6458	68,690,756	1,250,000	918,607	1.0000	918,607	12,776,342	9,389,149	207,538,354
2111	4,669,339	3,431,430	41.7596	143,295,132	6,828,297	5,018,017	14.0347	70,426,357	1,250,000	918,607	1.0000	918,607	12,747,636	9,368,053	214,640,096
2112	3,139,522	2,307,189	43.4508	100,249,222	2,222,602	1,633,358	14.4347	23,577,032	1,250,000	918,607	1.0000	918,607	6,612,124	4,859,154	124,744,860
2113	7,745,160	5,691,806	45.2106	257,329,968	16,055,761	11,799,146	14.8461	175,171,308	1,250,000	918,607	1.0000	918,607	25,050,921	18,409,559	433,419,883
2114	6,207,249	4,561,618	47.0416	214,585,787	11,442,029	8,408,581	15.2692	128,392,313	1,250,000	918,607	1.0000	918,607	18,899,278	13,888,806	343,896,707
2115	5,001,161	3,675,281	48.9468	179,893,239	7,823,765	5,749,572	15.7044	90,293,572	1,250,000	918,607	1.0000	918,607	14,074,926	10,343,459	271,105,418
2116	3,139,522	2,307,189	50.9291	117,503,075	13,878,680	10,199,241	16.1520	164,738,142	1,250,000	918,607	1.0000	918,607	18,268,202	13,425,037	283,159,824
2117	3,127,840	2,298,604	52.9918	121,807,184	2,203,801	1,619,541	16.6123	26,904,307	1,250,000	918,607	1.0000	918,607	6,581,641	4,836,753	149,630,097
2118	1,058,128	777,603	55.1379	42,875,395	2,284,593	1,678,914	17.0857	28,685,429	0	0	1.0000	0	3,342,721	2,456,517	71,560,824
	\$740,716,704	\$544,341,994		\$5,178,979,867	\$854,501,635	\$627,960,894		\$3,154,984,274	\$106,250,000	\$78,081,589		\$78,081,589	\$1,701,468,338	\$1,250,384,477	\$8,412,045,730

AMOUNT TO RECOVER

LABOR				NON-LABOR				PHIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional	
Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in	
Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Future \$'s	
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2034	\$7,760,265	\$5,702,906	1.9639	\$11,199,938	\$4,479,535	\$3,291,946	1.6124	\$5,307,933	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459	\$17,426,478
2035	46,911,429	34,474,531	2.0434	70,445,256	35,601,339	26,162,909	1.6584	43,388,568	1,250,000	918,607	1.0000	918,607	83,762,768	61,556,047	114,752,431
2036	67,514,041	49,615,092	2.1262	105,491,609	86,298,834	63,419,765	1.7056	108,168,751	1,250,000	918,607	1.0000	918,607	155,062,874	113,953,464	214,578,967
2037	72,593,441	53,347,870	2.2123	118,021,492	75,650,363	55,594,358	1.7542	97,523,623	1,250,000	918,607	1.0000	918,607	149,493,804	109,860,835	216,463,722
2038	46,603,525	34,248,257	2.3019	78,836,063	42,782,150	31,439,983	1.8042	56,724,017	1,250,000	918,607	1.0000	918,607	90,635,675	66,606,847	136,478,687
2039	40,341,063	29,646,064	2.3951	71,005,287	76,484,927	56,207,667	1.8556	104,298,947	1,250,000	918,607	1.0000	918,607	118,075,990	86,772,338	176,222,841
2040	37,417,178	27,497,343	2.4921	68,526,129	14,193,500	10,430,598	1.9085	19,906,796	1,250,000	918,607	1.0000	918,607	52,860,678	38,846,548	89,351,532
2041	23,380,886	17,182,275	2.5930	44,553,639	13,070,130	9,605,049	1.9629	18,853,752	1,250,000	918,607	1.0000	918,607	37,701,016	27,705,931	64,325,998
2042	16,738,669	12,301,006	2.6981	33,189,343	17,178,640	12,624,334	2.0189	25,487,268	1,250,000	918,607	1.0000	918,607	35,167,309	25,843,947	59,595,219
2043	9,790,576	7,194,952	2.8073	20,198,390	9,051,726	6,651,983	2.0764	13,812,177	1,250,000	918,607	1.0000	918,607	20,092,302	14,765,542	34,929,174
2044	3,676,270	2,701,638	2.9210	7,891,484	1,896,910	1,394,012	2.1356	2,977,052	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	11,787,142
2045	5,973,091	4,389,538	3.0393	13,341,123	8,808,910	6,473,541	2.1964	14,218,485	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	28,478,215
2046	5,204,136	3,824,444	3.1624	12,094,423	6,502,044	4,778,258	2.2590	10,794,085	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	23,807,115
2047	5,204,136	3,824,444	3.2905	12,584,334	6,502,044	4,778,258	2.3234	11,101,805	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	24,604,746
2048	3,676,270	2,701,638	3.4238	9,249,867	1,896,910	1,394,012	2.3896	3,331,131	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	13,499,605
2049	5,204,136	3,824,444	3.5624	13,624,200	6,502,044	4,778,258	2.4577	11,743,525	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	26,286,332
2050	5,973,091	4,389,538	3.7067	16,270,701	8,808,910	6,473,541	2.5278	16,363,816	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	33,553,124
2051	5,779,136	4,247,003	3.8568	16,379,843	8,227,044	6,045,936	2.5998	15,718,224	1,250,000	918,607	1.0000	918,607	15,256,180	11,211,546	33,016,674
2052	5,983,136	4,396,920	4.0130	17,644,840	8,817,508	6,479,859	2.6739	17,326,496	1,250,000	918,607	1.0000	918,607	16,050,644	11,795,386	35,889,943
2053	3,666,225	2,694,256	4.1756	11,250,134	1,888,312	1,387,693	2.7501	3,816,295	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	15,985,036
2054	3,666,225	2,694,256	4.3447	11,705,733	1,888,312	1,387,693	2.8285	3,925,090	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	16,549,430
2055	5,973,091	4,389,538	4.5206	19,843,346	8,808,910	6,473,541	2.9091	18,832,177	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	39,594,130
2056	5,214,180	3,831,825	4.7037	18,023,758	6,510,642	4,784,577	2.9920	14,315,454	1,250,000	918,607	1.0000	918,607	12,974,822	9,535,009	33,257,818
2057	5,204,136	3,824,444	4.8942	18,717,595	6,502,044	4,778,258	3.0773	14,704,134	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	34,340,336
2058	3,666,225	2,694,256	5.0924	13,720,228	1,888,312	1,387,693	3.1650	4,392,049	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	19,030,884
2059	5,010,180	3,681,909	5.2987	19,509,330	5,920,178	4,350,653	3.2552	14,162,246	1,250,000	918,607	1.0000	918,607	12,180,358	8,951,169	34,590,184
2060	5,214,180	3,831,825	5.5133	21,126,003	6,510,642	4,784,577	3.3480	16,018,763	1,250,000	918,607	1.0000	918,607	12,974,822	9,535,009	38,063,373
2061	5,204,136	3,824,444	5.7366	21,939,307	6,502,044	4,778,258	3.4434	16,453,454	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	39,311,368
2062	3,666,225	2,694,256	5.9689	16,081,743	1,888,312	1,387,693	3.5415	4,914,516	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	21,914,866
2063	8,279,957	6,084,821	6.2106	37,790,387	15,729,508	11,559,388	3.6425	42,105,071	1,250,000	918,607	1.0000	918,607	25,259,465	18,562,816	80,814,065
2064	6,558,136	4,819,479	6.4622	31,144,439	10,542,508	7,747,537	3.7463	29,024,597	1,250,000	918,607	1.0000	918,607	18,350,644	13,485,623	61,087,643
2065	5,204,136	3,824,444	6.7239	25,715,181	6,502,044	4,778,258	3.8531	18,411,107	1,250,000	918,607	1.0000	918,607	12,956,180	9,521,309	45,044,894
2066	3,666,225	2,694,256	6.9962	18,849,552	1,888,312	1,387,693	3.9629	5,499,289	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	25,267,448
2067	3,666,225	2,694,256	7.2795	19,612,835	1,888,312	1,387,693	4.0758	5,655,960	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	26,187,402
2068	6,752,091	4,962,014	7.5744	37,584,279	11,124,374	8,175,142	4.1920	34,270,194	1,250,000	918,607	1.0000	918,607	19,126,465	14,055,763	72,773,080
2069	5,973,091	4,389,538	7.8811	34,594,389	8,808,910	6,473,541	4.3115	27,910,670	1,250,000	918,607	1.0000	918,607	16,032,001	11,781,686	63,423,667
2070	3,666,225	2,694,256	8.2003	22,093,705	1,888,312	1,387,693	4.4343	6,153,448	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	29,165,760
2071	3,666,225	2,694,256	8.5324	22,988,468	1,888,312	1,387,693	4.5607	6,328,853	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	30,235,927
2072	7,327,091	5,384,573	8.8780	47,804,241	12,849,374	9,442,819	4.6907	44,293,432	1,250,000	918,607	1.0000	918,607	21,426,465	15,745,999	93,016,280
2073	3,666,225	2,694,256	9.2375	24,888,187	1,888,312	1,387,693	4.8244	6,694,787	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	32,501,581
2074	3,666,225	2,694,256	9.6117	25,896,378	1,888,312	1,387,693	4.9619	6,885,595	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	33,700,580
2075	7,842,824	5,763,578	10.0009	57,640,967	14,418,110	10,595,661	5.1033	54,072,835	1,250,000	918,607	1.0000	918,607	23,510,934	17,277,845	112,632,408
2076	3,676,270	2,701,638	10.4060	28,113,241	1,896,910	1,394,012	5.2487	7,316,750	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	36,348,598
2077	3,666,225	2,694,256	10.8274	29,171,785	1,888,312	1,387,693	5.3983	7,491,184	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	37,581,576
2078	7,511,002	5,519,727	11.2659	62,184,690	13,422,642	9,864,106	5.5522	54,767,487	1,250,000	918,607	1.0000	918,607	22,183,644	16,302,439	117,870,783
2079	3,666,225	2,694,256	11.7222	31,582,605	1,888,312	1,387,693	5.7104	7,924,283	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	40,425,495
2080	3,676,270	2,701,638	12.1970	32,951,875	1,896,910	1,394,012	5.8731	8,187,171	1,250,000	918,607	1.0000	918,607	6,823,180		

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2089	26,815,724	19,706,488	17.4353	343,588,526	71,336,809	52,424,389	7.5633	396,501,384	1,250,000	918,607	1.0000	918,607	99,402,533	73,049,484	741,008,517
2090	3,666,225	2,694,256	18.1415	48,877,840	3,822,743	2,809,279	7.7788	21,852,819	1,250,000	918,607	1.0000	918,607	8,738,968	6,422,142	71,649,266
2091	3,666,225	2,694,256	18.8762	50,857,310	1,888,312	1,387,693	8.0005	11,102,240	1,250,000	918,607	1.0000	918,607	6,804,537	5,000,556	62,878,157
2092	3,676,270	2,701,638	19.6407	53,062,055	1,896,910	1,394,012	8.2285	11,470,627	1,250,000	918,607	1.0000	918,607	6,823,180	5,014,256	65,451,288
2093	3,050,095	2,241,471	20.4361	45,806,920	1,970,568	1,448,142	8.4630	12,255,624	1,250,000	918,607	1.0000	918,607	6,270,663	4,608,219	58,981,150
2094	3,145,781	2,311,789	21.2638	49,157,418	2,257,624	1,659,095	8.7042	14,441,095	1,250,000	918,607	1.0000	918,607	6,653,405	4,889,491	64,517,121
2095	5,452,647	4,007,071	22.1250	88,656,455	9,178,222	6,744,942	8.9523	60,382,748	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	149,957,811
2096	4,739,629	3,483,085	23.0210	80,184,095	7,022,923	5,161,044	9.2075	47,520,316	1,250,000	918,607	1.0000	918,607	13,012,552	9,562,736	128,623,019
2097	4,635,849	3,406,818	23.9534	81,604,884	6,727,827	4,944,183	9.4699	46,820,915	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	129,344,406
2098	3,241,467	2,382,107	24.9235	59,370,449	2,544,683	1,870,051	9.7398	18,213,919	1,250,000	918,607	1.0000	918,607	7,036,150	5,170,765	78,502,975
2099	3,097,938	2,276,630	25.9329	59,039,614	2,114,095	1,553,618	10.0173	15,563,055	1,250,000	918,607	1.0000	918,607	6,462,033	4,748,854	75,521,275
2100	5,356,961	3,936,753	26.9832	106,226,198	8,891,163	6,533,987	10.3028	67,318,361	1,250,000	918,607	1.0000	918,607	15,498,124	11,389,347	174,463,166
2101	5,452,647	4,007,071	28.0760	112,502,537	9,178,222	6,744,942	10.5965	71,472,783	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	184,893,927
2102	5,452,647	4,007,071	29.2131	117,058,978	9,178,222	6,744,942	10.8985	73,509,756	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	191,487,341
2103	3,097,938	2,276,630	30.3962	69,200,896	2,114,095	1,553,618	11.2091	17,414,656	1,250,000	918,607	1.0000	918,607	6,462,033	4,748,854	87,534,159
2104	3,153,875	2,317,737	31.6272	73,303,536	2,265,661	1,665,001	11.5285	19,194,968	1,250,000	918,607	1.0000	918,607	6,669,536	4,901,345	93,417,111
2105	5,452,647	4,007,071	32.9081	131,865,107	9,178,222	6,744,942	11.8571	79,975,457	1,250,000	918,607	1.0000	918,607	15,880,869	11,670,621	212,759,172
2106	4,635,849	3,406,818	34.2409	116,652,528	6,727,827	4,944,183	12.1950	60,294,307	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	177,865,442
2107	4,683,692	3,441,978	35.6277	122,629,742	6,871,356	5,049,660	12.5426	63,335,866	1,250,000	918,607	1.0000	918,607	12,805,048	9,410,244	186,884,215
2108	3,153,875	2,317,737	37.0706	85,919,906	2,265,661	1,665,001	12.9000	21,478,518	1,250,000	918,607	1.0000	918,607	6,669,536	4,901,345	108,317,031
2109	4,635,849	3,406,818	38.5720	131,407,799	6,727,827	4,944,183	13.2677	65,597,932	1,250,000	918,607	1.0000	918,607	12,613,676	9,269,608	197,924,338
2110	4,676,515	3,436,703	40.1341	137,928,992	6,849,827	5,033,839	13.6458	68,690,756	1,250,000	918,607	1.0000	918,607	12,776,342	9,389,149	207,538,354
2111	4,669,339	3,431,430	41.7596	143,295,132	6,828,297	5,018,017	14.0347	70,426,357	1,250,000	918,607	1.0000	918,607	12,747,636	9,368,053	214,640,096
2112	3,139,522	2,307,189	43.4508	100,249,222	2,222,602	1,633,358	14.4347	23,577,032	1,250,000	918,607	1.0000	918,607	6,612,124	4,859,154	124,744,860
2113	7,745,160	5,691,806	45.2106	257,329,968	16,055,761	11,799,146	14.8461	175,171,308	1,250,000	918,607	1.0000	918,607	25,050,921	18,409,559	433,419,883
2114	6,207,249	4,561,618	47.0416	214,585,787	11,442,029	8,408,581	15.2692	128,392,313	1,250,000	918,607	1.0000	918,607	18,899,278	13,888,806	343,896,707
2115	5,001,161	3,675,281	48.9468	179,893,239	7,823,765	5,749,572	15.7044	90,293,572	1,250,000	918,607	1.0000	918,607	14,074,926	10,343,459	271,105,418
2116	3,139,522	2,307,189	50.9291	117,503,075	13,878,680	10,199,241	16.1520	164,738,142	1,250,000	918,607	1.0000	918,607	18,268,202	13,425,037	283,159,824
2117	3,127,840	2,298,604	52.9918	121,807,184	2,203,801	1,619,541	16.6123	26,904,307	1,250,000	918,607	1.0000	918,607	6,581,641	4,836,753	149,630,097
2118	1,058,128	777,603	55.1379	42,875,395	2,284,593	1,678,914	17.0857	28,685,429	0	-	1.0000	-	3,342,721	2,456,517	71,560,824
	\$736,174,967	\$541,004,338		\$5,194,908,576	\$862,601,579	\$633,913,426		\$3,175,749,753	\$105,000,000	\$77,162,982		\$77,162,982	\$1,703,776,546	\$1,252,080,745	\$8,447,821,310
	\$2,785,920,120	\$2,047,332,409		\$24,198,794,924	\$2,827,210,344	\$2,077,675,998		\$10,798,895,750	\$211,250,000	\$155,244,570		\$155,244,570	\$5,824,380,465	\$4,280,252,977	\$35,152,935,244

Proposed

EXTERNAL FUND CALCULATION

Monticello

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,769,559	-	6,696,113	646,137,854
2018	646,137,854	32,837,549	-	13,392,226	692,367,629
2019	692,367,629	35,162,906	-	13,392,226	740,922,761
2020	740,922,761	37,605,229	-	13,392,226	791,920,216
2021	791,920,216	41,304,928	-	58,502,632	891,727,776
2022	891,727,776	46,325,248	-	58,502,632	996,555,657
2023	996,555,657	51,598,091	-	58,502,632	1,106,656,380
2024	1,106,656,380	57,136,157	-	58,502,632	1,222,295,169
2025	1,222,295,169	62,952,788	-	58,502,632	1,343,750,589
2026	1,343,750,589	69,061,996	-	58,502,632	1,471,315,217
2027	1,471,315,217	75,478,497	-	58,502,632	1,605,296,346
2028	1,605,296,346	82,217,747	-	58,502,632	1,746,016,726
2029	1,746,016,726	89,295,982	-	58,502,632	1,893,815,340
2030	1,893,815,340	91,764,608	(35,447,395)	43,876,974	1,994,009,528
2031	1,994,009,528	95,513,056	(139,568,856)	-	1,949,953,728
2032	1,949,953,728	93,402,784	(235,103,207)	-	1,808,253,305
2033	1,808,253,305	86,615,333	(224,495,047)	-	1,670,373,591
2034	1,670,373,591	80,010,895	(141,890,436)	-	1,608,494,050
2035	1,608,494,050	77,046,865	(268,360,596)	-	1,417,180,319
2036	1,417,180,319	67,882,937	(104,537,352)	-	1,380,525,905
2037	1,380,525,905	66,127,191	(74,807,128)	-	1,371,845,968
2038	1,371,845,968	65,711,422	(70,470,367)	-	1,367,087,023
2039	1,367,087,023	65,483,468	(15,508,490)	-	1,417,062,002
2040	1,417,062,002	67,877,270	(16,145,665)	-	1,468,793,607
2041	1,468,793,607	70,355,214	(16,718,034)	-	1,522,430,787
2042	1,522,430,787	72,924,435	(17,358,857)	-	1,577,996,364
2043	1,577,996,364	75,586,026	(18,023,610)	-	1,635,558,779
2044	1,635,558,779	78,343,266	(18,765,674)	-	1,695,136,371
2045	1,695,136,371	81,197,032	(19,432,530)	-	1,756,900,873
2046	1,756,900,873	84,155,552	(20,178,433)	-	1,820,877,992
2047	1,820,877,992	87,220,056	(20,953,473)	-	1,887,144,575
2048	1,887,144,575	90,394,225	(26,984,005)	-	1,950,554,795
2049	1,950,554,795	93,431,575	(22,594,805)	-	2,021,391,565
2050	2,021,391,565	96,824,656	(35,853,028)	-	2,082,363,193
2051	2,082,363,193	99,745,197	(37,157,503)	-	2,144,950,887
2052	2,144,950,887	102,743,147	(38,579,910)	-	2,209,114,125
2053	2,209,114,125	105,816,567	(39,915,373)	-	2,275,015,318
2054	2,275,015,318	108,973,234	(41,371,799)	-	2,342,616,752
2055	2,342,616,752	112,211,342	(42,882,168)	-	2,411,945,926
2056	2,411,945,926	115,532,210	(44,529,708)	-	2,482,948,428

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	2,482,948,428	118,933,230	(46,075,584)	-	2,555,806,073
	2058	2,555,806,073	122,423,111	(113,115,965)	-	2,565,113,219
	2059	2,565,113,219	122,868,923	(49,512,681)	-	2,638,469,461
	2060	2,638,469,461	126,382,687	(51,421,830)	-	2,713,430,318
	2061	2,713,430,318	129,973,312	(53,212,278)	-	2,790,191,353
	2062	2,790,191,353	133,650,166	(55,166,430)	-	2,868,675,088
	2063	2,868,675,088	137,409,537	(57,194,466)	-	2,948,890,159
	2064	2,948,890,159	141,251,839	(59,407,738)	-	3,030,734,259
	2065	3,030,734,259	145,172,171	(61,482,516)	-	3,114,423,914
	2066	3,114,423,914	149,180,905	(114,512,212)	-	3,149,092,607
	2067	3,149,092,607	150,841,536	(66,098,430)	-	3,233,835,713
	2068	3,233,835,713	154,900,731	(195,052,653)	-	3,193,683,791
	2069	3,193,683,791	152,977,454	(71,070,115)	-	3,275,591,130
	2070	3,275,591,130	156,900,815	(73,697,053)	-	3,358,794,892
	2071	3,358,794,892	160,886,275	(76,423,540)	-	3,443,257,628
	2072	3,443,257,628	164,932,040	(79,400,766)	-	3,528,788,902
	2073	3,528,788,902	169,028,988	(82,189,645)	-	3,615,628,246
	2074	3,615,628,246	173,188,593	(85,237,868)	-	3,703,578,971
	2075	3,703,578,971	177,401,433	(88,400,458)	-	3,792,579,945
	2076	3,792,579,945	181,664,579	(91,855,321)	-	3,882,389,203
	2077	3,882,389,203	185,966,443	(95,090,888)	-	3,973,264,758
	2078	3,973,264,758	190,319,382	(98,627,820)	-	4,064,956,320
	2079	4,064,956,320	194,711,408	(102,298,874)	-	4,157,368,854
	2080	4,157,368,854	199,137,968	(106,309,556)	-	4,250,197,266
	2081	4,250,197,266	203,584,449	(110,064,413)	-	4,343,717,302
	2082	4,343,717,302	208,064,059	(114,170,534)	-	4,437,610,827
	2083	4,437,610,827	212,561,559	(118,432,292)	-	4,531,740,094
	2084	4,531,740,094	217,070,351	(123,090,567)	-	4,625,719,878
	2085	4,625,719,878	221,571,982	(127,450,327)	-	4,719,841,533
	2086	4,719,841,533	226,080,409	(132,217,906)	-	4,813,704,036
	2087	4,813,704,036	230,576,423	(137,168,061)	-	4,907,112,398
	2088	4,907,112,398	235,050,684	(161,510,305)	-	4,980,652,777
	2089	4,980,652,777	238,573,268	(147,641,765)	-	5,071,584,280
	2090	5,071,584,280	242,928,887	(153,180,919)	-	5,161,332,248
	2091	5,161,332,248	247,227,815	(158,931,496)	-	5,249,628,567
	2092	5,249,628,567	251,457,208	(193,314,969)	-	5,307,770,806
	2093	5,307,770,806	254,242,222	(221,931,179)	-	5,340,081,849
	2094	5,340,081,849	255,789,921	(185,045,343)	-	5,410,826,427
	2095	5,410,826,427	259,178,586	(1,058,535,380)	-	4,611,469,633
	2096	4,611,469,633	220,889,395	(255,730,524)	-	4,576,628,504
	2097	4,576,628,504	219,220,505	(140,268,948)	-	4,655,580,062
	2098	4,655,580,062	223,002,285	(145,776,468)	-	4,732,805,879
	2099	4,732,805,879	226,701,402	(151,502,020)	-	4,808,005,261
	2100	4,808,005,261	230,303,452	(157,454,618)	-	4,880,854,095
	2101	4,880,854,095	233,792,911	(163,642,973)	-	4,951,004,033
	2102	4,951,004,033	237,153,093	(170,076,691)	-	5,018,080,435

Proposed

EXTERNAL FUND CALCULATION

2103	5,018,080,435	240,366,053	(176,765,162)	-	5,081,681,326
2104	5,081,681,326	243,412,535	(184,222,021)	-	5,140,871,840
2105	5,140,871,840	246,247,761	(190,948,331)	-	5,196,171,270
2106	5,196,171,270	248,896,604	(198,464,804)	-	5,246,603,070
2107	5,246,603,070	251,312,287	(206,279,730)	-	5,291,635,628
2108	5,291,635,628	253,469,347	(554,455,003)	-	4,990,649,971
2109	4,990,649,971	239,052,134	(222,851,861)	-	5,006,850,244
2110	5,006,850,244	239,828,127	(231,634,144)	-	5,015,044,227
2111	5,015,044,227	240,220,618	(240,765,936)	-	5,014,498,909
2112	5,014,498,909	240,194,498	(250,945,436)	-	5,003,747,971
2113	5,003,747,971	239,679,528	(360,493,113)	-	4,882,934,386
2114	4,882,934,386	233,892,557	(270,394,786)	-	4,846,432,156
2115	4,846,432,156	232,144,100	(281,066,441)	-	4,797,509,816
2116	4,797,509,816	229,800,720	(560,118,279)	-	4,467,192,257
2117	4,467,192,257	213,978,509	(303,699,284)	-	4,377,471,482
2118	4,377,471,482	209,680,884	(970,793,029)	-	3,616,359,336
2119	3,616,359,336	173,223,612	(322,957,700)	-	3,466,625,248
2120	3,466,625,248	166,051,349	(328,219,064)	-	3,304,457,533
2121	3,304,457,533	158,283,516	(340,125,566)	-	3,122,615,484
2122	3,122,615,484	149,573,282	(353,317,367)	-	2,918,871,398
2123	2,918,871,398	139,813,940	(375,903,562)	-	2,682,781,777
2124	2,682,781,777	128,505,247	(382,193,765)	-	2,429,093,258
2125	2,429,093,258	116,353,567	(396,081,860)	-	2,149,364,966
2126	2,149,364,966	102,954,582	(411,470,691)	-	1,840,848,856
2127	1,840,848,856	88,176,660	(437,648,062)	-	1,491,377,454
2128	1,491,377,454	71,436,980	(518,265,240)	-	1,044,549,194
2129	1,044,549,194	50,033,906	(461,361,733)	-	633,221,367
2130	633,221,367	30,331,303	(445,437,243)	-	218,115,428
2131	218,115,428	10,447,729	(228,563,157)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,415,641	-	24,632	383,807,328
2018	383,807,328	19,306,748	-	49,264	403,163,340
2019	403,163,340	20,280,355	-	49,264	423,492,960
2020	423,492,960	21,302,935	-	49,264	444,845,159
2021	444,845,159	23,381,453	-	39,989,727	508,216,339
2022	508,216,339	26,569,023	-	39,989,727	574,775,089
2023	574,775,089	29,916,929	-	39,989,727	644,681,745
2024	644,681,745	33,433,233	-	39,989,727	718,104,705
2025	718,104,705	37,126,408	-	39,989,727	795,220,841
2026	795,220,841	41,005,350	-	39,989,727	876,215,918
2027	876,215,918	45,079,402	-	39,989,727	961,285,047
2028	961,285,047	49,358,379	-	39,989,727	1,050,633,153
2029	1,050,633,153	53,852,589	-	39,989,727	1,144,475,470
2030	1,144,475,470	58,572,858	-	39,989,727	1,243,038,054
2031	1,243,038,054	63,530,556	-	39,989,727	1,346,558,337
2032	1,346,558,337	68,737,626	-	39,989,727	1,455,285,690
2033	1,455,285,690	69,174,934	(42,768,206)	26,793,117	1,508,485,535
2034	1,508,485,535	71,049,669	(131,752,423)	-	1,447,782,781
2035	1,447,782,781	68,190,569	(198,854,122)	-	1,317,119,228
2036	1,317,119,228	62,036,316	(173,386,483)	-	1,205,769,061
2037	1,205,769,061	56,791,723	(119,758,858)	-	1,142,801,927
2038	1,142,801,927	53,825,971	(48,446,231)	-	1,148,181,666
2039	1,148,181,666	54,079,356	(166,746,607)	-	1,035,514,416
2040	1,035,514,416	48,772,729	(78,122,006)	-	1,006,165,138
2041	1,006,165,138	47,390,378	(51,940,213)	-	1,001,615,304
2042	1,001,615,304	47,176,081	(47,702,666)	-	1,001,088,718
2043	1,001,088,718	47,151,279	(29,178,024)	-	1,019,061,973
2044	1,019,061,973	47,997,819	(11,787,142)	-	1,055,272,649
2045	1,055,272,649	49,703,342	(28,478,215)	-	1,076,497,776
2046	1,076,497,776	50,703,045	(23,807,115)	-	1,103,393,707
2047	1,103,393,707	51,969,844	(24,604,746)	-	1,130,758,804
2048	1,130,758,804	53,258,740	(13,499,605)	-	1,170,517,939
2049	1,170,517,939	55,131,395	(26,286,332)	-	1,199,363,002
2050	1,199,363,002	56,489,997	(33,553,124)	-	1,222,299,875
2051	1,222,299,875	57,570,324	(33,016,674)	-	1,246,853,526
2052	1,246,853,526	58,726,801	(35,889,943)	-	1,269,690,384
2053	1,269,690,384	59,802,417	(15,985,036)	-	1,313,507,765
2054	1,313,507,765	61,866,216	(16,549,430)	-	1,358,824,550
2055	1,358,824,550	64,000,636	(39,594,130)	-	1,383,231,056
2056	1,383,231,056	65,150,183	(33,257,818)	-	1,415,123,421

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	1,415,123,421	66,652,313	(34,340,336)	-	1,447,435,398
	2058	1,447,435,398	68,174,207	(19,030,884)	-	1,496,578,721
	2059	1,496,578,721	70,488,858	(34,590,184)	-	1,532,477,395
	2060	1,532,477,395	72,179,685	(38,063,373)	-	1,566,593,707
	2061	1,566,593,707	73,786,564	(39,311,368)	-	1,601,068,903
	2062	1,601,068,903	75,410,345	(21,914,866)	-	1,654,564,383
	2063	1,654,564,383	77,929,982	(80,814,065)	-	1,651,680,300
	2064	1,651,680,300	77,794,142	(61,087,643)	-	1,668,386,799
	2065	1,668,386,799	78,581,018	(45,044,894)	-	1,701,922,923
	2066	1,701,922,923	80,160,570	(25,267,448)	-	1,756,816,044
	2067	1,756,816,044	82,746,036	(26,187,402)	-	1,813,374,678
	2068	1,813,374,678	85,409,947	(72,773,080)	-	1,826,011,545
	2069	1,826,011,545	86,005,144	(63,423,667)	-	1,848,593,022
	2070	1,848,593,022	87,068,731	(29,165,760)	-	1,906,495,993
	2071	1,906,495,993	89,795,961	(30,235,927)	-	1,966,056,028
	2072	1,966,056,028	92,601,239	(93,016,280)	-	1,965,640,986
	2073	1,965,640,986	92,581,690	(32,501,581)	-	2,025,721,095
	2074	2,025,721,095	95,411,464	(33,700,580)	-	2,087,431,979
	2075	2,087,431,979	98,318,046	(112,632,408)	-	2,073,117,617
	2076	2,073,117,617	97,643,840	(36,348,598)	-	2,134,412,858
	2077	2,134,412,858	100,530,846	(37,581,576)	-	2,197,362,128
	2078	2,197,362,128	103,495,756	(117,870,783)	-	2,182,987,101
	2079	2,182,987,101	102,818,692	(40,425,495)	-	2,245,380,298
	2080	2,245,380,298	105,757,412	(42,057,653)	-	2,309,080,058
	2081	2,309,080,058	108,757,671	(43,493,498)	-	2,374,344,231
	2082	2,374,344,231	111,831,613	(126,011,290)	-	2,360,164,554
	2083	2,360,164,554	111,163,750	(46,803,816)	-	2,424,524,489
	2084	2,424,524,489	114,195,103	(48,703,066)	-	2,490,016,526
	2085	2,490,016,526	117,279,778	(50,375,896)	-	2,556,920,409
	2086	2,556,920,409	120,430,951	(52,266,185)	-	2,625,085,175
	2087	2,625,085,175	123,641,512	(54,230,116)	-	2,694,496,570
	2088	2,694,496,570	126,910,788	(56,440,284)	-	2,764,967,075
	2089	2,764,967,075	130,229,949	(751,760,396)	-	2,143,436,628
	2090	2,143,436,628	100,955,865	(60,591,035)	-	2,183,801,458
	2091	2,183,801,458	102,857,049	(62,878,157)	-	2,223,780,350
	2092	2,223,780,350	104,740,054	(65,451,288)	-	2,263,069,116
	2093	2,263,069,116	106,590,555	(58,981,132)	-	2,310,678,540
	2094	2,310,678,540	108,832,959	(64,517,121)	-	2,354,994,378
	2095	2,354,994,378	110,920,235	(149,957,811)	-	2,315,956,803
	2096	2,315,956,803	109,081,565	(128,623,019)	-	2,296,415,349
	2097	2,296,415,349	108,161,163	(129,344,406)	-	2,275,232,107
	2098	2,275,232,107	107,163,432	(78,502,975)	-	2,303,892,564
	2099	2,303,892,564	108,513,340	(75,521,275)	-	2,336,884,628
	2100	2,336,884,628	110,067,266	(174,463,166)	-	2,272,488,728
	2101	2,272,488,728	107,034,219	(184,893,927)	-	2,194,629,020
	2102	2,194,629,020	103,367,027	(191,487,341)	-	2,106,508,706

EXTERNAL FUND CALCULATION

2103	2,106,508,706	99,216,560	(87,534,159)	-	2,118,191,107
2104	2,118,191,107	99,766,801	(93,417,111)	-	2,124,540,798
2105	2,124,540,798	100,065,872	(212,759,172)	-	2,011,847,497
2106	2,011,847,497	94,758,017	(177,865,442)	-	1,928,740,073
2107	1,928,740,073	90,843,657	(186,884,215)	-	1,832,699,515
2108	1,832,699,515	86,320,147	(108,317,031)	-	1,810,702,632
2109	1,810,702,632	85,284,094	(197,924,338)	-	1,698,062,388
2110	1,698,062,388	79,978,738	(207,538,354)	-	1,570,502,772
2111	1,570,502,772	73,970,681	(214,640,096)	-	1,429,833,357
2112	1,429,833,357	67,345,151	(124,744,860)	-	1,372,433,648
2113	1,372,433,648	64,641,625	(433,419,883)	-	1,003,655,390
2114	1,003,655,390	47,272,169	(343,896,707)	-	707,030,852
2115	707,030,852	33,301,153	(271,105,418)	-	469,226,587
2116	469,226,587	22,100,572	(283,159,824)	-	208,167,335
2117	208,167,335	9,804,681	(149,630,097)	-	68,341,919
2118	68,341,919	3,218,904	(71,560,824)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,656,032	-	294,670	431,159,670
2018	431,159,670	21,874,735	-	589,341	453,623,746
2019	453,623,746	23,013,664	-	589,341	477,226,750
2020	477,226,750	24,210,336	-	589,341	502,026,427
2021	502,026,427	26,244,904	-	31,249,066	559,520,397
2022	559,520,397	29,159,848	-	31,249,066	619,929,312
2023	619,929,312	32,222,580	-	31,249,066	683,400,958
2024	683,400,958	35,440,592	-	31,249,066	750,090,617
2025	750,090,617	38,821,758	-	31,249,066	820,161,441
2026	820,161,441	42,374,349	-	31,249,066	893,784,856
2027	893,784,856	46,107,056	-	31,249,066	971,140,979
2028	971,140,979	50,029,011	-	31,249,066	1,052,419,057
2029	1,052,419,057	54,149,810	-	31,249,066	1,137,817,933
2030	1,137,817,933	58,479,533	-	31,249,066	1,227,546,532
2031	1,227,546,532	63,028,773	-	31,249,066	1,321,824,372
2032	1,321,824,372	67,808,659	-	31,249,066	1,420,882,098
2033	1,420,882,098	72,830,886	-	31,249,066	1,524,962,050
2034	1,524,962,050	72,128,936	(17,426,478)	25,936,725	1,605,601,234
2035	1,605,601,234	75,302,698	(114,752,431)	-	1,566,151,500
2036	1,566,151,500	73,452,505	(214,578,967)	-	1,425,025,039
2037	1,425,025,039	66,833,674	(216,463,722)	-	1,275,394,992
2038	1,275,394,992	59,816,025	(136,478,687)	-	1,198,732,330
2039	1,198,732,330	56,220,546	(176,222,841)	-	1,078,730,035
2040	1,078,730,035	50,592,439	(89,351,532)	-	1,039,970,942
2041	1,039,970,942	48,774,637	(64,325,998)	-	1,024,419,581
2042	1,024,419,581	48,045,278	(59,595,219)	-	1,012,869,641
2043	1,012,869,641	47,503,586	(34,929,174)	-	1,025,444,053
2044	1,025,444,053	48,093,326	(11,787,142)	-	1,061,750,237
2045	1,061,750,237	49,796,086	(28,478,215)	-	1,083,068,108
2046	1,083,068,108	50,795,894	(23,807,115)	-	1,110,056,888
2047	1,110,056,888	52,061,668	(24,604,746)	-	1,137,513,810
2048	1,137,513,810	53,349,398	(13,499,605)	-	1,177,363,603
2049	1,177,363,603	55,218,353	(26,286,332)	-	1,206,295,623
2050	1,206,295,623	56,575,265	(33,553,124)	-	1,229,317,764
2051	1,229,317,764	57,655,003	(33,016,674)	-	1,253,956,094
2052	1,253,956,094	58,810,541	(35,889,943)	-	1,276,876,691
2053	1,276,876,691	59,885,517	(15,985,036)	-	1,320,777,172
2054	1,320,777,172	61,944,449	(16,549,430)	-	1,366,172,191
2055	1,366,172,191	64,073,476	(39,594,130)	-	1,390,651,536
2056	1,390,651,536	65,221,557	(33,257,818)	-	1,422,615,275

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	1,422,615,275	66,720,656	(34,340,336)	-	1,454,995,596
	2058	1,454,995,596	68,239,293	(19,030,884)	-	1,504,204,005
	2059	1,504,204,005	70,547,168	(34,590,184)	-	1,540,160,989
	2060	1,540,160,989	72,233,550	(38,063,373)	-	1,574,331,166
	2061	1,574,331,166	73,836,132	(39,311,368)	-	1,608,855,930
	2062	1,608,855,930	75,455,343	(21,914,866)	-	1,662,396,408
	2063	1,662,396,408	77,966,392	(80,814,065)	-	1,659,548,734
	2064	1,659,548,734	77,832,836	(61,087,643)	-	1,676,293,927
	2065	1,676,293,927	78,618,185	(45,044,894)	-	1,709,867,217
	2066	1,709,867,217	80,192,772	(25,267,448)	-	1,764,792,541
	2067	1,764,792,541	82,768,770	(26,187,402)	-	1,821,373,910
	2068	1,821,373,910	85,422,436	(72,773,080)	-	1,834,023,266
	2069	1,834,023,266	86,015,691	(63,423,667)	-	1,856,615,291
	2070	1,856,615,291	87,075,257	(29,165,760)	-	1,914,524,787
	2071	1,914,524,787	89,791,213	(30,235,927)	-	1,974,080,073
	2072	1,974,080,073	92,584,355	(93,016,280)	-	1,973,648,148
	2073	1,973,648,148	92,564,098	(32,501,581)	-	2,033,710,665
	2074	2,033,710,665	95,381,030	(33,700,580)	-	2,095,391,115
	2075	2,095,391,115	98,273,843	(112,632,408)	-	2,081,032,550
	2076	2,081,032,550	97,600,427	(36,348,598)	-	2,142,284,378
	2077	2,142,284,378	100,473,137	(37,581,576)	-	2,205,175,940
	2078	2,205,175,940	103,422,752	(117,870,783)	-	2,190,727,908
	2079	2,190,727,908	102,745,139	(40,425,495)	-	2,253,047,552
	2080	2,253,047,552	105,667,930	(42,057,653)	-	2,316,657,830
	2081	2,316,657,830	108,651,252	(43,493,498)	-	2,381,815,584
	2082	2,381,815,584	111,707,151	(126,011,290)	-	2,367,511,445
	2083	2,367,511,445	111,036,287	(46,803,816)	-	2,431,743,916
	2084	2,431,743,916	114,048,790	(48,703,066)	-	2,497,089,640
	2085	2,497,089,640	117,113,504	(50,375,896)	-	2,563,827,248
	2086	2,563,827,248	120,243,498	(52,266,185)	-	2,631,804,561
	2087	2,631,804,561	123,431,634	(54,230,116)	-	2,701,006,078
	2088	2,701,006,078	126,677,185	(56,440,284)	-	2,771,242,980
	2089	2,771,242,980	129,971,296	(741,008,517)	-	2,160,205,758
	2090	2,160,205,758	101,313,650	(71,649,266)	-	2,189,870,142
	2091	2,189,870,142	102,704,910	(62,878,157)	-	2,229,696,895
	2092	2,229,696,895	104,572,784	(65,451,288)	-	2,268,818,391
	2093	2,268,818,391	106,407,583	(58,981,150)	-	2,316,244,823
	2094	2,316,244,823	108,631,882	(64,517,121)	-	2,360,359,585
	2095	2,360,359,585	110,700,865	(149,957,811)	-	2,321,102,639
	2096	2,321,102,639	108,859,714	(128,623,019)	-	2,301,339,333
	2097	2,301,339,333	107,932,815	(129,344,406)	-	2,279,927,743
	2098	2,279,927,743	106,928,611	(78,502,975)	-	2,308,353,379
	2099	2,308,353,379	108,261,773	(75,521,275)	-	2,341,093,877
	2100	2,341,093,877	109,797,303	(174,463,166)	-	2,276,428,014
	2101	2,276,428,014	106,764,474	(184,893,927)	-	2,198,298,560
	2102	2,198,298,560	103,100,202	(191,487,341)	-	2,109,911,422

EXTERNAL FUND CALCULATION

2103	2,109,911,422	98,954,846	(87,534,159)	-	2,121,332,109
2104	2,121,332,109	99,490,476	(93,417,111)	-	2,127,405,474
2105	2,127,405,474	99,775,317	(212,759,172)	-	2,014,421,619
2106	2,014,421,619	94,476,374	(177,865,442)	-	1,931,032,551
2107	1,931,032,551	90,565,427	(186,884,215)	-	1,834,713,763
2108	1,834,713,763	86,048,075	(108,317,031)	-	1,812,444,808
2109	1,812,444,808	85,003,661	(197,924,338)	-	1,699,524,131
2110	1,699,524,131	79,707,682	(207,538,354)	-	1,571,693,459
2111	1,571,693,459	73,712,423	(214,640,096)	-	1,430,765,786
2112	1,430,765,786	67,102,915	(124,744,860)	-	1,373,123,841
2113	1,373,123,841	64,399,508	(433,419,883)	-	1,004,103,467
2114	1,004,103,467	47,092,453	(343,896,707)	-	707,299,213
2115	707,299,213	33,172,333	(271,105,418)	-	469,366,127
2116	469,366,127	22,013,271	(283,159,824)	-	208,219,574
2117	208,219,574	9,765,498	(149,630,097)	-	68,354,975
2118	68,354,975	3,205,848	(71,560,824)	-	0

2021 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$83,850,493	\$70,458,267
Prairie Island Unit 1	49,264	52,464,065	52,414,800
Prairie Island Unit 2	589,341	43,013,201	42,423,861
TOTAL	\$14,030,831	\$179,327,759	\$165,296,928

Xcel Energy
Nuclear Decommissioning Accrual
200-Year Decommissioning Period
DECON Method

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Proposed

2021 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2021 Decommissioning Accrual
Monticello	13.75	5.04%	4.97%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	83,850,493
Prairie Island Unit 1	16.67	5.04%	4.94%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	52,464,065
Prairie Island Unit 2	17.83	5.08%	4.93%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	43,013,201
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$179,327,759

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional
	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Estimate	Cost in	Cost in
	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s	Nominal \$s	Nominal \$s	Future \$'s
Monticello															
Factors	2017	73.4886%	4.05%			2.85%					0.00%				
2030	\$21,103,620	\$15,508,745	1.6755	\$25,984,903	\$8,935,561	\$6,566,615	1.4410	\$9,462,492	\$0	\$0	1.0000	\$0	\$30,039,182	\$22,075,360	\$35,447,395
2031	72,416,235	53,217,644	1.7434	92,779,641	42,961,344	31,571,670	1.4820	46,789,215	0	0	1.0000	0	115,377,579	84,789,314	139,568,856
2032	81,871,155	60,165,928	1.8140	109,140,994	112,447,584	82,636,104	1.5243	125,962,213	0	0	1.0000	0	194,318,740	142,802,032	235,103,206
2033	78,663,227	57,808,468	1.8874	109,107,702	100,155,663	73,602,948	1.5677	115,387,342	0	0	1.0000	0	178,818,889	131,411,416	224,495,044
2034	66,380,422	48,782,012	1.9639	95,802,993	38,894,668	28,583,129	1.6124	46,087,438	0	0	1.0000	0	105,275,090	77,365,141	141,890,431
2035	86,879,799	63,846,708	2.0434	130,464,363	113,147,093	83,150,162	1.6584	137,896,229	0	0	1.0000	0	200,026,892	146,996,870	268,360,592
2036	50,307,501	36,970,255	2.1262	78,606,156	20,688,341	15,203,562	1.7056	25,931,196	0	0	1.0000	0	70,995,842	52,173,817	104,537,352
2037	34,755,725	25,541,479	2.2123	56,505,415	14,196,879	10,433,081	1.7542	18,301,711	0	0	1.0000	0	48,952,604	35,974,561	74,807,126
2038	29,827,531	21,919,821	2.3019	50,457,236	15,091,277	11,090,361	1.8042	20,009,230	0	0	1.0000	0	44,918,808	33,010,182	70,466,465
2039	7,164,560	5,265,132	2.3951	12,610,517	2,086,795	1,533,555	1.8556	2,845,665	0	0	1.0000	0	9,251,355	6,798,687	15,456,182
2040	7,184,150	5,279,528	2.4921	13,157,112	2,092,376	1,537,657	1.9085	2,934,618	0	0	1.0000	0	9,276,526	6,817,185	16,091,729
2041	7,164,560	5,265,132	2.5930	13,652,486	2,086,795	1,533,555	1.9629	3,010,216	0	0	1.0000	0	9,251,355	6,798,687	16,662,702
2042	7,164,560	5,265,132	2.6981	14,205,851	2,086,795	1,533,555	2.0189	3,096,095	0	0	1.0000	0	9,251,355	6,798,687	17,301,946
2043	7,164,560	5,265,132	2.8073	14,780,804	2,086,795	1,533,555	2.0764	3,184,274	0	0	1.0000	0	9,251,355	6,798,687	17,965,078
2044	7,184,150	5,279,528	2.9210	15,421,501	2,092,376	1,537,657	2.1356	3,283,820	0	0	1.0000	0	9,276,526	6,817,185	18,705,321
2045	7,164,560	5,265,132	3.0393	16,002,314	2,086,795	1,533,555	2.1964	3,368,301	0	0	1.0000	0	9,251,355	6,798,687	19,370,615
2046	7,164,560	5,265,132	3.1624	16,650,452	2,086,795	1,533,555	2.2590	3,464,302	0	0	1.0000	0	9,251,355	6,798,687	20,114,754
2047	7,164,560	5,265,132	3.2905	17,324,915	2,086,795	1,533,555	2.3234	3,563,063	0	0	1.0000	0	9,251,355	6,798,687	20,887,978
2048	7,847,790	5,767,227	3.4238	19,745,833	4,083,316	3,000,770	2.3896	7,170,639	0	0	1.0000	0	11,931,106	8,767,997	26,916,472
2049	7,164,560	5,265,132	3.5624	18,756,505	2,086,795	1,533,555	2.4577	3,769,019	0	0	1.0000	0	9,251,355	6,798,687	22,525,524
2050	8,657,770	6,362,470	3.7067	23,583,767	6,566,405	4,825,556	2.5278	12,198,040	0	0	1.0000	0	15,224,175	11,188,026	35,781,808
2051	8,657,770	6,362,470	3.8568	24,538,774	6,566,405	4,825,556	2.5998	12,545,480	0	0	1.0000	0	15,224,175	11,188,026	37,084,255
2052	8,677,350	6,376,859	4.0130	25,590,335	6,571,986	4,829,657	2.6739	12,914,021	0	0	1.0000	0	15,249,336	11,206,516	38,504,356
2053	8,657,770	6,362,470	4.1756	26,567,130	6,566,405	4,825,556	2.7501	13,270,762	0	0	1.0000	0	15,224,175	11,188,026	39,837,891
2054	8,657,770	6,362,470	4.3447	27,643,023	6,566,405	4,825,556	2.8285	13,649,085	0	0	1.0000	0	15,224,175	11,188,026	41,292,108
2055	8,657,770	6,362,470	4.5206	28,762,182	6,566,405	4,825,556	2.9091	14,038,025	0	0	1.0000	0	15,224,175	11,188,026	42,800,207
2056	8,677,350	6,376,859	4.7037	29,994,832	6,571,986	4,829,657	2.9920	14,450,335	0	0	1.0000	0	15,249,336	11,206,516	44,445,167
2057	8,657,770	6,362,470	4.8942	31,139,201	6,566,405	4,825,556	3.0773	14,849,683	0	0	1.0000	0	15,224,175	11,188,026	45,988,884
2058	14,754,150	10,842,611	5.0924	55,214,915	24,855,555	18,265,988	3.1650	57,811,852	0	0	1.0000	0	39,609,705	29,108,599	113,026,766
2059	8,657,770	6,362,470	5.2987	33,712,820	6,566,405	4,825,556	3.2552	15,708,150	0	0	1.0000	0	15,224,175	11,188,026	49,420,970
2060	8,677,350	6,376,859	5.5133	35,157,537	6,571,986	4,829,657	3.3480	16,169,693	0	0	1.0000	0	15,249,336	11,206,516	51,327,230
2061	8,657,770	6,362,470	5.7366	36,498,945	6,566,405	4,825,556	3.4434	16,616,320	0	0	1.0000	0	15,224,175	11,188,026	53,115,265
2062	8,657,770	6,362,470	5.9689	37,976,947	6,566,405	4,825,556	3.5415	17,089,707	0	0	1.0000	0	15,224,175	11,188,026	55,066,654
2063	8,657,770	6,362,470	6.2106	39,514,756	6,566,405	4,825,556	3.6425	17,577,088	0	0	1.0000	0	15,224,175	11,188,026	57,091,844
2064	8,677,350	6,376,859	6.4622	41,208,538	6,571,986	4,829,657	3.7463	18,093,345	0	0	1.0000	0	15,249,336	11,206,516	59,301,884
2065	8,657,770	6,362,470	6.7239	42,780,612	6,566,405	4,825,556	3.8531	18,593,350	0	0	1.0000	0	15,224,175	11,188,026	61,373,962
2066	12,315,600	9,050,556	6.9962	63,319,502	17,539,895	12,889,815	3.9629	51,081,408	0	0	1.0000	0	29,855,495	21,940,371	114,400,551
2067	8,657,770	6,362,470	7.2795	46,315,600	6,566,405	4,825,556	4.0758	19,668,001	0	0	1.0000	0	15,224,175	11,188,026	65,983,601
2068	17,212,290	12,649,063	7.5744	95,809,063	32,176,796	23,646,262	4.1920	99,125,130	0	0	1.0000	0	49,389,086	36,295,325	194,934,193
2069	8,657,770	6,362,470	7.8811	50,143,262	6,566,405	4,825,556	4.3115	20,805,385	0	0	1.0000	0	15,224,175	11,188,026	70,948,647
2070	8,657,770	6,362,470	8.2003	52,174,163	6,566,405	4,825,556	4.4343	21,397,963	0	0	1.0000	0	15,224,175	11,188,026	73,572,125
2071	8,657,770	6,362,470	8.5324	54,287,139	6,566,405	4,825,556	4.5607	22,007,913	0	0	1.0000	0	15,224,175	11,188,026	76,295,052
2072	8,677,350	6,376,859	8.8780	56,613,754	6,571,986	4,829,657	4.6907	22,654,474	0	0	1.0000	0	15,249,336	11,206,516	79,268,228
2073	8,657,770	6,362,470	9.2375	58,773,316	6,566,405	4,825,556	4.8244	23,280,412	0	0	1.0000	0	15,224,175	11,188,026	82,053,729
2074	8,657,770	6,362,470	9.6117	61,154,153	6,566,405	4,825,556	4.9619	23,943,926	0	0	1.0000	0	15,224,175	11,188,026	85,098,079
2075	8,657,770	6,362,470	10.0009	63,630,426	6,566,405	4,825,556	5.1033	24,626,260	0	0	1.0000	0	15,224,175	11,188,026	88,256,686
2076	8,677,350	6,376,859	10.4060	66,357,595	6,571,986	4,829,657	5.2487	25,349,422	0	0	1.0000	0	15,249,336	11,206,516	91,707,017
2077	8,657,770	6,362,470	10.8274	68,889,007	6,566,405	4,825,556	5.3983	26,049,799	0	0	1.0000	0	15,224,175	11,188,026	94,938,806
2078	8,657,770	6,362,470	11.2659	71,678,950	6,566,405	4,825,556	5.5522	26,792,452	0	0	1.0000	0	15,224,175	11,188,026	98,471,402
2079	8,657,770	6,362,470	11.7222	74,582,146	6,566,405	4,825,556	5.7104	27,555,855	0	0	1.0000	0	15,224,175	11,188,026	102,138,001
2080	8,677,350	6,376,859	12.1970	77,778,550	6,571,986	4,829,657	5.8731	28,365,060	0	0	1.0000	0	15,249,336	11,206,516	106,143,610
2081	8,657,770	6,362,470	12.6909	80,745,470	6,566,405	4,825,556	6.0405	29,148,771	0	0	1.0000	0	15,224,175	11,188,026	109,894,241
2082	8,657,770	6,362,470	13.2049	84,015,780	6,566,405	4,825,556	6.2127	29,979,732	0	0	1.0000	0	15,224,175	11,188,026	113,995,512
2083	8,657,770	6,362,470	13.7397	87,418,429	6,566,405	4,825,556	6.3897	30,833,855	0	0	1.0000	0	15,224,175	11,188,026	118,252,284
2084	8,677,350	6,376,859	14.2962	91,164,852	6,571,986	4,829,657	6.5719	31,740,025	0	0	1.0000	0	15,249,336	11,206,516	122,904,877

Proposed

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional			
	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s			
2085	8,657,770	6,362,470	14.8752	94,643,013	6,566,405	4,825,556	6.7592	32,616,898	0	0	1.0000	0	15,224,175	11,188,026	127,259,911
2086	8,657,770	6,362,470	15.4776	98,475,765	6,566,405	4,825,556	6.9518	33,546,300	0	0	1.0000	0	15,224,175	11,188,026	132,022,065
2087	8,657,770	6,362,470	16.1045	102,464,398	6,566,405	4,825,556	7.1499	34,502,243	0	0	1.0000	0	15,224,175	11,188,026	136,966,641
2088	9,340,990	6,864,558	16.7567	115,027,347	8,562,916	6,292,763	7.3537	46,275,091	0	0	1.0000	0	17,903,906	13,157,321	161,302,438
2089	8,657,770	6,362,470	17.4353	110,931,573	6,566,405	4,825,556	7.5633	36,497,128	0	0	1.0000	0	15,224,175	11,188,026	147,428,700
2090	8,657,770	6,362,470	18.1415	115,424,749	6,566,405	4,825,556	7.7788	37,537,035	0	0	1.0000	0	15,224,175	11,188,026	152,961,784
2091	8,657,770	6,362,470	18.8762	120,099,256	6,566,405	4,825,556	8.0005	38,606,861	0	0	1.0000	0	15,224,175	11,188,026	158,706,116
2092	8,677,350	6,376,859	19.6407	125,245,975	6,571,986	4,829,657	8.2285	39,740,835	0	0	1.0000	0	15,249,336	11,206,516	164,986,810
2093	8,657,770	6,362,470	20.4361	130,024,073	6,566,405	4,825,556	8.4630	40,838,680	0	0	1.0000	0	15,224,175	11,188,026	170,862,753
2094	8,657,770	6,362,470	21.2638	135,290,289	6,566,405	4,825,556	8.7042	42,002,605	0	0	1.0000	0	15,224,175	11,188,026	177,292,894
2095	29,995,110	22,042,973	22.1250	487,700,768	79,650,261	58,533,825	8.9523	524,012,362	0	0	1.0000	0	109,645,371	80,576,798	1,011,713,130
2096	8,677,350	6,376,859	23.0210	146,801,672	6,571,986	4,829,657	9.2075	44,469,070	0	0	1.0000	0	15,249,336	11,206,516	191,270,742
2097	8,657,770	6,362,470	23.9534	152,402,788	6,566,405	4,825,556	9.4699	45,697,533	0	0	1.0000	0	15,224,175	11,188,026	198,100,321
2098	8,657,770	6,362,470	24.9235	158,575,020	6,566,405	4,825,556	9.7398	46,999,950	0	0	1.0000	0	15,224,175	11,188,026	205,574,971
2099	8,657,770	6,362,470	25.9329	164,997,298	6,566,405	4,825,556	10.0173	48,339,042	0	0	1.0000	0	15,224,175	11,188,026	213,336,340
2100	8,657,770	6,362,470	26.9832	171,679,800	6,566,405	4,825,556	10.3028	49,716,738	0	0	1.0000	0	15,224,175	11,188,026	221,396,538
2101	8,657,770	6,362,470	28.0760	178,632,707	6,566,405	4,825,556	10.5965	51,134,004	0	0	1.0000	0	15,224,175	11,188,026	229,776,711
2102	8,657,770	6,362,470	29.2131	185,867,472	6,566,405	4,825,556	10.8985	52,591,322	0	0	1.0000	0	15,224,175	11,188,026	238,458,794
2103	8,657,770	6,362,470	30.3962	193,394,910	6,566,405	4,825,556	11.2091	54,090,140	0	0	1.0000	0	15,224,175	11,188,026	247,485,050
2104	8,677,350	6,376,859	31.6272	201,682,196	6,571,986	4,829,657	11.5285	55,678,704	0	0	1.0000	0	15,249,336	11,206,516	257,360,900
2105	8,657,770	6,362,470	32.9081	209,376,798	6,566,405	4,825,556	11.8571	57,217,100	0	0	1.0000	0	15,224,175	11,188,026	266,593,898
2106	8,657,770	6,362,470	34.2409	217,856,698	6,566,405	4,825,556	12.1950	58,847,655	0	0	1.0000	0	15,224,175	11,188,026	276,704,354
2107	8,657,770	6,362,470	35.6277	226,680,171	6,566,405	4,825,556	12.5426	60,525,019	0	0	1.0000	0	15,224,175	11,188,026	287,205,190
2108	14,773,730	10,857,001	37.0706	402,475,524	24,861,136	18,270,089	12.9000	235,684,150	0	0	1.0000	0	39,634,866	29,127,090	638,159,674
2109	8,657,770	6,362,470	38.5720	245,413,192	6,566,405	4,825,556	13.2677	64,024,029	0	0	1.0000	0	15,224,175	11,188,026	309,437,221
2110	8,657,770	6,362,470	40.1341	255,352,006	6,566,405	4,825,556	13.6458	65,848,572	0	0	1.0000	0	15,224,175	11,188,026	321,200,578
2111	8,657,770	6,362,470	41.7596	265,694,201	6,566,405	4,825,556	14.0347	67,725,231	0	0	1.0000	0	15,224,175	11,188,026	333,419,432
2112	8,677,350	6,376,859	43.4508	277,079,626	6,571,986	4,829,657	14.4347	69,714,654	0	0	1.0000	0	15,249,336	11,206,516	346,794,281
2113	8,657,770	6,362,470	45.2106	287,651,085	6,566,405	4,825,556	14.8461	71,640,687	0	0	1.0000	0	15,224,175	11,188,026	359,291,772
2114	8,657,770	6,362,470	47.0416	299,300,767	6,566,405	4,825,556	15.2692	73,682,380	0	0	1.0000	0	15,224,175	11,188,026	372,983,147
2115	8,657,770	6,362,470	48.9468	311,422,545	6,566,405	4,825,556	15.7044	75,782,462	0	0	1.0000	0	15,224,175	11,188,026	387,205,007
2116	12,335,180	9,064,945	50.9291	461,669,511	17,545,476	12,893,916	16.1520	208,262,538	0	0	1.0000	0	29,880,656	21,958,862	669,932,049
2117	8,657,770	6,362,470	52.9918	337,158,736	6,566,405	4,825,556	16.6123	80,163,584	0	0	1.0000	0	15,224,175	11,188,026	417,322,320
2118	17,192,700	12,634,667	55.1379	696,648,984	32,171,215	23,642,161	17.0857	403,942,863	0	0	1.0000	0	49,363,915	36,276,827	1,100,591,847
2119	8,657,770	6,362,470	57.3710	365,021,265	6,566,405	4,825,556	17.5727	84,798,048	0	0	1.0000	0	15,224,175	11,188,026	449,819,313
2120	8,677,350	6,376,859	59.6946	380,664,049	6,571,986	4,829,657	18.0735	87,288,812	0	0	1.0000	0	15,249,336	11,206,516	467,952,861
2121	8,657,770	6,362,470	62.1122	395,187,007	6,566,405	4,825,556	18.5886	89,700,330	0	0	1.0000	0	15,224,175	11,188,026	484,887,338
2122	8,657,770	6,362,470	64.6277	411,191,801	6,566,405	4,825,556	19.1184	92,256,910	0	0	1.0000	0	15,224,175	11,188,026	503,448,710
2123	8,657,770	6,362,470	67.2451	427,844,930	6,566,405	4,825,556	19.6633	94,886,355	0	0	1.0000	0	15,224,175	11,188,026	522,731,285
2124	8,677,350	6,376,859	69.9686	446,179,899	6,571,986	4,829,657	20.2237	97,673,541	0	0	1.0000	0	15,249,336	11,206,516	543,853,439
2125	8,657,770	6,362,470	72.8023	463,202,448	6,566,405	4,825,556	20.8000	100,371,565	0	0	1.0000	0	15,224,175	11,188,026	563,574,012
2126	8,657,770	6,362,470	75.7508	481,962,190	6,566,405	4,825,556	21.3928	103,232,154	0	0	1.0000	0	15,224,175	11,188,026	585,194,345
2127	8,657,770	6,362,470	78.8187	501,481,612	6,566,405	4,825,556	22.0025	106,174,296	0	0	1.0000	0	15,224,175	11,188,026	607,655,908
2128	9,340,990	6,864,558	82.0109	562,968,618	8,562,916	6,292,763	22.6296	142,402,709	0	0	1.0000	0	17,903,906	13,157,321	705,371,327
2129	8,657,770	6,362,470	85.3323	542,924,196	6,566,405	4,825,556	23.2745	112,312,403	0	0	1.0000	0	15,224,175	11,188,026	655,236,600
2130	8,657,770	6,362,470	88.7883	564,912,893	6,566,405	4,825,556	23.9379	115,513,677	0	0	1.0000	0	15,224,175	11,188,026	680,426,570
2131	8,657,770	6,362,470	92.3842	587,791,698	6,566,405	4,825,556	24.6201	118,805,671	0	0	1.0000	0	15,224,175	11,188,026	706,597,370
2132	8,677,350	6,376,859	96.1257	612,980,038	6,571,986	4,829,657	25.3218	122,295,617	0	0	1.0000	0	15,249,336	11,206,516	735,275,655
2133	8,657,770	6,362,470	100.0188	636,366,612	6,566,405	4,825,556	26.0434	125,673,885	0	0	1.0000	0	15,224,175	11,188,026	762,040,497
2134	8,657,770	6,362,470	104.0696	662,139,705	6,566,405	4,825,556	26.7857	129,255,895	0	0	1.0000	0	15,224,175	11,188,026	791,395,600
2135	8,657,770	6,362,470	108.2844	688,956,243	6,566,405	4,825,556	27.5491	132,939,725	0	0	1.0000	0	15,224,175	11,188,026	821,895,968
2136	8,677,350	6,376,859	112.6699	718,480,609	6,571,986	4,829,657	28.3342	136,844,476	0	0	1.0000	0	15,249,336	11,206,516	855,324,546
2137	8,657,770	6,362,470	117.2331	745,892,078	6,566,405	4,825,556	29.1417	140,624,905	0	0	1.0000	0	15,224,175	11,188,026	886,516,984
2138	8,657,770	6,362,470	121.9810	776,100,450	6,566,405	4,825,556	29.9723	144,633,012	0	0	1.0000	0	15,224,175	11,188,026	920,733,462
2139	8,657,770	6,362,470	126.9212	807,532,324	6,566,405	4,825,556	30.8265	148,755,002	0	0	1.0000	0	15,224,175	11,188,026	956,287,326
2140	8,677,350	6,376,859	132.0616	842,138,207	6,571,986	4,829,657	31.7050	153,124,285	0	0	1.0000	0	15,249,336	11,206,516	995,262,492
2141	8,657,770	6,362,470	137.4100	874,266,999	6,566,405	4,825,556	32.6086	157,354,625	0	0	1.0000	0	15,224,175	11,188,026	1,031,621,624

Proposed

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2142	8,657,770	6,362,470	142.9752	909,675,417	6,566,405	4,825,556	33.5380	161,839,497	0	0	1.0000	0	15,224,175	11,188,026	1,071,514,914
2143	8,657,770	6,362,470	148.7656	946,516,663	6,566,405	4,825,556	34.4938	166,451,764	0	0	1.0000	0	15,224,175	11,188,026	1,112,968,427
2144	8,677,350	6,376,859	154.7907	987,078,473	6,571,986	4,829,657	35.4769	171,341,270	0	0	1.0000	0	15,249,336	11,206,516	1,158,419,743
2145	29,995,110	22,042,973	161.0597	3,550,234,550	70,578,445	51,867,079	36.4880	1,892,525,961	0	0	1.0000	0	100,573,555	73,910,051	5,442,760,511
2146	8,657,770	6,362,470	167.5826	1,066,239,260	6,566,405	4,825,556	37.5279	181,092,983	0	0	1.0000	0	15,224,175	11,188,026	1,247,332,243
2147	8,657,770	6,362,470	174.3697	1,109,421,980	6,566,405	4,825,556	38.5974	186,253,915	0	0	1.0000	0	15,224,175	11,188,026	1,295,675,896
2148	8,677,350	6,376,859	181.4317	1,156,964,375	6,571,986	4,829,657	39.6975	191,725,321	0	0	1.0000	0	15,249,336	11,206,516	1,348,689,696
2149	8,657,770	6,362,470	188.7796	1,201,104,536	6,566,405	4,825,556	40.8288	197,021,661	0	0	1.0000	0	15,224,175	11,188,026	1,398,126,197
2150	8,657,770	6,362,470	196.4252	1,249,749,437	6,566,405	4,825,556	41.9925	202,637,160	0	0	1.0000	0	15,224,175	11,188,026	1,452,386,597
2151	8,657,770	6,362,470	204.3804	1,300,364,158	6,566,405	4,825,556	43.1893	208,412,386	0	0	1.0000	0	15,224,175	11,188,026	1,508,776,544
2152	8,677,350	6,376,859	212.6578	1,356,088,812	6,571,986	4,829,657	44.4201	214,533,861	0	0	1.0000	0	15,249,336	11,206,516	1,570,622,673
2153	8,657,770	6,362,470	221.2705	1,407,826,912	6,566,405	4,825,556	45.6861	220,460,834	0	0	1.0000	0	15,224,175	11,188,026	1,628,287,746
2154	8,657,770	6,362,470	230.2319	1,464,843,550	6,566,405	4,825,556	46.9882	226,744,191	0	0	1.0000	0	15,224,175	11,188,026	1,691,587,741
2155	8,657,770	6,362,470	239.5563	1,524,169,765	6,566,405	4,825,556	48.3273	233,206,093	0	0	1.0000	0	15,224,175	11,188,026	1,757,375,858
2156	8,677,350	6,376,859	249.2584	1,589,485,679	6,571,986	4,829,657	49.7047	240,056,668	0	0	1.0000	0	15,249,336	11,206,516	1,829,542,347
2157	8,657,770	6,362,470	259.3533	1,650,127,583	6,566,405	4,825,556	51.1212	246,688,214	0	0	1.0000	0	15,224,175	11,188,026	1,896,815,797
2158	14,754,150	10,842,611	269.8571	2,925,955,689	24,855,555	18,265,988	52.5782	960,392,763	0	0	1.0000	0	39,609,705	29,108,599	3,886,348,451
2159	8,657,770	6,362,470	280.7864	1,786,495,039	6,566,405	4,825,556	54.0767	260,950,144	0	0	1.0000	0	15,224,175	11,188,026	2,047,445,183
2160	8,677,350	6,376,859	292.1582	1,863,051,656	6,571,986	4,829,657	55.6179	268,615,398	0	0	1.0000	0	15,249,336	11,206,516	2,131,667,054
2161	8,657,770	6,362,470	303.9906	1,934,131,064	6,566,405	4,825,556	57.2030	276,036,280	0	0	1.0000	0	15,224,175	11,188,026	2,210,167,344
2162	8,657,770	6,362,470	316.3022	2,012,463,250	6,566,405	4,825,556	58.8333	283,903,384	0	0	1.0000	0	15,224,175	11,188,026	2,296,366,634
2163	8,657,770	6,362,470	329.1125	2,093,968,399	6,566,405	4,825,556	60.5100	291,994,394	0	0	1.0000	0	15,224,175	11,188,026	2,385,962,792
2164	8,677,350	6,376,859	342.4415	2,183,701,172	6,571,986	4,829,657	62.2345	300,571,308	0	0	1.0000	0	15,249,336	11,206,516	2,484,272,480
2165	8,657,770	6,362,470	356.3104	2,267,014,221	6,566,405	4,825,556	64.0082	308,875,154	0	0	1.0000	0	15,224,175	11,188,026	2,575,889,374
2166	12,315,600	9,050,556	370.7410	3,355,412,309	17,539,895	12,889,815	65.8325	848,568,754	0	0	1.0000	0	29,855,495	21,940,371	4,203,981,063
2167	8,657,770	6,362,470	385.7560	2,454,360,967	6,566,405	4,825,556	67.7087	326,732,124	0	0	1.0000	0	15,224,175	11,188,026	2,781,093,090
2168	17,875,930	13,136,762	401.3791	5,272,821,890	34,167,736	25,109,375	69.6384	1,748,576,695	0	0	1.0000	0	52,043,666	38,246,137	7,021,398,585
2169	8,657,770	6,362,470	417.6350	2,657,190,147	6,566,405	4,825,556	71.6231	345,621,280	0	0	1.0000	0	15,224,175	11,188,026	3,002,811,427
2170	8,657,770	6,362,470	434.5492	2,764,806,236	6,566,405	4,825,556	73.6643	355,471,205	0	0	1.0000	0	15,224,175	11,188,026	3,120,277,441
2171	8,657,770	6,362,470	452.1484	2,876,780,618	6,566,405	4,825,556	75.7638	365,602,460	0	0	1.0000	0	15,224,175	11,188,026	3,242,383,078
2172	8,677,350	6,376,859	470.4604	3,000,059,650	6,571,986	4,829,657	77.9230	376,341,387	0	0	1.0000	0	15,249,336	11,206,516	3,376,401,038
2173	8,657,770	6,362,470	489.5141	3,114,518,762	6,566,405	4,825,556	80.1438	386,738,395	0	0	1.0000	0	15,224,175	11,188,026	3,501,257,157
2174	8,657,770	6,362,470	509.3394	3,240,656,638	6,566,405	4,825,556	82.4279	397,760,448	0	0	1.0000	0	15,224,175	11,188,026	3,638,417,086
2175	8,657,770	6,362,470	529.9676	3,371,902,941	6,566,405	4,825,556	84.7771	409,096,644	0	0	1.0000	0	15,224,175	11,188,026	3,780,999,585
2176	8,677,350	6,376,859	551.4313	3,516,399,665	6,571,986	4,829,657	87.1933	421,113,759	0	0	1.0000	0	15,249,336	11,206,516	3,937,513,425
2177	8,657,770	6,362,470	573.7643	3,650,558,130	6,566,405	4,825,556	89.6783	432,747,659	0	0	1.0000	0	15,224,175	11,188,026	4,083,305,789
2178	8,657,770	6,362,470	597.0018	3,798,406,026	6,566,405	4,825,556	92.2341	445,080,815	0	0	1.0000	0	15,224,175	11,188,026	4,243,486,841
2179	8,657,770	6,362,470	621.1803	3,952,241,006	6,566,405	4,825,556	94.8628	457,765,754	0	0	1.0000	0	15,224,175	11,188,026	4,410,006,760
2180	8,677,350	6,376,859	646.3381	4,121,606,950	6,571,986	4,829,657	97.5664	471,212,278	0	0	1.0000	0	15,249,336	11,206,516	4,592,819,228
2181	8,657,770	6,362,470	672.5148	4,278,855,221	6,566,405	4,825,556	100.3470	484,230,068	0	0	1.0000	0	15,224,175	11,188,026	4,763,085,289
2182	8,657,770	6,362,470	699.7517	4,452,149,179	6,566,405	4,825,556	103.2069	498,030,676	0	0	1.0000	0	15,224,175	11,188,026	4,950,179,855
2183	8,657,770	6,362,470	728.0916	4,632,460,942	6,566,405	4,825,556	106.1483	512,224,566	0	0	1.0000	0	15,224,175	11,188,026	5,144,685,508
2184	8,677,350	6,376,859	757.5793	4,830,976,401	6,571,986	4,829,657	109.1736	527,271,076	0	0	1.0000	0	15,249,336	11,206,516	5,358,247,477
2185	8,657,770	6,362,470	788.2613	5,015,288,851	6,566,405	4,825,556	112.2850	541,837,556	0	0	1.0000	0	15,224,175	11,188,026	5,557,126,407
2186	8,657,770	6,362,470	820.1859	5,218,408,160	6,566,405	4,825,556	115.4851	557,279,817	0	0	1.0000	0	15,224,175	11,188,026	5,775,687,978
2187	8,657,770	6,362,470	853.4034	5,429,753,507	6,566,405	4,825,556	118.7764	573,162,170	0	0	1.0000	0	15,224,175	11,188,026	6,002,915,676
2188	8,677,350	6,376,859	887.9662	5,662,435,282	6,571,986	4,829,657	122.1616	589,998,665	0	0	1.0000	0	15,249,336	11,206,516	6,252,433,947
2189	8,657,770	6,362,470	923.9289	5,878,469,883	6,566,405	4,825,556	125.6432	606,298,298	0	0	1.0000	0	15,224,175	11,188,026	6,484,768,180
2190	8,657,770	6,362,470	961.3480	6,116,547,783	6,566,405	4,825,556	129.2240	623,577,649	0	0	1.0000	0	15,224,175	11,188,026	6,740,125,432
2191	8,657,770	6,36,													

Proposed

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2199	7,147,970	5,252,940	1,374.2299	7,218,746,916	2,037,025	1,496,980	166.4109	249,113,812	0	0	1.0000	0	9,184,995	6,749,920	7,467,860,728
2200	7,147,970	5,252,940	1,429.8862	7,511,106,109	2,037,025	1,496,980	171.1537	256,213,690	0	0	1.0000	0	9,184,995	6,749,920	7,767,319,798
2201	7,147,970	5,252,940	1,487.7966	7,815,305,953	2,037,025	1,496,980	176.0315	263,515,660	0	0	1.0000	0	9,184,995	6,749,920	8,078,821,612
2202	7,147,970	5,252,940	1,548.0523	8,131,825,517	2,037,025	1,496,980	181.0484	271,025,859	0	0	1.0000	0	9,184,995	6,749,920	8,402,851,376
2203	7,147,970	5,252,940	1,610.7485	8,461,164,880	2,037,025	1,496,980	186.2083	278,750,127	0	0	1.0000	0	9,184,995	6,749,920	8,739,915,007
2204	7,167,560	5,267,336	1,675.9838	8,827,970,129	2,042,606	1,501,081	191.5152	287,479,915	0	0	1.0000	0	9,210,166	6,768,418	9,115,450,044
2205	7,147,970	5,252,940	1,743.8611	9,160,397,352	2,037,025	1,496,980	196.9734	294,865,268	0	0	1.0000	0	9,184,995	6,749,920	9,455,262,620
2206	7,147,970	5,252,940	1,814.4875	9,531,393,579	2,037,025	1,496,980	202.5872	303,269,015	0	0	1.0000	0	9,184,995	6,749,920	9,834,662,594
2207	7,147,970	5,252,940	1,887.9742	9,917,414,789	2,037,025	1,496,980	208.3609	311,912,129	0	0	1.0000	0	9,184,995	6,749,920	10,229,326,918
2208	13,927,590	10,235,184	1,964.4372	20,106,377,146	22,322,696	16,404,626	214.2992	3,515,498,298	0	0	1.0000	0	36,250,286	26,639,811	23,621,875,444
2209	7,147,970	5,252,940	2,043.9969	10,736,992,637	2,037,025	1,496,980	220.4067	329,944,453	0	0	1.0000	0	9,184,995	6,749,920	11,066,937,090
2210	7,147,970	5,252,940	2,126.7788	11,171,840,973	2,037,025	1,496,980	226.6883	339,347,883	0	0	1.0000	0	9,184,995	6,749,920	11,511,188,856
2211	7,147,970	5,252,940	2,212.9133	11,624,300,315	2,037,025	1,496,980	233.1489	349,019,273	0	0	1.0000	0	9,184,995	6,749,920	11,973,319,588
2212	7,167,560	5,267,336	2,302.5363	12,128,232,789	2,042,606	1,501,081	239.7937	359,949,876	0	0	1.0000	0	9,210,166	6,768,418	12,488,182,665
2213	7,147,970	5,252,940	2,395.7890	12,584,935,356	11,235,929	8,257,122	246.6278	2,036,435,750	0	0	1.0000	0	18,383,899	13,510,061	14,621,371,106
2214	7,147,970	5,252,940	2,492.8185	13,094,625,476	2,037,025	1,496,980	253.6567	379,719,042	0	0	1.0000	0	9,184,995	6,749,920	13,474,344,519
2215	7,147,970	5,252,940	2,593.7776	13,624,957,550	2,037,025	1,496,980	260.8859	390,541,011	0	0	1.0000	0	9,184,995	6,749,920	14,015,498,561
2216	10,825,390	7,955,423	2,698.8256	21,470,298,074	13,016,096	9,565,341	268.3212	2,566,583,660	0	0	1.0000	0	23,841,486	17,520,763	24,036,881,734
2217	7,147,970	5,252,940	2,808.1281	14,750,927,819	2,037,025	1,496,980	275.9683	413,119,064	0	0	1.0000	0	9,184,995	6,749,920	15,164,046,883
2218	14,921,800	10,965,815	2,921.8572	32,040,545,612	29,162,168	21,430,855	283.8334	6,082,792,505	0	0	1.0000	0	44,083,968	32,396,670	38,123,338,117
2219	6,482,540	4,763,925	3,040.1925	14,483,248,755	3,844,408	2,825,200	291.9227	824,739,875	0	0	1.0000	0	10,326,948	7,589,124	15,307,988,630
2220	6,403,050	4,705,509	3,163.3203	14,885,031,666	3,563,171	2,618,523	300.2424	786,191,677	0	0	1.0000	0	9,966,221	7,324,032	15,671,223,343
2221	6,386,860	4,693,611	3,291.4347	15,448,714,288	3,557,358	2,614,251	308.7994	807,279,028	0	0	1.0000	0	9,944,218	7,307,862	16,255,993,316
2222	6,386,860	4,693,611	3,424.7378	16,074,387,191	3,557,358	2,614,251	317.6001	830,286,263	0	0	1.0000	0	9,944,218	7,307,862	16,904,673,455
2223	6,482,540	4,763,925	3,563.4397	16,975,959,121	3,844,408	2,825,200	326.6517	922,856,229	0	0	1.0000	0	10,326,948	7,589,124	17,898,815,350
2224	6,403,050	4,705,509	3,707.7590	17,446,892,787	3,563,171	2,618,523	335.9613	879,722,443	0	0	1.0000	0	9,966,221	7,324,032	18,326,615,231
2225	6,386,860	4,693,611	3,857.9233	18,107,591,442	3,557,358	2,614,251	345.5362	903,318,231	0	0	1.0000	0	9,944,218	7,307,862	19,010,909,673
2226	6,386,860	4,693,611	4,014.1692	18,840,948,925	3,557,358	2,614,251	355.3840	929,062,848	0	0	1.0000	0	9,944,218	7,307,862	19,770,011,773
2227	6,482,540	4,763,925	4,176.7430	19,897,689,984	3,844,408	2,825,200	365.5124	1,032,645,461	0	0	1.0000	0	10,326,948	7,589,124	20,930,335,445
2228	6,403,050	4,705,509	4,345.9011	20,449,676,086	3,563,171	2,618,523	375.9295	984,380,100	0	0	1.0000	0	9,966,221	7,324,032	21,434,056,187
2229	6,386,860	4,693,611	4,521.9101	21,224,087,226	3,557,358	2,614,251	386.6435	1,010,783,016	0	0	1.0000	0	9,944,218	7,307,862	22,234,870,241
2230	6,099,800	4,482,655	4,705.0475	21,091,103,808	2,696,178	1,981,382	397.6629	787,922,075	0	0	1.0000	0	8,795,978	6,464,037	21,879,025,883
2231	2,028,079	1,490,406	4,895.6019	7,296,434,457	5,022,573	3,691,016	408.9963	1,509,612,017	0	0	1.0000	0	7,050,652	5,181,422	8,806,046,474
	\$2,255,855,813	\$1,657,795,815		\$717,266,338,345	\$2,005,587,868	\$1,473,877,521		\$73,233,079,006	\$0	\$0		\$0	\$4,261,443,682	\$3,131,673,337	\$790,499,417,350

Proposed

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost	Total Jurisdictional	Total Jurisdictional
Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Estimate	Cost in	Cost in
Estimate	Cost in		Cost in	Estimate	Cost in		Cost in	Estimate	Cost in		Cost in	Estimate	Cost in	Cost in
Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Future \$'s
Prairie Island Unit 1														
Factors	2017	73.4886%	4.05%				2.85%				0.00%			
2033	\$22,324,352	\$16,405,843	1.8874	\$30,964,388	\$9,448,311	\$6,943,427	1.5677	\$10,885,211	\$1,250,000	\$918,607	\$918,607	\$33,022,663	\$24,267,877	\$42,768,206
2034	63,582,247	46,725,674	1.9639	91,764,550	32,971,808	24,230,505	1.6124	39,069,266	1,250,000	918,607	918,607	97,804,054	71,874,785	131,752,423
2035	65,877,294	48,412,271	2.0434	98,925,635	81,239,940	59,702,057	1.6584	99,009,891	1,250,000	918,607	918,607	148,367,234	109,032,935	198,854,133
2036	57,759,315	42,446,486	2.1262	90,249,718	65,595,019	48,204,831	1.7056	82,218,159	1,250,000	918,607	918,607	124,604,334	91,569,923	173,386,484
2037	39,808,349	29,254,580	2.2123	64,719,908	41,981,869	30,851,869	1.7542	54,120,348	1,250,000	918,607	918,607	83,040,219	61,025,056	119,758,863
2038	13,207,909	9,706,302	2.3019	22,342,936	18,994,690	13,958,923	1.8042	25,184,688	1,250,000	918,607	918,607	33,452,599	24,583,831	48,446,231
2039	35,713,293	26,245,183	2.3951	62,859,838	75,509,032	55,490,496	1.8556	102,968,164	1,250,000	918,607	918,607	112,472,326	82,654,286	166,746,609
2040	31,919,565	23,457,227	2.4921	58,457,756	13,365,605	9,822,190	1.9085	18,745,649	1,250,000	918,607	918,607	46,535,170	34,198,024	78,122,012
2041	19,624,629	14,421,856	2.5930	37,395,872	9,445,873	6,941,635	1.9629	13,625,736	1,250,000	918,607	918,607	30,320,501	22,282,098	51,940,215
2042	14,863,700	10,923,118	2.6981	29,471,665	11,668,700	8,575,159	2.0189	17,312,388	1,250,000	918,607	918,607	27,782,400	20,416,884	47,702,660
2043	8,912,163	6,549,420	2.8073	18,386,186	6,432,175	4,726,912	2.0764	9,814,961	1,250,000	918,607	918,607	16,594,338	12,194,939	29,119,754
2044	3,676,270	2,701,638	2.9210	7,891,484	1,824,877	1,341,076	2.1356	2,864,001	1,250,000	918,607	918,607	6,751,147	4,961,320	11,674,091
2045	5,973,090	4,389,537	3.0393	13,341,121	8,737,075	6,420,750	2.1964	14,102,536	1,250,000	918,607	918,607	15,960,165	11,728,895	28,362,264
2046	5,204,130	3,824,440	3.1624	12,094,409	6,430,205	4,725,465	2.2590	10,674,825	1,250,000	918,607	918,607	12,884,335	9,468,512	23,687,841
2047	5,204,130	3,824,440	3.2905	12,584,319	6,430,205	4,725,465	2.3234	10,979,145	1,250,000	918,607	918,607	12,884,335	9,468,512	24,482,072
2048	3,676,270	2,701,638	3.4238	9,249,867	1,824,877	1,341,076	2.3896	3,204,634	1,250,000	918,607	918,607	6,751,147	4,961,320	13,373,108
2049	5,204,130	3,824,440	3.5624	13,624,185	6,430,205	4,725,465	2.4577	11,613,775	1,250,000	918,607	918,607	12,884,335	9,468,512	26,156,567
2050	5,973,090	4,389,537	3.7067	16,270,699	8,737,075	6,420,750	2.5278	16,230,373	1,250,000	918,607	918,607	15,960,165	11,728,895	33,419,678
2051	5,779,130	4,246,999	3.8568	16,379,826	8,155,205	5,993,143	2.5998	15,580,972	1,250,000	918,607	918,607	15,184,335	11,158,749	32,879,405
2052	5,983,130	4,396,916	4.0130	17,644,823	8,745,477	6,426,924	2.6739	17,184,953	1,250,000	918,607	918,607	15,978,607	11,742,447	35,748,383
2053	3,666,220	2,694,252	4.1756	11,250,119	1,816,475	1,334,902	2.7501	3,671,113	1,250,000	918,607	918,607	6,732,695	4,947,761	15,839,839
2054	3,666,220	2,694,252	4.3447	11,705,717	1,816,475	1,334,902	2.8285	3,775,769	1,250,000	918,607	918,607	6,732,695	4,947,761	16,400,093
2055	5,973,090	4,389,537	4.5206	19,843,343	8,737,075	6,420,750	2.9091	18,678,605	1,250,000	918,607	918,607	15,960,165	11,728,895	39,440,555
2056	5,214,180	3,831,825	4.7037	18,023,758	6,438,607	4,731,639	2.9920	14,157,064	1,250,000	918,607	918,607	12,902,787	9,482,071	33,099,428
2057	5,204,130	3,824,440	4.8942	18,717,574	6,430,205	4,725,465	3.0773	14,541,673	1,250,000	918,607	918,607	12,884,335	9,468,512	34,177,854
2058	3,666,220	2,694,252	5.0924	13,720,209	1,816,475	1,334,902	3.1650	4,224,963	1,250,000	918,607	918,607	6,732,695	4,947,761	18,863,779
2059	5,010,180	3,681,909	5.2987	19,509,330	5,848,345	4,297,864	3.2552	13,990,408	1,250,000	918,607	918,607	12,108,525	8,898,380	34,418,346
2060	5,214,180	3,831,825	5.5133	21,126,003	6,438,607	4,731,639	3.3480	15,841,527	1,250,000	918,607	918,607	12,902,787	9,482,071	37,886,138
2061	5,204,130	3,824,440	5.7366	21,939,282	6,430,205	4,725,465	3.4434	16,271,666	1,250,000	918,607	918,607	12,884,335	9,468,512	39,129,555
2062	3,666,220	2,694,252	5.9689	16,081,721	1,816,475	1,334,902	3.5415	4,727,554	1,250,000	918,607	918,607	6,732,695	4,947,761	21,727,882
2063	8,279,960	6,084,823	6.2106	37,790,401	15,657,675	11,506,599	3.6425	41,912,788	1,250,000	918,607	918,607	25,187,635	18,510,029	80,621,796
2064	6,558,130	4,819,475	6.4622	31,144,411	10,470,477	7,694,602	3.7463	28,826,287	1,250,000	918,607	918,607	18,278,607	13,432,684	60,889,305
2065	5,204,130	3,824,440	6.7239	25,715,151	6,430,205	4,725,465	3.8531	18,207,689	1,250,000	918,607	918,607	12,884,335	9,468,512	44,841,447
2066	3,666,220	2,694,252	6.9962	18,849,526	1,816,475	1,334,902	3.9629	5,290,081	1,250,000	918,607	918,607	6,732,695	4,947,761	25,058,214
2067	3,666,220	2,694,252	7.2795	19,612,808	1,816,475	1,334,902	4.0758	5,440,792	1,250,000	918,607	918,607	6,732,695	4,947,761	25,972,206
2068	6,752,090	4,962,013	7.5744	37,584,274	11,052,337	8,122,202	4.1920	34,048,273	1,250,000	918,607	918,607	19,054,427	14,002,823	72,551,153
2069	5,973,090	4,389,537	7.8811	34,594,384	8,737,075	6,420,750	4.3115	27,683,065	1,250,000	918,607	918,607	15,960,165	11,728,895	63,196,056
2070	3,666,220	2,694,252	8.2003	22,093,675	1,816,475	1,334,902	4.4343	5,919,354	1,250,000	918,607	918,607	6,732,695	4,947,761	28,931,636
2071	3,666,220	2,694,252	8.5324	22,988,436	1,816,475	1,334,902	4.5607	6,088,085	1,250,000	918,607	918,607	6,732,695	4,947,761	29,995,129
2072	7,327,090	5,384,572	8.8780	47,804,235	12,777,337	9,389,880	4.6907	44,045,110	1,250,000	918,607	918,607	21,354,427	15,693,059	92,767,952
2073	3,666,220	2,694,252	9.2375	24,888,153	1,816,475	1,334,902	4.8244	6,440,099	1,250,000	918,607	918,607	6,732,695	4,947,761	32,246,859
2074	3,666,220	2,694,252	9.6117	25,896,343	1,816,475	1,334,902	4.9619	6,623,648	1,250,000	918,607	918,607	6,732,695	4,947,761	33,438,597
2075	7,842,820	5,763,575	10.0009	57,640,937	14,346,275	10,542,870	5.1033	53,803,430	1,250,000	918,607	918,607	23,439,095	17,225,052	112,362,974
2076	3,676,270	2,701,638	10.4060	28,113,241	1,824,877	1,341,076	5.2487	7,038,993	1,250,000	918,607	918,607	6,751,147	4,961,320	36,070,752
2077	3,666,220	2,694,252	10.8274	29,171,745	1,816,475	1,334,902	5.3983	7,206,199	1,250,000	918,607	918,607	6,732,695	4,947,761	37,296,551
2078	7,511,000	5,519,725	11.2659	62,184,673	13,350,805	9,811,314	5.5522	54,474,377	1,250,000	918,607	918,607	22,111,805	16,249,646	117,577,657
2079	3,666,220	2,694,252	11.7222	31,582,562	1,816,475	1,334,902	5.7104	7,622,822	1,250,000	918,607	918,607	6,732,695	4,947,761	40,123,990
2080	3,676,270	2,701,638	12.1970	32,951,875	1,824,877	1,341,076	5.8731	7,876,271	1,250,000	918,607	918,607	6,751,147	4,961,320	41,746,752
2081	3,666,220	2,694,252	12.6909	34,192,483	1,816,475	1,334,902	6.0405	8,063,473	1,250,000	918,607	918,607	6,732,695	4,947,761	43,174,563
2082	7,123,090	5,234,656	13.2049	69,123,107	12,187,075	8,956,105	6.2127	55,641,597	1,250,000	918,607	918,607	20,560,165	15,109,368	125,083,310
2083	3,666,220	2,694,252	13.7397	37,018,215	1,816,475	1,334,902	6.3897	8,529,620	1,250,000	918,607	918,607	6,732,695	4,947,761	46,466,442
2084	3,676,270	2,701,638	14.2962	38,623,152	1,824,877	1,341,076	6.5719	8,813,410	1,250,000	918,607	918,607	6,751,147	4,961,320	48,355,173
2085	3,666,220	2,694,252	14.8752	40,077,538	1,816,475	1,334,902	6.7592	9,022,866	1,250,000	918,607	918,607	6,732,695	4,947,761	50,019,012
2086	3,666,220	2,694,252	15.4776	41,700,556	1,816,475	1,334,902	6.9518	9,279,968	1,250,000	918,607	918,607	6,732,695	4,947,761	51,899,131
2087	3,666,220	2,694,252	16.1045	43,389,582	1,816,475	1,334,902	7.1499	9,544,412	1,250,000	918,607	918,607	6,732,695	4,947,761	53,852,602

Proposed

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2088	3,676,270	2,701,638	16.7567	45,270,532	1,824,877	1,341,076	7.3537	9,861,867	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	56,051,006
2089	26,770,050	19,672,923	17.4353	343,003,308	73,210,048	53,801,006	7.5633	406,913,146	1,250,000	918,607	1.0000	918,607	101,230,098	74,392,535	750,835,061
2090	3,666,220	2,694,252	18.1415	48,877,774	1,816,475	1,334,902	7.7788	10,383,932	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	60,180,313
2091	3,666,220	2,694,252	18.8762	50,857,241	1,816,475	1,334,902	8.0005	10,679,880	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	62,455,727
2092	3,676,270	2,701,638	19.6407	53,062,055	1,824,877	1,341,076	8.2285	11,035,040	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	65,015,702
2093	3,666,220	2,694,252	20.4361	55,060,005	1,816,475	1,334,902	8.4630	11,297,272	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	67,275,883
2094	3,666,220	2,694,252	21.2638	57,290,037	1,816,475	1,334,902	8.7042	11,619,250	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	69,827,894
2095	5,973,090	4,389,537	22.1250	97,118,516	8,737,075	6,420,750	8.9523	57,480,484	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	155,517,607
2096	5,214,180	3,831,825	23.0210	88,212,454	6,438,607	4,731,639	9.2075	43,566,566	1,250,000	918,607	1.0000	918,607	12,902,787	9,482,071	132,697,627
2097	5,204,130	3,824,440	23.9534	91,608,338	6,430,205	4,725,465	9.4699	44,749,681	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	137,276,626
2098	3,666,220	2,694,252	24.9235	67,150,191	1,816,475	1,334,902	9.7398	13,001,674	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	81,070,472
2099	3,666,220	2,694,252	25.9329	69,869,769	1,816,475	1,334,902	10.0173	13,372,109	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	84,160,485
2100	5,973,090	4,389,537	26.9832	118,443,767	8,737,075	6,420,750	10.3028	66,151,707	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	185,514,081
2101	5,973,090	4,389,537	28.0760	123,240,654	8,737,075	6,420,750	10.5965	68,037,482	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	192,196,742
2102	5,973,090	4,389,537	29.2131	128,231,997	8,737,075	6,420,750	10.8985	69,976,548	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	199,127,152
2103	3,666,220	2,694,252	30.3962	81,895,024	1,816,475	1,334,902	11.2091	14,963,045	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	97,776,676
2104	3,676,270	2,701,638	31.6272	85,445,235	1,824,877	1,341,076	11.5285	15,460,589	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	101,824,431
2105	5,973,090	4,389,537	32.9081	144,451,338	8,737,075	6,420,750	11.8571	76,131,479	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	221,501,424
2106	5,204,130	3,824,440	34.2409	130,952,263	6,430,205	4,725,465	12.1950	57,627,046	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	189,497,916
2107	5,204,130	3,824,440	35.6277	136,255,997	6,430,205	4,725,465	12.5426	59,269,617	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	196,444,221
2108	3,676,270	2,701,638	37.0706	100,151,329	1,824,877	1,341,076	12.9000	17,299,874	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	118,369,810
2109	5,204,130	3,824,440	38.5720	147,516,295	6,430,205	4,725,465	13.2677	62,696,052	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	211,130,954
2110	5,204,130	3,824,440	40.1341	153,490,453	6,430,205	4,725,465	13.6458	64,482,750	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	218,891,810
2111	5,204,130	3,824,440	41.7596	159,707,080	6,430,205	4,725,465	14.0347	66,320,483	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	226,946,170
2112	3,676,270	2,701,638	43.4508	117,388,318	1,824,877	1,341,076	14.4347	19,358,023	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	137,664,947
2113	8,279,960	6,084,823	45.2106	275,098,493	15,657,675	11,506,599	14.8461	170,828,123	1,250,000	918,607	1.0000	918,607	25,187,635	18,510,029	446,845,223
2114	6,742,050	4,954,635	47.0416	233,073,960	11,043,935	8,116,028	15.2692	123,925,262	1,250,000	918,607	1.0000	918,607	19,035,985	13,989,270	357,917,829
2115	5,535,960	4,068,297	48.9468	199,130,117	7,425,675	5,457,021	15.7044	85,699,248	1,250,000	918,607	1.0000	918,607	14,211,635	10,443,925	285,747,972
2116	3,676,270	2,701,638	50.9291	137,591,975	1,824,877	1,341,076	16.1520	21,661,052	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	160,171,633
2117	3,666,220	2,694,252	52.9918	142,773,266	1,816,475	1,334,902	16.6123	22,175,785	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	165,867,658
2118	6,742,050	4,954,635	55.1379	273,188,172	11,043,935	8,116,028	17.0857	138,668,027	1,250,000	918,607	1.0000	918,607	19,035,985	13,989,270	412,774,806
2119	5,973,090	4,389,537	57.3710	251,832,154	8,737,075	6,420,750	17.5727	112,829,920	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	365,580,681
2120	3,676,270	2,701,638	59.6946	161,273,179	1,824,877	1,341,076	18.0735	24,237,929	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	186,429,715
2121	3,666,220	2,694,252	62.1122	167,345,923	1,816,475	1,334,902	18.5886	24,813,951	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	193,078,480
2122	7,511,000	5,519,725	64.6277	356,727,150	13,350,805	9,811,314	19.1184	187,576,623	1,250,000	918,607	1.0000	918,607	22,111,805	16,249,646	545,222,379
2123	3,666,220	2,694,252	67.2451	181,175,249	1,816,475	1,334,902	19.6633	26,248,569	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	208,342,425
2124	3,676,270	2,701,638	69.9686	189,029,805	1,824,877	1,341,076	20.2237	27,121,509	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	217,069,921
2125	7,511,000	5,519,725	72.8023	401,848,696	13,350,805	9,811,314	20.8000	204,075,328	1,250,000	918,607	1.0000	918,607	22,111,805	16,249,646	606,842,631
2126	3,666,220	2,694,252	75.7508	204,091,749	1,816,475	1,334,902	21.3928	28,557,281	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	233,567,637
2127	3,666,220	2,694,252	78.8187	212,357,445	1,816,475	1,334,902	22.0025	29,371,171	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	242,647,223
2128	7,521,050	5,527,111	82.0109	453,283,338	13,359,207	9,817,488	22.6296	222,165,823	1,250,000	918,607	1.0000	918,607	22,130,257	16,263,206	676,367,768
2129	3,666,220	2,694,252	85.3323	229,906,725	1,816,475	1,334,902	23.2745	31,069,166	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	261,894,498
2130	3,666,220	2,694,252	88.7883	239,218,060	1,816,475	1,334,902	23.9379	31,954,739	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	272,091,406
2131	3,666,220	2,694,252	92.3842	248,906,321	1,816,475	1,334,902	24.6201	32,865,409	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	282,690,337
2132	7,521,050	5,527,111	96.1257	531,297,403	13,359,207	9,817,488	25.3218	248,596,464	1,250,000	918,607	1.0000	918,607	22,130,257	16,263,206	780,812,473
2133	3,666,220	2,694,252	100.0188	269,475,858	1,816,475	1,334,902	26.0434	34,765,375	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	305,159,839
2134	3,666,220	2,694,252	104.0696	280,389,734	1,816,475	1,334,902	26.7857	35,756,272	1,250,000	918,607	1.0000	918,6			

Proposed

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2145	5,973,090	4,389,537	161.0597	706,977,587	8,737,075	6,420,750	36.4880	234,280,340	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	942,176,534
2146	5,204,130	3,824,440	167.5826	640,909,579	6,430,205	4,725,465	37.5279	177,336,778	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	819,164,963
2147	5,204,130	3,824,440	174.3697	666,866,434	6,430,205	4,725,465	38.5974	182,390,662	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	850,175,704
2148	3,676,270	2,701,638	181.4317	490,162,713	1,824,877	1,341,076	39.6975	53,237,346	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	544,318,666
2149	3,666,220	2,694,252	188.7796	508,619,826	1,816,475	1,334,902	40.8288	54,502,428	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	564,040,861
2150	5,973,090	4,389,537	196.4252	862,215,774	8,737,075	6,420,750	41.9925	269,623,361	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	1,132,757,742
2151	5,973,090	4,389,537	204.3804	897,135,423	8,737,075	6,420,750	43.1893	277,307,715	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	1,175,361,744
2152	5,983,130	4,396,916	212.6578	935,038,423	8,745,477	6,426,924	44.4201	285,484,624	1,250,000	918,607	1.0000	918,607	15,978,607	11,742,447	1,221,441,653
2153	3,666,220	2,694,252	221.2705	596,158,501	1,816,475	1,334,902	45.6861	60,986,445	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	658,063,552
2154	3,666,220	2,694,252	230.2319	620,302,771	1,816,475	1,334,902	46.9882	62,724,620	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	683,945,998
2155	6,304,910	4,633,387	239.5563	1,109,957,090	9,732,545	7,152,307	48.3273	345,651,681	1,250,000	918,607	1.0000	918,607	17,287,455	12,704,301	1,456,527,378
2156	5,214,180	3,831,825	249.2584	955,114,688	6,438,607	4,731,639	49.7047	235,184,696	1,250,000	918,607	1.0000	918,607	12,902,787	9,482,071	1,191,217,991
2157	5,204,130	3,824,440	259.3533	991,881,103	6,430,205	4,725,465	51.1212	241,571,441	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	1,234,371,151
2158	3,666,220	2,694,252	269.8571	727,063,048	1,816,475	1,334,902	52.5782	70,186,720	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	798,168,374
2159	5,204,130	3,824,440	280.7864	1,073,850,706	6,430,205	4,725,465	54.0767	255,537,553	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	1,330,306,865
2160	5,214,180	3,831,825	292.1582	1,119,499,235	6,438,607	4,731,639	55.6179	263,163,824	1,250,000	918,607	1.0000	918,607	12,902,787	9,482,071	1,383,581,665
2161	5,204,130	3,824,440	303.9906	1,162,593,774	6,430,205	4,725,465	57.2030	270,310,774	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	1,433,823,154
2162	3,666,220	2,694,252	316.3022	852,197,854	1,816,475	1,334,902	58.8333	78,536,662	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	931,653,123
2163	8,279,960	6,084,823	329.1125	2,002,591,266	15,657,675	11,506,599	60.5100	696,264,321	1,250,000	918,607	1.0000	918,607	25,187,635	18,510,029	2,699,774,193
2164	6,752,090	4,962,013	342.4415	1,699,199,277	11,052,337	8,122,202	62.2345	505,481,208	1,250,000	918,607	1.0000	918,607	19,054,427	14,002,823	2,205,599,092
2165	5,204,130	3,824,440	356.3104	1,362,687,703	6,430,205	4,725,465	64.0082	302,468,508	1,250,000	918,607	1.0000	918,607	12,884,335	9,468,512	1,666,074,818
2166	3,666,220	2,694,252	370.7410	998,869,703	1,816,475	1,334,902	65.8325	87,879,905	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,087,668,215
2167	3,666,220	2,694,252	385.7560	1,039,323,898	1,816,475	1,334,902	67.7087	90,384,447	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,130,626,952
2168	6,752,090	4,962,013	401.3791	1,991,648,432	11,052,337	8,122,202	69.6384	565,617,182	1,250,000	918,607	1.0000	918,607	19,054,427	14,002,823	2,558,184,221
2169	5,973,090	4,389,537	417.6350	1,833,224,479	8,737,075	6,420,750	71.6231	459,874,047	1,250,000	918,607	1.0000	918,607	15,960,165	11,728,895	2,294,017,133
2170	3,666,220	2,694,252	434.5492	1,170,785,077	1,816,475	1,334,902	73.6643	98,334,587	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,270,038,271
2171	3,666,220	2,694,252	452.1484	1,218,201,758	1,816,475	1,334,902	75.7638	101,137,213	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,320,257,578
2172	7,521,050	5,527,111	470.4604	2,600,286,797	13,359,207	9,817,488	77.9230	765,008,105	1,250,000	918,607	1.0000	918,607	22,130,257	16,263,206	3,366,213,509
2173	3,666,220	2,694,252	489.5141	1,318,874,373	1,816,475	1,334,902	80.1438	106,984,081	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,426,777,061
2174	3,666,220	2,694,252	509.3394	1,372,288,728	1,816,475	1,334,902	82.4279	110,033,130	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,483,240,465
2175	7,511,000	5,519,725	529.9676	2,925,275,561	13,350,805	9,811,314	84.7771	831,774,735	1,250,000	918,607	1.0000	918,607	22,111,805	16,249,646	3,757,968,903
2176	3,676,270	2,701,638	551.4313	1,489,767,567	1,824,877	1,341,076	87.1933	116,932,801	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	1,607,618,975
2177	3,666,220	2,694,252	573.7643	1,545,865,647	1,816,475	1,334,902	89.6783	119,711,700	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,666,495,954
2178	7,511,000	5,519,725	597.0018	3,295,285,929	13,350,805	9,811,314	92.2341	904,937,703	1,250,000	918,607	1.0000	918,607	22,111,805	16,249,646	4,201,142,239
2179	3,666,220	2,694,252	621.1803	1,673,616,303	1,816,475	1,334,902	94.8628	126,632,497	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,801,167,407
2180	3,676,270	2,701,638	646.3381	1,746,171,352	1,824,877	1,341,076	97.5664	130,843,911	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	1,877,933,870
2181	3,666,220	2,694,252	672.5148	1,811,924,386	1,816,475	1,334,902	100.3470	133,953,364	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	1,946,796,356
2182	7,511,000	5,519,725	699.7517	3,862,437,150	13,350,805	9,811,314	103.2069	1,012,595,287	1,250,000	918,607	1.0000	918,607	22,111,805	16,249,646	4,875,951,044
2183	3,666,220	2,694,252	728.0916	1,961,662,293	1,816,475	1,334,902	106.1483	141,697,528	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	2,104,278,428
2184	3,676,270	2,701,638	757.5793	2,046,704,767	1,824,877	1,341,076	109.1736	146,410,043	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	2,194,033,417
2185	3,666,220	2,694,252	788.2613	2,123,774,632	1,816,475	1,334,902	112.2850	149,889,418	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	2,274,582,657
2186	3,666,220	2,694,252	820.1859	2,209,787,551	1,816,475	1,334,902	115.4851	154,161,237	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	2,364,867,395
2187	3,666,220	2,694,252	853.4034	2,299,283,869	1,816,475	1,334,902	118.7764	158,554,798	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	2,458,757,274
2188	3,676,270	2,701,638	887.9662	2,398,962,927	1,824,877	1,341,076	122.1616	163,827,932	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	2,563,709,466
2189	26,780,760	19,680,793	923.9289	18,183,653,653	71,160,065	52,294,503	125.6432	6,570,448,704	1,250,000	918,607	1.0000	918,607	99,190,825	72,893,903	24,755,020,964
2190	3,666,220	2,694,252	961.3480	2,590,113,830	1,816,475	1,334,902	129.2240	172,501,315	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	2,763,533,752
2191	3,666,220	2,694,252	1,000.2826	2,695,013,456	1,816,475	1,334,902	132.9069	177,417,624	1,250,000	918,607	1.0000	918,607	6,732,695	4,947,761	2,873,349,687
2192	3,676,270	2,701,638	1,040.7940	2,811,848,267	1,824,877	1,341,076	136.6947	183,317,917	1,250,000	918,607	1.0000	918,607	6,751,147	4,961,320	2,996,084,790
2193	3,050,090	2,241,467	1,082.9462	2,427,388,206	1,970,568	1,448,142	140.5905	203,594,977	1,250,000	918,607	1.0000	918,607	6,270,658	4,608,216	2,631,901,790
2194	3,145,780	2,311,788	1,126.8055	2,604,935,693	2,257,628	1,659,098	144.5974	239,901,260	1,250,000	918,607	1.0000	918,607	6,653,408	4,889,493	2,845,755,560
2195	5,784,470	4,250,923	1,172.4411	4,983,957,252	10,173,688	7,476,496	148.7184	1,111,892,529	1,250,000	918,607	1.0000	918,607	17,208,158	12,646,026	6,096,768,388
2196	4,739,630	3,483,086	1,219.9250	4,249,103,136	7,022,925	5,161,046	152.9595	789,417,579	1,250,000	918,607	1.0000	918,607	13,012,555	9,562,738	5,039,439,321

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional	Cost	Jurisdictional	Escalation	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s	Factor	Cost in Future \$'s			
2202	5,452,650	4,007,074	1,548.0523	6,203,159,555	9,178,228	6,744,947	181.0484	1,221,161,841	1,250,000	918,607	1.0000	918,607	15,880,878	11,670,627	7,425,240,003
2203	3,097,940	2,276,631	1,610.7485	3,667,080,462	2,114,098	1,553,620	186.2083	289,296,920	1,250,000	918,607	1.0000	918,607	6,462,038	4,748,858	3,957,295,989
2204	3,153,870	2,317,733	1,675.9838	3,884,483,723	2,265,665	1,665,004	191.5152	318,873,632	1,250,000	918,607	1.0000	918,607	6,669,535	4,901,345	4,204,275,961
2205	5,452,650	4,007,074	1,743.8611	6,987,779,835	9,178,228	6,744,947	196.9734	1,328,575,120	1,250,000	918,607	1.0000	918,607	15,880,878	11,670,627	8,317,273,562
2206	4,635,850	3,406,819	1,814.4875	6,181,630,718	6,727,828	4,944,183	202.5872	1,001,628,263	1,250,000	918,607	1.0000	918,607	12,613,678	9,269,609	7,184,177,587
2207	4,683,690	3,441,976	1,887.9742	6,498,361,979	6,871,358	5,049,661	208.3609	1,052,152,010	1,250,000	918,607	1.0000	918,607	12,805,048	9,410,244	7,551,432,596
2208	3,153,870	2,317,733	1,964.4372	4,553,041,818	2,265,665	1,665,004	214.2992	356,809,090	1,250,000	918,607	1.0000	918,607	6,669,535	4,901,345	4,910,769,515
2209	4,635,850	3,406,819	2,043.9969	6,963,527,731	6,727,828	4,944,183	220.4067	1,089,731,138	1,250,000	918,607	1.0000	918,607	12,613,678	9,269,609	8,054,177,476
2210	4,676,510	3,436,700	2,126.7788	7,309,099,791	6,849,828	5,033,839	226.6883	1,141,112,494	1,250,000	918,607	1.0000	918,607	12,776,338	9,389,146	8,451,130,892
2211	4,669,340	3,431,430	2,212.9133	7,593,458,063	6,828,298	5,018,017	233.1489	1,169,945,215	1,250,000	918,607	1.0000	918,607	12,747,638	9,368,055	8,764,321,886
2212	3,139,520	2,307,188	2,302.5363	5,312,383,769	2,222,605	1,633,360	239.7937	391,669,469	1,250,000	918,607	1.0000	918,607	6,612,125	4,859,155	5,704,971,845
2213	7,745,160	5,691,806	2,395.7890	13,636,366,398	16,055,768	11,799,152	246.6278	2,909,998,794	1,250,000	918,607	1.0000	918,607	25,050,928	18,409,565	16,547,283,798
2214	6,207,250	4,561,618	2,492.8185	11,371,286,392	11,442,028	8,408,581	253.6567	2,132,892,848	1,250,000	918,607	1.0000	918,607	18,899,278	13,888,806	13,505,097,847
2215	4,669,340	3,431,430	2,593.7776	8,900,367,417	6,828,298	5,018,017	260.8859	1,309,129,961	1,250,000	918,607	1.0000	918,607	12,747,638	9,368,055	10,210,415,985
2216	3,139,520	2,307,188	2,698.8256	6,226,697,626	13,878,683	10,199,243	268.3212	2,736,673,199	1,250,000	918,607	1.0000	918,607	18,268,203	13,425,038	8,964,289,432
2217	3,145,780	2,311,788	2,808.1281	6,491,797,491	2,257,628	1,659,098	275.9683	457,858,460	1,250,000	918,607	1.0000	918,607	6,653,408	4,889,493	6,950,574,559
2218	1,058,128	777,603	2,921.8572	2,272,044,845	2,283,531	1,678,134	283.8334	476,310,374	0	0	1.0000	0	3,341,659	2,455,737	2,748,355,219
	\$1,259,022,756	\$925,237,616		\$257,498,187,414	\$1,487,265,430	\$1,092,969,857		\$50,395,864,825	\$231,250,000	\$169,942,281		\$169,942,281	\$2,977,538,186	\$2,188,149,754	\$308,063,994,519

Proposed

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate	Total Jurisdictional Cost	Total Jurisdictional Cost
Cost Estimate	Jurisdictional Cost	Escalation	Jurisdictional Cost	Cost Estimate	Jurisdictional Cost	Escalation	Jurisdictional Cost	Cost Estimate	Jurisdictional Cost	Escalation	Jurisdictional Cost	Estimate	Estimate	Estimate
Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Nominal \$s
Prairie Island Unit 2														
Factors	2017	73.4886%	4.05%			2.85%				0.00%				
2034	\$7,760,265	\$5,702,906	1.9639	\$11,199,938	\$4,479,535	\$3,291,946	1.6124	\$5,307,933	\$1,250,000	\$918,607	1.0000	\$918,607	\$13,489,800	\$9,913,459
2035	46,911,429	34,474,531	2.0434	70,445,256	35,601,336	26,162,907	1.6584	43,388,565	1,250,000	918,607	1.0000	918,607	83,762,765	61,556,044
2036	67,514,041	49,615,092	2.1262	105,491,609	86,298,834	63,419,765	1.7056	108,168,751	1,250,000	918,607	1.0000	918,607	155,062,874	113,953,464
2037	72,593,441	53,347,870	2.2123	118,021,492	75,650,363	55,594,358	1.7542	97,523,623	1,250,000	918,607	1.0000	918,607	149,493,804	109,860,835
2038	46,603,525	34,248,257	2.3019	78,836,063	42,782,150	31,439,983	1.8042	56,724,017	1,250,000	918,607	1.0000	918,607	90,635,675	66,606,847
2039	40,341,063	29,646,064	2.3951	71,005,287	76,484,927	56,207,667	1.8556	104,298,947	1,250,000	918,607	1.0000	918,607	118,075,990	86,772,338
2040	37,417,178	27,497,343	2.4921	68,526,129	14,193,500	10,430,598	1.9085	19,906,796	1,250,000	918,607	1.0000	918,607	52,860,678	38,846,548
2041	23,380,886	17,182,275	2.5930	44,553,639	13,070,130	9,605,049	1.9629	18,853,752	1,250,000	918,607	1.0000	918,607	37,701,016	27,705,931
2042	16,738,669	12,301,006	2.6981	33,189,343	17,178,640	12,624,334	2.0189	25,487,268	1,250,000	918,607	1.0000	918,607	35,167,309	25,843,947
2043	9,790,575	7,194,952	2.8073	20,198,388	9,014,069	6,624,309	2.0764	13,754,715	1,250,000	918,607	1.0000	918,607	20,054,644	14,737,868
2044	3,676,269	2,701,637	2.9210	7,891,481	1,825,866	1,341,803	2.1356	2,865,554	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047
2045	5,973,090	4,389,537	3.0393	13,341,121	8,738,060	6,421,474	2.1964	14,104,126	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619
2046	5,204,135	3,824,444	3.1624	12,094,420	6,431,194	4,726,192	2.2590	10,676,467	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242
2047	5,204,135	3,824,444	3.2905	12,584,332	6,431,194	4,726,192	2.3234	10,980,834	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242
2048	3,676,269	2,701,637	3.4238	9,249,865	1,825,866	1,341,803	2.3896	3,206,372	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047
2049	5,204,135	3,824,444	3.5624	13,624,198	6,431,194	4,726,192	2.4577	11,615,561	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242
2050	5,973,090	4,389,537	3.7067	16,270,699	8,738,060	6,421,474	2.5278	16,232,202	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619
2051	5,779,135	4,247,003	3.8568	16,379,840	8,156,192	5,993,868	2.5998	15,582,857	1,250,000	918,607	1.0000	918,607	15,185,327	11,159,477
2052	5,983,135	4,396,919	4.0130	17,644,838	8,746,464	6,427,650	2.6739	17,186,894	1,250,000	918,607	1.0000	918,607	15,979,599	11,743,176
2053	3,666,224	2,694,255	4.1756	11,250,131	1,817,462	1,335,627	2.7501	3,673,107	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2054	3,666,224	2,694,255	4.3447	11,705,730	1,817,462	1,335,627	2.8285	3,777,820	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2055	5,973,090	4,389,537	4.5206	19,843,343	8,738,060	6,421,474	2.9091	18,680,710	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619
2056	5,214,179	3,831,825	4.7037	18,023,754	6,439,598	4,732,368	2.9920	14,159,244	1,250,000	918,607	1.0000	918,607	12,903,777	9,482,799
2057	5,204,135	3,824,444	4.8942	18,717,592	6,431,194	4,726,192	3.0773	14,543,910	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242
2058	3,666,224	2,694,255	5.0924	13,720,224	1,817,462	1,335,627	3.1650	4,227,259	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2059	5,010,180	3,681,909	5.2987	19,509,330	5,849,328	4,298,587	3.2552	13,992,760	1,250,000	918,607	1.0000	918,607	12,109,508	8,899,102
2060	5,214,179	3,831,825	5.5133	21,125,999	6,439,598	4,732,368	3.3480	15,843,967	1,250,000	918,607	1.0000	918,607	12,903,777	9,482,799
2061	5,204,135	3,824,444	5.7366	21,939,303	6,431,194	4,726,192	3.4434	16,274,168	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242
2062	3,666,224	2,694,255	5.9689	16,081,739	1,817,462	1,335,627	3.5415	4,730,122	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2063	8,279,956	6,084,820	6.2106	37,790,383	15,658,658	11,507,322	3.6425	41,915,419	1,250,000	918,607	1.0000	918,607	25,188,614	18,510,748
2064	6,558,135	4,819,479	6.4622	31,144,434	10,471,464	7,695,328	3.7463	28,829,006	1,250,000	918,607	1.0000	918,607	18,279,599	13,433,413
2065	5,204,135	3,824,444	6.7239	25,715,176	6,431,194	4,726,192	3.8531	18,210,489	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242
2066	3,666,224	2,694,255	6.9962	18,849,547	1,817,462	1,335,627	3.9629	5,292,955	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2067	3,666,224	2,694,255	7.2795	19,612,829	1,817,462	1,335,627	4.0758	5,443,747	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2068	6,752,090	4,962,013	7.5744	37,584,274	11,053,330	8,122,933	4.1920	34,051,333	1,250,000	918,607	1.0000	918,607	19,055,420	14,003,553
2069	5,973,090	4,389,537	7.8811	34,594,384	8,738,060	6,421,474	4.3115	27,686,186	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619
2070	3,666,224	2,694,255	8.2003	22,093,699	1,817,462	1,335,627	4.4343	5,922,570	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2071	3,666,224	2,694,255	8.5324	22,988,461	1,817,462	1,335,627	4.5607	6,091,393	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2072	7,327,090	5,384,572	8.8780	47,804,235	12,778,330	9,390,610	4.6907	44,048,535	1,250,000	918,607	1.0000	918,607	21,355,420	15,693,790
2073	3,666,224	2,694,255	9.2375	24,888,181	1,817,462	1,335,627	4.8244	6,443,598	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2074	3,666,224	2,694,255	9.6117	25,896,371	1,817,462	1,335,627	4.9619	6,627,246	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2075	7,842,823	5,763,577	10.0009	57,640,959	14,347,260	10,543,594	5.1033	53,807,124	1,250,000	918,607	1.0000	918,607	23,440,083	17,225,778
2076	3,676,269	2,701,637	10.4060	28,113,234	1,825,866	1,341,803	5.2487	7,042,720	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047
2077	3,666,224	2,694,255	10.8274	29,171,777	1,817,462	1,335,627	5.3983	7,210,114	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2078	7,511,001	5,519,726	11.2659	62,184,681	13,351,792	9,812,039	5.5522	54,478,403	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372
2079	3,666,224	2,694,255	11.7222	31,582,596	1,817,462	1,335,627	5.7104	7,626,963	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2080	3,676,269	2,701,637	12.1970	32,951,866	1,825,866	1,341,803	5.8731	7,880,541	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047
2081	3,666,224	2,694,255	12.6909	34,192,521	1,817,462	1,335,627	6.0405	8,067,853	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2082	7,123,090	5,234,656	13.2049	69,123,107	12,188,060	8,956,829	6.2127	55,646,093	1,250,000	918,607	1.0000	918,607	20,561,150	15,110,092
2083	3,666,224	2,694,255	13.7397	37,018,255	1,817,462	1,335,627	6.3897	8,534,254	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2084	3,676,269	2,701,637	14.2962	38,623,142	1,825,866	1,341,803	6.5719	8,818,193	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047
2085	3,666,224	2,694,255	14.8752	40,077,582	1,817,462	1,335,627	6.7592	9,027,768	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2086	3,666,224	2,694,255	15.4776	41,700,601	1,817,462	1,335,627	6.9518	9,285,010	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2087	3,666,224	2,694,255	16.1045	43,389,630	1,817,462	1,335,627	7.1499	9,549,598	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489
2088	3,676,269	2,701,637	16.7567	45,270,519	1,825,866	1,341,803	7.3537	9,867,215	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
	Nominal \$s	Nominal \$s			Nominal \$s	Nominal \$s			Nominal \$s	Nominal \$s					
2089	26,770,052	19,672,924	17.4353	343,003,333	73,063,378	53,693,220	7.5633	406,097,928	1,250,000	918,607	1.0000	918,607	101,083,430	74,284,751	750,019,869
2090	3,666,224	2,694,255	18.1415	48,877,827	1,817,462	1,335,627	7.7788	10,389,573	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	60,186,007
2091	3,666,224	2,694,255	18.8762	50,857,296	1,817,462	1,335,627	8.0005	10,685,682	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	62,461,585
2092	3,676,269	2,701,637	19.6407	53,062,040	1,825,866	1,341,803	8.2285	11,041,024	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	65,021,671
2093	3,666,224	2,694,255	20.4361	55,060,065	1,817,462	1,335,627	8.4630	11,303,409	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	67,282,081
2094	3,666,224	2,694,255	21.2638	57,290,099	1,817,462	1,335,627	8.7042	11,625,562	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	69,834,269
2095	5,973,090	4,389,537	22.1250	97,118,516	8,738,060	6,421,474	8.9523	57,486,963	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	155,524,086
2096	5,214,179	3,831,825	23.0210	88,212,437	6,439,598	4,732,368	9.2075	43,573,275	1,250,000	918,607	1.0000	918,607	12,903,777	9,482,799	132,704,319
2097	5,204,135	3,824,444	23.9534	91,608,426	6,431,194	4,726,192	9.4699	44,756,562	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	137,283,595
2098	3,666,224	2,694,255	24.9235	67,150,264	1,817,462	1,335,627	9.7398	13,008,737	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	81,077,609
2099	3,666,224	2,694,255	25.9329	69,869,845	1,817,462	1,335,627	10.0173	13,379,374	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	84,167,826
2100	5,973,090	4,389,537	26.9832	118,443,767	8,738,060	6,421,474	10.3028	66,159,164	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	185,521,538
2101	5,973,090	4,389,537	28.0760	123,240,654	8,738,060	6,421,474	10.5965	68,045,150	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	192,204,411
2102	5,973,090	4,389,537	29.2131	128,231,997	8,738,060	6,421,474	10.8985	69,984,436	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	199,135,039
2103	3,666,224	2,694,255	30.3962	81,895,114	1,817,462	1,335,627	11.2091	14,971,174	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	97,784,894
2104	3,676,269	2,701,637	31.6272	85,445,211	1,825,866	1,341,803	11.5285	15,468,973	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	101,832,791
2105	5,973,090	4,389,537	32.9081	144,451,338	8,738,060	6,421,474	11.8571	76,140,061	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	221,510,005
2106	5,204,135	3,824,444	34.2409	130,952,389	6,431,194	4,726,192	12.1950	57,635,907	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	189,506,903
2107	5,204,135	3,824,444	35.6277	136,256,128	6,431,194	4,726,192	12.5426	59,278,731	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	196,453,466
2108	3,676,269	2,701,637	37.0706	100,151,302	1,825,866	1,341,803	12.9000	17,309,255	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	118,379,164
2109	5,204,135	3,824,444	38.5720	147,516,437	6,431,194	4,726,192	13.2677	62,705,693	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	211,140,737
2110	5,204,135	3,824,444	40.1341	153,490,600	6,431,194	4,726,192	13.6458	64,492,666	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	218,901,873
2111	5,204,135	3,824,444	41.7596	159,707,233	6,431,194	4,726,192	14.0347	66,330,682	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	226,956,522
2112	3,676,269	2,701,637	43.4508	117,388,286	1,825,866	1,341,803	14.4347	19,368,520	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	137,675,412
2113	8,279,956	6,084,820	45.2106	275,098,360	15,658,658	11,507,322	14.8461	170,838,846	1,250,000	918,607	1.0000	918,607	25,188,614	18,510,748	446,855,813
2114	6,742,046	4,954,632	47.0416	233,073,822	11,044,926	8,116,757	15.2692	123,936,380	1,250,000	918,607	1.0000	918,607	19,036,972	13,989,996	357,928,808
2115	5,535,957	4,068,295	48.9468	199,130,009	7,426,662	5,457,747	15.7044	85,710,637	1,250,000	918,607	1.0000	918,607	14,212,619	10,444,648	285,759,253
2116	3,676,269	2,701,637	50.9291	137,591,937	1,825,866	1,341,803	16.1520	21,672,797	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	160,183,341
2117	3,666,224	2,694,255	52.9918	142,773,422	1,817,462	1,335,627	16.6123	22,187,832	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	165,879,861
2118	6,742,046	4,954,632	55.1379	273,188,010	11,044,926	8,116,757	17.0857	138,680,468	1,250,000	918,607	1.0000	918,607	19,036,972	13,989,996	412,787,085
2119	5,973,090	4,389,537	57.3710	251,832,154	8,738,060	6,421,474	17.5727	112,842,638	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	365,593,399
2120	3,676,269	2,701,637	59.6946	161,273,136	1,825,866	1,341,803	18.0735	24,251,071	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	186,442,814
2121	3,666,224	2,694,255	62.1122	167,346,105	1,817,462	1,335,627	18.5886	24,827,431	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	193,092,143
2122	7,511,001	5,519,726	64.6277	356,727,197	13,351,792	9,812,039	19.1184	187,590,487	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	545,236,291
2123	3,666,224	2,694,255	67.2451	181,175,447	1,817,462	1,335,627	19.6633	26,262,829	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	208,356,883
2124	3,676,269	2,701,637	69.9686	189,029,753	1,825,866	1,341,803	20.2237	27,136,215	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	217,084,576
2125	7,511,001	5,519,726	72.8023	401,848,749	13,351,792	9,812,039	20.8000	204,090,412	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	606,857,768
2126	3,666,224	2,694,255	75.7508	204,091,972	1,817,462	1,335,627	21.3928	28,572,795	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	233,583,374
2127	3,666,224	2,694,255	78.8187	212,357,677	1,817,462	1,335,627	22.0025	29,387,127	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	242,663,411
2128	7,521,045	5,527,107	82.0109	453,283,037	13,360,196	9,818,215	22.6296	222,182,279	1,250,000	918,607	1.0000	918,607	22,131,241	16,263,929	676,383,922
2129	3,666,224	2,694,255	85.3323	229,906,976	1,817,462	1,335,627	23.2745	31,086,044	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	261,911,627
2130	3,666,224	2,694,255	88.7883	239,218,321	1,817,462	1,335,627	23.9379	31,972,099	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	272,109,027
2131	3,666,224	2,694,255	92.3842	248,906,593	1,817,462	1,335,627	24.6201	32,883,264	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	282,708,463
2132	7,521,045	5,527,107	96.1257	531,297,049	13,360,196	9,818,215	25.3218	248,614,877	1,250,000	918,607	1.0000	918,607	22,131,241	16,263,929	780,830,534
2133	3,666,224	2,694,255	100.0188	269,476,152	1,817,462	1,335,627	26.0434	34,784,261	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	305,179,020
2134	3,666,224	2,694,255	104.0696	280,390,040	1,817,462	1,335,627	26.7857	35,775,697	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	317,084,344
2135	3,666,224	2,694,255	108.2844	291,745,786	1,817,462	1,335,627	27.5491	36,795,314	1,250,000	918,67					

Proposed

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2146	5,204,135	3,824,444	167.5826	640,910,194	6,431,194	4,726,192	37.5279	177,364,048	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	819,192,849
2147	5,204,135	3,824,444	174.3697	666,867,075	6,431,194	4,726,192	38.5974	182,418,710	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	850,204,392
2148	3,676,269	2,701,637	181.4317	490,162,580	1,825,866	1,341,803	39.6975	53,266,213	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	544,347,400
2149	3,666,224	2,694,255	188.7796	508,620,381	1,817,462	1,335,627	40.8288	54,532,036	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	564,071,025
2150	5,973,090	4,389,537	196.4252	862,215,774	8,738,060	6,421,474	41.9925	269,653,752	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	1,132,788,133
2151	5,973,090	4,389,537	204.3804	897,135,423	8,738,060	6,421,474	43.1893	277,338,972	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	1,175,393,002
2152	5,983,135	4,396,919	212.6578	935,039,204	8,746,464	6,427,650	44.4201	285,516,860	1,250,000	918,607	1.0000	918,607	15,979,599	11,743,176	1,221,474,671
2153	3,666,224	2,694,255	221.2705	596,159,151	1,817,462	1,335,627	45.6861	61,019,576	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	658,097,334
2154	3,666,224	2,694,255	230.2319	620,303,448	1,817,462	1,335,627	46.9882	62,758,696	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	683,980,750
2155	6,304,913	4,633,389	239.5563	1,109,957,618	9,733,528	7,153,029	48.3273	345,686,586	1,250,000	918,607	1.0000	918,607	17,288,441	12,705,025	1,456,562,811
2156	5,214,179	3,831,825	249.2584	955,114,505	6,439,598	4,732,368	49.7047	235,220,914	1,250,000	918,607	1.0000	918,607	12,903,777	9,482,799	1,191,254,025
2157	5,204,135	3,824,444	259.3533	991,882,056	6,431,194	4,726,192	51.1212	241,608,589	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	1,234,409,252
2158	3,666,224	2,694,255	269.8571	727,063,841	1,817,462	1,335,627	52.5782	70,224,849	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	798,207,297
2159	5,204,135	3,824,444	280.7864	1,073,851,738	6,431,194	4,726,192	54.0767	255,576,848	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	1,330,347,193
2160	5,214,179	3,831,825	292.1582	1,119,499,020	6,439,598	4,732,368	55.6179	263,204,350	1,250,000	918,607	1.0000	918,607	12,903,777	9,482,799	1,383,621,977
2161	5,204,135	3,824,444	303.9906	1,162,594,891	6,431,194	4,726,192	57.2030	270,352,341	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	1,433,865,839
2162	3,666,224	2,694,255	316.3022	852,198,784	1,817,462	1,335,627	58.8333	78,579,328	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	931,696,719
2163	8,279,956	6,084,820	329.1125	2,002,590,298	15,658,658	11,507,322	60.5100	696,308,024	1,250,000	918,607	1.0000	918,607	25,188,614	18,510,748	2,699,816,930
2164	6,752,090	4,962,013	342.4415	1,699,199,277	11,053,330	8,122,933	62.2345	505,526,647	1,250,000	918,607	1.0000	918,607	19,055,420	14,003,553	2,205,644,530
2165	5,204,135	3,824,444	356.3104	1,362,689,012	6,431,194	4,726,192	64.0082	302,515,021	1,250,000	918,607	1.0000	918,607	12,885,329	9,469,242	1,666,122,640
2166	3,666,224	2,694,255	370.7410	998,870,793	1,817,462	1,335,627	65.8325	87,927,646	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,087,717,046
2167	3,666,224	2,694,255	385.7560	1,039,325,032	1,817,462	1,335,627	67.7087	90,433,549	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,130,677,188
2168	6,752,090	4,962,013	401.3791	1,991,648,432	11,053,330	8,122,933	69.6384	565,668,027	1,250,000	918,607	1.0000	918,607	19,055,420	14,003,553	2,558,235,066
2169	5,973,090	4,389,537	417.6350	1,833,224,479	8,738,060	6,421,474	71.6231	459,925,883	1,250,000	918,607	1.0000	918,607	15,961,150	11,729,619	2,294,068,968
2170	3,666,224	2,694,255	434.5492	1,170,786,355	1,817,462	1,335,627	73.6643	98,388,008	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,270,092,970
2171	3,666,224	2,694,255	452.1484	1,218,203,087	1,817,462	1,335,627	75.7638	101,192,156	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,320,313,851
2172	7,521,045	5,527,107	470.4604	2,600,285,068	13,360,196	9,818,215	77.9230	765,064,770	1,250,000	918,607	1.0000	918,607	22,131,241	16,250,372	3,366,268,444
2173	3,666,224	2,694,255	489.5141	1,318,875,811	1,817,462	1,335,627	80.1438	107,042,201	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,426,836,620
2174	3,666,224	2,694,255	509.3394	1,372,290,225	1,817,462	1,335,627	82.4279	110,092,906	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,483,301,738
2175	7,511,001	5,519,726	529.9676	2,925,275,950	13,351,792	9,812,039	84.7771	831,836,215	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	3,758,030,772
2176	3,676,269	2,701,637	551.4313	1,489,767,162	1,825,866	1,341,803	87.1933	116,996,206	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	1,607,681,975
2177	3,666,224	2,694,255	573.7643	1,545,867,334	1,817,462	1,335,627	89.6783	119,776,734	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,666,562,675
2178	7,511,001	5,519,726	597.0018	3,295,286,368	13,351,792	9,812,039	92.2341	905,004,590	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	4,201,209,565
2179	3,666,224	2,694,255	621.1803	1,673,618,129	1,817,462	1,335,627	94.8628	126,701,291	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,801,238,027
2180	3,676,269	2,701,637	646.3381	1,746,170,877	1,825,866	1,341,803	97.5664	130,914,860	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	1,878,004,344
2181	3,666,224	2,694,255	672.5148	1,811,926,362	1,817,462	1,335,627	100.3470	134,026,135	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	1,946,871,104
2182	7,511,001	5,519,726	699.7517	3,862,437,664	13,351,792	9,812,039	103.2069	1,012,670,132	1,250,000	918,607	1.0000	918,607	22,112,793	16,250,372	4,876,026,404
2183	3,666,224	2,694,255	728.0916	1,961,664,434	1,817,462	1,335,627	106.1483	141,774,506	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,104,357,547
2184	3,676,269	2,701,637	757.5793	2,046,704,211	1,825,866	1,341,803	109.1736	146,489,432	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	2,194,112,250
2185	3,666,224	2,694,255	788.2613	2,123,776,949	1,817,462	1,335,627	112.2850	149,970,847	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,274,666,403
2186	3,666,224	2,694,255	820.1859	2,209,789,962	1,817,462	1,335,627	115.4851	154,244,986	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,364,953,555
2187	3,666,224	2,694,255	853.4034	2,299,286,377	1,817,462	1,335,627	118.7764	158,640,934	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,458,845,919
2188	3,676,269	2,701,637	887.9662	2,398,962,274	1,825,866	1,341,803	122.1616	163,916,766	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	2,563,797,647
2189	26,780,755	19,680,790	923.9289	18,183,650,259	71,161,056	52,295,231	125.6432	6,570,540,189	1,250,000	918,607	1.0000	918,607	99,191,811	72,894,628	24,755,109,055
2190	3,666,224	2,694,255	961.3480	2,590,116,656	1,817,462	1,335,627	129.2240	172,595,028	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,763,630,291
2191	3,666,224	2,694,255	1,000.2826	2,695,016,396	1,817,462	1,335,627	132.9069	177,514,008	1,250,000	918,607	1.0000	918,607	6,733,686	4,948,489	2,873,449,011
2192	3,676,269	2,701,637	1,040.7940	2,811,847,502	1,825,866	1,341,803	136.6947	183,417,319	1,250,000	918,607	1.0000	918,607	6,752,135	4,962,047	2,996,183,428
2193	3,050,093	2,241,469	1,082.9462	2,427,390,594	1,970,568	1,448,142	140.5905	203,594,977	1,250,000	918,607	1.0000	918,607	6,270,661	4,608,218	2,631,904,177
2194	3,145,779	2,311,787	1,126.8055	2,604,934,865	2,257,627	1,659,097	144.5974	239,901,154	1,250,000	918,607	1.0000	918,607	6,653,406	4,889,492	2,845,754,626
2195	5,784,468	4,250,922	1,172.4411	4,983,955,529	10,173,693	7,476,500	148.7184	1,111,893,075	1,250,000	918,607	1.0000	918,607	17,208,161	12,646,029	6,096,767,211
2196	4,739,628	3,483,084	1,219.9250	4,249,101,343	7,022,926	5,161,047	152.9569	789,417,691	1,250,000	918,607	1.0000	918,607	13,012,554	9,562,738	5,039,437,641
2197	4,635,847	3,406,817	1,269.3320	4,324,381,736	6,727,830	4,944,185	157.3161	777,799,875	1,250,000	918,607	1.0000	918,607	12,613,677	9,269,609	5,103,100,21

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s	Estimate Nominal \$s	Cost in Nominal \$s		Cost in Future \$'s			
2203	3,097,936	2,276,628	1,610.7485	3,667,075,727	2,114,098	1,553,620	186.2083	289,296,920	1,250,000	918,607	1.0000	918,607	6,462,034	4,748,855	3,957,291,254
2204	3,153,874	2,317,736	1,675.9838	3,884,488,649	2,265,664	1,665,004	191.5152	318,873,491	1,250,000	918,607	1.0000	918,607	6,669,538	4,901,347	4,204,280,747
2205	5,452,645	4,007,070	1,743.8611	6,987,773,427	9,178,225	6,744,945	196.9734	1,328,574,686	1,250,000	918,607	1.0000	918,607	15,880,870	11,670,622	8,317,266,720
2206	4,635,847	3,406,817	1,814.4875	6,181,626,718	6,727,830	4,944,185	202.5872	1,001,628,560	1,250,000	918,607	1.0000	918,607	12,613,677	9,269,609	7,184,173,885
2207	4,683,690	3,441,976	1,887.9742	6,498,361,979	6,871,359	5,049,662	208.3609	1,052,152,164	1,250,000	918,607	1.0000	918,607	12,805,049	9,410,245	7,551,432,749
2208	3,153,874	2,317,736	1,964.4372	4,553,047,592	2,265,664	1,665,004	214.2992	356,808,932	1,250,000	918,607	1.0000	918,607	6,669,538	4,901,347	4,910,775,132
2209	4,635,847	3,406,817	2,043.9969	6,963,523,225	6,727,830	4,944,185	220.4067	1,089,731,462	1,250,000	918,607	1.0000	918,607	12,613,677	9,269,609	8,054,173,294
2210	4,676,514	3,436,703	2,126.7788	7,309,106,042	6,849,830	5,033,841	226.6883	1,141,112,828	1,250,000	918,607	1.0000	918,607	12,776,344	9,389,150	8,451,137,477
2211	4,669,337	3,431,428	2,212.9133	7,593,453,185	6,828,301	5,018,020	233.1489	1,169,945,729	1,250,000	918,607	1.0000	918,607	12,747,638	9,368,055	8,764,317,521
2212	3,139,521	2,307,189	2,302.5363	5,312,385,461	2,222,606	1,633,361	239.7937	391,669,645	1,250,000	918,607	1.0000	918,607	6,612,127	4,859,156	5,704,973,713
2213	7,745,159	5,691,805	2,395.7890	13,636,364,637	16,055,764	11,799,149	246.6278	2,909,998,069	1,250,000	918,607	1.0000	918,607	25,050,923	18,409,561	16,547,281,313
2214	6,207,248	4,561,617	2,492.8185	11,371,282,728	11,442,033	8,408,584	253.6567	2,132,893,780	1,250,000	918,607	1.0000	918,607	18,899,281	13,888,808	13,505,095,115
2215	4,669,337	3,431,428	2,593.7776	8,900,361,698	6,828,301	5,018,020	260.8859	1,309,130,537	1,250,000	918,607	1.0000	918,607	12,747,638	9,368,055	10,210,410,842
2216	3,139,521	2,307,189	2,698.8256	6,226,699,609	13,878,684	10,199,244	268.3212	2,736,673,397	1,250,000	918,607	1.0000	918,607	18,268,205	13,425,040	8,964,291,613
2217	3,145,779	2,311,787	2,808.1281	6,491,795,428	2,257,627	1,659,097	275.9683	457,858,258	1,250,000	918,607	1.0000	918,607	6,653,406	4,889,492	6,950,572,292
2218	1,058,128	777,603	2,921.8572	2,272,044,845	2,283,531	1,678,134	283.8334	476,310,374	0	-	1.0000	-	3,341,659	2,455,737	2,748,355,219
	\$1,254,481,263	\$921,900,139		\$257,514,109,402	\$1,495,365,399	\$1,098,922,407		\$50,419,031,894	\$230,000,000	\$169,023,674		\$169,023,674	\$2,979,846,662	\$2,189,846,220	\$308,102,164,970
	\$4,769,359,832	\$3,504,933,570		\$1,232,278,635,160	\$4,988,218,698	\$3,665,769,786		\$174,047,975,724	\$461,250,000	\$338,965,955		\$338,965,955	\$10,218,828,530	\$7,509,669,311	\$1,406,665,576,839

EXTERNAL FUND CALCULATION

Monticello

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,800,910	-	6,696,113	646,169,205
2018	646,169,205	32,904,412	-	13,392,226	692,465,843
2019	692,465,843	35,237,763	-	13,392,226	741,095,832
2020	741,095,832	37,688,714	-	13,392,226	792,176,772
2021	792,176,772	42,038,742	-	83,850,493	918,066,006
2022	918,066,006	48,383,559	-	83,850,493	1,050,300,058
2023	1,050,300,058	55,048,155	-	83,850,493	1,189,198,706
2024	1,189,198,706	62,048,647	-	83,850,493	1,335,097,846
2025	1,335,097,846	69,401,964	-	83,850,493	1,488,350,302
2026	1,488,350,302	77,125,888	-	83,850,493	1,649,326,682
2027	1,649,326,682	85,239,097	-	83,850,493	1,818,416,272
2028	1,818,416,272	93,761,213	-	83,850,493	1,996,027,977
2029	1,996,027,977	102,712,842	-	83,850,493	2,182,591,313
2030	2,182,591,313	110,037,552	(35,447,395)	62,887,869	2,320,069,339
2031	2,320,069,339	115,307,446	(139,568,856)	-	2,295,807,930
2032	2,295,807,930	114,101,654	(235,103,206)	-	2,174,806,377
2033	2,174,806,377	108,087,877	(224,495,044)	-	2,058,399,210
2034	2,058,399,210	102,302,441	(141,890,431)	-	2,018,811,220
2035	2,018,811,220	100,334,918	(268,360,592)	-	1,850,785,546
2036	1,850,785,546	91,984,042	(104,537,352)	-	1,838,232,235
2037	1,838,232,235	91,360,142	(74,807,126)	-	1,854,785,251
2038	1,854,785,251	92,182,827	(70,466,465)	-	1,876,501,613
2039	1,876,501,613	93,262,130	(15,456,182)	-	1,954,307,561
2040	1,954,307,561	97,129,086	(16,091,729)	-	2,035,344,917
2041	2,035,344,917	101,156,642	(16,662,702)	-	2,119,838,858
2042	2,119,838,858	105,355,991	(17,301,946)	-	2,207,892,903
2043	2,207,892,903	109,732,277	(17,965,078)	-	2,299,660,102
2044	2,299,660,102	114,293,107	(18,705,321)	-	2,395,247,888
2045	2,395,247,888	119,043,820	(19,370,615)	-	2,494,921,093
2046	2,494,921,093	123,997,578	(20,114,754)	-	2,598,803,918
2047	2,598,803,918	129,160,555	(20,887,978)	-	2,707,076,494
2048	2,707,076,494	134,541,702	(26,916,472)	-	2,814,701,724
2049	2,814,701,724	139,890,676	(22,525,524)	-	2,932,066,876
2050	2,932,066,876	145,723,724	(35,781,808)	-	3,042,008,791
2051	3,042,008,791	151,187,837	(37,084,255)	-	3,156,112,374
2052	3,156,112,374	156,858,785	(38,504,356)	-	3,274,466,803
2053	3,274,466,803	162,741,000	(39,837,891)	-	3,397,369,912
2054	3,397,369,912	168,849,285	(41,292,108)	-	3,524,927,088
2055	3,524,927,088	175,188,876	(42,800,207)	-	3,657,315,757
2056	3,657,315,757	181,768,593	(44,445,167)	-	3,794,639,184
2057	3,794,639,184	188,593,567	(45,988,884)	-	3,937,243,867
2058	3,937,243,867	195,681,020	(113,026,766)	-	4,019,898,121
2059	4,019,898,121	199,788,937	(49,420,970)	-	4,170,266,088
2060	4,170,266,088	207,262,225	(51,327,230)	-	4,326,201,083
2061	4,326,201,083	215,012,194	(53,115,265)	-	4,488,098,012
2062	4,488,098,012	223,058,471	(55,066,654)	-	4,656,089,830
2063	4,656,089,830	231,407,665	(57,091,844)	-	4,830,405,651

EXTERNAL FUND CALCULATION

2064	4,830,405,651	240,071,161	(59,301,884)	-	5,011,174,928
2065	5,011,174,928	249,055,394	(61,373,962)	-	5,198,856,360
2066	5,198,856,360	258,383,161	(114,400,551)	-	5,342,838,971
2067	5,342,838,971	265,539,097	(65,983,601)	-	5,542,394,466
2068	5,542,394,466	275,457,005	(194,934,193)	-	5,622,917,278
2069	5,622,917,278	279,458,989	(70,948,647)	-	5,831,427,620
2070	5,831,427,620	289,821,953	(73,572,125)	-	6,047,677,448
2071	6,047,677,448	300,569,569	(76,295,052)	-	6,271,951,965
2072	6,271,951,965	311,716,013	(79,268,228)	-	6,504,399,749
2073	6,504,399,749	323,268,668	(82,053,729)	-	6,745,614,688
2074	6,745,614,688	335,257,050	(85,098,079)	-	6,995,773,659
2075	6,995,773,659	347,689,951	(88,256,686)	-	7,255,206,924
2076	7,255,206,924	360,583,784	(91,707,017)	-	7,524,083,691
2077	7,524,083,691	373,946,959	(94,938,806)	-	7,803,091,844
2078	7,803,091,844	387,813,665	(98,471,402)	-	8,092,434,106
2079	8,092,434,106	402,193,975	(102,138,001)	-	8,392,490,081
2080	8,392,490,081	417,106,757	(106,143,610)	-	8,703,453,228
2081	8,703,453,228	432,561,625	(109,894,241)	-	9,026,120,612
2082	9,026,120,612	448,598,194	(113,995,512)	-	9,360,723,295
2083	9,360,723,295	465,227,948	(118,252,284)	-	9,707,698,959
2084	9,707,698,959	482,472,638	(122,904,877)	-	10,067,266,720
2085	10,067,266,720	500,343,156	(127,259,911)	-	10,440,349,964
2086	10,440,349,964	518,885,393	(132,022,065)	-	10,827,213,292
2087	10,827,213,292	538,112,501	(136,966,641)	-	11,228,359,152
2088	11,228,359,152	558,049,450	(161,302,438)	-	11,625,106,164
2089	11,625,106,164	577,767,776	(147,428,700)	-	12,055,445,240
2090	12,055,445,240	599,155,628	(152,961,784)	-	12,501,639,084
2091	12,501,639,084	621,331,462	(158,706,116)	-	12,964,264,430
2092	12,964,264,430	644,323,942	(164,986,810)	-	13,443,601,562
2093	13,443,601,562	668,146,998	(170,862,753)	-	13,940,885,807
2094	13,940,885,807	692,862,025	(177,292,894)	-	14,456,454,938
2095	14,456,454,938	718,485,810	(1,011,713,130)	-	14,163,227,618
2096	14,163,227,618	703,912,413	(191,270,742)	-	14,675,869,289
2097	14,675,869,289	729,390,704	(198,100,321)	-	15,207,159,672
2098	15,207,159,672	755,795,836	(205,574,971)	-	15,757,380,537
2099	15,757,380,537	783,141,813	(213,336,340)	-	16,327,186,010
2100	16,327,186,010	811,461,145	(221,396,538)	-	16,917,250,616
2101	16,917,250,616	840,787,356	(229,766,711)	-	17,528,271,261
2102	17,528,271,261	871,155,082	(238,458,794)	-	18,160,967,549
2103	18,160,967,549	902,600,087	(247,485,050)	-	18,816,082,586
2104	18,816,082,586	935,159,305	(257,360,900)	-	19,493,880,991
2105	19,493,880,991	968,845,885	(266,593,898)	-	20,196,132,978
2106	20,196,132,978	1,003,747,809	(276,704,354)	-	20,923,176,433
2107	20,923,176,433	1,039,881,869	(287,205,190)	-	21,675,853,112
2108	21,675,853,112	1,077,289,900	(638,159,674)	-	22,114,983,337
2109	22,114,983,337	1,099,114,672	(309,437,221)	-	22,904,660,788
2110	22,904,660,788	1,138,361,641	(321,200,578)	-	23,721,821,851
2111	23,721,821,851	1,178,974,546	(333,419,432)	-	24,567,376,965
2112	24,567,376,965	1,220,998,635	(346,794,281)	-	25,441,581,319
2113	25,441,581,319	1,264,446,592	(359,291,772)	-	26,346,736,139
2114	26,346,736,139	1,309,432,786	(372,983,147)	-	27,283,185,778
2115	27,283,185,778	1,355,974,333	(387,205,007)	-	28,251,955,104
2116	28,251,955,104	1,404,122,169	(669,932,049)	-	28,986,145,224
2117	28,986,145,224	1,440,611,418	(417,322,320)	-	30,009,434,321

EXTERNAL FUND CALCULATION

External Levelized

2118	30,009,434,321	1,491,468,886	(1,100,591,847)	-	30,400,311,360
2119	30,400,311,360	1,510,895,475	(449,819,313)	-	31,461,387,522
2120	31,461,387,522	1,563,630,960	(467,952,861)	-	32,557,065,621
2121	32,557,065,621	1,618,086,161	(484,887,338)	-	33,690,264,444
2122	33,690,264,444	1,674,406,143	(503,448,710)	-	34,861,221,877
2123	34,861,221,877	1,732,602,727	(522,731,285)	-	36,071,093,319
2124	36,071,093,319	1,792,733,338	(543,853,439)	-	37,319,973,218
2125	37,319,973,218	1,854,802,669	(563,574,012)	-	38,611,201,874
2126	38,611,201,874	1,918,976,733	(585,194,345)	-	39,944,984,263
2127	39,944,984,263	1,985,265,718	(607,655,908)	-	41,322,594,072
2128	41,322,594,072	2,053,732,925	(705,371,327)	-	42,670,955,670
2129	42,670,955,670	2,120,746,497	(655,236,600)	-	44,136,465,568
2130	44,136,465,568	2,193,582,339	(680,426,570)	-	45,649,621,337
2131	45,649,621,337	2,268,786,180	(706,597,370)	-	47,211,810,147
2132	47,211,810,147	2,346,426,964	(735,275,655)	-	48,822,961,457
2133	48,822,961,457	2,426,501,184	(762,040,497)	-	50,487,422,145
2134	50,487,422,145	2,509,224,881	(791,395,600)	-	52,205,251,425
2135	52,205,251,425	2,594,600,996	(821,895,968)	-	53,977,956,452
2136	53,977,956,452	2,682,704,436	(855,324,546)	-	55,805,336,342
2137	55,805,336,342	2,773,525,216	(886,516,984)	-	57,692,344,575
2138	57,692,344,575	2,867,309,525	(920,733,462)	-	59,638,920,638
2139	59,638,920,638	2,964,054,356	(956,287,326)	-	61,646,687,668
2140	61,646,687,668	3,063,840,377	(995,262,492)	-	63,715,265,553
2141	63,715,265,553	3,166,648,698	(1,031,621,624)	-	65,850,292,627
2142	65,850,292,627	3,272,759,544	(1,071,514,914)	-	68,051,537,256
2143	68,051,537,256	3,382,161,402	(1,112,968,427)	-	70,320,730,232
2144	70,320,730,232	3,494,940,293	(1,158,419,743)	-	72,657,250,781
2145	72,657,250,781	3,611,065,364	(5,442,760,511)	-	70,825,555,634
2146	70,825,555,634	3,520,030,115	(1,247,332,243)	-	73,098,253,506
2147	73,098,253,506	3,632,983,199	(1,295,675,896)	-	75,435,560,809
2148	75,435,560,809	3,749,147,372	(1,348,689,696)	-	77,836,018,485
2149	77,836,018,485	3,868,450,119	(1,398,126,197)	-	80,306,342,407
2150	80,306,342,407	3,991,225,218	(1,452,386,597)	-	82,845,181,027
2151	82,845,181,027	4,117,405,497	(1,508,776,544)	-	85,453,809,981
2152	85,453,809,981	4,247,054,356	(1,570,622,673)	-	88,130,241,663
2153	88,130,241,663	4,380,073,011	(1,628,287,746)	-	90,882,026,928
2154	90,882,026,928	4,516,836,738	(1,691,587,741)	-	93,707,275,925
2155	93,707,275,925	4,657,251,613	(1,757,375,858)	-	96,607,151,681
2156	96,607,151,681	4,801,375,439	(1,829,542,347)	-	99,578,984,772
2157	99,578,984,772	4,949,075,543	(1,896,815,797)	-	102,631,244,519
2158	102,631,244,519	5,100,772,853	(3,886,348,451)	-	103,845,668,920
2159	103,845,668,920	5,161,129,745	(2,047,445,183)	-	106,959,353,482
2160	106,959,353,482	5,315,879,868	(2,131,667,054)	-	110,143,566,297
2161	110,143,566,297	5,474,135,245	(2,210,167,344)	-	113,407,534,197
2162	113,407,534,197	5,636,354,450	(2,296,366,634)	-	116,747,522,013
2163	116,747,522,013	5,802,351,844	(2,385,962,792)	-	120,163,911,065
2164	120,163,911,065	5,972,146,380	(2,484,272,480)	-	123,651,784,965
2165	123,651,784,965	6,145,493,713	(2,575,889,374)	-	127,221,389,303
2166	127,221,389,303	6,322,903,048	(4,203,981,063)	-	129,340,311,289
2167	129,340,311,289	6,428,213,471	(2,781,093,090)	-	132,987,431,670
2168	132,987,431,670	6,609,475,354	(7,021,398,585)	-	132,575,508,439
2169	132,575,508,439	6,589,002,769	(3,002,811,427)	-	136,161,699,782
2170	136,161,699,782	6,767,236,479	(3,120,277,441)	-	139,808,658,820
2171	139,808,658,820	6,948,490,343	(3,242,383,078)	-	143,514,766,085

EXTERNAL FUND CALCULATION

2172	143,514,766,085	7,132,683,874	(3,376,401,038)	-	147,271,048,922
2173	147,271,048,922	7,319,371,131	(3,501,257,157)	-	151,089,162,896
2174	151,089,162,896	7,509,131,396	(3,638,417,086)	-	154,959,877,206
2175	154,959,877,206	7,701,505,897	(3,780,999,585)	-	158,880,383,519
2176	158,880,383,519	7,896,355,061	(3,937,513,425)	-	162,839,225,155
2177	162,839,225,155	8,093,109,490	(4,083,305,789)	-	166,849,028,856
2178	166,849,028,856	8,292,396,734	(4,243,486,841)	-	170,897,938,750
2179	170,897,938,750	8,493,627,556	(4,410,006,760)	-	174,981,559,546
2180	174,981,559,546	8,696,583,509	(4,592,819,228)	-	179,085,323,828
2181	179,085,323,828	8,900,540,594	(4,763,085,289)	-	183,222,779,133
2182	183,222,779,133	9,106,172,123	(4,950,179,855)	-	187,378,771,401
2183	187,378,771,401	9,312,724,939	(5,144,685,508)	-	191,546,810,832
2184	191,546,810,832	9,519,876,498	(5,358,247,477)	-	195,708,439,853
2185	195,708,439,853	9,726,709,461	(5,557,126,407)	-	199,878,022,907
2186	199,878,022,907	9,933,937,738	(5,775,687,978)	-	204,036,272,667
2187	204,036,272,667	10,140,602,752	(6,002,915,676)	-	208,173,959,742
2188	208,173,959,742	10,346,245,799	(6,252,433,947)	-	212,267,771,595
2189	212,267,771,595	10,549,708,248	(6,484,768,180)	-	216,332,711,663
2190	216,332,711,663	10,751,735,770	(6,740,125,432)	-	220,344,322,001
2191	220,344,322,001	10,951,112,803	(7,005,617,695)	-	224,289,817,109
2192	224,289,817,109	11,147,203,910	(8,216,807,977)	-	227,220,213,042
2193	227,220,213,042	11,292,844,588	(9,237,695,262)	-	229,275,362,369
2194	229,275,362,369	11,394,985,510	(8,114,316,172)	-	232,556,031,706
2195	232,556,031,706	11,558,034,776	(35,096,569,593)	-	209,017,496,888
2196	209,017,496,888	10,388,169,595	(10,646,190,792)	-	208,759,475,691
2197	208,759,475,691	10,375,345,942	(6,903,223,641)	-	212,231,597,992
2198	212,231,597,992	10,547,910,420	(7,179,978,104)	-	215,599,530,308
2199	215,599,530,308	10,715,296,656	(7,467,860,728)	-	218,846,966,236
2200	218,846,966,236	10,876,694,222	(7,767,319,798)	-	221,956,340,659
2201	221,956,340,659	11,031,230,131	(8,078,821,612)	-	224,908,749,178
2202	224,908,749,178	11,177,964,834	(8,402,851,376)	-	227,683,862,636
2203	227,683,862,636	11,315,887,973	(8,739,915,007)	-	230,259,835,602
2204	230,259,835,602	11,443,913,829	(9,115,450,044)	-	232,588,299,388
2205	232,588,299,388	11,559,638,480	(9,455,262,620)	-	234,692,675,247
2206	234,692,675,247	11,664,225,960	(9,834,662,594)	-	236,522,238,613
2207	236,522,238,613	11,755,155,259	(10,229,326,918)	-	238,048,066,953
2208	238,048,066,953	11,830,988,928	(23,621,875,444)	-	226,257,180,437
2209	226,257,180,437	11,244,981,868	(11,066,937,090)	-	226,435,225,215
2210	226,435,225,215	11,253,830,693	(11,511,188,856)	-	226,177,867,052
2211	226,177,867,052	11,241,039,992	(11,973,319,588)	-	225,445,587,456
2212	225,445,587,456	11,204,645,697	(12,488,182,665)	-	224,162,050,487
2213	224,162,050,487	11,140,853,909	(14,621,371,106)	-	220,681,533,291
2214	220,681,533,291	10,967,872,205	(13,474,344,519)	-	218,175,060,976
2215	218,175,060,976	10,843,300,531	(14,015,498,561)	-	215,002,862,946
2216	215,002,862,946	10,685,642,288	(24,036,881,734)	-	201,651,623,501
2217	201,651,623,501	10,022,085,688	(15,164,046,883)	-	196,509,662,306
2218	196,509,662,306	9,766,530,217	(38,123,338,117)	-	168,152,854,406
2219	168,152,854,406	8,357,196,864	(15,307,988,630)	-	161,202,062,639
2220	161,202,062,639	8,011,742,513	(15,671,223,343)	-	153,542,581,810
2221	153,542,581,810	7,631,066,316	(16,255,993,316)	-	144,917,654,810
2222	144,917,654,810	7,202,407,444	(16,904,673,455)	-	135,215,388,799
2223	135,215,388,799	6,720,204,823	(17,898,815,350)	-	124,036,778,272
2224	124,036,778,272	6,164,627,880	(18,326,615,231)	-	111,874,790,922
2225	111,874,790,922	5,560,177,109	(19,010,909,673)	-	98,424,058,358

Proposed

EXTERNAL FUND CALCULATION

2226	98,424,058,358	4,891,675,700	(19,770,011,773)	-	83,545,722,285
2227	83,545,722,285	4,152,222,398	(20,930,335,445)	-	66,767,609,238
2228	66,767,609,238	3,318,350,179	(21,434,056,187)	-	48,651,903,230
2229	48,651,903,230	2,417,999,591	(22,234,870,241)	-	28,835,032,579
2230	28,835,032,579	1,433,101,119	(21,879,025,883)	-	8,389,107,815
2231	8,389,107,815	416,938,658	(8,806,046,474)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,434,360	-	24,632	383,826,047
2018	383,826,047	19,346,074	-	49,264	403,221,386
2019	403,221,386	20,323,599	-	49,264	423,594,249
2020	423,594,249	21,350,392	-	49,264	444,993,905
2021	444,993,905	23,749,787	-	52,464,065	521,207,757
2022	521,207,757	27,590,965	-	52,464,065	601,262,787
2023	601,262,787	31,625,739	-	52,464,065	685,352,591
2024	685,352,591	35,863,865	-	52,464,065	773,680,520
2025	773,680,520	40,315,593	-	52,464,065	866,460,178
2026	866,460,178	44,991,687	-	52,464,065	963,915,930
2027	963,915,930	49,903,457	-	52,464,065	1,066,283,452
2028	1,066,283,452	55,062,780	-	52,464,065	1,173,810,297
2029	1,173,810,297	60,482,133	-	52,464,065	1,286,756,495
2030	1,286,756,495	66,174,622	-	52,464,065	1,405,395,181
2031	1,405,395,181	72,154,012	-	52,464,065	1,530,013,257
2032	1,530,013,257	78,434,763	-	52,464,065	1,660,912,084
2033	1,660,912,084	82,917,285	(42,768,206)	35,150,923	1,736,212,087
2034	1,736,212,087	85,768,877	(131,752,423)	-	1,690,228,541
2035	1,690,228,541	83,497,290	(198,854,133)	-	1,574,871,698
2036	1,574,871,698	77,798,662	(173,386,484)	-	1,479,283,876
2037	1,479,283,876	73,076,623	(119,758,863)	-	1,432,601,637
2038	1,432,601,637	70,770,521	(48,446,231)	-	1,454,925,926
2039	1,454,925,926	71,873,341	(166,746,609)	-	1,360,052,659
2040	1,360,052,659	67,186,601	(78,122,012)	-	1,349,117,248
2041	1,349,117,248	66,646,392	(51,940,215)	-	1,363,823,426
2042	1,363,823,426	67,372,877	(47,702,660)	-	1,383,493,643
2043	1,383,493,643	68,344,586	(29,119,754)	-	1,422,718,475
2044	1,422,718,475	70,282,293	(11,674,091)	-	1,481,326,676
2045	1,481,326,676	73,177,538	(28,362,264)	-	1,526,141,949
2046	1,526,141,949	75,391,412	(23,687,841)	-	1,577,845,521
2047	1,577,845,521	77,945,569	(24,482,072)	-	1,631,309,018
2048	1,631,309,018	80,586,665	(13,373,108)	-	1,698,522,575
2049	1,698,522,575	83,907,015	(26,156,567)	-	1,756,273,023
2050	1,756,273,023	86,759,887	(33,419,678)	-	1,809,613,232
2051	1,809,613,232	89,394,894	(32,879,405)	-	1,866,128,721
2052	1,866,128,721	92,186,759	(35,748,383)	-	1,922,567,097
2053	1,922,567,097	94,974,815	(15,839,839)	-	2,001,702,073
2054	2,001,702,073	98,884,082	(16,400,093)	-	2,084,186,063
2055	2,084,186,063	102,958,792	(39,440,555)	-	2,147,704,300
2056	2,147,704,300	106,096,592	(33,099,428)	-	2,220,701,464
2057	2,220,701,464	109,702,652	(34,177,854)	-	2,296,226,262
2058	2,296,226,262	113,433,577	(18,863,779)	-	2,390,796,060
2059	2,390,796,060	118,105,325	(34,418,346)	-	2,474,483,039
2060	2,474,483,039	122,239,462	(37,886,138)	-	2,558,836,364
2061	2,558,836,364	126,406,516	(39,129,555)	-	2,646,113,325
2062	2,646,113,325	130,717,998	(21,727,882)	-	2,755,103,442
2063	2,755,103,442	136,102,110	(80,621,796)	-	2,810,583,756

EXTERNAL FUND CALCULATION

External Levelized

2064	2,810,583,756	138,842,838	(60,889,305)	-	2,888,537,289
2065	2,888,537,289	142,693,742	(44,841,447)	-	2,986,389,584
2066	2,986,389,584	147,527,645	(25,058,214)	-	3,108,859,015
2067	3,108,859,015	153,577,635	(25,972,206)	-	3,236,464,444
2068	3,236,464,444	159,881,344	(72,551,153)	-	3,323,794,634
2069	3,323,794,634	164,195,455	(63,196,056)	-	3,424,794,033
2070	3,424,794,033	169,184,825	(28,931,636)	-	3,565,047,222
2071	3,565,047,222	176,113,333	(29,995,129)	-	3,711,165,426
2072	3,711,165,426	183,331,572	(92,767,952)	-	3,801,729,047
2073	3,801,729,047	187,805,415	(32,246,859)	-	3,957,287,603
2074	3,957,287,603	195,490,008	(33,438,597)	-	4,119,339,013
2075	4,119,339,013	203,495,347	(112,362,974)	-	4,210,471,386
2076	4,210,471,386	207,997,286	(36,070,752)	-	4,382,397,921
2077	4,382,397,921	216,490,457	(37,296,551)	-	4,561,591,827
2078	4,561,591,827	225,342,636	(117,577,657)	-	4,669,356,807
2079	4,669,356,807	230,666,226	(40,123,990)	-	4,859,899,043
2080	4,859,899,043	240,079,013	(41,746,752)	-	5,058,231,304
2081	5,058,231,304	249,876,626	(43,174,563)	-	5,264,933,367
2082	5,264,933,367	260,087,708	(125,683,310)	-	5,399,337,765
2083	5,399,337,765	266,727,286	(46,466,442)	-	5,619,598,608
2084	5,619,598,608	277,608,171	(48,355,173)	-	5,848,851,606
2085	5,848,851,606	288,933,269	(50,019,012)	-	6,087,765,864
2086	6,087,765,864	300,735,634	(51,899,131)	-	6,336,602,366
2087	6,336,602,366	313,028,157	(53,852,602)	-	6,595,777,921
2088	6,595,777,921	325,831,429	(56,051,006)	-	6,865,558,345
2089	6,865,558,345	339,158,582	(750,835,061)	-	6,453,881,866
2090	6,453,881,866	318,821,764	(60,180,313)	-	6,712,523,318
2091	6,712,523,318	331,598,652	(62,455,727)	-	6,981,666,242
2092	6,981,666,242	344,894,312	(65,015,702)	-	7,261,544,853
2093	7,261,544,853	358,720,316	(67,275,883)	-	7,552,989,285
2094	7,552,989,285	373,117,671	(69,827,894)	-	7,856,279,062
2095	7,856,279,062	388,100,186	(155,517,607)	-	8,088,861,641
2096	8,088,861,641	399,589,765	(132,697,627)	-	8,355,753,779
2097	8,355,753,779	412,774,237	(137,276,626)	-	8,631,251,390
2098	8,631,251,390	426,383,819	(81,070,472)	-	8,976,564,736
2099	8,976,564,736	443,442,298	(84,160,485)	-	9,335,846,549
2100	9,335,846,549	461,190,820	(185,514,081)	-	9,611,523,287
2101	9,611,523,287	474,809,250	(192,196,742)	-	9,894,135,795
2102	9,894,135,795	488,770,308	(199,127,152)	-	10,183,778,951
2103	10,183,778,951	503,078,680	(97,776,676)	-	10,589,080,955
2104	10,589,080,955	523,100,599	(101,824,431)	-	11,010,357,124
2105	11,010,357,124	543,911,642	(221,501,424)	-	11,332,767,342
2106	11,332,767,342	559,838,707	(189,497,916)	-	11,703,108,132
2107	11,703,108,132	578,133,542	(196,444,221)	-	12,084,797,453
2108	12,084,797,453	596,988,994	(118,369,810)	-	12,563,416,637
2109	12,563,416,637	620,632,782	(211,130,954)	-	12,972,918,465
2110	12,972,918,465	640,862,172	(218,891,810)	-	13,394,888,828
2111	13,394,888,828	661,707,508	(226,946,170)	-	13,829,650,166
2112	13,829,650,166	683,184,718	(137,664,947)	-	14,375,169,937
2113	14,375,169,937	710,133,395	(446,845,223)	-	14,638,458,109
2114	14,638,458,109	723,139,831	(357,917,829)	-	15,003,680,111
2115	15,003,680,111	741,181,797	(285,747,972)	-	15,459,113,936
2116	15,459,113,936	763,680,228	(160,171,633)	-	16,062,622,531
2117	16,062,622,531	793,493,553	(165,867,658)	-	16,690,248,426

EXTERNAL FUND CALCULATION

2118	16,690,248,426	824,498,272	(412,774,806)	-	17,101,971,893
2119	17,101,971,893	844,837,412	(365,580,681)	-	17,581,228,623
2120	17,581,228,623	868,512,694	(186,429,715)	-	18,263,311,602
2121	18,263,311,602	902,207,593	(193,078,480)	-	18,972,440,715
2122	18,972,440,715	937,238,571	(545,222,379)	-	19,364,456,907
2123	19,364,456,907	956,604,171	(208,342,425)	-	20,112,718,653
2124	20,112,718,653	993,568,301	(217,069,921)	-	20,889,217,033
2125	20,889,217,033	1,031,927,321	(606,842,631)	-	21,314,301,724
2126	21,314,301,724	1,052,926,505	(233,567,637)	-	22,133,660,592
2127	22,133,660,592	1,093,402,833	(242,647,223)	-	22,984,416,202
2128	22,984,416,202	1,135,430,160	(676,367,768)	-	23,443,478,595
2129	23,443,478,595	1,158,107,843	(261,894,498)	-	24,339,691,940
2130	24,339,691,940	1,202,380,782	(272,091,406)	-	25,269,981,315
2131	25,269,981,315	1,248,337,077	(282,690,337)	-	26,235,628,055
2132	26,235,628,055	1,296,040,026	(780,812,473)	-	26,750,855,608
2133	26,750,855,608	1,321,492,267	(305,159,839)	-	27,767,188,035
2134	27,767,188,035	1,371,699,089	(317,064,613)	-	28,821,822,511
2135	28,821,822,511	1,423,798,032	(329,439,410)	-	29,916,181,133
2136	29,916,181,133	1,477,859,348	(343,310,154)	-	31,050,730,327
2137	31,050,730,327	1,533,906,078	(355,675,428)	-	32,228,960,977
2138	32,228,960,977	1,592,110,672	(369,576,237)	-	33,451,495,412
2139	33,451,495,412	1,652,503,873	(4,110,885,000)	-	30,993,114,285
2140	30,993,114,285	1,531,059,846	(400,219,998)	-	32,123,954,133
2141	32,123,954,133	1,586,923,334	(414,665,053)	-	33,296,212,414
2142	33,296,212,414	1,644,832,893	(430,899,762)	-	34,510,145,546
2143	34,510,145,546	1,704,801,190	(447,776,458)	-	35,767,170,278
2144	35,767,170,278	1,766,898,212	(466,684,194)	-	37,067,384,296
2145	37,067,384,296	1,831,128,784	(942,176,534)	-	37,956,336,546
2146	37,956,336,546	1,875,043,025	(819,164,963)	-	39,012,214,609
2147	39,012,214,609	1,927,203,402	(850,175,704)	-	40,089,242,307
2148	40,089,242,307	1,980,408,570	(544,318,666)	-	41,525,332,210
2149	41,525,332,210	2,051,351,411	(564,040,861)	-	43,012,642,761
2150	43,012,642,761	2,124,824,552	(1,132,757,742)	-	44,004,709,571
2151	44,004,709,571	2,173,832,653	(1,175,361,744)	-	45,003,180,480
2152	45,003,180,480	2,223,157,116	(1,221,441,653)	-	46,004,895,942
2153	46,004,895,942	2,272,641,860	(658,063,552)	-	47,619,474,249
2154	47,619,474,249	2,352,402,028	(683,945,998)	-	49,287,930,279
2155	49,287,930,279	2,434,823,756	(1,456,527,378)	-	50,266,226,657
2156	50,266,226,657	2,483,151,597	(1,191,217,991)	-	51,558,160,263
2157	51,558,160,263	2,546,973,117	(1,234,371,151)	-	52,870,762,229
2158	52,870,762,229	2,611,815,654	(798,168,374)	-	54,684,409,508
2159	54,684,409,508	2,701,409,830	(1,330,306,865)	-	56,055,512,473
2160	56,055,512,473	2,769,142,316	(1,383,581,665)	-	57,441,073,124
2161	57,441,073,124	2,837,589,012	(1,433,823,154)	-	58,844,838,982
2162	58,844,838,982	2,906,935,046	(931,653,123)	-	60,820,120,904
2163	60,820,120,904	3,004,513,973	(2,699,774,193)	-	61,124,860,684
2164	61,124,860,684	3,019,568,118	(2,205,599,092)	-	61,938,829,710
2165	61,938,829,710	3,059,778,188	(1,666,074,818)	-	63,332,533,079
2166	63,332,533,079	3,128,627,134	(1,087,668,215)	-	65,373,491,998
2167	65,373,491,998	3,229,450,505	(1,130,626,952)	-	67,472,315,551
2168	67,472,315,551	3,333,132,388	(2,558,184,221)	-	68,247,263,718
2169	68,247,263,718	3,371,414,828	(2,294,017,133)	-	69,324,661,413
2170	69,324,661,413	3,424,638,274	(1,270,038,271)	-	71,479,261,415
2171	71,479,261,415	3,531,075,514	(1,320,257,578)	-	73,690,079,352

EXTERNAL FUND CALCULATION

2172	73,690,079,352	3,640,289,920	(3,366,213,509)	-	73,964,155,763
2173	73,964,155,763	3,653,829,295	(1,426,777,061)	-	76,191,207,997
2174	76,191,207,997	3,763,845,675	(1,483,240,465)	-	78,471,813,207
2175	78,471,813,207	3,876,507,572	(3,757,968,903)	-	78,590,351,877
2176	78,590,351,877	3,882,363,383	(1,607,618,975)	-	80,865,096,285
2177	80,865,096,285	3,994,735,756	(1,666,495,954)	-	83,193,336,087
2178	83,193,336,087	4,109,750,803	(4,201,142,239)	-	83,101,944,651
2179	83,101,944,651	4,105,236,066	(1,801,167,407)	-	85,406,013,310
2180	85,406,013,310	4,219,057,058	(1,877,933,870)	-	87,747,136,497
2181	87,747,136,497	4,334,708,543	(1,946,796,356)	-	90,135,048,684
2182	90,135,048,684	4,452,671,405	(4,875,951,044)	-	89,711,769,045
2183	89,711,769,045	4,431,761,391	(2,104,278,428)	-	92,039,252,007
2184	92,039,252,007	4,546,739,049	(2,194,033,417)	-	94,391,957,639
2185	94,391,957,639	4,662,962,707	(2,274,582,657)	-	96,780,337,689
2186	96,780,337,689	4,780,948,682	(2,364,867,395)	-	99,196,418,976
2187	99,196,418,976	4,900,303,097	(2,458,757,274)	-	101,637,964,800
2188	101,637,964,800	5,020,915,461	(2,563,709,466)	-	104,095,170,795
2189	104,095,170,795	5,142,301,437	(24,755,020,964)	-	84,482,451,268
2190	84,482,451,268	4,173,433,093	(2,763,533,752)	-	85,892,350,609
2191	85,892,350,609	4,243,082,120	(2,873,349,687)	-	87,262,083,042
2192	87,262,083,042	4,310,746,902	(2,996,084,790)	-	88,576,745,154
2193	88,576,745,154	4,375,691,211	(2,631,901,790)	-	90,320,534,575
2194	90,320,534,575	4,461,834,408	(2,845,755,560)	-	91,936,613,423
2195	91,936,613,423	4,541,668,703	(6,096,768,388)	-	90,381,513,738
2196	90,381,513,738	4,464,846,779	(5,039,439,321)	-	89,806,921,195
2197	89,806,921,195	4,436,461,907	(5,103,102,785)	-	89,140,280,318
2198	89,140,280,318	4,403,529,848	(3,449,639,793)	-	90,094,170,372
2199	90,094,170,372	4,450,652,016	(3,388,072,705)	-	91,156,749,684
2200	91,156,749,684	4,503,143,434	(6,748,343,262)	-	88,911,549,856
2201	88,911,549,856	4,392,230,563	(7,149,952,252)	-	86,153,828,167
2202	86,153,828,167	4,255,999,111	(7,425,240,003)	-	82,984,587,275
2203	82,984,587,275	4,099,438,611	(3,957,295,989)	-	83,126,729,898
2204	83,126,729,898	4,106,460,457	(4,204,275,961)	-	83,028,914,393
2205	83,028,914,393	4,101,628,371	(8,317,273,562)	-	78,813,269,203
2206	78,813,269,203	3,893,375,499	(7,184,177,587)	-	75,522,467,114
2207	75,522,467,114	3,730,809,875	(7,551,432,596)	-	71,701,844,393
2208	71,701,844,393	3,542,071,113	(4,910,769,515)	-	70,333,145,992
2209	70,333,145,992	3,474,457,412	(8,054,177,476)	-	65,753,425,928
2210	65,753,425,928	3,248,219,241	(8,451,130,892)	-	60,550,514,276
2211	60,550,514,276	2,991,195,405	(8,764,321,886)	-	54,777,387,796
2212	54,777,387,796	2,706,002,957	(5,704,971,845)	-	51,778,418,908
2213	51,778,418,908	2,557,853,894	(16,547,283,798)	-	37,788,989,004
2214	37,788,989,004	1,866,776,057	(13,505,097,847)	-	26,150,667,214
2215	26,150,667,214	1,291,842,960	(10,210,415,985)	-	17,232,094,189
2216	17,232,094,189	851,265,453	(8,964,289,432)	-	9,119,070,210
2217	9,119,070,210	450,482,068	(6,950,574,559)	-	2,618,977,720
2218	2,618,977,720	129,377,499	(2,748,355,219)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,677,050	-	294,670	431,180,688
2018	431,180,688	21,918,948	-	589,341	453,688,977
2019	453,688,977	23,062,369	-	589,341	477,340,687
2020	477,340,687	24,263,876	-	589,341	502,193,904
2021	502,193,904	26,603,986	-	43,013,201	571,811,091
2022	571,811,091	30,140,539	-	43,013,201	644,964,831
2023	644,964,831	33,856,749	-	43,013,201	721,834,781
2024	721,834,781	37,761,742	-	43,013,201	802,609,725
2025	802,609,725	41,865,109	-	43,013,201	887,488,036
2026	887,488,036	46,176,928	-	43,013,201	976,678,165
2027	976,678,165	50,707,786	-	43,013,201	1,070,399,152
2028	1,070,399,152	55,468,812	-	43,013,201	1,168,881,166
2029	1,168,881,166	60,471,699	-	43,013,201	1,272,366,066
2030	1,272,366,066	65,728,731	-	43,013,201	1,381,107,999
2031	1,381,107,999	71,252,822	-	43,013,201	1,495,374,022
2032	1,495,374,022	77,057,536	-	43,013,201	1,615,444,759
2033	1,615,444,759	83,157,129	-	43,013,201	1,741,615,090
2034	1,741,615,090	86,741,653	(17,426,478)	35,700,957	1,846,631,222
2035	1,846,631,222	91,038,919	(114,752,428)	-	1,822,917,714
2036	1,822,917,714	89,869,843	(214,578,967)	-	1,698,208,590
2037	1,698,208,590	83,721,683	(216,463,722)	-	1,565,466,552
2038	1,565,466,552	77,177,501	(136,478,687)	-	1,506,165,366
2039	1,506,165,366	74,253,953	(176,222,841)	-	1,404,196,477
2040	1,404,196,477	69,226,886	(89,351,532)	-	1,384,071,832
2041	1,384,071,832	68,234,741	(64,325,998)	-	1,387,980,575
2042	1,387,980,575	68,427,442	(59,595,219)	-	1,396,812,799
2043	1,396,812,799	68,862,871	(34,871,710)	-	1,430,803,960
2044	1,430,803,960	70,538,635	(11,675,642)	-	1,489,666,953
2045	1,489,666,953	73,440,581	(28,363,854)	-	1,534,743,680
2046	1,534,743,680	75,662,863	(23,689,494)	-	1,586,717,049
2047	1,586,717,049	78,225,151	(24,483,772)	-	1,640,458,427
2048	1,640,458,427	80,874,600	(13,374,843)	-	1,707,958,185
2049	1,707,958,185	84,202,339	(26,158,366)	-	1,766,002,157
2050	1,766,002,157	87,063,906	(33,421,508)	-	1,819,644,556
2051	1,819,644,556	89,708,477	(32,881,304)	-	1,876,471,728
2052	1,876,471,728	92,510,056	(35,750,338)	-	1,933,231,446
2053	1,933,231,446	95,308,310	(15,841,845)	-	2,012,697,911
2054	2,012,697,911	99,226,007	(16,402,157)	-	2,095,521,762
2055	2,095,521,762	103,309,223	(39,442,660)	-	2,159,388,324
2056	2,159,388,324	106,457,844	(33,101,605)	-	2,232,744,564
2057	2,232,744,564	110,074,307	(34,180,108)	-	2,308,638,762
2058	2,308,638,762	113,815,891	(18,866,090)	-	2,403,588,564
2059	2,403,588,564	118,496,916	(34,420,697)	-	2,487,664,783
2060	2,487,664,783	122,641,874	(37,888,573)	-	2,572,418,084
2061	2,572,418,084	126,820,212	(39,132,078)	-	2,660,106,217
2062	2,660,106,217	131,143,237	(21,730,468)	-	2,769,518,986
2063	2,769,518,986	136,537,286	(80,624,408)	-	2,825,431,864

EXTERNAL FUND CALCULATION

External Levelized

2064	2,825,431,864	139,293,791	(60,892,047)	-	2,903,833,608
2065	2,903,833,608	143,158,997	(44,844,272)	-	3,002,148,332
2066	3,002,148,332	148,005,913	(25,061,109)	-	3,125,093,136
2067	3,125,093,136	154,067,092	(25,975,184)	-	3,253,185,044
2068	3,253,185,044	160,382,023	(72,554,214)	-	3,341,012,853
2069	3,341,012,853	164,711,934	(63,199,176)	-	3,442,525,611
2070	3,442,525,611	169,716,513	(28,934,876)	-	3,583,307,247
2071	3,583,307,247	176,657,047	(29,998,461)	-	3,729,965,834
2072	3,729,965,834	183,887,316	(92,771,376)	-	3,821,081,773
2073	3,821,081,773	188,379,331	(32,250,385)	-	3,977,210,719
2074	3,977,210,719	196,076,488	(33,442,224)	-	4,139,844,984
2075	4,139,844,984	204,094,358	(112,366,690)	-	4,231,572,651
2076	4,231,572,651	208,616,532	(36,074,561)	-	4,404,114,623
2077	4,404,114,623	217,122,851	(37,300,497)	-	4,583,936,976
2078	4,583,936,976	225,988,093	(117,581,691)	-	4,692,343,378
2079	4,692,343,378	231,332,529	(40,128,166)	-	4,883,547,740
2080	4,883,547,740	240,758,904	(41,751,014)	-	5,082,555,630
2081	5,082,555,630	250,569,993	(43,178,981)	-	5,289,946,642
2082	5,289,946,642	260,794,369	(125,687,807)	-	5,425,053,204
2083	5,425,053,204	267,455,123	(46,471,116)	-	5,646,037,211
2084	5,646,037,211	278,349,635	(48,359,942)	-	5,876,026,904
2085	5,876,026,904	289,688,126	(50,023,957)	-	6,115,691,073
2086	6,115,691,073	301,503,570	(51,904,218)	-	6,365,290,425
2087	6,365,290,425	313,808,818	(53,857,834)	-	6,625,241,409
2088	6,625,241,409	326,624,401	(56,056,341)	-	6,895,809,469
2089	6,895,809,469	339,963,407	(750,019,869)	-	6,485,753,007
2090	6,485,753,007	319,747,623	(60,186,007)	-	6,745,314,623
2091	6,745,314,623	332,544,011	(62,461,585)	-	7,015,397,049
2092	7,015,397,049	345,859,075	(65,021,671)	-	7,296,234,453
2093	7,296,234,453	359,704,359	(67,282,081)	-	7,588,656,731
2094	7,588,656,731	374,120,777	(69,834,269)	-	7,892,943,239
2095	7,892,943,239	389,122,102	(155,524,086)	-	8,126,541,255
2096	8,126,541,255	400,638,484	(132,704,319)	-	8,394,475,420
2097	8,394,475,420	413,847,638	(137,283,595)	-	8,671,039,462
2098	8,671,039,462	427,482,245	(81,077,609)	-	9,017,444,099
2099	9,017,444,099	444,559,994	(84,167,826)	-	9,377,836,267
2100	9,377,836,267	462,327,328	(185,521,538)	-	9,654,642,057
2101	9,654,642,057	475,973,853	(192,204,411)	-	9,938,411,500
2102	9,938,411,500	489,963,687	(199,135,039)	-	10,229,240,147
2103	10,229,240,147	504,301,539	(97,784,894)	-	10,635,756,792
2104	10,635,756,792	524,342,810	(101,832,791)	-	11,058,266,811
2105	11,058,266,811	545,172,554	(221,510,005)	-	11,381,929,359
2106	11,381,929,359	561,129,117	(189,506,903)	-	11,753,551,573
2107	11,753,551,573	579,450,093	(196,453,466)	-	12,136,548,200
2108	12,136,548,200	598,331,826	(118,379,164)	-	12,616,500,863
2109	12,616,500,863	621,993,493	(211,140,737)	-	13,027,353,618
2110	13,027,353,618	642,248,533	(218,901,873)	-	13,450,700,279
2111	13,450,700,279	663,119,524	(226,956,522)	-	13,886,863,281
2112	13,886,863,281	684,622,360	(137,675,412)	-	14,433,810,228
2113	14,433,810,228	711,586,844	(446,855,813)	-	14,698,541,260
2114	14,698,541,260	724,638,084	(357,928,808)	-	15,065,250,536
2115	15,065,250,536	742,716,851	(285,759,253)	-	15,522,208,134
2116	15,522,208,134	765,244,861	(160,183,341)	-	16,127,269,653
2117	16,127,269,653	795,074,394	(165,879,861)	-	16,756,464,186

EXTERNAL FUND CALCULATION

2118	16,756,464,186	826,093,684	(412,787,085)	-	17,169,770,786
2119	17,169,770,786	846,469,700	(365,593,399)	-	17,650,647,087
2120	17,650,647,087	870,176,901	(186,442,814)	-	18,334,381,175
2121	18,334,381,175	903,884,992	(193,092,143)	-	19,045,174,023
2122	19,045,174,023	938,927,079	(545,236,291)	-	19,438,864,811
2123	19,438,864,811	958,336,035	(208,356,883)	-	20,188,843,964
2124	20,188,843,964	995,310,007	(217,084,576)	-	20,967,069,395
2125	20,967,069,395	1,033,676,521	(606,857,768)	-	21,393,888,148
2126	21,393,888,148	1,054,718,686	(233,583,374)	-	22,215,023,460
2127	22,215,023,460	1,095,200,657	(242,663,411)	-	23,067,560,706
2128	23,067,560,706	1,137,230,743	(676,383,922)	-	23,528,407,526
2129	23,528,407,526	1,159,950,491	(261,911,627)	-	24,426,446,390
2130	24,426,446,390	1,204,223,807	(272,109,027)	-	25,358,561,170
2131	25,358,561,170	1,250,177,066	(282,708,463)	-	26,326,029,773
2132	26,326,029,773	1,297,873,268	(780,830,534)	-	26,843,072,507
2133	26,843,072,507	1,323,363,475	(305,179,020)	-	27,861,256,962
2134	27,861,256,962	1,373,559,968	(317,084,344)	-	28,917,732,586
2135	28,917,732,586	1,425,644,216	(329,459,707)	-	30,013,917,095
2136	30,013,917,095	1,479,686,113	(343,330,675)	-	31,150,272,533
2137	31,150,272,533	1,535,708,436	(355,696,906)	-	32,330,284,062
2138	32,330,284,062	1,593,883,004	(369,598,331)	-	33,554,568,735
2139	33,554,568,735	1,654,240,239	(4,110,906,980)	-	31,097,901,994
2140	31,097,901,994	1,533,126,568	(400,242,957)	-	32,230,785,606
2141	32,230,785,606	1,588,977,730	(414,689,104)	-	33,405,074,232
2142	33,405,074,232	1,646,870,160	(430,924,504)	-	34,621,019,888
2143	34,621,019,888	1,706,816,280	(447,801,910)	-	35,880,034,259
2144	35,880,034,259	1,768,885,689	(466,709,878)	-	37,182,210,070
2145	37,182,210,070	1,833,082,956	(942,202,942)	-	38,073,090,085
2146	38,073,090,085	1,877,003,341	(819,192,849)	-	39,130,900,577
2147	39,130,900,577	1,929,153,398	(850,204,392)	-	40,209,849,583
2148	40,209,849,583	1,982,345,584	(544,347,400)	-	41,647,847,768
2149	41,647,847,768	2,053,238,895	(564,071,025)	-	43,137,015,638
2150	43,137,015,638	2,126,654,871	(1,132,788,133)	-	44,130,882,376
2151	44,130,882,376	2,175,652,501	(1,175,393,002)	-	45,131,141,876
2152	45,131,141,876	2,224,965,294	(1,221,474,671)	-	46,134,632,499
2153	46,134,632,499	2,274,437,382	(658,097,334)	-	47,750,972,547
2154	47,750,972,547	2,354,122,947	(683,980,750)	-	49,421,114,743
2155	49,421,114,743	2,436,460,957	(1,456,562,811)	-	50,401,012,889
2156	50,401,012,889	2,484,769,935	(1,191,254,025)	-	51,694,528,799
2157	51,694,528,799	2,548,540,270	(1,234,409,252)	-	53,008,659,817
2158	53,008,659,817	2,613,326,929	(798,207,297)	-	54,823,779,449
2159	54,823,779,449	2,702,812,327	(1,330,347,193)	-	56,196,244,583
2160	56,196,244,583	2,770,474,858	(1,383,621,977)	-	57,583,097,464
2161	57,583,097,464	2,838,846,705	(1,433,865,839)	-	58,988,078,330
2162	58,988,078,330	2,908,112,262	(931,696,719)	-	60,964,493,873
2163	60,964,493,873	3,005,549,548	(2,699,816,930)	-	61,270,226,492
2164	61,270,226,492	3,020,622,166	(2,205,644,530)	-	62,085,204,127
2165	62,085,204,127	3,060,800,563	(1,666,122,640)	-	63,479,882,051
2166	63,479,882,051	3,129,558,185	(1,087,717,046)	-	65,521,723,190
2167	65,521,723,190	3,230,220,953	(1,130,677,188)	-	67,621,266,955
2168	67,621,266,955	3,333,728,461	(2,558,235,066)	-	68,396,760,350
2169	68,396,760,350	3,371,960,285	(2,294,068,968)	-	69,474,651,667
2170	69,474,651,667	3,425,100,327	(1,270,092,970)	-	71,629,659,024
2171	71,629,659,024	3,531,342,190	(1,320,313,851)	-	73,840,687,364

EXTERNAL FUND CALCULATION

2172	73,840,687,364	3,640,345,887	(3,366,268,444)	-	74,114,764,806
2173	74,114,764,806	3,653,857,905	(1,426,836,620)	-	76,341,786,092
2174	76,341,786,092	3,763,650,054	(1,483,301,738)	-	78,622,134,408
2175	78,622,134,408	3,876,071,226	(3,758,030,772)	-	78,740,174,862
2176	78,740,174,862	3,881,890,621	(1,607,681,975)	-	81,014,383,508
2177	81,014,383,508	3,994,009,107	(1,666,562,675)	-	83,341,829,939
2178	83,341,829,939	4,108,752,216	(4,201,209,565)	-	83,249,372,590
2179	83,249,372,590	4,104,194,069	(1,801,238,027)	-	85,552,328,632
2180	85,552,328,632	4,217,729,802	(1,878,004,344)	-	87,892,054,089
2181	87,892,054,089	4,333,078,267	(1,946,871,104)	-	90,278,261,251
2182	90,278,261,251	4,450,718,280	(4,876,026,404)	-	89,852,953,127
2183	89,852,953,127	4,429,750,589	(2,104,357,547)	-	92,178,346,169
2184	92,178,346,169	4,544,392,466	(2,194,112,250)	-	94,528,626,386
2185	94,528,626,386	4,660,261,281	(2,274,666,403)	-	96,914,221,264
2186	96,914,221,264	4,777,871,108	(2,364,953,555)	-	99,327,138,817
2187	99,327,138,817	4,896,827,944	(2,458,845,919)	-	101,765,120,842
2188	101,765,120,842	5,017,020,458	(2,563,797,647)	-	104,218,343,653
2189	104,218,343,653	5,137,964,342	(24,755,109,055)	-	84,601,198,940
2190	84,601,198,940	4,170,839,108	(2,763,630,291)	-	86,008,407,757
2191	86,008,407,757	4,240,214,502	(2,873,449,011)	-	87,375,173,249
2192	87,375,173,249	4,307,596,041	(2,996,183,428)	-	88,686,585,862
2193	88,686,585,862	4,372,248,683	(2,631,904,177)	-	90,426,930,368
2194	90,426,930,368	4,458,047,667	(2,845,754,626)	-	92,039,223,409
2195	92,039,223,409	4,537,533,714	(6,096,767,211)	-	90,479,989,912
2196	90,479,989,912	4,460,663,503	(5,039,437,641)	-	89,901,215,775
2197	89,901,215,775	4,432,129,938	(5,103,100,217)	-	89,230,245,495
2198	89,230,245,495	4,399,051,103	(3,449,635,792)	-	90,179,660,806
2199	90,179,660,806	4,445,857,278	(3,388,068,666)	-	91,237,449,418
2200	91,237,449,418	4,498,006,256	(6,748,341,960)	-	88,987,113,714
2201	88,987,113,714	4,387,064,706	(7,149,946,397)	-	86,224,232,024
2202	86,224,232,024	4,250,854,639	(7,425,233,915)	-	83,049,852,747
2203	83,049,852,747	4,094,357,740	(3,957,291,254)	-	83,186,919,233
2204	83,186,919,233	4,101,115,118	(4,204,280,747)	-	83,083,753,604
2205	83,083,753,604	4,096,029,053	(8,317,266,720)	-	78,862,515,937
2206	78,862,515,937	3,887,922,036	(7,184,173,885)	-	75,566,264,088
2207	75,566,264,088	3,725,416,820	(7,551,432,749)	-	71,740,248,158
2208	71,740,248,158	3,536,794,234	(4,910,775,132)	-	70,366,267,261
2209	70,366,267,261	3,469,056,976	(8,054,173,294)	-	65,781,150,943
2210	65,781,150,943	3,243,010,741	(8,451,137,477)	-	60,573,024,208
2211	60,573,024,208	2,986,250,093	(8,764,317,521)	-	54,794,956,780
2212	54,794,956,780	2,701,391,369	(5,704,973,713)	-	51,791,374,436
2213	51,791,374,436	2,553,314,760	(16,547,281,313)	-	37,797,407,883
2214	37,797,407,883	1,863,412,209	(13,505,095,115)	-	26,155,724,977
2215	26,155,724,977	1,289,477,241	(10,210,410,842)	-	17,234,791,376
2216	17,234,791,376	849,675,215	(8,964,291,613)	-	9,120,174,978
2217	9,120,174,978	449,624,626	(6,950,572,292)	-	2,619,227,312
2218	2,619,227,312	129,127,906	(2,748,355,219)	-	(0)

2021 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$9,627,369	(\$3,764,857)
Prairie Island Unit 1	49,264	13,677,983	13,628,719
Prairie Island Unit 2	589,341	3,832,669	3,243,328
TOTAL	\$14,030,831	\$27,138,020	\$13,107,189

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
SAFSTOR Method

Docket No. E002/M-17-828
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Proposed

2021 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2021 Decommissioning Accrual
Monticello	13.75	5.10%	4.83%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	9,627,369
Prairie Island Unit 1	16.67	5.12%	4.82%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	13,677,983
Prairie Island Unit 2	17.83	5.14%	4.83%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	3,832,669
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$27,138,020

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2030	\$17,759,328	\$13,051,073	1.6755	\$21,867,073	\$8,763,593	\$6,440,238	1.4410	\$9,280,383	\$0	\$0	1.0000	\$0	\$26,522,921	\$19,491,311	\$31,147,456
2031	63,231,064	46,467,594	1.7434	81,011,604	46,823,276	34,409,748	1.4820	50,995,247	0	0	1.0000	0	110,054,340	80,877,343	132,006,851
2032	30,098,747	22,119,134	1.8140	40,124,109	21,963,833	16,140,903	1.5243	24,603,579	0	0	1.0000	0	52,062,580	38,260,037	64,727,688
2033	30,011,960	22,055,355	1.8874	41,627,277	35,867,567	26,358,556	1.5677	41,322,308	0	0	1.0000	0	65,879,526	48,413,911	82,949,586
2034	24,261,956	17,829,760	1.9639	35,015,866	18,617,567	13,681,781	1.6124	22,060,503	0	0	1.0000	0	42,879,522	31,511,541	57,076,369
2035	43,935,865	32,287,832	2.0434	65,976,955	88,132,650	64,767,410	1.6584	107,410,272	0	0	1.0000	0	132,068,514	97,055,241	173,387,228
2036	8,481,485	6,232,921	2.1262	13,252,436	4,523,995	3,324,618	1.7056	5,670,469	0	0	1.0000	0	13,005,479	9,557,539	18,922,905
2037	8,458,357	6,215,924	2.2123	13,751,489	4,511,770	3,315,635	1.7542	5,816,286	0	0	1.0000	0	12,970,127	9,531,559	19,567,775
2038	8,458,357	6,215,924	2.3019	14,308,436	4,511,770	3,315,635	1.8042	5,982,068	0	0	1.0000	0	12,970,127	9,531,559	20,290,504
2039	8,458,357	6,215,924	2.3951	14,887,760	4,511,770	3,315,635	1.8556	6,152,491	0	0	1.0000	0	12,970,127	9,531,559	21,040,251
2040	8,481,485	6,232,921	2.4921	15,533,061	4,523,995	3,324,618	1.9085	6,345,034	0	0	1.0000	0	13,005,479	9,557,539	21,878,095
2041	8,458,357	6,215,924	2.5930	16,117,891	4,511,770	3,315,635	1.9629	6,508,259	0	0	1.0000	0	12,970,127	9,531,559	22,626,150
2042	8,458,357	6,215,924	2.6981	16,771,185	4,511,770	3,315,635	2.0189	6,693,935	0	0	1.0000	0	12,970,127	9,531,559	23,465,119
2043	8,458,357	6,215,924	2.8073	17,449,964	4,511,770	3,315,635	2.0764	6,884,584	0	0	1.0000	0	12,970,127	9,531,559	24,334,547
2044	8,481,485	6,232,921	2.9210	18,206,361	4,523,995	3,324,618	2.1356	7,100,055	0	0	1.0000	0	13,005,479	9,557,539	25,306,416
2045	8,458,357	6,215,924	3.0393	18,892,058	4,511,770	3,315,635	2.1964	7,282,460	0	0	1.0000	0	12,970,127	9,531,559	26,174,518
2046	8,458,357	6,215,924	3.1624	19,657,238	4,511,770	3,315,635	2.2590	7,490,018	0	0	1.0000	0	12,970,127	9,531,559	27,147,257
2047	8,458,357	6,215,924	3.2905	20,453,498	4,511,770	3,315,635	2.3234	7,703,545	0	0	1.0000	0	12,970,127	9,531,559	28,157,044
2048	9,145,130	6,720,624	3.4238	23,010,071	6,514,932	4,787,729	2.3896	11,440,757	0	0	1.0000	0	15,660,061	11,508,353	34,450,829
2049	8,458,357	6,215,924	3.5624	22,143,608	4,511,767	3,315,632	2.4577	8,148,830	0	0	1.0000	0	12,970,124	9,531,556	30,292,438
2050	9,951,558	7,313,256	3.7067	27,108,046	8,991,374	6,607,631	2.5278	16,702,769	0	0	1.0000	0	18,942,932	13,920,887	43,810,815
2051	9,951,558	7,313,256	3.8568	28,205,765	8,991,374	6,607,631	2.5998	17,178,518	0	0	1.0000	0	18,942,932	13,920,887	45,384,284
2052	10,837,186	7,964,091	4.0130	31,959,898	11,591,099	8,518,131	2.6739	22,776,630	0	0	1.0000	0	22,428,284	16,482,222	54,736,528
2053	11,460,933	8,422,474	4.1756	35,168,881	13,519,499	9,935,284	2.7501	27,323,025	0	0	1.0000	0	24,980,432	18,357,758	62,491,907
2054	10,167,183	7,471,716	4.3447	32,462,363	9,638,249	7,083,010	2.8285	20,034,293	0	0	1.0000	0	19,805,432	14,554,725	52,496,656
2055	11,245,308	8,264,014	4.5206	37,358,302	12,872,624	9,459,905	2.9091	27,519,810	0	0	1.0000	0	24,117,932	17,723,919	64,878,112
2056	11,699,686	8,597,930	4.7037	40,442,083	14,178,599	10,419,647	2.9920	31,175,584	0	0	1.0000	0	25,878,284	19,017,577	71,617,667
2057	8,441,765	6,203,731	4.8942	30,362,300	4,461,997	3,279,057	3.0773	10,090,642	0	0	1.0000	0	12,903,762	9,482,788	40,452,942
2058	8,441,765	6,203,731	5.0924	31,591,879	4,461,997	3,279,057	3.1650	10,378,216	0	0	1.0000	0	12,903,762	9,482,788	41,970,095
2059	8,441,765	6,203,731	5.2987	32,871,709	4,461,997	3,279,057	3.2552	10,673,987	0	0	1.0000	0	12,903,762	9,482,788	43,545,695
2060	8,464,894	6,220,728	5.5133	34,296,740	4,474,222	3,288,041	3.3480	11,008,361	0	0	1.0000	0	12,939,115	9,508,769	45,305,101
2061	8,441,765	6,203,731	5.7366	35,588,322	4,461,997	3,279,057	3.4434	11,291,105	0	0	1.0000	0	12,903,762	9,482,788	46,879,428
2062	8,441,765	6,203,731	5.9689	37,029,449	4,461,997	3,279,057	3.5415	11,612,781	0	0	1.0000	0	12,903,762	9,482,788	48,442,230
2063	8,441,765	6,203,731	6.2106	38,528,891	4,461,997	3,279,057	3.6425	11,943,965	0	0	1.0000	0	12,903,762	9,482,788	50,472,856
2064	8,464,894	6,220,728	6.4622	40,199,589	4,474,222	3,288,041	3.7463	12,317,987	0	0	1.0000	0	12,939,115	9,508,769	52,517,576
2065	8,441,765	6,203,731	6.7239	41,713,266	4,461,997	3,279,057	3.8531	12,634,535	0	0	1.0000	0	12,903,762	9,482,788	54,347,801
2066	8,441,765	6,203,731	6.9962	43,402,542	4,461,997	3,279,057	3.9629	12,994,575	0	0	1.0000	0	12,903,762	9,482,788	56,397,117
2067	8,441,765	6,203,731	7.2795	45,160,059	4,461,997	3,279,057	4.0758	13,364,781	0	0	1.0000	0	12,903,762	9,482,788	58,524,840
2068	8,464,894	6,220,728	7.5744	47,118,282	4,474,222	3,288,041	4.1920	13,783,467	0	0	1.0000	0	12,939,115	9,508,769	60,901,750
2069	8,441,765	6,203,731	7.8811	48,892,223	4,461,997	3,279,057	4.3115	14,137,655	0	0	1.0000	0	12,903,762	9,482,788	63,029,878
2070	8,441,765	6,203,731	8.2003	50,872,454	4,461,997	3,279,057	4.4343	14,540,323	0	0	1.0000	0	12,903,762	9,482,788	65,412,777
2071	8,441,765	6,203,731	8.5324	52,932,713	4,461,997	3,279,057	4.5607	14,954,796	0	0	1.0000	0	12,903,762	9,482,788	67,887,509
2072	8,464,894	6,220,728	8.8780	55,227,624	4,474,222	3,288,041	4.6907	15,425,213	0	0	1.0000	0	12,939,115	9,508,769	70,650,837
2073	8,441,765	6,203,731	9.2375	57,306,964	4,461,997	3,279,057	4.8244	15,819,483	0	0	1.0000	0	12,903,762	9,482,788	73,126,447
2074	8,441,765	6,203,731	9.6117	59,628,400	4,461,997	3,279,057	4.9619	16,270,353	0	0	1.0000	0	12,903,762	9,482,788	75,898,753
2075	8,441,765	6,203,731	10.0009	62,042,892	4,461,997	3,279,057	5.1033	16,734,012	0	0	1.0000	0	12,903,762	9,482,788	78,776,904
2076	8,464,894	6,220,728	10.4060	64,732,896	4,474,222	3,288,041	5.2487	17,257,940	0	0	1.0000	0	12,939,115	9,508,769	81,990,836
2077	8,441,765	6,203,731	10.8274	67,170,276	4,461,997	3,279,057	5.3983	17,701,334	0	0	1.0000	0	12,903,762	9,482,788	84,871,609
2078	8,920,197	6,555,324	11.2659	73,851,620	5,897,293	4,333,835	5.5522	24,062,321	0	0	1.0000	0	14,817,490	10,889,159	97,913,941
2079	9,015,884	6,625,643	11.7222	77,667,108	6,184,352	4,544,791	5.7104	25,952,574	0	0	1.0000	0	15,200,236	11,170,433	103,619,682
2080	8,943,325	6,572,320	12.1970	80,162,588	5,909,518	4,342,819	5.8731	25,505,811	0	0	1.0000	0	14,852,842	10,915,139	105,668,399
2081	8,920,197	6,555,324	12.6909	83,192,957	5,897,293	4,333,835	6.0405	26,178,533	0	0	1.0000	0	14,817,490	10,889,159	109,371,489
2082	8,920,197	6,555,324	13.2049	86,562,393	5,897,293	4,333,835	6.2127	26,924,819	0	0	1.0000	0	14,817,490	10,889,159	113,487,212
2083	9,015,884	6,625,643	13.7397	91,034,342	6,184,352	4,544,791	6.3897	29,039,850	0	0	1.0000	0	15,200,236	11,170,433	120,074,192
2084	8,943,325	6,572,320	14.2962	93,959,202	5,909,518	4,342,819	6.5719	28,540,573	0	0	1.0000	0	14,852,842	10,915,139	122,499,775

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s			
2085	46,126,149	33,897,440	14.8752	504,231,201	12,314,062	9,049,426	6.7592	61,166,882	0	0	1.0000	0	58,440,212	42,946,866	565,398,083
2086	53,631,139	39,412,748	15.4776	610,014,753	46,945,385	34,499,485	6.9518	239,833,517	0	0	1.0000	0	100,576,524	73,912,233	849,848,270
2087	57,419,114	42,196,476	16.1045	679,553,153	80,273,242	58,991,645	7.1499	421,784,362	0	0	1.0000	0	137,692,356	101,188,121	1,101,337,516
2088	52,652,752	38,693,746	16.7567	648,379,491	33,214,319	24,408,722	7.3537	179,494,423	0	0	1.0000	0	85,867,070	63,102,468	827,873,914
2089	50,913,638	37,415,697	17.4353	652,353,896	30,841,715	22,665,130	7.5633	171,423,181	0	0	1.0000	0	81,755,354	60,080,827	823,777,077
2090	32,667,889	24,007,160	18.1415	435,525,885	23,001,023	16,903,119	7.7788	131,485,985	0	0	1.0000	0	55,668,913	40,910,279	567,011,870
2091	21,071,356	15,485,035	18.8762	292,298,617	16,131,940	11,855,130	8.0005	94,846,965	0	0	1.0000	0	37,203,297	27,340,165	387,145,582
2092	8,832,651	6,490,987	19.6407	127,487,533	6,762,156	4,969,411	8.2285	40,890,795	0	0	1.0000	0	15,594,807	11,460,398	168,378,328
	\$967,171,883	\$710,760,631		\$6,275,707,486	\$750,282,438	\$551,371,714		\$2,329,665,815	\$0	\$0		\$0	\$1,717,454,322	\$1,262,132,345	\$8,605,373,301

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$
	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional	Cost	Jurisdictional	Escalation Factor	Jurisdictional			
	Estimate Nominal \$	Cost in Nominal \$		Cost in Future \$	Estimate Nominal \$	Cost in Nominal \$		Cost in Future \$	Estimate Nominal \$	Cost in Nominal \$		Cost in Future \$			
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2033	\$18,446,908	\$13,556,366	1.8874	\$25,586,285	\$4,190,856	\$3,079,799	1.5677	\$4,828,201	\$1,250,000	\$918,607	1.0000	\$918,607	\$23,887,764	\$17,554,772	\$31,333,093
2034	46,142,627	33,909,549	1.9639	66,594,964	29,162,161	21,430,850	1.6124	34,555,103	1,250,000	918,607	1.0000	918,607	76,554,787	56,259,006	102,068,673
2035	16,398,923	12,051,331	2.0434	24,625,691	15,491,742	11,384,657	1.6584	18,880,315	1,250,000	918,607	1.0000	918,607	33,140,665	24,354,595	44,424,613
2036	12,659,656	9,303,398	2.1262	19,780,886	13,774,811	10,122,909	1.7056	17,265,634	1,250,000	918,607	1.0000	918,607	27,684,467	20,344,915	37,965,127
2037	12,625,333	9,278,174	2.2123	20,526,103	13,734,545	10,093,318	1.7542	17,705,699	1,250,000	918,607	1.0000	918,607	27,609,877	20,290,100	39,150,411
2038	15,404,499	11,320,543	2.3019	26,058,758	22,072,045	16,220,427	1.8042	29,264,894	1,250,000	918,607	1.0000	918,607	38,726,543	28,459,577	56,242,259
2039	32,688,492	24,022,300	2.3951	57,535,811	76,524,027	56,236,401	1.8556	104,352,265	1,250,000	918,607	1.0000	918,607	110,462,519	81,177,308	162,806,683
2040	4,604,176	3,383,542	2.4921	8,432,126	4,477,123	3,290,173	1.9085	6,279,295	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	15,630,028
2041	4,591,596	3,374,297	2.5930	8,749,553	4,461,475	3,278,674	1.9629	6,435,709	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	16,103,868
2042	4,591,596	3,374,297	2.6981	9,104,191	4,461,475	3,278,674	2.0189	6,619,314	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	16,642,112
2043	4,591,596	3,374,297	2.8073	9,472,665	4,461,475	3,278,674	2.0764	6,807,838	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	17,199,109
2044	4,604,176	3,383,542	2.9210	9,883,328	4,477,123	3,290,173	2.1356	7,026,494	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	17,828,428
2045	4,591,596	3,374,297	3.0393	10,255,502	4,461,475	3,278,674	2.1964	7,201,279	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	18,375,387
2046	4,591,596	3,374,297	3.1624	10,670,878	4,461,475	3,278,674	2.2590	7,406,524	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	18,996,008
2047	4,591,596	3,374,297	3.2905	11,103,125	4,461,475	3,278,674	2.3234	7,617,670	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	19,639,402
2048	4,604,176	3,383,542	3.4238	11,584,573	4,477,123	3,290,173	2.3896	7,862,198	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	20,365,377
2049	4,591,596	3,374,297	3.5624	12,020,596	4,461,475	3,278,674	2.4577	8,057,996	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	20,997,200
2050	4,591,596	3,374,297	3.7067	12,507,507	4,461,475	3,278,674	2.5278	8,287,831	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	21,713,946
2051	4,591,596	3,374,297	3.8568	13,013,990	4,461,475	3,278,674	2.5998	8,523,896	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	22,456,492
2052	4,604,176	3,383,542	4.0130	13,578,156	4,477,123	3,290,173	2.6739	8,797,594	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	23,294,357
2053	4,687,283	3,444,616	4.1756	14,383,339	4,748,534	3,489,629	2.7501	9,596,829	1,250,000	918,607	1.0000	918,607	10,685,817	7,852,852	24,898,776
2054	4,782,969	3,514,934	4.3447	15,271,336	5,035,593	3,700,585	2.8285	10,467,104	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	26,657,046
2055	4,782,969	3,514,934	4.5206	15,889,613	5,035,593	3,700,585	2.9091	10,765,371	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	27,573,591
2056	4,843,392	3,559,339	4.7037	16,742,062	5,194,771	3,817,562	2.9920	11,422,146	1,250,000	918,607	1.0000	918,607	11,288,163	8,295,508	29,082,815
2057	4,735,126	3,479,775	4.8942	17,030,716	4,892,064	3,595,107	3.0773	11,063,224	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	29,012,547
2058	4,878,656	3,585,253	5.0924	18,257,545	5,322,652	3,911,540	3.1650	12,380,025	1,250,000	918,607	1.0000	918,607	11,451,308	8,415,401	31,556,176
2059	4,735,126	3,479,775	5.2987	18,438,286	4,892,064	3,595,107	3.2552	11,702,793	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	31,059,686
2060	4,699,862	3,453,861	5.5133	19,042,170	4,764,182	3,501,129	3.3480	11,721,778	1,250,000	918,607	1.0000	918,607	10,714,044	7,873,596	31,682,556
2061	4,782,969	3,514,934	5.7366	20,163,773	5,035,593	3,700,585	3.4434	12,742,593	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	33,824,973
2062	4,782,969	3,514,934	5.9689	20,980,292	5,035,593	3,700,585	3.5415	13,105,621	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	35,004,520
2063	4,735,126	3,479,775	6.2106	21,611,943	4,892,064	3,595,107	3.6425	13,095,178	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	35,625,278
2064	4,795,548	3,524,179	6.4622	22,773,949	5,051,241	3,712,084	3.7463	13,906,581	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	37,599,137
2065	4,782,969	3,514,934	6.7239	23,634,068	5,035,593	3,700,585	3.8531	14,258,723	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	38,811,398
2066	4,735,126	3,479,775	6.9962	24,345,204	4,892,064	3,595,107	3.9629	14,247,051	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	39,510,862
2067	4,782,969	3,514,934	7.2795	25,586,965	5,035,593	3,700,585	4.0758	15,082,843	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	41,588,415
2068	4,795,548	3,524,179	7.5744	26,693,541	5,051,241	3,712,084	4.1920	15,561,056	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	43,173,205
2069	4,735,126	3,479,775	7.8811	27,424,457	4,892,064	3,595,107	4.3115	15,500,305	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	43,843,369
2070	4,782,969	3,514,934	8.2003	28,823,517	5,035,593	3,700,585	4.4343	16,409,503	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	46,151,627
2071	4,782,969	3,514,934	8.5324	29,990,827	5,035,593	3,700,585	4.5607	16,877,257	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	47,786,690
2072	4,795,548	3,524,179	8.8780	31,287,661	5,051,241	3,712,084	4.6907	17,412,273	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	49,618,541
2073	4,782,969	3,514,934	9.2375	32,469,207	5,035,593	3,700,585	4.8244	17,853,101	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	51,240,915
2074	4,782,969	3,514,934	9.6117	33,784,496	5,035,593	3,700,585	4.9619	18,361,931	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	53,065,034
2075	5,114,792	3,758,786	10.0009	37,591,247	6,031,061	4,432,140	5.1033	22,618,539	1,250,000	918,607	1.0000	918,607	12,395,853	9,109,533	61,128,392
2076	4,795,548	3,524,179	10.4060	36,672,606	5,051,241	3,712,084	5.2487	19,483,616	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	57,074,829
2077	4,782,969	3,514,934	10.8274	38,057,601	5,035,593	3,700,585	5.3983	19,976,866	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	58,953,075
2078	3,942,348	2,897,174	11.2659	32,639,275	3,256,582	2,393,215	5.5522	13,287,607	0	0	1.0000	0	7,198,929	5,290,389	45,926,882
2079	3,942,348	2,897,174	11.7222	33,961,256	3,256,582	2,393,215	5.7104	13,666,214	0	0	1.0000	0	7,198,929	5,290,389	47,627,470
2080	3,953,149	2,905,112	12.1970	35,433,647	3,265,504	2,399,772	5.8731	14,094,099	0	0	1.0000	0			

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2088	45,111,220	33,151,584	16.7567	555,511,141	11,805,071	8,675,376	7.3537	63,796,110	0	0	1.0000	0	56,916,291	41,826,959	619,307,251
2089	51,818,304	38,080,522	17.4353	663,945,327	62,277,980	45,767,187	7.5633	346,150,962	0	0	1.0000	0	114,096,283	83,847,709	1,010,096,289
2090	44,187,860	32,473,019	18.1415	589,109,275	56,754,748	41,708,244	7.7788	324,440,085	0	0	1.0000	0	100,942,608	74,181,263	913,549,360
2091	35,668,367	26,212,167	18.8762	494,786,111	31,834,151	23,394,458	8.0005	187,167,358	0	0	1.0000	0	67,502,519	49,606,625	681,953,469
2092	13,715,750	10,079,506	19.6407	197,968,561	10,259,487	7,539,548	8.2285	62,039,173	0	0	1.0000	0	23,975,237	17,619,055	260,007,735
2093	18,089,191	13,293,485	20.4361	271,666,992	6,228,187	4,577,005	8.4630	38,735,191	0	0	1.0000	0	24,317,379	17,870,490	310,402,183
2094	12,584,719	9,248,328	21.2638	196,654,598	9,264,588	6,808,412	8.7042	59,261,777	0	0	1.0000	0	21,849,307	16,056,740	255,916,375
2095	9,102,372	6,689,202	22.1250	147,998,586	6,700,962	4,924,440	8.9523	44,085,066	0	0	1.0000	0	15,803,334	11,613,642	192,083,653
	\$611,385,166	\$449,298,117		\$4,601,690,206	\$588,533,792	\$432,504,973		\$1,975,329,908	\$56,250,000	\$41,337,312		\$41,337,312	\$1,256,168,958	\$923,140,402	\$6,618,357,426

Proposed

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s	
Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in				
Nominal \$s	Nominal \$s		Future \$'s	Nominal \$s	Nominal \$s		Future \$'s	Nominal \$s	Nominal \$s		Future \$'s				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2034	\$7,248,794	\$5,327,034	1.9639	\$10,461,762	\$2,826,485	\$2,077,143	1.6124	\$3,349,185	\$1,250,000	\$918,607	1.0000	\$918,607	\$11,325,279	\$8,322,784	\$14,729,554
2035	44,817,806	32,935,958	2.0434	67,301,336	32,275,248	23,718,613	1.6584	39,334,948	1,250,000	918,607	1.0000	918,607	78,343,054	57,573,177	107,554,890
2036	23,021,476	16,918,150	2.1262	35,971,370	19,944,127	14,656,651	1.7056	24,998,384	1,250,000	918,607	1.0000	918,607	44,215,603	32,493,407	61,888,360
2037	10,761,111	7,908,185	2.2123	17,495,278	12,388,936	9,104,450	1.7542	15,971,026	1,250,000	918,607	1.0000	918,607	24,400,047	17,931,242	34,384,910
2038	13,540,277	9,950,554	2.3019	22,905,180	20,726,436	15,231,558	1.8042	27,480,777	1,250,000	918,607	1.0000	918,607	35,516,713	26,100,719	51,304,564
2039	31,160,880	22,899,680	2.3951	54,847,024	75,415,818	55,421,994	1.8556	102,841,052	1,250,000	918,607	1.0000	918,607	107,826,698	79,240,281	158,606,683
2040	4,659,832	3,424,443	2.4921	8,534,055	4,485,457	3,296,297	1.9085	6,290,984	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	15,743,645
2041	4,647,099	3,415,086	2.5930	8,855,319	4,469,786	3,284,781	1.9629	6,447,697	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	16,221,623
2042	4,647,099	3,415,086	2.6981	9,214,244	4,469,786	3,284,781	2.0189	6,631,645	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	16,764,496
2043	4,647,099	3,415,086	2.8073	9,587,172	4,469,786	3,284,781	2.0764	6,820,520	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	17,326,298
2044	4,659,832	3,424,443	2.9210	10,002,799	4,485,457	3,296,297	2.1356	7,039,573	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	17,960,978
2045	4,647,099	3,415,086	3.0393	10,379,472	4,469,786	3,284,781	2.1964	7,214,693	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	18,512,772
2046	4,647,099	3,415,086	3.1624	10,799,869	4,469,786	3,284,781	2.2590	7,420,321	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	19,138,796
2047	4,647,099	3,415,086	3.2905	11,237,341	4,469,786	3,284,781	2.3234	7,631,861	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	19,787,809
2048	4,659,832	3,424,443	3.4238	11,724,609	4,485,457	3,296,297	2.3896	7,876,832	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	20,520,048
2049	4,647,099	3,415,086	3.5624	12,165,903	4,469,786	3,284,781	2.4577	8,073,007	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	21,157,517
2050	4,647,099	3,415,086	3.7067	12,658,700	4,469,786	3,284,781	2.5278	8,303,270	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	21,880,577
2051	4,647,099	3,415,086	3.8568	13,171,304	4,469,786	3,284,781	2.5998	8,539,774	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	22,629,686
2052	4,659,832	3,424,443	4.0130	13,742,291	4,485,457	3,296,297	2.6739	8,813,970	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	23,474,867
2053	4,742,786	3,485,405	4.1756	14,553,658	4,756,846	3,917,648	2.7501	9,613,628	1,250,000	918,607	1.0000	918,607	10,749,633	7,899,750	25,085,893
2054	4,838,472	3,555,723	4.3447	15,448,552	5,043,904	3,706,692	2.8285	10,484,379	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	26,851,538
2055	4,838,472	3,555,723	4.5206	16,074,003	5,043,904	3,706,692	2.9091	10,783,138	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	27,775,749
2056	4,899,048	3,600,240	4.7037	16,934,447	5,203,105	3,823,687	2.9920	11,440,470	1,250,000	918,607	1.0000	918,607	11,352,153	8,342,533	29,293,524
2057	4,790,629	3,520,564	4.8942	17,230,346	4,900,375	3,601,215	3.0773	11,082,018	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	29,230,971
2058	4,934,159	3,626,042	5.0924	18,465,259	5,330,963	3,917,648	3.1650	12,399,355	1,250,000	918,607	1.0000	918,607	11,515,123	8,462,297	31,783,221
2059	4,790,629	3,520,564	5.2987	18,654,414	4,900,375	3,601,215	3.2552	11,722,675	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	31,295,696
2060	4,755,518	3,494,761	5.5133	19,267,668	4,772,516	3,507,253	3.3480	11,742,283	1,250,000	918,607	1.0000	918,607	10,778,034	7,920,621	31,928,558
2061	4,838,472	3,555,723	5.7366	20,397,763	5,043,904	3,706,692	3.4434	12,763,624	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	34,079,994
2062	4,838,472	3,555,723	5.9689	21,223,758	5,043,904	3,706,692	3.5415	13,127,251	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	35,269,615
2063	4,790,629	3,520,564	6.2106	21,864,817	4,900,375	3,601,215	3.6425	13,117,425	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	35,900,849
2064	4,851,204	3,565,080	6.4622	23,038,258	5,059,575	3,718,208	3.7463	13,929,524	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	37,886,389
2065	4,838,472	3,555,723	6.7239	23,908,329	5,043,904	3,706,692	3.8531	14,282,256	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	39,109,192
2066	4,790,629	3,520,564	6.9962	24,630,572	4,900,375	3,601,215	3.9629	14,271,254	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	39,820,433
2067	4,838,472	3,555,723	7.2795	25,883,889	5,043,904	3,706,692	4.0758	15,107,736	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	41,910,232
2068	4,851,204	3,565,080	7.5744	27,003,340	5,059,575	3,718,208	4.1920	15,586,730	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	43,508,676
2069	4,790,629	3,520,564	7.8811	27,745,920	4,900,375	3,601,215	4.3115	15,526,638	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	44,191,164
2070	4,838,472	3,555,723	8.2003	29,157,999	5,043,904	3,706,692	4.4343	16,436,585	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	46,513,191
2071	4,838,472	3,555,723	8.5324	30,338,855	5,043,904	3,706,692	4.5607	16,905,111	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	48,162,573
2072	4,851,204	3,565,080	8.8780	31,650,778	5,059,575	3,718,208	4.6907	17,441,000	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	50,010,385
2073	4,838,472	3,555,723	9.2375	32,845,995	5,043,904	3,706,692	4.8244	17,882,566	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	51,647,168
2074	4,838,472	3,555,723	9.6117	34,176,547	5,043,904	3,706,692	4.9619	18,392,236	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	53,487,390
2075	5,170,295	3,799,575	10.0009	37,999,173	6,039,372	4,438,247	5.1033	22,649,707	1,250,000	918,607	1.0000	918,607	12,459,668	9,156,430	61,567,488
2076	4,851,204	3,565,080	10.4060	37,098,220	5,059,575	3,718,208	5.2487	19,515,760	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	57,532,587
2077	4,838,472	3,555,723	10.8274	38,499,240	5,043,904	3,706,692	5.3983	20,009,837	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	59,427,684
2078	823,359	605,074	11.2659	6,816,708	3,272,479	2,404,897	5.5522	13,352,471	0	-	1.0000	-	4,095,838	3,009,972	20,169,179
2079	823,359	605,074	11.7222	7,092,804	3,272,479	2,404,897	5.7104	13,732,926	0	-	1.0000	-	4,095,838	3,009,972	20,825,729
2080	825,615	606,732	12.1970	7,400,312	3,281,444	2,411,486	5.8731	14,162,899	0	-	1.0000	-	4,107,059	3,018,218	21,563,211
2081	823,359	605,074	12.6909	7,678,939	3,272,479	2,404,897	6.0405	14,526,782	0	-	1.0000				

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s			
2089	29,172,411	21,438,383	17.4353	373,784,641	10,590,974	7,783,154	7.5633	58,866,327	0	-	1.0000	-	39,763,385	29,221,537	432,650,967
2090	57,665,154	42,377,288	18.1415	768,787,572	90,528,180	66,527,851	7.7788	517,506,845	0	-	1.0000	-	148,193,335	108,905,139	1,286,294,416
2091	55,538,057	40,814,115	18.8762	770,415,403	42,217,329	31,024,904	8.0005	248,214,748	0	-	1.0000	-	97,755,386	71,839,020	1,018,630,150
2092	51,408,076	37,779,052	19.6407	742,007,025	32,588,487	23,948,808	8.2285	197,062,766	0	-	1.0000	-	83,996,563	61,727,860	939,069,791
2093	23,223,558	17,066,657	20.4361	348,775,903	8,238,061	6,054,032	8.4630	51,235,271	0	-	1.0000	-	31,461,619	23,120,689	400,011,174
2094	14,460,844	10,627,065	21.2638	225,971,787	14,186,680	10,425,586	8.7042	90,746,385	0	-	1.0000	-	28,647,524	21,052,651	316,718,172
2095	10,459,350	7,686,425	22.1250	170,062,157	10,261,051	7,540,698	8.9523	67,506,588	0	-	1.0000	-	20,720,401	15,227,123	237,568,746
	\$573,536,674	\$421,483,808		\$4,595,865,805	\$595,414,118	\$437,561,225		\$2,092,889,180	\$55,000,000	\$40,418,705		\$40,418,705	\$1,223,950,791	\$899,463,737	\$6,729,173,689
	\$2,152,093,723	\$1,581,542,556		\$15,473,263,497	\$1,934,230,348	\$1,421,437,911		\$6,397,884,902	\$111,250,000	\$81,756,016		\$81,756,016	\$4,197,574,071	\$3,084,736,483	\$21,952,904,416

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,989,016	-	6,696,113	646,357,311
2018	646,357,311	33,305,725	-	13,392,226	693,055,262
2019	693,055,262	35,687,320	-	13,392,226	742,134,808
2020	742,134,808	38,190,377	-	13,392,226	793,717,411
2021	793,717,411	40,725,086	-	9,627,369	844,069,865
2022	844,069,865	43,293,061	-	9,627,369	896,990,295
2023	896,990,295	45,992,003	-	9,627,369	952,609,667
2024	952,609,667	48,828,591	-	9,627,369	1,011,065,626
2025	1,011,065,626	51,809,845	-	9,627,369	1,072,502,840
2026	1,072,502,840	54,943,143	-	9,627,369	1,137,073,351
2027	1,137,073,351	58,236,239	-	9,627,369	1,204,936,959
2028	1,204,936,959	61,697,283	-	9,627,369	1,276,261,610
2029	1,276,261,610	65,334,840	-	9,627,369	1,351,223,819
2030	1,351,223,819	65,438,486	(31,147,456)	7,220,526	1,392,735,375
2031	1,392,735,375	67,269,119	(132,006,851)	-	1,327,997,643
2032	1,327,997,643	64,142,286	(64,727,688)	-	1,327,412,241
2033	1,327,412,241	64,114,011	(82,949,586)	-	1,308,576,666
2034	1,308,576,666	63,204,253	(57,076,369)	-	1,314,704,550
2035	1,314,704,550	63,500,230	(173,387,228)	-	1,204,817,552
2036	1,204,817,552	58,192,688	(18,922,905)	-	1,244,087,335
2037	1,244,087,335	60,089,418	(19,567,775)	-	1,284,608,979
2038	1,284,608,979	62,046,614	(20,290,504)	-	1,326,365,089
2039	1,326,365,089	64,063,434	(21,040,251)	-	1,369,388,271
2040	1,369,388,271	66,141,454	(21,878,095)	-	1,413,651,630
2041	1,413,651,630	68,279,374	(22,626,150)	-	1,459,304,853
2042	1,459,304,853	70,484,424	(23,465,119)	-	1,506,324,158
2043	1,506,324,158	72,755,457	(24,334,547)	-	1,554,745,068
2044	1,554,745,068	75,094,187	(25,306,416)	-	1,604,532,839
2045	1,604,532,839	77,498,936	(26,174,518)	-	1,655,857,257
2046	1,655,857,257	79,977,906	(27,147,257)	-	1,708,687,906
2047	1,708,687,906	82,529,626	(28,157,044)	-	1,763,060,488
2048	1,763,060,488	85,155,822	(34,450,829)	-	1,813,765,481
2049	1,813,765,481	87,604,873	(30,292,438)	-	1,871,077,916
2050	1,871,077,916	90,373,063	(43,810,815)	-	1,917,640,165
2051	1,917,640,165	92,622,020	(45,384,284)	-	1,964,877,901
2052	1,964,877,901	94,903,603	(54,736,528)	-	2,005,044,976
2053	2,005,044,976	96,843,672	(62,491,907)	-	2,039,396,741
2054	2,039,396,741	98,502,863	(52,496,656)	-	2,085,402,948
2055	2,085,402,948	100,724,962	(64,878,112)	-	2,121,249,798
2056	2,121,249,798	102,456,365	(71,617,667)	-	2,152,088,496

EXTERNAL FUND CALCULATION

2057	2,152,088,496	103,945,874	(40,452,942)	-	2,215,581,428
2058	2,215,581,428	107,012,583	(41,970,095)	-	2,280,623,917
2059	2,280,623,917	110,154,135	(43,545,695)	-	2,347,232,356
2060	2,347,232,356	113,371,323	(45,305,101)	-	2,415,298,579
2061	2,415,298,579	116,658,921	(46,879,428)	-	2,485,078,072
2062	2,485,078,072	120,029,271	(48,642,230)	-	2,556,465,113
2063	2,556,465,113	123,477,265	(50,472,856)	-	2,629,469,522
2064	2,629,469,522	127,003,378	(52,517,576)	-	2,703,955,324
2065	2,703,955,324	130,601,042	(54,347,801)	-	2,780,208,565
2066	2,780,208,565	134,284,074	(56,397,117)	-	2,858,095,521
2067	2,858,095,521	138,046,014	(58,524,840)	-	2,937,616,695
2068	2,937,616,695	141,886,886	(60,901,750)	-	3,018,601,832
2069	3,018,601,832	145,798,468	(63,029,878)	-	3,101,370,423
2070	3,101,370,423	149,796,191	(65,412,777)	-	3,185,753,837
2071	3,185,753,837	153,871,910	(67,887,509)	-	3,271,738,238
2072	3,271,738,238	158,024,957	(70,650,837)	-	3,359,112,359
2073	3,359,112,359	162,245,127	(73,126,447)	-	3,448,231,039
2074	3,448,231,039	166,549,559	(75,898,753)	-	3,538,881,845
2075	3,538,881,845	170,927,993	(78,776,904)	-	3,631,032,934
2076	3,631,032,934	175,378,891	(81,990,836)	-	3,724,420,988
2077	3,724,420,988	179,889,534	(84,871,609)	-	3,819,438,913
2078	3,819,438,913	184,478,899	(97,913,941)	-	3,906,003,871
2079	3,906,003,871	188,659,987	(103,619,682)	-	3,991,044,176
2080	3,991,044,176	192,767,434	(105,668,399)	-	4,078,143,211
2081	4,078,143,211	196,974,317	(109,371,489)	-	4,165,746,039
2082	4,165,746,039	201,205,534	(113,487,212)	-	4,253,464,361
2083	4,253,464,361	205,442,329	(120,074,192)	-	4,338,832,498
2084	4,338,832,498	209,565,610	(122,499,775)	-	4,425,898,332
2085	4,425,898,332	213,770,889	(565,398,083)	-	4,074,271,139
2086	4,074,271,139	196,787,296	(849,848,270)	-	3,421,210,166
2087	3,421,210,166	165,244,451	(1,101,337,516)	-	2,485,117,101
2088	2,485,117,101	120,031,156	(827,873,914)	-	1,777,274,343
2089	1,777,274,343	85,842,351	(823,777,077)	-	1,039,339,617
2090	1,039,339,617	50,200,104	(567,011,870)	-	522,527,851
2091	522,527,851	25,238,095	(387,145,582)	-	160,620,364
2092	160,620,364	7,757,964	(168,378,328)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,584,112	-	24,632	383,975,799
2018	383,975,799	19,660,822	-	49,264	403,685,885
2019	403,685,885	20,669,978	-	49,264	424,405,128
2020	424,405,128	21,730,804	-	49,264	446,185,196
2021	446,185,196	23,194,838	-	13,677,983	483,058,017
2022	483,058,017	25,082,727	-	13,677,983	521,818,727
2023	521,818,727	27,067,275	-	13,677,983	562,563,985
2024	562,563,985	29,153,432	-	13,677,983	605,395,401
2025	605,395,401	31,346,401	-	13,677,983	650,419,784
2026	650,419,784	33,651,649	-	13,677,983	697,749,417
2027	697,749,417	36,074,926	-	13,677,983	747,502,326
2028	747,502,326	38,622,275	-	13,677,983	799,802,584
2029	799,802,584	41,300,049	-	13,677,983	854,780,616
2030	854,780,616	44,114,924	-	13,677,983	912,573,523
2031	912,573,523	47,073,921	-	13,677,983	973,325,427
2032	973,325,427	50,184,418	-	13,677,983	1,037,187,828
2033	1,037,187,828	50,256,165	(31,333,093)	10,942,386	1,067,053,286
2034	1,067,053,286	51,431,968	(102,068,673)	-	1,016,416,581
2035	1,016,416,581	48,991,279	(44,424,613)	-	1,020,983,247
2036	1,020,983,247	49,211,393	(37,965,127)	-	1,032,229,513
2037	1,032,229,513	49,753,463	(39,150,411)	-	1,042,832,565
2038	1,042,832,565	50,264,530	(56,242,259)	-	1,036,854,835
2039	1,036,854,835	49,976,403	(162,806,683)	-	924,024,555
2040	924,024,555	44,537,984	(15,630,028)	-	952,932,510
2041	952,932,510	45,931,347	(16,103,868)	-	982,759,989
2042	982,759,989	47,369,031	(16,642,112)	-	1,013,486,908
2043	1,013,486,908	48,850,069	(17,199,109)	-	1,045,137,867
2044	1,045,137,867	50,375,645	(17,828,428)	-	1,077,685,085
2045	1,077,685,085	51,944,421	(18,375,387)	-	1,111,254,118
2046	1,111,254,118	53,562,449	(18,996,008)	-	1,145,820,559
2047	1,145,820,559	55,228,551	(19,639,402)	-	1,181,409,707
2048	1,181,409,707	56,943,948	(20,365,377)	-	1,217,988,278
2049	1,217,988,278	58,707,035	(20,997,200)	-	1,255,698,114
2050	1,255,698,114	60,524,649	(21,713,946)	-	1,294,508,817
2051	1,294,508,817	62,395,325	(22,456,492)	-	1,334,447,650
2052	1,334,447,650	64,320,377	(23,294,357)	-	1,375,473,670
2053	1,375,473,670	66,297,831	(24,898,776)	-	1,416,872,725
2054	1,416,872,725	68,293,265	(26,657,046)	-	1,458,508,944
2055	1,458,508,944	70,300,131	(27,573,591)	-	1,501,235,485
2056	1,501,235,485	72,359,550	(29,082,815)	-	1,544,512,220

Proposed

EXTERNAL FUND CALCULATION

2057	1,544,512,220	74,445,489	(29,012,547)	-	1,589,945,162
2058	1,589,945,162	76,635,357	(31,556,176)	-	1,635,024,342
2059	1,635,024,342	78,808,173	(31,059,686)	-	1,682,772,830
2060	1,682,772,830	81,109,650	(31,682,556)	-	1,732,199,925
2061	1,732,199,925	83,492,036	(33,824,973)	-	1,781,866,988
2062	1,781,866,988	85,885,989	(35,004,520)	-	1,832,748,457
2063	1,832,748,457	88,338,476	(35,625,278)	-	1,885,461,654
2064	1,885,461,654	90,879,252	(37,599,137)	-	1,938,741,769
2065	1,938,741,769	93,447,353	(38,811,398)	-	1,993,377,725
2066	1,993,377,725	96,080,806	(39,510,862)	-	2,049,947,670
2067	2,049,947,670	98,807,478	(41,588,415)	-	2,107,166,732
2068	2,107,166,732	101,565,436	(43,173,205)	-	2,165,558,964
2069	2,165,558,964	104,379,942	(43,843,369)	-	2,226,095,536
2070	2,226,095,536	107,297,805	(46,151,627)	-	2,287,241,715
2071	2,287,241,715	110,245,051	(47,786,690)	-	2,349,700,075
2072	2,349,700,075	113,255,544	(49,618,541)	-	2,413,337,078
2073	2,413,337,078	116,322,847	(51,240,915)	-	2,478,419,010
2074	2,478,419,010	119,459,796	(53,065,034)	-	2,544,813,773
2075	2,544,813,773	122,660,024	(61,128,392)	-	2,606,345,405
2076	2,606,345,405	125,625,849	(57,074,829)	-	2,674,896,424
2077	2,674,896,424	128,930,008	(58,953,075)	-	2,744,873,357
2078	2,744,873,357	132,302,896	(45,926,882)	-	2,831,249,371
2079	2,831,249,371	136,466,220	(47,627,470)	-	2,920,088,121
2080	2,920,088,121	140,748,247	(49,527,746)	-	3,011,308,622
2081	3,011,308,622	145,145,076	(51,223,963)	-	3,105,229,735
2082	3,105,229,735	149,672,073	(53,125,222)	-	3,201,776,587
2083	3,201,776,587	154,325,631	(55,098,229)	-	3,301,003,989
2084	3,301,003,989	159,108,392	(57,303,117)	-	3,402,809,265
2085	3,402,809,265	164,015,407	(59,272,264)	-	3,507,552,407
2086	3,507,552,407	169,064,026	(61,478,455)	-	3,615,137,979
2087	3,615,137,979	174,249,651	(165,701,740)	-	3,623,685,889
2088	3,623,685,889	174,661,660	(619,307,251)	-	3,179,040,298
2089	3,179,040,298	153,229,742	(1,010,096,289)	-	2,322,173,751
2090	2,322,173,751	111,928,775	(913,549,360)	-	1,520,553,166
2091	1,520,553,166	73,290,663	(681,953,469)	-	911,890,360
2092	911,890,360	43,953,115	(260,007,735)	-	695,835,741
2093	695,835,741	33,539,283	(310,402,183)	-	418,972,840
2094	418,972,840	20,194,491	(255,916,375)	-	183,250,957
2095	183,250,957	8,832,696	(192,083,653)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,803,157	-	294,670	431,306,795
2018	431,306,795	22,184,315	-	589,341	454,080,451
2019	454,080,451	23,354,881	-	589,341	478,024,673
2020	478,024,673	24,585,614	-	589,341	503,199,628
2021	503,199,628	25,962,960	-	3,832,669	532,995,257
2022	532,995,257	27,494,456	-	3,832,669	564,322,382
2023	564,322,382	29,104,670	-	3,832,669	597,259,721
2024	597,259,721	30,797,649	-	3,832,669	631,890,039
2025	631,890,039	32,577,648	-	3,832,669	668,300,356
2026	668,300,356	34,449,138	-	3,832,669	706,582,162
2027	706,582,162	36,416,823	-	3,832,669	746,831,654
2028	746,831,654	38,485,647	-	3,832,669	789,149,970
2029	789,149,970	40,660,808	-	3,832,669	833,643,446
2030	833,643,446	42,947,773	-	3,832,669	880,423,888
2031	880,423,888	45,352,287	-	3,832,669	929,608,844
2032	929,608,844	47,880,394	-	3,832,669	981,321,907
2033	981,321,907	50,538,446	-	3,832,669	1,035,693,022
2034	1,035,693,022	50,098,020	(14,729,554)	3,066,135	1,074,127,623
2035	1,074,127,623	51,880,364	(107,554,890)	-	1,018,453,097
2036	1,018,453,097	49,191,285	(61,888,360)	-	1,005,756,021
2037	1,005,756,021	48,578,016	(34,384,910)	-	1,019,949,126
2038	1,019,949,126	49,263,543	(51,304,564)	-	1,017,908,105
2039	1,017,908,105	49,164,961	(158,606,683)	-	908,466,384
2040	908,466,384	43,878,926	(15,743,645)	-	936,601,665
2041	936,601,665	45,237,860	(16,221,623)	-	965,617,903
2042	965,617,903	46,639,345	(16,764,496)	-	995,492,752
2043	995,492,752	48,082,300	(17,326,298)	-	1,026,248,754
2044	1,026,248,754	49,567,815	(17,960,978)	-	1,057,855,590
2045	1,057,855,590	51,094,425	(18,512,772)	-	1,090,437,244
2046	1,090,437,244	52,668,119	(19,138,796)	-	1,123,966,566
2047	1,123,966,566	54,287,585	(19,787,809)	-	1,158,466,342
2048	1,158,466,342	55,953,924	(20,520,048)	-	1,193,900,219
2049	1,193,900,219	57,665,381	(21,157,517)	-	1,230,408,083
2050	1,230,408,083	59,428,710	(21,880,577)	-	1,267,956,216
2051	1,267,956,216	61,242,285	(22,629,686)	-	1,306,568,816
2052	1,306,568,816	63,107,274	(23,474,867)	-	1,346,201,222
2053	1,346,201,222	65,021,519	(25,085,893)	-	1,386,136,849
2054	1,386,136,849	66,950,410	(26,851,538)	-	1,426,235,721
2055	1,426,235,721	68,887,185	(27,775,749)	-	1,467,347,158
2056	1,467,347,158	70,872,868	(29,293,524)	-	1,508,926,501

Proposed

EXTERNAL FUND CALCULATION

2057	1,508,926,501	72,881,150	(29,230,971)	-	1,552,576,680
2058	1,552,576,680	74,989,454	(31,783,221)	-	1,595,782,913
2059	1,595,782,913	77,076,315	(31,295,696)	-	1,641,563,532
2060	1,641,563,532	79,287,519	(31,928,558)	-	1,688,922,493
2061	1,688,922,493	81,574,956	(34,079,994)	-	1,736,417,455
2062	1,736,417,455	83,868,963	(35,269,615)	-	1,785,016,803
2063	1,785,016,803	86,216,312	(35,900,849)	-	1,835,332,265
2064	1,835,332,265	88,646,548	(37,886,389)	-	1,886,092,425
2065	1,886,092,425	91,098,264	(39,109,192)	-	1,938,081,497
2066	1,938,081,497	93,609,336	(39,820,433)	-	1,991,870,400
2067	1,991,870,400	96,207,340	(41,910,232)	-	2,046,167,508
2068	2,046,167,508	98,829,891	(43,508,676)	-	2,101,488,722
2069	2,101,488,722	101,501,905	(44,191,164)	-	2,158,799,463
2070	2,158,799,463	104,270,014	(46,513,191)	-	2,216,556,286
2071	2,216,556,286	107,059,669	(48,162,573)	-	2,275,453,381
2072	2,275,453,381	109,904,398	(50,010,385)	-	2,335,347,395
2073	2,335,347,395	112,797,279	(51,647,168)	-	2,396,497,506
2074	2,396,497,506	115,750,830	(53,487,390)	-	2,458,760,945
2075	2,458,760,945	118,758,154	(61,567,488)	-	2,515,951,611
2076	2,515,951,611	121,520,463	(57,532,587)	-	2,579,939,487
2077	2,579,939,487	124,611,077	(59,427,684)	-	2,645,122,880
2078	2,645,122,880	127,759,435	(20,169,179)	-	2,752,713,136
2079	2,752,713,136	132,956,044	(20,825,729)	-	2,864,843,451
2080	2,864,843,451	138,371,939	(21,563,211)	-	2,981,652,179
2081	2,981,652,179	144,013,800	(22,205,721)	-	3,103,460,257
2082	3,103,460,257	149,897,130	(22,930,853)	-	3,230,426,535
2083	3,230,426,535	156,029,602	(23,680,114)	-	3,362,776,023
2084	3,362,776,023	162,422,082	(24,522,010)	-	3,500,676,095
2085	3,500,676,095	169,082,655	(25,255,785)	-	3,644,502,965
2086	3,644,502,965	176,029,493	(26,083,465)	-	3,794,448,993
2087	3,794,448,993	183,271,886	(26,939,197)	-	3,950,781,682
2088	3,950,781,682	190,822,755	(171,196,773)	-	3,970,407,664
2089	3,970,407,664	191,770,690	(432,650,967)	-	3,729,527,387
2090	3,729,527,387	180,136,173	(1,286,294,416)	-	2,623,369,144
2091	2,623,369,144	126,708,730	(1,018,630,150)	-	1,731,447,723
2092	1,731,447,723	83,628,925	(939,069,791)	-	876,006,857
2093	876,006,857	42,311,131	(400,011,174)	-	518,306,814
2094	518,306,814	25,034,219	(316,718,172)	-	226,622,861
2095	226,622,861	10,945,884	(237,568,746)	-	0

2021 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	\$32,521,178	\$19,128,952
Prairie Island Unit 1	49,264	27,503,535	27,454,270
Prairie Island Unit 2	589,341	11,536,963	10,947,622
TOTAL	\$14,030,831	\$71,561,676	\$57,530,845

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
SAFSTOR Method
5-Year Early Shutdown

Docket No. E002/M-17-828
Schedule F.19
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Proposed

2021 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2021 Decommissioning Accrual
Monticello	8.75	5.10%	4.83%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	32,521,178
Prairie Island Unit 1	11.67	5.12%	4.82%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	27,503,535
Prairie Island Unit 2	12.83	5.14%	4.83%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	11,536,963
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	\$71,561,676

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$	Nominal \$	Nominal \$	Factor	Future \$			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2025	\$17,759,328	\$13,051,073	1.3738	\$17,929,565	\$8,763,593	\$6,440,238	1.2521	\$8,063,822	\$0	\$0	1.0000	\$0	\$26,522,921	\$19,491,311	\$25,993,386
2026	63,231,064	46,467,594	1.4295	66,425,426	46,823,276	34,409,748	1.2878	44,312,874	0	0	1.0000	0	110,054,340	80,877,343	110,738,300
2027	30,098,747	22,119,134	1.4874	32,900,000	21,963,833	16,140,903	1.3245	21,378,627	0	0	1.0000	0	52,062,580	38,260,037	54,278,627
2028	30,011,960	22,055,355	1.5476	34,132,868	35,867,567	26,358,556	1.3622	35,905,625	0	0	1.0000	0	65,879,526	48,413,911	70,038,493
2029	24,261,956	17,829,760	1.6103	28,711,263	18,617,567	13,681,781	1.4010	19,168,175	0	0	1.0000	0	42,879,522	31,511,541	47,879,438
2030	43,935,865	32,287,832	1.6755	54,098,262	88,132,650	64,767,410	1.4410	93,329,837	0	0	1.0000	0	132,068,514	97,055,241	147,428,099
2031	8,481,485	6,232,921	1.7434	10,866,474	4,523,995	3,324,618	1.4820	4,927,084	0	0	1.0000	0	13,005,479	9,557,539	15,793,558
2032	8,458,357	6,215,924	1.8140	11,275,686	4,511,770	3,315,635	1.5243	5,054,022	0	0	1.0000	0	12,970,127	9,531,559	16,329,708
2033	8,458,357	6,215,924	1.8874	11,731,935	4,511,770	3,315,635	1.5677	5,197,920	0	0	1.0000	0	12,970,127	9,531,559	16,929,855
2034	8,458,357	6,215,924	1.9639	12,207,453	4,511,770	3,315,635	1.6124	5,346,129	0	0	1.0000	0	12,970,127	9,531,559	17,553,582
2035	8,481,485	6,232,921	2.0434	12,736,350	4,523,995	3,324,618	1.6584	5,513,547	0	0	1.0000	0	13,005,479	9,557,539	18,249,897
2036	8,458,357	6,215,924	2.1262	13,216,298	4,511,770	3,315,635	1.7056	5,655,146	0	0	1.0000	0	12,970,127	9,531,559	18,871,444
2037	8,458,357	6,215,924	2.2123	13,751,489	4,511,770	3,315,635	1.7542	5,816,286	0	0	1.0000	0	12,970,127	9,531,559	19,567,775
2038	8,458,357	6,215,924	2.3019	14,308,436	4,511,770	3,315,635	1.8042	5,982,068	0	0	1.0000	0	12,970,127	9,531,559	20,290,504
2039	8,481,485	6,232,921	2.3951	14,928,468	4,523,995	3,324,618	1.8556	6,169,162	0	0	1.0000	0	13,005,479	9,557,539	21,097,630
2040	8,458,357	6,215,924	2.4921	15,490,704	4,511,770	3,315,635	1.9085	6,327,889	0	0	1.0000	0	12,970,127	9,531,559	21,818,593
2041	8,458,357	6,215,924	2.5930	16,117,891	4,511,770	3,315,635	1.9629	6,508,259	0	0	1.0000	0	12,970,127	9,531,559	22,626,150
2042	8,458,357	6,215,924	2.6981	16,771,185	4,511,770	3,315,635	2.0189	6,693,935	0	0	1.0000	0	12,970,127	9,531,559	23,465,119
2043	9,145,130	6,720,624	2.8073	18,866,807	6,514,932	4,787,729	2.0764	9,941,241	0	0	1.0000	0	15,660,061	11,508,353	28,808,047
2044	8,458,357	6,215,924	2.9210	18,156,714	4,511,767	3,315,632	2.1356	7,080,864	0	0	1.0000	0	12,970,124	9,531,556	25,237,579
2045	9,951,558	7,313,256	3.0393	22,227,179	8,991,374	6,607,631	2.1964	14,513,000	0	0	1.0000	0	18,942,932	13,920,887	36,740,179
2046	9,951,558	7,313,256	3.1624	23,127,440	8,991,374	6,607,631	2.2590	14,926,638	0	0	1.0000	0	18,942,932	13,920,887	38,054,078
2047	10,837,186	7,964,091	3.2905	26,205,842	11,591,099	8,518,131	2.3234	19,791,025	0	0	1.0000	0	22,428,284	16,482,222	45,996,867
2048	11,460,933	8,422,474	3.4238	28,836,866	13,519,499	9,935,284	2.3896	23,741,355	0	0	1.0000	0	24,980,432	18,357,758	52,578,221
2049	10,167,183	7,471,716	3.5624	26,617,240	9,638,249	7,083,010	2.4577	17,407,913	0	0	1.0000	0	19,805,432	14,554,725	44,025,153
2050	11,245,308	8,264,014	3.7067	30,632,221	12,872,624	9,459,905	2.5278	23,912,748	0	0	1.0000	0	24,117,932	17,723,919	54,544,969
2051	11,699,686	8,597,930	3.8568	33,160,496	14,178,599	10,419,647	2.5998	27,088,999	0	0	1.0000	0	25,878,284	19,017,577	60,249,495
2052	8,441,765	6,203,731	4.0130	24,895,572	4,461,997	3,279,057	2.6739	8,767,871	0	0	1.0000	0	12,903,762	9,482,788	33,663,443
2053	8,441,765	6,203,731	4.1756	25,904,299	4,461,997	3,279,057	2.7501	9,017,735	0	0	1.0000	0	12,903,762	9,482,788	34,922,034
2054	8,441,765	6,203,731	4.3447	26,953,349	4,461,997	3,279,057	2.8285	9,274,813	0	0	1.0000	0	12,903,762	9,482,788	36,228,162
2055	8,464,894	6,220,728	4.5206	28,121,423	4,474,222	3,288,041	2.9091	9,565,240	0	0	1.0000	0	12,939,115	9,508,769	37,686,663
2056	8,441,765	6,203,731	4.7037	29,180,489	4,461,997	3,279,057	2.9920	9,810,939	0	0	1.0000	0	12,903,762	9,482,788	38,991,428
2057	8,441,765	6,203,731	4.8942	30,362,300	4,461,997	3,279,057	3.0773	10,090,642	0	0	1.0000	0	12,903,762	9,482,788	40,452,942
2058	8,441,765	6,203,731	5.0924	31,591,879	4,461,997	3,279,057	3.1650	10,378,216	0	0	1.0000	0	12,903,762	9,482,788	41,970,095
2059	8,464,894	6,220,728	5.2987	32,961,772	4,474,222	3,288,041	3.2552	10,703,230	0	0	1.0000	0	12,939,115	9,508,769	43,665,002
2060	8,441,765	6,203,731	5.5133	34,203,029	4,461,997	3,279,057	3.3480	10,978,283	0	0	1.0000	0	12,903,762	9,482,788	45,181,313
2061	8,441,765	6,203,731	5.7366	35,588,322	4,461,997	3,279,057	3.4434	11,291,105	0	0	1.0000	0	12,903,762	9,482,788	46,879,428
2062	8,441,765	6,203,731	5.9689	37,029,449	4,461,997	3,279,057	3.5415	11,612,781	0	0	1.0000	0	12,903,762	9,482,788	48,642,230
2063	8,464,894	6,220,728	6.2106	38,634,454	4,474,222	3,288,041	3.6425	11,976,689	0	0	1.0000	0	12,939,115	9,508,769	50,611,142
2064	8,441,765	6,203,731	6.4622	40,089,750	4,461,997	3,279,057	3.7463	12,284,332	0	0	1.0000	0	12,903,762	9,482,788	52,374,081
2065	8,441,765	6,203,731	6.7239	41,713,266	4,461,997	3,279,057	3.8531	12,634,535	0	0	1.0000	0	12,903,762	9,482,788	54,347,801
2066	8,441,765	6,203,731	6.9962	43,402,542	4,461,997	3,279,057	3.9629	12,994,575	0	0	1.0000	0	12,903,762	9,482,788	56,397,117
2067	8,464,894	6,220,728	7.2795	45,283,790	4,474,222	3,288,041	4.0758	13,401,397	0	0	1.0000	0	12,939,115	9,508,769	58,685,187
2068	8,441,765	6,203,731	7.5744	46,989,539	4,461,997	3,279,057	4.1920	13,745,807	0	0	1.0000	0	12,903,762	9,482,788	60,735,346
2069	8,441,765	6,203,731	7.8811	48,892,223	4,461,997	3,279,057	4.3115	14,137,655	0	0	1.0000	0	12,903,762	9,482,788	63,029,878
2070	8,441,765	6,203,731	8.2003	50,872,454	4,461,997	3,279,057	4.4343	14,540,323	0	0	1.0000	0	12,903,762	9,482,788	65,412,777
2071	8,464,894	6,220,728	8.5324	53,077,740	4,474,222	3,288,041	4.5607	14,995,768	0	0	1.0000	0	12,939,115	9,508,769	68,073,508
2072	8,441,765	6,203,731	8.8780	55,076,723	4,461,997	3,279,057	4.6907	15,381,073	0	0	1.0000	0	12,903,762	9,482,788	70,457,796
2073	8,920,197	6,555,324	9.2375	60,554,802	5,897,293	4,333,835	4.8244	20,908,155	0	0	1.0000	0	14,817,490	10,889,159	81,462,957
2074	9,015,884	6,625,643	9.6117	63,683,689	6,184,352	4,544,791	4.9619	22,550,798	0	0	1.0000	0	15,200,236	11,170,433	86,234,487
2075	8,943,325	6,572,320	10.0009	65,729,116	5,909,518	4,342,819	5.1033	22,162,709	0	0	1.0000	0	14,852,842	10,915,139	87,891,824
2076	8,920,197	6,555,324	10.4060	68,214,698	5,897,293	4,333,835	5.2487	22,747,002	0	0	1.0000	0	14,817,490	10,889,159	90,961,699
2077	8,920,197	6,555,324	10.8274	70,977,111	5,897,293	4,333,835	5.3983	23,395,343	0	0	1.0000	0	14,817,490	10,889,159	94,372,454
2078	9,015,884	6,625,643	11.2659	74,643,827	6,184,352	4,544,791	5.5522	25,233,588	0	0	1.0000	0	15,200,236	11,170,433	99,877,415
2079	8,943,325	6,572,320	11.7222	77,042,050	5,909,518	4,342,819	5.7104	24,799,234	0	0	1.0000	0	14,852,842	10,915,139	101,841,284

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2080	46,126,149	33,897,440	12.1970	413,447,077	12,314,062	9,049,426	5.8731	53,148,185	0	0	1.0000	0	58,440,212	42,946,866	466,595,262
2081	53,631,139	39,412,748	12.6909	500,183,247	46,945,385	34,499,485	6.0405	208,394,136	0	0	1.0000	0	100,576,524	73,912,233	708,577,384
2082	57,419,114	42,196,476	13.2049	557,200,251	80,273,242	58,991,645	6.2127	366,497,393	0	0	1.0000	0	137,692,356	101,188,121	923,697,643
2083	52,652,752	38,693,746	13.7397	531,640,460	33,214,319	24,408,722	6.3897	155,964,414	0	0	1.0000	0	85,867,070	63,102,468	687,604,874
2084	50,913,638	37,415,697	14.2962	534,902,283	30,841,715	22,665,130	6.5719	148,952,970	0	0	1.0000	0	81,755,354	60,080,827	683,855,253
2085	32,667,889	24,007,160	14.8752	357,111,300	23,001,023	16,903,119	6.7592	114,251,564	0	0	1.0000	0	55,668,913	40,910,279	471,362,864
2086	21,071,356	15,485,035	15.4776	239,671,177	16,131,940	11,855,130	6.9518	82,414,491	0	0	1.0000	0	37,203,297	27,340,165	322,085,668
2087	8,832,651	6,490,987	16.1045	104,534,104	6,762,156	4,969,411	7.1499	35,530,788	0	0	1.0000	0	15,594,807	11,460,398	140,064,893
	\$967,171,883	\$710,760,631		\$5,145,790,110	\$750,282,438	\$551,371,714		\$2,024,287,970	\$0	\$0		\$0	\$1,717,454,322	\$1,262,132,345	\$7,170,078,080

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s	
Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s				
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2028	\$18,446,908	\$13,556,366	1.5476	\$20,979,832	\$4,190,856	\$3,079,799	1.3622	\$4,195,302	\$1,250,000	\$918,607	1.0000	\$918,607	\$23,887,764	\$17,554,772	\$26,093,741
2029	46,142,627	33,909,549	1.6103	54,604,547	29,162,161	21,430,850	1.4010	30,024,621	1,250,000	918,607	1.0000	918,607	76,554,787	56,259,006	85,547,775
2030	16,398,923	12,051,331	1.6755	20,192,006	15,491,742	11,384,657	1.4410	16,405,291	1,250,000	918,607	1.0000	918,607	33,140,665	24,354,595	37,515,903
2031	12,659,656	9,303,398	1.7434	16,219,545	13,774,811	10,122,909	1.4820	15,002,152	1,250,000	918,607	1.0000	918,607	27,684,467	20,344,915	32,140,303
2032	12,625,333	9,278,174	1.8140	16,830,608	13,734,545	10,093,318	1.5243	15,385,245	1,250,000	918,607	1.0000	918,607	27,609,877	20,290,100	33,134,460
2033	15,404,499	11,320,543	1.8874	21,366,393	22,072,045	16,220,427	1.5677	25,428,763	1,250,000	918,607	1.0000	918,607	38,726,543	28,459,577	47,713,763
2034	32,688,492	24,022,300	1.9639	47,177,395	76,524,027	56,236,401	1.6124	90,675,573	1,250,000	918,607	1.0000	918,607	110,462,519	81,177,308	138,771,575
2035	4,604,176	3,383,542	2.0434	6,913,931	4,477,123	3,290,173	1.6584	5,456,423	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	13,288,961
2036	4,591,596	3,374,297	2.1262	7,174,431	4,461,475	3,278,674	1.7056	5,592,106	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	13,685,143
2037	4,591,596	3,374,297	2.2123	7,464,958	4,461,475	3,278,674	1.7542	5,751,449	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	14,135,014
2038	4,591,596	3,374,297	2.3019	7,767,295	4,461,475	3,278,674	1.8042	5,915,383	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	14,601,285
2039	4,604,176	3,383,542	2.3951	8,103,923	4,477,123	3,290,173	1.8556	6,105,245	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	15,127,775
2040	4,591,596	3,374,297	2.4921	8,409,086	4,461,475	3,278,674	1.9085	6,257,349	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	15,585,042
2041	4,591,596	3,374,297	2.5930	8,749,553	4,461,475	3,278,674	1.9629	6,435,709	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	16,103,868
2042	4,591,596	3,374,297	2.6981	9,104,191	4,461,475	3,278,674	2.0189	6,619,314	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	16,642,112
2043	4,604,176	3,383,542	2.8073	9,498,619	4,477,123	3,290,173	2.0764	6,831,715	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	17,248,941
2044	4,591,596	3,374,297	2.9210	9,856,322	4,461,475	3,278,674	2.1356	7,001,935	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	17,776,865
2045	4,591,596	3,374,297	3.0393	10,255,502	4,461,475	3,278,674	2.1964	7,201,279	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	18,375,387
2046	4,591,596	3,374,297	3.1624	10,670,878	4,461,475	3,278,674	2.2590	7,406,524	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	18,996,008
2047	4,604,176	3,383,542	3.2905	11,133,546	4,477,123	3,290,173	2.3234	7,644,388	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	19,696,541
2048	4,687,283	3,444,616	3.4238	11,793,677	4,748,534	3,489,629	2.3896	8,338,818	1,250,000	918,607	1.0000	918,607	10,685,817	7,852,852	21,051,102
2049	4,782,969	3,514,934	3.5624	12,521,603	5,035,593	3,700,585	2.4577	9,094,927	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	22,535,136
2050	4,782,969	3,514,934	3.7067	13,028,808	5,035,593	3,700,585	2.5278	9,354,338	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	23,301,752
2051	4,843,392	3,559,339	3.8568	13,727,658	5,194,771	3,817,562	2.5998	9,924,898	1,250,000	918,607	1.0000	918,607	11,288,163	8,295,508	24,571,163
2052	4,735,126	3,479,775	4.0130	13,964,338	4,892,064	3,595,107	2.6739	9,612,957	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	24,495,903
2053	4,878,656	3,585,253	4.1756	14,970,584	5,322,652	3,911,540	2.7501	10,757,127	1,250,000	918,607	1.0000	918,607	11,451,308	8,415,401	26,646,318
2054	4,735,126	3,479,775	4.3447	15,118,580	4,892,064	3,595,107	2.8285	10,168,761	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	26,205,948
2055	4,699,862	3,453,861	4.5206	15,613,523	4,764,182	3,501,129	2.9091	10,185,133	1,250,000	918,607	1.0000	918,607	10,714,044	7,873,596	26,717,263
2056	4,782,969	3,514,934	4.7037	16,533,197	5,035,593	3,700,585	2.9920	11,072,149	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	28,523,954
2057	4,782,969	3,514,934	4.8942	17,202,792	5,035,593	3,700,585	3.0773	11,387,809	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	29,509,208
2058	4,735,126	3,479,775	5.0924	17,720,408	4,892,064	3,595,107	3.1650	11,378,515	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	30,017,529
2059	4,795,548	3,524,179	5.2987	18,673,567	5,051,241	3,712,084	3.2552	12,083,576	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	31,675,750
2060	4,782,969	3,514,934	5.5133	19,378,888	5,035,593	3,700,585	3.3480	12,389,557	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	32,687,053
2061	4,735,126	3,479,775	5.7366	19,962,079	4,892,064	3,595,107	3.4434	12,379,392	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	33,260,079
2062	4,782,969	3,514,934	5.9689	20,980,292	5,035,593	3,700,585	3.5415	13,105,621	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	35,004,520
2063	4,795,548	3,524,179	6.2106	21,887,266	5,051,241	3,712,084	3.6425	13,521,266	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	36,327,139
2064	4,735,126	3,479,775	6.4622	22,487,004	4,892,064	3,595,107	3.7463	13,468,350	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	36,873,962
2065	4,782,969	3,514,934	6.7239	23,634,068	5,035,593	3,700,585	3.8531	14,258,723	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	38,811,398
2066	4,782,969	3,514,934	6.9962	24,591,185	5,035,593	3,700,585	3.9629	14,665,047	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	40,174,838
2067	4,795,548	3,524,179	7.2795	25,654,261	5,051,241	3,712,084	4.0758	15,129,712	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	41,702,580
2068	4,782,969	3,514,934	7.5744	26,623,520	5,035,593	3,700,585	4.1920	15,512,851	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	43,054,977
2069	4,782,969	3,514,934	7.8811	27,701,550	5,035,593	3,700,585	4.3115	15,955,071	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	44,575,228
2070	5,114,792	3,758,786	8.2003	30,823,176	6,031,061	4,432,140	4.4343	19,653,437	1,250,000	918,607	1.0000	918,607	12,395,853	9,109,533	51,395,220
2071	4,795,548	3,524,179	8.5324	30,069,705	5,051,241	3,712,084	4.5607	16,929,702	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	47,918,013
2072	4,782,969	3,514,934	8.8780	31,205,588	5,035,593	3,700,585	4.6907	17,358,333	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	49,482,528
2073	3,942,348	2,897,174	9.2375	26,762,647	3,256,582	2,393,215	4.8244	11,545,826	0	0	1.0000	0	7,198,929	5,290,389	38,308,473
2074	3,942,348	2,897,174	9.6117	27,846,769	3,256,582	2,393,215	4.9619	11,874,893	0	0	1.0000	0	7,198,929	5,290,389	39,721,662
2075	3,953,149	2,905,112	10.0009	29,053,731	3,265,										

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2083	45,111,220	33,151,584	13.7397	455,492,813	11,805,071	8,675,376	6.3897	55,433,048	0	0	1.0000	0	56,916,291	41,826,959	510,925,861
2084	51,818,304	38,080,522	14.2962	544,406,760	62,277,980	45,767,187	6.5719	300,777,373	0	0	1.0000	0	114,096,283	83,847,709	845,184,134
2085	44,187,860	32,473,019	14.8752	483,042,653	56,754,748	41,708,244	6.7592	281,914,360	0	0	1.0000	0	100,942,608	74,181,263	764,957,013
2086	35,668,367	26,212,167	15.4776	405,701,439	31,834,151	23,394,458	6.9518	162,633,590	0	0	1.0000	0	67,502,519	49,606,625	568,335,029
2087	13,715,750	10,079,506	16.1045	162,325,411	10,259,487	7,539,548	7.1499	53,907,017	0	0	1.0000	0	23,975,237	17,619,055	216,232,427
2088	18,089,191	13,293,485	16.7567	222,754,942	6,228,187	4,577,005	7.3537	33,657,920	0	0	1.0000	0	24,317,379	17,870,490	256,412,862
2089	12,584,719	9,248,328	17.4353	161,247,374	9,264,588	6,808,412	7.5633	51,494,060	0	0	1.0000	0	21,849,307	16,056,740	212,741,434
2090	9,102,372	6,689,202	18.1415	121,352,152	6,700,962	4,924,440	7.7788	38,306,236	0	0	1.0000	0	15,803,334	11,613,642	159,658,387
	\$611,385,166	\$449,298,117		\$3,773,175,957	\$588,533,792	\$432,504,973		\$1,716,403,540	\$56,250,000	\$41,337,312		\$41,337,312	\$1,256,168,958	\$923,140,402	\$5,530,916,809

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in	
Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in				
Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2029	\$7,248,794	\$5,327,034	1.6103	\$8,578,123	\$2,826,485	\$2,077,143	1.4010	\$2,910,077	\$1,250,000	\$918,607	1.0000	\$918,607	\$11,325,279	\$8,322,784	\$12,406,807
2030	44,817,806	32,935,958	1.6755	55,184,197	32,275,248	23,718,613	1.4410	34,178,521	1,250,000	918,607	1.0000	918,607	78,343,054	57,573,177	90,281,325
2031	23,021,476	16,918,150	1.7434	29,495,102	19,944,127	14,656,651	1.4820	21,721,156	1,250,000	918,607	1.0000	918,607	44,215,603	32,493,407	52,134,866
2032	10,761,111	7,908,185	1.8140	14,345,447	12,388,936	9,104,450	1.5243	13,877,913	1,250,000	918,607	1.0000	918,607	24,400,047	17,931,242	29,141,967
2033	13,540,277	9,950,554	1.8874	18,780,675	20,726,436	15,231,558	1.5677	23,878,514	1,250,000	918,607	1.0000	918,607	35,516,713	26,100,719	43,577,796
2034	31,160,880	22,899,680	1.9639	44,972,682	75,415,818	55,421,994	1.6124	89,362,423	1,250,000	918,607	1.0000	918,607	107,826,698	79,240,281	135,253,712
2035	4,659,832	3,424,443	2.0434	6,997,507	4,485,457	3,296,297	1.6584	5,466,580	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	13,382,694
2036	4,647,099	3,415,086	2.1262	7,261,156	4,469,786	3,284,781	1.7056	5,602,523	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	13,782,286
2037	4,647,099	3,415,086	2.2123	7,555,195	4,469,786	3,284,781	1.7542	5,762,163	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	14,235,965
2038	4,647,099	3,415,086	2.3019	7,861,187	4,469,786	3,284,781	1.8042	5,926,402	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	14,706,196
2039	4,659,832	3,424,443	2.3951	8,201,884	4,485,457	3,296,297	1.8556	6,116,609	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	15,237,100
2040	4,647,099	3,415,086	2.4921	8,510,736	4,469,786	3,284,781	1.9085	6,269,005	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	15,698,348
2041	4,647,099	3,415,086	2.5930	8,855,319	4,469,786	3,284,781	1.9629	6,447,697	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	16,221,623
2042	4,647,099	3,415,086	2.6981	9,214,244	4,469,786	3,284,781	2.0189	6,631,645	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	16,764,496
2043	4,659,832	3,424,443	2.8073	9,613,439	4,485,457	3,296,297	2.0764	6,844,432	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	17,376,478
2044	4,647,099	3,415,086	2.9210	9,975,467	4,469,786	3,284,781	2.1356	7,014,979	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	17,909,053
2045	4,647,099	3,415,086	3.0393	10,379,472	4,469,786	3,284,781	2.1964	7,214,693	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	18,512,772
2046	4,647,099	3,415,086	3.1624	10,799,869	4,469,786	3,284,781	2.2590	7,420,321	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	19,138,796
2047	4,659,832	3,424,443	3.2905	11,268,130	4,485,457	3,296,297	2.3234	7,658,617	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	19,845,355
2048	4,742,786	3,485,405	3.4238	11,933,330	4,756,846	3,495,737	2.3896	8,353,414	1,250,000	918,607	1.0000	918,607	10,749,633	7,899,750	21,205,352
2049	4,838,472	3,555,723	3.5624	12,666,909	5,043,904	3,706,692	2.4577	9,109,938	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	22,695,454
2050	4,838,472	3,555,723	3.7067	13,180,000	5,043,904	3,706,692	2.5278	9,369,777	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	23,468,384
2051	4,899,048	3,600,240	3.8568	13,885,404	5,203,105	3,823,687	2.5998	9,940,820	1,250,000	918,607	1.0000	918,607	11,352,153	8,342,533	24,744,831
2052	4,790,629	3,520,564	4.0130	14,128,025	4,900,375	3,601,215	2.6739	9,629,288	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	24,675,920
2053	4,934,159	3,626,042	4.1756	15,140,903	5,330,963	3,917,648	2.7501	10,773,923	1,250,000	918,607	1.0000	918,607	11,515,123	8,462,297	26,833,433
2054	4,790,629	3,520,564	4.3447	15,295,796	4,900,375	3,601,215	2.8285	10,186,036	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	26,400,439
2055	4,755,518	3,494,761	4.5206	15,798,419	4,772,516	3,507,253	2.9091	10,202,949	1,250,000	918,607	1.0000	918,607	10,778,034	7,920,621	26,919,975
2056	4,838,472	3,555,723	4.7037	16,725,056	5,043,904	3,706,692	2.9920	11,090,423	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	28,734,087
2057	4,838,472	3,555,723	4.8942	17,402,422	5,043,904	3,706,692	3.0773	11,406,604	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	29,727,633
2058	4,790,629	3,520,564	5.0924	17,928,122	4,900,375	3,601,215	3.1650	11,397,845	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	30,244,574
2059	4,851,204	3,565,080	5.2987	18,890,288	5,059,575	3,718,208	3.2552	12,103,512	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	31,912,407
2060	4,838,472	3,555,723	5.5133	19,603,770	5,043,904	3,706,692	3.3480	12,410,006	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	32,932,383
2061	4,790,629	3,520,564	5.7366	20,196,069	4,900,375	3,601,215	3.4434	12,400,423	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	33,515,100
2062	4,838,472	3,555,723	5.9689	21,223,758	5,043,904	3,706,692	3.5415	13,127,251	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	35,269,615
2063	4,851,204	3,565,080	6.2106	22,141,284	5,059,575	3,718,208	3.6425	13,543,574	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	36,603,465
2064	4,790,629	3,520,564	6.4622	22,750,591	4,900,375	3,601,215	3.7463	13,491,231	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	37,160,429
2065	4,838,472	3,555,723	6.7239	23,908,329	5,043,904	3,706,692	3.8531	14,282,256	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	39,109,192
2066	4,838,472	3,555,723	6.9962	24,876,552	5,043,904	3,706,692	3.9629	14,689,251	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	40,484,410
2067	4,851,204	3,565,080	7.2795	25,951,998	5,059,575	3,718,208	4.0758	15,154,674	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	42,025,278
2068	4,838,472	3,555,723	7.5744	26,932,472	5,043,904	3,706,692	4.1920	15,538,454	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	43,389,533
2069	4,838,472	3,555,723	7.8811	28,023,012	5,043,904	3,706,692	4.3115	15,981,404	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	44,923,023
2070	5,170,295	3,799,575	8.2003	31,157,658	6,039,372	4,438,247	4.4343	19,680,520	1,250,000	918,607	1.0000	918,607	12,459,668	9,156,430	51,756,785
2071	4,851,204	3,565,080	8.5324	30,418,686	5,059,575	3,718,208	4.5607	16,957,633	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	48,294,926
2072	4,838,472	3,555,723	8.8780	31,567,713	5,043,904	3,706,692	4.6907	17,386,981	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	49,873,301
2073	823,359	605,074	9.2375	5,589,375	3,272,479	2,404,897	4.8244	11,602,187	0	-	1.0000	-	4,095,838	3,009,972	17,191,562
2074	823,359	605,074	9.6117	5,815,794	3,272,479	2,404,897	4.9619	11,932,860	0	-	1.0000	-	4,095,838	3,009,972	17,748,654
2075	825,615	606,732	10.0009	6,067,868	3,281,444	2,411,486	5.1033	12,306,537	0	-	1.0000	-	4,107,059	3,018,218	18,374,405
2076	823,359	605,074	10.4060	6,296,405	3,272,479	2,404,897	5.2487	12,622,585	0	-	1.0000	-	4,095,838	3,009,972	18,918,989
2077	823,359	605,074	10.8274	6,551,31											

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in			
	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s	Nominal \$s	Nominal \$s	Factor	Future \$'s			
2084	29,172,411	21,438,383	14.2962	306,487,412	10,590,974	7,783,154	6.5719	51,150,108	0	-	1.0000	-	39,763,385	29,221,537	357,637,520
2085	57,665,154	42,377,288	14.8752	630,370,636	90,528,180	66,527,851	6.7592	449,675,048	0	-	1.0000	-	148,193,335	108,905,139	1,080,045,684
2086	55,538,057	40,814,115	15.4776	631,704,550	42,217,329	31,024,904	6.9518	215,678,931	0	-	1.0000	-	97,755,386	71,839,020	847,383,481
2087	51,408,076	37,779,052	16.1045	608,412,741	32,588,487	23,948,808	7.1499	171,231,582	0	-	1.0000	-	83,996,563	61,727,860	779,644,323
2088	23,223,558	17,066,657	16.7567	285,980,846	8,238,061	6,054,032	7.3537	44,519,534	0	-	1.0000	-	31,461,619	23,120,689	330,500,380
2089	14,460,844	10,627,065	17.4353	185,286,068	14,186,680	10,425,586	7.5633	78,851,834	0	-	1.0000	-	28,647,524	21,052,651	264,137,902
2090	10,459,350	7,686,425	18.1415	139,443,282	10,261,051	7,540,698	7.7788	58,657,580	0	-	1.0000	-	20,720,401	15,227,123	198,100,862
	\$573,536,674	\$421,483,808		\$3,768,401,389	\$595,414,118	\$437,561,225		\$1,818,555,225	\$55,000,000	\$40,418,705		\$40,418,705	\$1,223,950,791	\$899,463,737	\$5,627,375,318
	\$2,152,093,723	\$1,581,542,556		\$12,687,367,456	\$1,934,230,348	\$1,421,437,911		\$5,559,246,735	\$111,250,000	\$81,756,016		\$81,756,016	\$4,197,574,071	\$3,084,736,483	\$18,328,370,207

EXTERNAL FUND CALCULATION

Monticello

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,989,016	-	6,696,113	646,357,311
2018	646,357,311	33,305,725	-	13,392,226	693,055,262
2019	693,055,262	35,687,320	-	13,392,226	742,134,808
2020	742,134,808	38,190,377	-	13,392,226	793,717,411
2021	793,717,411	41,308,878	-	32,521,178	867,547,467
2022	867,547,467	45,074,211	-	32,521,178	945,142,856
2023	945,142,856	49,031,576	-	32,521,178	1,026,695,610
2024	1,026,695,610	53,190,766	-	32,521,178	1,112,407,555
2025	1,112,407,555	54,318,325	(25,993,386)	24,390,884	1,165,123,377
2026	1,165,123,377	56,275,459	(110,738,300)	-	1,110,660,536
2027	1,110,660,536	53,644,904	(54,278,627)	-	1,110,026,813
2028	1,110,026,813	53,614,295	(70,038,493)	-	1,093,602,616
2029	1,093,602,616	52,821,006	(47,879,438)	-	1,098,544,184
2030	1,098,544,184	53,059,684	(147,428,099)	-	1,004,175,769
2031	1,004,175,769	48,501,690	(15,793,558)	-	1,036,883,900
2032	1,036,883,900	50,081,492	(16,329,708)	-	1,070,635,685
2033	1,070,635,685	51,711,704	(16,929,855)	-	1,105,417,533
2034	1,105,417,533	53,391,667	(17,553,582)	-	1,141,255,617
2035	1,141,255,617	55,122,646	(18,249,897)	-	1,178,128,367
2036	1,178,128,367	56,903,600	(18,871,444)	-	1,216,160,523
2037	1,216,160,523	58,740,553	(19,567,775)	-	1,255,333,301
2038	1,255,333,301	60,632,598	(20,290,504)	-	1,295,675,396
2039	1,295,675,396	62,581,122	(21,097,630)	-	1,337,158,888
2040	1,337,158,888	64,584,774	(21,818,593)	-	1,379,925,069
2041	1,379,925,069	66,650,381	(22,626,150)	-	1,423,949,300
2042	1,423,949,300	68,776,751	(23,465,119)	-	1,469,260,932
2043	1,469,260,932	70,965,303	(28,808,047)	-	1,511,418,187
2044	1,511,418,187	73,001,498	(25,237,579)	-	1,559,182,107
2045	1,559,182,107	75,308,496	(36,740,179)	-	1,597,750,424
2046	1,597,750,424	77,171,345	(38,054,078)	-	1,636,867,691
2047	1,636,867,691	79,060,709	(45,996,867)	-	1,669,931,534
2048	1,669,931,534	80,657,693	(52,578,221)	-	1,698,011,006
2049	1,698,011,006	82,013,932	(44,025,153)	-	1,735,999,784
2050	1,735,999,784	83,848,790	(54,544,969)	-	1,765,303,604
2051	1,765,303,604	85,264,164	(60,249,495)	-	1,790,318,274
2052	1,790,318,274	86,472,373	(33,663,443)	-	1,843,127,204
2053	1,843,127,204	89,023,044	(34,922,034)	-	1,897,228,214
2054	1,897,228,214	91,636,123	(36,228,162)	-	1,952,636,174
2055	1,952,636,174	94,312,327	(37,686,663)	-	2,009,261,839
2056	2,009,261,839	97,047,347	(38,991,428)	-	2,067,317,758

EXTERNAL FUND CALCULATION

2057	2,067,317,758	99,851,448	(40,452,942)	-	2,126,716,264
2058	2,126,716,264	102,720,396	(41,970,095)	-	2,187,466,565
2059	2,187,466,565	105,654,635	(43,665,002)	-	2,249,456,198
2060	2,249,456,198	108,648,734	(45,181,313)	-	2,312,923,619
2061	2,312,923,619	111,714,211	(46,879,428)	-	2,377,758,402
2062	2,377,758,402	114,845,731	(48,642,230)	-	2,443,961,903
2063	2,443,961,903	118,043,360	(50,611,142)	-	2,511,394,121
2064	2,511,394,121	121,300,336	(52,374,081)	-	2,580,320,376
2065	2,580,320,376	124,629,474	(54,347,801)	-	2,650,602,049
2066	2,650,602,049	128,024,079	(56,397,117)	-	2,722,229,011
2067	2,722,229,011	131,483,661	(58,685,187)	-	2,795,027,486
2068	2,795,027,486	134,999,828	(60,735,346)	-	2,869,291,967
2069	2,869,291,967	138,586,802	(63,029,878)	-	2,944,848,891
2070	2,944,848,891	142,236,201	(65,412,777)	-	3,021,672,315
2071	3,021,672,315	145,946,773	(68,073,508)	-	3,099,545,580
2072	3,099,545,580	149,708,052	(70,457,796)	-	3,178,795,836
2073	3,178,795,836	153,535,839	(81,462,957)	-	3,250,868,718
2074	3,250,868,718	157,016,959	(86,234,487)	-	3,321,651,190
2075	3,321,651,190	160,435,752	(87,891,824)	-	3,394,195,118
2076	3,394,195,118	163,939,624	(90,961,699)	-	3,467,173,043
2077	3,467,173,043	167,464,458	(94,372,454)	-	3,540,265,046
2078	3,540,265,046	170,994,802	(99,877,415)	-	3,611,382,433
2079	3,611,382,433	174,429,772	(101,841,284)	-	3,683,970,920
2080	3,683,970,920	177,935,795	(466,595,262)	-	3,395,311,454
2081	3,395,311,454	163,993,543	(708,577,384)	-	2,850,727,613
2082	2,850,727,613	137,690,144	(923,697,643)	-	2,064,720,113
2083	2,064,720,113	99,725,981	(687,604,874)	-	1,476,841,221
2084	1,476,841,221	71,331,431	(683,855,253)	-	864,317,399
2085	864,317,399	41,746,530	(471,362,864)	-	434,701,065
2086	434,701,065	20,996,061	(322,085,668)	-	133,611,459
2087	133,611,459	6,453,433	(140,064,893)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,584,112	-	24,632	383,975,799
2018	383,975,799	19,660,822	-	49,264	403,685,885
2019	403,685,885	20,669,978	-	49,264	424,405,128
2020	424,405,128	21,730,804	-	49,264	446,185,196
2021	446,185,196	23,548,773	-	27,503,535	497,237,503
2022	497,237,503	26,162,651	-	27,503,535	550,903,689
2023	550,903,689	28,910,359	-	27,503,535	607,317,583
2024	607,317,583	31,798,751	-	27,503,535	666,619,868
2025	666,619,868	34,835,028	-	27,503,535	728,958,430
2026	728,958,430	38,026,762	-	27,503,535	794,488,727
2027	794,488,727	41,381,913	-	27,503,535	863,374,175
2028	863,374,175	42,058,735	(26,093,741)	18,427,368	897,766,537
2029	897,766,537	43,272,347	(85,547,775)	-	855,491,109
2030	855,491,109	41,234,671	(37,515,903)	-	859,209,877
2031	859,209,877	41,413,916	(32,140,303)	-	868,483,490
2032	868,483,490	41,860,904	(33,134,460)	-	877,209,934
2033	877,209,934	42,281,519	(47,713,763)	-	871,777,690
2034	871,777,690	42,019,685	(138,771,575)	-	775,025,800
2035	775,025,800	37,356,244	(13,288,961)	-	799,093,082
2036	799,093,082	38,516,287	(13,685,143)	-	823,924,226
2037	823,924,226	39,713,148	(14,135,014)	-	849,502,359
2038	849,502,359	40,946,014	(14,601,285)	-	875,847,088
2039	875,847,088	42,215,830	(15,127,775)	-	902,935,143
2040	902,935,143	43,521,474	(15,585,042)	-	930,871,576
2041	930,871,576	44,868,010	(16,103,868)	-	959,635,717
2042	959,635,717	46,254,442	(16,642,112)	-	989,248,047
2043	989,248,047	47,681,756	(17,248,941)	-	1,019,680,861
2044	1,019,680,861	49,148,618	(17,776,865)	-	1,051,052,614
2045	1,051,052,614	50,660,736	(18,375,387)	-	1,083,337,963
2046	1,083,337,963	52,216,890	(18,996,008)	-	1,116,558,845
2047	1,116,558,845	53,818,136	(19,696,541)	-	1,150,680,440
2048	1,150,680,440	55,462,797	(21,051,102)	-	1,185,092,135
2049	1,185,092,135	57,121,441	(22,535,136)	-	1,219,678,439
2050	1,219,678,439	58,788,501	(23,301,752)	-	1,255,165,188
2051	1,255,165,188	60,498,962	(24,571,163)	-	1,291,092,987
2052	1,291,092,987	62,230,682	(24,495,903)	-	1,328,827,766
2053	1,328,827,766	64,049,498	(26,646,318)	-	1,366,230,946
2054	1,366,230,946	65,852,332	(26,205,948)	-	1,405,877,330
2055	1,405,877,330	67,763,287	(26,717,263)	-	1,446,923,355
2056	1,446,923,355	69,741,706	(28,523,954)	-	1,488,141,107

EXTERNAL FUND CALCULATION

2057	1,488,141,107	71,728,401	(29,509,208)	-	1,530,360,300
2058	1,530,360,300	73,763,366	(30,017,529)	-	1,574,106,137
2059	1,574,106,137	75,871,916	(31,675,750)	-	1,618,302,302
2060	1,618,302,302	78,002,171	(32,687,053)	-	1,663,617,421
2061	1,663,617,421	80,186,360	(33,260,079)	-	1,710,543,702
2062	1,710,543,702	82,448,206	(35,004,520)	-	1,757,987,389
2063	1,757,987,389	84,734,992	(36,327,139)	-	1,806,395,242
2064	1,806,395,242	87,068,251	(36,873,962)	-	1,856,589,531
2065	1,856,589,531	89,487,615	(38,811,398)	-	1,907,265,748
2066	1,907,265,748	91,930,209	(40,174,838)	-	1,959,021,119
2067	1,959,021,119	94,424,818	(41,702,580)	-	2,011,743,357
2068	2,011,743,357	96,966,030	(43,054,977)	-	2,065,654,409
2069	2,065,654,409	99,564,543	(44,575,228)	-	2,120,643,724
2070	2,120,643,724	102,215,028	(51,395,220)	-	2,171,463,532
2071	2,171,463,532	104,664,542	(47,918,013)	-	2,228,210,060
2072	2,228,210,060	107,399,725	(49,482,528)	-	2,286,127,258
2073	2,286,127,258	110,191,334	(38,308,473)	-	2,358,010,119
2074	2,358,010,119	113,656,088	(39,721,662)	-	2,431,944,544
2075	2,431,944,544	117,219,727	(41,300,486)	-	2,507,863,786
2076	2,507,863,786	120,879,034	(42,709,262)	-	2,586,033,559
2077	2,586,033,559	124,646,818	(44,288,156)	-	2,666,392,220
2078	2,666,392,220	128,520,105	(45,926,882)	-	2,748,985,443
2079	2,748,985,443	132,501,098	(47,757,956)	-	2,833,728,585
2080	2,833,728,585	136,585,718	(49,392,424)	-	2,920,921,879
2081	2,920,921,879	140,788,435	(51,223,963)	-	3,010,486,351
2082	3,010,486,351	145,105,442	(137,141,374)	-	3,018,450,419
2083	3,018,450,419	145,489,310	(510,925,861)	-	2,653,013,868
2084	2,653,013,868	127,875,268	(845,184,134)	-	1,935,705,003
2085	1,935,705,003	93,300,981	(764,957,013)	-	1,264,048,971
2086	1,264,048,971	60,927,160	(568,335,029)	-	756,641,102
2087	756,641,102	36,470,101	(216,232,427)	-	576,878,776
2088	576,878,776	27,805,557	(256,412,862)	-	348,271,470
2089	348,271,470	16,786,685	(212,741,434)	-	152,316,721
2090	152,316,721	7,341,666	(159,658,387)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

External Levelized

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,803,157	-	294,670	431,306,795
2018	431,306,795	22,184,315	-	589,341	454,080,451
2019	454,080,451	23,354,881	-	589,341	478,024,673
2020	478,024,673	24,585,614	-	589,341	503,199,628
2021	503,199,628	26,160,961	-	11,536,963	540,897,552
2022	540,897,552	28,098,634	-	11,536,963	580,533,149
2023	580,533,149	30,135,904	-	11,536,963	622,206,016
2024	622,206,016	32,277,889	-	11,536,963	666,020,869
2025	666,020,869	34,529,973	-	11,536,963	712,087,805
2026	712,087,805	36,897,813	-	11,536,963	760,522,581
2027	760,522,581	39,387,361	-	11,536,963	811,446,905
2028	811,446,905	42,004,871	-	11,536,963	864,988,739
2029	864,988,739	42,010,209	(12,406,807)	9,575,679	904,167,820
2030	904,167,820	43,671,306	(90,281,325)	-	857,557,801
2031	857,557,801	41,420,042	(52,134,866)	-	846,842,977
2032	846,842,977	40,902,516	(29,141,967)	-	858,603,525
2033	858,603,525	41,470,550	(43,577,796)	-	856,496,280
2034	856,496,280	41,368,770	(135,253,712)	-	762,611,338
2035	762,611,338	36,834,128	(13,382,694)	-	786,062,772
2036	786,062,772	37,966,832	(13,782,286)	-	810,247,318
2037	810,247,318	39,134,945	(14,235,965)	-	835,146,298
2038	835,146,298	40,337,566	(14,706,196)	-	860,777,668
2039	860,777,668	41,575,561	(15,237,100)	-	887,116,129
2040	887,116,129	42,847,709	(15,698,348)	-	914,265,490
2041	914,265,490	44,159,023	(16,221,623)	-	942,202,891
2042	942,202,891	45,508,400	(16,764,496)	-	970,946,794
2043	970,946,794	46,896,730	(17,376,478)	-	1,000,467,046
2044	1,000,467,046	48,322,558	(17,909,053)	-	1,030,880,552
2045	1,030,880,552	49,791,531	(18,512,772)	-	1,062,159,311
2046	1,062,159,311	51,302,295	(19,138,796)	-	1,094,322,809
2047	1,094,322,809	52,855,792	(19,845,355)	-	1,127,333,246
2048	1,127,333,246	54,450,196	(21,205,352)	-	1,160,578,091
2049	1,160,578,091	56,055,922	(22,695,454)	-	1,193,938,559
2050	1,193,938,559	57,667,232	(23,468,384)	-	1,228,137,407
2051	1,228,137,407	59,319,037	(24,744,831)	-	1,262,711,613
2052	1,262,711,613	60,988,971	(24,675,920)	-	1,299,024,664
2053	1,299,024,664	62,742,891	(26,833,433)	-	1,334,934,122
2054	1,334,934,122	64,477,318	(26,400,439)	-	1,373,011,002
2055	1,373,011,002	66,316,431	(26,919,975)	-	1,412,407,458
2056	1,412,407,458	68,219,280	(28,734,087)	-	1,451,892,652

EXTERNAL FUND CALCULATION

2057	1,451,892,652	70,126,415	(29,727,633)	-	1,492,291,434
2058	1,492,291,434	72,077,676	(30,244,574)	-	1,534,124,536
2059	1,534,124,536	74,098,215	(31,912,407)	-	1,576,310,345
2060	1,576,310,345	76,135,790	(32,932,383)	-	1,619,513,752
2061	1,619,513,752	78,222,514	(33,515,100)	-	1,664,221,166
2062	1,664,221,166	80,381,882	(35,269,615)	-	1,709,333,434
2063	1,709,333,434	82,560,805	(36,603,465)	-	1,755,290,773
2064	1,755,290,773	84,780,544	(37,160,429)	-	1,802,910,889
2065	1,802,910,889	87,080,596	(39,109,192)	-	1,850,882,293
2066	1,850,882,293	89,397,615	(40,484,410)	-	1,899,795,497
2067	1,899,795,497	91,760,123	(42,025,278)	-	1,949,530,341
2068	1,949,530,341	94,162,315	(43,389,533)	-	2,000,303,124
2069	2,000,303,124	96,614,641	(44,923,023)	-	2,051,994,743
2070	2,051,994,743	99,111,346	(51,756,785)	-	2,099,349,304
2071	2,099,349,304	101,398,571	(48,294,926)	-	2,152,452,949
2072	2,152,452,949	103,963,477	(49,873,301)	-	2,206,543,125
2073	2,206,543,125	106,576,033	(17,191,562)	-	2,295,927,596
2074	2,295,927,596	110,893,303	(17,748,654)	-	2,389,072,245
2075	2,389,072,245	115,392,189	(18,374,405)	-	2,486,090,030
2076	2,486,090,030	120,078,148	(18,918,989)	-	2,587,249,189
2077	2,587,249,189	124,964,136	(19,533,740)	-	2,692,679,585
2078	2,692,679,585	130,056,424	(20,169,179)	-	2,802,566,830
2079	2,802,566,830	135,363,978	(20,882,786)	-	2,917,048,022
2080	2,917,048,022	140,893,419	(21,504,295)	-	3,036,437,146
2081	3,036,437,146	146,659,914	(22,205,721)	-	3,160,891,338
2082	3,160,891,338	152,671,052	(22,930,853)	-	3,290,631,537
2083	3,290,631,537	158,937,503	(141,957,420)	-	3,307,611,620
2084	3,307,611,620	159,757,641	(357,637,520)	-	3,109,731,741
2085	3,109,731,741	150,200,043	(1,080,045,684)	-	2,179,886,100
2086	2,179,886,100	105,288,499	(847,383,481)	-	1,437,791,118
2087	1,437,791,118	69,445,311	(779,644,323)	-	727,592,106
2088	727,592,106	35,142,699	(330,500,380)	-	432,234,424
2089	432,234,424	20,876,923	(264,137,902)	-	188,973,445
2090	188,973,445	9,127,417	(198,100,862)	-	0

2021 ACCRUAL COMPARISON

	Present	Proposed	Difference
Monticello	\$13,392,226	(\$8,586,256)	(\$21,978,482)
Prairie Island Unit 1	49,264	(1,085,269)	(1,134,533)
Prairie Island Unit 2	589,341	(6,304,910)	(6,894,251)
TOTAL	\$14,030,831	(\$15,976,435)	(\$30,007,266)

Xcel Energy
Nuclear Decommissioning Accrual
60-Year Decommissioning Period
SAFSTOR Method
20-Year Life Extension

Docket No. E002/M-17-828
Schedule F.20
Page 2 of 17
Proposed

2021 MN RETAIL SUMMARY

	Remaining Life (yrs)	Operational Earnings Rate	Post-Shutdown Earnings Rate	Market Value Balance 6/30/2017	Book Value 6/30/2017	Unrealized Gain/Loss 6/30/2017	Tax-Effect Adjustment	Tax-Adjusted Fund Balance 6/30/2017	2021 Decommissioning Accrual
Monticello	33.75	5.10%	4.83%	\$660,140,345	\$529,148,381	\$130,991,964	\$36,468,163	\$623,672,182	(8,586,256)
Prairie Island Unit 1	36.67	5.12%	4.82%	399,941,696	308,078,761	91,862,935	25,574,641	374,367,055	(1,085,269)
Prairie Island Unit 2	37.83	5.14%	4.83%	448,597,551	346,627,064	101,970,487	28,388,583	420,208,967	(6,304,910)
TOTAL DECOMMISSIONING ACCRUAL				\$1,508,679,592	\$1,183,854,206	\$324,825,386	\$90,431,387	\$1,418,248,204	(\$15,976,435)

INPUT DATA

Escalation Rate (Labor)	4.05%
Escalation Rate (Non-Labor)	2.85%
Escalation Rate (PIIC)	0.00%
Jurisdictional Factor	73.4886%
Tax Rate for tax-effect adjustment	27.84%

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in
	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation Factor	Jurisdictional Cost in			
	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s	Nominal \$	Nominal \$		Future \$'s			
Monticello															
Factors	2017	73.4886%	4.05%				2.85%					0.00%			
2050	\$17,759,328	\$13,051,073	3.7067	\$48,376,414	\$8,763,593	\$6,440,238	2.5278	\$16,279,633	\$0	\$0	1.0000	\$0	\$26,522,921	\$19,491,311	\$64,656,047
2051	63,231,064	46,467,594	3.8568	179,216,218	46,823,276	34,409,748	2.5998	89,458,463	0	0	1.0000	0	110,054,340	80,877,343	268,674,682
2052	30,098,747	22,119,134	4.0130	88,764,085	21,963,833	16,140,903	2.6739	43,159,162	0	0	1.0000	0	52,062,580	38,260,037	131,923,246
2053	30,011,960	22,055,355	4.1756	92,094,341	35,867,567	26,358,556	2.7501	72,488,665	0	0	1.0000	0	65,879,526	48,413,911	164,583,006
2054	24,261,956	17,829,760	4.3447	77,464,960	18,617,567	13,681,781	2.8285	38,698,916	0	0	1.0000	0	42,879,522	31,511,541	116,163,876
2055	43,935,865	32,287,832	4.5206	145,960,372	88,132,650	64,767,410	2.9091	188,414,872	0	0	1.0000	0	132,068,514	97,055,241	334,375,244
2056	8,481,485	6,232,921	4.7037	29,317,788	4,523,995	3,324,618	2.9920	9,947,258	0	0	1.0000	0	13,005,479	9,557,539	39,265,046
2057	8,458,357	6,215,924	4.8942	30,421,976	4,511,770	3,315,635	3.0773	10,203,202	0	0	1.0000	0	12,970,127	9,531,559	40,625,178
2058	8,458,357	6,215,924	5.0924	31,653,972	4,511,770	3,315,635	3.1650	10,493,983	0	0	1.0000	0	12,970,127	9,531,559	42,147,955
2059	8,458,357	6,215,924	5.2987	32,936,317	4,511,770	3,315,635	3.2552	10,793,054	0	0	1.0000	0	12,970,127	9,531,559	43,729,371
2060	8,481,485	6,232,921	5.5133	34,363,961	4,523,995	3,324,618	3.3480	11,130,822	0	0	1.0000	0	13,005,479	9,557,539	45,494,783
2061	8,458,357	6,215,924	5.7366	35,658,270	4,511,770	3,315,635	3.4434	11,417,056	0	0	1.0000	0	12,970,127	9,531,559	47,075,326
2062	8,458,357	6,215,924	5.9689	37,102,229	4,511,770	3,315,635	3.5415	11,742,320	0	0	1.0000	0	12,970,127	9,531,559	48,844,549
2063	8,458,357	6,215,924	6.2106	38,604,618	4,511,770	3,315,635	3.6425	12,077,199	0	0	1.0000	0	12,970,127	9,531,559	50,681,817
2064	8,481,485	6,232,921	6.4622	40,278,379	4,523,995	3,324,618	3.7463	12,455,017	0	0	1.0000	0	13,005,479	9,557,539	52,733,396
2065	8,458,357	6,215,924	6.7239	41,795,252	4,511,770	3,315,635	3.8531	12,775,472	0	0	1.0000	0	12,970,127	9,531,559	54,570,723
2066	8,458,357	6,215,924	6.9962	43,487,848	4,511,770	3,315,635	3.9629	13,139,528	0	0	1.0000	0	12,970,127	9,531,559	56,627,376
2067	8,458,357	6,215,924	7.2795	45,248,819	4,511,770	3,315,635	4.0758	13,513,863	0	0	1.0000	0	12,970,127	9,531,559	58,762,683
2068	9,145,130	6,720,624	7.5744	50,904,692	6,514,932	4,787,729	4.1920	20,070,160	0	0	1.0000	0	15,660,061	11,508,353	70,974,852
2069	8,458,357	6,215,924	7.8811	48,988,319	4,511,767	3,315,632	4.3115	14,295,349	0	0	1.0000	0	12,970,124	9,531,556	63,283,668
2070	9,951,558	7,313,256	8.2003	59,970,892	8,991,374	6,607,631	4.4343	29,300,217	0	0	1.0000	0	18,942,932	13,920,887	89,271,109
2071	9,951,558	7,313,256	8.5324	62,399,625	8,991,374	6,607,631	4.5607	30,135,422	0	0	1.0000	0	18,942,932	13,920,887	92,535,046
2072	10,837,186	7,964,091	8.8780	70,705,201	11,591,099	8,518,131	4.6907	39,955,996	0	0	1.0000	0	22,428,284	16,482,222	110,661,197
2073	11,460,933	8,422,474	9.2375	77,802,601	13,519,499	9,935,284	4.8244	47,931,786	0	0	1.0000	0	24,980,432	18,357,758	125,734,387
2074	10,167,183	7,471,716	9.6117	71,815,889	9,638,249	7,083,010	4.9619	35,145,187	0	0	1.0000	0	19,805,432	14,554,725	106,961,075
2075	11,245,308	8,264,014	10.0009	82,647,578	12,872,624	9,459,905	5.1033	48,276,734	0	0	1.0000	0	24,117,932	17,723,919	130,924,313
2076	11,699,686	8,597,930	10.4060	89,470,059	14,178,599	10,419,647	5.2487	54,689,602	0	0	1.0000	0	25,878,284	19,017,577	144,159,660
2077	8,441,765	6,203,731	10.8274	67,170,276	4,461,997	3,279,057	5.3983	17,701,334	0	0	1.0000	0	12,903,762	9,482,788	84,871,609
2078	8,441,765	6,203,731	11.2659	69,890,612	4,461,997	3,279,057	5.5522	18,205,981	0	0	1.0000	0	12,903,762	9,482,788	88,096,592
2079	8,441,765	6,203,731	11.7222	72,721,374	4,461,997	3,279,057	5.7104	18,724,728	0	0	1.0000	0	12,903,762	9,482,788	91,446,102
2080	8,464,894	6,220,728	12.1970	75,874,220	4,474,222	3,288,041	5.8731	19,310,993	0	0	1.0000	0	12,939,115	9,508,769	95,185,212
2081	8,441,765	6,203,731	12.6909	78,730,928	4,461,997	3,279,057	6.0405	19,807,144	0	0	1.0000	0	12,903,762	9,482,788	98,538,072
2082	8,441,765	6,203,731	13.2049	81,919,646	4,461,997	3,279,057	6.2127	20,371,798	0	0	1.0000	0	12,903,762	9,482,788	102,291,444
2083	8,441,765	6,203,731	13.7397	85,237,401	4,461,997	3,279,057	6.3897	20,952,191	0	0	1.0000	0	12,903,762	9,482,788	106,189,592
2084	8,464,894	6,220,728	14.2962	88,932,772	4,474,222	3,288,041	6.5719	21,608,675	0	0	1.0000	0	12,939,115	9,508,769	110,541,448
2085	8,441,765	6,203,731	14.8752	92,281,737	4,461,997	3,279,057	6.7592	22,163,803	0	0	1.0000	0	12,903,762	9,482,788	114,445,540
2086	8,441,765	6,203,731	15.4776	96,018,865	4,461,997	3,279,057	6.9518	22,795,349	0	0	1.0000	0	12,903,762	9,482,788	118,814,214
2087	8,441,765	6,203,731	16.1045	99,907,984	4,461,997	3,279,057	7.1499	23,444,930	0	0	1.0000	0	12,903,762	9,482,788	123,352,914
2088	8,464,894	6,220,728	16.7567	104,238,874	4,474,222	3,288,041	7.3537	24,179,266	0	0	1.0000	0	12,939,115	9,508,769	128,418,139
2089	8,441,765	6,203,731	17.4353	108,163,909	4,461,997	3,279,057	7.5633	24,800,493	0	0	1.0000	0	12,903,762	9,482,788	132,964,401
2090	8,441,765	6,203,731	18.1415	112,544,983	4,461,997	3,279,057	7.7788	25,507,129	0	0	1.0000	0	12,903,762	9,482,788	138,052,113
2091	8,441,765	6,203,731	18.8762	117,102,865	4,461,997	3,279,057	8.0005	26,234,096	0	0	1.0000	0	12,903,762	9,482,788	143,336,961
2092	8,464,894	6,220,728	19.6407	122,179,453	4,474,222	3,288,041	8.2285	27,055,644	0	0	1.0000	0	12,939,115	9,508,769	149,235,097
2093	8,441,765	6,203,731	20.4361	126,780,064	4,461,997	3,279,057	8.4630	27,750,660	0	0	1.0000	0	12,903,762	9,482,788	154,530,725
2094	8,441,765	6,203,731	21.2638	131,914,892	4,461,997	3,279,057	8.7042	28,541,569	0	0	1.0000	0	12,903,762	9,482,788	160,456,461
2095	8,441,765	6,203,731	22.1250	137,257,545	4,461,997	3,279,057	8.9523	29,355,103	0	0	1.0000	0	12,903,762	9,482,788	166,612,648
2096	8,464,894	6,220,728	23.0210	143,207,380	4,474,222	3,288,041	9.2075	30,274,636	0	0	1.0000	0	12,939,115	9,508,769	173,482,016
2097	8,441,765	6,203,731	23.9534	148,600,447	4,461,997	3,279,057	9.4699	31,052,343	0	0	1.0000	0	12,903,762	9,482,788	179,652,790
2098	8,920,197	6,555,324	24.9235	163,381,608	5,897,293	4,333,835	9.7398	42,210,690	0	0	1.0000	0	14,817,490	10,889,159	205,592,298
2099	9,015,884	6,625,643	25.9329	171,822,127	6,184,352	4,544,791	10.0173	45,526,534	0	0	1.0000	0	15,200,236	11,170,433	217,348,661
2100	8,943,325	6,572,320	26.9832	177,342,227	5,909,518	4,342,819	10.3028	44,743,197	0	0	1.0000	0	14,852,842	10,915,139	222,085,423
2101	8,920,197	6,555,324	28.0760	184,047,266	5,897,293	4,333,835	10.5965	45,923,487	0	0	1.0000	0	14,817,490	10,889,159	229,970,753
2102	8,920,197	6,555,324	29.2131	191,501,325	5,897,293	4,333,835	10.8985	47,232,305	0	0	1.0000	0	14,817,490	10,889,159	238,733,629
2103	9,015,884	6,625,643	30.3962	201,394,358	6,184,352	4,544,791	11.2091	50,943,015	0	0	1.0000	0	15,200,236	11,170,433	252,337,374
2104	8,943,325	6,572,320	31.6272	207,864,081	5,909,518										

AMOUNT TO RECOVER															
	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2105	46,126,149	33,897,440	32.9081	1,115,500,348	12,314,062	9,049,426	11.8571	107,299,952	0	0	1.0000	0	58,440,212	42,946,866	1,222,800,300
2106	53,631,139	39,412,748	34.2409	1,349,527,973	46,945,385	34,499,485	12.1950	420,721,214	0	0	1.0000	0	100,576,524	73,912,233	1,770,249,187
2107	57,419,114	42,196,476	35.6277	1,503,363,401	80,273,242	58,991,645	12.5426	739,908,606	0	0	1.0000	0	137,692,356	101,188,121	2,243,272,007
2108	52,652,752	38,693,746	37.0706	1,434,400,375	33,214,319	24,408,722	12.9000	314,872,520	0	0	1.0000	0	85,867,070	63,102,468	1,749,272,895
2109	50,913,638	37,415,697	38.5720	1,443,198,252	30,841,715	22,665,130	13.2677	300,714,150	0	0	1.0000	0	81,755,354	60,080,827	1,743,912,402
2110	32,667,889	24,007,160	40.1341	963,505,742	23,001,023	16,903,119	13.6458	230,656,586	0	0	1.0000	0	55,668,913	40,910,279	1,194,162,328
2111	21,071,356	15,485,035	41.7596	646,648,865	16,131,940	11,855,130	14.0347	166,383,189	0	0	1.0000	0	37,203,297	27,340,165	813,032,054
2112	8,832,651	6,490,987	43.4508	282,038,589	6,762,156	4,969,411	14.4347	71,731,950	0	0	1.0000	0	15,594,807	11,460,398	353,770,539
	\$967,171,883	\$710,760,631		\$13,883,663,437	\$750,282,438	\$551,371,714		\$4,086,760,388	\$0	\$0		\$0	\$1,717,454,322	\$1,262,132,345	\$17,970,423,825

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PHIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
Prairie Island Unit 1															
Factors	2017	73.4886%	4.05%				2.85%					0.00%			
2053	\$18,446,908	\$13,556,366	4.1756	\$56,605,961	\$4,190,856	\$3,079,799	2.7501	\$8,469,756	\$1,250,000	\$918,607	1.0000	\$918,607	\$23,887,764	\$17,554,772	\$65,994,324
2054	46,142,627	33,909,549	4.3447	147,326,818	29,162,161	21,430,850	2.8285	60,617,159	1,250,000	918,607	1.0000	918,607	76,554,787	56,259,006	208,862,585
2055	16,398,923	12,051,331	4.5206	54,479,249	15,491,742	11,384,657	2.9091	33,119,105	1,250,000	918,607	1.0000	918,607	33,140,665	24,354,595	88,516,961
2056	12,659,656	9,303,398	4.7037	43,760,395	13,774,811	10,122,909	2.9920	30,287,745	1,250,000	918,607	1.0000	918,607	27,684,467	20,344,915	74,966,746
2057	12,625,333	9,278,174	4.8942	45,409,241	13,734,545	10,093,318	3.0773	31,060,169	1,250,000	918,607	1.0000	918,607	27,609,877	20,290,100	77,388,016
2058	15,404,499	11,320,543	5.0924	57,648,734	22,072,045	16,220,427	3.1650	51,337,650	1,250,000	918,607	1.0000	918,607	38,726,543	28,459,577	109,904,991
2059	32,688,492	24,022,300	5.2987	127,286,962	76,524,027	56,236,401	3.2552	183,060,732	1,250,000	918,607	1.0000	918,607	110,462,519	81,177,308	311,266,301
2060	4,604,176	3,383,542	5.5133	18,654,485	4,477,123	3,290,173	3.3480	11,015,499	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	30,588,591
2061	4,591,596	3,374,297	5.7366	19,356,993	4,461,475	3,278,674	3.4434	11,289,785	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	31,565,385
2062	4,591,596	3,374,297	5.9689	20,140,843	4,461,475	3,278,674	3.5415	11,611,423	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	32,670,872
2063	4,591,596	3,374,297	6.2106	20,956,410	4,461,475	3,278,674	3.6425	11,942,569	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	33,817,586
2064	4,604,176	3,383,542	6.4622	21,865,128	4,477,123	3,290,173	3.7463	12,325,975	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	35,109,710
2065	4,591,596	3,374,297	6.7239	22,688,437	4,461,475	3,278,674	3.8531	12,633,057	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	36,240,101
2066	4,591,596	3,374,297	6.9962	23,607,258	4,461,475	3,278,674	3.9629	12,993,056	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	37,518,921
2067	4,591,596	3,374,297	7.2795	24,563,197	4,461,475	3,278,674	4.0758	13,363,218	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	38,845,022
2068	4,604,176	3,383,542	7.5744	25,628,304	4,477,123	3,290,173	4.1920	13,792,405	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	40,339,316
2069	4,591,596	3,374,297	7.8811	26,593,174	4,461,475	3,278,674	4.3115	14,136,001	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	41,647,782
2070	4,591,596	3,374,297	8.2003	27,670,249	4,461,475	3,278,674	4.4343	14,538,623	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	43,127,479
2071	4,591,596	3,374,297	8.5324	28,790,854	4,461,475	3,278,674	4.5607	14,953,047	1,250,000	918,607	1.0000	918,607	10,303,071	7,571,578	44,662,507
2072	4,604,176	3,383,542	8.8780	30,039,090	4,477,123	3,290,173	4.6907	15,433,215	1,250,000	918,607	1.0000	918,607	10,331,299	7,592,322	46,390,912
2073	4,687,283	3,444,616	9.2375	31,819,642	4,748,534	3,489,629	4.8244	16,835,367	1,250,000	918,607	1.0000	918,607	10,685,817	7,852,852	49,573,616
2074	4,782,969	3,514,934	9.6117	33,784,496	5,035,593	3,700,585	4.9619	18,361,931	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	53,065,034
2075	4,782,969	3,514,934	10.0009	35,152,508	5,035,593	3,700,585	5.1033	18,885,194	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	54,956,309
2076	4,843,392	3,559,339	10.4060	37,038,480	5,194,771	3,817,562	5.2487	20,037,239	1,250,000	918,607	1.0000	918,607	11,288,163	8,295,508	57,994,326
2077	4,735,126	3,479,775	10.8274	37,676,920	4,892,064	3,595,107	5.3983	19,407,468	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	58,002,994
2078	4,878,656	3,585,253	11.2659	40,391,107	5,322,652	3,911,540	5.5522	21,717,653	1,250,000	918,607	1.0000	918,607	11,451,308	8,415,401	63,027,367
2079	4,735,126	3,479,775	11.7222	40,790,622	4,892,064	3,595,107	5.7104	20,529,501	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	62,238,730
2080	4,699,862	3,453,861	12.1970	42,126,739	4,764,182	3,501,129	5.8731	20,562,478	1,250,000	918,607	1.0000	918,607	10,714,044	7,873,596	63,607,824
2081	4,782,969	3,514,934	12.6909	44,607,682	5,035,593	3,700,585	6.0405	22,353,382	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	67,879,670
2082	4,782,969	3,514,934	13.2049	46,414,358	5,035,593	3,700,585	6.2127	22,990,622	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	70,323,587
2083	4,735,126	3,479,775	13.7397	47,811,069	4,892,064	3,595,107	6.3897	22,971,657	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	71,701,333
2084	4,795,548	3,524,179	14.2962	50,382,367	5,051,241	3,712,084	6.5719	24,395,445	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	75,696,420
2085	4,782,969	3,514,934	14.8752	52,285,353	5,035,593	3,700,585	6.7592	25,012,992	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	78,216,952
2086	4,735,126	3,479,775	15.4776	53,858,571	4,892,064	3,595,107	6.9518	24,992,467	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	79,769,645
2087	4,782,969	3,514,934	16.1045	56,606,262	5,035,593	3,700,585	7.1499	26,458,810	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	83,983,679
2088	4,795,548	3,524,179	16.7567	59,053,610	5,051,241	3,712,084	7.3537	27,297,553	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	87,269,769
2089	4,735,126	3,479,775	17.4353	60,670,927	4,892,064	3,595,107	7.5633	27,190,875	1,250,000	918,607	1.0000	918,607	10,877,190	7,993,490	88,780,409
2090	4,782,969	3,514,934	18.1415	63,766,184	5,035,593	3,700,585	7.7788	28,786,108	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	93,470,899
2091	4,782,969	3,514,934	18.8762	66,348,606	5,035,593	3,700,585	8.0005	29,606,528	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	96,873,741
2092	4,795,548	3,524,179	19.6407	69,217,342	5,051,241	3,712,084	8.2285	30,544,884	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	100,680,833
2093	4,782,969	3,514,934	20.4361	71,831,552	5,035,593	3,700,585	8.4630	31,318,048	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	104,068,207
2094	4,782,969	3,514,934	21.2638	74,740,864	5,035,593	3,700,585	8.7042	32,210,629	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	107,870,100
2095	5,114,792	3,758,786	22.1250	83,163,149	6,031,061	4,432,140	8.9523	39,677,844	1,250,000	918,607	1.0000	918,607	12,395,853	9,109,533	123,759,600
2096	4,795,548	3,524,179	23.0210	81,130,124	5,051,241	3,712,084	9.2075	34,179,014	1,250,000	918,607	1.0000	918,607	11,096,789	8,154,870	116,227,745
2097	4,782,969	3,514,934	23.9534	84,194,631	5,035,593	3,700,585	9.4699	35,044,167	1,250,000	918,607	1.0000	918,607	11,068,562	8,134,126	120,157,405
2098	3,942,348	2,897,174	24.9235	72,207,722	3,256,582	2,393,215	9.7398	23,309,434	0	0	1.0000	0	7,198,929	5,290,389	95,517,156
2099	3,942,348	2,897,174	25.9329	75,132,129	3,256,582	2,393,215	10.0173	23,973,551	0	0	1.0000	0	7,198,929	5,290,389	99,105,680
2100	3,95,														

AMOUNT TO RECOVER															
	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$	Total Jurisdictional Cost in Nominal \$	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$	Jurisdictional Cost in Nominal \$	Escalation Factor	Jurisdictional Cost in Future \$'s			
2108	45,111,220	33,151,584	37.0706	1,228,949,094	11,805,071	8,675,376	12.9000	111,912,347	0	0	1.0000	0	56,916,291	41,826,959	1,340,861,441
2109	51,818,304	38,080,522	38.5720	1,468,841,899	62,277,980	45,767,187	13.2677	607,225,301	0	0	1.0000	0	114,096,283	83,847,709	2,076,067,200
2110	44,187,860	32,473,019	40.1341	1,303,275,394	56,754,748	41,708,244	13.6458	569,142,350	0	0	1.0000	0	100,942,608	74,181,263	1,872,417,744
2111	35,668,367	26,212,167	41.7596	1,094,609,618	31,834,151	23,394,458	14.0347	328,334,194	0	0	1.0000	0	67,502,519	49,606,625	1,422,943,812
2112	13,715,750	10,079,506	43.4508	437,962,617	10,259,487	7,539,548	14.4347	108,831,118	0	0	1.0000	0	23,975,237	17,619,055	546,793,735
2113	18,089,191	13,293,485	45.2106	601,006,439	6,228,187	4,577,005	14.8461	67,950,670	0	0	1.0000	0	24,317,379	17,870,490	668,957,109
2114	12,584,719	9,248,328	47.0416	435,056,148	9,264,588	6,808,412	15.2692	103,959,000	0	0	1.0000	0	21,849,307	16,056,740	539,015,148
2115	9,102,372	6,689,202	48.9468	327,415,015	6,700,962	4,924,440	15.7044	77,335,379	0	0	1.0000	0	15,803,334	11,613,642	404,750,394
	\$611,385,166	\$449,298,117		\$10,180,264,092	\$588,533,792	\$432,504,973		\$3,465,181,777	\$56,250,000	\$41,337,312		\$41,337,312	\$1,256,168,958	\$923,140,402	\$13,686,783,181

AMOUNT TO RECOVER

LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate	Total Jurisdictional Cost in	Total Jurisdictional Cost in	
Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in	Cost Estimate	Jurisdictional Cost in	Escalation	Jurisdictional Cost in				
Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s	Nominal \$	Nominal \$	Factor	Future \$'s				
Prairie Island Unit 2															
Factors	2017	73.4886%	4.05%				2.85%				0.00%				
2054	\$7,248,794	\$5,327,034	4.3447	\$23,144,365	\$2,826,485	\$2,077,143	2.8285	\$5,875,198	\$1,250,000	\$918,607	1.0000	\$918,607	\$11,325,279	\$8,322,784	\$29,938,170
2055	44,817,806	32,935,958	4.5206	148,890,290	32,275,248	23,718,613	2.9091	68,999,817	1,250,000	918,607	1.0000	918,607	78,343,054	57,573,177	218,808,713
2056	23,021,476	16,918,150	4.7037	79,577,901	19,944,127	14,656,651	2.9920	43,852,699	1,250,000	918,607	1.0000	918,607	44,215,603	32,493,407	124,349,207
2057	10,761,111	7,908,185	4.8942	38,704,239	12,388,936	9,104,450	3.0773	28,017,124	1,250,000	918,607	1.0000	918,607	24,400,047	17,931,242	67,639,969
2058	13,540,277	9,950,554	5.0924	50,672,200	20,726,436	15,231,558	3.1650	48,207,881	1,250,000	918,607	1.0000	918,607	35,516,713	26,100,719	99,798,689
2059	31,160,880	22,899,680	5.2987	121,338,535	75,415,818	55,421,994	3.2552	180,409,674	1,250,000	918,607	1.0000	918,607	107,826,698	79,240,281	302,666,816
2060	4,659,832	3,424,443	5.5133	18,879,983	4,485,457	3,296,297	3.3480	11,036,004	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	30,834,593
2061	4,647,099	3,415,086	5.7366	19,590,984	4,469,786	3,284,781	3.4434	11,310,816	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	31,820,406
2062	4,647,099	3,415,086	5.9689	20,384,308	4,469,786	3,284,781	3.5415	11,633,053	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	32,935,968
2063	4,647,099	3,415,086	6.2106	21,209,734	4,469,786	3,284,781	3.6425	11,964,816	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	34,093,157
2064	4,659,832	3,424,443	6.4622	22,129,437	4,485,457	3,296,297	3.7463	12,348,919	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	35,396,963
2065	4,647,099	3,415,086	6.7239	22,962,698	4,469,786	3,284,781	3.8531	12,656,591	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	36,537,896
2066	4,647,099	3,415,086	6.9962	23,892,626	4,469,786	3,284,781	3.9629	13,017,260	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	37,828,493
2067	4,647,099	3,415,086	7.2795	24,860,120	4,469,786	3,284,781	4.0758	13,388,111	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	39,166,838
2068	4,659,832	3,424,443	7.5744	25,938,103	4,485,457	3,296,297	4.1920	13,818,079	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	40,674,788
2069	4,647,099	3,415,086	7.8811	26,914,636	4,469,786	3,284,781	4.3115	14,162,334	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	41,995,577
2070	4,647,099	3,415,086	8.2003	28,004,731	4,469,786	3,284,781	4.4343	14,565,705	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	43,489,044
2071	4,647,099	3,415,086	8.5324	29,138,882	4,469,786	3,284,781	4.5607	14,980,902	1,250,000	918,607	1.0000	918,607	10,366,886	7,618,474	45,038,390
2072	4,659,832	3,424,443	8.8780	30,402,207	4,485,457	3,296,297	4.6907	15,461,942	1,250,000	918,607	1.0000	918,607	10,395,289	7,639,347	46,782,756
2073	4,742,786	3,485,405	9.2375	32,196,431	4,756,846	3,495,737	4.8244	16,864,836	1,250,000	918,607	1.0000	918,607	10,749,633	7,899,750	49,979,873
2074	4,838,472	3,555,723	9.6117	34,176,547	5,043,904	3,706,692	4.9619	18,392,236	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	53,487,390
2075	4,838,472	3,555,723	10.0009	35,560,435	5,043,904	3,706,692	5.1033	18,916,363	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	55,395,404
2076	4,899,048	3,600,240	10.4060	37,464,093	5,203,105	3,823,687	5.2487	20,069,383	1,250,000	918,607	1.0000	918,607	11,352,153	8,342,533	58,452,083
2077	4,790,629	3,520,564	10.8274	38,118,558	4,900,375	3,601,215	5.3983	19,440,438	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	58,477,603
2078	4,934,159	3,626,042	11.2659	40,850,632	5,330,963	3,917,648	5.5522	21,751,564	1,250,000	918,607	1.0000	918,607	11,515,123	8,462,297	63,520,802
2079	4,790,629	3,520,564	11.7222	41,268,759	4,900,375	3,601,215	5.7104	20,564,377	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	62,751,743
2080	4,755,518	3,494,761	12.1970	42,625,606	4,772,516	3,507,253	5.8731	20,598,447	1,250,000	918,607	1.0000	918,607	10,778,034	7,920,621	64,142,659
2081	4,838,472	3,555,723	12.6909	45,125,331	5,043,904	3,706,692	6.0405	22,390,275	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	68,434,212
2082	4,838,472	3,555,723	13.2049	46,952,973	5,043,904	3,706,692	6.2127	23,028,567	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	70,900,147
2083	4,790,629	3,520,564	13.7397	48,371,498	4,900,375	3,601,215	6.3897	23,010,683	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	72,300,787
2084	4,851,204	3,565,080	14.2962	50,967,093	5,059,575	3,718,208	6.5719	24,435,694	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	76,321,393
2085	4,838,472	3,555,723	14.8752	52,892,098	5,043,904	3,706,692	6.7592	25,054,274	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	78,864,979
2086	4,790,629	3,520,564	15.4776	54,489,887	4,900,375	3,601,215	6.9518	25,034,925	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	80,443,419
2087	4,838,472	3,555,723	16.1045	57,263,148	5,043,904	3,706,692	7.1499	26,502,479	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	84,684,234
2088	4,851,204	3,565,080	16.7567	59,738,971	5,059,575	3,718,208	7.3537	27,342,589	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	88,000,167
2089	4,790,629	3,520,564	17.4353	61,382,095	4,900,375	3,601,215	7.5633	27,237,068	1,250,000	918,607	1.0000	918,607	10,941,005	8,040,386	89,537,771
2090	4,838,472	3,555,723	18.1415	64,506,157	5,043,904	3,706,692	7.7788	28,833,618	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	94,258,382
2091	4,838,472	3,555,723	18.8762	67,118,547	5,043,904	3,706,692	8.0005	29,655,391	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	97,692,545
2092	4,851,204	3,565,080	19.6407	70,020,661	5,059,575	3,718,208	8.2285	30,595,278	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	101,534,546
2093	4,838,472	3,555,723	20.4361	72,665,120	5,043,904	3,706,692	8.4630	31,369,736	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	104,953,464
2094	4,838,472	3,555,723	21.2638	75,608,193	5,043,904	3,706,692	8.7042	32,263,791	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	108,790,590
2095	5,170,295	3,799,575	22.1250	84,065,605	6,039,372	4,438,247	8.9523	39,732,521	1,250,000	918,607	1.0000	918,607	12,459,668	9,156,430	124,716,733
2096	4,851,204	3,565,080	23.0210	82,071,700	5,059,575	3,718,208	9.2075	34,235,404	1,250,000	918,607	1.0000	918,607	11,160,779	8,201,895	117,225,711
2097	4,838,472	3,555,723	23.9534	85,171,666	5,043,904	3,706,692	9.4699	35,102,005	1,250,000	918,607	1.0000	918,607	11,132,377	8,181,023	121,192,278
2098	823,359	605,074	24.9235	15,080,573	3,272,479	2,404,897	9.7398	23,423,219	0	-	1.0000	-	4,095,838	3,009,972	38,503,792
2099	823,359	605,074	25.9329	15,691,335	3,272,479	2,404,897	10.0173	24,090,578	0	-	1.0000	-	4,095,838	3,009,972	39,781,913
2100	825,615	606,732	26.9832	16,371,576	3,281,444	2,411,486	10.3028	24,845,059	0	-	1.0000	-	4,107,059	3,018,218	41,216,634
2101	823,359	605,074	28.0760	16,988,070											

AMOUNT TO RECOVER

	LABOR				NON-LABOR				PIIC Payment				Total Cost Estimate Nominal \$s	Total Jurisdictional Cost in Nominal \$s	Total Jurisdictional Cost in Future \$'s
	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s	Cost Estimate Nominal \$s	Jurisdictional Cost in Nominal \$s	Escalation Factor	Jurisdictional Cost in Future \$'s			
2109	29,172,411	21,438,383	38.5720	826,921,313	10,590,974	7,783,154	13.2677	103,264,549	0	-	1.0000	-	39,763,385	29,221,537	930,185,861
2110	57,665,154	42,377,288	40.1341	1,700,774,317	90,528,180	66,527,851	13.6458	907,825,744	0	-	1.0000	-	148,193,335	108,905,139	2,608,600,062
2111	55,538,057	40,814,115	41.7596	1,704,381,128	42,217,329	31,024,904	14.0347	435,425,226	0	-	1.0000	-	97,755,386	71,839,020	2,139,806,354
2112	51,408,076	37,779,052	43.4508	1,641,530,028	32,588,487	23,948,808	14.4347	345,693,858	0	-	1.0000	-	83,996,563	61,727,860	1,987,223,886
2113	23,223,558	17,066,657	45.2106	771,593,789	8,238,061	6,054,032	14.8461	89,878,762	0	-	1.0000	-	31,461,619	23,120,689	861,472,551
2114	14,460,844	10,627,065	47.0416	499,914,146	14,186,680	10,425,586	15.2692	159,190,356	0	-	1.0000	-	28,647,524	21,052,651	659,104,503
2115	10,459,350	7,686,425	48.9468	376,225,916	10,261,051	7,540,698	15.7044	118,422,134	0	-	1.0000	-	20,720,401	15,227,123	494,648,050
	\$573,536,674	\$421,483,808		\$10,167,374,423	\$595,414,118	\$437,561,225		\$3,671,409,774	\$55,000,000	\$40,418,705		\$40,418,705	\$1,223,950,791	\$899,463,737	\$13,879,202,902
	\$2,152,093,723	\$1,581,542,556		\$34,231,301,951	\$1,934,230,348	\$1,421,437,911		\$11,223,351,940	\$111,250,000	\$81,756,016		\$81,756,016	\$4,197,574,071	\$3,084,736,483	\$45,536,409,907

EXTERNAL FUND CALCULATION

Monticello

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	623,672,182	15,989,016	-	6,696,113	646,357,311
2018	646,357,311	33,305,725	-	13,392,226	693,055,262
2019	693,055,262	35,687,320	-	13,392,226	742,134,808
2020	742,134,808	38,190,377	-	13,392,226	793,717,411
2021	793,717,411	40,260,638	-	(8,586,256)	825,391,793
2022	825,391,793	41,876,032	-	(8,586,256)	858,681,569
2023	858,681,569	43,573,811	-	(8,586,256)	893,669,124
2024	893,669,124	45,358,176	-	(8,586,256)	930,441,043
2025	930,441,043	47,233,544	-	(8,586,256)	969,088,331
2026	969,088,331	49,204,555	-	(8,586,256)	1,009,706,630
2027	1,009,706,630	51,276,089	-	(8,586,256)	1,052,396,463
2028	1,052,396,463	53,453,270	-	(8,586,256)	1,097,263,477
2029	1,097,263,477	55,741,488	-	(8,586,256)	1,144,418,709
2030	1,144,418,709	58,146,405	-	(8,586,256)	1,193,978,857
2031	1,193,978,857	60,673,972	-	(8,586,256)	1,246,066,574
2032	1,246,066,574	63,330,446	-	(8,586,256)	1,300,810,763
2033	1,300,810,763	66,122,399	-	(8,586,256)	1,358,346,907
2034	1,358,346,907	69,056,743	-	(8,586,256)	1,418,817,393
2035	1,418,817,393	72,140,738	-	(8,586,256)	1,482,371,875
2036	1,482,371,875	75,382,016	-	(8,586,256)	1,549,167,635
2037	1,549,167,635	78,788,600	-	(8,586,256)	1,619,369,979
2038	1,619,369,979	82,368,919	-	(8,586,256)	1,693,152,642
2039	1,693,152,642	86,131,835	-	(8,586,256)	1,770,698,221
2040	1,770,698,221	90,086,660	-	(8,586,256)	1,852,198,625
2041	1,852,198,625	94,243,180	-	(8,586,256)	1,937,855,549
2042	1,937,855,549	98,611,683	-	(8,586,256)	2,027,880,977
2043	2,027,880,977	103,202,980	-	(8,586,256)	2,122,497,701
2044	2,122,497,701	108,028,433	-	(8,586,256)	2,221,939,878
2045	2,221,939,878	113,099,984	-	(8,586,256)	2,326,453,606
2046	2,326,453,606	118,430,184	-	(8,586,256)	2,436,297,535
2047	2,436,297,535	124,032,225	-	(8,586,256)	2,551,743,503
2048	2,551,743,503	129,919,969	-	(8,586,256)	2,673,077,217
2049	2,673,077,217	136,107,989	-	(8,586,256)	2,800,598,949
2050	2,800,598,949	135,113,411	(64,656,047)	(6,439,692)	2,864,616,621
2051	2,864,616,621	138,360,983	(268,674,682)	-	2,734,302,922
2052	2,734,302,922	132,066,831	(131,923,246)	-	2,734,446,507
2053	2,734,446,507	132,073,766	(164,583,006)	-	2,701,937,267
2054	2,701,937,267	130,503,570	(116,163,876)	-	2,716,276,961
2055	2,716,276,961	131,196,177	(334,375,244)	-	2,513,097,894
2056	2,513,097,894	121,382,628	(39,265,046)	-	2,595,215,476

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	2,595,215,476	125,348,908	(40,625,178)	-	2,679,939,206
	2058	2,679,939,206	129,441,064	(42,147,955)	-	2,767,232,314
	2059	2,767,232,314	133,657,321	(43,729,371)	-	2,857,160,265
	2060	2,857,160,265	138,000,841	(45,494,783)	-	2,949,666,323
	2061	2,949,666,323	142,468,883	(47,075,326)	-	3,045,059,880
	2062	3,045,059,880	147,076,392	(48,844,549)	-	3,143,291,723
	2063	3,143,291,723	151,820,990	(50,681,817)	-	3,244,430,896
	2064	3,244,430,896	156,706,012	(52,733,396)	-	3,348,403,512
	2065	3,348,403,512	161,727,890	(54,570,723)	-	3,455,560,678
	2066	3,455,560,678	166,903,581	(56,627,376)	-	3,565,836,883
	2067	3,565,836,883	172,229,921	(58,762,683)	-	3,679,304,122
	2068	3,679,304,122	177,710,389	(70,974,852)	-	3,786,039,659
	2069	3,786,039,659	182,865,716	(63,283,668)	-	3,905,621,706
	2070	3,905,621,706	188,641,528	(89,271,109)	-	4,004,992,125
	2071	4,004,992,125	193,441,120	(92,535,046)	-	4,105,898,198
	2072	4,105,898,198	198,314,883	(110,661,197)	-	4,193,551,884
	2073	4,193,551,884	202,548,556	(125,734,387)	-	4,270,366,053
	2074	4,270,366,053	206,258,680	(106,961,075)	-	4,369,663,658
	2075	4,369,663,658	211,054,755	(130,924,313)	-	4,449,794,100
	2076	4,449,794,100	214,925,055	(144,159,660)	-	4,520,559,494
	2077	4,520,559,494	218,343,024	(84,871,609)	-	4,654,030,909
	2078	4,654,030,909	224,789,693	(88,096,592)	-	4,790,724,009
	2079	4,790,724,009	231,391,970	(91,446,102)	-	4,930,669,877
	2080	4,930,669,877	238,151,355	(95,185,212)	-	5,073,636,020
	2081	5,073,636,020	245,056,620	(98,538,072)	-	5,220,154,567
	2082	5,220,154,567	252,133,466	(102,291,444)	-	5,369,996,589
	2083	5,369,996,589	259,370,835	(106,189,592)	-	5,523,177,832
	2084	5,523,177,832	266,769,489	(110,541,448)	-	5,679,405,874
	2085	5,679,405,874	274,315,304	(114,445,540)	-	5,839,275,637
	2086	5,839,275,637	282,037,013	(118,814,214)	-	6,002,498,437
	2087	6,002,498,437	289,920,674	(123,352,914)	-	6,169,066,197
	2088	6,169,066,197	297,965,897	(128,418,139)	-	6,338,613,955
	2089	6,338,613,955	306,155,054	(132,964,401)	-	6,511,804,608
	2090	6,511,804,608	314,520,163	(138,052,113)	-	6,688,272,658
	2091	6,688,272,658	323,043,569	(143,336,961)	-	6,867,979,266
	2092	6,867,979,266	331,723,399	(149,235,097)	-	7,050,467,568
	2093	7,050,467,568	340,537,584	(154,530,725)	-	7,236,474,427
	2094	7,236,474,427	349,521,715	(160,456,461)	-	7,425,539,680
	2095	7,425,539,680	358,653,567	(166,612,648)	-	7,617,580,599
	2096	7,617,580,599	367,929,143	(173,482,016)	-	7,812,027,726
	2097	7,812,027,726	377,320,939	(179,652,790)	-	8,009,695,875
	2098	8,009,695,875	386,868,311	(205,592,298)	-	8,190,971,888
	2099	8,190,971,888	395,623,942	(217,348,661)	-	8,369,247,169
	2100	8,369,247,169	404,234,638	(222,085,423)	-	8,551,396,384
	2101	8,551,396,384	413,032,445	(229,970,753)	-	8,734,458,077
	2102	8,734,458,077	421,874,325	(238,733,629)	-	8,917,598,772

EXTERNAL FUND CALCULATION

2103	8,917,598,772	430,720,021	(252,337,374)	-	9,095,981,420
2104	9,095,981,420	439,335,903	(257,930,271)	-	9,277,387,051
2105	9,277,387,051	448,097,795	(1,222,800,300)	-	8,502,684,546
2106	8,502,684,546	410,679,664	(1,770,249,187)	-	7,143,115,022
2107	7,143,115,022	345,012,456	(2,243,272,007)	-	5,244,855,471
2108	5,244,855,471	253,326,519	(1,749,272,895)	-	3,748,909,095
2109	3,748,909,095	181,072,309	(1,743,912,402)	-	2,186,069,003
2110	2,186,069,003	105,587,133	(1,194,162,328)	-	1,097,493,808
2111	1,097,493,808	53,008,951	(813,032,054)	-	337,470,704
2112	337,470,704	16,299,835	(353,770,539)	-	(0)

EXTERNAL FUND CALCULATION

Prairie Island Unit 1

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	374,367,055	9,584,112	-	24,632	383,975,799
2018	383,975,799	19,660,822	-	49,264	403,685,885
2019	403,685,885	20,669,978	-	49,264	424,405,128
2020	424,405,128	21,730,804	-	49,264	446,185,196
2021	446,185,196	22,816,899	-	(1,085,269)	467,916,827
2022	467,916,827	23,929,559	-	(1,085,269)	490,761,117
2023	490,761,117	25,099,186	-	(1,085,269)	514,775,035
2024	514,775,035	26,328,699	-	(1,085,269)	540,018,465
2025	540,018,465	27,621,163	-	(1,085,269)	566,554,359
2026	566,554,359	28,979,800	-	(1,085,269)	594,448,891
2027	594,448,891	30,408,000	-	(1,085,269)	623,771,623
2028	623,771,623	31,909,324	-	(1,085,269)	654,595,678
2029	654,595,678	33,487,516	-	(1,085,269)	686,997,926
2030	686,997,926	35,146,511	-	(1,085,269)	721,059,168
2031	721,059,168	36,890,447	-	(1,085,269)	756,864,346
2032	756,864,346	38,723,672	-	(1,085,269)	794,502,749
2033	794,502,749	40,650,758	-	(1,085,269)	834,068,238
2034	834,068,238	42,676,511	-	(1,085,269)	875,659,481
2035	875,659,481	44,805,983	-	(1,085,269)	919,380,195
2036	919,380,195	47,044,483	-	(1,085,269)	965,339,409
2037	965,339,409	49,397,595	-	(1,085,269)	1,013,651,736
2038	1,013,651,736	51,871,186	-	(1,085,269)	1,064,437,653
2039	1,064,437,653	54,471,425	-	(1,085,269)	1,117,823,809
2040	1,117,823,809	57,204,796	-	(1,085,269)	1,173,943,337
2041	1,173,943,337	60,078,116	-	(1,085,269)	1,232,936,185
2042	1,232,936,185	63,098,550	-	(1,085,269)	1,294,949,466
2043	1,294,949,466	66,273,630	-	(1,085,269)	1,360,137,827
2044	1,360,137,827	69,611,274	-	(1,085,269)	1,428,663,832
2045	1,428,663,832	73,119,805	-	(1,085,269)	1,500,698,369
2046	1,500,698,369	76,807,974	-	(1,085,269)	1,576,421,074
2047	1,576,421,074	80,684,976	-	(1,085,269)	1,656,020,782
2048	1,656,020,782	84,760,481	-	(1,085,269)	1,739,695,994
2049	1,739,695,994	89,044,652	-	(1,085,269)	1,827,655,378
2050	1,827,655,378	93,548,172	-	(1,085,269)	1,920,118,282
2051	1,920,118,282	98,282,273	-	(1,085,269)	2,017,315,286
2052	2,017,315,286	103,258,760	-	(1,085,269)	2,119,488,778
2053	2,119,488,778	102,141,835	(65,994,324)	(727,130)	2,154,909,159
2054	2,154,909,159	103,866,621	(208,862,585)	-	2,049,913,196
2055	2,049,913,196	98,805,816	(88,516,961)	-	2,060,202,050
2056	2,060,202,050	99,301,739	(74,966,746)	-	2,084,537,043

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	2,084,537,043	100,474,685	(77,388,016)	-	2,107,623,712
	2058	2,107,623,712	101,587,463	(109,904,991)	-	2,099,306,183
	2059	2,099,306,183	101,186,558	(311,266,301)	-	1,889,226,441
	2060	1,889,226,441	91,060,714	(30,588,591)	-	1,949,698,564
	2061	1,949,698,564	93,975,471	(31,565,385)	-	2,012,108,650
	2062	2,012,108,650	96,983,637	(32,670,872)	-	2,076,421,414
	2063	2,076,421,414	100,083,512	(33,817,586)	-	2,142,687,341
	2064	2,142,687,341	103,277,530	(35,109,710)	-	2,210,855,160
	2065	2,210,855,160	106,563,219	(36,240,101)	-	2,281,178,277
	2066	2,281,178,277	109,952,793	(37,518,921)	-	2,353,612,149
	2067	2,353,612,149	113,444,106	(38,845,022)	-	2,428,211,233
	2068	2,428,211,233	117,039,781	(40,339,316)	-	2,504,911,698
	2069	2,504,911,698	120,736,744	(41,647,782)	-	2,584,000,660
	2070	2,584,000,660	124,548,832	(43,127,479)	-	2,665,422,013
	2071	2,665,422,013	128,473,341	(44,662,507)	-	2,749,232,847
	2072	2,749,232,847	132,513,023	(46,390,912)	-	2,835,354,958
	2073	2,835,354,958	136,664,109	(49,573,616)	-	2,922,445,451
	2074	2,922,445,451	140,861,871	(53,065,034)	-	3,010,242,288
	2075	3,010,242,288	145,093,678	(54,956,309)	-	3,100,379,658
	2076	3,100,379,658	149,438,299	(57,994,326)	-	3,191,823,632
	2077	3,191,823,632	153,845,899	(58,002,994)	-	3,287,666,537
	2078	3,287,666,537	158,465,527	(63,027,367)	-	3,383,104,696
	2079	3,383,104,696	163,065,646	(62,238,730)	-	3,483,931,613
	2080	3,483,931,613	167,925,504	(63,607,824)	-	3,588,249,292
	2081	3,588,249,292	172,953,616	(67,879,670)	-	3,693,323,238
	2082	3,693,323,238	178,018,180	(70,323,587)	-	3,801,017,830
	2083	3,801,017,830	183,209,059	(71,701,333)	-	3,912,525,556
	2084	3,912,525,556	188,583,732	(75,696,420)	-	4,025,412,868
	2085	4,025,412,868	194,024,900	(78,216,952)	-	4,141,220,817
	2086	4,141,220,817	199,606,843	(79,769,645)	-	4,261,058,016
	2087	4,261,058,016	205,382,996	(83,983,679)	-	4,382,457,332
	2088	4,382,457,332	211,234,443	(87,269,769)	-	4,506,422,007
	2089	4,506,422,007	217,209,541	(88,780,409)	-	4,634,851,138
	2090	4,634,851,138	223,399,825	(93,470,899)	-	4,764,780,065
	2091	4,764,780,065	229,662,399	(96,873,741)	-	4,897,568,723
	2092	4,897,568,723	236,062,812	(100,680,833)	-	5,032,950,703
	2093	5,032,950,703	242,588,224	(104,068,207)	-	5,171,470,720
	2094	5,171,470,720	249,264,889	(107,870,100)	-	5,312,865,509
	2095	5,312,865,509	256,080,118	(123,759,600)	-	5,445,186,026
	2096	5,445,186,026	262,457,966	(116,227,745)	-	5,591,416,247
	2097	5,591,416,247	269,506,263	(120,157,405)	-	5,740,765,105
	2098	5,740,765,105	276,704,878	(95,517,156)	-	5,921,952,828
	2099	5,921,952,828	285,438,126	(99,105,680)	-	6,108,285,274
	2100	6,108,285,274	294,419,350	(103,113,576)	-	6,299,591,048
	2101	6,299,591,048	303,640,289	(106,700,764)	-	6,496,530,572
	2102	6,496,530,572	313,132,774	(110,717,892)	-	6,698,945,453

EXTERNAL FUND CALCULATION

2103	6,698,945,453	322,889,171	(114,888,871)	-	6,906,945,753
2104	6,906,945,753	332,914,785	(119,546,315)	-	7,120,314,223
2105	7,120,314,223	343,199,146	(123,717,087)	-	7,339,796,282
2106	7,339,796,282	353,778,181	(128,387,108)	-	7,565,187,355
2107	7,565,187,355	364,642,031	(354,661,844)	-	7,575,167,542
2108	7,575,167,542	365,123,076	(1,340,861,441)	-	6,599,429,176
2109	6,599,429,176	318,092,486	(2,076,067,200)	-	4,841,454,463
2110	4,841,454,463	233,358,105	(1,872,417,744)	-	3,202,394,824
2111	3,202,394,824	154,355,431	(1,422,943,812)	-	1,933,806,442
2112	1,933,806,442	93,209,471	(546,793,735)	-	1,480,222,178
2113	1,480,222,178	71,346,709	(668,957,109)	-	882,611,778
2114	882,611,778	42,541,888	(539,015,148)	-	386,138,518
2115	386,138,518	18,611,877	(404,750,394)	-	0

EXTERNAL FUND CALCULATION

Prairie Island Unit 2

	Beginning Balance	Assumed Interest	Decommissioning Payment	Annuity	Ending Balance
2017	420,208,967	10,803,157	-	294,670	431,306,795
2018	431,306,795	22,184,315	-	589,341	454,080,451
2019	454,080,451	23,354,881	-	589,341	478,024,673
2020	478,024,673	24,585,614	-	589,341	503,199,628
2021	503,199,628	25,702,425	-	(6,304,910)	522,597,142
2022	522,597,142	26,699,457	-	(6,304,910)	542,991,689
2023	542,991,689	27,747,737	-	(6,304,910)	564,434,515
2024	564,434,515	28,849,898	-	(6,304,910)	586,979,503
2025	586,979,503	30,008,710	-	(6,304,910)	610,683,303
2026	610,683,303	31,227,086	-	(6,304,910)	635,605,478
2027	635,605,478	32,508,085	-	(6,304,910)	661,808,653
2028	661,808,653	33,854,929	-	(6,304,910)	689,358,671
2029	689,358,671	35,271,000	-	(6,304,910)	718,324,760
2030	718,324,760	36,759,856	-	(6,304,910)	748,779,707
2031	748,779,707	38,325,241	-	(6,304,910)	780,800,037
2032	780,800,037	39,971,086	-	(6,304,910)	814,466,212
2033	814,466,212	41,701,527	-	(6,304,910)	849,862,829
2034	849,862,829	43,520,913	-	(6,304,910)	887,078,832
2035	887,078,832	45,433,816	-	(6,304,910)	926,207,738
2036	926,207,738	47,445,042	-	(6,304,910)	967,347,869
2037	967,347,869	49,559,644	-	(6,304,910)	1,010,602,603
2038	1,010,602,603	51,782,938	-	(6,304,910)	1,056,080,630
2039	1,056,080,630	54,120,508	-	(6,304,910)	1,103,896,228
2040	1,103,896,228	56,578,230	-	(6,304,910)	1,154,169,547
2041	1,154,169,547	59,162,279	-	(6,304,910)	1,207,026,916
2042	1,207,026,916	61,879,147	-	(6,304,910)	1,262,601,152
2043	1,262,601,152	64,735,663	-	(6,304,910)	1,321,031,905
2044	1,321,031,905	67,739,004	-	(6,304,910)	1,382,465,999
2045	1,382,465,999	70,896,716	-	(6,304,910)	1,447,057,804
2046	1,447,057,804	74,216,735	-	(6,304,910)	1,514,969,629
2047	1,514,969,629	77,707,403	-	(6,304,910)	1,586,372,121
2048	1,586,372,121	81,377,491	-	(6,304,910)	1,661,444,702
2049	1,661,444,702	85,236,221	-	(6,304,910)	1,740,376,013
2050	1,740,376,013	89,293,291	-	(6,304,910)	1,823,364,394
2051	1,823,364,394	93,558,894	-	(6,304,910)	1,910,618,377
2052	1,910,618,377	98,043,748	-	(6,304,910)	2,002,357,215
2053	2,002,357,215	102,759,125	-	(6,304,910)	2,098,811,429
2054	2,098,811,429	101,246,213	(29,938,170)	(5,233,076)	2,164,886,397
2055	2,164,886,397	104,564,013	(218,808,713)	-	2,050,641,696
2056	2,050,641,696	99,045,994	(124,349,207)	-	2,025,338,483

EXTERNAL FUND CALCULATION

<i>External Levelized</i>	2057	2,025,338,483	97,823,849	(67,639,969)	-	2,055,522,362
	2058	2,055,522,362	99,281,730	(99,798,689)	-	2,055,005,404
	2059	2,055,005,404	99,256,761	(302,666,816)	-	1,851,595,349
	2060	1,851,595,349	89,432,055	(30,834,593)	-	1,910,192,811
	2061	1,910,192,811	92,262,313	(31,820,406)	-	1,970,634,717
	2062	1,970,634,717	95,181,657	(32,935,968)	-	2,032,880,406
	2063	2,032,880,406	98,188,124	(34,093,157)	-	2,096,975,373
	2064	2,096,975,373	101,283,911	(35,396,963)	-	2,162,862,321
	2065	2,162,862,321	104,466,250	(36,537,896)	-	2,230,790,675
	2066	2,230,790,675	107,747,190	(37,828,493)	-	2,300,709,372
	2067	2,300,709,372	111,124,263	(39,166,838)	-	2,372,666,797
	2068	2,372,666,797	114,599,806	(40,674,788)	-	2,446,591,815
	2069	2,446,591,815	118,170,385	(41,995,577)	-	2,522,766,623
	2070	2,522,766,623	121,849,628	(43,489,044)	-	2,601,127,207
	2071	2,601,127,207	125,634,444	(45,038,390)	-	2,681,723,260
	2072	2,681,723,260	129,527,233	(46,782,756)	-	2,764,467,738
	2073	2,764,467,738	133,523,792	(49,979,873)	-	2,848,011,657
	2074	2,848,011,657	137,558,963	(53,487,390)	-	2,932,083,229
	2075	2,932,083,229	141,619,620	(55,395,404)	-	3,018,307,445
	2076	3,018,307,445	145,784,250	(58,452,083)	-	3,105,639,611
	2077	3,105,639,611	150,002,393	(58,477,603)	-	3,197,164,401
	2078	3,197,164,401	154,423,041	(63,520,802)	-	3,288,066,639
	2079	3,288,066,639	158,813,619	(62,751,743)	-	3,384,128,514
	2080	3,384,128,514	163,453,407	(64,142,659)	-	3,483,439,262
	2081	3,483,439,262	168,250,116	(68,434,212)	-	3,583,255,166
	2082	3,583,255,166	173,071,225	(70,900,147)	-	3,685,426,244
	2083	3,685,426,244	178,006,088	(72,300,787)	-	3,791,131,545
	2084	3,791,131,545	183,111,654	(76,321,393)	-	3,897,921,805
	2085	3,897,921,805	188,269,623	(78,864,979)	-	4,007,326,449
	2086	4,007,326,449	193,553,867	(80,443,419)	-	4,120,436,898
	2087	4,120,436,898	199,017,102	(84,684,234)	-	4,234,769,766
	2088	4,234,769,766	204,539,380	(88,000,167)	-	4,351,308,978
	2089	4,351,308,978	210,168,224	(89,537,771)	-	4,471,939,431
	2090	4,471,939,431	215,994,675	(94,258,382)	-	4,593,675,724
	2091	4,593,675,724	221,874,537	(97,692,545)	-	4,717,857,716
	2092	4,717,857,716	227,872,528	(101,534,546)	-	4,844,195,698
	2093	4,844,195,698	233,974,652	(104,953,464)	-	4,973,216,886
	2094	4,973,216,886	240,206,376	(108,790,590)	-	5,104,632,672
	2095	5,104,632,672	246,553,758	(124,716,733)	-	5,226,469,697
	2096	5,226,469,697	252,438,486	(117,225,711)	-	5,361,682,472
	2097	5,361,682,472	258,969,263	(121,192,278)	-	5,499,459,457
	2098	5,499,459,457	265,623,892	(38,503,792)	-	5,726,579,557
	2099	5,726,579,557	276,593,793	(39,781,913)	-	5,963,391,437
	2100	5,963,391,437	288,031,806	(41,216,634)	-	6,210,206,609
	2101	6,210,206,609	299,952,979	(42,471,564)	-	6,467,688,024
	2102	6,467,688,024	312,389,332	(43,885,874)	-	6,736,191,482

EXTERNAL FUND CALCULATION

2103	6,736,191,482	325,358,049	(45,348,698)	-	7,016,200,832
2104	7,016,200,832	338,882,500	(46,990,057)	-	7,308,093,275
2105	7,308,093,275	352,980,905	(48,426,958)	-	7,612,647,222
2106	7,612,647,222	367,690,861	(50,046,016)	-	7,930,292,067
2107	7,930,292,067	383,033,107	(51,721,076)	-	8,261,604,098
2108	8,261,604,098	399,035,478	(363,913,701)	-	8,296,725,875
2109	8,296,725,875	400,731,860	(930,185,861)	-	7,767,271,873
2110	7,767,271,873	375,159,231	(2,608,600,062)	-	5,533,831,043
2111	5,533,831,043	267,284,039	(2,139,806,354)	-	3,661,308,729
2112	3,661,308,729	176,841,212	(1,987,223,886)	-	1,850,926,054
2113	1,850,926,054	89,399,728	(861,472,551)	-	1,078,853,232
2114	1,078,853,232	52,108,611	(659,104,503)	-	471,857,340
2115	471,857,340	22,790,710	(494,648,050)	-	(0)

Decommissioning Filings

Year of Filing	Docket No.	Date of Filing	Start Date of Accrual	End Date of Accrual	Accrual Amount
2005	E002/M-05-1648	10/11/2005	1/1/2006	12/31/2008	\$32,016,646
2008	E002/M-08-1201	10/13/2008	1/1/2009	12/31/2011	-
2011	E002/M-11-939	12/30/2011	1/1/2012	12/31/2012	-
			1/1/2013	12/31/2014	14,189,132
2014	E002/M-14-761	12/1/2014	1/1/2015	12/31/2015	14,189,132
			1/1/2016	12/31/2018	14,030,831
2017	E002/M-17-828 (pending)	12/1/2017	1/1/2019	12/31/2021	14,030,831

Rate Cases

Year of Filing	Docket No.	Test Year	Accrual Amount	Recovery Amount
2005	E002/GR-05-1428	2006	\$32,017,000	\$32,017,000
2008	E002/GR-08-1065	2009	-	-
2010	E002/GR-10-971	2011	-	-
2012	E002/GR-12-961 *	2013	14,189,132	-
2013	E002/GR-13-868 *	2014/2015	14,189,132	-
2015	E002/GR-15-826	2016-2018	14,030,831	14,030,831

* Accrual was offset by DOE Refund

2019 Accrual Amounts

Current Accrual	14,030,831
32-Year Scenario (DECON)	28,483,732
60-Year Scenario (DECON) - No Recasking	45,593,406
60-Year Scenario (DECON) - No Recasking -5 years	87,157,100
60-Year Scenario (DECON) - No Recasking +20 years	(1,849,439)
60-Year Scenario (DECON) - With Recasking	56,932,276
60-Year Scenario (SAFSTOR) - No Recasking	24,896,813
60-Year Scenario (SAFSTOR) - No Recasking -5 years	55,836,840
60-Year Scenario (SAFSTOR) - No Recasking +20 years	(12,515,906)
100-Year Scenario (DECON)	107,438,894
200-Year Scenario (DECON)	147,056,491

Analysis by Customer Class	Residential	C&I Non-Demand	C&I Demand	Lighting	Total
Stratification⁽¹⁾					
Capacity Component (D10S) 19.3%	35.53%	3.41%	61.06%	0.00%	100.00%
Energy Component (E8760) 80.7%	28.69%	3.16%	67.68%	0.47%	100.00%
Combined	30.01%	3.21%	66.40%	0.38%	100.00%
Combined Allocation to Class					
Current Accrual	4,210,669	450,144	9,316,800	53,218	14,030,831
32-Year Scenario (DECON)	8,548,002	913,829	18,913,865	108,036	28,483,732
60-Year Scenario (DECON) - No Recasking	13,682,636	1,462,750	30,275,088	172,931	45,593,406
60-Year Scenario (DECON) - No Recasking -5 years	26,155,950	2,796,218	57,874,354	330,578	87,157,100
60-Year Scenario (DECON) - No Recasking +20 years	(555,019)	(59,335)	(1,228,070)	(7,015)	(1,849,439)
60-Year Scenario (DECON) - With Recasking	17,085,444	1,826,530	37,804,363	215,938	56,932,276
60-Year Scenario (SAFSTOR) - No Recasking	7,471,564	798,752	16,532,067	94,431	24,896,813
60-Year Scenario (SAFSTOR) - No Recasking -5 years	16,756,703	1,791,385	37,076,968	211,784	55,836,840
60-Year Scenario (SAFSTOR) - No Recasking +20 years	(3,756,038)	(401,542)	(8,310,855)	(47,472)	(12,515,906)
100-Year Scenario (DECON)	32,242,541	3,446,908	71,341,940	407,505	107,438,894
200-Year Scenario (DECON)	44,131,830	4,717,940	97,648,951	557,771	147,056,491
Class MWh Sales⁽²⁾	8,558,594	923,181	20,950,649	177,621	30,610,045
Average Class Amount per kWh					
Current Accrual	0.000492	0.000488	0.000445	0.000300	
32-Year Scenario (DECON)	0.000999	0.000990	0.000903	0.000608	
60-Year Scenario (DECON) - No Recasking	0.001599	0.001584	0.001445	0.000974	
60-Year Scenario (DECON) - No Recasking -5 years	0.003056	0.003029	0.002762	0.001861	
60-Year Scenario (DECON) - No Recasking +20 years	(0.000065)	(0.000064)	(0.000059)	(0.000039)	
60-Year Scenario (DECON) - With Recasking	0.001996	0.001979	0.001804	0.001216	
60-Year Scenario (SAFSTOR) - No Recasking	0.000873	0.000865	0.000789	0.000532	
60-Year Scenario (SAFSTOR) - No Recasking -5 years	0.001958	0.001940	0.001770	0.001192	
60-Year Scenario (SAFSTOR) - No Recasking +20 years	(0.000439)	(0.000435)	(0.000397)	(0.000267)	
100-Year Scenario (DECON)	0.003767	0.003734	0.003405	0.002294	
200-Year Scenario (DECON)	0.005156	0.005111	0.004661	0.003140	
Average Customer Monthly kWh⁽²⁾	629	891	37,098	3,370	
Average Customer Monthly Amount					
Current Accrual	0.31	0.43	16.51	1.01	
32-Year Scenario (DECON)	0.63	0.88	33.50	2.05	
60-Year Scenario (DECON) - No Recasking	1.01	1.41	53.61	3.28	
60-Year Scenario (DECON) - No Recasking -5 years	1.92	2.70	102.46	6.27	
60-Year Scenario (DECON) - No Recasking +20 years	(0.04)	(0.06)	(2.19)	(0.13)	
60-Year Scenario (DECON) - With Recasking	1.26	1.76	66.92	4.10	
60-Year Scenario (SAFSTOR) - No Recasking	0.55	0.77	29.27	1.79	
60-Year Scenario (SAFSTOR) - No Recasking -5 years	1.23	1.73	65.66	4.02	
60-Year Scenario (SAFSTOR) - No Recasking +20 years	(0.28)	(0.39)	(14.73)	(0.90)	
100-Year Scenario (DECON)	2.37	3.33	126.32	7.73	
200-Year Scenario (DECON)	3.24	4.55	172.91	10.58	

(1) Docket No. E002/GR-15-826, Nuclear Stratification Percentages (Peppin Direct Testimony, Table 6) (Peppin Testimony, Schedule 4, Pages 13-14)

(2) Year Ending December 31, 2017. Sales and Revenue by Rate Schedule (Huso Direct Testimony, Schedule 4, Page 1)

2021 Accrual Amounts

Current Accrual	14,030,831
32-Year Scenario (DECON)	31,460,634
60-Year Scenario (DECON) - No Recasking	53,019,302
60-Year Scenario (DECON) - No Recasking -5 years	115,873,173
60-Year Scenario (DECON) - No Recasking +20 years	(3,814,517)
60-Year Scenario (DECON) - With Recasking	67,116,594
60-Year Scenario (SAFSTOR) - No Recasking	27,138,020
60-Year Scenario (SAFSTOR) - No Recasking -5 years	71,561,676
60-Year Scenario (SAFSTOR) - No Recasking +20 years	(15,976,435)
100-Year Scenario (DECON)	129,741,425
200-Year Scenario (DECON)	179,327,759

Analysis by Customer Class	Residential	C&I Non-Demand	C&I Demand	Lighting	Total
Stratification⁽¹⁾					
Capacity Component (D10S) 19.3%	35.53%	3.41%	61.06%	0.00%	100.00%
Energy Component (E8760) 80.7%	28.69%	3.16%	67.68%	0.47%	100.00%
Combined	30.01%	3.21%	66.40%	0.38%	100.00%
Combined Allocation to Class					
Current Accrual	4,210,669	450,144	9,316,800	53,218	14,030,831
32-Year Scenario (DECON)	9,441,374	1,009,336	20,890,597	119,327	31,460,634
60-Year Scenario (DECON) - No Recasking	15,911,156	1,700,992	35,206,057	201,097	53,019,302
60-Year Scenario (DECON) - No Recasking -5 years	34,773,678	3,717,501	76,942,498	439,495	115,873,173
60-Year Scenario (DECON) - No Recasking +20 years	(1,144,741)	(122,379)	(2,532,929)	(14,468)	(3,814,517)
60-Year Scenario (DECON) - With Recasking	20,141,770	2,153,268	44,566,989	254,567	67,116,594
60-Year Scenario (SAFSTOR) - No Recasking	8,144,153	870,656	18,020,281	102,932	27,138,020
60-Year Scenario (SAFSTOR) - No Recasking -5 years	21,475,745	2,295,877	47,518,627	271,426	71,561,676
60-Year Scenario (SAFSTOR) - No Recasking +20 years	(4,794,547)	(512,564)	(10,608,727)	(60,597)	(15,976,435)
100-Year Scenario (DECON)	38,935,557	4,162,429	86,151,342	492,096	129,741,425
200-Year Scenario (DECON)	53,816,476	5,753,283	119,077,828	680,172	179,327,759
Class MWh Sales⁽²⁾	8,558,594	923,181	20,950,649	177,621	30,610,045
Average Class Amount per kWh					
Current Accrual	0.000492	0.000488	0.000445	0.000300	
32-Year Scenario (DECON)	0.001103	0.001093	0.000997	0.000672	
60-Year Scenario (DECON) - No Recasking	0.001859	0.001843	0.001680	0.001132	
60-Year Scenario (DECON) - No Recasking -5 years	0.004063	0.004027	0.003673	0.002474	
60-Year Scenario (DECON) - No Recasking +20 years	(0.000134)	(0.000133)	(0.000121)	(0.000081)	
60-Year Scenario (DECON) - With Recasking	0.002353	0.002332	0.002127	0.001433	
60-Year Scenario (SAFSTOR) - No Recasking	0.000952	0.000943	0.000860	0.000580	
60-Year Scenario (SAFSTOR) - No Recasking -5 years	0.002509	0.002487	0.002268	0.001528	
60-Year Scenario (SAFSTOR) - No Recasking +20 years	(0.000560)	(0.000555)	(0.000506)	(0.000341)	
100-Year Scenario (DECON)	0.004549	0.004509	0.004112	0.002770	
200-Year Scenario (DECON)	0.006288	0.006232	0.005684	0.003829	
Average Customer Monthly kWh⁽²⁾	629	891	37,098	3,370	
Average Customer Monthly Amount					
Current Accrual	\$0.31	\$0.43	\$16.51	\$1.01	
32-Year Scenario (DECON)	\$0.69	\$0.97	\$36.99	\$2.26	
60-Year Scenario (DECON) - No Recasking	\$1.17	\$1.64	\$62.32	\$3.82	
60-Year Scenario (DECON) - No Recasking -5 years	\$2.56	\$3.59	\$136.26	\$8.34	
60-Year Scenario (DECON) - No Recasking +20 years	(\$0.08)	(\$0.12)	(\$4.49)	(\$0.27)	
60-Year Scenario (DECON) - With Recasking	\$1.48	\$2.08	\$78.91	\$4.83	
60-Year Scenario (SAFSTOR) - No Recasking	\$0.60	\$0.84	\$31.90	\$1.95	
60-Year Scenario (SAFSTOR) - No Recasking -5 years	\$1.58	\$2.21	\$84.14	\$5.15	
60-Year Scenario (SAFSTOR) - No Recasking +20 years	(\$0.35)	(\$0.49)	(\$18.77)	(\$1.15)	
100-Year Scenario (DECON)	\$2.86	\$4.02	\$152.55	\$9.34	
200-Year Scenario (DECON)	\$3.96	\$5.55	\$210.86	\$12.90	

(1) Docket No. E002/GR-15-826, Nuclear Stratification Percentages (Peppin Direct Testimony, Table 6) (Peppin Testimony, Schedule 4, Pages 13-14)

(2) Year Ending December 31, 2017. Sales and Revenue by Rate Schedule (Huso Direct Testimony, Schedule 4, Page 1)

End-of-life nuclear fuel refers to the book recovery of unused nuclear fuel at the time of reactor shutdown. The unit of production method assures full recovery. However, the Company does not want a dramatic increase in recovery in the final period. To mitigate this possibility, the increase over usual amortization levels was isolated and a sinking fund method was established to spread this amount over the remaining life of the nuclear units. The Company received approval from the Minnesota Public Utilities Commission to recover for end-of-life nuclear fuel in 1992¹.

At the end of the final period or the last cycle, each reactor unit will contain fuel that is partially burned and fuel that is fully burned. Normally, the partially burned fuel would have been recovered in future periods, but without those future periods, the unit of production method takes the remaining depreciation in the last several cycles prior to permanent shutdown causing a spike in amortization expense. To eliminate this spike, the remaining recovery associated with the partially burned fuel becomes the amount to recover over the remaining life of the plant, using the sinking fund method.

Before quantifying this spike through the use of in-house plant specific core design models, fuel management strategies were developed to minimize the amount of unburned fuel in each reactor at end of licensed life (EOLL). As the reactors at Prairie Island and Monticello approach their EOLL, a spike in fuel expense is indicated since all useful energy in the fuel will not be recovered. By minimizing the amount of useful energy remaining in the fuel at EOLL, the spikes in fuel expense in the last several cycles of operation are lowered, thereby reducing the overall dollar amount to be recovered prior to permanent shutdown.

The strategy for Prairie Island Unit 1 and Unit 2 uses the ability to interchange fuel between the two reactors and the re-insertion of fuel burned from previous cycles. In this EOLL study, the last cycle of Unit 1 (Cycle 38 with an August 9, 2033 shutdown) utilizes 20 fresh assemblies. The last cycle for Unit 2 (Cycle 38 with an October 29, 2034 shutdown) utilizes 53 burned assemblies discharged from Unit 1 that contained the most useful remaining energy. Re-using these burned assemblies from Unit 1 permits more energy to be extracted from these assemblies resulting in reduced EOLL expense. Moreover, it eliminates the need to purchase a large number of fresh fuel assemblies for the final cycle of Unit 2. As such, 12 fresh assemblies are loaded

¹ The Commission's Order received on February 25, 1992, MPUC Docket No. E002/D-90-184, Triennial Review of Nuclear Decommissioning.

in the last cycle of Unit 2 based on operational considerations. This significantly reduces the EOLL cost for the combined Prairie Island units.

Since the previous EOLL study, both Prairie Island Units have transitioned to an almost two year cycle. This reduced the total cycles through the end of life from 39 cycles to 38 cycles for both units. The last cycle for both units used more fresh assemblies (4 more for each unit) compared to the previous EOLL study but resulted in one less refueling outage which reduces the fuel expense required for the life of both plants.

Monticello is on a two-year operating cycle and was uprated from its previous thermal capacity of 1,775 megawatt thermal ("MWth") to 2,004 MWth in 2014. The current operating conditions have resulted in typical cycle lengths ranging from approximately 15,200 to 15,800 megawatt days per metric ton of uranium ("MWd/MTU") and requires between 148-164 fresh fuel assemblies to be loaded into the core each new cycle. Due to operational factors associated with the two-year cycle lengths, the current EOLL study for Monticello does not utilize the reinsertion method employed by Prairie Island to reduce the number of fresh assemblies in the final cycle.

The multi-cycle Monticello fuel management strategy in this EOLL study loads 120 fresh assemblies into Monticello's final cycle (Cycle 35 with September 7, 2030 shutdown) compared with 100 in the 2014 Filing. Thus, 20 additional assemblies are loaded in the last cycle compared to the previous EOLL study due to the average enrichment being drastically lowered from 4.027 to 2.619 weight percent. The cost of a reload is mainly driven by the cost of the quantity of uranium, conversion and enrichment needed to build the fuel assemblies. By lowering the average enrichment in a reload you reduce the amount of uranium, conversion and enrichment needed to support the reload. Cycle 35 has a shortened cycle length requirement of about 10,470 MWd/MTU. The combination of shorter cycle length and fresh fuel loading in the last cycle results in about 100 days of gradual power coast down at the end of license life in order to minimize the fresh fuel reload costs.

Note that some of the decrease is also due to the drop in the unit price forecast for uranium and conversion, with a slight increase in the forecast price for enrichment. For each cycle through the end of life the uranium cost has dropped between \$25 and \$35 per pound which results in the lower overall cost to be recovered at the point of shutdown.

Since the strategy is to manage the fuel for the entire station at Prairie Island as indicated by the plan to re-insert partially burned fuel from Unit 1 into Unit 2, only

one net figure is shown for the Prairie Island Station. The amounts below represent the total cost to be recovered, and do not take into account the amounts already collected to date. The result of this analysis produced the following future amounts to be recovered:

Amount to Be Recovered	
Monticello	\$52,856,869
Prairie Island	70,018,922
	<u>\$122,875,791</u>

This projected recovery of \$122,875,791 compares to \$127,047,569 in the 2014 Filing. For the most part, this \$4,171,778 decrease in the amount to recover is brought about by the following factors:

- Improved fuel utilization in the updated multi-cycle core designs close to EOLL
- Lower projected nuclear fuel commodity prices throughout the forecast period

The remaining life is the same as was used for decommissioning. The internal rate of return is the the weighted cost of capital from the MYRP. The after tax internal rate of return is 6.16 percent based on an approved rate of return of 7.08 percent using a 40.85 percent tax rate for the debt component.

The proposed 2019 accrual for total Company is \$2,777,148. Applying the Minnesota jurisdictional factor of 73.4886 percent to this total Company amount, the result is a Minnesota jurisdictional amount of \$2,040,887. This is a decrease of \$372,402 over the present 2019 Minnesota jurisdictional accrual of \$2,413,289. Therefore, the Company requests a 2019 accrual for EOL nuclear fuel of \$2,040,887 for the MN Jurisdiction.

Schedule H contains the accrual worksheets supporting the end-of-life nuclear fuel numbers in the main document, the various sections of which are listed in the table below.

EOL Nuclear Fuel Supporting Schedules

H.1 Present to Proposed Accrual Comparison

H.2 2021 EOL Nuclear Fuel Accrual (Proposed)

H.3 2021 EOL Nuclear Fuel Accrual (Present)

Current Assumptions

ANNUAL ACCRUAL

Generating Plant	Sinking Fund Rate	Remaining Life 1/1/19	Amount to Recover	Amount Recovered	Annual Accrual
	(1)	(2)	(3)	(4)	(5)
Monticello	6.51%	11.75	\$73,999,696	\$35,490,547	\$2,283,300
Prairie Island	6.51%	15.30	53,047,873	28,082,941	1,000,596
			\$127,047,569	\$63,573,488	\$3,283,896

INPUT DATA

Tax Rate	41.37% (a)		
Rate of Return - Internal			
	<u>Percent</u>	<u>Cost</u>	<u>Weight</u>
Short-Term	2.14	0.68	0.01
Long-Term	45.30	5.02	2.27
Total Debt	47.44		2.28 (c)
Preferred	0.00	0.00	0.00
Common	52.56	9.83	5.17
Total	100.00		7.45 (d)
After-Tax Rate	6.51% (e)		

NOTES

Input Data

(e) = (d) - [(c) x (a)]

(2) = Remaining life based on E,G002/D-15-46

(3) = Final Core Analysis from 2014 filing

Annual Accrual

(5) = {[(3) - (4)] x (1) } / { [(1 + (1)) ^ (2)] - 1 }

This section discusses the issues surrounding premature decommissioning of nuclear generating facilities, which can be either accident or non-accident related. Presently, insurance is unavailable for non-accident related premature decommissioning such as those caused by regulatory directives. Therefore, the insurance analysis deals with accident related premature decommissioning.

The Company has insurance for accident-related premature decommissioning, covering property, liability, and replacement energy costs. In 1981, an internal sinking fund for the accrual of nuclear decommissioning costs was established. In 1990, an external fund was also created. In 2005, all internal funds were transferred to external funds. Further, in 2006 the Company established an external escrow fund. In 2016 the external escrow fund was transferred to the Qualified Trust, in accordance with the order in the 2014 Filing. Amounts have been accumulating in the Qualified Trust and would apply to all premature decommissioning expenses. The total fund accumulation as of June 30, 2017, for the Minnesota Jurisdiction is approximately \$1,151 million.

Availability of Insurance

In the event of an accident-related premature decommissioning, the Company's property insurance coverage would apply to any resulting property damage and the cost of site decontamination and clean up. Insurance coverage for public liability and business interruption also would apply, if necessary. Marsh USA, a commercial nuclear insurance broker, is also the Company's insurance consultant and assists in providing the proper insurance coverage.

Property Insurance

The Company maintains property insurance in the amount of \$2.25 billion per site. The insurance is currently provided by Nuclear Electric Insurance Limited (NEIL) in the form of two insurance policies per site. These insurance policies cover property damage to the Company's nuclear facilities plus site decontamination clean up caused by an accident.

The primary policy provides coverage limits of \$1.5 billion per site; the excess policy provides an additional \$750 million of insurance limits on a combined basis. There is a \$5 million deductible per loss that would have to be satisfied. NEIL, a mutual insurance company owned by the insured utilities, including the Company, initiated a program in November 1981 to offer additional nuclear property insurance for each site. After receiving the approval of the Commission

in Docket No. E002/M-81-560, the Company purchased \$118 million of NEIL nuclear property insurance.

Public Liability Insurance

The Price-Anderson liability provisions of the Atomic Energy Act of 1954 (Act) previously set a limit of \$640 million for public liability claims that could arise from a nuclear incident. In August 1988, an extension of the Act was signed continuing the provision for another 15 years and increasing the liability limits. In August 2005, an additional 20 year extension of the Act was signed into law. The Company purchases the maximum available private insurance of \$450 million to satisfy requirements under the Act. Claims above \$450 million up to \$13.436 billion would be satisfied by a NRC assessment against all owners of licensed nuclear generating units.

In the event of such an assessment by the NRC in response to an accident, the Company could be charged up to \$127.314 million per accident for each of its three licensed nuclear reactors but limited to a maximum cash payment of \$19.0 million per reactor per accident for any one year. The following is a breakdown of the coverage provided by the Act.

Price Anderson Act	
Liability Coverage (Millions)	
Private Insurance	\$450
NRC Assessment	12,986
	\$13,436 Per accident
NRC Assessment (Millions)	
Per Unit Assessment	\$127.314
No. Of Nuclear Units	X 102
Total Assessment	\$12,986

Accidental Outage Insurance

The Company purchases insurance to offset the potential additional outage-related expenses that would follow an accident at its nuclear generating plants.

The cost of replacement energy is included in this coverage. NEIL has provided this coverage since September 15, 1980.

NEIL accidental outage insurance provides coverage for a period of two years and forty-six and three-tenths (46.3) weeks following a 12-week waiting period deductible. Accidental outage insurance coverage amounts for the first 52 weeks are \$3.75 million, per week, for each unit at Prairie Island and Monticello, respectively. Thereafter, payments would be reduced by 20 percent for another 98.3 weeks, at which time the coverage would be exhausted.

In the event of an accident at Prairie Island that causes outages at both units, accidental outage insurance payments for each unit would be 80 percent of the amount payable had the outage affected only one unit.

Accidental Outage Insurance			
	Monticello	Prairie Island Unit 1	Prairie Island Unit 2
Deductible (weeks)	12	12	12
Coverage Dollar Amount (millions)*			
First Year	\$3.75	\$3.75	\$3.75
Second Year	\$3.0	\$3.0	\$3.0
Last 46.3 Weeks	\$3.0	\$3.0	\$3.0
Total Limits (millions)	\$490	\$490	\$490

*Coverage dollar amounts are in millions per week.

Federal Agency Programs and Studies

There are no known new federal agency programs or studies to report since the 2005 Triennial Nuclear Decommissioning Accrual filing.

Steps Taken To Minimize Possible Loss

The Company monitors NRC rulemaking to define methods for reducing risks associated with premature decommissioning. The Company purchases nuclear property and liability insurance from the commercial and captive markets in

amounts adequate to cover a maximum foreseeable loss. In addition, replacement power insurance is purchased to cover the cost of replacing megawatt hours lost while a unit is shut down.

Additionally, with Commission approval, the Company has accrued funds in an internal sinking fund for future decommissioning expenses since 1981. The internal fund amounts for the Minnesota Jurisdiction were transferred to the external fund under an accelerated schedule, with completion in 2005. The potential expense of a premature, non-accident related nuclear decommissioning would be partially offset by the external fund accumulations.

The Company's decommissioning fund plan and insurance levels are consistent with the NRC guidelines in NUREG-0584, Assuring the Availability of Funds for Decommissioning Nuclear Facilities, Page 49:

Although premature decommissioning insurance would be preferable, as long as adequate levels of on-site accident decontamination insurance are maintained by licensees, the author believes that such insurance, together with an internal reserve, would provide a reasonable level of assurance.

Financial Ability to Withstand Premature Nuclear Decommissioning

The Commission attempts to coordinate several goals:

1. to ensure that funds are available at the time decommissioning takes place;
2. to avoid intergenerational subsidies which occur when ratepayers in one generation subsidize ratepayers in another generation; and
3. to avoid the rate shock that would result from placing an excessive burden on a specific group of ratepayers.

There are economic and financial consequences for any premature decommissioning in general and specific expenses associated with an accident-related decommissioning. The ability to manage these uncertainties will provide customers and shareholders with financial security.

Premature Decommissioning – General

There are five major financial consequences associated with any premature decommissioning. These consequences consist of the expense of

decommissioning, the replacement energy costs, the replacement capacity costs, the recovery of un-recovered plant investment and premature decommissioning specific.

Expense of Decommissioning

As a part of this filing, seven decommissioning cost estimates have been filed, showing various possible decommissioning scenarios.

The decommissioning cost estimates in 2017 dollars for DECON using dry storage is \$3.0 billion for the estimate using a 32-year decommissioning period. The decommissioning cost estimate is \$3.5 billion in 2017 dollars for the estimate using a 60-year decommissioning period that assumes no recasking occurs. The decommissioning cost estimate is \$3.8 billion in 2017 dollars for the estimate using a 60-year decommissioning period that assumes a 50 year recasking requirement. The decommissioning cost estimate is \$5.8 billion in 2017 dollars for the estimate using a 100-year decommissioning period. The decommissioning cost estimate is \$10.2 billion in 2017 dollars for the estimate using a 200-year decommissioning period.

The decommissioning cost estimates in 2017 dollars for SAFSTOR is \$3.8 billion for the estimate using a 32-year decommissioning period. The decommissioning cost estimate is \$4.2 billion in 2017 dollars for the estimate using a 60-year decommissioning period that assumes no recasking occurs.

Presently the Qualified Trust would be used to offset the potential costs resulting from premature decommissioning. The maximum annual, after-tax cash requirement for a worst-case premature decommissioning scenario involving all three Company's nuclear units is considerably reduced because of 100 percent external funding.

Replacement Energy Costs

A significant cost resulting from a premature shutdown is the cost of replacement energy. Replacement energy costs for a transitional period (until a more permanent asset could be constructed) would consist of increased fuel costs due to the use of more expensive coal, natural gas, and oil, costs associated with the increased operation of our existing generation fleet or the purchase of power from others, and the loss of revenues associated with a reduction in sales to other utilities. On a more permanent nature, replacement

energy costs would likely consist of a combination of increased fuel cost due to more expensive use of more natural gas, wind, solar and possibly coal. The unplanned nature of the power requirement, as well as the substantial increase in demand this replacement would represent in the open market also would be expected to command a substantial premium.

The variable operating costs associated with electric generation from nuclear facilities is less than for all other current forms of generation. Due to the low cost of nuclear production, relative to fossil production, the cost of replacement energy for a nuclear facility is larger than potential replacement energy costs for a fossil-generating unit. This cost could be compounded if the replacement energy is needed during a peak period. Nuclear plants provide base load capacity and produce more energy annually than most fossil units. Therefore, more expensive energy would have to replace nuclear energy if a nuclear unit were shut down prematurely.

Replacement Capacity Costs

Current nuclear plant net capability is 1,771 MW; 671 MW for Monticello and 1,100 MW for Prairie Island Units 1 and 2. If the Company's nuclear generating capability were lost, the Company's reserve margins would be below the 15.3 percent minimum reserve level currently specified by the Midcontinent Independent System Operator, Inc., as necessary to maintain adequate electric system reliability. Therefore, nearly all of the 1,771 of MW of lost nuclear capability would have to be replaced.

A premature shutdown of this magnitude may cause a severe capacity shortage, which would become more severe as demand increases. To overcome this, the capacity shortage would have to be handled in a two-step process. This process would be to 1) purchase temporary replacement capacity and 2) to construct replacement facilities that would likely be a combination of natural gas combustion turbines and combined cycle generating units. Current cost estimates for the construction of new natural gas combustion turbines and combined cycle units can be found in the Company's most current resource plan.

Due to the length of time to complete construction of new base load plants, premature retirement of a nuclear unit or a major coal unit would necessitate the purchase of temporary replacement capacity. The purchase of this quantity

of temporary replacement capacity would become a significant challenge in meeting customer demand.

Recovery of Un-recovered Investment

If there were a premature, non-accident related decommissioning, an un-recovered investment (original cost less accumulated depreciation) would continue as a revenue requirement. The un-recovered nuclear plant investment on January 1, 2017 was \$2,070 million, \$982 million at Monticello and \$1,088 million at Prairie Island. These figures do not include land, nuclear fuel, and general plant equipment, such as office furniture. It also does not include the un-recovered decommissioning costs. However, it does include the licensing costs at both facilities and the held for future use assets at Monticello. These amounts are aligned with the 2017 Remaining Life Filing, Docket No. E,G002/D-17-147, when adjusted to include the \$5.8 million of held for future use assets at Monticello.

Premature Decommissioning - Specific

An accident-related decommissioning would add additional expenses to those mentioned in the foregoing discussion. Potential contamination clean-up costs are the most significant expenses of an accident-related decommissioning. As an example, General Public Utilities has indicated that the total estimated cost for clean-up for the Three Mile Island nuclear site was approximately \$1 billion, occurring over an estimated 11 to 12 year time period beginning in 1979. The damaged unit, at this time, is in SAFSTOR until Three Mile Island Unit 1 is ready to be decommissioned.

The Company's property insurance coverage of \$2.25 billion would largely offset the potential impact of an accident-related decommissioning. Although accident-related decommissioning expenses are significant, the length of time involved in a clean-up process, insurance payments, tax deductibility of expenses, and related rate relief would affect the yearly expense. Although accident related premature decommissioning would impact both the Company and its customers, it is anticipated that, under reasonable regulation, the financial integrity of the Company would be maintained.

Xcel Energy
Nuclear Asset Retirement Obligation Balances

Docket No. E002/M-17-828
Schedule J
Page 1 of 1

ARO Balance Sheet Accounts	FERC Acct. Num.	2016	2017
ASSETS			
Nuclear Plant In-Service - ARC		\$ 482,670,802	\$ 482,670,802 [1]
Beginning Accumulated Depreciation - Nuclear ARC	108	(115,085,517)	(154,326,898)
Depreciation Expense		(39,241,381)	(11,100,334)
Ending Accumulated Depreciation - Nuclear ARC		\$ (154,326,898)	\$ (165,427,232) [1]
Regulatory Asset Nuclear - Beginning	182.3	\$ 1,773,439,075	\$ 1,920,978,498
Asset Balance Adjustment		0	0
Reserve Balance Adjustment		0	0
ARO Liability Adjustment		0	0
Accretion Expense		108,298,041	56,189,556
Depreciation Expense		39,241,381	11,100,334
Regulatory Asset Nuclear - Ending		\$ 1,920,978,498	\$ 1,988,268,388 [1]
Total Assets		\$ 2,249,322,401	\$ 2,305,511,958
LIABILITIES			
Asset Retirement Obligation - Beginning	230	\$ (2,141,024,360)	\$ (2,249,322,401)
Accretion Expense - Nuclear		(108,298,041)	(56,189,556)
Liabilities Incurred		0	0
Asset Retirement Obligation - Ending		\$ (2,249,322,401)	\$ (2,305,511,958) [1]
Total Liabilities		\$ (2,249,322,401)	\$ (2,305,511,958)

[1] As of June 30, 2017

This schedule presents the Commission Order Points from the 2014 Filing that require the Company to provide information in this filing. It also shows specifically where in the filing the Order Point is addressed.

	Order Point	Petition Reference
6.	Xcel shall provide more detailed analysis when proposing future assumption changes related to the transition to bonds.	Petition starting at page 26, Schedule D
12.	In its next triennial decommissioning filing, Xcel shall:	
	a. provide balance sheet accounts for SFAS 143 related to nuclear decommissioning, with a brief narrative explaining the numbers provided on the ARO (Asset Retirement Obligation) balance sheet.	Schedule J
	b. continue using a consultant (rather than Xcel) to prepare the Schedule C escalation analysis section and provide a statement indicating that the consultant is doing this calculation in an independent manner.	Schedule C
	c. develop a 60, 100 and 200-year plan for the City of Red Wing to enable Xcel to build, improve, communicate, and share an understanding of the long-term safety-related costs of spent fuel storage on host communities.	Schedule B
	d. discuss possible end of life nuclear cost mitigation alternatives.	Schedule H
	e. re-examine its 50-year recasking cost assumption and analysis, by providing two scenarios – one based on the same recasking assumptions used in this filing, and one assuming the need to replace all casks prior to being turned over to the custody of the federal government.	Petition starting at page 19
	f. provide an updated assessment of the risk of premature decommissioning.	Schedule I
	g. provide a detailed discussion of the status of the Nuclear Regulatory Commission relicensing of casks, on the anticipated life of casks used by Xcel, manufacturer and contractor warranties and liability obligations for the casks, the technical and regulatory barriers associated with transporting the casks used and the status of any federal storage initiatives whether permanent or temporary.	Petition starting at page 18
	h. include a detailed explanation of the anticipated financial responsibility of utilities for the delivery of the casks into federal custody that includes descriptions of when ratepayers' and Xcel's present storage duties terminate and the cost and liabilities would shift to the federal government.	Petition starting at page 21
13.	In next and future triennial decommissioning filings, Xcel shall provide a more detailed break out of "spent fuel management" costs.	Schedules A.1to A.14, A.17, L, and M

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DECOMMISSIONING COST ANALYSIS
for the
MONTICELLO NUCLEAR GENERATING PLANT



prepared for

Xcel Energy

prepared by

TLG Services, Inc.
Bridgewater, Connecticut

October 2017

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APPROVALS

Project Manager


Francis W. Seymore

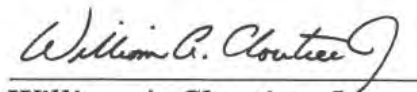
10/17/17
Date

Project Engineer


Jeffrey M. Martin

10/17/17
Date

Technical Manager


William A. Cloutier, Jr.

10/17/2017
Date

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No.	Date	Item Revised	Reason for Revision
0	10-17-2017		Original Issue

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EXECUTIVE SUMMARY

This report presents estimates of the cost to decommission the Monticello Nuclear Generating Plant (Monticello) for the identified decommissioning scenarios following a cessation of plant operations in 2030. The estimates are designed to provide Xcel Energy with the information to assess its current decommissioning liability, as it relates to Monticello.

The analysis relies upon site-specific, technical information from an evaluation prepared in 2014, ^[1] updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

The analysis is not a detailed engineering evaluation, but an estimate prepared in advance of the detailed engineering required to carry out the decommissioning of the nuclear unit. It may also not reflect the actual plan to decommission Monticello; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The primary goal of the decommissioning is the removal and disposal of the contaminated systems and structures so that the plant's operating license can be terminated. The analysis recognizes that spent fuel will be stored at the site in the reactor building's storage pool and/or in an Independent Spent Fuel Storage Installation (ISFSI) until such time that it can be transferred to a Department of Energy (DOE) facility. Consequently, the estimates also include those costs to manage and subsequently decommission these storage facilities.

The costs to decommission Monticello, for the scenarios evaluated, are tabulated at the end of this section. Costs are reported in 2017 dollars and include monies anticipated to be spent for radiological remediation and operating license termination, spent fuel management, and site restoration activities.

A complete discussion of the assumptions relied upon in this analysis is provided in Section 3, along with schedules of annual expenditures for each scenario. A sequence of significant project activities is provided in Section 4 with a timeline for

¹ "Decommissioning Cost Analysis for the Monticello Nuclear Generating Plant," Document No. X01-1617-006, Rev. 0, TLG Services, Inc., October 2014

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each scenario. Detailed cost reports used to generate the summary tables contained within this document are provided in Appendices C through J.

The current cost estimates assume that Monticello ceases operations in 2030. The cost estimates assume that the shutdown date of the nuclear unit is scheduled and pre-planned (i.e., there is no delay in transitioning the plant and workforce from operations or in obtaining regulatory relief from operating requirements, etc.). This estimate includes additional resources to support the engineering, planning, and licensing efforts for the station; this is done to support a decommissioning schedule similar to the prior estimate. The estimates include the continued operation of the reactor building as an interim wet fuel storage facility for approximately five years after operations cease. The spent fuel will remain in the ISFSI until the DOE is able to complete the transfer of the fuel to a federal facility (e.g., a monitored retrievable storage facility).^[2] The estimates also include the dismantling of non-essential structures and limited restoration of the site.

Alternatives and Regulations

The ultimate objective of the decommissioning process is to reduce the inventory of contaminated and activated material so that the license can be terminated. The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule adopted on June 27, 1988.^[3] In this rule, the NRC set forth technical and financial criteria for decommissioning licensed nuclear power facilities. The regulations addressed planning needs, timing, funding methods, and environmental review requirements for decommissioning. The rule also defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB.

DECON is defined as "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations."^[4]

² Projected expenditures for spent fuel management identified in the cost analysis do not consider any compensation for damages with regard to the delays incurred by Xcel Energy in the timely removal of spent fuel by the DOE.

³ U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72, "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, 53 Fed. Reg. 24018, June 27, 1988

⁴ Ibid. Page FR24022, Column 3

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SAFSTOR is defined as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use."^[5] Decommissioning is to be completed within 60 years, although longer time periods will be considered when necessary to protect public health and safety.

ENTOMB is defined as "the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained and continued surveillance is carried out until the radioactivity decays to a level permitting unrestricted release of the property."^[6] As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years, although longer time periods will also be considered when necessary to protect public health and safety.

The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 1997, the Commission directed its staff to re-evaluate this alternative and identify the technical requirements and regulatory actions that would be necessary for entombment to become a viable option. The resulting evaluation provided several recommendations, however, rulemaking has been deferred based upon several factors (e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities) at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation. In a draft regulatory basis document published in March 2017 in support of rulemaking that would amend NRC regulations concerning nuclear plant decommissioning, the NRC staff proposes removing any discussion of the ENTOMB option from existing guidance documents since the method is not deemed practically feasible.

In 1996, the NRC published revisions to its general requirements for decommissioning nuclear power plants to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process.^[7] The amendments allow for greater public participation and better define the transition

⁵ Ibid.

⁶ Ibid. Page FR24023, Column 2

⁷ U.S. Code of Federal Regulations, Title 10, Parts 2, 50 and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, 61 Fed. Reg. 39278, July 29, 1996

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process from operations to decommissioning. Regulatory Guide 1.184 Revision 1, issued in October 2013, further described the methods and procedures that are acceptable to the NRC staff for implementing the requirements of the 1996 revised rule that relate to the initial activities and the major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and sequence in the amended regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202, issued February 2005.^[8]

In 2011, the NRC published amended regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.^[9] The amended regulations require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, which includes the site's subsurface soil and groundwater. Licensees also may be required to perform site surveys to determine whether residual radioactivity is present in subsurface areas and to keep records of these surveys with records important for decommissioning. The amended regulations require licensees to report additional details in their decommissioning cost estimate as well as requiring additional financial reporting and assurances. These additional details are included in this analysis, including the ISFSI decommissioning estimate (Appendix J).

Decommissioning Scenarios

The following scenarios were evaluated and are intended to bound the liability associated with the removal of spent fuel from the site. The current operating license expires in 2030. The scenarios consist of five DECON scenarios, with differing spent fuel management assumptions, but essentially no changes to the decommissioning costs and timing of the power block. There are also two SAFSTOR scenarios (Scenarios 6 and 7) each corresponding to the first two DECON scenario spent fuel management assumptions. The spent fuel in the plant's spent fuel storage pool is transferred to the ISFSI within the first five years. The equipment, structures, and portions of the plant containing radioactive contaminants are removed or decontaminated to a level that permits the facility to be released for unrestricted use. Non-essential structures are then demolished. Spent fuel storage operations continue at the ISFSI until the transfer of the fuel to the DOE is completed (2062 in Scenarios 1 & 6, 2090 in Scenarios 2, 5 & 7, 2130 in Scenario 3, and 2230 in Scenario 4).

⁸ "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, Nuclear Regulatory Commission, February 2005

⁹ U.S. Code of Federal Regulations, Title 10, Parts 20, 30, 40, 50, 70, and 72, "Decommissioning Planning," Nuclear Regulatory Commission, Federal Register Volume 76, (p 35512 et seq.), June 17, 2011

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Scenario	1 st Spent Fuel Canister Replacement	1 st Spent Fuel Assembly Removed from Monticello*	Last Spent Fuel Assembly Removed from Monticello	Scenario Identification
1	n/a	2042	2062	DECON with 32 Year DFS ⁺
2	n/a	2078	2090	DECON with 60 Year DFS
3	2058	2118	2130	DECON with 100 Year DFS
4	2058	2218	2230	DECON with 200 Year DFS
5	2058	2078	2090	DECON with 60 Year DFS and recasking
6	n/a	2042	2062	SAFSTOR with 32 Year DFS
7	n/a	2078	2090	SAFSTOR with 60 Year DFS

* Spent fuel stored at Morris is removed prior to fuel stored at the Monticello site.

⁺ Dry Fuel Storage

For Scenarios 2 and 7, although they provide a total fuel storage period of 60 years following plant shutdown, Xcel Energy directed TLG Services to not include the cost of transferring the spent fuel in dry storage to new canisters at 50 years after plant shutdown. The assumption to not transfer spent fuel at 50 years following plant shutdown in Scenarios 2 and 7 was premised on the likelihood that the life of the canisters could be successfully managed for an additional 10 years.

In Scenarios 3, 4 and 5, the DSCs are assumed to be replaced after fifty years of use. Since the reactor building spent fuel storage pool and fuel handling facilities are removed by the year 2038, a dry fuel transfer facility is assumed to be constructed on site to perform the transfers from the old to the new DSCs. For Scenarios 3 and 5, only one such transfer is needed over the time frame assumed (some fuel canisters in Scenario 5 will not require recasking). For Scenario 4, the spent fuel will be transferred three times following initial placement in the ISFSI.

Methodology

The methodology used to develop the estimates follows the basic approach originally presented in the cost estimating guidelines ^[10] developed by the Atomic Industrial

¹⁰ T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

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Forum (now Nuclear Energy Institute). This reference describes a unit cost factor method for estimating decommissioning activity costs. The unit cost factors used in this analysis incorporate site-specific costs and the latest available information about worker productivity in decommissioning.

An activity duration critical path is used to determine the total decommissioning program schedule. This is required for calculating the carrying costs, which include program management, administration, field engineering, equipment rental, quality assurance, and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

The estimates also reflect lessons learned from previously completed decommissioning projects, including TLG's involvement in the Shippingport Station decommissioning, completed in 1989, and the decommissioning of the Cintichem reactor, hot cells and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, Vermont Yankee and Fort Calhoun nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

Contingency

Consistent with cost estimating practice, contingencies are applied to the decontamination and dismantling costs developed as "specific provision for unforeseeable elements of cost within the defined project scope, particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur."^[11] The cost elements in the estimates are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station, or duration of the decommissioning program and dry fuel storage period.

¹¹ Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, p. 239

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Contingency funds are expected to be fully expended throughout the program. As such, inclusion of contingency is necessary to provide assurance that sufficient funding will be available to accomplish the intended tasks.

Low-Level Radioactive Waste Disposal

The contaminated and neutron-activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for “shallow-land” disposal. With the passage of the “Low-Level Radioactive Waste Policy Act” in 1980, ^[12] and its Amendments of 1985, ^[13] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders. It was expected that groups of states would combine together to jointly deal with their radioactive wastes; these organizations are referred to as waste disposal compacts.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to Xcel Energy. The majority of the low-level radioactive waste designated for direct disposal (Class A ^[14]) can be sent to EnergySolutions’ facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon representative rates. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The Texas facility is licensed to receive the higher activity waste forms (Classes B and C). As such, for this analysis, disposal costs for the Class B and C waste were based upon the preliminary and indicative information on the cost for such from WCS.

The dismantling of the components residing closest to the reactor core generates radioactive waste considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government

¹² “Low-Level Radioactive Waste Policy Act,” Public Law 96-573, 1980

¹³ “Low-Level Radioactive Waste Policy Amendments Act of 1985,” Public Law 99-240, 1986

¹⁴ Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55

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the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in the same canisters used for spent fuel and either stored on site or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to isolate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates reflect the savings from waste recovery/volume reduction.

High-Level Radioactive Waste Management

Congress passed the “Nuclear Waste Policy Act” ^[15] (NWPA) in 1982, assigning the federal government’s long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The NWPA provided that DOE would enter into contracts with utilities in which DOE would promise to take the utilities’ spent fuel and high-level radioactive waste and utilities would pay the cost of the disposition services for that material. NWPA, along with the individual contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to accept any spent fuel or high-level waste, as required by the NWPA and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to obtain compensation for DOE’s partial breach of contract. To date no spent fuel has been accepted from commercial generating sites for disposal.

¹⁵ “Nuclear Waste Policy Act of 1982 and Amendments,” DOE’s Office of Civilian Radioactive Management, 1982

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In 2010 the Obama Administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter includes a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."^[16]

On January 26, 2012, the Blue Ribbon Commission issued its "Report to the Secretary of Energy" containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- "[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities"^[17]
- "[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste."^[18]

In January 2013, the DOE issued the "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," in response to the recommendations made by the Blue Ribbon Commission and as "a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel..."^[19] This document states:

"With the appropriate authorizations from Congress, the Obama Administration planned to implement a program over the next 10 years that would have:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide

¹⁶ Charter of the Blue Ribbon Commission on America's Nuclear Future, "Objectives and Scope of Activities," 2010

¹⁷ "Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy," p. 32, January 2012

¹⁸ *Ibid.*, p.27

¹⁹ "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," U.S. DOE, January 11, 2013

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flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and

- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.”^[20]

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Obama Administration slashed the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013) ^[21] ordering NRC to comply with federal law and restart its review of DOE’s Yucca Mountain repository license application to the extent of previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A supplement to DOE’s environmental impact statement and an adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

The state of Minnesota directed the Public Utilities Commission, “when considering approval of a plan for the accrual of funds for the decommissioning of nuclear facilities” ...to “include an evaluation of the costs, if any, arising from storage of used nuclear fuel that may be incurred by the state of Minnesota, and any tribal community, county, city, or township where used nuclear fuel is located following the cessation of operations at a nuclear plant.”^[22]

The state of Minnesota statute also prescribed the parameters to be used in evaluating spent fuel management costs. “To assist the commission in making the determination ... the filing shall provide cost estimates, including ratepayer impacts, assuming used nuclear fuel will be stored in the state for 60 years, 100 years, and 200 years following the cessation of operation of the nuclear plant.” ^[23]

Xcel Energy’s current spent fuel management plan for the Monticello spent fuel is based in general upon:

²⁰ Ibid., p.2

²¹ United States Court of Appeals for the District Of Columbia Circuit, In Re: Aiken County, et al, August 2013

²² Minnesota Statute 216B.1614, “Nuclear Power Plant Decommissioning and Storage of Used Nuclear Fuel”

²³ Ibid.

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- 1) Fuel transferred from the pool to the ISFSI within 5 years of shutdown;
- 2) Exchange of Monticello and Prairie Island spent fuel acceptance rights to best manage the overall cost of spent fuel storage for both plants;
- 3) Fuel will be shipped in the existing NUHOMS DSCs (Scenarios 1, 2, 6, and 7); the canisters and NUHOMS are periodically replaced in Scenarios 3, 4 and 5. Canisters that are unloaded in the spent fuel transfer operation will be surveyed for neutron activation.
- 4) As an allowance, some of these canisters and NUHOMS modules from the first off-load operation are assumed to be mildly neutron activated and therefore must be disposed of as radioactive waste.

The NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy, pursuant to 10 CFR Part 50.54(bb).^[24] This requirement is prepared for through inclusion of certain cost elements in the decommissioning estimates, for example, associated with the isolation and continued operation of the spent fuel pool and the ISFSI.

The spent fuel pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor core at shutdown. The assemblies are packaged into dry shielded canisters (DSCs) over the first five years after shutdown for transfer to the ISFSI for interim storage. It is assumed that this period provides the necessary cooling for the final core to meet the transport and/or storage requirements for decay heat.

An ISFSI, operated under a Part 50 General License (in accordance with 10 CFR 72, Subpart K^[25]), has been constructed to support continued plant operations. The facility is assumed to be expanded to support decommissioning. This will allow decommissioning activities to proceed within the reactor building.

DOE has breached its obligations to remove fuel from reactor sites, and has also failed to provide the plant owners with information about how it will ultimately perform. DOE officials have stated that DOE does not have an obligation to accept already-canistered fuel without an amendment to DOE's contracts with plant licensees to remove the fuel (the "Standard Contract"), but DOE has not explained what any such

²⁴ U.S. Code of Federal Regulations, Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," Subpart 54 (bb), "Conditions of Licenses"

²⁵ U.S. Code of Federal Regulations, Title 10, Part 72, Subpart K, "General License for Storage of Spent Fuel at Power Reactor Sites"

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amendment would involve. Consequently, Xcel Energy has no information or expectations on how DOE will remove fuel from the site in the future. In the absence of information about how DOE will perform, and for purposes of this analysis only, it is assumed that DOE will accept already-canistered fuel. If this assumption is incorrect, it is assumed that DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers.

Xcel Energy's position is that the DOE has a contractual obligation to accept Monticello's fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, including the cost of storing spent fuel in this study is appropriate to ensure the availability of sufficient decommissioning funds at the end of the station's life if the DOE has not met its obligation. The cost for the interim storage of spent fuel has been calculated and is separately presented as "Spent Fuel Management" expenditures in this report.

Site Restoration

The efficient removal of the contaminated materials at the site may result in damage to many of the site structures. Blasting, coring, drilling, and the other decontamination activities can substantially damage power block structures, potentially weakening the footings and structural supports. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized is more efficient and less costly than if the process were deferred. Experience at shutdown generating stations has shown that plant facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public and the demolition work force.

This estimate assumes that some site features will remain following the decommissioning project. These include the existing electrical switchyard, which is assumed to remain functional in support of the regional electrical distribution system. The existing shoreline will also be left intact.

Consequently, non-essential site structures addressed by this analysis are completely removed (including foundations) as required by Minnesota statute [26]. The site is then graded and stabilized. The cost for the site restoration of non-essential and/or non-contaminated structures has been calculated and is separately presented as "Site Restoration" expenditures in this report.

²⁶ Minnesota Administrative Rule part 7035.0400 "General Requirements"

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Summary

The costs to decommission the Monticello station were evaluated for several decommissioning scenarios, based upon the DECON and SAFSTOR decommissioning alternatives. Regardless of the timing of the decommissioning activities, the estimates to decommission Monticello assume the removal of all contaminated and activated plant components and structural materials such that Xcel Energy may then have unrestricted use of the site with no further requirements for an operating license. In most of the scenarios, spent fuel remains on site following the decommissioning and site restoration of the power block structures. The spent fuel remains in storage at the site until such time that the transfer to a DOE facility can be completed. Once the transfer is complete, the storage facilities are also decommissioned.

The alternatives evaluated in this analysis are described in Section 2. The assumptions are presented in Section 3, along with schedules of annual expenditures. The major cost contributors are identified in Section 6, with detailed activity costs, waste volumes, and associated manpower requirements delineated in Appendices C through J. The major cost components are also identified in the cost summary provided at the end of this section.

The estimates presented in this document reflects the total cost to decontaminate the nuclear unit, manage the spent fuel until the DOE is able to complete the transfer to a federal facility, dismantle the plant and restore the site for alternative use.

The cost elements in the estimates for the five DECON and two SAFSTOR alternatives are assigned to one of three subcategories: NRC License Termination (radiological remediation), Spent Fuel Management, and Site Restoration. The subcategory "NRC License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the unit's operating license, recognizing that there may be some additional cost impact from spent fuel management. The License Termination cost subcategory also includes costs to decommission the ISFSI (as required by 10 CFR §72.30). Section 3.4.1 provides the basis for the ISFSI decommissioning cost.

The "Spent Fuel Management" subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pool to a DOE transport cask or to the ISFSI for interim storage, as well as the transfer of the spent fuel in storage at the ISFSI to the DOE. Costs are included for the operation of the storage pool and the management of the ISFSI until such time that the transfer is complete. It does not include any spent fuel management expenses

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incurred prior to the cessation of plant operations, nor does it include any costs related to the final disposal of the spent fuel.

“Site Restoration” is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are completely removed (including foundations) and backfilled to conform to local surface elevation.

It should be noted that the costs assigned to these subcategories are allocations. Delegation of cost elements is for the purposes of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., Asset Retirement Obligation determinations). In reality, there can be considerable interaction between the activities in the three subcategories. For example, Xcel Energy may decide to remove non-contaminated structures early in the project to improve access to highly contaminated facilities or plant components. In these instances, the non-contaminated removal costs could be reassigned from Site Restoration to an NRC License Termination support activity. However, in general, the allocations represent a reasonable accounting of those costs that can be expected to be incurred for the specific subcomponents of the total estimated program cost, if executed as described.

As noted within this document, the estimates were developed and costs are presented in 2017 dollars. As such, the estimates do not reflect the escalation of costs (due to inflationary and market forces) over the remaining operating life of the plant or during the decommissioning period.

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**SCENARIO 1: DECON WITH 32 YEARS DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Total
Decontamination	23,268
Removal	119,462
Packaging	26,800
Transportation	12,389
Waste Disposal	95,919
Off-site Waste Processing	29,702
Program Management ^[1]	303,532
Security	233,970
Spent Fuel Pool Isolation	13,445
Spent Fuel Storage (Direct Costs) ^[2]	197,448
Insurance and Regulatory Fees	33,282
Energy	11,068
Characterization and Licensing Surveys	28,626
Property Taxes	36,452
Miscellaneous Equipment	7,265
Railroad Track Maintenance	5,048
Retention and Severance	43,877
Security Modifications	10,000
Total ^[3]	1,231,552

Cost Element	Total
NRC License Termination	759,294
Spent Fuel Management	400,983
Site Restoration	71,275
Total ^[3]	1,231,552

^[1] Includes engineering costs

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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**SCENARIO 2: DECON WITH 60 YEAR DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Total
Decontamination	23,268
Removal	119,501
Packaging	26,800
Transportation	12,389
Waste Disposal	95,919
Off-site Waste Processing	29,702
Program Management ^[1]	343,355
Security	359,469
Spent Fuel Pool Isolation	13,445
Spent Fuel Storage (Direct Costs) ^[2]	274,588
Insurance and Regulatory Fees	55,483
Energy	11,068
Characterization and Licensing Surveys	28,626
Property Taxes	52,336
Miscellaneous Equipment	7,265
Railroad Track Maintenance	8,759
Retention and Severance	43,877
Security Modifications	10,000
Total ^[3]	1,515,850

Cost Element	Total
NRC License Termination	759,047
Spent Fuel Management	685,479
Site Restoration	71,324
Total ^[3]	1,515,850

^[1] Includes engineering costs

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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**SCENARIO 3: DECON WITH 100 YEAR DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Total
Decontamination	23,306
Removal	119,474
Packaging	26,803
Transportation	11,749
Waste Disposal	95,178
Off-site Waste Processing	29,702
Program Management ^[1]	498,687
Security	538,987
Spent Fuel Pool Isolation	13,445
Spent Fuel Storage (Direct Costs) ^[2]	784,638
Insurance and Regulatory Fees	87,239
Energy	11,068
Characterization and Licensing Surveys	28,626
Property Taxes	75,024
Miscellaneous Equipment	7,265
Railroad Track Maintenance	14,068
Retention and Severance	43,877
Security Modifications	10,000
Total ^[3]	2,419,135

Cost Element	Total
NRC License Termination	748,156
Spent Fuel Management	1,599,295
Site Restoration	71,685
Total ^[3]	2,419,136

^[1] Includes engineering costs

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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**SCENARIO 4: DECON WITH 200 YEAR DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Total
Decontamination	23,306
Removal	119,474
Packaging	26,803
Transportation	11,749
Waste Disposal	95,178
Off-site Waste Processing	29,702
Program Management ^[1]	765,140
Security	987,801
Spent Fuel Pool Isolation	13,445
Spent Fuel Storage (Direct Costs) ^[2]	1,762,292
Insurance and Regulatory Fees	166,633
Energy	11,068
Characterization and Licensing Surveys	28,626
Property Taxes	131,743
Miscellaneous Equipment	7,265
Railroad Track Maintenance	27,341
Retention and Severance	43,877
Security Modifications	10,000
Total ^[3]	4,261,442

Cost Element	Total
NRC License Termination	748,155
Spent Fuel Management	3,441,602
Site Restoration	71,685
Total ^[3]	4,261,443

^[1] Includes engineering costs

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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**SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Total
Decontamination	23,306
Removal	119,505
Packaging	26,805
Transportation	12,393
Waste Disposal	95,943
Off-site Waste Processing	29,702
Program Management ^[1]	343,355
Security	359,469
Spent Fuel Pool Isolation	13,445
Spent Fuel Storage (Direct Costs) ^[2]	361,324
Insurance and Regulatory Fees	55,483
Energy	11,068
Characterization and Licensing Surveys	28,626
Property Taxes	52,336
Miscellaneous Equipment	7,265
Railroad Track Maintenance	8,759
Retention and Severance	43,877
Security Modifications	10,000
Total ^[3]	1,602,660

Cost Element	Total
NRC License Termination	759,122
Spent Fuel Management	772,214
Site Restoration	71,324
Total ^[3]	1,602,660

^[1] Includes engineering costs

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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**SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Total
Decontamination	25,220
Removal	122,447
Packaging	17,915
Transportation	8,026
Waste Disposal	66,222
Off-site Waste Processing	34,993
Program Management ^[1]	403,048
Security	236,063
Spent Fuel Pool Isolation	13,445
Spent Fuel Storage (Direct Costs) ^[2]	195,063
Insurance and Regulatory Fees	68,491
Energy	23,440
Characterization and Licensing Surveys	28,277
Property Taxes	148,737
Miscellaneous Equipment	20,825
Railroad Track Maintenance	8,536
Retention and Severance	43,877
Security Modifications	10,000
Total ^[3]	1,474,626

Cost Element	Total
NRC License Termination	1,045,043
Spent Fuel Management	364,666
Site Restoration	64,917
Total ^[3]	1,474,626

^[1] Includes engineering costs

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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**SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Total
Decontamination	25,220
Removal	122,659
Packaging	17,920
Transportation	8,028
Waste Disposal	66,243
Off-site Waste Processing	34,993
Program Management ^[1]	430,133
Security	386,682
Spent Fuel Pool Isolation	13,445
Spent Fuel Storage (Direct Costs) ^[2]	259,117
Insurance and Regulatory Fees	69,323
Energy	23,440
Characterization and Licensing Surveys	28,277
Property Taxes	148,737
Miscellaneous Equipment	20,825
Railroad Track Maintenance	8,536
Retention and Severance	43,877
Security Modifications	10,000
Total ^[3]	1,717,454

Cost Element	Total
NRC License Termination	1,099,775
Spent Fuel Management	552,724
Site Restoration	64,956
Total ^[3]	1,717,454

^[1] Includes engineering costs

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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1. INTRODUCTION

This report presents estimates of the cost to decommission the Monticello Nuclear Generating Plant (Monticello) and the operation and eventual decommissioning of the on-site Independent Spent Fuel Storage Installation (ISFSI) for the selected decommissioning scenarios following the scheduled cessation of plant operations. The estimates are designed to provide Xcel Energy with the information to assess its current decommissioning liability, as it relates to Monticello.

The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2014, ^{[1]*} updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

The analysis is not a detailed engineering evaluation, but an estimate prepared in advance of the detailed engineering required to carry out the decommissioning of the nuclear unit. It may also not reflect the actual plan to decommission Monticello; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The 2014 plant inventory was reviewed for this analysis. It serves as the basis for the decontamination and dismantling requirements, cost, and the decommissioning waste streams. The review confirmed that there were no substantive changes to the configuration of the plant or site facilities that would impact decommissioning over the last three years. Removal of new FLEX facilities was included.

1.1 OBJECTIVES OF STUDY

The objectives of this study are to prepare comprehensive estimates of the cost to decommission Monticello, to provide a sequence or schedule for the associated activities, and to develop waste stream projections from the decontamination and dismantling activities.

The operating license was originally issued for the plant on September 8th, 1970, and was valid for a period of 40 years. In early 2005, Nuclear Management Company (as agent for Xcel Energy), submitted an application for

* Annotated references for citations in Sections 1-6 are provided in Section 7

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a renewed license (i.e., 20 year extension). The application was approved by the NRC in November 2006. Therefore, for the purposes of this study, the final shutdown date (license expiration) for Monticello is September 8th, 2030, assuming a 60-year operating life (the current operating license's expiration date).

1.2 SITE DESCRIPTION

Monticello is located on the Mississippi River within the city limits of Monticello, in Wright County, Minnesota. The plant is located approximately 30 miles northwest of the Minneapolis-St. Paul area.

The Nuclear Steam Supply System (NSSS) consists of a single cycle, forced circulation, low power density boiling water reactor. The reactor recirculation system is comprised of the reactor vessel; the two loop reactor recirculation system with its pumps, pipes, and valves; the main steam piping up to the main steam isolation valves; and the reactor auxiliary systems piping. The system is housed within a "containment system," consisting of a steel light bulb-shaped drywell, a steel doughnut-shaped pressure suppression chamber, and interconnecting vent pipes. This system provides the first containment barrier surrounding the reactor vessel and reactor primary system. The reactor building provides secondary containment and is designed as a controlled leakage structure.

The saturated steam leaving the reactor vessel flows through the four main steam lines to the main turbine located in the turbine building. After passing through the main turbine, low-pressure steam is condensed, the non-condensable gases are removed, and the condensate is demineralized before being returned to the reactor vessel through the reactor feedwater system heaters. The turbine-generator system converts the thermodynamic energy of the steam into electrical energy. The unit's turbine-generator consists of one single-flow, high-pressure, and two double-flow, low-pressure turbines driving a direct-coupled generator at 1800 rpm. Heat rejected in the main condenser is removed by the circulating water system.

The circulating water system has been designed for open cycle once-through cooling towers, closed cycle with cooling towers, or for variations of these modes, i.e., partial recirculation. The system for open cycle operation consists of an intake structure with two half-capacity circulating water pumps, piping river water through the condenser to a discharge structure where the water enters a 1000-foot long canal that returns the water to the river downstream from the intake. Two induced-draft cooling towers are used during the open

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and closed cycle operations. Cooled effluent returns by gravity to the intake structure from the cooling tower basins.

1.3 REGULATORY GUIDANCE

The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988.^[2] This rule set forth financial criteria for decommissioning licensed nuclear power facilities. The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely manner and that adequate funds would be available for this purpose. Subsequent to the rule, the NRC issued Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors,^[3]" which provided additional guidance to the licensees of nuclear facilities on the financial methods acceptable to the NRC staff for complying with the requirements of the rule. The regulatory guide addressed the funding requirements and provided guidance on the content and form of the financial assurance mechanisms indicated in the rule.

The rule defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB. The DECON alternative assumes that any contaminated or activated portion of the plant's systems, structures, and facilities are removed or decontaminated to levels that permit the site to be released for unrestricted use shortly after the cessation of plant operations while the SAFSTOR and ENTOMB alternatives defer the process.

The rule also placed limits on the time allowed to complete the decommissioning process. For the SAFSTOR alternative, the process is restricted in overall duration to 60 years, unless it can be shown that a longer duration is necessary to protect public health and safety. The guidelines for ENTOMB are similar, providing the NRC with both sufficient leverage and flexibility to ensure that these deferred options are only used in situations where it is reasonable and consistent with the definition of decommissioning. At the conclusion of a 50 to 60-year dormancy period (or longer for ENTOMB if the NRC approves such a case), the site would still require significant remediation to meet the unrestricted release limits for license termination.

The ENTOMB alternative has not been viewed as a viable option for power reactors due to the significant time required to isolate the long-lived radionuclides for decay to permissible levels. However, with rulemaking permitting the controlled release of a site, ^[4] the NRC did re-evaluate the

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alternative. The resulting feasibility study, based upon an assessment by Pacific Northwest National Laboratory, concluded that the method did have conditional merit for some, if not most reactors. The staff also found that additional rulemaking would be needed before this option could be treated as a generic alternative.

The NRC had considered rulemaking to alter the 60-year time for completing decommissioning and to clarify the use of engineered barriers for reactor entombments.^[5] However, the NRC's staff has recommended that rulemaking be deferred, based upon several factors, e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities, at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation. In a draft regulatory basis document published in March 2017 in support of rulemaking that would amend NRC regulations concerning nuclear plant decommissioning, the NRC staff proposes removing any discussion of the ENTOMB option from existing guidance documents since the method is not deemed practically feasible.

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants. ^[6] When the regulations were originally adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the facility's operating licensed life. Since that time, several licensees permanently and prematurely ceased operations. Exemptions from certain operating requirements were required once the reactor was defueled to facilitate the decommissioning. Each case was handled individually, without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The new amendments allow for greater public participation and better define the transition process from operations to decommissioning.

Under the revised regulations, licensees will submit written certification to the NRC within 30 days after permanent shutdown. Certification will also be required once the fuel is permanently removed from the reactor vessel. Submittal of these notices will entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Within two years of submitting notice of permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. The PSDAR describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing

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decommissioning, the licensee is required to submit applications to the NRC to terminate the license, which will include a License Termination Plan (LTP).

In 2011, the NRC published amended regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.^[7] The amended regulations require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, which includes the site's subsurface soil and groundwater. Licensees also may be required to perform site surveys to determine whether residual radioactivity is present in subsurface areas and to keep records of these surveys with records important for decommissioning. The amended regulations require licensees to report additional details in their decommissioning cost estimate as well as requiring additional financial reporting and assurances. These additional details, including an ISFSI decommissioning estimate, are included in this analysis.

1.3.1 High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act" ^[8] (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The NWPA provided that DOE would enter into contracts with utilities in which DOE would promise to take the utilities' spent fuel and high-level radioactive waste and utilities would pay the cost of the disposition services for that material. NWPA, along with the individual contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to accept any spent fuel or high level waste, as required by the NWPA and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to obtain compensation for DOE's partial breach of contract. To date no spent fuel has been accepted from commercial generating sites for disposal.

In 2010, the Obama Administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter includes a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."^[9]

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On January 26, 2012, the Blue Ribbon Commission issued its “Report to the Secretary of Energy” containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- “[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities”^[10]
- “[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste.”

In January 2013, the DOE issued the “Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste,” in response to the recommendations made by the Blue Ribbon Commission and as “a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel...”^[11] This document states:

“With the appropriate authorizations from Congress, the Obama Administration planned to implement a program over the next 10 years that would have:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.”

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Obama Administration slashed the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)^[12] ordering NRC to comply with federal law and restart its review of DOE’s Yucca Mountain repository

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license application to the extent of previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A supplement to DOE's environmental impact statement and an adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

The state of Minnesota directed the Public Utilities Commission, "when considering approval of a plan for the accrual of funds for the decommissioning of nuclear facilities" ...to "include an evaluation of the costs, if any, arising from storage of used nuclear fuel that may be incurred by the state of Minnesota, and any tribal community, county, city, or township where used nuclear fuel is located following the cessation of operations at a nuclear plant."^[13]

The state of Minnesota statute also prescribed the parameters to be used in evaluating spent fuel management costs. "To assist the commission in making the determination ... the filing shall provide cost estimates, including ratepayer impacts, assuming used nuclear fuel will be stored in the state for 60 years, 100 years, and 200 years following the cessation of operation of the nuclear plant."

Xcel Energy's current spent fuel management plan for the Monticello spent fuel is based in general upon:

- 1) Fuel transferred from the pool to the ISFSI within 5 years of shutdown;
- 2) Exchange of Monticello and Prairie Island spent fuel acceptance rights to best manage the overall cost of spent fuel storage for both plants;
- 3) Fuel will be shipped in the existing NUHOMS DSCs (Scenarios 1, 2, 6, and 7); the canisters and NUHOMS are periodically replaced in Scenarios 3, 4 and 5. Canisters that are unloaded in the spent fuel transfer operation will be surveyed for neutron activation.
- 4) As an allowance, some of these canisters and NUHOMS modules from the first off-load operation are assumed to be mildly neutron activated and therefore must be disposed of as radioactive waste.

The NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor

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site until title of the fuel is transferred to the Secretary of Energy, pursuant to 10 CFR Part 50.54(bb).^[14] This requirement is prepared for through inclusion of certain cost elements in the decommissioning estimates, for example, associated with the isolation and continued operation of the spent fuel pool and the ISFSI.

The spent fuel pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor core at shutdown. In the DECON and SAFSTOR scenarios, the assemblies are packaged into dry shielded canisters (DSCs) over the first five years after shutdown for transfer to the ISFSI for interim storage. It is assumed that this period provides the necessary cooling for the final core to meet the transport and/or storage requirements for decay heat.

An ISFSI, operated under a Part 50 General License (in accordance with 10 CFR 72, Subpart K^[15]), has been constructed to support continued plant operations. The facility is assumed to be expanded to support decommissioning. This will allow decommissioning activities to proceed within the reactor building.

DOE has breached its obligations to remove fuel from reactor sites, and has also failed to provide the plant owners with information about how it will ultimately perform. DOE officials have stated that DOE does not have an obligation to accept already-canistered fuel without an amendment to DOE's contracts with plant licensees to remove the fuel (the "Standard Contract"), but DOE has not explained what any such amendment would involve. Consequently, Xcel Energy has no information or expectations on how DOE will remove fuel from the site in the future. In the absence of information about how DOE will perform, and for purposes of this analysis only, it is assumed that DOE will accept already-canistered fuel. If this assumption is incorrect, it is assumed that DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers.

Xcel Energy's position is that the DOE has a contractual obligation to accept Monticello's fuel earlier than the projections set out above, consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, including the cost of storing spent fuel in this study is appropriate to ensure the availability of sufficient decommissioning funds at the end of the station's life if the DOE has not met its obligation. The cost for the interim storage of spent fuel has been calculated and is separately presented as "Spent Fuel Management" expenditures in this report.

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1.3.2 Low-Level Radioactive Waste Disposal

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for “shallow-land” disposal. With the passage of the “Low-Level Radioactive Waste Policy Act” in 1980, ^[16] and its Amendments of 1985, ^[17] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders. It was expected that groups of states would combine together to jointly deal with their radioactive wastes; these organizations are referred to as waste disposal compacts.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to Xcel Energy. The majority of the low-level radioactive waste designated for direct disposal (Class A ^[18]) can be sent to EnergySolutions’ facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon representative rates. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The Texas facility is licensed to receive the higher activity waste forms (Classes B and C). As such, for this analysis, disposal costs for the Class B and C waste were based upon the preliminary and indicative information on the cost for such from WCS.

The dismantling of the components residing closest to the reactor core generates radioactive waste considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

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For purposes of this analysis, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste (i.e., in a geologic repository) and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in the same canisters used for spent fuel and either stored on site or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the metallic waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be surveyed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to isolate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates reflect the savings from waste recovery/volume reduction.

1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, “Radiological Criteria for License Termination,” ^[19] amending 10 CFR §20. This subpart provides radiological criteria for releasing a facility for unrestricted use. The regulation states that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year, and provided that residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA). The decommissioning estimates for Monticello assume that the site will be remediated to a residual level consistent with the NRC-prescribed level for radioactive material.

It should be noted that the NRC and the Environmental Protection Agency (EPA) differ on the amount of residual radioactivity considered acceptable in site remediation. The EPA has two limits that apply to radioactive materials. An EPA limit of 15 millirem per year is derived from criteria established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). ^[20] An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.66, is applied to drinking water. ^[21]

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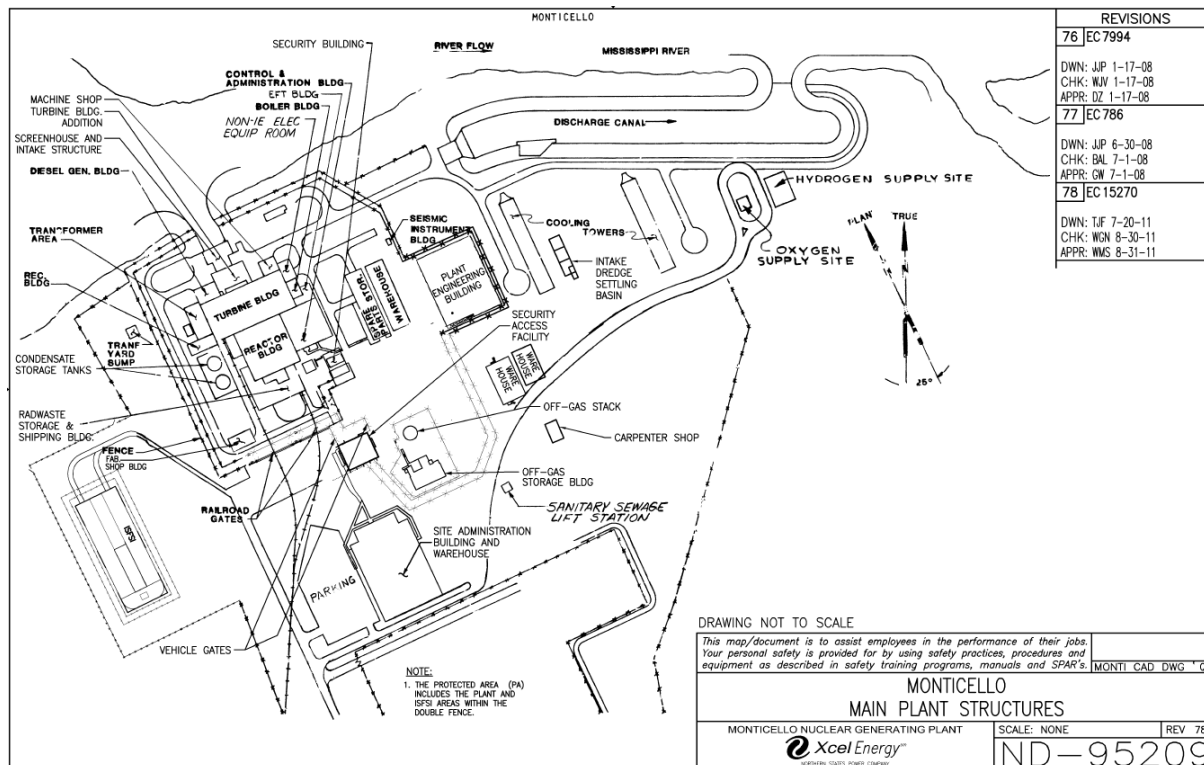
On October 9, 2002, the NRC signed an agreement with the EPA on the radiological decommissioning and decontamination of NRC-licensed sites. The Memorandum of Understanding (MOU) ^[22] provides that EPA will defer exercise of authority under CERCLA for the majority of facilities decommissioned under NRC authority. The MOU also includes provisions for NRC and EPA consultation for certain sites when, at the time of license termination, (1) groundwater contamination exceeds EPA-permitted levels; (2) NRC contemplates restricted release of the site; and/or (3) residual radioactive soil concentrations exceed levels defined in the MOU.

The MOU does not impose any new requirements on NRC licensees and should reduce the involvement of the EPA with NRC licensees who are decommissioning. Most sites are expected to meet the NRC criteria for unrestricted use, and the NRC believes that only a few sites will have groundwater or soil contamination in excess of the levels specified in the MOU that trigger consultation with the EPA. However, if there are other hazardous materials on the site, the EPA may be involved in the cleanup. As such, the possibility of dual regulation remains for certain licensees. The present study does not include any costs for this occurrence.

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**FIGURE 1.1
MONTICELLO NUCLEAR GENERATING PLANT
GENERAL PLAN**



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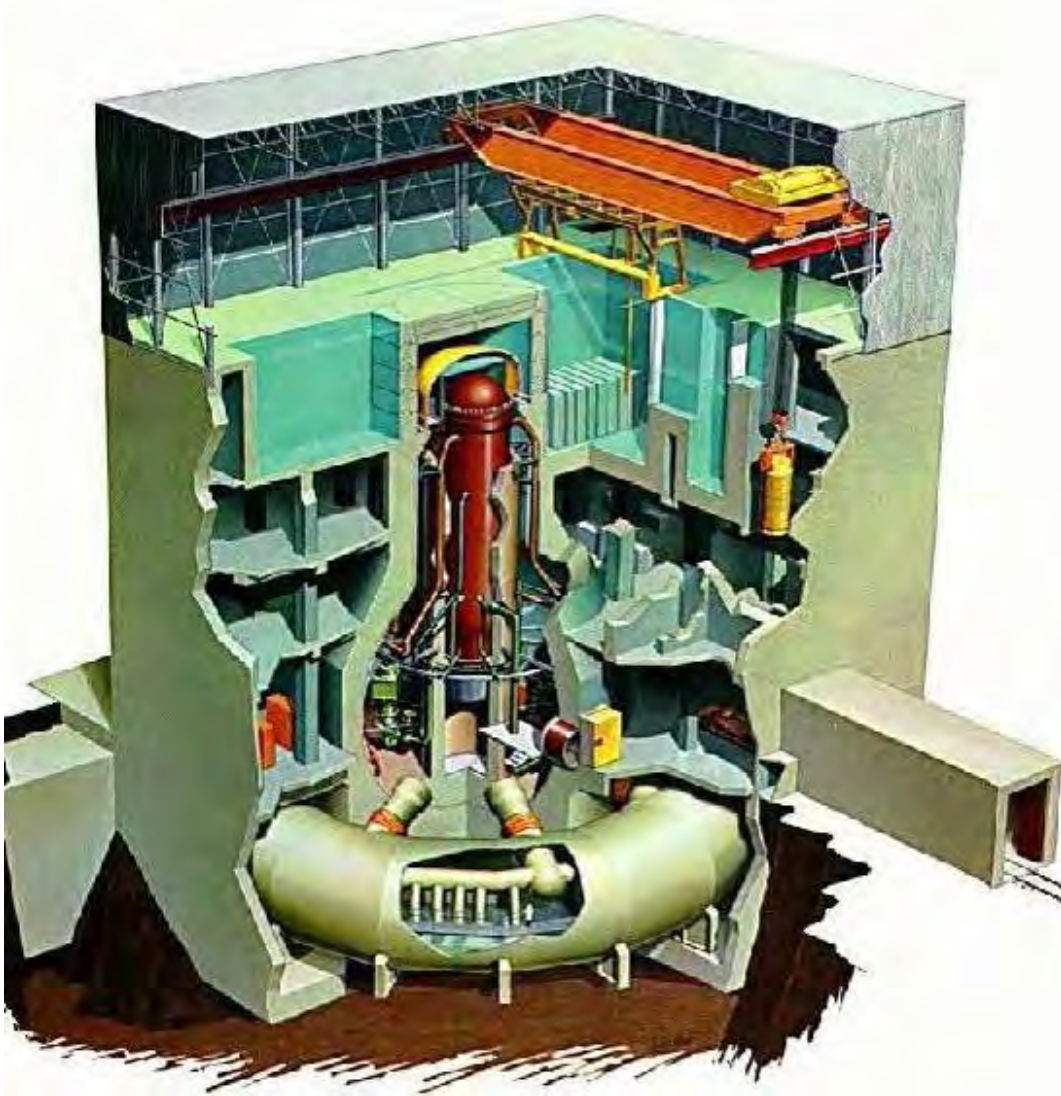
**FIGURE 1.2
MONTICELLO NUCLEAR GENERATING PLANT
AERIAL VIEW**



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**FIGURE 1.3
MONTICELLO NUCLEAR GENERATING PLANT
REACTOR BUILDING SECTION**



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2. DECOMMISSIONING ALTERNATIVES

Detailed cost estimates were developed to decommission Monticello based upon the approved decommissioning alternatives: DECON and SAFSTOR. Although the alternatives differ with respect to technique, process, cost, and schedule, they attain the same result: the ultimate release of the site for unrestricted use.

The following scenarios were evaluated and are intended to bound the liability associated with the removal of spent fuel from the site. The current operating license expires in 2030. The scenarios consist of five DECON scenarios, with differing spent fuel management assumptions, but essentially no changes to the decommissioning costs and timing of the power block. There are also two SAFSTOR scenarios (Scenarios 6 and 7) each corresponding to the first two DECON scenario spent fuel management assumptions. The spent fuel in the plant's spent fuel storage pool is transferred to the ISFSI within the first five years. The equipment, structures, and portions of the plant containing radioactive contaminants are removed or decontaminated to a level that permits the facility to be released for unrestricted use. Non-essential structures are then demolished. Spent fuel storage operations continue at the ISFSI until the transfer of the fuel to the DOE is completed (2062 in Scenarios 1 & 6, 2090 in Scenarios 2, 5 & 7, 2130 in Scenario 3, and 2230 in Scenario 4).

Scenario	1 st Spent Fuel Canister Replacement	1 st Spent Fuel Assembly Removed from Monticello*	Last Spent Fuel Assembly Removed from Monticello	Scenario Identification
1	n/a	2042	2062	DECON with 32 Year DFS ⁺
2	n/a	2078	2090	DECON with 60 Year DFS
3	2058	2118	2130	DECON with 100 Year DFS
4	2058	2218	2230	DECON with 200 Year DFS
5	2058	2078	2090	DECON with 60 Year DFS and recasking
6	n/a	2042	2062	SAFSTOR with 32 Year DFS
7	n/a	2078	2090	SAFSTOR with 60 Year DFS

* Spent fuel stored at Morris is removed prior to fuel stored at the Monticello site.

⁺ Dry Fuel Storage

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For Scenarios 2 and 7, although they provide a total fuel storage period of 60 years following plant shutdown, Xcel Energy directed TLG Services to not include the cost of transferring the spent fuel in dry storage to new canisters at 50 years after plant shutdown. The assumption to not transfer spent fuel at 50 years following plant shutdown in Scenarios 2 and 7 was premised on the likelihood that the life of the canisters could be successfully managed for an additional 10 years.

In Scenarios 3, 4 and 5, the DSCs are assumed to be replaced after fifty years of use. Since the reactor building spent fuel storage pool and fuel handling facilities are removed by the year 2038, a dry fuel transfer facility is assumed to be constructed on site to perform the transfers from the old to the new DSCs. For Scenarios 3 and 5, only one such transfer is needed over the time frame assumed (some fuel canisters in Scenario 5 will not require recasking). For Scenario 4, the spent fuel will be transferred three times following initial placement in the ISFSI.

The following sections describe the basic activities associated with each alternative. Although detailed procedures for each activity identified are not provided, and the actual sequence of work may vary, the activity descriptions provide a basis not only for estimating but also for the expected scope of work (i.e., engineering and planning at the time of decommissioning).

The conceptual approach that the NRC has described in its regulations divides decommissioning into three phases. The initial phase commences with the effective date of permanent cessation of operations and involves the transition of both plant and licensee from reactor operations (i.e., power production) to facilitate deactivation and closure. During the first phase, notification is to be provided to the NRC certifying the permanent cessation of operations and the removal of fuel from the reactor vessel. The licensee would then be prohibited from reactor operation.

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. The decommissioning estimates developed for Monticello are also divided into phases or periods; however, demarcation of the phases is based upon major milestones within the project or significant changes in the projected expenditures.

2.1 DECON

The DECON alternative, as defined by the NRC, is "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." This study does not address the cost to dispose of the spent fuel

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residing at the site; such costs are funded through a surcharge on electrical generation. However, the study does estimate the costs incurred with the interim on-site storage of the fuel pending shipment by the DOE to an off-site disposal facility. Those costs are separately presented as "Spent Fuel Management" expenditures in this report.

2.1.1 Period 1 - Preparations

In anticipation of the cessation of plant operations, detailed preparations are undertaken to provide a smooth transition from plant operations to site decommissioning. Through implementation of a staffing transition plan, the organization required to manage the intended decommissioning activities is assembled from available plant staff and outside resources. Preparations include the planning for permanent defueling of the reactor, revision of technical specifications applicable to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

Engineering and Planning

The PSDAR, required prior to, or within two years of permanent cessation of operations, provides a description of the licensee's planned decommissioning activities, a timetable, a site-specific decommissioning cost estimate, and the associated financial requirements of the intended decommissioning program. Upon receipt of the PSDAR, the NRC will make the document available to the public for comment in a local meeting to be held in the vicinity of the reactor site. Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a modified 10 CFR §50.59 procedure, (10 CFR §50.59 establishes the conditions under which licensees may make changes to the facility or procedures and conduct test or experiments, i.e., without prior NRC approval). Major activities are defined as any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components (for shipment) containing GTCC, as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor recirculation system piping, and other large components that are radioactive. The NRC includes the following additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

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- foreclose release of the site for possible unrestricted use,
- significantly increase decommissioning costs,
- cause any significant environmental impact not previously reviewed, or
- result in there no longer being reasonable assurance that adequate funds will be available for decommissioning

Existing operational technical specifications are reviewed and modified to reflect plant conditions and the safety concerns associated with permanent cessation of operations. The environmental impact associated with the planned decommissioning activities is also considered. Typically, a licensee will not be allowed to proceed if the consequences of a particular decommissioning activity are greater than that bounded by previously evaluated environmental assessments or impact statements. In this instance, the licensee would have to submit a license amendment for the specific activity and update the environmental report.

The decommissioning program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines (as defined in 10 CFR §20) for protection of personnel from exposure to radiation hazards. It will also address the continued protection of the health and safety of the public and the environment during the dismantling activity. Consequently, with the development of the PSDAR, activity specifications, cost-benefit and safety analyses, and work packages and procedures, would be assembled to support the proposed decontamination and dismantling activities.

Site Preparations

Following final plant shutdown, and in preparation for actual decommissioning activities, the following activities are initiated:

- Characterization of the site and surrounding environs. This includes radiation surveys of work areas, major components (including the reactor vessel and its internals), internal piping, and primary shield cores.
- An ISFSI has been constructed to support continued plant operation and will need to be expanded following the cessation of operations to offload the spent fuel pool in support of the decommissioning program.

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- Isolation of the spent fuel storage pool and fuel handling systems, such that decommissioning operations can commence on the balance of the plant. Decommissioning operations are scheduled around the fuel handling area to optimize the overall project schedule. It is assumed that the fuel pool remains operational for the transfer of fuel for approximately five years following the cessation of operations.
- Specification of transport and disposal requirements for activated materials and/or hazardous materials, including shielding and waste stabilization.
- Development of procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste (including dry-active waste, resins, filter media, metallic and non-metallic components generated in decommissioning), site security and emergency programs, and industrial safety.

2.1.2 Period 2 - Decommissioning Operations

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful amendment of the 10 CFR §50 operating license (releasing the site, exclusive of the ISFSI). Significant decommissioning activities in this phase include:

- Construction of temporary facilities and/or modification of existing facilities to support dismantling activities. This may include a centralized processing area to facilitate equipment removal and component preparations for off-site disposal.
- Reconfiguration and modification of site structures and facilities as needed to support decommissioning operations. This may include the upgrading of roads (on- and off-site) to facilitate hauling and transport. Modifications may be required to the containment structure to facilitate access of large/heavy equipment. Modifications may also be required to the refueling area of the reactor building to support the segmentation of the reactor vessel internals and component extraction.
- Transfer of the spent fuel from the storage pool to the ISFSI pad for interim storage.
- Design and fabrication of temporary and permanent shielding to support removal and transportation activities, construction of

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contamination control envelopes, and the procurement of specialty tooling.

- Procurement (lease or purchase) of shipping canisters, cask liners, and industrial packages.
- Decontamination of components and piping systems as required to control (minimize) worker exposure.
- Removal of piping and components no longer essential to support decommissioning operations.
- Transfer of the steam separator and dryer assemblies to the dryer-separator pool for segmentation. Segmentation by weight and activity maximizes the loading of the shielded transport casks. The operations are conducted under water using remotely operated tooling and contamination controls.
- Disconnection of the control blades from the drives on the vessel lower head. Blades are transferred to the spent fuel pool for packaging.
- Disassembly, segmentation, and packaging of the core shroud and in-core guide tubes. Some of the material is expected to exceed Class C disposal requirements. As such, those segments are packaged in modified fuel storage canisters for geologic disposal.
- Removal and segmentation of the remaining internals including the jet pump assemblies, fuel support castings, and core plate assembly.
- Removal of spent fuel storage racks from spent fuel pool, and cleanup of spent fuel pool.
- Draining and decontamination of the reactor well and the permanent sealing of the spent fuel transfer gate. Installation of a shielded platform for segmentation of the reactor vessel. Cutting operations are performed in air using remotely operated equipment within a contamination control envelope, with the water level maintained just below the cut to minimize the working area dose rates. Sections are transferred to the dryer-separator pool for packaging and interim storage.
- Disconnection of the control rod drives and instrumentation tubes from the reactor vessel lower head. The lower reactor head and vessel supporting structure are then segmented.
- Removal of the reactor recirculation pumps. Exterior surfaces are decontaminated and openings covered. Components can serve as

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their own burial containers provided that all penetrations are properly sealed.

- Demolition of the sacrificial shield wall activated concrete by controlled demolition.
- Spent fuel storage operations continue throughout the active decommissioning period.

At least two years prior to the anticipated date of license termination, an LTP is required. Submitted as a supplement to the Final Safety Analysis Report (FSAR) or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local meeting. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission. The licensee may then commence with the final remediation of site facilities and services, including:

- Removal of remaining plant systems and associated components as they become nonessential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).
- Removal of the steel liners from the drywell, disposing of the activated and contaminated sections as radioactive waste. Removal of any activated/contaminated concrete.
- Removal of the steel liners from the dryer/separator pool, reactor well, and spent fuel storage pool.
- Surveys of the decontaminated areas of the containment structure.
- Removal of the contaminated equipment and material from the turbine and radwaste buildings, and any other contaminated facility. Use radiation and contamination control techniques until radiation surveys indicate that the structures can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and components (both clean and contaminated) located within these buildings. This activity will facilitate surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.

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- Removal of the remaining components, equipment, and plant services in support of the area release survey(s).
- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination is released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material is characterized and segregated for additional off-site processing (disassembly, chemical cleaning, volume reduction, and waste treatment), and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.

Incorporated into the LTP is the Final Survey Plan. This plan identifies the radiological surveys to be performed once the decontamination activities are completed and is developed using the guidance provided in the “Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).”^[23] This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on the requested change to the operating license (that would release the property, exclusive of the ISFSI, for unrestricted use).

The NRC will amend the operating license to reduce the licensed area to the ISFSI area if it determines that site remediation has been performed in accordance with the LTP, and that the terminal radiation survey and associated documentation demonstrate that the property (exclusive of the ISFSI) is suitable for release.

2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities will begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits will result in substantial damage to many of the structures. Although performed in a controlled and safe manner, blasting, coring, drilling, scarification (surface removal), and the other decontamination activities will substantially degrade power block structures including the reactor, turbine and radwaste buildings. Under certain

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circumstances, verifying that subsurface radionuclide concentrations meet NRC site release requirements will require removal of grade slabs and lower floors, potentially weakening footings and structural supports. This removal activity will be necessary for those facilities and plant areas where historical records, when available, indicate the potential for radionuclides having been present in the soil, where system failures have been recorded, or where it is required to confirm that subsurface process and drain lines were not breached over the operating life of the station.

Dismantling of site structures following decommissioning is clearly the most appropriate and cost-effective option. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The effort to dismantle site structures with a work force already mobilized on site is more efficient than if the process were deferred. Site facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public as well as to future workers. Abandonment creates a breeding ground for vermin infestation as well as other biological hazards.

This cost study presumes that non-essential structures and site facilities are dismantled as a continuation of the decommissioning activity. Foundations and exterior walls are completely removed, including foundations and basemats, as required by Minnesota regulations. [24] Site areas affected by the dismantling activities are restored and the plant area graded as required to prevent ponding, establish erosion control by the planting of native vegetation, and inhibit the refloating of subsurface materials.

Non-contaminated concrete rubble produced by demolition activities is processed to remove reinforcing steel and miscellaneous embedments. All non-contaminated materials are trucked to an off-site area for disposal as construction debris. Subgrade voids are backfilled with clean construction fill, suitable under Minnesota regulations.

2.1.4 ISFSI Operations and Decommissioning

The ISFSI will continue to operate under a general license (10 CFR §50) following the amendment of the operating license to release the adjacent (power block) property. Assuming that Monticello spent fuel shipments begin in 2042, the process is not expected to be completed until 2062 (Scenario 1). Any delay in the transfer process, for example, due to a

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delay in the scheduled opening of the geologic repository, a slower acceptance rate, or a combination of both, can result in a longer on-site residence time for the fuel discharge from the reactor, as well as additional caretaking expenses. Scenarios 3 and 4 address extended delay periods. Scenarios 3, 4 and 5 also reflect an assumption that the spent fuel DSCs will need to be replaced every fifty years.

The assumed design for the ISFSI is based upon the use of a multi-purpose dry shielded storage canister and a horizontal storage module for pad storage.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The Commission will terminate the license if it determines that the remediation of the ISFSI has been performed in accordance with an ISFSI license termination plan and that the final radiation survey and associated documentation demonstrate that the facility is suitable for release. Once the requirements are satisfied, the NRC can terminate the license for the ISFSI.

For purposes of this cost analysis, it is assumed that once the DSCs containing the spent fuel assemblies have been removed, any required decontamination is performed on the storage overpacks (some minor neutron-induced activation is assumed), and the license for the facility terminated, the concrete overpacks can be dismantled using conventional techniques for the demolition of reinforced concrete. The concrete storage pad is then removed and the area regraded. This topic is discussed in greater detail in section 3.4.1.

2.2 SAFSTOR

The NRC defines SAFSTOR as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." The facility is left intact (during the dormancy period), with structures maintained in a sound condition. Systems not required to operate in support of the spent fuel pool or site surveillance and security are drained, de-energized, and secured. Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination are performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

The engineering and planning requirements are similar to those for the DECON alternative. Site preparations are also similar to those for the DECON

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alternative. However, with the exception of the required radiation surveys and site characterizations, the mobilization and preparation of site facilities is less extensive.

2.2.1 Period 1 - Preparations

Preparations for long-term storage include the planning for permanent defueling of the reactor, revision of technical specifications appropriate to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

The process of placing the plant in safe-storage includes, but is not limited to, the following activities:

- Isolation of the spent fuel storage services and fuel handling systems located in the reactor building so that safe-storage operations may commence on the balance of the plant. This activity may be carried out by plant personnel in accordance with existing operating technical specifications. Activities are scheduled around the fuel handling systems to the greatest extent possible.
- Draining and de-energizing of the non-contaminated systems not required to support continued site operations or maintenance.
- Disposing of contaminated filter elements and resin beds not required for processing wastes from layup activities for future operations.
- Draining of the reactor vessel, with the internals left in place and the vessel head secured.
- Draining and de-energizing non-essential, contaminated systems with decontamination as required for future maintenance and inspection.
- Preparing lighting and alarm systems whose continued use is required; de-energizing portions of fire protection, electric power, and HVAC systems whose continued use is not required.
- Cleaning of the loose surface contamination from building access pathways.
- Performing an interim radiation survey of plant, posting warning signs where appropriate.
- Erecting physical barriers and/or securing all access to radioactive or contaminated areas, except as required for inspection and maintenance.

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- Installing security and surveillance monitoring equipment and relocating security fence around secured structures, as required.

2.2.2 Period 2 - Dormancy

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the deferred decommissioning alternatives. Dormancy activities include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. Resident maintenance personnel perform equipment maintenance, inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services.

An environmental surveillance program is carried out during the dormancy period to ensure that releases of radioactive material to the environment are prevented and/or detected and controlled. Appropriate emergency procedures are established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal plant operations.

Security during the dormancy period is conducted primarily to protect the spent nuclear fuel while it is on site, prevent unauthorized entry, and to protect the public from the consequences of their own actions. The security fence, sensors, alarms, and other surveillance equipment provide security. Fire and radiation alarms are also monitored and maintained. While remote surveillance is an option, it does not offer the immediate response time of a physical presence.

During Scenario 6, the transfer of the spent fuel to a DOE facility continues during this period until complete. In Scenario 7, ISFSI operations and fuel transfer to the DOE continue through delayed decommissioning.

The length of the dormancy period is such that decommissioning (license termination) of the station (excluding the ISFSI) is accomplished within 60 years of final shutdown. The Scenario 6 SAFSTOR has the site remain in dormancy following spent fuel removal to the maximum

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extent possible, such that the license is terminated within the required 60-year time period.

It is required that the licensee submit an application to terminate the license, along with a LTP (described in Section 2.1.2), thereby initiating the third phase.

2.2.3 Periods 3 and 4 - Delayed Decommissioning

Prior to the commencement of decommissioning operations, preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning management organization. Final planning for activities and the writing of activity specifications and detailed procedures are also initiated at this time.

Much of the work in developing a termination plan is relevant to the development of the detailed engineering plans and procedures. The activities associated with this phase and the follow-on decontamination and dismantling processes are detailed in Sections 2.1.1 and 2.1.2. The primary difference between the sequences anticipated for the DECON and SAFSTOR scenarios is the absence, in the latter, of any constraint on the availability of the fuel storage pool located within the reactor building for decommissioning.

For Scenario 7, final fuel shipment occurs during Period 4f, the Final Survey period. ISFSI decommissioning begins immediately upon completion of final shipment of the spent fuel and GTCC canisters.

Variations in the length of the dormancy period are expected to have some effect upon the quantities of radioactive wastes generated from system and structure removal operations. However, given the levels of radioactivity and spectrum of radionuclides expected from approximately sixty years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone. (i.e., there is no significant reduction in the waste generated from the decommissioning activities). Due to the lower activity levels, a greater percentage of the waste volume can be designated for off-site processing and recovery.

The delay in decommissioning also yields lower working area radiation levels. As such, the estimate for the delayed scenarios incorporate

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reduced ALARA controls for the SAFSTOR's lower occupational exposure potential.

Although the initial radiation levels due to ^{60}Co will substantially decrease during the dormancy period, the internal components of the reactor vessel will still exhibit sufficiently high radiation dose rates to require remote sectioning under water due to the presence of long-lived radionuclides such as ^{94}Nb , ^{59}Ni , and ^{63}Ni . Therefore, the dismantling procedures described for the DECON alternative would still be employed during this scenario. Portions of the sacrificial shield wall will still be radioactive due to the presence of activated trace elements with long half-lives (^{152}Eu and ^{154}Eu). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal. These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

2.2.4 Period 5 - Site Restoration

Following completion of decommissioning operations, site-restoration activities can begin. Dismantling, as a continuation of the decommissioning process, is a cost-effective option, as described in Section 2.1.3. The basis for the dismantling cost in this scenario is consistent with that described for DECON, presuming the removal of structures and site facilities to include the existing foundations and basemats, and the limited restoration of the site.

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3. COST ESTIMATES

The cost estimates prepared for decommissioning Monticello consider the unique features of the site, including the NSSS, power generation systems, support services, site buildings, and ancillary facilities. The basis of the estimates, including the sources of information relied upon, the estimating methodology employed, site-specific considerations, and other pertinent assumptions, is described in this section.

3.1 BASIS OF ESTIMATES

The estimates were developed using the site-specific, technical information from the 2014 analysis. The plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, was reviewed for this analysis; no substantive changes were identified over the three-year period to the configuration of the plant or site facilities that would impact decommissioning. The site-specific considerations and assumptions used in the previous evaluation were also revisited; no necessary modifications were identified. Modifications such as new FLEX facilities were incorporated where new information was available or experience from ongoing decommissioning programs provided viable alternatives or improved processes.

3.2 METHODOLOGY

The methodology used to develop the estimates follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"^[25] and the DOE "Decommissioning Handbook."^[26] These documents present a unit factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit factors for concrete removal (\$/cubic yard), steel removal (\$/ton), and cutting costs (\$/inch) were developed using local labor rates. The activity-dependent costs were estimated with the item quantities (cubic yards and tons), developed from plant drawings and inventory documents. Removal rates and material costs for the conventional disposition of components and structures relied upon information available in the industry publication, "Building Construction Cost Data," published by RSMeans.^[27]

The unit factor method provides a demonstrable basis for establishing reliable cost estimates. The detail provided in the unit factors, including activity duration, labor costs (by craft), and equipment and consumable costs, ensures

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that essential elements have not been omitted. Appendix A presents the detailed development of a typical unit factor. Appendix B provides the values contained within one set of factors developed for this analysis.

Regulatory Guide 1.184 ^[28] describes the methods and procedures that are acceptable to the NRC staff for implementing the requirements that relate to the initial activities and the major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and sequence in the regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202. ^[29]

This analysis reflects lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, Vermont Yankee and Fort Calhoun nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

Work Difficulty Factors

TLG has historically applied work difficulty adjustment factors (WDFs) to account for the inefficiencies in working in a power plant environment. WDFs were assigned to each unique set of unit factors, commensurate with the inefficiencies associated with working in confined, hazardous environments. The ranges used for the WDFs are as follows:

• Access Factor	10% to 20%
• Respiratory Protection Factor	10% to 50%
• Radiation/ALARA Factor	10% to 40%
• Protective Clothing Factor	10% to 30%
• Work Break Factor	8.33%

The factors and their associated range of values were developed in conjunction with the AIF/NESP-036 study. The application of the factors is discussed in more detail in that publication.

Scheduling Program Durations

The unit factors, adjusted by the WDFs as described above, are applied against the inventory of materials to be removed in the radiologically controlled areas.

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The resulting man-hours, or crew-hours, are used in the development of the decommissioning program schedule, using resource loading and event sequencing considerations. The scheduling of conventional removal and dismantling activities are based upon productivity information available from the RSMeans "Building Construction Cost Data" publication. Dismantling of the fuel handling systems and decontamination of the spent fuel pool is also dependent upon the timetable for the transfer of the spent fuel assemblies from the pool to the ISFSI or the DOE.

The program schedule is used to determine the period-dependent costs for program management, administration, field engineering, equipment rental, contracted services, etc. The study relies upon regional or site-specific salary and wage rates for the personnel associated with the intended program.

3.3 FINANCIAL COMPONENTS OF THE COST MODEL

TLG's proprietary decommissioning cost model, DECCER, produces a number of distinct cost elements. These direct expenditures, however, do not comprise the total cost to accomplish the project goal, i.e., license termination and site restoration.

3.3.1 Contingency

Inherent in any cost estimate that does not rely on historical data is the inability to specify the precise source of costs imposed by factors such as tool breakage, accidents, illnesses, weather delays, and labor stoppages. In the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes funds to cover these types of expenses.

The activity- and period-dependent costs are combined to develop the total decommissioning cost. A contingency is then applied on a line-item basis, using one or more of the contingency types listed in the AIF/NESP-036 study. "Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook"^[30] as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this analysis are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice, a

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contingency factor has been applied. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and guidelines are provided for percentage contingency in each category. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

The use and role of contingency within decommissioning estimates is not a “safety factor issue.” Safety factors provide additional security and address situations that may never occur. Contingency funds are expected to be fully expended throughout the program. They also provide assurance that sufficient funding is available to accomplish the intended tasks. An estimate without contingency, or from which contingency has been removed, can disrupt the orderly progression of events and jeopardize a successful conclusion to the decommissioning process.

For example, the most technologically challenging task in decommissioning a commercial nuclear plant is the disposition of the reactor vessel and internal components, now highly radioactive after a lifetime of exposure to core activity. The disposition of these components forms the basis of the critical path (schedule) for decommissioning operations. Cost and schedule are interdependent, and any deviation in schedule has a significant impact on cost for performing a specific activity.

Disposition of the reactor vessel internals involves the underwater cutting of complex components that are highly radioactive. Costs are based upon optimum segmentation, handling, and packaging scenarios. The schedule is primarily dependent upon the turnaround time for the heavily shielded shipping casks, including preparation, loading, and decontamination of the containers for transport. The number of casks required is a function of the pieces generated in the segmentation activity, a value calculated on optimum performance of the tooling employed in cutting the various subassemblies. The expected optimization, however, may not be achieved, resulting in delays and additional program costs. For this reason, contingency must be included to mitigate the consequences of the expected inefficiencies inherent in this complex activity, along with related concerns associated with the operation of highly specialized tooling, field conditions, and water clarity.

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Contingency funds are an integral part of the total cost to complete the decommissioning process. Exclusion of this component puts at risk a successful completion of the intended tasks and, potentially, subsequent related activities. For this study, TLG examined the major activity-related problems (decontamination, segmentation, equipment handling, packaging, transport, and waste disposal) that necessitate a contingency. Individual activity contingencies ranged from 10% to 75%, depending on the degree of difficulty judged to be appropriate from TLG's actual decommissioning experience. The contingency values used in this study are as follows:

Decontamination	50%
Contaminated Component Removal	25%
Contaminated Component Packaging	10%
Contaminated Component Transport	15%
Low-Level Radioactive Waste Disposal	25%
Reactor Segmentation	75%
NSSS Component Removal	25%
Reactor Waste Packaging	25%
Reactor Waste Transport	25%
Reactor Vessel Component Disposal	50%
GTCC Disposal	15%
Non-Radioactive Component Removal	15%
Heavy Equipment and Tooling	15%
Supplies	25%
Engineering	15%
Energy	15%
Characterization and Termination Surveys	30%
Construction	15%
Taxes and Fees	10%
Insurance	10%
Staffing	15%
Spent Fuel Storage (Dry) Systems	15%
Spent Fuel Transfer Costs	15%
Operations and Maintenance Expenses	15%
ISFSI Decommissioning	25%

The contingency values are applied to the appropriate components of the estimates on a line item basis. A composite value is then reported at the

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end of each detailed estimate (as provided in Appendices C through I). Appendix J, the ISFSI decommissioning calculation, uses a flat 25% contingency added at the end of the calculation.

3.3.2 Financial Risk

In addition to the routine uncertainties addressed by contingency, another cost element that is sometimes necessary to consider when bounding decommissioning costs relates to uncertainty, or risk. Examples can include changes in work scope, pricing, job performance, and other variations that could conceivably, but not necessarily, occur. Consideration is sometimes necessary to generate a level of confidence in the estimate, within a range of probabilities. TLG considers these types of costs under the broad term “financial risk.” Included within the category of financial risk are:

- Transition activities and costs: ancillary expenses associated with eliminating 50% to 80% of the site labor force shortly after the cessation of plant operations, added cost for worker separation packages throughout the decommissioning program, national or company-mandated retraining, and retention incentives for key personnel.
- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, and national and local hearings.
- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), variations in plant inventory or configuration not indicated by the as-built drawings.
- Regulatory changes (e.g., affecting worker health and safety, site release criteria, waste transportation, and disposal).
- Policy decisions altering national commitments (e.g., in the ability to accommodate certain waste forms for disposition) or in the timetable for such, for example, the start and rate of acceptance of spent fuel by the DOE.
- Pricing changes for basic inputs such as labor, energy, materials, and disposal. Items subject to widespread price competition (such as materials) may not show significant variation; however, others such

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as waste disposal could exhibit large pricing uncertainties, particularly in markets where limited access to services is available.

This cost study does not add any additional costs to the estimate for financial risk, since there is insufficient historical data from which to project future liabilities. Consequently, the areas of uncertainty or risk are revisited periodically and addressed through repeated revisions or updates of the base estimates.

3.4 SITE-SPECIFIC CONSIDERATIONS

There are a number of site-specific considerations that affect the method for dismantling and removal of equipment from the site and the degree of restoration required. The cost impacts of the considerations identified below are included in this cost study.

3.4.1 Spent Fuel Management

The cost to dispose of spent fuel generated from plant operations is not reflected within the estimates to decommission Monticello. Ultimate disposition of the spent fuel is within the province of the DOE's Waste Management System, as defined by the Nuclear Waste Policy Act. As such, the disposal cost was financed by a 1 mill/kWhr surcharge paid into the DOE's waste fund during operations. On November 19, 2013, the U.S. Court of Appeals for the D.C. Circuit ordered the Secretary of the Department of Energy to suspend collecting annual fees for nuclear waste disposal from nuclear power plant operators until the DOE has conducted a legally adequate fee assessment.

The NRC does, however, require licensees to establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy. This requirement is prepared for through inclusion of certain high-level waste cost elements within the estimates, as described below.

Xcel Energy's current spent fuel management plan for the Monticello spent fuel is based in general upon:

- 1) Fuel transferred from the pool to the ISFSI within 5 years of shutdown;
- 2) Exchange of Monticello and Prairie Island spent fuel acceptance rights to best manage the overall cost of spent fuel storage for both plants;

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- 3) Currently Monticello is storing 1,058 fuel assemblies at the Morris Operation facility of GE Hitachi Nuclear Energy in Morris, Illinois. These assemblies will be shipped for final disposal to DOE prior to removal of fuel from the Monticello site.
- 4) Fuel will be shipped in the existing NUHOMS DSCs (Scenarios 1, 2, 6, and 7); the canisters and NUHOMS are periodically replaced in Scenarios 3, 4 and 5. Canisters that are unloaded in the spent fuel transfer operation will be surveyed for neutron activation.
- 5) As an allowance, some of these canisters and NUHOMS modules from the first off-load operation are assumed to be mildly neutron activated and therefore must be disposed of as radioactive waste.

This analysis assumes that the existing ISFSI is modified at the cessation of plant operations to accommodate the fuel present in the storage pool at shutdown.

The DOE's repository program assumes that spent fuel will be accepted for disposal from the nation's commercial nuclear plants in the order (the "queue") in which it was removed from service ("oldest fuel first").^[31] Repository operations were based upon annual industry-wide receipt of 400 Metric Tons Heavy Metal (MTHM) in the first year of operation, a total of 3,800 MTHM in years 2 through 4 and 3,000 MTHM for year 5 and beyond.^[32] This logic supports the spent fuel schedules for Scenarios 1 and 6. All other spent fuel scenarios are consistent with those identified by the Minnesota PSC.

Operation and maintenance costs for the spent fuel pool and ISFSI are included within the estimates and address the costs for staffing the facility, as well as security, insurance, and licensing fees. The estimates also include the costs to purchase, load, and transfer the NUHOMS DSCs from the pool to the ISFSI. Costs are also provided for the final disposition of the ISFSI once the transfer of the DSCs from the ISFSI to the DOE is complete.

Storage Canister Design

The design and capacity of the ISFSI is based upon the Transnuclear NUHOMS system (with a 61-fuel assembly capacity). The system consists of a multi-purpose (storage and transport) dry shielded storage canister (DSC) and a horizontal storage module (HSM). The existing

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DSCs and HSMs will remain in the ISFSI until either shipment to the DOE, or until recasked.

Canister Loading and Transfer

The estimates include an average cost of \$750,000 for the labor to load/transport the spent fuel from the pool to the ISFSI pad. For estimating purposes an allowance of \$332,800 is used for the cost to transfer each fuel canister from the ISFSI pad to the DOE transport vehicle.

Operations and Maintenance

An annual cost (excluding labor) of approximately \$803,000 and \$103,000 are used for operation and maintenance of the spent fuel pool and the ISFSI, respectively.

At shutdown, the spent fuel pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles). Over the next five years the assemblies are packaged into DSCs for transfer to the ISFSI for transfer to the DOE. It is assumed that the five years provides the necessary cooling period for the final core to meet the decay heat requirements for dry storage. Once the pool is emptied, the spent fuel storage and handling facilities are available for decommissioning.

Replacement of DSCs during ISFSI fuel storage period

Scenarios 1, 2, 6, and 7 do not assume any replacement of the spent fuel storage DSCs (recasking).

Three of the cost estimates, Scenarios 3, 4 and 5, include costs to recask the spent fuel, based upon an assumption that the DSC has a limited lifetime of approximately 50 years.

Scenario 3, which is 100 years (nominally) in length, considers a single repackaging effort for each DSC in the ISFSI.

Scenario 4, which is a (nominal) 200-year scenario, assumes that when any DSC in the ISFSI reaches the 50 years of storage milestone, the DSC is replaced. In Scenario 4, the fuel will be recasked three times following final shutdown of Monticello.

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Scenario 5, which is 60 years (nominally) in length, considers a single repackaging effort for each DSC in the ISFSI. Not all fuel will be recasked.

Since the reactor building, spent fuel storage pool, and fuel handling facilities are removed by the year 2038, a dry fuel transfer facility is assumed to be constructed on site to perform the transfers from the old to the new DSCs. Scenarios 3, 4 and 5 include the cost to construct such a transfer facility, as well as additional staffing positions for support of the dry transfer activities, and additional NRC oversight associated with the transfer operations. The decommissioning of this transfer facility is also included in Scenarios 3, 4 and 5.

ISFSI Decommissioning

In accordance with 10 CFR §72.30, licensees must have a proposed decommissioning plan for the ISFSI site and facilities that includes a cost estimate for the plan. The plan should contain sufficient information on the proposed practices and procedures for the decontamination of the ISFSI and for the disposal of residual radioactive materials after all spent fuel, high-level radioactive waste, and reactor-related GTCC waste have been removed.

The NUHOMS multi-purpose dry shielded storage canister with a horizontal, reinforced concrete storage module is used as a basis for the ISFSI decommissioning cost analyses. The modules are assumed to have some level of neutron-induced activation, as a result of the long-term storage of the fuel, i.e., to levels exceeding free-release limits. As an allowance, 8 modules are assumed to require remediation, equivalent to the number of modules required to accommodate the final core offload at Monticello (484 assemblies). The cost of the disposition of this material, as well as the demolition of the ISFSI facility, is included in the estimates.

In accordance with the specific requirements of 10 CFR §72.30 for the ISFSI work scope, the cost estimate for decommissioning the ISFSI reflects: 1) the cost of an independent contractor performing the decommissioning activities; 2) an adequate contingency factor; and 3) the cost of meeting the criteria for unrestricted use. The cost summary for decommissioning the ISFSI is presented in Appendix J. It contains four different scenarios reflecting the different number of casks present at the end of the ISFSI operations. The demolition of the ISFSI for all seven scenarios is reflected within the estimates.

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GTCC

The dismantling of the reactor internals is expected to generate radioactive waste considered unsuitable for shallow land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. ^[33]

Although the material is not classified as high-level waste, federal regulations under the Act designate that disposal of this material is a federal responsibility under Section 3(b)(1)(D). However, the DOE has not been forthcoming with an acceptance criteria or disposition schedule for this material, and numerous questions remain as to the ultimate disposal cost and waste form requirements.

As such, for purposes of this study, the GTCC has been packaged and disposed of in the same manner as high-level waste, at a cost equivalent to that envisioned for the spent fuel. The number of DSCs required and the packaged volume for GTCC was based upon experience at Maine Yankee (e.g., the constraints on loading as identified in the canister's certificate of compliance), but adjusted for the increased spent fuel capacity of the current DSCs.

It is assumed that the DOE would not accept this waste prior to completing the transfer of spent fuel. Therefore, until such time the DOE is ready to accept GTCC waste, it is reasonable to assume that this material would remain in storage at Monticello (for the DECON alternatives). In the SAFSTOR alternatives, the GTCC material is shipped directly to a DOE facility as it is generated. GTCC costs have been segregated and included within the "License Termination" expenditures.

3.4.2 Reactor Vessel and Internal Components

The NSSS (reactor vessel and reactor recirculation system components) will be decontaminated using chemical agents prior to the start of cutting operations (for DECON alternative only).

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The reactor pressure vessel and internal components are segmented for disposal in shielded, reusable transportation casks. Segmentation is performed underwater in the dryer-separator pool, where a turntable and remote cutter are installed. The vessel is segmented in place, using a mast-mounted cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor well. Transportation cask specifications and transportation regulations dictate the segmentation and packaging methodology.

Intact disposal of reactor vessel shells has been successfully demonstrated at several of the sites that have been decommissioned. Access to navigable waterways has allowed these large packages to be transported to the Barnwell disposal site with minimal overland travel. Intact disposal of the reactor vessel and internal components can provide savings in cost and worker exposure by eliminating the complex segmentation requirements, isolation of the GTCC material, and transport/storage of the resulting waste packages. Portland General Electric (PGE) was able to dispose of the Trojan reactor as an intact package (including the internals). However, its location on the Columbia River simplified the transportation analysis since:

- the reactor package could be secured to the transport vehicle for the entire journey, i.e., the package was not lifted during transport,
- there were no man-made or natural terrain features between the plant site and the disposal location that could produce a large drop, and
- transport speeds were very low, limited by the overland transport vehicle and the river barge.

As a member of the Northwest Compact, PGE had a site available for disposal of the package - the US Ecology facility in Washington State. The characteristics of this arid site proved favorable in demonstrating compliance with land disposal regulations.

It is not known whether this option will be available when Monticello ceases operation. Future viability of this option will depend upon the ultimate location of the disposal site, as well as the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. Additionally, with BWRs, the diameter of the reactor vessel may severely limit overland transport.

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Consequently, the study assumes the reactor vessel will require segmentation, as a bounding condition.

3.4.3 Primary System Components

Reactor recirculation piping is cut from the reactor vessel once the water level in the vessel (used for personnel shielding during dismantling and cutting operations in and around the vessel) is dropped below the nozzle zone. The piping is boxed and transported by shielded van. The reactor recirculation pumps and motors are lifted out intact, packaged, and transported for processing and/or disposal.

3.4.4 Main Turbine and Condenser

The main turbine will be dismantled using conventional maintenance procedures. The turbine rotors and shafts will be removed to a laydown area. The lower turbine casings will be removed from their anchors by controlled demolition. The main condensers will also be disassembled and moved to a laydown area. Material is then prepared for transportation to an off-site recycling facility where it will be surveyed and designated for either decontamination or volume reduction, or controlled disposal. Components will be packaged and readied for transport in accordance with the intended disposition.

3.4.5 Transportation Methods

Contaminated piping, components, and structural material other than the highly activated reactor vessel and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49.^[34] The contaminated material will be packaged in Industrial Packages (IP-1, IP-2, or IP-3, as defined in subpart 173.411) for transport unless demonstrated to qualify as their own shipping containers. The reactor vessel and internal components are expected to be transported in accordance with 10 CFR Part 71, as Type B. It is conceivable that the reactor, due to its limited specific activity, could qualify as LSA II or III. However, the high radiation levels on the outer surface would require that additional shielding be incorporated within the packaging so as to attenuate the dose to levels acceptable for transport.

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ¹³⁷Cs, ⁹⁰Sr, or

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transuranics) has been prevented from reaching levels exceeding those that permit the major reactor components to be shipped under current transportation regulations and disposal requirements.

Transport of the highly activated metal, produced in the segmentation of the reactor vessel and internal components, will be by shielded truck cask. Cask shipments may exceed 95,000 pounds, including vessel segment(s), supplementary shielding, cask tie-downs, and tractor-trailer. The maximum level of activity per shipment assumed permissible was based upon the license limits of the available shielded transport casks. The segmentation scheme for the vessel and internal segments is designed to meet these limits.

Transportation costs for Class A radioactive material requiring controlled disposal are based upon the mileage to the EnergySolutions facility in Clive, Utah. Transportation costs for the higher activity Class B and C radioactive material are based upon the mileage to the WCS facility in Andrews County, Texas. The transportation cost for the GTCC material is assumed to be contained within the disposal cost. Transportation costs for off-site waste processing are based upon the mileage to Oak Ridge, Tennessee. Truck transport costs were estimated using published tariffs from Tri-State Motor Transit.^[35]

3.4.6 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is processed to reduce the total cost of controlled disposal. Material meeting the regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning (preparing the material to meet the waste acceptance criteria of the disposal site) and recovery of the waste stream is performed off site at a licensed processing center. Any material leaving the site is subject to a survey and release charge, at a minimum.

The mass of radioactive waste generated during the various decommissioning activities at the site is shown on a line-item basis in the detailed Appendices C through J, and summarized in Section 5. The quantified waste summaries shown in these tables are consistent with 10 CFR Part 61 classifications. Commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations. The volumes are calculated based on the exterior package dimensions for

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containerized material or a specific calculation for components serving as their own waste containers.

The more highly activated reactor components will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume and weight, with surcharges added for the special handling requirements and the radiological characteristics of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

The cost to dispose of the lowest level and majority of the material generated from the decontamination and dismantling activities is based upon representative costs for disposal at EnergySolutions facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) were based upon preliminary and indicative information from WCS for the Andrews County facility

Material exceeding Class C limits (limited to material closest to the reactor core and comprising less than 1% of the total waste volume) is generally not suitable for shallow-land disposal. This material is packaged in the same multipurpose canisters used for spent fuel storage/transport, for eventual transfer to the DOE for disposal.

3.4.7 Site Conditions Following Decommissioning

The NRC will amend or terminate the unit license if it determines that site remediation has been performed in accordance with the license termination plan, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release. The NRC's involvement in the decommissioning process will end at this point. Building codes and environmental regulations will dictate the next step in the decommissioning process, as well as Xcel Energy's own future plans for the site, e.g., the electrical switchyard will remain in support of the regional transmission and distribution system.

Asphalt surfaces in the immediate vicinity of site buildings are broken up and the material disposed of as construction debris. The site access road will remain.

Only existing site structures are considered in the dismantling cost. All subgrade structures are removed. The voids are backfilled with clean

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debris and capped with soil. The site is then re-graded to conform to the adjacent landscape. Vegetation is established to inhibit erosion. These “non-radiological costs” are included in the total cost of decommissioning.

Bulk excavation of soil and material in the immediate vicinity of the reactor building is included to remove various duct banks, catch basins, and underground utilities that may exist.

The estimates do not assume the remediation of any significant volume of contaminated soil. This assumption may be affected by continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria.

3.5 ASSUMPTIONS

The following are the major assumptions made in the development of the estimates for decommissioning the site.

3.5.1 Estimating Basis

The study follows the principles of ALARA through the use of work duration adjustment factors. These factors address the impact of activities such as radiological protection instruction, mock-up training, and the use of respiratory protection and protective clothing. The factors lengthen a task's duration, increasing costs and lengthening the overall schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to worker exposure limits may impact the decommissioning cost and project schedule.

3.5.2 Labor Costs

For purposes of this analysis, it is assumed that Xcel Energy will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. Xcel Energy will provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Contract personnel will provide engineering services (e.g., for preparing the activity specifications, work procedures, neutron activation, and structural analyses) under the direction of Xcel Energy.

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Utility labor costs were provided by Xcel Energy. Average costs were provided by department or work group and included payroll overheads. Decommissioning Operations Contractor (DOC) labor costs were based on utility labor costs with modified markups to account for employee benefits, DOC overhead and profit.

The craft labor required to decontaminate and dismantle the nuclear station will be acquired through standard site contracting practices. Craft labor costs were based upon information from Xcel Energy. Craft labor costs include applicable overheads and profit.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel.

Staffing levels are assigned by sub-period and functional area. The types of positions and staffing levels are adjusted based upon the type of activity occurring in each sub-period.

Representative profiles of the staffing level for decommissioning, including contractors and craft, is provided in Figures 3.1 and 3.2 for the DECON (Scenario 2) and SAFSTOR (Scenario 7) estimates. Utility staffing levels will gradually decrease after completing the removal of physical systems. Staffing levels and management support will vary based upon the amount and type of decommissioning work. Craft manpower levels decrease after systems removal and structures decontamination and drop substantially during the delay period and the license termination survey period. However, craft levels increase again during the site restoration period due to the work associated with structures demolition.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel (in accordance with the requirements of 10 CFR Part 37, Part 72, and Part 73). Once the fuel has been transferred to the DOE, the security organization will be reduced to Part 37 requirements for Scenario 6.

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3.5.3 Design Conditions

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ^{137}Cs , ^{90}Sr , or transuranics) has been prevented from reaching levels exceeding those that permit the major NSSS components to be shipped under current transportation regulations and disposal requirements.

The curie contents of the vessel and internals at final shutdown are derived from those listed in NUREG/CR-3474.^[36] Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the Monticello components, projected operating life, and different periods of decay. Additional short-lived isotopes were derived from NUREG/CR-0130^[37] and NUREG/CR-0672,^[38] and benchmarked to the long-lived values from NUREG/CR-3474.

The disposal cost for the control blades removed from the vessel with the final core load was included within the estimates. Control blade residence time in the reactor is assumed to be controlled such that the blades do not become GTCC material. Disposition of any blades stored in the pool from operations was considered an operating expense and therefore not accounted for in the estimates.

Neutron activation of the reactor building structure is confined to the reactor sacrificial shield.

3.5.4 General

Transition Activities

Existing warehouses will be cleared of non-essential material and remain for use by Xcel Energy and subcontractors. The plant's operating staff will perform the following activities at no additional cost or credit to the project during the transition period:

- Drain and collect fuel oils, lubricating oils, and transformer oils for recycle and/or sale.
- Drain and collect acids, caustics, and other chemical stores for recycle and/or sale.
- Processes operating waste inventories, i.e., the estimates do not address the disposition of any legacy wastes; the disposal of

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operating wastes during this initial period is not considered a decommissioning expense.

Scrap and Salvage

The existing plant equipment is considered obsolete and suitable for scrap as deadweight quantities only. Xcel Energy will make economically reasonable efforts to salvage equipment following final plant shutdown. However, dismantling techniques assumed by TLG for equipment in this analysis are not consistent with removal techniques required for salvage (resale) of equipment. Experience has indicated that some buyers wanted equipment stripped down to very specific requirements before they would consider purchase. This required expensive rework after the equipment had been removed from its installed location. Since placing a salvage value on this machinery and equipment would be speculative, and the value would be small in comparison to the overall decommissioning expenses, this analysis does not attempt to quantify the possible salvage value that Xcel Energy may realize based upon those efforts.

It is assumed, for purposes of this analysis, that any value received from the sale of scrap generated in the dismantling process would be offset by the on-site processing costs. The dismantling techniques assumed in the decommissioning estimates do not include the additional cost for size reduction and preparation to meet “furnace ready” conditions. For example, the recovery of copper from electrical cabling may require the removal and disposition of any contaminated insulation, an added expense. With a volatile market, the potential profit margin in scrap recovery is highly speculative, regardless of the ability to free release this material. This assumption is an implicit recognition of scrap value in the disposal of clean metallic waste at no additional cost to the project.

Furniture, tools, mobile equipment such as forklifts, trucks, bulldozers, and other property will be removed at no cost or credit to the decommissioning project. Disposition may include relocation to other facilities. Spare parts will also be made available for alternative use.

The concrete debris resulting from building demolition activities is crushed on site to reduce the size of the debris. The resulting crushed concrete is disposed offsite as construction debris. The rebar removed from the concrete crushing process is disposed of as scrap steel in a similar fashion as other scrap metal as discussed previously.

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Energy

For estimating purposes, the plant is assumed to be de-energized, with the exception of those facilities associated with spent fuel storage. Replacement power costs are used for the cost of energy consumption during decommissioning for tooling, lighting, ventilation, and essential services.

Emergency Planning

FEMA and state fees associated with emergency planning are assumed to continue for approximately 18 months following the cessation of operations. At this time, the FEMA fees are discontinued. The timing is based upon the anticipated condition of the spent fuel (i.e., the hottest spent fuel assemblies are assumed to be cool enough that no substantial Zircaloy oxidation and off-site event would occur with the loss of spent fuel pool water). State and local fees are continued until all spent fuel is transferred out of the spent fuel pool.

Insurance

Costs for continuing coverage (nuclear liability and property insurance) following cessation of plant operations and during decommissioning are included and based upon current operating premiums. Reductions in premiums throughout the decommissioning process are based upon guidance provided by Xcel Energy. Reductions in premiums, throughout the decommissioning process, are based upon the guidance provided in SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning."^[39] The NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

Taxes

Property taxes are included for all decommissioning periods. Xcel Energy provided a schedule of decreasing tax payments against the current tax assessment. These payments are maintained for the balance of the decommissioning program.

NRC Fees

These estimates include charges from the NRC to support the Monticello decommissioning program. Charges are included for the yearly license held by Xcel Energy for the Part 50 license, as well as engineering

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support charges by the NRC to review activities at the site. The Part 50 license fee for a reactor in a decommissioning or possession-only status and which has spent fuel onsite is \$194 thousand per year. Once the reactor has been decommissioned, the site Part 50 license continues at the same fee until final removal of the spent fuel. The hourly rate for NRC review is \$267.00. The level of effort of NRC participation is commensurate with the decommissioning alternative and schedule.

Disposal of Processed Water

This estimate assumes that processed water which meets state and federal release limits can be disposed of without additional cost.

Site Modifications

The perimeter fence and in-plant security barriers will be moved, as appropriate, to conform to the Site Security Plan in force during the various stages of the project.

Minnesota state regulations regarding concrete

This estimate complies with the Minnesota state regulations regarding the removal of all subterranean concrete during demolition, plus the survey and confirmation of the suitability of the clean fill used for backfill of the subgrade structures following concrete removal.

3.6 COST ESTIMATE SUMMARY

The estimates presented in this document reflects the total cost to decontaminate the nuclear units, manage the spent fuel until the DOE is able to complete the transfer to a federal facility, dismantle the plant and restore the site for alternative use.

Schedules of expenditures are provided in Tables 3.1 through 3.7. The tables delineate the cost contributors by year of expenditures as well as cost contributor (e.g., labor, materials, and waste disposal).

Additional tables in Appendices C through I provide detailed costs elements. The cost elements are also assigned to one of three subcategories: "License Termination," "Spent Fuel Management," and "Site Restoration." The subcategory "License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). In situations where the long-term

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management of spent fuel is not an issue, the cost reported for this subcategory is generally sufficient to terminate the unit's operating license, recognizing that there may be some additional cost impact from spent fuel management. The "Spent Fuel Management" subcategory contains costs associated with the containerization and transfer of spent fuel from the pool to the DOE or to the ISFSI for interim storage, and the transfer of the multipurpose canisters from the ISFSI to the DOE. Costs are also included for the operations of the pool and management of the ISFSI until such time that the transfer of all fuel from this facility to an off-site location (e.g., interim storage facility) is complete.

"Site Restoration" is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are completely removed, including foundations and basemats and backfilled to conform to local grade.

As discussed in Section 3.4.1, it is assumed that the DOE will not accept the GTCC waste prior to completing the transfer of spent fuel. Therefore, the cost of GTCC disposal is shown in the final year of ISFSI operation (for the DECON alternative). While designated for disposal at a federal facility along with the spent fuel, GTCC waste is still classified as low-level radioactive waste and, as such, included as a "License Termination" expense.

Decommissioning costs are reported in 2017 dollars. Costs are not inflated, escalated, or discounted over the period of expenditure (or projected lifetime of the plant).

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TABLE 3.1
SCENARIO 1: DECON WITH 32 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	22,829	6,415	627	20	7,049	36,939
2031	72,400	7,603	2,616	913	31,779	115,311
2032	78,460	28,886	2,284	40,103	30,941	180,673
2033	78,072	37,838	1,749	34,741	24,053	176,453
2034	66,364	7,235	1,492	9,590	20,527	105,209
2035	86,863	81,152	1,273	13,277	17,396	199,960
2036	50,291	3,982	573	9,360	6,723	70,929
2037	34,607	10,274	237	9	3,627	48,754
2038	29,565	11,366	184	0	3,515	44,629
2039	5,908	0	0	0	2,334	8,243
2040	5,925	0	0	0	2,341	8,265
2041	5,908	0	0	0	2,334	8,243
2042	6,004	287	0	0	2,334	8,625
2043	6,195	861	0	0	2,334	9,391
2044	6,116	574	0	0	2,341	9,031
2045	6,100	574	0	0	2,334	9,008
2046	6,483	1,722	0	0	2,334	10,539
2047	6,387	1,435	0	0	2,334	10,156
2048	7,067	3,426	0	0	2,341	12,834
2049	6,387	1,435	0	0	2,334	10,156
2050	6,195	861	0	0	2,334	9,391
2051	6,100	574	0	0	2,334	9,008
2052	6,212	861	0	0	2,341	9,413
2053	6,100	574	0	0	2,334	9,008
2054	6,100	574	0	0	2,334	9,008
2055	6,195	861	0	0	2,334	9,391
2056	6,116	574	0	0	2,341	9,031
2057	6,100	574	0	0	2,334	9,008
2058	6,195	861	0	0	2,334	9,391
2059	6,291	1,148	0	0	2,334	9,774

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TABLE 3.1 (continued)
SCENARIO 1: DECON WITH 32 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	6,116	574	0	0	2,341	9,031
2061	6,291	1,148	0	0	2,334	9,774
2062	6,291	1,148	0	0	2,334	9,774
2063	2,248	3,118	33	10,073	11,731	27,203
Total	670,480	218,520	11,068	118,086	213,400	1,231,552

Note: Columns may not add due to rounding

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TABLE 3.2
SCENARIO 2: DECON WITH 60 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	21,104	1,240	627	20	7,049	30,039
2031	72,416	7,653	2,616	913	31,779	115,378
2032	78,476	28,935	2,284	40,103	30,941	180,740
2033	78,663	39,613	1,749	34,741	24,053	178,819
2034	66,380	7,285	1,492	9,590	20,527	105,275
2035	86,880	81,202	1,273	13,277	17,396	200,027
2036	50,308	4,032	573	9,360	6,723	70,996
2037	34,623	10,324	237	9	3,627	48,820
2038	29,581	11,416	184	0	3,500	44,680
2039	5,925	50	0	0	2,137	8,112
2040	5,941	50	0	0	2,143	8,134
2041	5,925	50	0	0	2,137	8,112
2042	5,925	50	0	0	2,137	8,112
2043	5,925	50	0	0	2,137	8,112
2044	5,941	50	0	0	2,143	8,134
2045	5,925	50	0	0	2,137	8,112
2046	5,925	50	0	0	2,137	8,112
2047	5,925	50	0	0	2,137	8,112
2048	6,605	2,041	0	0	2,143	10,789
2049	5,925	50	0	0	2,137	8,112
2050	7,418	4,529	0	0	2,137	14,085
2051	7,418	4,529	0	0	2,137	14,085
2052	8,297	7,117	0	0	2,143	17,557
2053	8,928	9,058	0	0	2,137	20,122
2054	7,634	5,176	0	0	2,137	14,947
2055	8,712	8,411	0	0	2,137	19,260
2056	9,159	9,704	0	0	2,143	21,007
2057	5,908	0	0	0	2,137	8,046
2058	5,908	0	0	0	2,137	8,046
2059	5,908	0	0	0	2,137	8,046

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Decommissioning Cost Analysis**

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TABLE 3.2 (continued)
SCENARIO 2: DECON WITH 60 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	5,925	0	0	0	2,143	8,068
2061	5,908	0	0	0	2,137	8,046
2062	5,908	0	0	0	2,137	8,046
2063	5,908	0	0	0	2,137	8,046
2064	5,925	0	0	0	2,143	8,068
2065	5,908	0	0	0	2,137	8,046
2066	5,908	0	0	0	2,137	8,046
2067	5,908	0	0	0	2,137	8,046
2068	5,925	0	0	0	2,143	8,068
2069	5,908	0	0	0	2,137	8,046
2070	5,908	0	0	0	2,137	8,046
2071	5,908	0	0	0	2,137	8,046
2072	5,925	0	0	0	2,143	8,068
2073	5,908	0	0	0	2,137	8,046
2074	5,908	0	0	0	2,137	8,046
2075	5,908	0	0	0	2,137	8,046
2076	5,925	0	0	0	2,143	8,068
2077	5,908	0	0	0	2,137	8,046
2078	6,387	1,435	0	0	2,122	9,944
2079	6,483	1,722	0	0	2,122	10,327
2080	6,403	1,435	0	0	2,128	9,966
2081	6,387	1,435	0	0	2,122	9,944
2082	6,387	1,435	0	0	2,122	9,944
2083	6,483	1,722	0	0	2,122	10,327
2084	6,403	1,435	0	0	2,128	9,966
2085	6,387	1,435	0	0	2,122	9,944
2086	6,387	1,435	0	0	2,122	9,944
2087	6,483	1,722	0	0	2,122	10,327
2088	7,067	3,426	0	0	2,128	12,621
2089	6,387	1,435	0	0	2,122	9,944

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Decommissioning Cost Analysis**

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TABLE 3.2 (continued)
SCENARIO 2: DECON WITH 60 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	6,100	574	0	0	2,122	8,796
2091	2,035	3,143	33	10,073	11,706	26,990
Total	851,819	266,556	11,068	118,086	268,321	1,515,850

Note: Columns may not add due to rounding

**Monticello Nuclear Generating Plant
Decommissioning Cost Analysis**

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TABLE 3.3
SCENARIO 3: DECON WITH 100 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	21,104	1,240	627	20	7,049	30,039
2031	72,416	7,653	2,616	913	31,779	115,378
2032	81,871	39,120	2,284	40,103	30,941	194,319
2033	78,663	39,613	1,749	34,741	24,053	178,819
2034	66,380	7,285	1,492	9,590	20,527	105,275
2035	86,880	81,202	1,273	13,277	17,396	200,027
2036	50,308	4,032	573	9,360	6,723	70,996
2037	34,756	10,324	237	9	3,627	48,953
2038	29,828	11,416	184	0	3,495	44,922
2039	7,165	50	0	0	2,075	9,290
2040	7,184	50	0	0	2,081	9,315
2041	7,165	50	0	0	2,075	9,290
2042	7,165	50	0	0	2,075	9,290
2043	7,165	50	0	0	2,075	9,290
2044	7,184	50	0	0	2,081	9,315
2045	7,165	50	0	0	2,075	9,290
2046	7,165	50	0	0	2,075	9,290
2047	7,165	50	0	0	2,075	9,290
2048	7,848	2,041	0	0	2,081	11,970
2049	7,165	50	0	0	2,075	9,290
2050	8,658	4,529	0	0	2,075	15,263
2051	8,658	4,529	0	0	2,075	15,263
2052	8,677	4,529	0	0	2,081	15,288
2053	8,658	4,529	0	0	2,075	15,263
2054	8,658	4,529	0	0	2,075	15,263
2055	8,658	4,529	0	0	2,075	15,263
2056	8,677	4,529	0	0	2,081	15,288
2057	8,658	4,529	0	0	2,075	15,263
2058	14,754	22,819	0	0	2,075	39,648
2059	8,658	4,529	0	0	2,075	15,263

**Monticello Nuclear Generating Plant
Decommissioning Cost Analysis**

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TABLE 3.3 (continued)
SCENARIO 3: DECON WITH 100 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	8,677	4,529	0	0	2,081	15,288
2061	8,658	4,529	0	0	2,075	15,263
2062	8,658	4,529	0	0	2,075	15,263
2063	8,658	4,529	0	0	2,075	15,263
2064	8,677	4,529	0	0	2,081	15,288
2065	8,658	4,529	0	0	2,075	15,263
2066	12,316	15,503	0	0	2,075	29,894
2067	8,658	4,529	0	0	2,075	15,263
2068	17,212	30,134	0	0	2,081	49,428
2069	8,658	4,529	0	0	2,075	15,263
2070	8,658	4,529	0	0	2,075	15,263
2071	8,658	4,529	0	0	2,075	15,263
2072	8,677	4,529	0	0	2,081	15,288
2073	8,658	4,529	0	0	2,075	15,263
2074	8,658	4,529	0	0	2,075	15,263
2075	8,658	4,529	0	0	2,075	15,263
2076	8,677	4,529	0	0	2,081	15,288
2077	8,658	4,529	0	0	2,075	15,263
2078	8,658	4,529	0	0	2,075	15,263
2079	8,658	4,529	0	0	2,075	15,263
2080	8,677	4,529	0	0	2,081	15,288
2081	8,658	4,529	0	0	2,075	15,263
2082	8,658	4,529	0	0	2,075	15,263
2083	8,658	4,529	0	0	2,075	15,263
2084	8,677	4,529	0	0	2,081	15,288
2085	8,658	4,529	0	0	2,075	15,263
2086	8,658	4,529	0	0	2,075	15,263
2087	8,658	4,529	0	0	2,075	15,263
2088	9,341	6,520	0	0	2,081	17,942
2089	8,658	4,529	0	0	2,075	15,263

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Decommissioning Cost Analysis**

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TABLE 3.3 (continued)
SCENARIO 3: DECON WITH 100 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	8,658	4,529	0	0	2,075	15,263
2091	8,658	4,529	0	0	2,075	15,263
2092	9,540	7,117	0	0	2,081	18,738
2093	10,167	9,058	0	0	2,075	21,300
2094	8,873	5,176	0	0	2,075	16,125
2095	31,289	72,423	0	9,072	2,075	114,859
2096	10,402	9,704	0	0	2,081	22,188
2097	7,148	0	0	0	2,075	9,223
2098	7,148	0	0	0	2,075	9,223
2099	7,148	0	0	0	2,075	9,223
2100	7,148	0	0	0	2,075	9,223
2101	7,148	0	0	0	2,075	9,223
2102	7,148	0	0	0	2,075	9,223
2103	7,148	0	0	0	2,075	9,223
2104	7,168	0	0	0	2,081	9,249
2105	7,148	0	0	0	2,075	9,223
2106	7,148	0	0	0	2,075	9,223
2107	7,148	0	0	0	2,075	9,223
2108	13,264	18,289	0	0	2,081	33,634
2109	7,148	0	0	0	2,075	9,223
2110	7,148	0	0	0	2,075	9,223
2111	7,148	0	0	0	2,075	9,223
2112	7,168	0	0	0	2,081	9,249
2113	7,148	1,664	0	0	9,610	18,422
2114	7,148	0	0	0	2,075	9,223
2115	7,148	0	0	0	2,075	9,223
2116	10,825	10,973	0	0	2,081	23,880
2117	7,148	0	0	0	2,075	9,223
2118	14,922	27,040	0	0	2,122	44,084
2119	6,483	1,722	0	0	2,122	10,327

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Decommissioning Cost Analysis**

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TABLE 3.3 (continued)
SCENARIO 3: DECON WITH 100 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2120	6,403	1,435	0	0	2,128	9,966
2121	6,387	1,435	0	0	2,122	9,944
2122	6,387	1,435	0	0	2,122	9,944
2123	6,483	1,722	0	0	2,122	10,327
2124	6,403	1,435	0	0	2,128	9,966
2125	6,387	1,435	0	0	2,122	9,944
2126	6,387	1,435	0	0	2,122	9,944
2127	6,483	1,722	0	0	2,122	10,327
2128	7,067	3,426	0	0	2,128	12,621
2129	6,387	1,435	0	0	2,122	9,944
2130	6,100	574	0	0	2,122	8,796
2131	2,028	1,499	33	260	3,230	7,051
Total	1,309,028	633,674	11,068	117,345	348,021	2,419,136

Note: Columns may not add due to rounding

**Monticello Nuclear Generating Plant
Decommissioning Cost Analysis**

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**TABLE 3.4
SCENARIO 4: DECON WITH 200 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)**

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	21,104	1,240	627	20	7,049	30,039
2031	72,416	7,653	2,616	913	31,779	115,378
2032	81,871	39,120	2,284	40,103	30,941	194,319
2033	78,663	39,613	1,749	34,741	24,053	178,819
2034	66,380	7,285	1,492	9,590	20,527	105,275
2035	86,880	81,202	1,273	13,277	17,396	200,027
2036	50,308	4,032	573	9,360	6,723	70,996
2037	34,756	10,324	237	9	3,627	48,953
2038	29,828	11,416	184	0	3,492	44,919
2039	7,165	50	0	0	2,037	9,251
2040	7,184	50	0	0	2,043	9,277
2041	7,165	50	0	0	2,037	9,251
2042	7,165	50	0	0	2,037	9,251
2043	7,165	50	0	0	2,037	9,251
2044	7,184	50	0	0	2,043	9,277
2045	7,165	50	0	0	2,037	9,251
2046	7,165	50	0	0	2,037	9,251
2047	7,165	50	0	0	2,037	9,251
2048	7,848	2,041	0	0	2,043	11,931
2049	7,165	50	0	0	2,037	9,251
2050	8,658	4,529	0	0	2,037	15,224
2051	8,658	4,529	0	0	2,037	15,224
2052	8,677	4,529	0	0	2,043	15,249
2053	8,658	4,529	0	0	2,037	15,224
2054	8,658	4,529	0	0	2,037	15,224
2055	8,658	4,529	0	0	2,037	15,224
2056	8,677	4,529	0	0	2,043	15,249
2057	8,658	4,529	0	0	2,037	15,224
2058	14,754	22,819	0	0	2,037	39,610
2059	8,658	4,529	0	0	2,037	15,224

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Decommissioning Cost Analysis**

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TABLE 3.4 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	8,677	4,529	0	0	2,043	15,249
2061	8,658	4,529	0	0	2,037	15,224
2062	8,658	4,529	0	0	2,037	15,224
2063	8,658	4,529	0	0	2,037	15,224
2064	8,677	4,529	0	0	2,043	15,249
2065	8,658	4,529	0	0	2,037	15,224
2066	12,316	15,503	0	0	2,037	29,855
2067	8,658	4,529	0	0	2,037	15,224
2068	17,212	30,134	0	0	2,043	49,389
2069	8,658	4,529	0	0	2,037	15,224
2070	8,658	4,529	0	0	2,037	15,224
2071	8,658	4,529	0	0	2,037	15,224
2072	8,677	4,529	0	0	2,043	15,249
2073	8,658	4,529	0	0	2,037	15,224
2074	8,658	4,529	0	0	2,037	15,224
2075	8,658	4,529	0	0	2,037	15,224
2076	8,677	4,529	0	0	2,043	15,249
2077	8,658	4,529	0	0	2,037	15,224
2078	8,658	4,529	0	0	2,037	15,224
2079	8,658	4,529	0	0	2,037	15,224
2080	8,677	4,529	0	0	2,043	15,249
2081	8,658	4,529	0	0	2,037	15,224
2082	8,658	4,529	0	0	2,037	15,224
2083	8,658	4,529	0	0	2,037	15,224
2084	8,677	4,529	0	0	2,043	15,249
2085	8,658	4,529	0	0	2,037	15,224
2086	8,658	4,529	0	0	2,037	15,224
2087	8,658	4,529	0	0	2,037	15,224
2088	9,341	6,520	0	0	2,043	17,904
2089	8,658	4,529	0	0	2,037	15,224

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Decommissioning Cost Analysis**

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TABLE 3.4 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	8,658	4,529	0	0	2,037	15,224
2091	8,658	4,529	0	0	2,037	15,224
2092	8,677	4,529	0	0	2,043	15,249
2093	8,658	4,529	0	0	2,037	15,224
2094	8,658	4,529	0	0	2,037	15,224
2095	29,995	68,541	0	9,072	2,037	109,645
2096	8,677	4,529	0	0	2,043	15,249
2097	8,658	4,529	0	0	2,037	15,224
2098	8,658	4,529	0	0	2,037	15,224
2099	8,658	4,529	0	0	2,037	15,224
2100	8,658	4,529	0	0	2,037	15,224
2101	8,658	4,529	0	0	2,037	15,224
2102	8,658	4,529	0	0	2,037	15,224
2103	8,658	4,529	0	0	2,037	15,224
2104	8,677	4,529	0	0	2,043	15,249
2105	8,658	4,529	0	0	2,037	15,224
2106	8,658	4,529	0	0	2,037	15,224
2107	8,658	4,529	0	0	2,037	15,224
2108	14,774	22,819	0	0	2,043	39,635
2109	8,658	4,529	0	0	2,037	15,224
2110	8,658	4,529	0	0	2,037	15,224
2111	8,658	4,529	0	0	2,037	15,224
2112	8,677	4,529	0	0	2,043	15,249
2113	8,658	4,529	0	0	2,037	15,224
2114	8,658	4,529	0	0	2,037	15,224
2115	8,658	4,529	0	0	2,037	15,224
2116	12,335	15,503	0	0	2,043	29,881
2117	8,658	4,529	0	0	2,037	15,224
2118	17,193	30,134	0	0	2,037	49,364
2119	8,658	4,529	0	0	2,037	15,224

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Decommissioning Cost Analysis**

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TABLE 3.4 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2120	8,677	4,529	0	0	2,043	15,249
2121	8,658	4,529	0	0	2,037	15,224
2122	8,658	4,529	0	0	2,037	15,224
2123	8,658	4,529	0	0	2,037	15,224
2124	8,677	4,529	0	0	2,043	15,249
2125	8,658	4,529	0	0	2,037	15,224
2126	8,658	4,529	0	0	2,037	15,224
2127	8,658	4,529	0	0	2,037	15,224
2128	9,341	6,520	0	0	2,043	17,904
2129	8,658	4,529	0	0	2,037	15,224
2130	8,658	4,529	0	0	2,037	15,224
2131	8,658	4,529	0	0	2,037	15,224
2132	8,677	4,529	0	0	2,043	15,249
2133	8,658	4,529	0	0	2,037	15,224
2134	8,658	4,529	0	0	2,037	15,224
2135	8,658	4,529	0	0	2,037	15,224
2136	8,677	4,529	0	0	2,043	15,249
2137	8,658	4,529	0	0	2,037	15,224
2138	8,658	4,529	0	0	2,037	15,224
2139	8,658	4,529	0	0	2,037	15,224
2140	8,677	4,529	0	0	2,043	15,249
2141	8,658	4,529	0	0	2,037	15,224
2142	8,658	4,529	0	0	2,037	15,224
2143	8,658	4,529	0	0	2,037	15,224
2144	8,677	4,529	0	0	2,043	15,249
2145	29,995	68,541	0	0	2,037	100,574
2146	8,658	4,529	0	0	2,037	15,224
2147	8,658	4,529	0	0	2,037	15,224
2148	8,677	4,529	0	0	2,043	15,249
2149	8,658	4,529	0	0	2,037	15,224

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Decommissioning Cost Analysis**

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TABLE 3.4 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2150	8,658	4,529	0	0	2,037	15,224
2151	8,658	4,529	0	0	2,037	15,224
2152	8,677	4,529	0	0	2,043	15,249
2153	8,658	4,529	0	0	2,037	15,224
2154	8,658	4,529	0	0	2,037	15,224
2155	8,658	4,529	0	0	2,037	15,224
2156	8,677	4,529	0	0	2,043	15,249
2157	8,658	4,529	0	0	2,037	15,224
2158	14,754	22,819	0	0	2,037	39,610
2159	8,658	4,529	0	0	2,037	15,224
2160	8,677	4,529	0	0	2,043	15,249
2161	8,658	4,529	0	0	2,037	15,224
2162	8,658	4,529	0	0	2,037	15,224
2163	8,658	4,529	0	0	2,037	15,224
2164	8,677	4,529	0	0	2,043	15,249
2165	8,658	4,529	0	0	2,037	15,224
2166	12,316	15,503	0	0	2,037	29,855
2167	8,658	4,529	0	0	2,037	15,224
2168	17,876	32,125	0	0	2,043	52,044
2169	8,658	4,529	0	0	2,037	15,224
2170	8,658	4,529	0	0	2,037	15,224
2171	8,658	4,529	0	0	2,037	15,224
2172	8,677	4,529	0	0	2,043	15,249
2173	8,658	4,529	0	0	2,037	15,224
2174	8,658	4,529	0	0	2,037	15,224
2175	8,658	4,529	0	0	2,037	15,224
2176	8,677	4,529	0	0	2,043	15,249
2177	8,658	4,529	0	0	2,037	15,224
2178	8,658	4,529	0	0	2,037	15,224
2179	8,658	4,529	0	0	2,037	15,224

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TABLE 3.4 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2180	8,677	4,529	0	0	2,043	15,249
2181	8,658	4,529	0	0	2,037	15,224
2182	8,658	4,529	0	0	2,037	15,224
2183	8,658	4,529	0	0	2,037	15,224
2184	8,677	4,529	0	0	2,043	15,249
2185	8,658	4,529	0	0	2,037	15,224
2186	8,658	4,529	0	0	2,037	15,224
2187	8,658	4,529	0	0	2,037	15,224
2188	8,677	4,529	0	0	2,043	15,249
2189	8,658	4,529	0	0	2,037	15,224
2190	8,658	4,529	0	0	2,037	15,224
2191	8,658	4,529	0	0	2,037	15,224
2192	9,540	7,117	0	0	2,043	18,699
2193	10,167	9,058	0	0	2,037	21,262
2194	8,873	5,176	0	0	2,037	16,087
2195	31,289	72,423	0	0	2,037	105,749
2196	10,402	9,704	0	0	2,043	22,149
2197	7,148	0	0	0	2,037	9,185
2198	7,148	0	0	0	2,037	9,185
2199	7,148	0	0	0	2,037	9,185
2200	7,148	0	0	0	2,037	9,185
2201	7,148	0	0	0	2,037	9,185
2202	7,148	0	0	0	2,037	9,185
2203	7,148	0	0	0	2,037	9,185
2204	7,168	0	0	0	2,043	9,210
2205	7,148	0	0	0	2,037	9,185
2206	7,148	0	0	0	2,037	9,185
2207	7,148	0	0	0	2,037	9,185
2208	13,928	20,280	0	0	2,043	36,250
2209	7,148	0	0	0	2,037	9,185

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Decommissioning Cost Analysis**

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TABLE 3.4 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2210	7,148	0	0	0	2,037	9,185
2211	7,148	0	0	0	2,037	9,185
2212	7,168	0	0	0	2,043	9,210
2213	7,148	1,664	0	0	9,572	18,384
2214	7,148	0	0	0	2,037	9,185
2215	7,148	0	0	0	2,037	9,185
2216	10,825	10,973	0	0	2,043	23,841
2217	7,148	0	0	0	2,037	9,185
2218	14,922	27,040	0	0	2,122	44,084
2219	6,483	1,722	0	0	2,122	10,327
2220	6,403	1,435	0	0	2,128	9,966
2221	6,387	1,435	0	0	2,122	9,944
2222	6,387	1,435	0	0	2,122	9,944
2223	6,483	1,722	0	0	2,122	10,327
2224	6,403	1,435	0	0	2,128	9,966
2225	6,387	1,435	0	0	2,122	9,944
2226	6,387	1,435	0	0	2,122	9,944
2227	6,483	1,722	0	0	2,122	10,327
2228	6,403	1,435	0	0	2,128	9,966
2229	6,387	1,435	0	0	2,122	9,944
2230	6,100	574	0	0	2,122	8,796
2231	2,028	1,499	33	260	3,230	7,051
Total	2,255,856	1,328,352	11,068	117,345	548,823	4,261,444

Note: Columns may not add due to rounding

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TABLE 3.5
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	21,104	1,240	627	20	7,049	30,039
2031	72,416	7,653	2,616	913	31,779	115,378
2032	81,871	39,120	2,284	40,103	30,941	194,319
2033	78,663	39,613	1,749	34,741	24,053	178,819
2034	66,380	7,285	1,492	9,590	20,527	105,275
2035	86,880	81,202	1,273	13,277	17,396	200,027
2036	50,308	4,032	573	9,360	6,723	70,996
2037	34,623	10,324	237	9	3,627	48,820
2038	29,581	11,416	184	0	3,500	44,680
2039	5,925	50	0	0	2,137	8,112
2040	5,941	50	0	0	2,143	8,134
2041	5,925	50	0	0	2,137	8,112
2042	5,925	50	0	0	2,137	8,112
2043	5,925	50	0	0	2,137	8,112
2044	5,941	50	0	0	2,143	8,134
2045	5,925	50	0	0	2,137	8,112
2046	5,925	50	0	0	2,137	8,112
2047	5,925	50	0	0	2,137	8,112
2048	6,605	2,041	0	0	2,143	10,789
2049	5,925	50	0	0	2,137	8,112
2050	7,418	4,529	0	0	2,137	14,085
2051	7,418	4,529	0	0	2,137	14,085
2052	8,297	7,117	0	0	2,143	17,557
2053	8,928	9,058	0	0	2,137	20,122
2054	7,634	5,176	0	0	2,137	14,947
2055	8,712	8,411	0	0	2,137	19,260
2056	9,159	9,704	0	0	2,143	21,007
2057	5,908	0	0	0	2,137	8,046
2058	12,005	18,289	0	0	2,137	32,431
2059	5,908	0	0	0	2,137	8,046

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TABLE 3.5 (continued)
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	5,925	0	0	0	2,143	8,068
2061	5,908	0	0	0	2,137	8,046
2062	5,908	0	0	0	2,137	8,046
2063	5,908	0	0	0	2,137	8,046
2064	5,925	0	0	0	2,143	8,068
2065	5,908	0	0	0	2,137	8,046
2066	9,566	10,973	0	0	2,137	22,677
2067	5,908	0	0	0	2,137	8,046
2068	14,460	25,605	0	0	2,143	42,208
2069	5,908	0	0	0	2,137	8,046
2070	5,908	0	0	0	2,137	8,046
2071	5,908	0	0	0	2,137	8,046
2072	5,925	0	0	0	2,143	8,068
2073	5,908	0	0	0	2,137	8,046
2074	5,908	0	0	0	2,137	8,046
2075	5,908	0	0	0	2,137	8,046
2076	5,925	0	0	0	2,143	8,068
2077	5,908	0	0	0	2,137	8,046
2078	6,387	1,435	0	0	2,122	9,944
2079	6,483	1,722	0	0	2,122	10,327
2080	6,403	1,435	0	0	2,128	9,966
2081	6,387	1,435	0	0	2,122	9,944
2082	6,387	1,435	0	0	2,122	9,944
2083	6,483	1,722	0	0	2,122	10,327
2084	6,403	1,435	0	0	2,128	9,966
2085	6,387	1,435	0	0	2,122	9,944
2086	6,387	1,435	0	0	2,122	9,944
2087	6,483	1,722	0	0	2,122	10,327
2088	7,067	3,426	0	0	2,128	12,621
2089	6,387	1,435	0	0	2,122	9,944

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Decommissioning Cost Analysis**

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TABLE 3.5 (continued)
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	6,100	2,238	0	0	9,657	17,995
2091	2,067	1,493	33	10,097	4,175	17,866
Total	873,536	331,622	11,068	118,110	268,325	1,602,660

Note: Columns may not add due to rounding

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TABLE 3.6
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	19,484	6,243	627	20	7,049	33,423
2031	63,214	6,306	1,989	941	37,537	109,988
2032	30,082	1,835	695	420	18,964	51,996
2033	29,420	15,975	398	23	17,697	63,513
2034	24,245	450	398	23	17,697	42,813
2035	43,919	74,367	335	20	13,362	132,002
2036	8,465	315	199	11	3,948	12,939
2037	8,442	314	199	11	3,938	12,904
2038	8,442	314	199	11	3,938	12,904
2039	8,442	314	199	11	3,938	12,904
2040	8,465	315	199	11	3,948	12,939
2041	8,442	314	199	11	3,938	12,904
2042	8,537	601	199	11	3,938	13,287
2043	8,729	1,175	199	11	3,938	14,052
2044	8,656	889	199	11	3,948	13,705
2045	8,633	888	199	11	3,938	13,669
2046	9,016	2,037	199	11	3,938	15,200
2047	8,920	1,750	199	11	3,938	14,818
2048	9,607	3,741	199	11	3,948	17,507
2049	8,920	1,750	199	11	3,938	14,818
2050	8,729	1,175	199	11	3,938	14,052
2051	8,633	888	199	11	3,938	13,669
2052	8,752	1,176	199	11	3,948	14,087
2053	8,633	888	199	11	3,938	13,669
2054	8,633	888	199	11	3,938	13,669
2055	8,729	1,175	199	11	3,938	14,052
2056	8,656	889	199	11	3,948	13,705
2057	8,633	888	199	11	3,938	13,669
2058	8,729	1,175	199	11	3,938	14,052
2059	8,825	1,463	199	11	3,938	14,435

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Decommissioning Cost Analysis**

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TABLE 3.6 (continued)
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	8,656	889	199	11	3,948	13,705
2061	8,825	1,463	199	11	3,938	14,435
2062	8,825	1,463	199	11	3,938	14,435
2063	1,610	307	199	10	3,900	6,026
2064	1,614	308	199	10	3,910	6,042
2065	1,610	307	199	10	3,900	6,026
2066	1,610	307	199	10	3,900	6,026
2067	1,610	307	199	10	3,900	6,026
2068	1,614	308	199	10	3,910	6,042
2069	1,610	307	199	10	3,900	6,026
2070	1,610	307	199	10	3,900	6,026
2071	1,610	307	199	10	3,900	6,026
2072	1,614	308	199	10	3,910	6,042
2073	1,610	307	199	10	3,900	6,026
2074	1,610	307	199	10	3,900	6,026
2075	1,610	307	199	10	3,900	6,026
2076	1,614	308	199	10	3,910	6,042
2077	1,610	307	199	10	3,900	6,026
2078	1,610	307	199	10	3,900	6,026
2079	1,610	307	199	10	3,900	6,026
2080	1,614	308	199	10	3,910	6,042
2081	1,610	307	199	10	3,900	6,026
2082	1,610	307	199	10	3,900	6,026
2083	1,610	307	199	10	3,900	6,026
2084	1,614	308	199	10	3,910	6,042
2085	40,842	4,857	1,921	65	4,033	51,718
2086	48,428	16,050	1,943	18,529	8,986	93,937
2087	52,120	25,292	1,848	37,180	14,229	130,670
2088	46,773	7,413	1,496	13,385	7,493	76,560
2089	45,679	7,004	1,417	13,353	7,627	75,081

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TABLE 3.6 (continued)
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	28,929	5,553	335	9,189	7,305	51,311
2091	21,064	13,889	199	0	2,029	37,181
2092	8,829	5,822	83	0	851	15,585
Total	773,451	226,950	23,440	93,680	357,105	1,474,626

Note: Columns may not add due to rounding

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Decommissioning Cost Analysis**

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TABLE 3.7
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	17,759	1,068	627	20	7,049	26,523
2031	63,231	6,356	1,989	941	37,537	110,054
2032	30,099	1,885	695	420	18,964	52,063
2033	30,012	17,750	398	23	17,697	65,880
2034	24,262	500	398	23	17,697	42,880
2035	43,936	74,416	335	20	13,362	132,069
2036	8,481	365	199	11	3,948	13,005
2037	8,458	364	199	11	3,938	12,970
2038	8,458	364	199	11	3,938	12,970
2039	8,458	364	199	11	3,938	12,970
2040	8,481	365	199	11	3,948	13,005
2041	8,458	364	199	11	3,938	12,970
2042	8,458	364	199	11	3,938	12,970
2043	8,458	364	199	11	3,938	12,970
2044	8,481	365	199	11	3,948	13,005
2045	8,458	364	199	11	3,938	12,970
2046	8,458	364	199	11	3,938	12,970
2047	8,458	364	199	11	3,938	12,970
2048	9,145	2,356	199	11	3,948	15,660
2049	8,458	364	199	11	3,938	12,970
2050	9,952	4,844	199	11	3,938	18,943
2051	9,952	4,844	199	11	3,938	18,943
2052	10,837	7,432	199	11	3,948	22,428
2053	11,461	9,372	199	11	3,938	24,980
2054	10,167	5,491	199	11	3,938	19,805
2055	11,245	8,725	199	11	3,938	24,118
2056	11,700	10,020	199	11	3,948	25,878
2057	8,442	314	199	11	3,938	12,904
2058	8,442	314	199	11	3,938	12,904
2059	8,442	314	199	11	3,938	12,904

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Decommissioning Cost Analysis**

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TABLE 3.7 (continued)
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2060	8,465	315	199	11	3,948	12,939
2061	8,442	314	199	11	3,938	12,904
2062	8,442	314	199	11	3,938	12,904
2063	8,442	314	199	11	3,938	12,904
2064	8,465	315	199	11	3,948	12,939
2065	8,442	314	199	11	3,938	12,904
2066	8,442	314	199	11	3,938	12,904
2067	8,442	314	199	11	3,938	12,904
2068	8,465	315	199	11	3,948	12,939
2069	8,442	314	199	11	3,938	12,904
2070	8,442	314	199	11	3,938	12,904
2071	8,442	314	199	11	3,938	12,904
2072	8,465	315	199	11	3,948	12,939
2073	8,442	314	199	11	3,938	12,904
2074	8,442	314	199	11	3,938	12,904
2075	8,442	314	199	11	3,938	12,904
2076	8,465	315	199	11	3,948	12,939
2077	8,442	314	199	11	3,938	12,904
2078	8,920	1,750	199	11	3,938	14,817
2079	9,016	2,037	199	11	3,938	15,200
2080	8,943	1,750	199	11	3,948	14,853
2081	8,920	1,750	199	11	3,938	14,817
2082	8,920	1,750	199	11	3,938	14,817
2083	9,016	2,037	199	11	3,938	15,200
2084	8,943	1,750	199	11	3,948	14,853
2085	46,126	6,293	1,921	66	4,034	58,440
2086	53,631	17,486	1,943	18,529	8,987	100,577
2087	57,419	27,016	1,848	37,180	14,229	137,692
2088	52,653	10,840	1,496	13,385	7,493	85,867
2089	50,914	8,441	1,417	13,353	7,631	81,755

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Decommissioning Cost Analysis**

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TABLE 3.7 (continued)
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

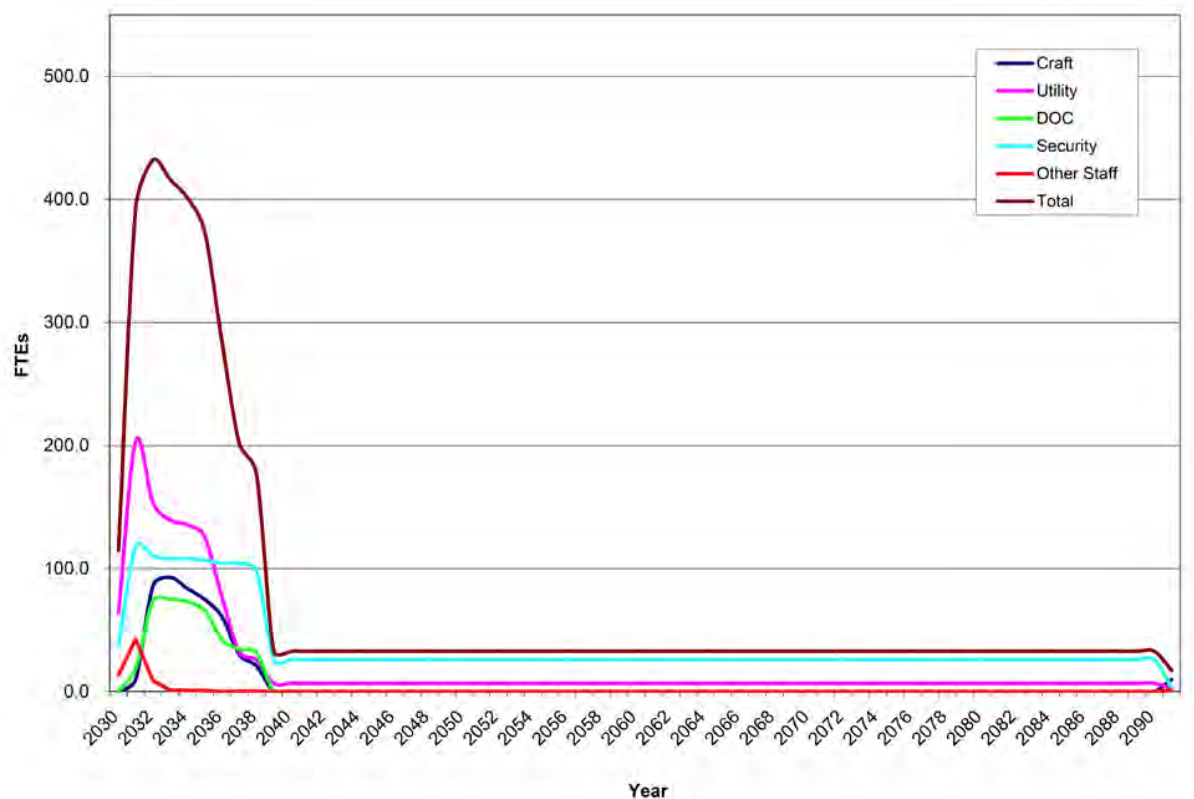
Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2090	32,668	6,135	335	9,190	7,341	55,669
2091	21,071	13,904	199	0	2,029	37,203
2092	8,833	5,828	83	0	851	15,595
Total	967,172	275,164	23,440	93,701	357,978	1,717,454

Note: Columns may not add due to rounding

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Decommissioning Cost Analysis**

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**FIGURE 3.1
SCENARIO 2: DECON WITH 60 YEAR DFS
MONTICELLO NUCLEAR GENERATING PLANT
MANPOWER LEVELS**

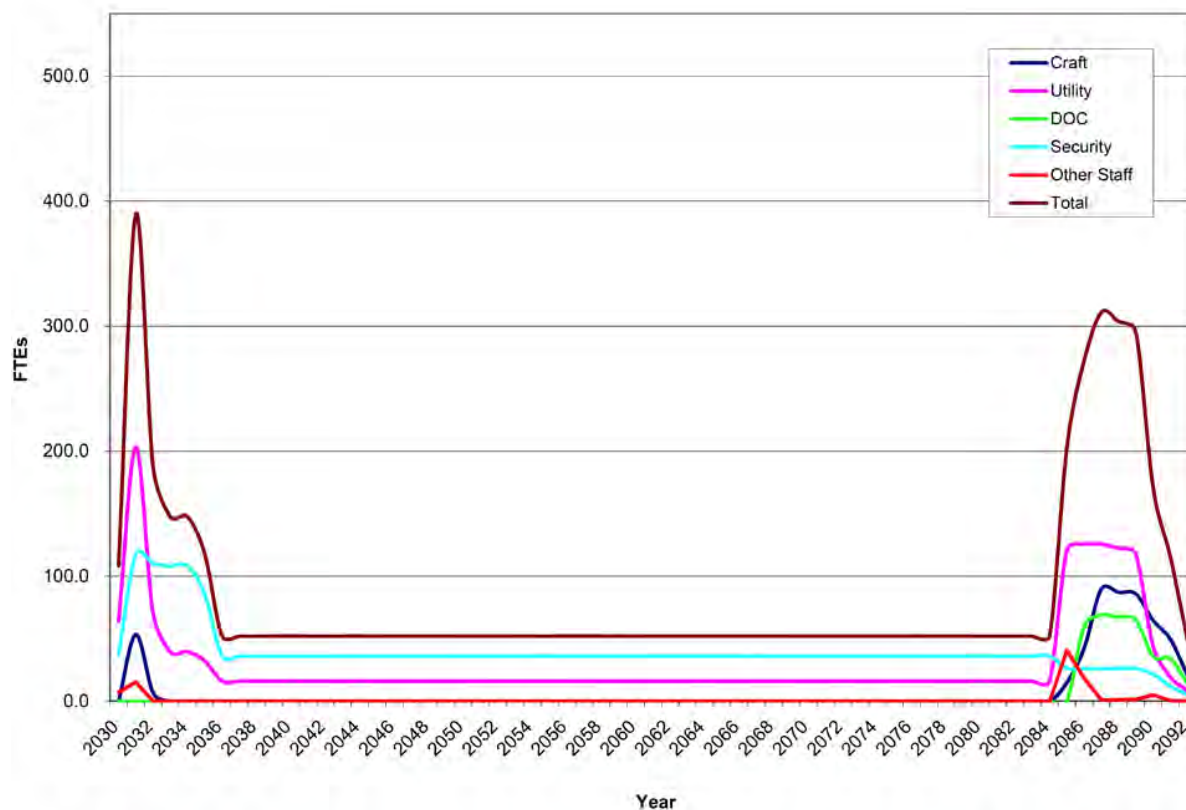


Note that the labor hour basis of this chart was taken from Appendix D; however not all line items in Appendix D have labor hour values available (e.g. spent fuel canister loading estimates from Xcel Energy)

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Decommissioning Cost Analysis**

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**FIGURE 3.2
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
MONTICELLO NUCLEAR GENERATING PLANT
MANPOWER LEVELS**



Note that the labor hour basis of this chart was taken from Appendix I; however not all line items in Appendix I have labor hour values available (e.g. spent fuel canister loading estimates from Xcel Energy)

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Decommissioning Cost Analysis**

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4. SCHEDULE ESTIMATE

The schedules for the decommissioning scenarios considered in this study follow the sequence presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management plans described in Section 3.4.1.

A schedule or sequence of activities for the DECON alternative is presented in Figure 4.1. The schedule is also representative of the work activities identified in the delayed dismantling scenarios, absent any spent fuel constraints. The scheduling sequence is based on the fuel being removed from the spent fuel pool within the first five years after operations cease. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the cost tables, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the "Microsoft Project Professional" computer software.^[40]

4.1 SCHEDULE ESTIMATE ASSUMPTIONS

The schedule reflects the results of a precedence network developed for the site decommissioning activities, i.e., a PERT (Program Evaluation and Review Technique) Software Package. The work activity durations used in the precedence network reflect the actual man-hour estimates from the cost table, adjusted by stretching certain activities over their slack range and shifting the start and end dates of others. The following assumptions were made in the development of the decommissioning schedule:

- The reactor building is isolated until such time that all spent fuel has been discharged from the storage pool to the DOE or to the ISFSI. Decontamination and dismantling of the spent fuel storage pool is initiated once the transfer of spent fuel is complete (DECON option).
- All work (except vessel and internals removal) is performed during an 8-hour workday, 5 days per week, with no overtime. There are eleven paid holidays per year.
- Reactor and internals removal activities are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.
- Multiple crews work parallel activities to the maximum extent possible, consistent with optimum efficiency, adequate access for cutting, removal and laydown space, and with the stringent safety measures necessary during demolition of heavy components and structures.

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- For plant systems removal, the systems with the longest removal durations in areas on the critical path are considered to determine the duration of the activity.

4.2 PROJECT SCHEDULE

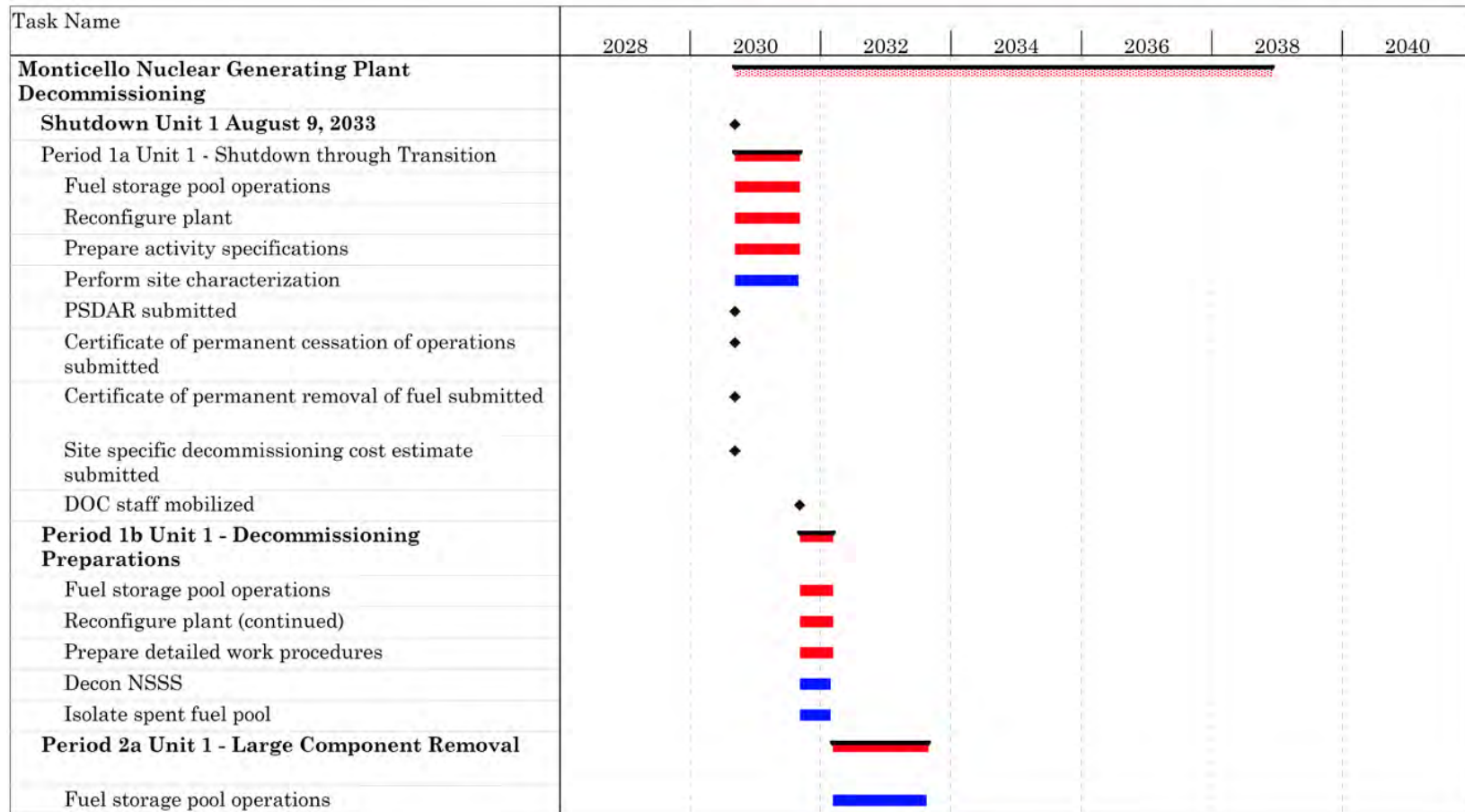
The period-dependent costs presented in the detailed cost tables are based upon the durations developed in the schedules for decommissioning Monticello. Durations are established between several milestones in each project period; these durations are used to establish a critical path for the entire project. In turn, the critical path duration for each period is used as the basis for determining the period-dependent costs. A second parallel path is also shown for the spent fuel cooling period, which determines the release of the reactor building for final decontamination.

Project timelines are provided in Figures 4.2 through 4.8, with milestone dates based on a 2030 shutdown date. The fuel pool is emptied approximately five years after shutdown, while ISFSI operations continue until the DOE completes the transfer of assemblies. Deferred decommissioning operations in the SAFSTOR scenarios are assumed to commence so that the operating license is terminated within a 60-year period from the cessation of operations.

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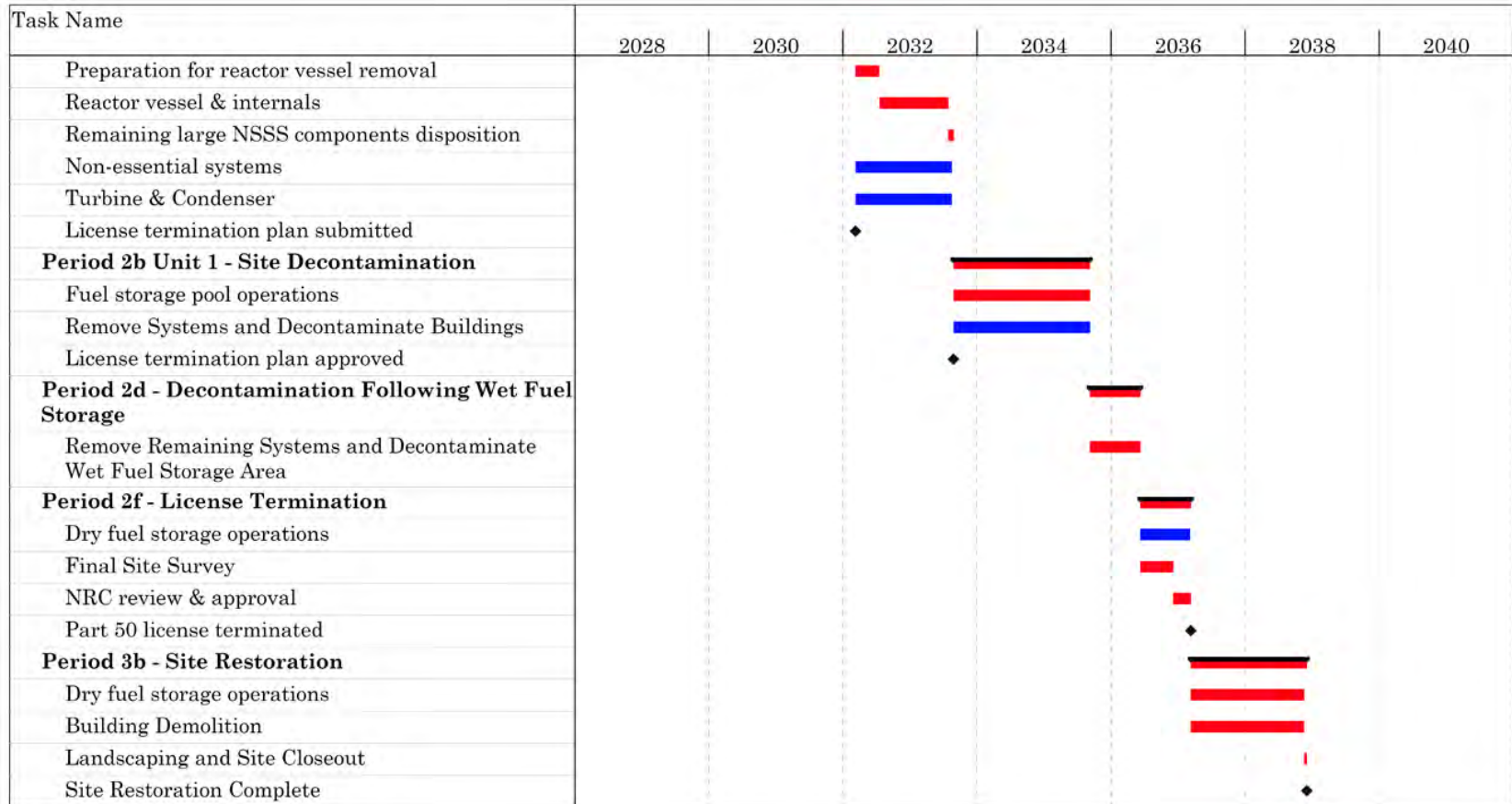
**FIGURE 4.1
DECON ACTIVITY SCHEDULE**



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**FIGURE 4.1 (continued)
DECON ACTIVITY SCHEDULE**



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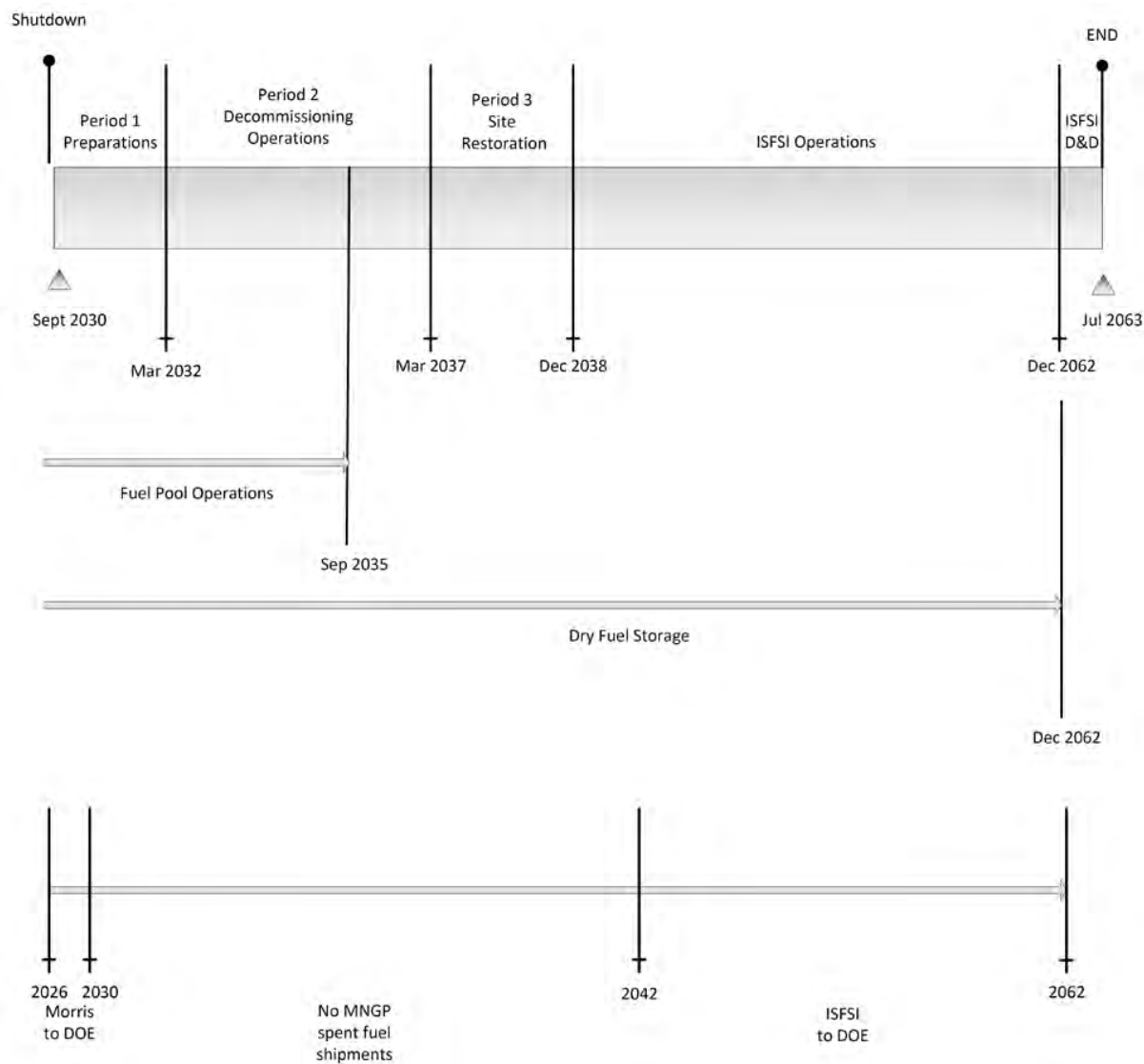
**FIGURE 4.1 (continued)
LEGEND**

1. Red scheduling bars indicate critical path activities
2. Blue scheduling bars associated with non-critical path activities
3. Diamond symbols indicate major milestones

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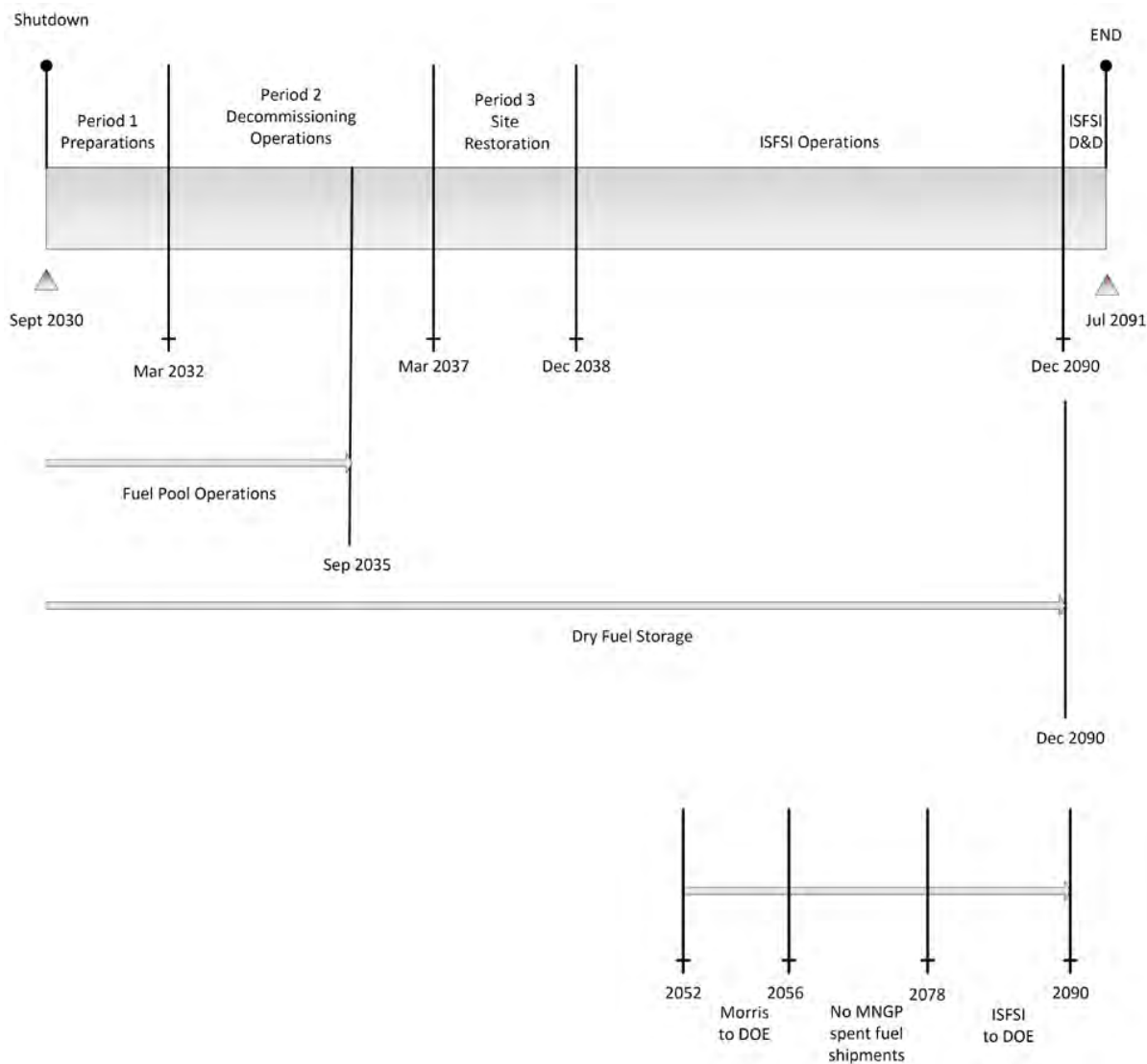
FIGURE 4.2
SCENARIO 1: DECON WITH 32 YEAR DFS
DECOMMISSIONING TIMELINE
(not to scale)



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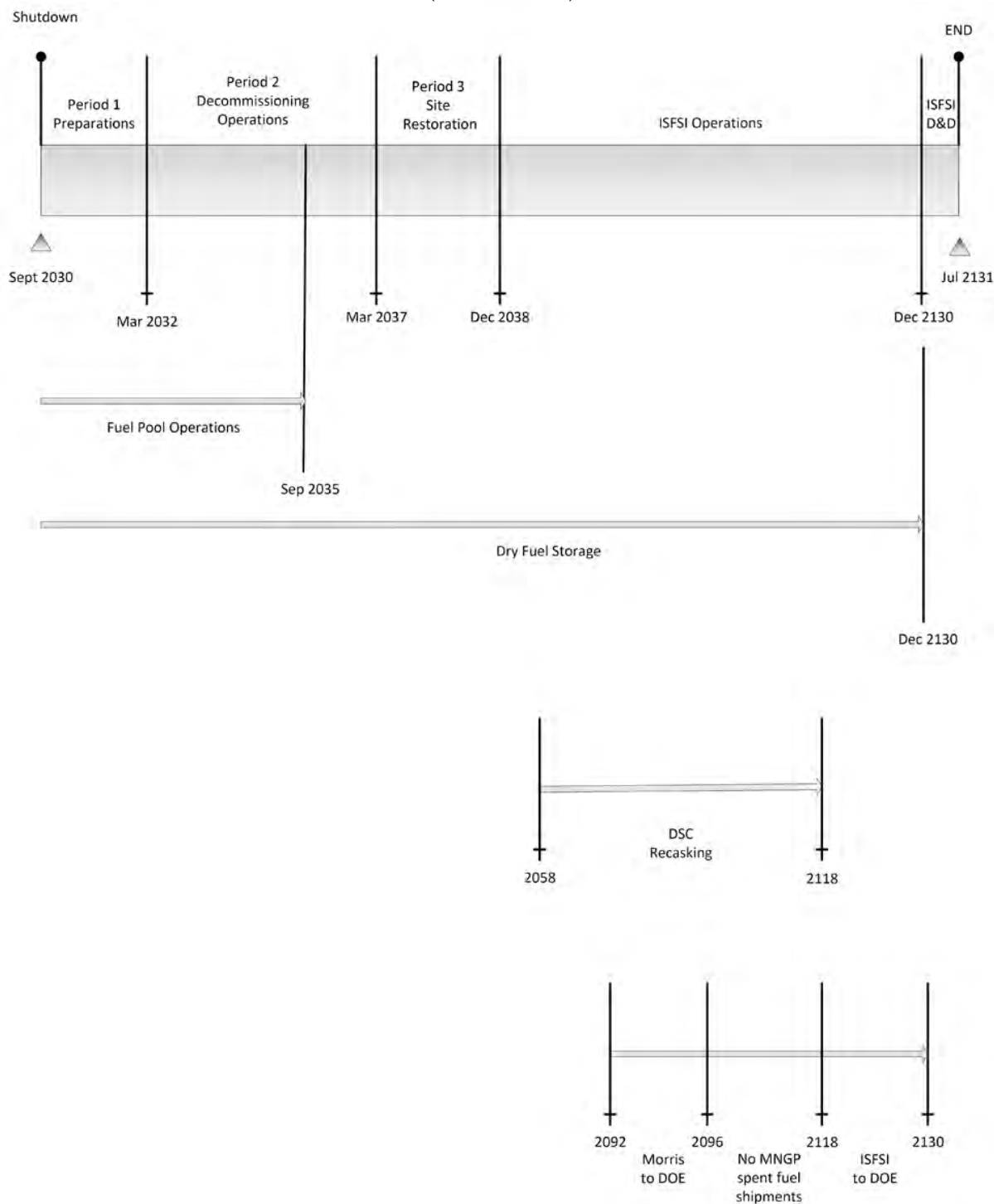
**FIGURE 4.3
SCENARIO 2: DECON WITH 60 YEAR DFS
DECOMMISSIONING TIMELINE
(not to scale)**



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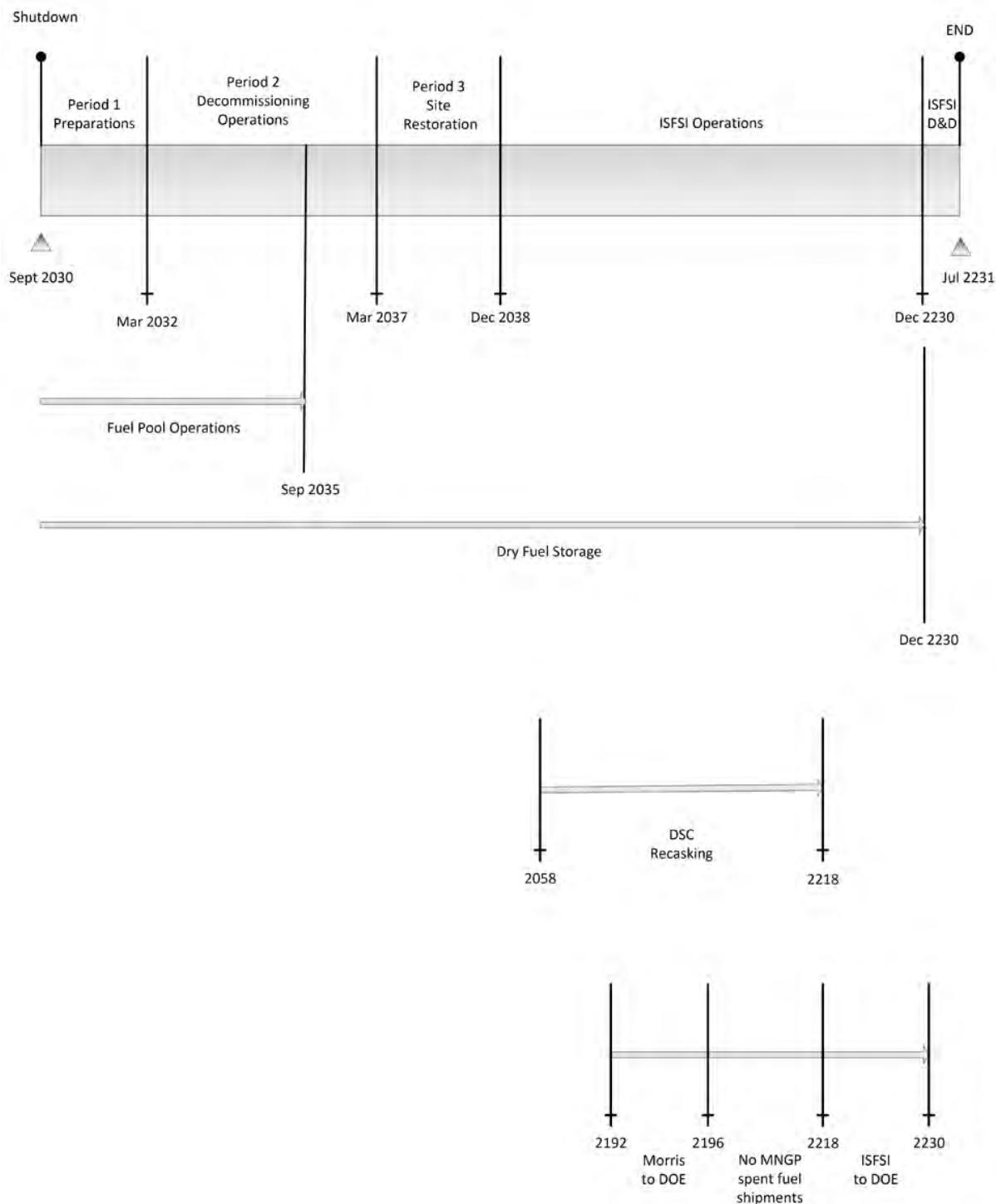
**FIGURE 4.4
SCENARIO 3: DECON WITH 100 YEAR DFS
DECOMMISSIONING TIMELINE**
(not to scale)



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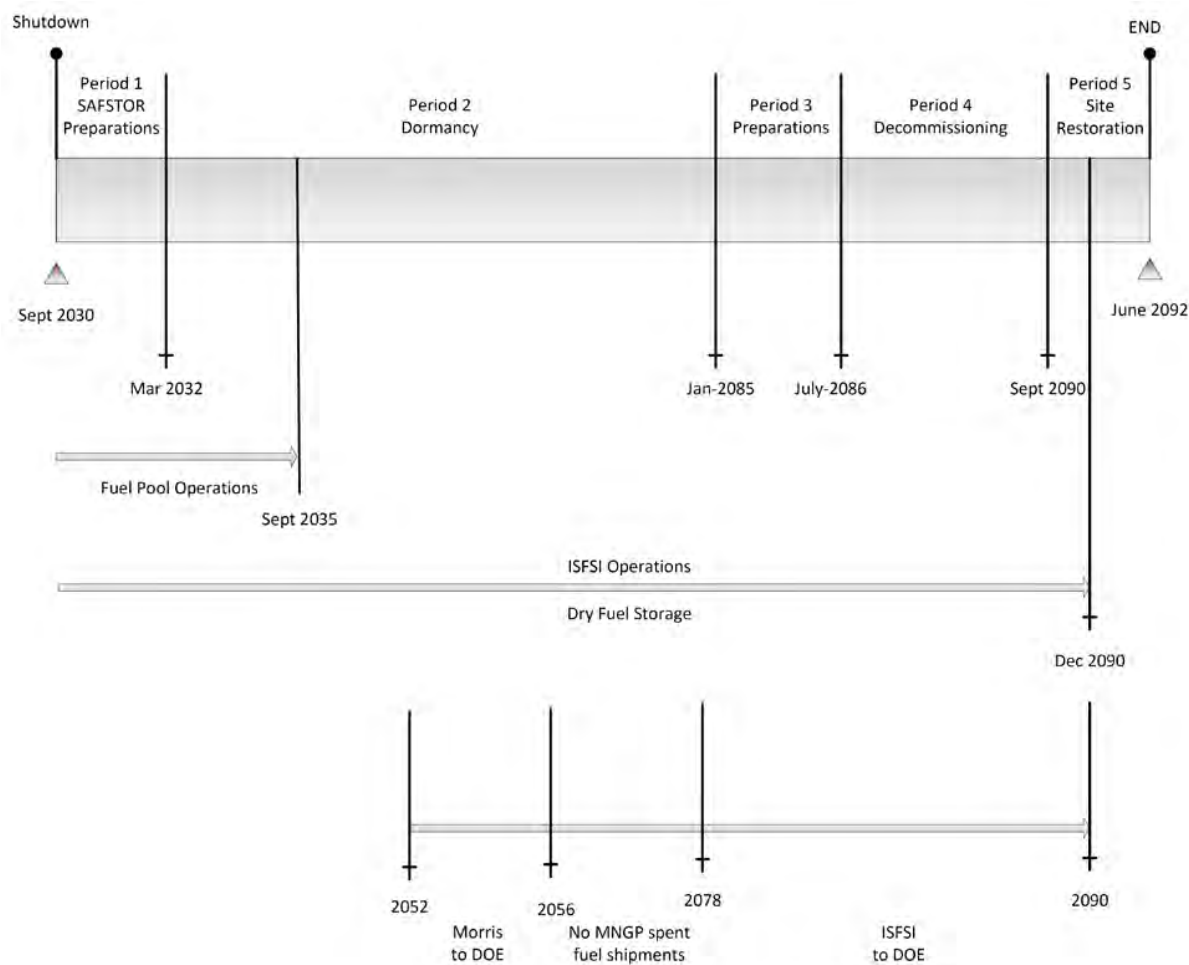
FIGURE 4.5
SCENARIO 4: DECON WITH 200 YEAR DFS
DECOMMISSIONING TIMELINE
(not to scale)



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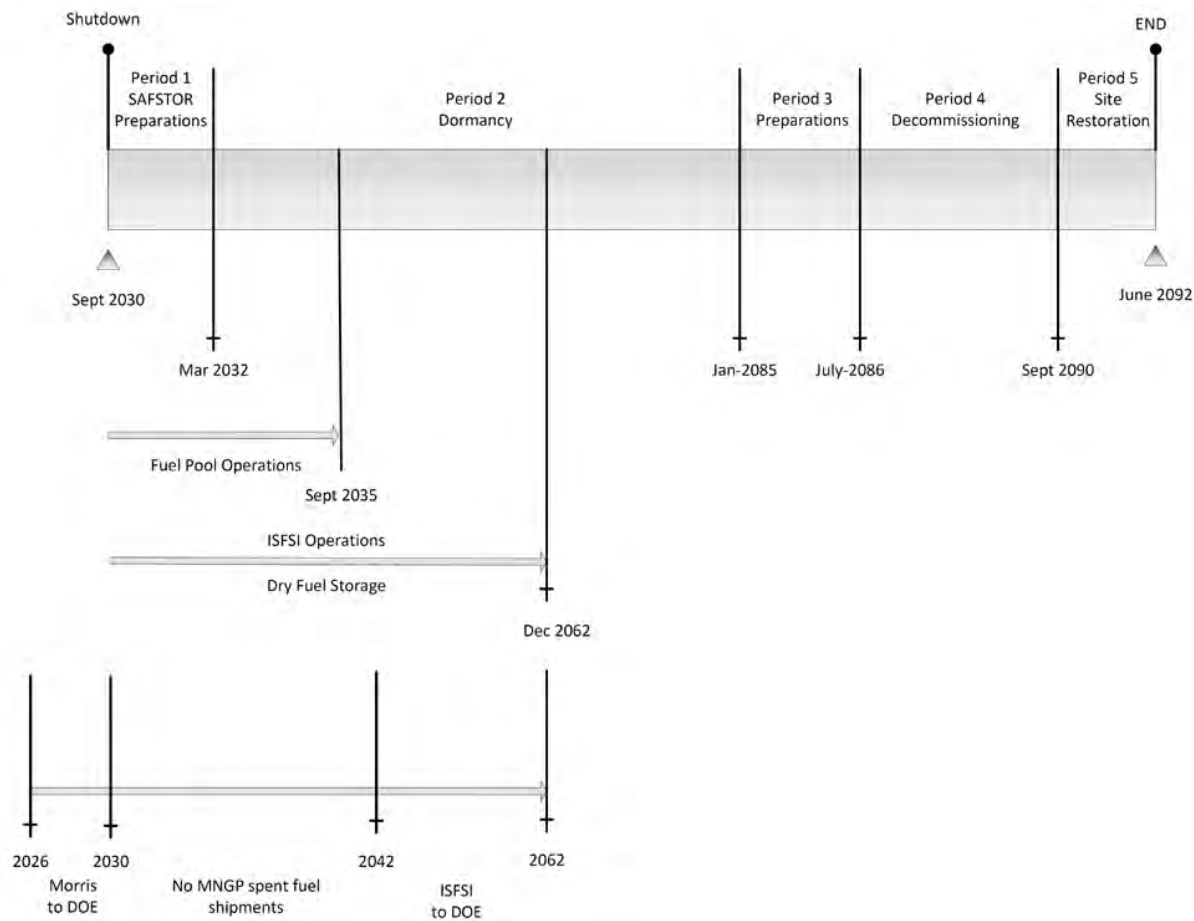
FIGURE 4.6
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
DECOMMISSIONING TIMELINE
(not to scale)



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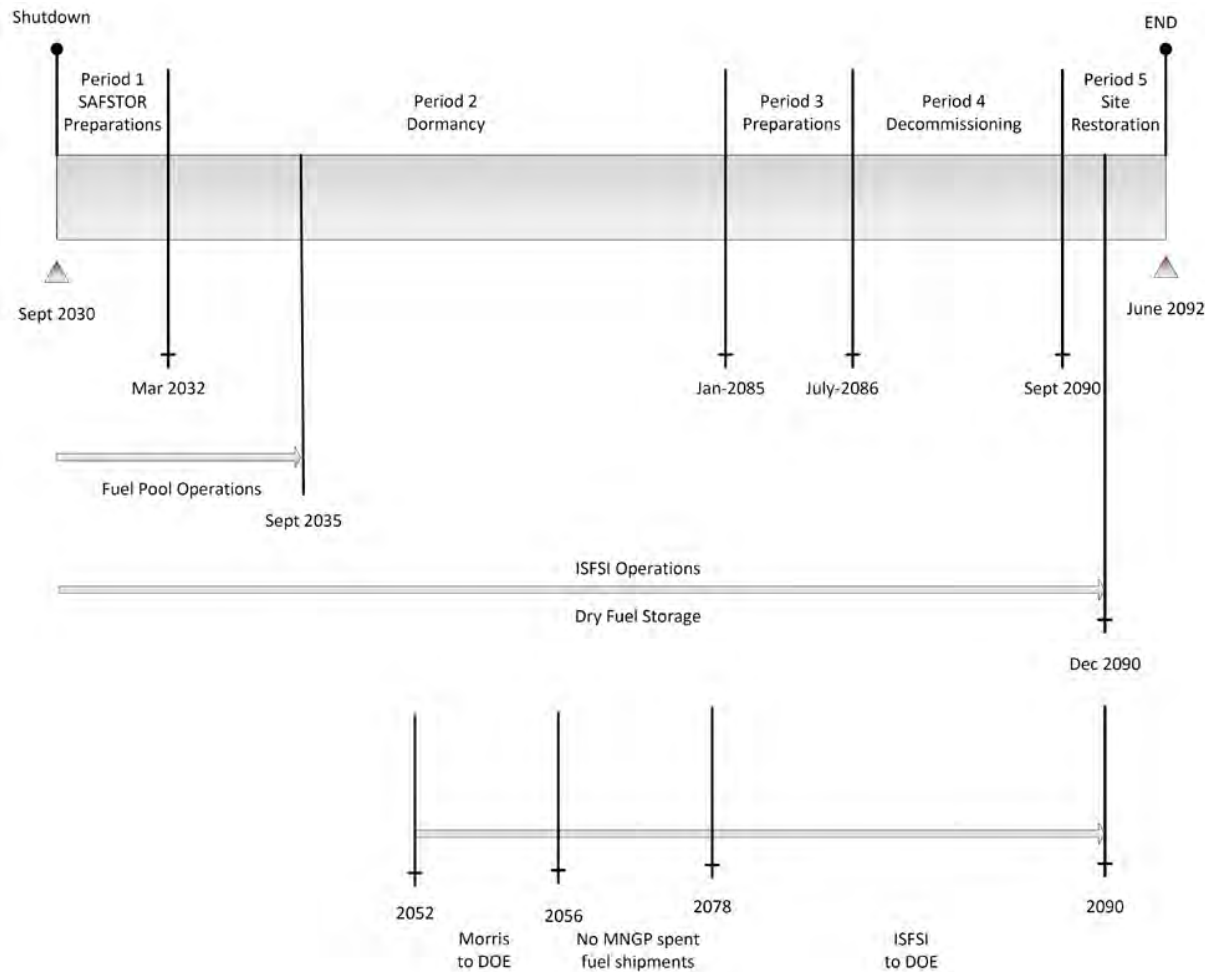
FIGURE 4.7
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
DECOMMISSIONING TIMELINE
(not to scale)



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FIGURE 4.8
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
DECOMMISSIONING TIMELINE
(not to scale)



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5. RADIOACTIVE WASTES

The objectives of the decommissioning process are the removal of all radioactive material from the site that would restrict its future use and the termination of the NRC license. This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act, ^[41] the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, Part 71 defines radioactive material as it pertains to transportation and Part 61 specifies its disposition.

Most of the materials being transported for controlled burial are categorized as Low Specific Activity (LSA) or Surface Contaminated Object (SCO) materials containing Type A quantities, as defined in 49 CFR Parts 173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3, as defined in 10 CFR §173.411). For this study, commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations.

The destinations for the various waste streams from decommissioning are identified in Figures 5.1 and 5.2. The volumes of radioactive waste generated during the various decommissioning activities at the site are shown on a line-item basis in Appendices C through J and summarized in Tables 5.1 through 5.7. The quantified waste volume summaries shown in these tables are consistent with §61 classifications. The volumes are calculated based on the exterior dimensions for containerized material and on the displaced volume of components serving as their own waste containers.

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

No process system containing/handling radioactive substances at shutdown is presumed to meet material release criteria by decay alone, i.e., systems radioactive at shutdown will still be radioactive over the time period during which the decommissioning is accomplished, due to the presence of long-lived radionuclides.

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While the dose rates decrease with time, radionuclides such as ^{137}Cs will still control the disposition requirements.

The waste material generated in the decontamination and dismantling of Monticello is primarily generated during Period 2 of the DECON alternatives and Period 4 of the SAFSTOR alternatives. Material that is considered potentially contaminated when removed from the radiologically controlled area is sent to processing facilities in Tennessee for conditioning and disposal. Heavily contaminated components and activated materials are routed for controlled disposal. The disposal volumes reported in the tables reflect the savings resulting from reprocessing and recycling.

Disposal fees are calculated using representative costs, with surcharges added for the highly activated components, for example, generated in the segmentation of the reactor vessel. The cost to dispose of the majority of the material generated from the decontamination and dismantling activities is based upon representative rates.

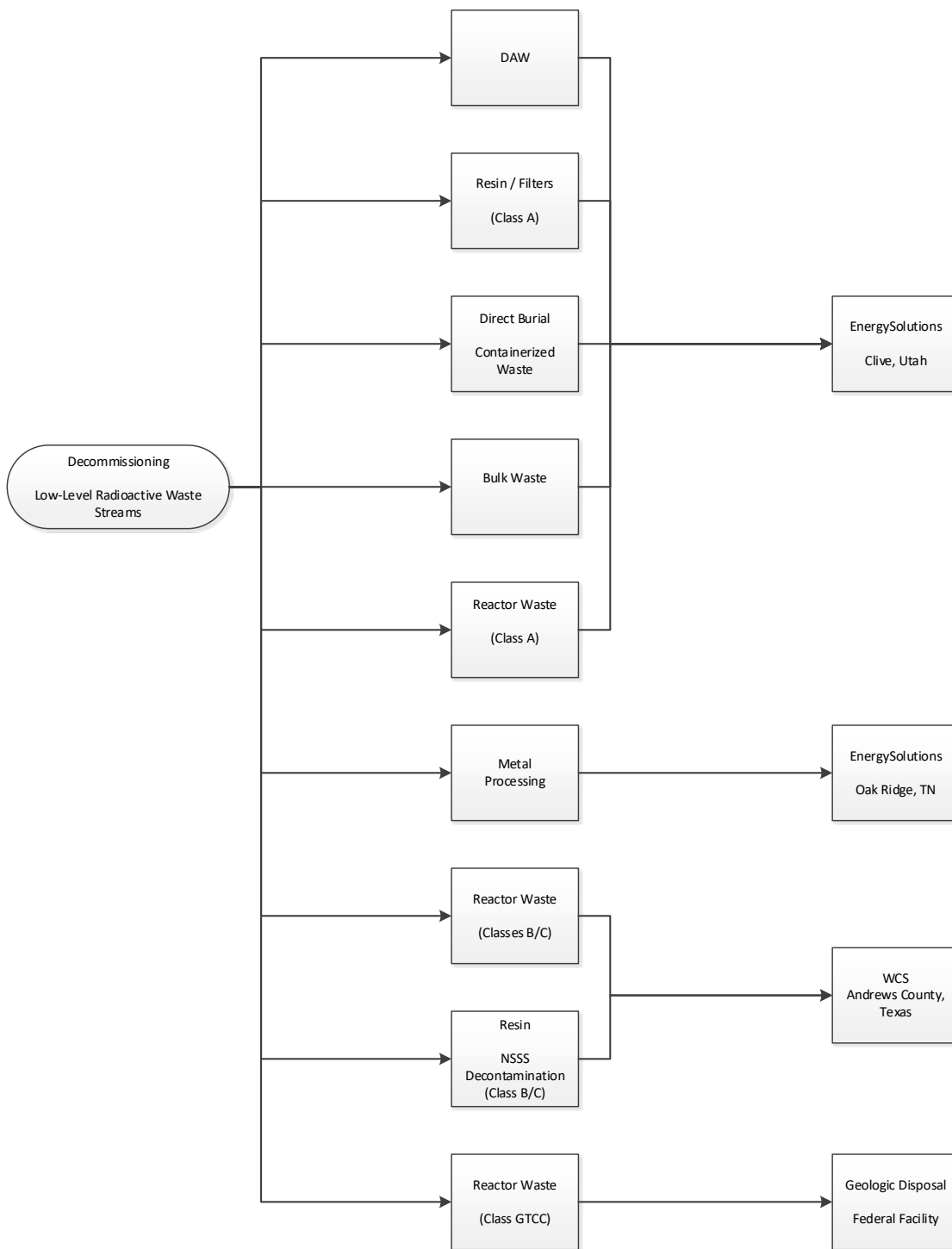
EnergySolutions is not able to accept the higher activity waste (Class B and C) generated in the decontamination of the NSSS and segmentation of the components closest to the core. Waste disposal costs for the higher activity waste (Class B and C) are based upon preliminary and indicative information on the cost for such from WCS.

A small quantity of material generated during the Monticello decommissioning will not be considered suitable for near-surface disposal, and is assumed to be disposed of in a geologic repository, in a manner similar to that envisioned for spent fuel disposal. Such material, known as Greater-Than-Class-C or GTCC material, is estimated to require four spent fuel storage canisters (or the equivalent) to dispose of the most radioactive portions of the reactor vessel internals. The volume and weight reported in Tables 5.1 through 5.7 represent the packaged weight and volume of the spent fuel storage canisters.

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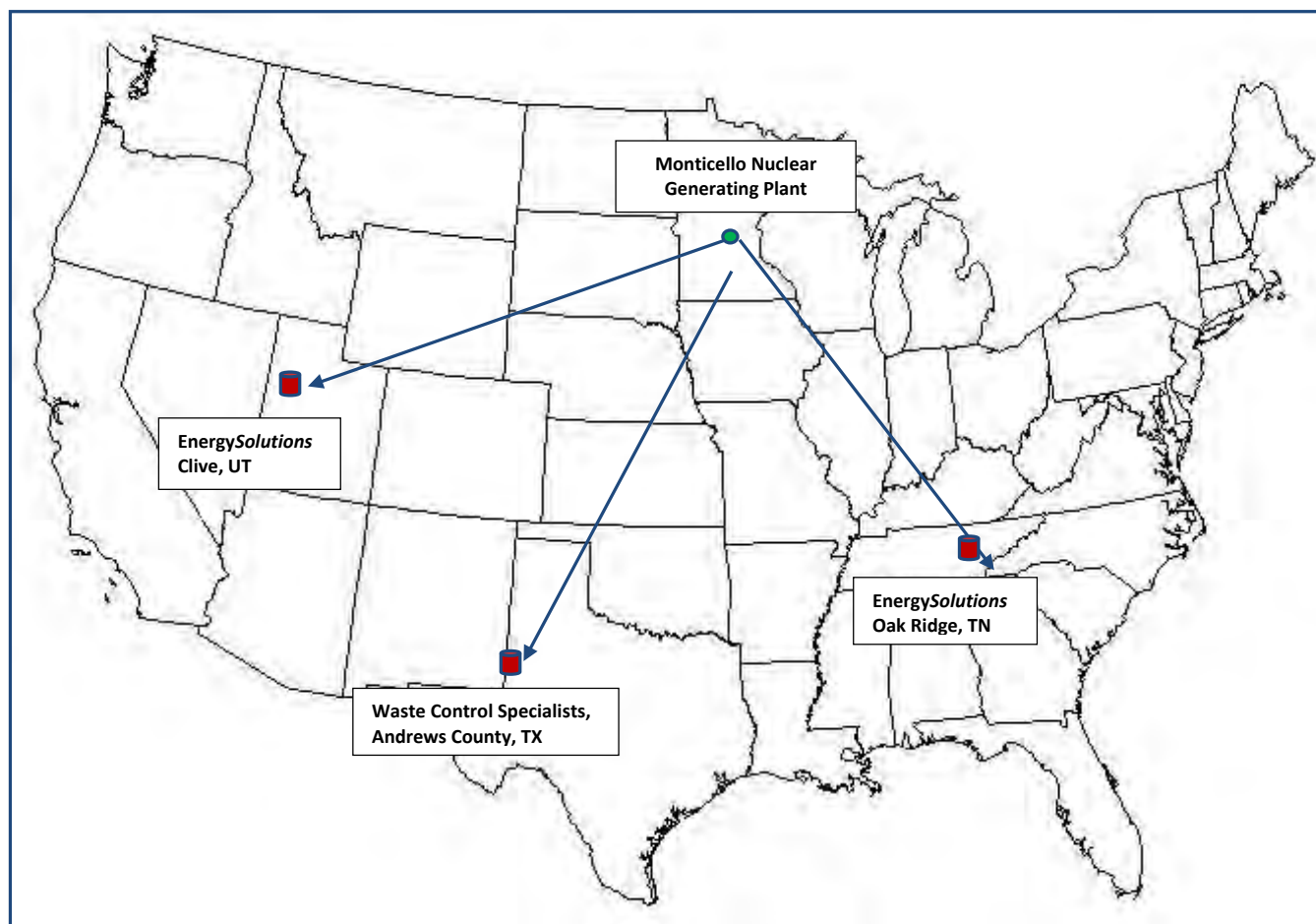
**FIGURE 5.1
RADIOACTIVE WASTE DISPOSITION**



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**FIGURE 5.2
DECOMMISSIONING WASTE DESTINATIONS
RADIOLOGICAL**



The figure indicates the destinations for the low-level radioactive waste designated for direct disposal (Clive, Utah) and processing/recovery (Oak Ridge, Tennessee).

Disposition of the Class B and C low-level radioactive waste will be at the Waste Control Specialists site in Andrews County, Texas.

Disposition options (and destinations) for GTCC are still being evaluated.

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**TABLE 5.1
SCENARIO 1: DECON WITH 32 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	124,968	7,403,271
	EnergySolutions Bulk	A	78,091	5,653,134
	Future LLRW Disposal Facility (Proxy)	B	1,711	185,173
	Future LLRW Disposal Facility (Proxy)	C	1,010	79,764
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,547	311,184
Total ^[2]			207,327	13,632,526
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	288,153	12,124,710
Scrap Metal				45,392,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.2
SCENARIO 2: DECON WITH 60 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	124,968	7,403,271
	EnergySolutions Bulk	A	78,091	5,653,134
	Future LLRW Disposal Facility (Proxy)	B	1,711	185,173
	Future LLRW Disposal Facility (Proxy)	C	1,010	79,764
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,547	311,184
Total ^[2]			207,327	13,632,526
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	288,153	12,124,710
Scrap Metal				45,392,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.3
SCENARIO 3: DECON WITH 100 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	144,351	8,515,592
	EnergySolutions Bulk	A	55,265	2,218,598
	Future LLRW Disposal Facility (Proxy)	B	1,711	185,173
	Future LLRW Disposal Facility (Proxy)	C	1,010	79,764
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,547	311,184
Total ^[2]			203,884	11,310,311
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	288,153	12,124,710
Scrap Metal				45,392,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.4
SCENARIO 4: DECON WITH 200 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	144,351	8,515,592
	EnergySolutions Bulk	A	55,265	2,218,598
	Future LLRW Disposal Facility (Proxy)	B	1,711	185,173
	Future LLRW Disposal Facility (Proxy)	C	1,010	79,764
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,547	311,184
Total ^[2]			203,884	11,310,311
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	288,153	12,124,710
Scrap Metal				45,392,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.5
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	124,968	7,403,271
	EnergySolutions Bulk	A	78,280	5,669,770
	Future LLRW Disposal Facility (Proxy)	B	1,711	185,173
	Future LLRW Disposal Facility (Proxy)	C	1,010	79,764
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,547	311,184
Total ^[2]			207,517	13,649,162
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	288,153	12,124,710
Scrap Metal				45,392,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.6
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	51,704	3,350,492
	EnergySolutions Bulk	A	98,724	6,508,668
	Future LLRW Disposal Facility (Proxy)	B	1,127	99,260
	Future LLRW Disposal Facility (Proxy)	C	643	71,913
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,547	311,184
Total ^[2]			153,744	10,341,518
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	340,130	14,284,870
Scrap Metal				45,392,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.7
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	51,704	3,350,492
	EnergySolutions Bulk	A	98,926	6,512,710
	Future LLRW Disposal Facility (Proxy)	B	1,127	99,260
	Future LLRW Disposal Facility (Proxy)	C	643	71,913
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,547	311,184
Total ^[2]			153,946	10,345,560
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	340,130	14,284,870
Scrap Metal				45,392,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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6. RESULTS

This report presents estimates of the cost to decommission Monticello for the selected decommissioning scenarios following the cessation of plant operations. The estimates are based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. While not an engineering study, the estimates provide Xcel Energy with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The decommissioning scenarios assume continued operation of the station's spent fuel pool for a minimum of five years following the cessation of operations for continued cooling of the assemblies. The existing ISFSI is expanded to accommodate the spent fuel, once sufficiently cooled, until such time that the DOE can complete the transfer of the assemblies to its repository.

The cost projected to promptly decommission the station, restore the site, and manage the spent fuel is estimated to be \$1.516 billion (2017 dollars). The majority of this cost (approximately 50.1%) is associated with the physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 45.2% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 4.7% is for the demolition of the designated structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 through 6.7, are either labor-related or associated with the management and disposition of the spent fuel or radioactive waste. Program management (including security) is the largest single contributor to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning, as well as the duration of the program. It is assumed, for purposes of this analysis, that Xcel Energy will hire a contractor to manage the decommissioning labor force. The size and composition of the management organizations varies with the decommissioning phase and associated site activities. However, once the operating license is amended or terminated, the staff is substantially reduced for the conventional demolition and restoration of the site, and the long-term care of the spent fuel (for the DECON alternative).

As described in this report, the spent fuel pool will remain operational for a minimum of five years following the cessation of operations. The pool will be isolated and an independent spent fuel island created. This will allow decommissioning operations to proceed in and around the pool areas. Over the five

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year period, the spent fuel will be packaged into transportable canisters for future loading into a DOE-provided transport cask or relocation to the ISFSI (DECON and both SAFSTOR alternatives). The canisters will be stored in horizontal storage casks at the ISFSI until the DOE is able to receive them. Dry storage of the fuel provides additional flexibility in the event the DOE is not able to meet the current timetable for completing the transfer of assemblies to an off-site facility and minimizes the associated caretaking expenses.

The cost for waste disposal includes only those costs associated with the controlled disposition of the low-level radioactive waste generated from decontamination and dismantling activities, including plant equipment and components, structural material, filters, resins and dry-active waste. As described in Section 5, disposition of the majority of the low-level radioactive material requiring controlled disposal is at the EnergySolutions facility, with higher-activity waste sent to the WCS facility. Highly activated components, requiring additional isolation from the environment (GTCC), are packaged for geologic disposal. The cost of geologic disposal is based upon a cost equivalent for spent fuel.

A significant portion of the metallic waste is designated for additional processing and treatment at an off-site facility. Processing reduces the volume of material requiring controlled disposal through such techniques and processes as survey and sorting, decontamination, and volume reduction. The material that cannot be unconditionally released is packaged for controlled disposal at one of the currently operating facilities. The cost identified in the summary tables for processing is all-inclusive, incorporating the ultimate disposition of the material.

Removal costs reflect the labor-intensive nature of the decommissioning process, as well as the management controls required to ensure a safe and successful program. Decontamination and packaging costs also have a large labor component that is based upon prevailing wages. Non-radiological demolition is a natural extension of the decommissioning process. The methods employed in decontamination and dismantling are generally destructive and indiscriminate in inflicting collateral damage. With a work force mobilized to support decommissioning operations, non-radiological demolition can be an integrated activity and a logical expansion of the work being performed in the process of terminating the operating license.

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, as well as the general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is moved overland by truck.

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Decontamination is used to reduce the plant's radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area is sent to an off-site processing center, i.e., this analysis does not assume that contaminated plant components and equipment can be decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more economical means of handling the large volumes of material produced in the dismantling of a nuclear plant.

License termination survey costs are associated with the labor intensive and complex activity of verifying that contamination has been removed from the site to the levels specified by the regulating agency. This process involves a systematic survey of all remaining plant surface areas and surrounding environs, sampling, isotopic analysis, and documentation of the findings. The status of any plant components and materials not removed in the decommissioning process will also require confirmation and will add to the expense of surveying the facilities alone.

The remaining costs include allocations for heavy equipment and temporary services, as well as for other expenses such as regulatory fees and the premiums for nuclear insurance. While site operating costs are greatly reduced following the final cessation of plant operations, certain administrative functions do need to be maintained either at a basic functional or regulatory level.

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TABLE 6.1
SCENARIO 1: DECON WITH 32 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Total	Percentage
Decontamination	23,268	1.9
Removal	119,462	9.7
Packaging	26,800	2.2
Transportation	12,389	1.0
Waste Disposal	95,919	7.8
Off-site Waste Processing	29,702	2.4
Program Management ^[1]	303,532	24.6
Security	233,970	19.0
Spent Fuel Pool Isolation	13,445	1.1
Spent Fuel Storage (Direct Costs) ^[2]	197,448	16.0
Insurance and Regulatory Fees	33,282	2.7
Energy	11,068	0.9
Characterization and Licensing Surveys	28,626	2.3
Property Taxes	36,452	3.0
Miscellaneous Equipment	7,265	0.6
Railroad Track Maintenance	5,048	0.4
Retention and Severance	43,877	3.6
Security Modifications	10,000	0.8
Total ^[3]	1,231,552	100.0

Cost Element	Total	Percentage
NRC License Termination	759,294	61.7
Spent Fuel Management	400,983	32.6
Site Restoration	71,275	5.8
Total ^[3]	1,231,552	100.0

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.2
SCENARIO 2: DECON WITH 60 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Total	Percentage
Decontamination	23,268	1.5
Removal	119,501	7.9
Packaging	26,800	1.8
Transportation	12,389	0.8
Waste Disposal	95,919	6.3
Off-site Waste Processing	29,702	2.0
Program Management ^[1]	343,355	22.7
Security	359,469	23.7
Spent Fuel Pool Isolation	13,445	0.9
Spent Fuel Storage (Direct Costs) ^[2]	274,588	18.1
Insurance and Regulatory Fees	55,483	3.7
Energy	11,068	0.7
Characterization and Licensing Surveys	28,626	1.9
Property Taxes	52,336	3.5
Miscellaneous Equipment	7,265	0.5
Railroad Track Maintenance	8,759	0.6
Retention and Severance	43,877	2.9
Security Modifications	10,000	0.7
Total ^[3]	1,515,850	100.0

Cost Element	Total	Percentage
NRC License Termination	759,047	50.1
Spent Fuel Management	685,479	45.2
Site Restoration	71,324	4.7
Total ^[3]	1,515,850	100.0

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.3
SCENARIO 3: DECON WITH 100 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Total	Percentage
Decontamination	23,306	1.0
Removal	119,474	4.9
Packaging	26,803	1.1
Transportation	11,749	0.5
Waste Disposal	95,178	3.9
Off-site Waste Processing	29,702	1.2
Program Management ^[1]	498,687	20.6
Security	538,987	22.3
Spent Fuel Pool Isolation	13,445	0.6
Spent Fuel Storage (Direct Costs) ^[2]	784,638	32.4
Insurance and Regulatory Fees	87,239	3.6
Energy	11,068	0.5
Characterization and Licensing Surveys	28,626	1.2
Property Taxes	75,024	3.1
Miscellaneous Equipment	7,265	0.3
Railroad Track Maintenance	14,068	0.6
Retention and Severance	43,877	1.8
Security Modifications	10,000	0.4
Total ^[3]	2,419,136	100.0

Cost Element	Total	Percentage
NRC License Termination	748,156	30.9
Spent Fuel Management	1,599,295	66.1
Site Restoration	71,685	3.0
Total ^[3]	2,419,136	100.0

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.4
SCENARIO 4: DECON WITH 200 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Total	Percentage
Decontamination	23,306	0.5
Removal	119,474	2.8
Packaging	26,803	0.6
Transportation	11,749	0.3
Waste Disposal	95,178	2.2
Off-site Waste Processing	29,702	0.7
Program Management ^[1]	765,140	18.0
Security	987,801	23.2
Spent Fuel Pool Isolation	13,445	0.3
Spent Fuel Storage (Direct Costs) ^[2]	1,762,292	41.4
Insurance and Regulatory Fees	166,633	3.9
Energy	11,068	0.3
Characterization and Licensing Surveys	28,626	0.7
Property Taxes	131,743	3.1
Miscellaneous Equipment	7,265	0.2
Railroad Track Maintenance	27,341	0.6
Retention and Severance	43,877	1.0
Security Modifications	10,000	0.2
Total ^[3]	4,261,443	100.0

Cost Element	Total	Percentage
NRC License Termination	748,155	17.6
Spent Fuel Management	3,441,602	80.8
Site Restoration	71,685	1.7
Total ^[3]	4,261,443	100.0

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.5
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Total	Percentage
Decontamination	23,306	1.5
Removal	119,505	7.5
Packaging	26,805	1.7
Transportation	12,393	0.8
Waste Disposal	95,943	6.0
Off-site Waste Processing	29,702	1.9
Program Management ^[1]	343,355	21.4
Security	359,469	22.4
Spent Fuel Pool Isolation	13,445	0.8
Spent Fuel Storage (Direct Costs) ^[2]	361,324	22.5
Insurance and Regulatory Fees	55,483	3.5
Energy	11,068	0.7
Characterization and Licensing Surveys	28,626	1.8
Property Taxes	52,336	3.3
Miscellaneous Equipment	7,265	0.5
Railroad Track Maintenance	8,759	0.5
Retention and Severance	43,877	2.7
Security Modifications	10,000	0.6
Total ^[3]	1,602,660	100.0

Cost Element	Total	Percentage
NRC License Termination	759,122	47.4
Spent Fuel Management	772,214	48.2
Site Restoration	71,324	4.5
Total ^[3]	1,602,660	100.0

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.6
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Total	Percentage
Decontamination	25,220	1.7
Removal	122,447	8.3
Packaging	17,915	1.2
Transportation	8,026	0.5
Waste Disposal	66,222	4.5
Off-site Waste Processing	34,993	2.4
Program Management ^[1]	403,048	27.3
Security	236,063	16.0
Spent Fuel Pool Isolation	13,445	0.9
Spent Fuel Storage (Direct Costs) ^[2]	195,063	13.2
Insurance and Regulatory Fees	68,491	4.6
Energy	23,440	1.6
Characterization and Licensing Surveys	28,277	1.9
Property Taxes	148,737	10.1
Miscellaneous Equipment	20,825	1.4
Railroad Track Maintenance	8,536	0.6
Retention and Severance	43,877	3.0
Security Modifications	10,000	0.7
Total ^[3]	1,474,626	100.0

Cost Element	Total	Percentage
NRC License Termination	1,045,043	70.9
Spent Fuel Management	364,666	24.7
Site Restoration	64,917	4.4
Total ^[3]	1,474,626	100.0

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.7
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Total	Percentage
Decontamination	25,220	1.5
Removal	122,659	7.1
Packaging	17,920	1.0
Transportation	8,028	0.5
Waste Disposal	66,243	3.9
Off-site Waste Processing	34,993	2.0
Program Management ^[1]	430,133	25.0
Security	386,682	22.5
Spent Fuel Pool Isolation	13,445	0.8
Spent Fuel Storage (Direct Costs) ^[2]	259,117	15.1
Insurance and Regulatory Fees	69,323	4.0
Energy	23,440	1.4
Characterization and Licensing Surveys	28,277	1.6
Property Taxes	148,737	8.7
Miscellaneous Equipment	20,825	1.2
Railroad Track Maintenance	8,536	0.5
Retention and Severance	43,877	2.6
Security Modifications	10,000	0.6
Total ^[3]	1,717,454	100.0

Cost Element	Total	
NRC License Termination	1,099,775	64.0
Spent Fuel Management	552,724	32.2
Site Restoration	64,956	3.8
Total ^[3]	1,717,454	100.0

^[1] Includes engineering costs

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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APPENDIX A

UNIT COST FACTOR DEVELOPMENT

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APPENDIX A
UNIT COST FACTOR DEVELOPMENT

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

1. SCOPE

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the waste processing area.

2. CALCULATIONS

Act ID	Activity Description	Activity Duration (minutes)	Critical Duration (minutes)*
a	Remove insulation	60	(b)
b	Mount pipe cutters	60	60
c	Install contamination controls	20	(b)
d	Disconnect inlet and outlet lines	60	60
e	Cap openings	20	(d)
f	Rig for removal	30	30
g	Unbolt from mounts	30	30
h	Remove contamination controls	15	15
i	Remove, wrap, send to waste processing area	<u>60</u>	<u>60</u>
Totals (Activity/Critical)		355	255

Duration adjustment(s):

+ Respiratory protection adjustment (50 of critical duration) 128

+ Radiation/ALARA adjustment (37.1 of critical duration) 95

Adjusted work duration 478

+ Protective clothing adjustment (30 of adjusted duration) 143

Productive work duration 621

+ Work break adjustment (8.33 of productive duration) 52

Total work duration (minutes) 673

***** Total duration = 11.217 hr *****

* alpha designators indicate activities that can be performed in parallel

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3. LABOR REQUIRED

Crew	Number	Duration (hours)	Rate (\$/hr)	Cost
Laborers	3.00	11.217	\$54.73	\$1841.72
Craftsmen	2.00	11.217	\$69.32	\$1,555.12
Foreman	1.00	11.217	\$72.53	\$813.57
General Foreman	0.25	11.217	\$74.83	\$209.84
Fire Watch	0.05	11.217	\$54.73	\$30.70
Health Physics Technician	1.00	11.217	\$76.50	<u>\$858.10</u>
Total Labor Cost				\$5,309.05

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs none

Consumables/Materials Costs

- Universal Sorbent 50 @ \$0.61 sq ft ^{1} \$30.50
- Tarpaulins (oil resistant/fire retardant) 50 @ \$0.46/sq ft ^{2} \$23.00
- Gas torch consumables 1 @ \$20.45/hr x 1 hr ^{3} \$20.45

Subtotal cost of equipment and materials \$73.95

Overhead & profit on equipment and materials @ 16.88% \$12.48

Total costs, equipment & material \$86.43

TOTAL COST:

Removal of contaminated heat exchanger <3000 pounds: \$5,395.48

Total labor cost: \$5,309.05

Total equipment/material costs: \$86.43

Total craft labor man-hours required per unit: 81.88

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5. NOTES AND REFERENCES

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum's (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.
- References for equipment & consumables costs:
 1. www.mcmaster.com online catalog, McMaster Carr Spill Control (7193T88)
 2. R.S. Means (2017) Division 01 56, Section 13.60-0600, page 23
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- Material and consumable costs were adjusted using the regional indices for Minneapolis, Minnesota.

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APPENDIX B

**UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)**

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APPENDIX B

**UNIT COST FACTOR LISTING
(Power Block Structures Only)**

Unit Cost Factor	Cost/Unit
Removal of clean instrument and sampling tubing, \$/linear foot	0.59
Removal of clean pipe 0.25 to 2 inches diameter, \$/linear foot	6.38
Removal of clean pipe >2 to 4 inches diameter, \$/linear foot	9.07
Removal of clean pipe >4 to 8 inches diameter, \$/linear foot	17.58
Removal of clean pipe >8 to 14 inches diameter, \$/linear foot	34.02
Removal of clean pipe >14 to 20 inches diameter, \$/linear foot	44.29
Removal of clean pipe >20 to 36 inches diameter, \$/linear foot	65.15
Removal of clean pipe >36 inches diameter, \$/linear foot	77.38
Removal of clean valve >2 to 4 inches	116.53
Removal of clean valve >4 to 8 inches	175.82
Removal of clean valve >8 to 14 inches	340.22
Removal of clean valve >14 to 20 inches	442.86
Removal of clean valve >20 to 36 inches	651.46
Removal of clean valve >36 inches	773.78
Removal of clean pipe hanger for small bore piping	40.73
Removal of clean pipe hanger for large bore piping	144.67
Removal of clean pump, <300 pound	297.76
Removal of clean pump, 300-1000 pound	821.40
Removal of clean pump, 1000-10,000 pound	3,244.34
Removal of clean pump, >10,000 pound	6,278.73
Removal of clean pump motor, 300-1000 pound	342.77
Removal of clean pump motor, 1000-10,000 pound	1,347.11
Removal of clean pump motor, >10,000 pound	3,030.99
Removal of clean heat exchanger <3000 pound	1,743.26
Removal of clean heat exchanger >3000 pound	4,394.19
Removal of clean feedwater heater/deaerator	12,379.20
Removal of clean moisture separator/reheater	25,438.07
Removal of clean tank, <300 gallons	382.87
Removal of clean tank, 300-3000 gallon	1,205.00
Removal of clean tank, >3000 gallons, \$/square foot surface area	10.09

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**UNIT COST FACTOR LISTING
(Power Block Structures Only)**

Unit Cost Factor	Cost/Unit
Removal of clean electrical equipment, <300 pound	160.89
Removal of clean electrical equipment, 300-1000 pound	558.06
Removal of clean electrical equipment, 1000-10,000 pound	1,116.13
Removal of clean electrical equipment, >10,000 pound	2,646.83
Removal of clean electrical transformer < 30 tons	1,838.18
Removal of clean electrical transformer > 30 tons	5,293.67
Removal of clean standby diesel generator, <100 kW	1,877.56
Removal of clean standby diesel generator, 100 kW to 1 MW	4,190.82
Removal of clean standby diesel generator, >1 MW	8,675.83
Removal of clean electrical cable tray, \$/linear foot	15.16
Removal of clean electrical conduit, \$/linear foot	6.63
Removal of clean mechanical equipment, <300 pound	160.89
Removal of clean mechanical equipment, 300-1000 pound	558.06
Removal of clean mechanical equipment, 1000-10,000 pound	1,116.13
Removal of clean mechanical equipment, >10,000 pound	2,646.83
Removal of clean HVAC equipment, <300 pound	194.55
Removal of clean HVAC equipment, 300-1000 pound	670.56
Removal of clean HVAC equipment, 1000-10,000 pound	1,336.42
Removal of clean HVAC equipment, >10,000 pound	2,646.83
Removal of clean HVAC ductwork, \$/pound	0.63
Removal of contaminated instrument and sampling tubing, \$/linear foot	1.99
Removal of contaminated pipe 0.25 to 2 inches diameter, \$/linear foot	27.12
Removal of contaminated pipe >2 to 4 inches diameter, \$/linear foot	46.23
Removal of contaminated pipe >4 to 8 inches diameter, \$/linear foot	74.04
Removal of contaminated pipe >8 to 14 inches diameter, \$/linear foot	144.12
Removal of contaminated pipe >14 to 20 inches diameter, \$/linear foot	173.18
Removal of contaminated pipe >20 to 36 inches diameter, \$/linear foot	239.68
Removal of contaminated pipe >36 inches diameter, \$/linear foot	283.26
Removal of contaminated valve >2 to 4 inches	564.33
Removal of contaminated valve >4 to 8 inches	675.66

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**UNIT COST FACTOR LISTING
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Unit Cost Factor	Cost/Unit
Removal of contaminated valve >8 to 14 inches	1,378.64
Removal of contaminated valve >14 to 20 inches	1,752.81
Removal of contaminated valve >20 to 36 inches	2,334.29
Removal of contaminated valve >36 inches	2,770.04
Removal of contaminated pipe hanger for small bore piping	188.44
Removal of contaminated pipe hanger for large bore piping	611.48
Removal of contaminated pump, <300 pound	1,205.97
Removal of contaminated pump, 300-1000 pound	2,758.03
Removal of contaminated pump, 1000-10,000 pound	8,850.61
Removal of contaminated pump, >10,000 pound	21,559.16
Removal of contaminated pump motor, 300-1000 pound	1,173.89
Removal of contaminated pump motor, 1000-10,000 pound	3,603.57
Removal of contaminated pump motor, >10,000 pound	8,090.51
Removal of contaminated heat exchanger <3000 pound	5,395.48
Removal of contaminated heat exchanger >3000 pound	15,648.23
Removal of contaminated feedwater heater/deaerator	38,068.15
Removal of contaminated moisture separator/reheater	82,788.96
Removal of contaminated tank, <300 gallons	2,004.39
Removal of contaminated tank, >300 gallons, \$/square foot	38.67
Removal of contaminated electrical equipment, <300 pound	936.29
Removal of contaminated electrical equipment, 300-1000 pound	2,250.27
Removal of contaminated electrical equipment, 1000-10,000 pound	4,334.31
Removal of contaminated electrical equipment, >10,000 pound	8,447.10
Removal of contaminated electrical cable tray, \$/linear foot	45.27
Removal of contaminated electrical conduit, \$/linear foot	22.11
Removal of contaminated mechanical equipment, <300 pound	1,041.61
Removal of contaminated mechanical equipment, 300-1000 pound	2,484.99
Removal of contaminated mechanical equipment, 1000-10,000 pound	4,778.59
Removal of contaminated mechanical equipment, >10,000 pound	8,447.10
Removal of contaminated HVAC equipment, <300 pound	1,041.61

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**UNIT COST FACTOR LISTING
(Power Block Structures Only)**

Unit Cost Factor	Cost/Unit
Removal of contaminated HVAC equipment, 300-1000 pound	2,484.99
Removal of contaminated HVAC equipment, 1000-10,000 pound	4,778.59
Removal of contaminated HVAC equipment, >10,000 pound	8,447.10
Removal of contaminated HVAC ductwork, \$/pound	2.71
Removal/plasma arc cut of contaminated thin metal components, \$/linear in.	4.89
Additional decontamination of surface by washing, \$/square foot	10.12
Additional decontamination of surfaces by hydrolasing, \$/square foot	43.37
Decontamination rig hook up and flush, \$/ 250 foot length	8,781.13
Chemical flush of components/systems, \$/gallon	20.62
Removal of clean standard reinforced concrete, \$/cubic yard	76.85
Removal of grade slab concrete, \$/cubic yard	87.42
Removal of clean concrete floors, \$/cubic yard	431.26
Removal of sections of clean concrete floors, \$/cubic yard	1,298.07
Removal of clean heavily rein concrete w/#9 rebar, \$/cubic yard	111.01
Removal of contaminated heavily rein concrete w/#9 rebar, \$/cubic yard	2,568.54
Removal of clean heavily rein concrete w/#18 rebar, \$/cubic yard	150.46
Removal of contaminated heavily rein concrete w/#18 rebar, \$/cubic yard	3,397.61
Removal heavily rein concrete w/#18 rebar & steel embedments, \$/cubic yard	527.05
Removal of below-grade suspended floors, \$/cubic yard	211.02
Removal of clean monolithic concrete structures, \$/cubic yard	1,068.91
Removal of contaminated monolithic concrete structures, \$/cubic yard	2,555.68
Removal of clean foundation concrete, \$/cubic yard	840.09
Removal of contaminated foundation concrete, \$/cubic yard	2,381.01
Explosive demolition of bulk concrete, \$/cubic yard	56.88
Removal of clean hollow masonry block wall, \$/cubic yard	26.93
Removal of contaminated hollow masonry block wall, \$/cubic yard	72.18
Removal of clean solid masonry block wall, \$/cubic yard	26.93
Removal of contaminated solid masonry block wall, \$/cubic yard	72.18
Backfill of below-grade voids, \$/cubic yard	32.27
Removal of subterranean tunnels/voids, \$/linear foot	134.42

**Monticello Nuclear Generating Plant
Decommissioning Cost Analysis**

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APPENDIX B

**UNIT COST FACTOR LISTING
(Power Block Structures Only)**

Unit Cost Factor	Cost/Unit
Placement of concrete for below-grade voids, \$/cubic yard	151.11
Excavation of clean material, \$/cubic yard	3.38
Excavation of contaminated material, \$/cubic yard	48.96
Removal of clean concrete rubble (tipping fee included), \$/cubic yard	27.80
Removal of contaminated concrete rubble, \$/cubic yard	31.35
Removal of building by volume, \$/cubic foot	0.35
Removal of clean building metal siding, \$/square foot	1.63
Removal of contaminated building metal siding, \$/square foot	5.82
Removal of standard asphalt roofing, \$/square foot	2.79
Removal of transite panels, \$/square foot	2.50
Scarifying contaminated concrete surfaces (drill & spall), \$/square foot	15.10
Scabbling contaminated concrete floors, \$/square foot	9.40
Scabbling contaminated concrete walls, \$/square foot	25.13
Scabbling contaminated ceilings, \$/square foot	86.52
Scabbling structural steel, \$/square foot	7.77
Removal of clean overhead crane/monorail < 10 ton capacity	776.71
Removal of contaminated overhead crane/monorail < 10 ton capacity	2,303.06
Removal of clean overhead crane/monorail >10-50 ton capacity	1,864.11
Removal of contaminated overhead crane/monorail >10-50 ton capacity	5,526.42
Removal of polar crane > 50 ton capacity	7,769.78
Removal of gantry crane > 50 ton capacity	33,085.40
Removal of structural steel, \$/pound	0.23
Removal of clean steel floor grating, \$/square foot	5.62
Removal of contaminated steel floor grating, \$/square foot	16.90
Removal of clean free standing steel liner, \$/square foot	15.14
Removal of contaminated free standing steel liner, \$/square foot	45.26
Removal of clean concrete-anchored steel liner, \$/square foot	7.57
Removal of contaminated concrete-anchored steel liner, \$/square foot	52.76
Placement of scaffolding in clean areas, \$/square foot	17.30
Placement of scaffolding in contaminated areas, \$/square foot	30.78

**Monticello Nuclear Generating Plant
Decommissioning Cost Analysis****Document X01-1725-002, Rev. 0
Appendix B, Page 7 of 7****APPENDIX B****UNIT COST FACTOR LISTING
(Power Block Structures Only)**

Unit Cost Factor	Cost/Unit
Landscaping with topsoil, \$/acre	24,683.41
Cost of CPC B-88 LSA box & preparation for use	2,089.10
Cost of CPC B-25 LSA box & preparation for use	1,969.57
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,571.57
Cost of CPC B-144 LSA box & preparation for use	10,466.06
Cost of LSA drum & preparation for use	232.86
Cost of cask liner for CNSI 8 120A cask (resins)	12,441.18
Cost of cask liner for CNSI 8 120A cask (filters)	9,028.23
Decontamination of surfaces with vacuuming, \$/square foot	0.96

***Monticello Nuclear Generating Plant
Decommissioning Cost Analysis***

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APPENDIX C

DETAILED COST ANALYSIS

SCENARIO 1: DECON with 32 Year DFS

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C
Monticello Nuclear Generating Plant
Scenario 1: DECON with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	578	87	664	598	-	66	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Sacrificial shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Moisture separators/reheaters	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1a.1.17.10	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1a.1.17.11	Pressure suppression structure	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.17.12	Drywell	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	1,600
1a.1.17.13	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
1a.1.17.14	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.15	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	5,010	752	5,762	5,260	-	502	-	-	-	-	-	-	-	42,683
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlp/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	15,344	2,302	17,646	17,144	-	502	-	-	-	-	-	-	-	83,013
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,181	1,077	8,258	-	8,258	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	9,892	1,484	11,376	11,376	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	17,073	2,561	19,634	11,376	8,258	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	2,408	241	2,649	2,649	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,242	224	2,466	2,466	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,730	259	1,989	1,989	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	3,166	317	3,482	-	3,482	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	2,833	425	3,258	3,258	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	803	120	923	-	923	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	115	17	133	133	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	14,260	2,139	16,399	16,399	-	-	-	-	-	-	-	-	-	245,440
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	54,561	7,966	63,676	59,153	4,524	-	-	610	-	-	-	12,190	20	667,680

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C
Monticello Nuclear Generating Plant
Scenario 1: DECON with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	86,978	12,829	100,956	87,672	12,782	502	-	610	-	-	-	12,190	20	750,693
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	470	70	540	540	-	-	-	-	-	-	-	-	-	4,000
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD housings & NIs	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Removal primary containment	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
1b.1.1.10	Sacrificial shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.11	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
1b.1.1.12	Main Turbine	-	-	-	-	-	-	244	37	281	281	-	-	-	-	-	-	-	-	-	2,080
1b.1.1.13	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1b.1.1.14	Moisture separators & reheaters	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1b.1.1.15	Radwaste building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1.16	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,961	594	4,555	4,132	-	423	-	-	-	-	-	-	-	33,741
1b.1.2	Decon NSSS	286	-	-	-	-	-	-	143	429	429	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	286	-	-	-	-	-	3,961	737	4,984	4,561	-	423	-	-	-	-	-	-	1,067	33,741
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	6,446	1,934	8,380	8,380	-	-	-	-	-	-	-	-	30,500	10,852
1b.2.3	Mixed & RCRA Waste	-	-	29	19	13	-	-	8	69	69	-	-	43	-	-	-	-	5,253	163	-
1b.2	Subtotal Period 1b Additional Costs	-	-	29	19	13	-	18,137	3,695	21,894	21,894	-	-	43	-	-	-	-	5,253	30,663	10,852
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	37	-	24	61	-	98	-	54	275	275	-	-	-	233	-	-	-	13,986	45	-
1b.3.4	Process decommissioning chemical flush waste	1	-	23	85	-	969	-	258	1,336	1,336	-	-	-	-	231	-	-	24,599	43	-
1b.3.5	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	334	50	384	-	384	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	6,362	954	7,316	7,316	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,997	1,202	47	147	-	1,067	7,884	2,119	15,464	15,080	384	-	-	233	231	-	-	38,585	89	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	1,207	121	1,328	1,328	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,104	110	1,214	1,214	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	290	-	-	-	-	-	73	363	363	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	284	-	-	-	-	-	43	327	327	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	8	2	-	29	-	8	48	48	-	-	-	358	-	-	-	7,159	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,735	260	1,995	1,995	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	321	32	353	353	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,587	159	1,746	-	1,746	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	1,420	213	1,633	1,633	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	402	60	463	-	463	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	52	8	60	-	60	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	58	9	67	67	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	7,150	1,072	8,222	8,222	-	-	-	-	-	-	-	-	-	123,056
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	5,625	844	6,469	6,469	-	-	-	-	-	-	-	-	-	63,614
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	13,003	1,950	14,953	14,953	-	-	-	-	-	-	-	-	-	212,741
1b.4	Subtotal Period 1b Period-Dependent Costs	35	575	8	2	-	29	33,663	4,971	39,283	37,015	2,268	-	-	358	-	-	-	7,159	12	399,411
1b.0	TOTAL PERIOD 1b COST	3,318	1,777	84	169	13	1,096	63,646	11,522	81,625	78,550	2,652	423	43	591	231	-	-	50,997	31,830	444,004
PERIOD 1 TOTALS		3,318	2,859	97	173	13	1,146	150,623	24,351	182,581	166,222	15,434	925	43	1,201	231	-	-	63,188	31,850	1,194,697

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C
Monticello Nuclear Generating Plant
Scenario 1: DECON with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Recirculation System Piping & Valves	107	92	30	39	-	429	-	192	888	888	-	-	-	1,430	-	-	-	99,742	2,905	-
2a.1.1.2	Recirculation Pumps & Motors	38	59	16	40	22	438	-	154	767	767	-	-	96	945	-	-	-	112,200	1,563	-
2a.1.1.3	CRDMs & NIs Removal	187	1,022	402	105	-	919	-	635	3,269	3,269	-	-	-	3,741	-	-	-	213,700	17,768	-
2a.1.1.4	Reactor Vessel Internals	222	6,378	12,908	2,835	-	20,148	356	18,958	61,806	61,806	-	-	-	1,252	1,481	1,010	-	312,338	30,765	1,389
2a.1.1.5	Reactor Vessel	109	8,595	2,644	1,170	-	5,294	356	10,155	28,323	28,323	-	-	-	16,169	-	-	-	1,105,210	30,765	1,389
2a.1.1	Totals	663	16,147	15,999	4,189	22	27,228	711	30,094	95,053	95,053	-	-	96	23,536	1,481	1,010	-	1,843,190	83,767	2,778
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	362	1,496	349	3,174	357	-	858	6,596	6,596	-	-	24,835	1,383	-	-	-	1,577,959	5,438	-
2a.1.3	Main Condensers	-	1,245	397	128	1,667	198	-	670	4,306	4,306	-	-	17,396	727	-	-	-	828,955	18,831	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor Building	-	317	-	-	-	-	-	48	364	364	-	-	-	-	-	-	-	-	2,217	-
2a.1.4.2	Radwaste	-	24	-	-	-	-	-	4	27	27	-	-	-	-	-	-	-	-	127	-
2a.1.4.3	Turbine	-	118	-	-	-	-	-	18	136	136	-	-	-	-	-	-	-	-	1,254	-
2a.1.4	Totals	-	459	-	-	-	-	-	69	528	528	-	-	-	-	-	-	-	-	3,598	-
Disposal of Plant Systems																					
2a.1.5.1	Automatic Press Relief	-	115	7	8	69	57	-	55	311	311	-	-	803	206	-	-	-	45,852	1,656	-
2a.1.5.2	Chemistry Sampling	-	27	1	1	13	10	-	12	65	65	-	-	156	37	-	-	-	8,681	400	-
2a.1.5.3	Chemistry Sampling - Insulated	-	2	0	0	-	0	-	1	3	3	-	-	-	1	-	-	-	72	28	-
2a.1.5.4	Circulating Water - RCA	-	202	12	41	576	-	-	144	974	974	-	-	6,656	-	-	-	-	270,307	2,860	-
2a.1.5.5	Combustible Gas Control - Insul - RCA	-	29	0	1	18	-	-	10	59	59	-	-	212	-	-	-	-	8,617	378	-
2a.1.5.6	Combustible Gas Control - RCA	-	18	0	2	25	-	-	8	53	53	-	-	285	-	-	-	-	11,577	245	-
2a.1.5.7	Condensate & Feedwater	-	946	189	226	1,725	2,003	-	1,049	6,138	6,138	-	-	19,947	7,319	-	-	-	1,275,810	14,196	-
2a.1.5.8	Condensate & Feedwater - Insulated	-	480	34	43	361	332	-	267	1,517	1,517	-	-	4,176	1,207	-	-	-	246,693	6,964	-
2a.1.5.9	Condensate Demin	-	533	29	35	289	276	-	254	1,416	1,416	-	-	3,346	1,000	-	-	-	199,936	7,618	-
2a.1.5.10	Condensate Storage	-	706	31	55	617	219	-	335	1,963	1,963	-	-	7,131	795	-	-	-	340,568	10,345	-
2a.1.5.11	Control Rod Drive	-	3	0	0	2	1	-	1	7	7	-	-	19	4	-	-	-	1,009	41	-
2a.1.5.12	Control Rod Drive Hydraulic	-	405	16	18	143	155	-	166	902	902	-	-	1,658	562	-	-	-	103,306	5,898	-
2a.1.5.13	Core Spray	-	75	19	34	379	143	-	119	770	770	-	-	4,384	521	-	-	-	211,329	1,163	-
2a.1.5.14	Core Spray - Insulated	-	141	8	9	71	73	-	66	368	368	-	-	818	264	-	-	-	50,149	2,033	-
2a.1.5.15	Demin Water - Insulated - RCA	-	15	0	1	7	-	-	5	27	27	-	-	85	-	-	-	-	3,445	181	-
2a.1.5.16	Demin Water - RCA	-	40	0	2	22	-	-	14	78	78	-	-	253	-	-	-	-	10,278	508	-
2a.1.5.17	Diesel Oil - RCA	-	2	0	0	2	-	-	1	5	5	-	-	23	-	-	-	-	931	25	-
2a.1.5.18	Drywell Atmosphere Cooling - RCA	-	37	1	3	47	-	-	17	105	105	-	-	548	-	-	-	-	22,244	550	-
2a.1.5.19	EDG Emerg Service Water - Insul - RCA	-	0	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	84	4	-
2a.1.5.20	Electrical - Clean	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	182	-
2a.1.5.21	Emergency Service Water - Insul - RCA	-	21	0	1	12	-	-	7	41	41	-	-	137	-	-	-	-	5,544	281	-
2a.1.5.22	Emergency Service Water - RCA	-	2	0	0	1	-	-	1	4	4	-	-	13	-	-	-	-	512	22	-
2a.1.5.23	GEZIP - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2a.1.5.24	Generator Physical Design - RCA	-	5	0	0	3	-	-	2	9	9	-	-	31	-	-	-	-	1,250	67	-
2a.1.5.25	H2-O2 Control Analyzing	-	6	0	0	0	4	-	3	13	13	-	-	6	13	-	-	-	1,080	81	-
2a.1.5.26	H2-O2 Control Analyzing - Insulated	-	6	0	0	0	4	-	3	13	13	-	-	6	13	-	-	-	1,080	81	-
2a.1.5.27	High Pressure Coolant Injection	-	64	6	9	84	57	-	45	266	266	-	-	972	209	-	-	-	52,792	966	-
2a.1.5.28	High Pressure Coolant Injection - Insula	-	214	14	17	138	133	-	111	627	627	-	-	1,598	481	-	-	-	95,733	3,079	-
2a.1.5.29	Hydrogen Cooling	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	118	-
2a.1.5.30	Hydrogen Cooling - RCA	-	7	0	0	3	-	-	2	13	13	-	-	39	-	-	-	-	1,600	79	-
2a.1.5.31	Hydrogen Seal Oil - RCA	-	17	0	1	16	-	-	7	42	42	-	-	189	-	-	-	-	7,669	212	-
2a.1.5.32	Hydrogen Water Chemistry - RCA	-	24	0	1	12	-	-	8	45	45	-	-	140	-	-	-	-	5,672	304	-
2a.1.5.33	Instrument & Service Air - RCA	-	220	3	11	153	-	-	80	466	466	-	-	1,768	-	-	-	-	71,810	2,733	-
2a.1.5.34	Main Condenser	-	191	12	14	115	113	-	97	542	542	-	-	1,333	411	-	-	-	80,439	2,746	-
2a.1.5.35	Main Steam	-	243	17	22	186	163	-	134	764	764	-	-	2,148	594	-	-	-	125,135	3,512	-
2a.1.5.36	Main Turbine	-	972	214	244	1,709	2,375	-	1,151	6,665	6,665	-	-	19,760	8,687	-	-	-	1,354,661	14,733	-
2a.1.5.37	Main Turbine - Insulated	-	209	19	25	219	183	-	136	790	790	-	-	2,530	667	-	-	-	145,208	3,069	-
2a.1.5.38	Miscellaneous	-	42	1	2	26	-	-	15	85	85	-	-	302	-	-	-	-	12,283	622	-
2a.1.5.39	Off Gas Recombiner	-	182	19	22	155	209	-	126	714	714	-	-	1,795	764	-	-	-	121,554	2,708	-
2a.1.5.40	Off Gas Recombiner - Insulated	-	379	19	19	118	195	-	166	897	897	-	-	1,366	709	-	-	-	100,933	5,385	-
2a.1.5.41	Post Accident Sampling	-	24	1	1	5	9	-	9	50	50	-	-	53	33	-	-	-	4,318	345	-
2a.1.5.42	Post Accident Sampling - Insulated	-	16	1	1	1	11	-	7	37	37	-	-	17	37	-	-	-	3,116	212	-
2a.1.5.43	RHR Service Water - Insulated - RCA	-	81	3	9	128	-	-	41	262	262	-	-	1,485	-	-	-	-	60,293	1,125	-
2a.1.5.44	RHR Service Water - RCA	-	4	0	0	3	-	-	1	9	9	-	-	35	-	-	-	-	1,410	57	-
2a.1.5.45	Reactor Feedwater Pump Seal	-	55	3	3	17	26	-	23	126	126	-	-	193	96	-	-	-	14,009	773	-

Table C
Monticello Nuclear Generating Plant
Scenario 1: DECON with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2a.1.5.46	Residual Heat Removal	349	240	168	126	554	1,667	-	770	3,875	3,875	-	-	6,406	6,012	-	-	-	647,941	4,135	-
2a.1.5.47	Residual Heat Removal - Insulated	602	540	64	58	291	715	-	674	2,944	2,944	-	-	3,367	2,607	-	-	-	303,087	10,340	-
2a.1.5.48	Rx Core Isolation Cooling	-	47	2	3	22	21	-	21	116	116	-	-	259	76	-	-	-	15,396	691	-
2a.1.5.49	Rx Core Isolation Cooling - Insulated	-	105	5	5	25	55	-	45	240	240	-	-	288	198	-	-	-	24,419	1,479	-
2a.1.5.50	Rx Recirculation	56	57	6	3	4	53	-	57	235	235	-	-	43	190	-	-	-	14,095	1,580	-
2a.1.5.51	Snubbers	-	168	2	4	33	25	-	54	285	285	-	-	377	90	-	-	-	21,009	2,548	-
2a.1.5.52	Standby Liquid Control - Insul - RCA	-	4	0	0	2	-	-	1	7	7	-	-	22	-	-	-	-	904	48	-
2a.1.5.53	Standby Liquid Control - RCA	-	26	0	1	21	-	-	10	59	59	-	-	245	-	-	-	-	9,969	341	-
2a.1.5.54	Stator Cooling - RCA	-	7	0	1	11	-	-	4	23	23	-	-	126	-	-	-	-	5,135	98	-
2a.1.5.55	Traversing Incore Probe	0	4	0	0	0	2	-	1	7	7	-	-	1	5	-	-	-	386	51	-
2a.1.5	Totals	1,007	7,978	931	1,079	8,447	9,287	-	6,340	35,068	35,046	-	22	97,654	33,808	-	-	-	6,125,515	119,943	-
2a.1.6	Scaffolding in support of decommissioning	-	2,188	25	8	99	25	-	572	2,916	2,916	-	-	1,030	91	-	-	-	52,111	22,564	-
2a.1	Subtotal Period 2a Activity Costs	1,669	28,379	18,848	5,754	13,409	37,095	711	38,602	144,467	144,445	-	22	141,010	59,545	1,481	1,010	-	10,427,730	254,140	2,778
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,326	698	3,024	3,024	-	-	-	-	-	-	-	-	30,411	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	2,326	698	3,024	3,024	-	-	-	-	-	-	-	-	30,411	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	83	-	55	140	-	222	-	123	623	623	-	-	-	531	-	-	-	31,838	103	-
2a.3.2	Process decommissioning chemical flush waste	6	-	208	774	-	1,557	-	529	3,075	3,075	-	-	-	2,093	-	-	-	223,008	392	-
2a.3.3	Small tool allowance	-	315	-	-	-	-	-	47	363	326	-	36	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	12,181	1,827	14,008	-	14,008	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	13,235	1,985	15,221	15,221	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	89	315	263	914	-	1,779	25,417	4,512	33,290	19,245	14,008	36	-	2,623	-	-	-	254,846	495	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	102	-	-	-	-	-	-	25	127	127	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	1,055	106	1,161	1,161	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	3,061	306	3,367	3,367	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,133	-	-	-	-	-	533	2,666	2,666	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,212	-	-	-	-	-	482	3,694	3,694	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	122	37	-	453	-	131	743	743	-	-	-	5,567	-	-	-	111,335	182	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	2,404	361	2,765	2,765	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	847	85	932	932	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	3,757	376	4,133	-	4,133	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	3,392	509	3,900	3,900	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,174	176	1,350	-	1,350	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	151	23	174	-	174	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	466	70	536	536	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	19,265	2,890	22,154	22,154	-	-	-	-	-	-	-	-	-	328,651
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	20,125	3,019	23,144	23,144	-	-	-	-	-	-	-	-	-	231,273
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	26,670	4,000	30,670	30,670	-	-	-	-	-	-	-	-	-	430,594
2a.4	Subtotal Period 2a Period-Dependent Costs	102	5,345	122	37	-	453	82,366	13,090	101,515	95,858	5,657	-	-	5,567	-	-	-	111,335	182	990,519
2a.0	TOTAL PERIOD 2a COST	1,860	34,039	19,233	6,705	13,409	39,327	110,821	56,903	282,296	262,573	19,665	58	141,010	67,735	1,481	1,010	-	10,793,910	285,228	993,297
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	ALARA/Radiological	-	18	0	0	3	3	-	6	30	30	-	-	35	10	-	-	-	2,060	277	-
2b.1.1.2	Alternate N2 - RCA	-	16	0	1	8	-	-	5	30	30	-	-	93	-	-	-	-	3,765	185	-
2b.1.1.3	Decontamination Projects	-	1	0	0	0	0	-	0	2	2	-	-	2	0	-	-	-	129	17	-
2b.1.1.4	Electrical - Contaminated	-	439	6	16	207	25	-	150	841	841	-	-	2,389	90	-	-	-	102,726	6,325	-
2b.1.1.5	Electrical - Decontaminated	-	2,657	41	142	2,019	-	-	993	5,852	5,852	-	-	23,344	-	-	-	-	948,013	37,107	-
2b.1.1.6	Fire - RCA	-	99	1	4	53	-	-	33	191	191	-	-	614	-	-	-	-	24,917	1,324	-
2b.1.1.7	HVAC Ductwork	-	309	7	18	231	27	-	122	713	713	-	-	2,665	100	-	-	-	114,598	4,111	-
2b.1.1.8	HVAC/Chilled Water - RCA	-	317	5	17	238	-	-	118	694	694	-	-	2,752	-	-	-	-	111,779	3,985	-
2b.1.1.9	Heating & Ventilation	-	473	15	40	521	62	-	219	1,329	1,329	-	-	6,018	227	-	-	-	258,789	7,101	-
2b.1.1.10	Heating Boiler - Insulated - RCA	-	3	0	0	2	-	-	1	6	6	-	-	26	-	-	-	-	1,058	35	-
2b.1.1.11	Liquid Radwaste	572	669	46	44	266	476	-	623	2,697	2,697	-	-	3,073	1,728	-	-	-	235,484	17,194	-
2b.1.1.12	Makeup Demin - RCA	-	101	3	9	127	-	-	46	286	286	-	-	1,471	-	-	-	-	59,747	1,412	-
2b.1.1.13	Non-Essential Diesel Generator - RCA	-	26	2	9	123	-	-	27	187	187	-	-	1,424	-	-	-	-	57,832	395	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C
Monticello Nuclear Generating Plant
Scenario 1: DECON with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2b.1.1.14	Off Gas Holdup	-	333	20	26	238	174	-	168	960	960	-	-	2,755	630	-	-	-	152,277	4,769	-
2b.1.1.15	Primary Containment	-	443	43	59	536	412	-	308	1,801	1,801	-	-	6,201	1,506	-	-	-	347,704	6,454	-
2b.1.1.16	Process Radiation Monitors	-	45	2	2	12	14	-	17	92	92	-	-	142	52	-	-	-	9,115	649	-
2b.1.1.17	Rx Bldg Closed Clngr Water - Insul - RCA	-	111	2	6	85	-	-	42	245	245	-	-	977	-	-	-	-	39,675	1,484	-
2b.1.1.18	Rx Bldg Closed Clngr Water - RCA	-	178	12	43	614	-	-	144	991	991	-	-	7,093	-	-	-	-	288,031	2,489	-
2b.1.1.19	Rx Component Handling Equip	26	138	19	19	100	227	-	124	653	653	-	-	1,158	829	-	-	-	99,730	2,462	-
2b.1.1.20	Rx Pressure Vessel	28	46	6	4	7	63	-	43	196	196	-	-	75	230	-	-	-	17,816	1,051	-
2b.1.1.21	Rx Water Cleanup	169	258	19	11	11	204	-	205	877	877	-	-	130	737	-	-	-	52,670	5,736	-
2b.1.1.22	Secondary Containment	-	121	7	10	88	70	-	63	360	360	-	-	1,017	255	-	-	-	57,567	1,763	-
2b.1.1.23	Service & Seal Water - Insulated - RCA	-	117	2	7	102	-	-	46	274	274	-	-	1,180	-	-	-	-	47,917	1,565	-
2b.1.1.24	Service & Seal Water - RCA	-	155	3	11	156	-	-	64	390	390	-	-	1,809	-	-	-	-	73,453	2,016	-
2b.1.1.25	Service Air Blower - RCA	-	15	0	1	18	-	-	7	41	41	-	-	206	-	-	-	-	8,364	206	-
2b.1.1.26	Solid Radwaste	327	483	36	34	206	380	-	419	1,885	1,885	-	-	2,387	1,380	-	-	-	185,221	10,820	-
2b.1.1.27	Structures & Buildings	-	76	2	3	31	23	-	30	166	166	-	-	357	85	-	-	-	19,933	1,128	-
2b.1.1.28	Wells & Domestic Water	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	144	-
2b.1.1.29	Wells & Domestic Water - RCA	-	51	1	2	30	-	-	18	101	101	-	-	342	-	-	-	-	13,874	633	-
2b.1.1	Totals	1,122	7,707	299	537	6,032	2,160	-	4,042	21,900	21,890	-	10	69,735	7,859	-	-	-	3,334,244	122,835	-
2b.1.2	Scaffolding in support of decommissioning	-	2,735	31	10	123	31	-	715	3,645	3,645	-	-	1,287	114	-	-	-	65,139	28,205	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor Building	5,006	2,817	155	347	4,159	1,007	-	4,150	17,641	17,641	-	-	48,077	7,014	-	-	-	2,317,670	112,518	-
2b.1.3.2	Admin	103	6	0	2	-	14	-	57	182	182	-	-	-	145	-	-	-	6,840	1,600	-
2b.1.3.3	HPCI Room	28	27	1	2	10	13	-	26	107	107	-	-	118	125	-	-	-	10,759	789	-
2b.1.3.4	Hot Shop	16	4	0	1	-	10	-	12	43	43	-	-	-	103	-	-	-	4,860	286	-
2b.1.3.5	LLRW Storage & Shipping	56	23	1	6	3	41	-	46	176	176	-	-	31	433	-	-	-	21,708	1,127	-
2b.1.3.6	Offgas Stack	360	256	6	16	116	73	-	283	1,109	1,109	-	-	1,343	669	-	-	-	87,045	8,860	-
2b.1.3.7	Offgas Storage & Compressor	39	17	1	4	2	30	-	32	125	125	-	-	25	316	-	-	-	15,948	785	-
2b.1.3.8	Radwaste	117	59	3	13	15	86	-	100	393	393	-	-	172	910	-	-	-	49,943	2,503	-
2b.1.3.9	Radwaste Material Storage Warehouse	62	23	1	6	-	47	-	49	189	189	-	-	-	495	-	-	-	23,400	1,197	-
2b.1.3.10	Recombiner	26	24	1	4	17	22	-	28	122	122	-	-	199	216	-	-	-	18,405	695	-
2b.1.3.11	Turbine	684	341	18	76	111	507	-	583	2,319	2,319	-	-	1,283	5,299	-	-	-	303,150	14,443	-
2b.1.3.12	Turbine Building Addition	56	20	1	6	-	41	-	44	169	169	-	-	-	434	-	-	-	20,478	1,087	-
2b.1.3	Totals	6,554	3,618	188	483	4,433	1,889	-	5,410	22,574	22,574	-	-	51,247	16,159	-	-	-	2,880,206	145,889	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	7,676	14,060	518	1,031	10,588	4,079	481	10,239	48,672	48,662	-	10	122,269	24,132	-	-	-	6,279,589	296,929	4,096
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	3,241	972	4,213	4,213	-	-	-	-	-	-	-	-	42,370	-
2b.2.2	Operational Equipment	-	-	19	60	624	-	-	104	807	807	-	-	11,710	-	-	-	-	292,750	32	-
2b.2.3	Security Modifications	-	-	-	-	-	-	8,696	1,304	10,000	10,000	-	-	-	-	-	-	-	-	-	-
2b.2	Subtotal Period 2b Additional Costs	-	-	19	60	624	-	11,937	2,381	15,020	15,020	-	-	11,710	-	-	-	-	292,750	42,402	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	173	-	117	299	-	474	-	261	1,325	1,325	-	-	-	1,133	-	-	-	67,962	221	-
2b.3.2	Process decommissioning chemical flush waste	1	-	41	153	-	307	-	104	606	606	-	-	-	413	-	-	-	43,978	77	-
2b.3.3	Small tool allowance	-	341	-	-	-	-	-	51	392	392	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	65,095	9,764	74,859	-	74,859	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	8,665	1,300	9,964	9,964	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	174	341	159	452	-	781	73,759	11,481	87,146	12,287	74,859	-	-	1,545	-	-	-	111,940	298	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,361	-	-	-	-	-	-	340	1,701	1,701	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	1,470	147	1,617	1,617	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	3,915	391	4,306	4,306	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,681	-	-	-	-	-	670	3,352	3,352	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	4,602	-	-	-	-	-	690	5,292	5,292	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	124	38	-	463	-	134	759	759	-	-	-	5,690	-	-	-	113,799	186	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	2,645	397	3,041	3,041	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,180	118	1,298	1,298	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	5,234	523	5,758	-	5,758	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	4,725	709	5,434	5,434	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,636	245	1,881	-	1,881	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	412	62	474	474	-	-	-	-	-	-	-	-	-	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C
Monticello Nuclear Generating Plant
Scenario 1: DECON with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Period-Dependent Costs (continued)																					
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	210	32	242	-	242	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	26,840	4,026	30,867	30,867	-	-	-	-	-	-	-	-	-	457,896
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	27,122	4,068	31,191	31,191	-	-	-	-	-	-	-	-	-	309,504
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	35,641	5,346	40,988	40,988	-	-	-	-	-	-	-	-	-	574,490
2b.4	Subtotal Period 2b Period-Dependent Costs	1,361	7,283	124	38	-	463	111,268	17,935	138,473	130,592	7,881	-	-	5,690	-	-	-	113,799	186	1,341,891
2b.0	TOTAL PERIOD 2b COST	9,211	21,684	820	1,580	11,212	5,324	197,445	42,036	289,312	206,561	82,740	10	133,979	31,367	-	-	-	6,798,079	339,814	1,345,987
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	634	56	114	109	-	2,091	-	881	3,884	3,884	-	-	-	7,653	-	-	-	486,170	906	-
Disposal of Plant Systems																					
2d.1.2.1	Cranes/Heavy Loads/Rigging - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2d.1.2.2	Electrical - Contaminated Fuel Pool	-	46	1	2	21	2	-	16	87	87	-	-	240	9	-	-	-	10,334	665	-
2d.1.2.3	Electrical - Decontam. Fuel Pool Area	-	293	4	15	213	-	-	108	633	633	-	-	2,457	-	-	-	-	99,783	4,090	-
2d.1.2.4	Fire - RCA - Fuel Pool Area	-	11	0	0	5	-	-	4	20	20	-	-	62	-	-	-	-	2,499	143	-
2d.1.2.5	Fuel Pool Cooling & Cleanup	240	419	34	26	102	370	-	340	1,531	1,531	-	-	1,179	1,341	-	-	-	133,939	8,380	-
2d.1.2.6	Fuel Pool Cooling & Cleanup - Insulated	26	40	3	2	6	32	-	33	143	143	-	-	67	117	-	-	-	10,220	848	-
2d.1.2.7	HVAC Ductwork - Fuel Pool Area	-	34	1	2	26	3	-	14	79	79	-	-	296	11	-	-	-	12,733	457	-
2d.1.2.8	HVAC/Chilled Water - RCA Fuel Pool Area	-	32	0	1	19	-	-	11	64	64	-	-	223	-	-	-	-	9,072	397	-
2d.1.2.9	Instrument & Service Air-RCA-Fuel Pool	-	28	0	2	23	-	-	11	64	64	-	-	267	-	-	-	-	10,841	357	-
2d.1.2	Totals	266	907	44	51	423	408	-	537	2,637	2,637	-	-	4,894	1,479	-	-	-	293,606	15,385	-
Decontamination of Site Buildings																					
2d.1.3.1	Reactor (Post Fuel)	911	2,485	145	669	170	8,544	-	3,353	16,277	16,277	-	-	1,969	62,698	-	-	-	2,732,406	45,703	-
2d.1.3	Totals	911	2,485	145	669	170	8,544	-	3,353	16,277	16,277	-	-	1,969	62,698	-	-	-	2,732,406	45,703	-
2d.1.4	Scaffolding in support of decommissioning	-	547	6	2	25	6	-	143	729	729	-	-	257	23	-	-	-	13,028	5,641	-
2d.1	Subtotal Period 2d Activity Costs	1,811	3,994	309	831	618	11,049	-	4,915	23,527	23,527	-	-	7,120	71,852	-	-	-	3,525,210	67,635	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,291	387	1,678	1,678	-	-	-	-	-	-	-	-	-	12,480
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,198	359	1,557	1,557	-	-	-	-	-	-	-	-	15,661	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,489	747	3,235	3,235	-	-	-	-	-	-	-	-	15,661	12,480
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	69	-	47	120	-	191	-	105	533	533	-	-	-	457	-	-	-	27,391	89	-
2d.3.2	Process decommissioning chemical flush waste	1	-	25	92	-	185	-	63	366	366	-	-	-	249	-	-	-	26,553	47	-
2d.3.3	Small tool allowance	-	88	-	-	-	-	-	13	101	101	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	143	55	575	145	-	145	1,062	1,062	-	-	6,000	529	-	-	-	303,608	147	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	27,017	4,053	31,070	-	31,070	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	70	88	216	267	575	521	27,017	4,379	33,132	2,062	31,070	-	6,000	1,235	-	-	-	357,552	283	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	219	-	-	-	-	-	-	55	274	274	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,336	134	1,470	1,470	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	752	-	-	-	-	-	188	940	940	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,701	-	-	-	-	-	255	1,956	1,956	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	44	14	-	165	-	48	271	271	-	-	-	2,030	-	-	-	40,600	66	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	521	78	600	600	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	369	37	405	405	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,935	193	2,128	-	2,128	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	305	46	351	351	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	9,608	1,441	11,049	7,668	3,381	-	-	-	-	-	-	-	-	162,981
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,941	1,041	7,982	7,982	-	-	-	-	-	-	-	-	-	78,356
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	9,556	1,433	10,989	10,132	857	-	-	-	-	-	-	-	-	149,660
2d.4	Subtotal Period 2d Period-Dependent Costs	219	2,453	44	14	-	165	33,025	5,290	41,210	34,754	6,456	-	-	2,030	-	-	-	40,600	66	390,997
2d.0	TOTAL PERIOD 2d COST	2,099	6,535	569	1,112	1,193	11,735	62,531	15,330	101,104	63,579	37,525	-	13,120	75,117	-	-	-	3,923,362	83,645	403,477

Table C
Monticello Nuclear Generating Plant
Scenario 1: DECON with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,285	128	1,413	1,413	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	597	-	-	-	-	-	149	747	747	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	8	2	-	29	-	8	47	47	-	-	-	355	-	-	-	7,097	12	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	261	39	300	300	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	420	42	463	463	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	103	10	113	-	113	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	9,608	1,441	11,049	7,668	3,381	-	-	-	-	-	-	-	-	162,981
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	5,174	776	5,950	5,950	-	-	-	-	-	-	-	-	-	57,200
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	5,456	818	6,274	5,415	860	-	-	-	-	-	-	-	-	80,707
2f.4	Subtotal Period 2f Period-Dependent Costs	-	597	8	2	-	29	24,761	3,754	29,152	24,708	4,443	-	-	355	-	-	-	7,097	12	300,888
2f.0	TOTAL PERIOD 2f COST	-	597	8	2	-	29	33,467	6,188	40,291	35,848	4,443	-	-	355	-	-	-	7,097	96,208	307,128
PERIOD 2 TOTALS		13,170	62,856	20,629	9,399	25,814	56,415	404,263	120,456	713,004	568,562	144,374	68	288,110	174,575	1,481	1,010	-	21,522,450	804,895	3,049,889
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor Building	-	1,881	-	-	-	-	-	282	2,163	-	-	2,163	-	-	-	-	-	-	13,966	-
3b.1.1.2	Condensate Tanks Foundation	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	50	-
3b.1.1.3	Discharge Retention Basin	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	25	-
3b.1.1.4	HPCI Room	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	97	-
3b.1.1.5	Hot Shop	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	177	-
3b.1.1.6	Hydrogen & Oxygen Storage	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	19	-
3b.1.1.7	LLRW Storage & Shipping	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	662	-
3b.1.1.8	MSIV	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	42	-
3b.1.1.9	Misc Structures 2017	-	759	-	-	-	-	-	114	872	-	-	872	-	-	-	-	-	-	7,919	-
3b.1.1.10	Offgas Stack	-	104	-	-	-	-	-	16	120	-	-	120	-	-	-	-	-	-	544	-
3b.1.1.11	Offgas Storage & Compressor	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	199	-
3b.1.1.12	Radwaste	-	219	-	-	-	-	-	33	252	-	-	252	-	-	-	-	-	-	1,220	-
3b.1.1.13	Recombiner	-	123	-	-	-	-	-	18	141	-	-	141	-	-	-	-	-	-	713	-
3b.1.1.14	Security Barrier	-	179	-	-	-	-	-	27	206	-	-	206	-	-	-	-	-	-	933	-
3b.1.1.15	Structures Greater than 3' Below Grade	-	2,380	-	-	-	-	-	357	2,738	-	-	2,738	-	-	-	-	-	-	12,649	-
3b.1.1.16	Tank Farm	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	21	-
3b.1.1.17	Turbine	-	1,175	-	-	-	-	-	176	1,351	-	-	1,351	-	-	-	-	-	-	13,091	-
3b.1.1.18	Turbine Building Addition	-	51	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	618	-
3b.1.1.19	Turbine Pedestal	-	175	-	-	-	-	-	26	202	-	-	202	-	-	-	-	-	-	926	-
3b.1.1	Totals	-	7,219	-	-	-	-	-	1,083	8,302	-	-	8,302	-	-	-	-	-	-	53,870	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	864	-	-	-	-	-	130	994	-	-	994	-	-	-	-	-	-	1,841	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,083	-	-	-	-	183	1,240	9,506	211	-	9,295	-	-	-	-	-	-	55,711	1,560

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Table C
Monticello Nuclear Generating Plant
Scenario 1: DECON with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	3,297	-	-	-	-	11	496	3,805	-	-	3,805	-	-	-	-	-	-	12	-
3b.2.2	Excavation of Underground Services	-	1,380	-	-	-	-	947	349	2,677	-	-	2,677	-	-	-	-	-	-	13,475	-
3b.2.3	Intake Structure Cofferdam	-	320	-	-	-	-	-	48	368	-	-	368	-	-	-	-	-	-	2,584	-
3b.2.4	Construction Debris	-	-	-	-	-	-	350	53	403	-	-	403	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	5,102	-	-	-	-	-	765	5,868	-	-	5,868	-	-	-	-	-	-	5,422	-
3b.2	Subtotal Period 3b Additional Costs	-	10,100	-	-	-	-	1,309	1,711	13,120	-	-	13,120	-	-	-	-	-	-	21,493	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	97	-	-	-	-	-	15	111	-	-	111	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	97	-	-	-	-	-	15	111	-	-	111	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	1,251	125	1,376	-	1,376	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	2,737	274	3,011	-	3,011	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	5,455	-	-	-	-	-	818	6,273	-	-	6,273	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	300	45	345	-	-	345	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	386	39	424	-	424	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	237	24	261	-	261	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	1,260	189	1,450	-	-	1,450	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	179	27	206	-	206	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	497	75	572	-	-	572	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	22,115	3,317	25,432	(0)	7,782	17,650	-	-	-	-	-	-	-	375,152
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	11,290	1,693	12,983	-	-	12,983	-	-	-	-	-	-	-	122,646
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	6,583	987	7,571	-	1,976	5,595	-	-	-	-	-	-	-	98,297
3b.4	Subtotal Period 3b Period-Dependent Costs	-	5,455	-	-	-	-	46,836	7,613	59,904	(0)	15,036	44,868	-	-	-	-	-	-	-	596,095
3b.0	TOTAL PERIOD 3b COST	-	23,734	-	-	-	-	48,328	10,579	82,641	211	15,036	67,394	-	-	-	-	-	-	77,204	597,655
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	23,942	3,591	27,533	-	27,533	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	23,942	3,591	27,533	-	27,533	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	17,378	1,738	19,116	-	19,116	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	17,062	1,706	18,768	-	18,768	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	7,885	789	8,674	-	8,674	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	3,295	329	3,624	-	3,624	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	5,989	898	6,888	-	6,888	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2,487	373	2,861	-	2,861	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	2,779	417	3,196	-	3,196	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	93,967	14,095	108,062	-	108,062	-	-	-	-	-	-	-	-	1,302,958
3c.4.10	Utility Staff Cost	-	-	-	-	-	-	23,828	3,574	27,402	-	27,402	-	-	-	-	-	-	-	-	338,268
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	174,671	23,920	198,591	-	198,591	-	-	-	-	-	-	-	-	1,641,226
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	198,613	27,511	226,124	-	226,124	-	-	-	-	-	-	-	-	1,641,226
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
3d.1.1	Totals	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	28	3	30	30	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	26	3	29	29	-	-	-	-	-	-	-	-	-	-
3d.4.4	Emergency Planning Fees	-	-	-	-	-	-	5	1	6	-	6	-	-	-	-	-	-	-	-	-
3d.4.5	Fixed Overhead	-	-	-	-	-	-	10	1	11	11	-	-	-	-	-	-	-	-	-	-
3d.4.6	ISFSI Operating Costs	-	-	-	-	-	-	4	1	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.7	Railroad Track Maintenance	-	-	-	-	-	-	4	1	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.8	Security Staff Cost	-	-	-	-	-	-	150	22	172	172	-	-	-	-	-	-	-	-	-	2,074
3d.4.9	Utility Staff Cost	-	-	-	-	-	-	38	6	44	44	-	-	-	-	-	-	-	-	-	539
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	265	37	301	286	15	-	-	-	-	-	-	-	-	2,613

Monticello Nuclear Generating Plant
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Table C
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Scenario 1: DECON with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	6,552	265	1,352	9,500	9,485	15	-	-	-	-	-	1,547	311,184	-	2,613
PERIOD 3e - ISFSI Decontamination																					
Period 3e Additional Costs																					
3e.2.1	Decommissioning of ISFSI	-	131	3	784	-	8,058	1,850	2,707	13,534	13,534	-	-	-	27,284	-	-	-	3,860,412	11,022	1,848
3e.2	Subtotal Period 3e Additional Costs	-	131	3	784	-	8,058	1,850	2,707	13,534	13,534	-	-	-	27,284	-	-	-	3,860,412	11,022	1,848
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	110	28	138	138	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	226	57	283	283	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	82	21	103	103	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	38	10	48	48	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	308	77	385	385	-	-	-	-	-	-	-	-	-	4,999
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	260	65	325	325	-	-	-	-	-	-	-	-	-	3,792
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	1,025	256	1,281	1,281	-	-	-	-	-	-	-	-	-	8,792
3e.0	TOTAL PERIOD 3e COST	-	131	3	784	-	8,058	2,875	2,963	14,815	14,815	-	-	-	27,284	-	-	-	3,860,412	11,022	10,640
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	1,733	-	-	-	-	185	288	2,205	-	-	2,205	-	-	-	-	-	-	8,390	160
3f.2	Subtotal Period 3f Additional Costs	-	1,733	-	-	-	-	185	288	2,205	-	-	2,205	-	-	-	-	-	-	8,390	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	114	11	125	-	-	125	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	123	-	-	-	-	-	19	142	-	-	142	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	29	4	33	-	-	33	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	42	6	48	-	-	48	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	19	3	22	-	-	22	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	155	23	179	-	-	179	-	-	-	-	-	-	-	2,520
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	103	16	119	-	-	119	-	-	-	-	-	-	-	1,564
3f.4	Subtotal Period 3f Period-Dependent Costs	-	123	-	-	-	-	462	82	668	-	-	668	-	-	-	-	-	-	-	4,084
3f.0	TOTAL PERIOD 3f COST	-	1,869	-	-	-	-	647	372	2,888	-	-	2,888	-	-	-	-	-	-	8,390	4,244
PERIOD 3 TOTALS		-	25,734	1,335	784	-	14,610	250,728	42,777	335,968	24,510	241,175	70,282	-	27,284	-	-	1,547	4,171,597	96,616	2,256,378
TOTAL COST TO DECOMMISSION		16,489	91,449	22,061	10,357	25,828	72,171	805,615	187,584	1,231,552	759,294	400,983	71,275	288,153	203,059	1,711	1,010	1,547	25,757,230	933,360	6,500,963

TOTAL COST TO DECOMMISSION WITH 17.97% CONTINGENCY:	\$1,231,552	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 61.65% OR:	\$759,294	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 32.56% OR:	\$400,983	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 5.79% OR:	\$71,275	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	205,780	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	1,547	cubic feet
TOTAL SCRAP METAL REMOVED:	22,696	tons
TOTAL CRAFT LABOR REQUIREMENTS:	933,360	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

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Decommissioning Cost Analysis***

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APPENDIX D

DETAILED COST ANALYSIS

SCENARIO 2: DECON with 60 Year DFS

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Table D
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Scenario 2: DECON with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	578	87	664	598	-	66	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Sacrificial shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Moisture separators/reheaters	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1a.1.17.10	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1a.1.17.11	Pressure suppression structure	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.17.12	Drywell	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	1,600
1a.1.17.13	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
1a.1.17.14	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.15	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	5,010	752	5,762	5,260	-	502	-	-	-	-	-	-	-	42,683
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlp/s/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	15,344	2,302	17,646	17,144	-	502	-	-	-	-	-	-	-	83,013
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,221	183	1,404	-	1,404	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	9,892	1,484	11,376	11,376	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,113	1,667	12,779	11,376	1,404	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	2,408	241	2,649	2,649	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,242	224	2,466	2,466	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,730	259	1,989	1,989	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	3,166	317	3,482	-	3,482	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	2,833	425	3,258	3,258	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	803	120	923	-	923	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	115	17	133	133	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	14,260	2,139	16,399	16,399	-	-	-	-	-	-	-	-	-	245,440
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	54,561	7,966	63,676	59,153	4,524	-	-	610	-	-	-	12,190	20	667,680

Table D
Monticello Nuclear Generating Plant
Scenario 2: DECON with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	81,017	11,935	94,101	87,672	5,927	502	-	610	-	-	-	12,190	20	750,693
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	470	70	540	540	-	-	-	-	-	-	-	-	-	4,000
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD housings & NIs	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Removal primary containment	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
1b.1.1.10	Sacrificial shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.11	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
1b.1.1.12	Main Turbine	-	-	-	-	-	-	244	37	281	281	-	-	-	-	-	-	-	-	-	2,080
1b.1.1.13	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1b.1.1.14	Moisture separators & reheaters	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1b.1.1.15	Radwaste building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1.16	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,961	594	4,555	4,132	-	423	-	-	-	-	-	-	-	33,741
1b.1.2	Decon NSSS	286	-	-	-	-	-	-	143	429	429	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	286	-	-	-	-	-	3,961	737	4,984	4,561	-	423	-	-	-	-	-	-	1,067	33,741
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	6,446	1,934	8,380	8,380	-	-	-	-	-	-	-	-	30,500	10,852
1b.2.3	Mixed & RCRA Waste	-	-	29	19	13	-	-	8	69	69	-	-	43	-	-	-	-	5,253	163	-
1b.2	Subtotal Period 1b Additional Costs	-	-	29	19	13	-	18,137	3,695	21,894	21,894	-	-	43	-	-	-	-	5,253	30,663	10,852
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	37	-	24	61	-	98	-	54	275	275	-	-	-	233	-	-	-	13,986	45	-
1b.3.4	Process decommissioning chemical flush waste	1	-	23	85	-	969	-	258	1,336	1,336	-	-	-	-	231	-	-	24,599	43	-
1b.3.5	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	363	54	417	-	417	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	6,362	954	7,316	7,316	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,997	1,202	47	147	-	1,067	7,913	2,124	15,497	15,080	417	-	-	233	231	-	-	38,585	89	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	1,207	121	1,328	1,328	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,104	110	1,214	1,214	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	290	-	-	-	-	-	73	363	363	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	284	-	-	-	-	-	43	327	327	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	8	2	-	29	-	8	48	48	-	-	-	358	-	-	-	7,159	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,735	260	1,995	1,995	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	321	32	353	353	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,587	159	1,746	-	1,746	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	1,420	213	1,633	1,633	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	402	60	463	-	463	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	52	8	60	-	60	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	58	9	67	67	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	7,150	1,072	8,222	8,222	-	-	-	-	-	-	-	-	-	123,056
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	5,625	844	6,469	6,469	-	-	-	-	-	-	-	-	-	63,614
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	13,003	1,950	14,953	14,953	-	-	-	-	-	-	-	-	-	212,741
1b.4	Subtotal Period 1b Period-Dependent Costs	35	575	8	2	-	29	33,663	4,971	39,283	37,015	2,268	-	-	358	-	-	-	7,159	12	399,411
1b.0	TOTAL PERIOD 1b COST	3,318	1,777	84	169	13	1,096	63,675	11,527	81,658	78,550	2,685	423	43	591	231	-	-	50,998	31,830	444,004
PERIOD 1 TOTALS		3,318	2,859	97	173	13	1,146	144,692	23,461	175,759	166,222	8,613	925	43	1,201	231	-	-	63,188	31,850	1,194,697

Table D
Monticello Nuclear Generating Plant
Scenario 2: DECON with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Recirculation System Piping & Valves	107	92	30	39	-	429	-	192	888	888	-	-	-	1,430	-	-	-	99,742	2,905	-
2a.1.1.2	Recirculation Pumps & Motors	38	59	16	40	22	438	-	154	767	767	-	-	96	945	-	-	-	112,200	1,563	-
2a.1.1.3	CRDMs & NIs Removal	187	1,022	402	105	-	919	-	635	3,269	3,269	-	-	-	3,741	-	-	-	213,700	17,768	-
2a.1.1.4	Reactor Vessel Internals	222	6,378	12,908	2,835	-	20,148	356	18,958	61,806	61,806	-	-	-	1,252	1,481	1,010	-	312,338	30,765	1,389
2a.1.1.5	Reactor Vessel	109	8,595	2,644	1,170	-	5,294	356	10,155	28,323	28,323	-	-	-	16,169	-	-	-	1,105,210	30,765	1,389
2a.1.1	Totals	663	16,147	15,999	4,189	22	27,228	711	30,094	95,053	95,053	-	-	96	23,536	1,481	1,010	-	1,843,190	83,767	2,778
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	362	1,496	349	3,174	357	-	858	6,596	6,596	-	-	24,835	1,383	-	-	-	1,577,959	5,438	-
2a.1.3	Main Condensers	-	1,245	397	128	1,667	198	-	670	4,306	4,306	-	-	17,396	727	-	-	-	828,955	18,831	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor Building	-	317	-	-	-	-	-	48	364	364	-	-	-	-	-	-	-	-	2,217	-
2a.1.4.2	Radwaste	-	24	-	-	-	-	-	4	27	27	-	-	-	-	-	-	-	-	127	-
2a.1.4.3	Turbine	-	118	-	-	-	-	-	18	136	136	-	-	-	-	-	-	-	-	1,254	-
2a.1.4	Totals	-	459	-	-	-	-	-	69	528	528	-	-	-	-	-	-	-	-	3,598	-
Disposal of Plant Systems																					
2a.1.5.1	Automatic Press Relief	-	115	7	8	69	57	-	55	311	311	-	-	803	206	-	-	-	45,852	1,656	-
2a.1.5.2	Chemistry Sampling	-	27	1	1	13	10	-	12	65	65	-	-	156	37	-	-	-	8,681	400	-
2a.1.5.3	Chemistry Sampling - Insulated	-	2	0	0	-	0	-	1	3	3	-	-	-	1	-	-	-	72	28	-
2a.1.5.4	Circulating Water - RCA	-	202	12	41	576	-	-	144	974	974	-	-	6,656	-	-	-	-	270,307	2,860	-
2a.1.5.5	Combustible Gas Control - Insul - RCA	-	29	0	1	18	-	-	10	59	59	-	-	212	-	-	-	-	8,617	378	-
2a.1.5.6	Combustible Gas Control - RCA	-	18	0	2	25	-	-	8	53	53	-	-	285	-	-	-	-	11,577	245	-
2a.1.5.7	Condensate & Feedwater	-	946	189	226	1,725	2,003	-	1,049	6,138	6,138	-	-	19,947	7,319	-	-	-	1,275,810	14,196	-
2a.1.5.8	Condensate & Feedwater - Insulated	-	480	34	43	361	332	-	267	1,517	1,517	-	-	4,176	1,207	-	-	-	246,693	6,964	-
2a.1.5.9	Condensate Demin	-	533	29	35	289	276	-	254	1,416	1,416	-	-	3,346	1,000	-	-	-	199,936	7,618	-
2a.1.5.10	Condensate Storage	-	706	31	55	617	219	-	335	1,963	1,963	-	-	7,131	795	-	-	-	340,568	10,345	-
2a.1.5.11	Control Rod Drive	-	3	0	0	2	1	-	1	7	7	-	-	19	4	-	-	-	1,009	41	-
2a.1.5.12	Control Rod Drive Hydraulic	-	405	16	18	143	155	-	166	902	902	-	-	1,658	562	-	-	-	103,306	5,898	-
2a.1.5.13	Core Spray	-	75	19	34	379	143	-	119	770	770	-	-	4,384	521	-	-	-	211,329	1,163	-
2a.1.5.14	Core Spray - Insulated	-	141	8	9	71	73	-	66	368	368	-	-	818	264	-	-	-	50,149	2,033	-
2a.1.5.15	Demin Water - Insulated - RCA	-	15	0	1	7	-	-	5	27	27	-	-	85	-	-	-	-	3,445	181	-
2a.1.5.16	Demin Water - RCA	-	40	0	2	22	-	-	14	78	78	-	-	253	-	-	-	-	10,278	508	-
2a.1.5.17	Diesel Oil - RCA	-	2	0	0	2	-	-	1	5	5	-	-	23	-	-	-	-	931	25	-
2a.1.5.18	Drywell Atmosphere Cooling - RCA	-	37	1	3	47	-	-	17	105	105	-	-	548	-	-	-	-	22,244	550	-
2a.1.5.19	EDG Emerg Service Water - Insul - RCA	-	0	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	84	4	-
2a.1.5.20	Electrical - Clean	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	182	-
2a.1.5.21	Emergency Service Water - Insul - RCA	-	21	0	1	12	-	-	7	41	41	-	-	137	-	-	-	-	5,544	281	-
2a.1.5.22	Emergency Service Water - RCA	-	2	0	0	1	-	-	1	4	4	-	-	13	-	-	-	-	512	22	-
2a.1.5.23	GEZIP - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2a.1.5.24	Generator Physical Design - RCA	-	5	0	0	3	-	-	2	9	9	-	-	31	-	-	-	-	1,250	67	-
2a.1.5.25	H2-O2 Control Analyzing	-	6	0	0	0	4	-	3	13	13	-	-	6	13	-	-	-	1,080	81	-
2a.1.5.26	H2-O2 Control Analyzing - Insulated	-	6	0	0	0	4	-	3	13	13	-	-	6	13	-	-	-	1,080	81	-
2a.1.5.27	High Pressure Coolant Injection	-	64	6	9	84	57	-	45	266	266	-	-	972	209	-	-	-	52,792	966	-
2a.1.5.28	High Pressure Coolant Injection - Insula	-	214	14	17	138	133	-	111	627	627	-	-	1,598	481	-	-	-	95,733	3,079	-
2a.1.5.29	Hydrogen Cooling	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	118	-
2a.1.5.30	Hydrogen Cooling - RCA	-	7	0	0	3	-	-	2	13	13	-	-	39	-	-	-	-	1,600	79	-
2a.1.5.31	Hydrogen Seal Oil - RCA	-	17	0	1	16	-	-	7	42	42	-	-	189	-	-	-	-	7,669	212	-
2a.1.5.32	Hydrogen Water Chemistry - RCA	-	24	0	1	12	-	-	8	45	45	-	-	140	-	-	-	-	5,672	304	-
2a.1.5.33	Instrument & Service Air - RCA	-	220	3	11	153	-	-	80	466	466	-	-	1,768	-	-	-	-	71,810	2,733	-
2a.1.5.34	Main Condenser	-	191	12	14	115	113	-	97	542	542	-	-	1,333	411	-	-	-	80,439	2,746	-
2a.1.5.35	Main Steam	-	243	17	22	186	163	-	134	764	764	-	-	2,148	594	-	-	-	125,135	3,512	-
2a.1.5.36	Main Turbine	-	972	214	244	1,709	2,375	-	1,151	6,665	6,665	-	-	19,760	8,687	-	-	-	1,354,661	14,733	-
2a.1.5.37	Main Turbine - Insulated	-	209	19	25	219	183	-	136	790	790	-	-	2,530	667	-	-	-	145,208	3,069	-
2a.1.5.38	Miscellaneous	-	42	1	2	26	-	-	15	85	85	-	-	302	-	-	-	-	12,283	622	-
2a.1.5.39	Off Gas Recombiner	-	182	19	22	155	209	-	126	714	714	-	-	1,795	764	-	-	-	121,554	2,708	-
2a.1.5.40	Off Gas Recombiner - Insulated	-	379	19	19	118	195	-	166	897	897	-	-	1,366	709	-	-	-	100,933	5,385	-
2a.1.5.41	Post Accident Sampling	-	24	1	1	5	9	-	9	50	50	-	-	53	33	-	-	-	4,318	345	-
2a.1.5.42	Post Accident Sampling - Insulated	-	16	1	1	1	11	-	7	37	37	-	-	17	37	-	-	-	3,116	212	-
2a.1.5.43	RHR Service Water - Insulated - RCA	-	81	3	9	128	-	-	41	262	262	-	-	1,485	-	-	-	-	60,293	1,125	-
2a.1.5.44	RHR Service Water - RCA	-	4	0	0	3	-	-	1	9	9	-	-	35	-	-	-	-	1,410	57	-
2a.1.5.45	Reactor Feedwater Pump Seal	-	55	3	3	17	26	-	23	126	126	-	-	193	96	-	-	-	14,009	773	-

Table D
Monticello Nuclear Generating Plant
Scenario 2: DECON with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2a.1.5.46	Residual Heat Removal	349	240	168	126	554	1,667	-	770	3,875	3,875	-	-	6,406	6,012	-	-	-	647,941	4,135	-
2a.1.5.47	Residual Heat Removal - Insulated	602	540	64	58	291	715	-	674	2,944	2,944	-	-	3,367	2,607	-	-	-	303,087	10,340	-
2a.1.5.48	Rx Core Isolation Cooling	-	47	2	3	22	21	-	21	116	116	-	-	259	76	-	-	-	15,396	691	-
2a.1.5.49	Rx Core Isolation Cooling - Insulated	-	105	5	5	25	55	-	45	240	240	-	-	288	198	-	-	-	24,419	1,479	-
2a.1.5.50	Rx Recirculation	56	57	6	3	4	53	-	57	235	235	-	-	43	190	-	-	-	14,095	1,580	-
2a.1.5.51	Snubbers	-	168	2	4	33	25	-	54	285	285	-	-	377	90	-	-	-	21,009	2,548	-
2a.1.5.52	Standby Liquid Control - Insul - RCA	-	4	0	0	2	-	-	1	7	7	-	-	22	-	-	-	-	904	48	-
2a.1.5.53	Standby Liquid Control - RCA	-	26	0	1	21	-	-	10	59	59	-	-	245	-	-	-	-	9,969	341	-
2a.1.5.54	Stator Cooling - RCA	-	7	0	1	11	-	-	4	23	23	-	-	126	-	-	-	-	5,135	98	-
2a.1.5.55	Traversing Incore Probe	0	4	0	0	0	2	-	1	7	7	-	-	1	5	-	-	-	386	51	-
2a.1.5	Totals	1,007	7,978	931	1,079	8,447	9,287	-	6,340	35,068	35,046	-	22	97,654	33,808	-	-	-	6,125,515	119,943	-
2a.1.6	Scaffolding in support of decommissioning	-	2,188	25	8	99	25	-	572	2,916	2,916	-	-	1,030	91	-	-	-	52,111	22,564	-
2a.1	Subtotal Period 2a Activity Costs	1,669	28,379	18,848	5,754	13,409	37,095	711	38,602	144,467	144,445	-	22	141,010	59,545	1,481	1,010	-	10,427,730	254,140	2,778
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,326	698	3,024	3,024	-	-	-	-	-	-	-	-	30,411	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	2,326	698	3,024	3,024	-	-	-	-	-	-	-	-	30,411	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	83	-	55	140	-	222	-	123	623	623	-	-	-	531	-	-	-	31,838	103	-
2a.3.2	Process decommissioning chemical flush waste	6	-	208	774	-	1,557	-	529	3,075	3,075	-	-	-	2,093	-	-	-	223,008	392	-
2a.3.3	Small tool allowance	-	315	-	-	-	-	-	47	363	326	-	36	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13,559	2,034	15,592	-	15,592	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	13,235	1,985	15,221	15,221	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	89	315	263	914	-	1,779	26,794	4,719	34,874	19,245	15,592	36	-	2,623	-	-	-	254,846	495	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	102	-	-	-	-	-	-	25	127	127	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	1,055	106	1,161	1,161	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	3,061	306	3,367	3,367	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,133	-	-	-	-	-	533	2,666	2,666	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,212	-	-	-	-	-	482	3,694	3,694	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	122	37	-	453	-	131	743	743	-	-	-	5,567	-	-	-	111,335	182	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	2,404	361	2,765	2,765	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	847	85	932	932	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	3,757	376	4,133	-	4,133	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	3,392	509	3,900	3,900	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,174	176	1,350	-	1,350	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	151	23	174	-	174	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	466	70	536	536	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	19,265	2,890	22,154	22,154	-	-	-	-	-	-	-	-	-	328,651
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	20,125	3,019	23,144	23,144	-	-	-	-	-	-	-	-	-	231,273
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	26,670	4,000	30,670	30,670	-	-	-	-	-	-	-	-	-	430,594
2a.4	Subtotal Period 2a Period-Dependent Costs	102	5,345	122	37	-	453	82,366	13,090	101,515	95,858	5,657	-	-	5,567	-	-	-	111,335	182	990,519
2a.0	TOTAL PERIOD 2a COST	1,860	34,039	19,233	6,705	13,409	39,327	112,198	57,109	283,880	262,573	21,249	58	141,010	67,735	1,481	1,010	-	10,793,910	285,228	993,297
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	ALARA/Radiological	-	18	0	0	3	3	-	6	30	30	-	-	35	10	-	-	-	2,060	277	-
2b.1.1.2	Alternate N2 - RCA	-	16	0	1	8	-	-	5	30	30	-	-	93	-	-	-	-	3,765	185	-
2b.1.1.3	Decontamination Projects	-	1	0	0	0	0	-	0	2	2	-	-	2	0	-	-	-	129	17	-
2b.1.1.4	Electrical - Contaminated	-	439	6	16	207	25	-	150	841	841	-	-	2,389	90	-	-	-	102,726	6,325	-
2b.1.1.5	Electrical - Decontaminated	-	2,657	41	142	2,019	-	-	993	5,852	5,852	-	-	23,344	-	-	-	-	948,013	37,107	-
2b.1.1.6	Fire - RCA	-	99	1	4	53	-	-	33	191	191	-	-	614	-	-	-	-	24,917	1,324	-
2b.1.1.7	HVAC Ductwork	-	309	7	18	231	27	-	122	713	713	-	-	2,665	100	-	-	-	114,598	4,111	-
2b.1.1.8	HVAC/Chilled Water - RCA	-	317	5	17	238	-	-	118	694	694	-	-	2,752	-	-	-	-	111,779	3,985	-
2b.1.1.9	Heating & Ventilation	-	473	15	40	521	62	-	219	1,329	1,329	-	-	6,018	227	-	-	-	258,789	7,101	-
2b.1.1.10	Heating Boiler - Insulated - RCA	-	3	0	0	2	-	-	1	6	6	-	-	26	-	-	-	-	1,058	35	-
2b.1.1.11	Liquid Radwaste	572	669	46	44	266	476	-	623	2,697	2,697	-	-	3,073	1,728	-	-	-	235,484	17,194	-
2b.1.1.12	Makeup Demin - RCA	-	101	3	9	127	-	-	46	286	286	-	-	1,471	-	-	-	-	59,747	1,412	-
2b.1.1.13	Non-Essential Diesel Generator - RCA	-	26	2	9	123	-	-	27	187	187	-	-	1,424	-	-	-	-	57,832	395	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D
Monticello Nuclear Generating Plant
Scenario 2: DECON with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2b.1.1.14	Off Gas Holdup	-	333	20	26	238	174	-	168	960	960	-	-	2,755	630	-	-	-	152,277	4,769	-
2b.1.1.15	Primary Containment	-	443	43	59	536	412	-	308	1,801	1,801	-	-	6,201	1,506	-	-	-	347,704	6,454	-
2b.1.1.16	Process Radiation Monitors	-	45	2	2	12	14	-	17	92	92	-	-	142	52	-	-	-	9,115	649	-
2b.1.1.17	Rx Bldg Closed Clng Water - Insul - RCA	-	111	2	6	85	-	-	42	245	245	-	-	977	-	-	-	-	39,675	1,484	-
2b.1.1.18	Rx Bldg Closed Clng Water - RCA	-	178	12	43	614	-	-	144	991	991	-	-	7,093	-	-	-	-	288,031	2,489	-
2b.1.1.19	Rx Component Handling Equip	26	138	19	19	100	227	-	124	653	653	-	-	1,158	829	-	-	-	99,730	2,462	-
2b.1.1.20	Rx Pressure Vessel	28	46	6	4	7	63	-	43	196	196	-	-	75	230	-	-	-	17,816	1,051	-
2b.1.1.21	Rx Water Cleanup	169	258	19	11	11	204	-	205	877	877	-	-	130	737	-	-	-	52,670	5,736	-
2b.1.1.22	Secondary Containment	-	121	7	10	88	70	-	63	360	360	-	-	1,017	255	-	-	-	57,567	1,763	-
2b.1.1.23	Service & Seal Water - Insulated - RCA	-	117	2	7	102	-	-	46	274	274	-	-	1,180	-	-	-	-	47,917	1,565	-
2b.1.1.24	Service & Seal Water - RCA	-	155	3	11	156	-	-	64	390	390	-	-	1,809	-	-	-	-	73,453	2,016	-
2b.1.1.25	Service Air Blower - RCA	-	15	0	1	18	-	-	7	41	41	-	-	206	-	-	-	-	8,364	206	-
2b.1.1.26	Solid Radwaste	327	483	36	34	206	380	-	419	1,885	1,885	-	-	2,387	1,380	-	-	-	185,221	10,820	-
2b.1.1.27	Structures & Buildings	-	76	2	3	31	23	-	30	166	166	-	-	357	85	-	-	-	19,933	1,128	-
2b.1.1.28	Wells & Domestic Water	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	144	-
2b.1.1.29	Wells & Domestic Water - RCA	-	51	1	2	30	-	-	18	101	101	-	-	342	-	-	-	-	13,874	633	-
2b.1.1	Totals	1,122	7,707	299	537	6,032	2,160	-	4,042	21,900	21,890	-	10	69,735	7,859	-	-	-	3,334,244	122,835	-
2b.1.2	Scaffolding in support of decommissioning	-	2,735	31	10	123	31	-	715	3,645	3,645	-	-	1,287	114	-	-	-	65,139	28,205	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor Building	5,006	2,817	155	347	4,159	1,007	-	4,150	17,641	17,641	-	-	48,077	7,014	-	-	-	2,317,670	112,518	-
2b.1.3.2	Admin	103	6	0	2	-	14	-	57	182	182	-	-	-	145	-	-	-	6,840	1,600	-
2b.1.3.3	HPCI Room	28	27	1	2	10	13	-	26	107	107	-	-	118	125	-	-	-	10,759	789	-
2b.1.3.4	Hot Shop	16	4	0	1	-	10	-	12	43	43	-	-	-	103	-	-	-	4,860	286	-
2b.1.3.5	LLRW Storage & Shipping	56	23	1	6	3	41	-	46	176	176	-	-	31	433	-	-	-	21,708	1,127	-
2b.1.3.6	Offgas Stack	360	256	6	16	116	73	-	283	1,109	1,109	-	-	1,343	669	-	-	-	87,045	8,860	-
2b.1.3.7	Offgas Storage & Compressor	39	17	1	4	2	30	-	32	125	125	-	-	25	316	-	-	-	15,948	785	-
2b.1.3.8	Radwaste	117	59	3	13	15	86	-	100	393	393	-	-	172	910	-	-	-	49,943	2,503	-
2b.1.3.9	Radwaste Material Storage Warehouse	62	23	1	6	-	47	-	49	189	189	-	-	-	495	-	-	-	23,400	1,197	-
2b.1.3.10	Recombiner	26	24	1	4	17	22	-	28	122	122	-	-	199	216	-	-	-	18,405	695	-
2b.1.3.11	Turbine	684	341	18	76	111	507	-	583	2,319	2,319	-	-	1,283	5,299	-	-	-	303,150	14,443	-
2b.1.3.12	Turbine Building Addition	56	20	1	6	-	41	-	44	169	169	-	-	-	434	-	-	-	20,478	1,087	-
2b.1.3	Totals	6,554	3,618	188	483	4,433	1,889	-	5,410	22,574	22,574	-	-	51,247	16,159	-	-	-	2,880,206	145,889	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan								a												
2b.1	Subtotal Period 2b Activity Costs	7,676	14,060	518	1,031	10,588	4,079	481	10,239	48,672	48,662	-	10	122,269	24,132	-	-	-	6,279,589	296,929	4,096
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	3,241	972	4,213	4,213	-	-	-	-	-	-	-	-	42,370	-
2b.2.2	Operational Equipment	-	-	19	60	624	-	-	104	807	807	-	-	11,710	-	-	-	-	292,750	32	-
2b.2.3	Security Modifications	-	-	-	-	-	-	8,696	1,304	10,000	10,000	-	-	-	-	-	-	-	-	-	-
2b.2	Subtotal Period 2b Additional Costs	-	-	19	60	624	-	11,937	2,381	15,020	15,020	-	-	11,710	-	-	-	-	292,750	42,402	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	173	-	117	299	-	474	-	261	1,325	1,325	-	-	-	1,133	-	-	-	67,962	221	-
2b.3.2	Process decommissioning chemical flush waste	1	-	41	153	-	307	-	104	606	606	-	-	-	413	-	-	-	43,978	77	-
2b.3.3	Small tool allowance	-	341	-	-	-	-	-	51	392	392	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	65,919	9,888	75,807	-	75,807	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	8,665	1,300	9,964	9,964	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	174	341	159	452	-	781	74,584	11,604	88,094	12,287	75,807	-	-	1,545	-	-	-	111,940	298	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,361	-	-	-	-	-	-	340	1,701	1,701	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	1,470	147	1,617	1,617	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	3,915	391	4,306	4,306	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,681	-	-	-	-	-	670	3,352	3,352	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	4,602	-	-	-	-	-	690	5,292	5,292	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	124	38	-	463	-	134	759	759	-	-	-	5,690	-	-	-	113,799	186	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	2,645	397	3,041	3,041	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,180	118	1,298	1,298	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	5,234	523	5,758	-	5,758	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	4,725	709	5,434	5,434	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,636	245	1,881	-	1,881	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	412	62	474	474	-	-	-	-	-	-	-	-	-	-

Table D
Monticello Nuclear Generating Plant
Scenario 2: DECON with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Period-Dependent Costs (continued)																					
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	210	32	242	-	242	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	26,840	4,026	30,867	30,867	-	-	-	-	-	-	-	-	-	457,896
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	27,122	4,068	31,191	31,191	-	-	-	-	-	-	-	-	-	309,504
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	35,641	5,346	40,988	40,988	-	-	-	-	-	-	-	-	-	574,490
2b.4	Subtotal Period 2b Period-Dependent Costs	1,361	7,283	124	38	-	463	111,268	17,935	138,473	130,592	7,881	-	-	5,690	-	-	-	113,799	186	1,341,891
2b.0	TOTAL PERIOD 2b COST	9,211	21,684	820	1,580	11,212	5,324	198,269	42,159	290,260	206,561	83,688	10	133,979	31,367	-	-	-	6,798,079	339,814	1,345,987
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	634	56	114	109	-	2,091	-	881	3,884	3,884	-	-	-	7,653	-	-	-	486,170	906	-
Disposal of Plant Systems																					
2d.1.2.1	Cranes/Heavy Loads/Rigging - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2d.1.2.2	Electrical - Contaminated Fuel Pool	-	46	1	2	21	2	-	16	87	87	-	-	240	9	-	-	-	10,334	665	-
2d.1.2.3	Electrical - Decontam. Fuel Pool Area	-	293	4	15	213	-	-	108	633	633	-	-	2,457	-	-	-	-	99,783	4,090	-
2d.1.2.4	Fire - RCA - Fuel Pool Area	-	11	0	0	5	-	-	4	20	20	-	-	62	-	-	-	-	2,499	143	-
2d.1.2.5	Fuel Pool Cooling & Cleanup	240	419	34	26	102	370	-	340	1,531	1,531	-	-	1,179	1,341	-	-	-	133,939	8,380	-
2d.1.2.6	Fuel Pool Cooling & Cleanup - Insulated	26	40	3	2	6	32	-	33	143	143	-	-	67	117	-	-	-	10,220	848	-
2d.1.2.7	HVAC Ductwork - Fuel Pool Area	-	34	1	2	26	3	-	14	79	79	-	-	296	11	-	-	-	12,733	457	-
2d.1.2.8	HVAC/Chilled Water - RCA Fuel Pool Area	-	32	0	1	19	-	-	11	64	64	-	-	223	-	-	-	-	9,072	397	-
2d.1.2.9	Instrument & Service Air-RCA-Fuel Pool	-	28	0	2	23	-	-	11	64	64	-	-	267	-	-	-	-	10,841	357	-
2d.1.2	Totals	266	907	44	51	423	408	-	537	2,637	2,637	-	-	4,894	1,479	-	-	-	293,606	15,385	-
Decontamination of Site Buildings																					
2d.1.3.1	Reactor (Post Fuel)	911	2,485	145	669	170	8,544	-	3,353	16,277	16,277	-	-	1,969	62,698	-	-	-	2,732,406	45,703	-
2d.1.3	Totals	911	2,485	145	669	170	8,544	-	3,353	16,277	16,277	-	-	1,969	62,698	-	-	-	2,732,406	45,703	-
2d.1.4	Scaffolding in support of decommissioning	-	547	6	2	25	6	-	143	729	729	-	-	257	23	-	-	-	13,028	5,641	-
2d.1	Subtotal Period 2d Activity Costs	1,811	3,994	309	831	618	11,049	-	4,915	23,527	23,527	-	-	7,120	71,852	-	-	-	3,525,210	67,635	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,291	387	1,678	1,678	-	-	-	-	-	-	-	-	-	12,480
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,198	359	1,557	1,557	-	-	-	-	-	-	-	-	15,661	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,489	747	3,235	3,235	-	-	-	-	-	-	-	-	15,661	12,480
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	69	-	47	120	-	191	-	105	533	533	-	-	-	457	-	-	-	27,391	89	-
2d.3.2	Process decommissioning chemical flush waste	1	-	25	92	-	185	-	63	366	366	-	-	-	249	-	-	-	26,553	47	-
2d.3.3	Small tool allowance	-	88	-	-	-	-	-	13	101	101	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	143	55	575	145	-	145	1,062	1,062	-	-	6,000	529	-	-	-	303,608	147	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	27,061	4,059	31,120	-	31,120	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	70	88	216	267	575	521	27,061	4,385	33,182	2,062	31,120	-	6,000	1,235	-	-	-	357,552	283	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	219	-	-	-	-	-	-	55	274	274	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,336	134	1,470	1,470	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	752	-	-	-	-	-	188	940	940	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,701	-	-	-	-	-	255	1,956	1,956	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	44	14	-	165	-	48	271	271	-	-	-	2,030	-	-	-	40,600	66	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	521	78	600	600	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	369	37	405	405	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,935	193	2,128	-	2,128	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	305	46	351	351	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	9,608	1,441	11,049	7,668	3,381	-	-	-	-	-	-	-	-	162,981
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,941	1,041	7,982	7,982	-	-	-	-	-	-	-	-	-	78,356
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	9,556	1,433	10,989	10,132	857	-	-	-	-	-	-	-	-	149,660
2d.4	Subtotal Period 2d Period-Dependent Costs	219	2,453	44	14	-	165	33,025	5,290	41,210	34,754	6,456	-	-	2,030	-	-	-	40,600	66	390,997
2d.0	TOTAL PERIOD 2d COST	2,099	6,535	569	1,112	1,193	11,735	62,574	15,337	101,154	63,579	37,575	-	13,120	75,117	-	-	-	3,923,362	83,645	403,477

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

Table D
Monticello Nuclear Generating Plant
Scenario 2: DECON with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	43	7	50	-	50	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,232	185	1,417	1,367	50	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,285	128	1,413	1,413	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	597	-	-	-	-	-	149	747	747	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	8	2	-	29	-	8	47	47	-	-	-	355	-	-	-	7,097	12	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	261	39	300	300	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	420	42	463	463	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	103	10	113	-	113	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	9,608	1,441	11,049	7,668	3,381	-	-	-	-	-	-	-	-	162,981
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	5,174	776	5,950	5,950	-	-	-	-	-	-	-	-	-	57,200
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	5,456	818	6,274	5,415	860	-	-	-	-	-	-	-	-	80,707
2f.4	Subtotal Period 2f Period-Dependent Costs	-	597	8	2	-	29	24,761	3,754	29,152	24,708	4,443	-	-	355	-	-	-	7,097	12	300,888
2f.0	TOTAL PERIOD 2f COST	-	597	8	2	-	29	33,511	6,194	40,341	35,848	4,493	-	-	355	-	-	-	7,097	96,208	307,128
PERIOD 2 TOTALS		13,170	62,856	20,629	9,399	25,814	56,415	406,552	120,800	715,636	568,562	147,006	68	288,110	174,575	1,481	1,010	-	21,522,450	804,895	3,049,889
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor Building	-	1,881	-	-	-	-	-	282	2,163	-	-	2,163	-	-	-	-	-	-	13,966	-
3b.1.1.2	Condensate Tanks Foundation	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	50	-
3b.1.1.3	Discharge Retention Basin	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	25	-
3b.1.1.4	HPCI Room	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	97	-
3b.1.1.5	Hot Shop	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	177	-
3b.1.1.6	Hydrogen & Oxygen Storage	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	19	-
3b.1.1.7	LLRW Storage & Shipping	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	662	-
3b.1.1.8	MSIV	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	42	-
3b.1.1.9	Misc Structures 2017	-	759	-	-	-	-	-	114	872	-	-	872	-	-	-	-	-	-	7,919	-
3b.1.1.10	Offgas Stack	-	104	-	-	-	-	-	16	120	-	-	120	-	-	-	-	-	-	544	-
3b.1.1.11	Offgas Storage & Compressor	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	199	-
3b.1.1.12	Radwaste	-	219	-	-	-	-	-	33	252	-	-	252	-	-	-	-	-	-	1,220	-
3b.1.1.13	Recombiner	-	123	-	-	-	-	-	18	141	-	-	141	-	-	-	-	-	-	713	-
3b.1.1.14	Security Barrier	-	179	-	-	-	-	-	27	206	-	-	206	-	-	-	-	-	-	933	-
3b.1.1.15	Structures Greater than 3' Below Grade	-	2,380	-	-	-	-	-	357	2,738	-	-	2,738	-	-	-	-	-	-	12,649	-
3b.1.1.16	Tank Farm	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	21	-
3b.1.1.17	Turbine	-	1,175	-	-	-	-	-	176	1,351	-	-	1,351	-	-	-	-	-	-	13,091	-
3b.1.1.18	Turbine Building Addition	-	51	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	618	-
3b.1.1.19	Turbine Pedestal	-	175	-	-	-	-	-	26	202	-	-	202	-	-	-	-	-	-	926	-
3b.1.1	Totals	-	7,219	-	-	-	-	-	1,083	8,302	-	-	8,302	-	-	-	-	-	-	53,870	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D
Monticello Nuclear Generating Plant
Scenario 2: DECON with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	864	-	-	-	-	-	130	994	-	-	994	-	-	-	-	-	-	1,841	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,083	-	-	-	-	183	1,240	9,506	211	-	9,295	-	-	-	-	-	-	55,711	1,560
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	3,297	-	-	-	-	11	496	3,805	-	-	3,805	-	-	-	-	-	-	12	-
3b.2.2	Excavation of Underground Services	-	1,380	-	-	-	-	947	349	2,677	-	-	2,677	-	-	-	-	-	-	13,475	-
3b.2.3	Intake Structure Cofferdam	-	320	-	-	-	-	-	48	368	-	-	368	-	-	-	-	-	-	2,584	-
3b.2.4	Construction Debris	-	-	-	-	-	-	350	53	403	-	-	403	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	5,102	-	-	-	-	-	765	5,868	-	-	5,868	-	-	-	-	-	-	5,422	-
3b.2	Subtotal Period 3b Additional Costs	-	10,100	-	-	-	-	1,309	1,711	13,120	-	-	13,120	-	-	-	-	-	-	21,493	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	97	-	-	-	-	-	15	111	-	-	111	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	100	15	115	-	115	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	97	-	-	-	-	100	30	226	-	115	111	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	1,251	125	1,376	-	1,376	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	2,737	274	3,011	-	3,011	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	5,455	-	-	-	-	-	818	6,273	-	-	6,273	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	300	45	345	-	-	345	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	386	39	424	-	424	-	-	-	424	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	237	24	261	-	261	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	1,260	189	1,450	-	-	1,450	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	179	27	206	-	206	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	497	75	572	-	-	572	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	22,115	3,317	25,432	(0)	7,782	17,650	-	-	-	-	-	-	-	375,152
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	11,290	1,693	12,983	-	-	12,983	-	-	-	-	-	-	-	122,646
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	6,583	987	7,571	-	1,976	5,595	-	-	-	-	-	-	-	98,297
3b.4	Subtotal Period 3b Period-Dependent Costs	-	5,455	-	-	-	-	46,836	7,613	59,904	(0)	15,036	44,868	-	-	-	-	-	-	-	596,095
3b.0	TOTAL PERIOD 3b COST	-	23,734	-	-	-	-	48,428	10,594	82,756	211	15,152	67,394	-	-	-	-	-	-	77,204	597,655
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	59,208	8,881	68,089	-	68,089	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	59,208	8,881	68,089	-	68,089	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	28,205	2,821	31,026	-	31,026	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	24,796	2,480	27,276	-	27,276	-	-	-	-	-	-	-	-	-
3c.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	8,697	870	9,567	-	9,567	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	5,348	535	5,883	-	5,883	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	9,721	1,458	11,179	-	11,179	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	4,037	606	4,643	-	4,643	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	4,510	677	5,187	-	5,187	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	152,513	22,877	175,389	-	175,389	-	-	-	-	-	-	-	-	2,114,750
3c.4.10	Utility Staff Cost	-	-	-	-	-	-	38,674	5,801	44,475	-	44,475	-	-	-	-	-	-	-	-	549,022
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	276,502	38,123	314,624	-	314,624	-	-	-	-	-	-	-	-	2,663,772
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	335,709	47,004	382,713	-	382,713	-	-	-	-	-	-	-	-	2,663,772

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Table D
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Scenario 2: DECON with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
3d.1.1	Totals	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	23,942	3,591	27,533	-	27,533	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	23,942	3,591	27,533	-	27,533	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	9,383	938	10,321	-	10,321	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	6,703	670	7,374	-	7,374	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4,257	426	4,683	-	4,683	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs (continued)																					
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,779	178	1,957	-	1,957	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	3,234	485	3,719	-	3,719	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,343	201	1,544	-	1,544	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,500	225	1,725	-	1,725	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	50,734	7,610	58,344	-	58,344	-	-	-	-	-	-	-	-	703,485
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	12,865	1,930	14,795	-	14,795	-	-	-	-	-	-	-	-	182,635
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	91,799	12,664	104,462	-	104,462	-	-	-	-	-	-	-	-	886,120
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	6,552	115,740	17,571	141,194	9,199	131,995	-	-	-	-	-	1,547	311,184	-	886,120
PERIOD 3e - ISFSI Decontamination																					
Period 3e Additional Costs																					
3e.2.1	Decommissioning of ISFSI	-	131	3	784	-	8,058	1,865	2,710	13,551	13,551	-	-	-	27,284	-	-	-	3,860,412	11,160	1,848
3e.2	Subtotal Period 3e Additional Costs	-	131	3	784	-	8,058	1,865	2,710	13,551	13,551	-	-	-	27,284	-	-	-	3,860,412	11,160	1,848
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	110	28	138	138	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	244	61	304	304	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	82	21	103	103	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	38	10	48	48	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	308	77	385	385	-	-	-	-	-	-	-	-	-	4,999
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	260	65	325	325	-	-	-	-	-	-	-	-	-	3,792
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	1,042	261	1,303	1,303	-	-	-	-	-	-	-	-	-	8,792
3e.0	TOTAL PERIOD 3e COST	-	131	3	784	-	8,058	2,907	2,971	14,854	14,854	-	-	-	27,284	-	-	-	3,860,412	11,160	10,640
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	1,766	-	-	-	-	185	293	2,244	-	-	2,244	-	-	-	-	-	-	8,537	160
3f.2	Subtotal Period 3f Additional Costs	-	1,766	-	-	-	-	185	293	2,244	-	-	2,244	-	-	-	-	-	-	8,537	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	-	-

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Table D
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Scenario 2: DECON with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	123	12	135	-	-	135	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	123	-	-	-	-	-	19	142	-	-	142	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	29	4	33	-	-	33	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	42	6	48	-	-	48	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	19	3	22	-	-	22	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	155	23	179	-	-	179	-	-	-	-	-	-	-	2,520
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	103	16	119	-	-	119	-	-	-	-	-	-	-	1,564
3f.4	Subtotal Period 3f Period-Dependent Costs	-	123	-	-	-	-	471	83	678	-	-	678	-	-	-	-	-	-	-	4,084
3f.0	TOTAL PERIOD 3f COST	-	1,903	-	-	-	-	656	378	2,937	-	-	2,937	-	-	-	-	-	-	8,537	4,244
PERIOD 3 TOTALS		-	25,768	1,335	784	-	14,610	503,441	78,517	624,455	24,264	529,860	70,331	-	27,284	-	-	1,547	4,171,597	96,902	4,162,431
TOTAL COST TO DECOMMISSION		16,489	91,483	22,061	10,357	25,828	72,171	1,054,685	222,778	1,515,850	759,047	685,479	71,324	288,153	203,059	1,711	1,010	1,547	25,757,230	933,647	8,407,016

TOTAL COST TO DECOMMISSION WITH 17.23% CONTINGENCY:	\$1,515,850	thousands of 2017	dollars
TOTAL NRC LICENSE TERMINATION COST IS 50.07% OR:	\$759,047	thousands of 2017	dollars
SPENT FUEL MANAGEMENT COST IS 45.22% OR:	\$685,479	thousands of 2017	dollars
NON-NUCLEAR DEMOLITION COST IS 4.71% OR:	\$71,324	thousands of 2017	dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	205,780	cubic feet	
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	1,547	cubic feet	
TOTAL SCRAP METAL REMOVED:	22,696	tons	
TOTAL CRAFT LABOR REQUIREMENTS:	933,647	man-hours	

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

***Monticello Nuclear Generating Plant
Decommissioning Cost Analysis***

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APPENDIX E

DETAILED COST ANALYSIS

SCENARIO 3: DECON with 100 Year DFS

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Table E
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Scenario 3: DECON with 100 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	578	87	664	598	-	66	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Sacrificial shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Moisture separators/reheaters	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1a.1.17.10	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1a.1.17.11	Pressure suppression structure	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.17.12	Drywell	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	1,600
1a.1.17.13	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
1a.1.17.14	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.15	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	5,010	752	5,762	5,260	-	502	-	-	-	-	-	-	-	42,683
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlp/s/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	15,344	2,302	17,646	17,144	-	502	-	-	-	-	-	-	-	83,013
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,221	183	1,404	-	1,404	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	9,892	1,484	11,376	11,376	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,113	1,667	12,779	11,376	1,404	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	2,408	241	2,649	2,649	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,242	224	2,466	2,466	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,730	259	1,989	1,989	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	3,166	317	3,482	-	3,482	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	2,833	425	3,258	3,258	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	803	120	923	-	923	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	115	17	133	133	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	14,260	2,139	16,399	16,399	-	-	-	-	-	-	-	-	-	245,440
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	54,561	7,966	63,676	59,153	4,524	-	-	610	-	-	-	12,190	20	667,680

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Table E
Monticello Nuclear Generating Plant
Scenario 3: DECON with 100 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	81,017	11,935	94,101	87,672	5,927	502	-	610	-	-	-	12,190	20	750,693
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	470	70	540	540	-	-	-	-	-	-	-	-	-	4,000
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD housings & NIs	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Removal primary containment	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
1b.1.1.10	Sacrificial shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.11	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
1b.1.1.12	Main Turbine	-	-	-	-	-	-	244	37	281	281	-	-	-	-	-	-	-	-	-	2,080
1b.1.1.13	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1b.1.1.14	Moisture separators & reheaters	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1b.1.1.15	Radwaste building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1.16	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,961	594	4,555	4,132	-	423	-	-	-	-	-	-	-	33,741
1b.1.2	Decon NSSS	286	-	-	-	-	-	-	143	429	429	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	286	-	-	-	-	-	3,961	737	4,984	4,561	-	423	-	-	-	-	-	-	1,067	33,741
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	6,446	1,934	8,380	8,380	-	-	-	-	-	-	-	-	30,500	10,852
1b.2.3	Mixed & RCRA Waste	-	-	29	19	13	-	-	8	69	69	-	-	43	-	-	-	-	5,253	163	-
1b.2	Subtotal Period 1b Additional Costs	-	-	29	19	13	-	18,137	3,695	21,894	21,894	-	-	43	-	-	-	-	5,253	30,663	10,852
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	37	-	24	61	-	98	-	54	275	275	-	-	-	233	-	-	-	13,986	45	-
1b.3.4	Process decommissioning chemical flush waste	1	-	23	85	-	969	-	258	1,336	1,336	-	-	-	-	231	-	-	24,599	43	-
1b.3.5	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,557	383	2,940	-	2,940	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	6,362	954	7,316	7,316	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,997	1,202	47	147	-	1,067	10,107	2,453	18,020	15,080	2,940	-	-	233	231	-	-	38,585	89	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	1,207	121	1,328	1,328	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,104	110	1,214	1,214	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	290	-	-	-	-	-	73	363	363	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	284	-	-	-	-	-	43	327	327	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	8	2	-	29	-	8	48	48	-	-	-	358	-	-	-	7,159	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,735	260	1,995	1,995	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	321	32	353	353	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,587	159	1,746	-	1,746	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	1,420	213	1,633	1,633	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	402	60	463	-	463	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	52	8	60	-	60	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	58	9	67	67	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	7,150	1,072	8,222	8,222	-	-	-	-	-	-	-	-	-	123,056
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	5,625	844	6,469	6,469	-	-	-	-	-	-	-	-	-	63,614
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	13,003	1,950	14,953	14,953	-	-	-	-	-	-	-	-	-	212,741
1b.4	Subtotal Period 1b Period-Dependent Costs	35	575	8	2	-	29	33,663	4,971	39,283	37,015	2,268	-	-	358	-	-	-	7,159	12	399,411
1b.0	TOTAL PERIOD 1b COST	3,318	1,777	84	169	13	1,096	65,868	11,856	84,181	78,550	5,208	423	43	591	231	-	-	50,997	31,830	444,004
PERIOD 1 TOTALS		3,318	2,859	97	173	13	1,146	146,886	23,790	178,282	166,222	11,136	925	43	1,201	231	-	-	63,188	31,850	1,194,697

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Scenario 3: DECON with 100 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs		Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	Contractor Manhours
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Recirculation System Piping & Valves	107	92	30	39	-	429	-	192	888	888	-	-	-	1,430	-	-	-	99,742	2,905	-
2a.1.1.2	Recirculation Pumps & Motors	38	59	16	40	22	438	-	154	767	767	-	-	96	945	-	-	-	112,200	1,563	-
2a.1.1.3	CRDMs & NIs Removal	187	1,022	402	105	-	919	-	635	3,269	3,269	-	-	-	3,741	-	-	-	213,700	17,768	-
2a.1.1.4	Reactor Vessel Internals	222	6,378	12,908	2,835	-	20,148	356	18,958	61,806	61,806	-	-	-	1,252	1,481	1,010	-	312,338	30,765	1,389
2a.1.1.5	Reactor Vessel	109	8,595	2,644	1,170	-	5,294	356	10,155	28,323	28,323	-	-	-	16,169	-	-	-	1,105,210	30,765	1,389
2a.1.1	Totals	663	16,147	15,999	4,189	22	27,228	711	30,094	95,053	95,053	-	-	96	23,536	1,481	1,010	-	1,843,190	83,767	2,778
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	362	1,496	349	3,174	357	-	858	6,596	6,596	-	-	24,835	1,383	-	-	-	1,577,959	5,438	-
2a.1.3	Main Condensers	-	1,245	397	128	1,667	198	-	670	4,306	4,306	-	-	17,396	727	-	-	-	828,955	18,831	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor Building	-	317	-	-	-	-	-	48	364	364	-	-	-	-	-	-	-	-	2,217	-
2a.1.4.2	Radwaste	-	24	-	-	-	-	-	4	27	27	-	-	-	-	-	-	-	-	127	-
2a.1.4.3	Turbine	-	118	-	-	-	-	-	18	136	136	-	-	-	-	-	-	-	-	1,254	-
2a.1.4	Totals	-	459	-	-	-	-	-	69	528	528	-	-	-	-	-	-	-	-	3,598	-
Disposal of Plant Systems																					
2a.1.5.1	Automatic Press Relief	-	115	7	8	69	57	-	55	311	311	-	-	803	206	-	-	-	45,852	1,656	-
2a.1.5.2	Chemistry Sampling	-	27	1	1	13	10	-	12	65	65	-	-	156	37	-	-	-	8,681	400	-
2a.1.5.3	Chemistry Sampling - Insulated	-	2	0	0	-	0	-	1	3	3	-	-	-	1	-	-	-	72	28	-
2a.1.5.4	Circulating Water - RCA	-	202	12	41	576	-	-	144	974	974	-	-	6,656	-	-	-	-	270,307	2,860	-
2a.1.5.5	Combustible Gas Control - Insul - RCA	-	29	0	1	18	-	-	10	59	59	-	-	212	-	-	-	-	8,617	378	-
2a.1.5.6	Combustible Gas Control - RCA	-	18	0	2	25	-	-	8	53	53	-	-	285	-	-	-	-	11,577	245	-
2a.1.5.7	Condensate & Feedwater	-	946	189	226	1,725	2,003	-	1,049	6,138	6,138	-	-	19,947	7,319	-	-	-	1,275,810	14,196	-
2a.1.5.8	Condensate & Feedwater - Insulated	-	480	34	43	361	332	-	267	1,517	1,517	-	-	4,176	1,207	-	-	-	246,693	6,964	-
2a.1.5.9	Condensate Demin	-	533	29	35	289	276	-	254	1,416	1,416	-	-	3,346	1,000	-	-	-	199,936	7,618	-
2a.1.5.10	Condensate Storage	-	706	31	55	617	219	-	335	1,963	1,963	-	-	7,131	795	-	-	-	340,568	10,345	-
2a.1.5.11	Control Rod Drive	-	3	0	0	2	1	-	1	7	7	-	-	19	4	-	-	-	1,009	41	-
2a.1.5.12	Control Rod Drive Hydraulic	-	405	16	18	143	155	-	166	902	902	-	-	1,658	562	-	-	-	103,306	5,898	-
2a.1.5.13	Core Spray	-	75	19	34	379	143	-	119	770	770	-	-	4,384	521	-	-	-	211,329	1,163	-
2a.1.5.14	Core Spray - Insulated	-	141	8	9	71	73	-	66	368	368	-	-	818	264	-	-	-	50,149	2,033	-
2a.1.5.15	Demin Water - Insulated - RCA	-	15	0	1	7	-	-	5	27	27	-	-	85	-	-	-	-	3,445	181	-
2a.1.5.16	Demin Water - RCA	-	40	0	2	22	-	-	14	78	78	-	-	253	-	-	-	-	10,278	508	-
2a.1.5.17	Diesel Oil - RCA	-	2	0	0	2	-	-	1	5	5	-	-	23	-	-	-	-	931	25	-
2a.1.5.18	Drywell Atmosphere Cooling - RCA	-	37	1	3	47	-	-	17	105	105	-	-	548	-	-	-	-	22,244	550	-
2a.1.5.19	EDG Emerg Service Water - Insul - RCA	-	0	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	84	4	-
2a.1.5.20	Electrical - Clean	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	182	-
2a.1.5.21	Emergency Service Water - Insul - RCA	-	21	0	1	12	-	-	7	41	41	-	-	137	-	-	-	-	5,544	281	-
2a.1.5.22	Emergency Service Water - RCA	-	2	0	0	1	-	-	1	4	4	-	-	13	-	-	-	-	512	22	-
2a.1.5.23	GEZIP - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2a.1.5.24	Generator Physical Design - RCA	-	5	0	0	3	-	-	2	9	9	-	-	31	-	-	-	-	1,250	67	-
2a.1.5.25	H2-O2 Control Analyzing	-	6	0	0	0	4	-	3	13	13	-	-	6	13	-	-	-	1,080	81	-
2a.1.5.26	H2-O2 Control Analyzing - Insulated	-	6	0	0	0	4	-	3	13	13	-	-	6	13	-	-	-	1,080	81	-
2a.1.5.27	High Pressure Coolant Injection	-	64	6	9	84	57	-	45	266	266	-	-	972	209	-	-	-	52,792	966	-
2a.1.5.28	High Pressure Coolant Injection - Insula	-	214	14	17	138	133	-	111	627	627	-	-	1,598	481	-	-	-	95,733	3,079	-
2a.1.5.29	Hydrogen Cooling	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	118	-
2a.1.5.30	Hydrogen Cooling - RCA	-	7	0	0	3	-	-	2	13	13	-	-	39	-	-	-	-	1,600	79	-
2a.1.5.31	Hydrogen Seal Oil - RCA	-	17	0	1	16	-	-	7	42	42	-	-	189	-	-	-	-	7,669	212	-
2a.1.5.32	Hydrogen Water Chemistry - RCA	-	24	0	1	12	-	-	8	45	45	-	-	140	-	-	-	-	5,672	304	-
2a.1.5.33	Instrument & Service Air - RCA	-	220	3	11	153	-	-	80	466	466	-	-	1,768	-	-	-	-	71,810	2,733	-
2a.1.5.34	Main Condenser	-	191	12	14	115	113	-	97	542	542	-	-	1,333	411	-	-	-	80,439	2,746	-
2a.1.5.35	Main Steam	-	243	17	22	186	163	-	134	764	764	-	-	2,148	594	-	-	-	125,135	3,512	-
2a.1.5.36	Main Turbine	-	972	214	244	1,709	2,375	-	1,151	6,665	6,665	-	-	19,760	8,687	-	-	-	1,354,661	14,733	-
2a.1.5.37	Main Turbine - Insulated	-	209	19	25	219	183	-	136	790	790	-	-	2,530	667	-	-	-	145,208	3,069	-
2a.1.5.38	Miscellaneous	-	42	1	2	26	-	-	15	85	85	-	-	302	-	-	-	-	12,283	622	-
2a.1.5.39	Off Gas Recombiner	-	182	19	22	155	209	-	126	714	714	-	-	1,795	764	-	-	-	121,554	2,708	-
2a.1.5.40	Off Gas Recombiner - Insulated	-	379	19	19	118	195	-	166	897	897	-	-	1,366	709	-	-	-	100,933	5,385	-
2a.1.5.41	Post Accident Sampling	-	24	1	1	5	9	-	9	50	50	-	-	53	33	-	-	-	4,318	345	-
2a.1.5.42	Post Accident Sampling - Insulated	-	16	1	1	1	11	-	7	37	37	-	-	17	37	-	-	-	3,116	212	-
2a.1.5.43	RHR Service Water - Insulated - RCA	-	81	3	9	128	-	-	41	262	262	-	-	1,485	-	-	-	-	60,293	1,125	-
2a.1.5.44	RHR Service Water - RCA	-	4	0	0	3	-	-	1	9	9	-	-	35	-	-	-	-	1,410	57	-
2a.1.5.45	Reactor Feedwater Pump Seal	-	55	3	3	17	26	-	23	126	126	-	-	193	96	-	-	-	14,009	773	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table E
Monticello Nuclear Generating Plant
Scenario 3: DECON with 100 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /	Craft Manhours	Utility and
						Processing Costs	Disposal Costs				Lic. Term. Costs				Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.		Contractor Manhours
Disposal of Plant Systems (continued)																					
2a.1.5.46	Residual Heat Removal	349	240	168	126	554	1,667	-	770	3,875	3,875	-	-	6,406	6,012	-	-	-	647,941	4,135	-
2a.1.5.47	Residual Heat Removal - Insulated	602	540	64	58	291	715	-	674	2,944	2,944	-	-	3,367	2,607	-	-	-	303,087	10,340	-
2a.1.5.48	Rx Core Isolation Cooling	-	47	2	3	22	21	-	21	116	116	-	-	259	76	-	-	-	15,396	691	-
2a.1.5.49	Rx Core Isolation Cooling - Insulated	-	105	5	5	25	55	-	45	240	240	-	-	288	198	-	-	-	24,419	1,479	-
2a.1.5.50	Rx Recirculation	56	57	6	3	4	53	-	57	235	235	-	-	43	190	-	-	-	14,095	1,580	-
2a.1.5.51	Snubbers	-	168	2	4	33	25	-	54	285	285	-	-	377	90	-	-	-	21,009	2,548	-
2a.1.5.52	Standby Liquid Control - Insul - RCA	-	4	0	0	2	-	-	1	7	7	-	-	22	-	-	-	-	904	48	-
2a.1.5.53	Standby Liquid Control - RCA	-	26	0	1	21	-	-	10	59	59	-	-	245	-	-	-	-	9,969	341	-
2a.1.5.54	Stator Cooling - RCA	-	7	0	1	11	-	-	4	23	23	-	-	126	-	-	-	-	5,135	98	-
2a.1.5.55	Traversing Incore Probe	0	4	0	0	0	2	-	1	7	7	-	-	1	5	-	-	-	386	51	-
2a.1.5	Totals	1,007	7,978	931	1,079	8,447	9,287	-	6,340	35,068	35,046	-	22	97,654	33,808	-	-	-	6,125,515	119,943	-
2a.1.6	Scaffolding in support of decommissioning	-	2,188	25	8	99	25	-	572	2,916	2,916	-	-	1,030	91	-	-	-	52,111	22,564	-
2a.1	Subtotal Period 2a Activity Costs	1,669	28,379	18,848	5,754	13,409	37,095	711	38,602	144,467	144,445	-	22	141,010	59,545	1,481	1,010	-	10,427,730	254,140	2,778
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,326	698	3,024	3,024	-	-	-	-	-	-	-	-	30,411	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	2,326	698	3,024	3,024	-	-	-	-	-	-	-	-	30,411	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	83	-	55	140	-	222	-	123	623	623	-	-	-	531	-	-	-	31,838	103	-
2a.3.2	Process decommissioning chemical flush waste	6	-	208	774	-	1,557	-	529	3,075	3,075	-	-	-	2,093	-	-	-	223,008	392	-
2a.3.3	Small tool allowance	-	315	-	-	-	-	-	47	363	326	-	36	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	23,173	3,476	26,649	-	26,649	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	13,235	1,985	15,221	15,221	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	89	315	263	914	-	1,779	36,408	6,161	45,930	19,245	26,649	36	-	2,623	-	-	-	254,846	495	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	102	-	-	-	-	-	-	25	127	127	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	1,055	106	1,161	1,161	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	3,061	306	3,367	3,367	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,133	-	-	-	-	-	533	2,666	2,666	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,212	-	-	-	-	-	482	3,694	3,694	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	122	37	-	453	-	131	743	743	-	-	-	5,567	-	-	-	111,335	182	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	2,404	361	2,765	2,765	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	847	85	932	932	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	3,757	376	4,133	-	4,133	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	3,392	509	3,900	3,900	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,174	176	1,350	-	1,350	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	151	23	174	-	174	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	466	70	536	536	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	19,265	2,890	22,154	22,154	-	-	-	-	-	-	-	-	-	328,651
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	20,125	3,019	23,144	23,144	-	-	-	-	-	-	-	-	-	231,273
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	26,670	4,000	30,670	30,670	-	-	-	-	-	-	-	-	-	430,594
2a.4	Subtotal Period 2a Period-Dependent Costs	102	5,345	122	37	-	453	82,366	13,090	101,515	95,858	5,657	-	-	5,567	-	-	-	111,335	182	990,519
2a.0	TOTAL PERIOD 2a COST	1,860	34,039	19,233	6,705	13,409	39,327	121,812	58,551	294,937	262,573	32,305	58	141,010	67,735	1,481	1,010	-	10,793,910	285,228	993,297
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	ALARA/Radiological	-	18	0	0	3	3	-	6	30	30	-	-	35	10	-	-	-	2,060	277	-
2b.1.1.2	Alternate N2 - RCA	-	16	0	1	8	-	-	5	30	30	-	-	93	-	-	-	-	3,765	185	-
2b.1.1.3	Decontamination Projects	-	1	0	0	0	0	-	0	2	2	-	-	2	0	-	-	-	129	17	-
2b.1.1.4	Electrical - Contaminated	-	439	6	16	207	25	-	150	841	841	-	-	2,389	90	-	-	-	102,726	6,325	-
2b.1.1.5	Electrical - Decontaminated	-	2,657	41	142	2,019	-	-	993	5,852	5,852	-	-	23,344	-	-	-	-	948,013	37,107	-
2b.1.1.6	Fire - RCA	-	99	1	4	53	-	-	33	191	191	-	-	614	-	-	-	-	24,917	1,324	-
2b.1.1.7	HVAC Ductwork	-	309	7	18	231	27	-	122	713	713	-	-	2,665	100	-	-	-	114,598	4,111	-
2b.1.1.8	HVAC/Chilled Water - RCA	-	317	5	17	238	-	-	118	694	694	-	-	2,752	-	-	-	-	111,779	3,985	-
2b.1.1.9	Heating & Ventilation	-	473	15	40	521	62	-	219	1,329	1,329	-	-	6,018	227	-	-	-	258,789	7,101	-
2b.1.1.10	Heating Boiler - Insulated - RCA	-	3	0	0	2	-	-	1	6	6	-	-	26	-	-	-	-	1,058	35	-
2b.1.1.11	Liquid Radwaste	572	669	46	44	266	476	-	623	2,697	2,697	-	-	3,073	1,728	-	-	-	235,484	17,194	-
2b.1.1.12	Makeup Demin - RCA	-	101	3	9	127	-	-	46	286	286	-	-	1,471	-	-	-	-	59,747	1,412	-
2b.1.1.13	Non-Essential Diesel Generator - RCA	-	26	2	9	123	-	-	27	187	187	-	-	1,424	-	-	-	-	57,832	395	-

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Table E
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Scenario 3: DECON with 100 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and				
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs		Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	Contractor Manhours				
Disposal of Plant Systems (continued)																									
2b.1.1.14	Off Gas Holdup	-	333	20	26	238	174	-	168	960	960	-	-	2,755	630	-	-	-	152,277	4,769	-				
2b.1.1.15	Primary Containment	-	443	43	59	536	412	-	308	1,801	1,801	-	-	6,201	1,506	-	-	-	347,704	6,454	-				
2b.1.1.16	Process Radiation Monitors	-	45	2	2	12	14	-	17	92	92	-	-	142	52	-	-	-	9,115	649	-				
2b.1.1.17	Rx Bldg Closed Clnг Water - Insul - RCA	-	111	2	6	85	-	-	42	245	245	-	-	977	-	-	-	-	39,675	1,484	-				
2b.1.1.18	Rx Bldg Closed Clnг Water - RCA	-	178	12	43	614	-	-	144	991	991	-	-	7,093	-	-	-	-	288,031	2,489	-				
2b.1.1.19	Rx Component Handling Equip	26	138	19	19	100	227	-	124	653	653	-	-	1,158	829	-	-	-	99,730	2,462	-				
2b.1.1.20	Rx Pressure Vessel	28	46	6	4	7	63	-	43	196	196	-	-	75	230	-	-	-	17,816	1,051	-				
2b.1.1.21	Rx Water Cleanup	169	258	19	11	11	204	-	205	877	877	-	-	130	737	-	-	-	52,670	5,736	-				
2b.1.1.22	Secondary Containment	-	121	7	10	88	70	-	63	360	360	-	-	1,017	255	-	-	-	57,567	1,763	-				
2b.1.1.23	Service & Seal Water - Insulated - RCA	-	117	2	7	102	-	-	46	274	274	-	-	1,180	-	-	-	-	47,917	1,565	-				
2b.1.1.24	Service & Seal Water - RCA	-	155	3	11	156	-	-	64	390	390	-	-	1,809	-	-	-	-	73,453	2,016	-				
2b.1.1.25	Service Air Blower - RCA	-	15	0	1	18	-	-	7	41	41	-	-	206	-	-	-	-	8,364	206	-				
2b.1.1.26	Solid Radwaste	327	483	36	34	206	380	-	419	1,885	1,885	-	-	2,387	1,380	-	-	-	185,221	10,820	-				
2b.1.1.27	Structures & Buildings	-	76	2	3	31	23	-	30	166	166	-	-	357	85	-	-	-	19,933	1,128	-				
2b.1.1.28	Wells & Domestic Water	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	144	-				
2b.1.1.29	Wells & Domestic Water - RCA	-	51	1	2	30	-	-	18	101	101	-	-	342	-	-	-	-	13,874	633	-				
2b.1.1	Totals	1,122	7,707	299	537	6,032	2,160	-	4,042	21,900	21,890	-	10	69,735	7,859	-	-	-	3,334,244	122,835	-				
2b.1.2	Scaffolding in support of decommissioning	-	2,735	31	10	123	31	-	715	3,645	3,645	-	-	1,287	114	-	-	-	65,139	28,205	-				
Decontamination of Site Buildings																									
2b.1.3.1	Reactor Building	5,006	2,817	155	347	4,159	1,007	-	4,150	17,641	17,641	-	-	48,077	7,014	-	-	-	2,317,670	112,518	-				
2b.1.3.2	Admin	103	6	0	2	-	14	-	57	182	182	-	-	-	145	-	-	-	6,840	1,600	-				
2b.1.3.3	HPCI Room	28	27	1	2	10	13	-	26	107	107	-	-	118	125	-	-	-	10,759	789	-				
2b.1.3.4	Hot Shop	16	4	0	1	-	10	-	12	43	43	-	-	-	103	-	-	-	4,860	286	-				
2b.1.3.5	LLRW Storage & Shipping	56	23	1	6	3	41	-	46	176	176	-	-	31	433	-	-	-	21,708	1,127	-				
2b.1.3.6	Offgas Stack	360	256	6	16	116	73	-	283	1,109	1,109	-	-	1,343	669	-	-	-	87,045	8,860	-				
2b.1.3.7	Offgas Storage & Compressor	39	17	1	4	2	30	-	32	125	125	-	-	25	316	-	-	-	15,948	785	-				
2b.1.3.8	Radwaste	117	59	3	13	15	86	-	100	393	393	-	-	172	910	-	-	-	49,943	2,503	-				
2b.1.3.9	Radwaste Material Storage Warehouse	62	23	1	6	-	47	-	49	189	189	-	-	-	495	-	-	-	23,400	1,197	-				
2b.1.3.10	Recombiner	26	24	1	4	17	22	-	28	122	122	-	-	199	216	-	-	-	18,405	695	-				
2b.1.3.11	Turbine	684	341	18	76	111	507	-	583	2,319	2,319	-	-	1,283	5,299	-	-	-	303,150	14,443	-				
2b.1.3.12	Turbine Building Addition	56	20	1	6	-	41	-	44	169	169	-	-	-	434	-	-	-	20,478	1,087	-				
2b.1.3	Totals	6,554	3,618	188	483	4,433	1,889	-	5,410	22,574	22,574	-	-	51,247	16,159	-	-	-	2,880,206	145,889	-				
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096				
2b.1.5	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-				
2b.1	Subtotal Period 2b Activity Costs	7,676	14,060	518	1,031	10,588	4,079	481	10,239	48,672	48,662	-	10	122,269	24,132	-	-	-	6,279,589	296,929	4,096				
Period 2b Additional Costs																									
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	3,241	972	4,213	4,213	-	-	-	-	-	-	-	-	42,370	-				
2b.2.2	Operational Equipment	-	-	19	60	624	-	-	104	807	807	-	-	11,710	-	-	-	-	292,750	32	-				
2b.2.3	Security Modifications	-	-	-	-	-	-	8,696	1,304	10,000	10,000	-	-	-	-	-	-	-	-	-	-				
2b.2	Subtotal Period 2b Additional Costs	-	-	19	60	624	-	11,937	2,381	15,020	15,020	-	-	11,710	-	-	-	-	292,750	42,402	-				
Period 2b Collateral Costs																									
2b.3.1	Process decommissioning water waste	173	-	117	299	-	474	-	261	1,325	1,325	-	-	-	1,133	-	-	-	67,962	221	-				
2b.3.2	Process decommissioning chemical flush waste	1	-	41	153	-	307	-	104	606	606	-	-	-	413	-	-	-	43,978	77	-				
2b.3.3	Small tool allowance	-	341	-	-	-	-	-	51	392	392	-	-	-	-	-	-	-	-	-	-				
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	65,919	9,888	75,807	-	75,807	-	-	-	-	-	-	-	-	-				
2b.3.5	Retention and Severance	-	-	-	-	-	-	8,665	1,300	9,964	9,964	-	-	-	-	-	-	-	-	-	-				
2b.3	Subtotal Period 2b Collateral Costs	174	341	159	452	-	781	74,584	11,604	88,094	12,287	75,807	-	-	1,545	-	-	-	111,940	298	-				
Period 2b Period-Dependent Costs																									
2b.4.1	Decon supplies	1,361	-	-	-	-	-	-	340	1,701	1,701	-	-	-	-	-	-	-	-	-	-				
2b.4.2	Insurance	-	-	-	-	-	-	1,470	147	1,617	1,617	-	-	-	-	-	-	-	-	-	-				
2b.4.3	Property taxes	-	-	-	-	-	-	3,915	391	4,306	4,306	-	-	-	-	-	-	-	-	-	-				
2b.4.4	Health physics supplies	-	2,681	-	-	-	-	-	670	3,352	3,352	-	-	-	-	-	-	-	-	-	-				
2b.4.5	Heavy equipment rental	-	4,602	-	-	-	-	-	690	5,292	5,292	-	-	-	-	-	-	-	-	-	-				
2b.4.6	Disposal of DAW generated	-	-	124	38	-	463	-	134	759	759	-	-	-	5,690	-	-	-	113,799	186	-				
2b.4.7	Plant energy budget	-	-	-	-	-	-	2,645	397	3,041	3,041	-	-	-	-	-	-	-	-	-	-				
2b.4.8	NRC Fees	-	-	-	-	-	-	1,180	118	1,298	1,298	-	-	-	-	-	-	-	-	-	-				
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	5,234	523	5,758	-	5,758	-	-	-	-	-	-	-	-	-				
2b.4.10	Fixed Overhead	-	-	-	-	-	-	4,725	709	5,434	5,434	-	-	-	-	-	-	-	-	-	-				
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,636	245	1,881	-	1,881	-	-	-	-	-	-	-	-	-				
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	412	62	474	474	-	-	-	-	-	-	-	-	-	-				

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Table E
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Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Period-Dependent Costs (continued)																					
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	210	32	242	-	242	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	26,840	4,026	30,867	30,867	-	-	-	-	-	-	-	-	-	457,896
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	27,122	4,068	31,191	31,191	-	-	-	-	-	-	-	-	-	309,504
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	35,641	5,346	40,988	40,988	-	-	-	-	-	-	-	-	-	574,490
2b.4	Subtotal Period 2b Period-Dependent Costs	1,361	7,283	124	38	-	463	111,268	17,935	138,473	130,592	7,881	-	-	5,690	-	-	-	113,799	186	1,341,891
2b.0	TOTAL PERIOD 2b COST	9,211	21,684	820	1,580	11,212	5,324	198,269	42,159	290,260	206,561	83,688	10	133,979	31,367	-	-	-	6,798,079	339,814	1,345,987
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	634	56	114	109	-	2,091	-	881	3,884	3,884	-	-	-	7,653	-	-	-	486,170	906	-
Disposal of Plant Systems																					
2d.1.2.1	Cranes/Heavy Loads/Rigging - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2d.1.2.2	Electrical - Contaminated Fuel Pool	-	46	1	2	21	2	-	16	87	87	-	-	240	9	-	-	-	10,334	665	-
2d.1.2.3	Electrical - Decontam. Fuel Pool Area	-	293	4	15	213	-	-	108	633	633	-	-	2,457	-	-	-	-	99,783	4,090	-
2d.1.2.4	Fire - RCA - Fuel Pool Area	-	11	0	0	5	-	-	4	20	20	-	-	62	-	-	-	-	2,499	143	-
2d.1.2.5	Fuel Pool Cooling & Cleanup	240	419	34	26	102	370	-	340	1,531	1,531	-	-	1,179	1,341	-	-	-	133,939	8,380	-
2d.1.2.6	Fuel Pool Cooling & Cleanup - Insulated	26	40	3	2	6	32	-	33	143	143	-	-	67	117	-	-	-	10,220	848	-
2d.1.2.7	HVAC Ductwork - Fuel Pool Area	-	34	1	2	26	3	-	14	79	79	-	-	296	11	-	-	-	12,733	457	-
2d.1.2.8	HVAC/Chilled Water - RCA Fuel Pool Area	-	32	0	1	19	-	-	11	64	64	-	-	223	-	-	-	-	9,072	397	-
2d.1.2.9	Instrument & Service Air-RCA-Fuel Pool	-	28	0	2	23	-	-	11	64	64	-	-	267	-	-	-	-	10,841	357	-
2d.1.2	Totals	266	907	44	51	423	408	-	537	2,637	2,637	-	-	4,894	1,479	-	-	-	293,606	15,385	-
Decontamination of Site Buildings																					
2d.1.3.1	Reactor (Post Fuel)	911	2,485	145	669	170	8,544	-	3,353	16,277	16,277	-	-	1,969	62,698	-	-	-	2,732,406	45,703	-
2d.1.3	Totals	911	2,485	145	669	170	8,544	-	3,353	16,277	16,277	-	-	1,969	62,698	-	-	-	2,732,406	45,703	-
2d.1.4	Scaffolding in support of decommissioning	-	547	6	2	25	6	-	143	729	729	-	-	257	23	-	-	-	13,028	5,641	-
2d.1	Subtotal Period 2d Activity Costs	1,811	3,994	309	831	618	11,049	-	4,915	23,527	23,527	-	-	7,120	71,852	-	-	-	3,525,210	67,635	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,291	387	1,678	1,678	-	-	-	-	-	-	-	-	-	12,480
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,198	359	1,557	1,557	-	-	-	-	-	-	-	-	15,661	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,489	747	3,235	3,235	-	-	-	-	-	-	-	-	15,661	12,480
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	69	-	47	120	-	191	-	105	533	533	-	-	-	457	-	-	-	27,391	89	-
2d.3.2	Process decommissioning chemical flush waste	1	-	25	92	-	185	-	63	366	366	-	-	-	249	-	-	-	26,553	47	-
2d.3.3	Small tool allowance	-	88	-	-	-	-	-	13	101	101	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	143	55	575	145	-	145	1,062	1,062	-	-	6,000	529	-	-	-	303,608	147	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	27,061	4,059	31,120	-	31,120	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	70	88	216	267	575	521	27,061	4,385	33,182	2,062	31,120	-	6,000	1,235	-	-	-	357,552	283	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

Table E
Monticello Nuclear Generating Plant
Scenario 3: DECON with 100 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	219	-	-	-	-	-	-	55	274	274	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,336	134	1,470	1,470	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	752	-	-	-	-	-	188	940	940	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,701	-	-	-	-	-	255	1,956	1,956	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	44	14	-	165	-	48	271	271	-	-	-	2,030	-	-	-	40,600	66	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	521	78	600	600	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	369	37	405	405	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,935	193	2,128	-	2,128	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	305	46	351	351	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	9,608	1,441	11,049	7,668	3,381	-	-	-	-	-	-	-	-	162,981
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,941	1,041	7,982	7,982	-	-	-	-	-	-	-	-	-	78,356
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	9,556	1,433	10,989	10,132	857	-	-	-	-	-	-	-	-	149,660
2d.4	Subtotal Period 2d Period-Dependent Costs	219	2,453	44	14	-	165	33,025	5,290	41,210	34,754	6,456	-	-	2,030	-	-	-	40,600	66	390,997
2d.0	TOTAL PERIOD 2d COST	2,099	6,535	569	1,112	1,193	11,735	62,574	15,337	101,154	63,579	37,575	-	13,120	75,117	-	-	-	3,923,362	83,645	403,477
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	43	7	50	-	50	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,232	185	1,417	1,367	50	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,285	128	1,413	1,413	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	597	-	-	-	-	-	149	747	747	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	8	2	-	29	-	8	47	47	-	-	-	355	-	-	-	7,097	12	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	261	39	300	300	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	420	42	463	463	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	103	10	113	-	113	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	9,608	1,441	11,049	7,668	3,381	-	-	-	-	-	-	-	-	162,981
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	5,174	776	5,950	5,950	-	-	-	-	-	-	-	-	-	57,200
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	5,456	818	6,274	5,415	860	-	-	-	-	-	-	-	-	80,707
2f.4	Subtotal Period 2f Period-Dependent Costs	-	597	8	2	-	29	24,761	3,754	29,152	24,708	4,443	-	-	355	-	-	-	7,097	12	300,888
2f.0	TOTAL PERIOD 2f COST	-	597	8	2	-	29	33,511	6,194	40,341	35,848	4,493	-	-	355	-	-	-	7,097	96,208	307,128
PERIOD 2 TOTALS		13,170	62,856	20,629	9,399	25,814	56,415	416,166	122,242	726,692	568,562	158,062	68	288,110	174,575	1,481	1,010	-	21,522,450	804,895	3,049,889

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Monticello Nuclear Generating Plant
Scenario 3: DECON with 100 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor Building	-	1,881	-	-	-	-	-	282	2,163	-	-	2,163	-	-	-	-	-	-	13,966	-
3b.1.1.2	Condensate Tanks Foundation	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	50	-
3b.1.1.3	Discharge Retention Basin	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	25	-
3b.1.1.4	HPCI Room	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	97	-
3b.1.1.5	Hot Shop	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	177	-
3b.1.1.6	Hydrogen & Oxygen Storage	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	19	-
3b.1.1.7	LLRW Storage & Shipping	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	662	-
3b.1.1.8	MSIV	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	42	-
3b.1.1.9	Misc Structures 2017	-	759	-	-	-	-	-	114	872	-	-	872	-	-	-	-	-	-	7,919	-
3b.1.1.10	Offgas Stack	-	104	-	-	-	-	-	16	120	-	-	120	-	-	-	-	-	-	544	-
3b.1.1.11	Offgas Storage & Compressor	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	199	-
3b.1.1.12	Radwaste	-	219	-	-	-	-	-	33	252	-	-	252	-	-	-	-	-	-	1,220	-
3b.1.1.13	Recombiner	-	123	-	-	-	-	-	18	141	-	-	141	-	-	-	-	-	-	713	-
3b.1.1.14	Security Barrier	-	179	-	-	-	-	-	27	206	-	-	206	-	-	-	-	-	-	933	-
3b.1.1.15	Structures Greater than 3' Below Grade	-	2,380	-	-	-	-	-	357	2,738	-	-	2,738	-	-	-	-	-	-	12,649	-
3b.1.1.16	Tank Farm	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	21	-
3b.1.1.17	Turbine	-	1,175	-	-	-	-	-	176	1,351	-	-	1,351	-	-	-	-	-	-	13,091	-
3b.1.1.18	Turbine Building Addition	-	51	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	618	-
3b.1.1.19	Turbine Pedestal	-	175	-	-	-	-	-	26	202	-	-	202	-	-	-	-	-	-	926	-
3b.1.1	Totals	-	7,219	-	-	-	-	-	1,083	8,302	-	-	8,302	-	-	-	-	-	-	53,870	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	864	-	-	-	-	-	130	994	-	-	994	-	-	-	-	-	-	1,841	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,083	-	-	-	-	183	1,240	9,506	211	-	9,295	-	-	-	-	-	-	55,711	1,560
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	3,297	-	-	-	-	11	496	3,805	-	-	3,805	-	-	-	-	-	-	12	-
3b.2.2	Excavation of Underground Services	-	1,380	-	-	-	-	947	349	2,677	-	-	2,677	-	-	-	-	-	-	13,475	-
3b.2.3	Intake Structure Cofferdam	-	320	-	-	-	-	-	48	368	-	-	368	-	-	-	-	-	-	2,584	-
3b.2.4	Constrution Debris	-	-	-	-	-	-	350	53	403	-	-	403	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	5,102	-	-	-	-	-	765	5,868	-	-	5,868	-	-	-	-	-	-	5,422	-
3b.2	Subtotal Period 3b Additional Costs	-	10,100	-	-	-	-	1,309	1,711	13,120	-	-	13,120	-	-	-	-	-	-	21,493	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	97	-	-	-	-	-	15	111	-	-	111	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	100	15	115	-	115	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	97	-	-	-	-	100	30	226	-	115	111	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	1,251	125	1,376	-	1,376	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	2,737	274	3,011	-	3,011	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	5,455	-	-	-	-	-	818	6,273	-	-	6,273	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	300	45	345	-	-	345	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	386	39	424	-	424	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	237	24	261	-	261	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	1,260	189	1,450	-	-	1,450	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	179	27	206	-	206	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	497	75	572	-	-	572	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	22,115	3,317	25,432	(0)	7,782	17,650	-	-	-	-	-	-	-	375,152
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	11,290	1,693	12,983	-	-	12,983	-	-	-	-	-	-	-	122,646
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	6,830	1,024	7,854	-	2,050	5,804	-	-	-	-	-	-	-	101,904
3b.4	Subtotal Period 3b Period-Dependent Costs	-	5,455	-	-	-	-	47,083	7,650	60,188	(0)	15,110	45,077	-	-	-	-	-	-	-	599,702
3b.0	TOTAL PERIOD 3b COST	-	23,734	-	-	-	-	48,675	10,631	83,040	211	15,226	67,604	-	-	-	-	-	-	77,204	601,262

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Monticello Nuclear Generating Plant
Scenario 3: DECON with 100 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3c - Fuel Storage Operations																					
Period 3c Additional Costs																					
3c.2.1	ISFSI Disposition of Original MPC Canisters	-	-	-	293	-	7,257	-	1,844	9,395	-	9,395	-	-	23,007	-	-	-	1,317,864	-	-
3c.2	Subtotal Period 3c Additional Costs	-	-	-	293	-	7,257	-	1,844	9,395	-	9,395	-	-	23,007	-	-	-	1,317,864	-	-
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	443,333	66,500	509,833	-	509,833	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	443,333	66,500	509,833	-	509,833	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	57,075	5,707	62,782	-	62,782	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	45,421	4,542	49,963	-	49,963	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	17,600	1,760	19,360	-	19,360	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	10,821	1,082	11,904	-	11,904	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	19,671	2,951	22,622	-	22,622	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	8,169	1,225	9,395	-	9,395	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	9,127	1,369	10,495	-	10,495	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	308,615	46,292	354,908	-	354,908	-	-	-	-	-	-	-	-	4,279,284
3c.4.10	DOC Staff Cost	-	-	-	-	-	-	15,257	2,289	17,545	-	17,545	-	-	-	-	-	-	-	-	164,588
3c.4.11	Utility Staff Cost	-	-	-	-	-	-	148,292	22,244	170,536	-	170,536	-	-	-	-	-	-	-	-	2,180,789
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	640,048	89,461	729,509	-	729,509	-	-	-	-	-	-	-	-	6,624,661
3c.0	TOTAL PERIOD 3c COST	-	-	-	293	-	7,257	1,083,381	157,805	1,248,737	-	1,248,737	-	-	23,007	-	-	-	1,317,864	-	6,624,661
PERIOD 3d - Spent Fuel/GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
3d.1.1	Totals	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	53,629	8,044	61,673	-	61,673	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	53,629	8,044	61,673	-	61,673	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	9,383	938	10,321	-	10,321	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	6,703	670	7,374	-	7,374	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4,257	426	4,683	-	4,683	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,779	178	1,957	-	1,957	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	3,234	485	3,719	-	3,719	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,343	201	1,544	-	1,544	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,500	225	1,725	-	1,725	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	50,734	7,610	58,344	-	58,344	-	-	-	-	-	-	-	-	703,485
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	12,865	1,930	14,795	-	14,795	-	-	-	-	-	-	-	-	182,635
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	91,799	12,664	104,462	-	104,462	-	-	-	-	-	-	-	-	886,120
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	6,552	145,427	22,024	175,334	9,199	166,135	-	-	-	-	-	1,547	311,184	-	886,120

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table E
Monticello Nuclear Generating Plant
Scenario 3: DECON with 100 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3e - ISFSI Decontamination																					
Period 3e Additional Costs																					
3e.2.1	Decommissioning of ISFSI	30	2	6	14	-	208	1,867	532	2,659	2,659	-	-	-	834	-	-	-	220,333	10,633	1,848
3e.2	Subtotal Period 3e Additional Costs	30	2	6	14	-	208	1,867	532	2,659	2,659	-	-	-	834	-	-	-	220,333	10,633	1,848
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	110	28	138	138	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	244	61	304	304	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	82	21	103	103	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	38	10	48	48	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	308	77	385	385	-	-	-	-	-	-	-	-	-	4,999
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	260	65	325	325	-	-	-	-	-	-	-	-	-	3,792
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	1,042	261	1,303	1,303	-	-	-	-	-	-	-	-	-	8,792
3e.0	TOTAL PERIOD 3e COST	30	2	6	14	-	208	2,909	792	3,962	3,962	-	-	-	834	-	-	-	220,333	10,633	10,640
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	1,882	-	-	-	-	201	312	2,396	-	-	2,396	-	-	-	-	-	-	9,097	160
3f.2	Subtotal Period 3f Additional Costs	-	1,882	-	-	-	-	201	312	2,396	-	-	2,396	-	-	-	-	-	-	9,097	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	123	12	135	-	-	135	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	123	-	-	-	-	-	19	142	-	-	142	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	29	4	33	-	-	33	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	42	6	48	-	-	48	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	19	3	22	-	-	22	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	155	23	179	-	-	179	-	-	-	-	-	-	-	2,520
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	103	16	119	-	-	119	-	-	-	-	-	-	-	1,564
3f.4	Subtotal Period 3f Period-Dependent Costs	-	123	-	-	-	-	471	83	678	-	-	678	-	-	-	-	-	-	-	4,084
3f.0	TOTAL PERIOD 3f COST	-	2,018	-	-	-	-	673	398	3,088	-	-	3,088	-	-	-	-	-	-	9,097	4,244
PERIOD 3 TOTALS		30	25,755	1,337	308	-	14,017	1,281,065	191,649	1,514,161	13,372	1,430,098	70,692	-	23,841	-	-	1,547	1,849,382	96,934	8,126,927
TOTAL COST TO DECOMMISSION		16,519	91,470	22,063	9,880	25,828	71,578	1,844,117	337,682	2,419,136	748,155	1,599,295	71,685	288,153	199,616	1,711	1,010	1,547	23,435,020	933,679	12,371,510

TOTAL COST TO DECOMMISSION WITH 16.22% CONTINGENCY:	\$2,419,136	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 30.93% OR:	\$748,155	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 66.11% OR:	\$1,599,295	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 2.96% OR:	\$71,685	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	202,337	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	1,547	cubic feet
TOTAL SCRAP METAL REMOVED:	22,696	tons
TOTAL CRAFT LABOR REQUIREMENTS:	933,679	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

***Monticello Nuclear Generating Plant
Decommissioning Cost Analysis***

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APPENDIX F

DETAILED COST ANALYSIS

SCENARIO 4: DECON with 200 Year DFS

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table F
Monticello Nuclear Generating Plant
Scenario 4: DECON with 200 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	578	87	664	598	-	66	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Sacrificial shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Moisture separators/reheaters	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1a.1.17.10	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1a.1.17.11	Pressure suppression structure	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.17.12	Drywell	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	1,600
1a.1.17.13	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
1a.1.17.14	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.15	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	5,010	752	5,762	5,260	-	502	-	-	-	-	-	-	-	42,683
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlp/s/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	15,344	2,302	17,646	17,144	-	502	-	-	-	-	-	-	-	83,013
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,221	183	1,404	-	1,404	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	9,892	1,484	11,376	11,376	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,113	1,667	12,779	11,376	1,404	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	2,408	241	2,649	2,649	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,242	224	2,466	2,466	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,730	259	1,989	1,989	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	3,166	317	3,482	-	3,482	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	2,833	425	3,258	3,258	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	803	120	923	-	923	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	115	17	133	133	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	14,260	2,139	16,399	16,399	-	-	-	-	-	-	-	-	-	245,440
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	54,561	7,966	63,676	59,153	4,524	-	-	610	-	-	-	12,190	20	667,680

Table F
Monticello Nuclear Generating Plant
Scenario 4: DECON with 200 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	81,017	11,935	94,101	87,672	5,927	502	-	610	-	-	-	12,190	20	750,693
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	4,733	
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	1,000	
1b.1.1.3	Reactor internals	-	-	-	-	-	-	470	70	540	540	-	-	-	-	-	-	-	-	4,000	
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	1,350	
1b.1.1.5	CRD housings & NIs	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	1,000	
1b.1.1.6	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	1,000	
1b.1.1.7	Removal primary containment	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	2,000	
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	3,630	
1b.1.1.9	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	1,200	
1b.1.1.10	Sacrificial shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	1,200	
1b.1.1.11	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	1,000	
1b.1.1.12	Main Turbine	-	-	-	-	-	-	244	37	281	281	-	-	-	-	-	-	-	-	2,080	
1b.1.1.13	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	2,088	
1b.1.1.14	Moisture separators & reheaters	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	2,000	
1b.1.1.15	Radwaste building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	2,730	
1b.1.1.16	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	2,730	
1b.1.1	Total	-	-	-	-	-	-	3,961	594	4,555	4,132	-	423	-	-	-	-	-	-	33,741	
1b.1.2	Decon NSSS	286	-	-	-	-	-	-	143	429	429	-	-	-	-	-	-	-	1,067	-	
1b.1	Subtotal Period 1b Activity Costs	286	-	-	-	-	-	3,961	737	4,984	4,561	-	423	-	-	-	-	-	1,067	33,741	
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	
1b.2.2	Site Characterization	-	-	-	-	-	-	6,446	1,934	8,380	8,380	-	-	-	-	-	-	-	30,500	10,852	
1b.2.3	Mixed & RCRA Waste	-	-	29	19	13	-	-	8	69	69	-	-	43	-	-	-	5,253	163	-	
1b.2	Subtotal Period 1b Additional Costs	-	-	29	19	13	-	18,137	3,695	21,894	21,894	-	-	43	-	-	-	5,253	30,663	10,852	
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	
1b.3.3	Process decommissioning water waste	37	-	24	61	-	98	-	54	275	275	-	-	-	233	-	-	13,986	45	-	
1b.3.4	Process decommissioning chemical flush waste	1	-	23	85	-	969	-	258	1,336	1,336	-	-	-	-	231	-	24,599	43	-	
1b.3.5	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,557	383	2,940	-	2,940	-	-	-	-	-	-	-	-	
1b.3.9	Retention and Severance	-	-	-	-	-	-	6,362	954	7,316	7,316	-	-	-	-	-	-	-	-	-	
1b.3	Subtotal Period 1b Collateral Costs	2,997	1,202	47	147	-	1,067	10,107	2,453	18,020	15,080	2,940	-	-	233	231	-	-	38,585	89	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	
1b.4.2	Insurance	-	-	-	-	-	-	1,207	121	1,328	1,328	-	-	-	-	-	-	-	-	-	
1b.4.3	Property taxes	-	-	-	-	-	-	1,104	110	1,214	1,214	-	-	-	-	-	-	-	-	-	
1b.4.4	Health physics supplies	-	290	-	-	-	-	-	73	363	363	-	-	-	-	-	-	-	-	-	
1b.4.5	Heavy equipment rental	-	284	-	-	-	-	-	43	327	327	-	-	-	-	-	-	-	-	-	
1b.4.6	Disposal of DAW generated	-	-	8	2	-	29	-	8	48	48	-	-	-	358	-	-	-	7,159	12	
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,735	260	1,995	1,995	-	-	-	-	-	-	-	-	-	
1b.4.8	NRC Fees	-	-	-	-	-	-	321	32	353	353	-	-	-	-	-	-	-	-	-	
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,587	159	1,746	-	1,746	-	-	-	-	-	-	-	-	
1b.4.10	Fixed Overhead	-	-	-	-	-	-	1,420	213	1,633	1,633	-	-	-	-	-	-	-	-	-	
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	402	60	463	-	463	-	-	-	-	-	-	-	-	
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	52	8	60	-	60	-	-	-	-	-	-	-	-	
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	58	9	67	67	-	-	-	-	-	-	-	-	-	
1b.4.14	Security Staff Cost	-	-	-	-	-	-	7,150	1,072	8,222	8,222	-	-	-	-	-	-	-	-	123,056	
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	5,625	844	6,469	6,469	-	-	-	-	-	-	-	-	63,614	
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	13,003	1,950	14,953	14,953	-	-	-	-	-	-	-	-	212,741	
1b.4	Subtotal Period 1b Period-Dependent Costs	35	575	8	2	-	29	33,663	4,971	39,283	37,015	2,268	-	-	358	-	-	-	7,159	12	399,411
1b.0	TOTAL PERIOD 1b COST	3,318	1,777	84	169	13	1,096	65,868	11,856	84,181	78,550	5,208	423	43	591	231	-	-	50,997	31,830	444,004
PERIOD 1 TOTALS		3,318	2,859	97	173	13	1,146	146,886	23,790	178,282	166,222	11,136	925	43	1,201	231	-	-	63,188	31,850	1,194,697

Table F
Monticello Nuclear Generating Plant
Scenario 4: DECON with 200 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Recirculation System Piping & Valves	107	92	30	39	-	429	-	192	888	888	-	-	-	1,430	-	-	-	99,742	2,905	-
2a.1.1.2	Recirculation Pumps & Motors	38	59	16	40	22	438	-	154	767	767	-	-	96	945	-	-	-	112,200	1,563	-
2a.1.1.3	CRDMs & NIs Removal	187	1,022	402	105	-	919	-	635	3,269	3,269	-	-	-	3,741	-	-	-	213,700	17,768	-
2a.1.1.4	Reactor Vessel Internals	222	6,378	12,908	2,835	-	20,148	356	18,958	61,806	61,806	-	-	-	1,252	1,481	1,010	-	312,338	30,765	1,389
2a.1.1.5	Reactor Vessel	109	8,595	2,644	1,170	-	5,294	356	10,155	28,323	28,323	-	-	-	16,169	-	-	-	1,105,210	30,765	1,389
2a.1.1	Totals	663	16,147	15,999	4,189	22	27,228	711	30,094	95,053	95,053	-	-	96	23,536	1,481	1,010	-	1,843,190	83,767	2,778
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	362	1,496	349	3,174	357	-	858	6,596	6,596	-	-	24,835	1,383	-	-	-	1,577,959	5,438	-
2a.1.3	Main Condensers	-	1,245	397	128	1,667	198	-	670	4,306	4,306	-	-	17,396	727	-	-	-	828,955	18,831	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor Building	-	317	-	-	-	-	-	48	364	364	-	-	-	-	-	-	-	-	2,217	-
2a.1.4.2	Radwaste	-	24	-	-	-	-	-	4	27	27	-	-	-	-	-	-	-	-	127	-
2a.1.4.3	Turbine	-	118	-	-	-	-	-	18	136	136	-	-	-	-	-	-	-	-	1,254	-
2a.1.4	Totals	-	459	-	-	-	-	-	69	528	528	-	-	-	-	-	-	-	-	3,598	-
Disposal of Plant Systems																					
2a.1.5.1	Automatic Press Relief	-	115	7	8	69	57	-	55	311	311	-	-	803	206	-	-	-	45,852	1,656	-
2a.1.5.2	Chemistry Sampling	-	27	1	1	13	10	-	12	65	65	-	-	156	37	-	-	-	8,681	400	-
2a.1.5.3	Chemistry Sampling - Insulated	-	2	0	0	-	0	-	1	3	3	-	-	-	1	-	-	-	72	28	-
2a.1.5.4	Circulating Water - RCA	-	202	12	41	576	-	-	144	974	974	-	-	6,656	-	-	-	-	270,307	2,860	-
2a.1.5.5	Combustible Gas Control - Insul - RCA	-	29	0	1	18	-	-	10	59	59	-	-	212	-	-	-	-	8,617	378	-
2a.1.5.6	Combustible Gas Control - RCA	-	18	0	2	25	-	-	8	53	53	-	-	285	-	-	-	-	11,577	245	-
2a.1.5.7	Condensate & Feedwater	-	946	189	226	1,725	2,003	-	1,049	6,138	6,138	-	-	19,947	7,319	-	-	-	1,275,810	14,196	-
2a.1.5.8	Condensate & Feedwater - Insulated	-	480	34	43	361	332	-	267	1,517	1,517	-	-	4,176	1,207	-	-	-	246,693	6,964	-
2a.1.5.9	Condensate Demin	-	533	29	35	289	276	-	254	1,416	1,416	-	-	3,346	1,000	-	-	-	199,936	7,618	-
2a.1.5.10	Condensate Storage	-	706	31	55	617	219	-	335	1,963	1,963	-	-	7,131	795	-	-	-	340,568	10,345	-
2a.1.5.11	Control Rod Drive	-	3	0	0	2	1	-	1	7	7	-	-	19	4	-	-	-	1,009	41	-
2a.1.5.12	Control Rod Drive Hydraulic	-	405	16	18	143	155	-	166	902	902	-	-	1,658	562	-	-	-	103,306	5,898	-
2a.1.5.13	Core Spray	-	75	19	34	379	143	-	119	770	770	-	-	4,384	521	-	-	-	211,329	1,163	-
2a.1.5.14	Core Spray - Insulated	-	141	8	9	71	73	-	66	368	368	-	-	818	264	-	-	-	50,149	2,033	-
2a.1.5.15	Demin Water - Insulated - RCA	-	15	0	1	7	-	-	5	27	27	-	-	85	-	-	-	-	3,445	181	-
2a.1.5.16	Demin Water - RCA	-	40	0	2	22	-	-	14	78	78	-	-	253	-	-	-	-	10,278	508	-
2a.1.5.17	Diesel Oil - RCA	-	2	0	0	2	-	-	1	5	5	-	-	23	-	-	-	-	931	25	-
2a.1.5.18	Drywell Atmosphere Cooling - RCA	-	37	1	3	47	-	-	17	105	105	-	-	548	-	-	-	-	22,244	550	-
2a.1.5.19	EDG Emerg Service Water - Insul - RCA	-	0	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	84	4	-
2a.1.5.20	Electrical - Clean	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	182	-
2a.1.5.21	Emergency Service Water - Insul - RCA	-	21	0	1	12	-	-	7	41	41	-	-	137	-	-	-	-	5,544	281	-
2a.1.5.22	Emergency Service Water - RCA	-	2	0	0	1	-	-	1	4	4	-	-	13	-	-	-	-	512	22	-
2a.1.5.23	GEZIP - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2a.1.5.24	Generator Physical Design - RCA	-	5	0	0	3	-	-	2	9	9	-	-	31	-	-	-	-	1,250	67	-
2a.1.5.25	H2-O2 Control Analyzing	-	6	0	0	0	4	-	3	13	13	-	-	6	13	-	-	-	1,080	81	-
2a.1.5.26	H2-O2 Control Analyzing - Insulated	-	6	0	0	0	4	-	3	13	13	-	-	6	13	-	-	-	1,080	81	-
2a.1.5.27	High Pressure Coolant Injection	-	64	6	9	84	57	-	45	266	266	-	-	972	209	-	-	-	52,792	966	-
2a.1.5.28	High Pressure Coolant Injection - Insula	-	214	14	17	138	133	-	111	627	627	-	-	1,598	481	-	-	-	95,733	3,079	-
2a.1.5.29	Hydrogen Cooling	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	118	-
2a.1.5.30	Hydrogen Cooling - RCA	-	7	0	0	3	-	-	2	13	13	-	-	39	-	-	-	-	1,600	79	-
2a.1.5.31	Hydrogen Seal Oil - RCA	-	17	0	1	16	-	-	7	42	42	-	-	189	-	-	-	-	7,669	212	-
2a.1.5.32	Hydrogen Water Chemistry - RCA	-	24	0	1	12	-	-	8	45	45	-	-	140	-	-	-	-	5,672	304	-
2a.1.5.33	Instrument & Service Air - RCA	-	220	3	11	153	-	-	80	466	466	-	-	1,768	-	-	-	-	71,810	2,733	-
2a.1.5.34	Main Condenser	-	191	12	14	115	113	-	97	542	542	-	-	1,333	411	-	-	-	80,439	2,746	-
2a.1.5.35	Main Steam	-	243	17	22	186	163	-	134	764	764	-	-	2,148	594	-	-	-	125,135	3,512	-
2a.1.5.36	Main Turbine	-	972	214	244	1,709	2,375	-	1,151	6,665	6,665	-	-	19,760	8,687	-	-	-	1,354,661	14,733	-
2a.1.5.37	Main Turbine - Insulated	-	209	19	25	219	183	-	136	790	790	-	-	2,530	667	-	-	-	145,208	3,069	-
2a.1.5.38	Miscellaneous	-	42	1	2	26	-	-	15	85	85	-	-	302	-	-	-	-	12,283	622	-
2a.1.5.39	Off Gas Recombiner	-	182	19	22	155	209	-	126	714	714	-	-	1,795	764	-	-	-	121,554	2,708	-
2a.1.5.40	Off Gas Recombiner - Insulated	-	379	19	19	118	195	-	166	897	897	-	-	1,366	709	-	-	-	100,933	5,385	-
2a.1.5.41	Post Accident Sampling	-	24	1	1	5	9	-	9	50	50	-	-	53	33	-	-	-	4,318	345	-
2a.1.5.42	Post Accident Sampling - Insulated	-	16	1	1	1	11	-	7	37	37	-	-	17	37	-	-	-	3,116	212	-
2a.1.5.43	RHR Service Water - Insulated - RCA	-	81	3	9	128	-	-	41	262	262	-	-	1,485	-	-	-	-	60,293	1,125	-
2a.1.5.44	RHR Service Water - RCA	-	4	0	0	3	-	-	1	9	9	-	-	35	-	-	-	-	1,410	57	-
2a.1.5.45	Reactor Feedwater Pump Seal	-	55	3	3	17	26	-	23	126	126	-	-	193	96	-	-	-	14,009	773	-

Table F
Monticello Nuclear Generating Plant
Scenario 4: DECON with 200 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2a.1.5.46	Residual Heat Removal	349	240	168	126	554	1,667	-	770	3,875	3,875	-	-	6,406	6,012	-	-	-	647,941	4,135	-
2a.1.5.47	Residual Heat Removal - Insulated	602	540	64	58	291	715	-	674	2,944	2,944	-	-	3,367	2,607	-	-	-	303,087	10,340	-
2a.1.5.48	Rx Core Isolation Cooling	-	47	2	3	22	21	-	21	116	116	-	-	259	76	-	-	-	15,396	691	-
2a.1.5.49	Rx Core Isolation Cooling - Insulated	-	105	5	5	25	55	-	45	240	240	-	-	288	198	-	-	-	24,419	1,479	-
2a.1.5.50	Rx Recirculation	56	57	6	3	4	53	-	57	235	235	-	-	43	190	-	-	-	14,095	1,580	-
2a.1.5.51	Snubbers	-	168	2	4	33	25	-	54	285	285	-	-	377	90	-	-	-	21,009	2,548	-
2a.1.5.52	Standby Liquid Control - Insul - RCA	-	4	0	0	2	-	-	1	7	7	-	-	22	-	-	-	-	904	48	-
2a.1.5.53	Standby Liquid Control - RCA	-	26	0	1	21	-	-	10	59	59	-	-	245	-	-	-	-	9,969	341	-
2a.1.5.54	Stator Cooling - RCA	-	7	0	1	11	-	-	4	23	23	-	-	126	-	-	-	-	5,135	98	-
2a.1.5.55	Traversing Incore Probe	0	4	0	0	0	2	-	1	7	7	-	-	1	5	-	-	-	386	51	-
2a.1.5	Totals	1,007	7,978	931	1,079	8,447	9,287	-	6,340	35,068	35,046	-	22	97,654	33,808	-	-	-	6,125,515	119,943	-
2a.1.6	Scaffolding in support of decommissioning	-	2,188	25	8	99	25	-	572	2,916	2,916	-	-	1,030	91	-	-	-	52,111	22,564	-
2a.1	Subtotal Period 2a Activity Costs	1,669	28,379	18,848	5,754	13,409	37,095	711	38,602	144,467	144,445	-	22	141,010	59,545	1,481	1,010	-	10,427,730	254,140	2,778
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,326	698	3,024	3,024	-	-	-	-	-	-	-	-	30,411	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	2,326	698	3,024	3,024	-	-	-	-	-	-	-	-	30,411	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	83	-	55	140	-	222	-	123	623	623	-	-	-	531	-	-	-	31,838	103	-
2a.3.2	Process decommissioning chemical flush waste	6	-	208	774	-	1,557	-	529	3,075	3,075	-	-	-	2,093	-	-	-	223,008	392	-
2a.3.3	Small tool allowance	-	315	-	-	-	-	-	47	363	326	-	36	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	23,173	3,476	26,649	-	26,649	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	13,235	1,985	15,221	15,221	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	89	315	263	914	-	1,779	36,408	6,161	45,930	19,245	26,649	36	-	2,623	-	-	-	254,846	495	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	102	-	-	-	-	-	-	25	127	127	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	1,055	106	1,161	1,161	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	3,061	306	3,367	3,367	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,133	-	-	-	-	-	533	2,666	2,666	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,212	-	-	-	-	-	482	3,694	3,694	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	122	37	-	453	-	131	743	743	-	-	-	5,567	-	-	-	111,335	182	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	2,404	361	2,765	2,765	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	847	85	932	932	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	3,757	376	4,133	-	4,133	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	3,392	509	3,900	3,900	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,174	176	1,350	-	1,350	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	151	23	174	-	174	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	466	70	536	536	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	19,265	2,890	22,154	22,154	-	-	-	-	-	-	-	-	-	328,651
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	20,125	3,019	23,144	23,144	-	-	-	-	-	-	-	-	-	231,273
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	26,670	4,000	30,670	30,670	-	-	-	-	-	-	-	-	-	430,594
2a.4	Subtotal Period 2a Period-Dependent Costs	102	5,345	122	37	-	453	82,366	13,090	101,515	95,858	5,657	-	-	5,567	-	-	-	111,335	182	990,519
2a.0	TOTAL PERIOD 2a COST	1,860	34,039	19,233	6,705	13,409	39,327	121,812	58,551	294,937	262,573	32,305	58	141,010	67,735	1,481	1,010	-	10,793,910	285,228	993,297
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	ALARA/Radiological	-	18	0	0	3	3	-	6	30	30	-	-	35	10	-	-	-	2,060	277	-
2b.1.1.2	Alternate N2 - RCA	-	16	0	1	8	-	-	5	30	30	-	-	93	-	-	-	-	3,765	185	-
2b.1.1.3	Decontamination Projects	-	1	0	0	0	0	-	0	2	2	-	-	2	0	-	-	-	129	17	-
2b.1.1.4	Electrical - Contaminated	-	439	6	16	207	25	-	150	841	841	-	-	2,389	90	-	-	-	102,726	6,325	-
2b.1.1.5	Electrical - Decontaminated	-	2,657	41	142	2,019	-	-	993	5,852	5,852	-	-	23,344	-	-	-	-	948,013	37,107	-
2b.1.1.6	Fire - RCA	-	99	1	4	53	-	-	33	191	191	-	-	614	-	-	-	-	24,917	1,324	-
2b.1.1.7	HVAC Ductwork	-	309	7	18	231	27	-	122	713	713	-	-	2,665	100	-	-	-	114,598	4,111	-
2b.1.1.8	HVAC/Chilled Water - RCA	-	317	5	17	238	-	-	118	694	694	-	-	2,752	-	-	-	-	111,779	3,985	-
2b.1.1.9	Heating & Ventilation	-	473	15	40	521	62	-	219	1,329	1,329	-	-	6,018	227	-	-	-	258,789	7,101	-
2b.1.1.10	Heating Boiler - Insulated - RCA	-	3	0	0	2	-	-	1	6	6	-	-	26	-	-	-	-	1,058	35	-
2b.1.1.11	Liquid Radwaste	572	669	46	44	266	476	-	623	2,697	2,697	-	-	3,073	1,728	-	-	-	235,484	17,194	-
2b.1.1.12	Makeup Demin - RCA	-	101	3	9	127	-	-	46	286	286	-	-	1,471	-	-	-	-	59,747	1,412	-
2b.1.1.13	Non-Essential Diesel Generator - RCA	-	26	2	9	123	-	-	27	187	187	-	-	1,424	-	-	-	-	57,832	395	-

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Table F
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Scenario 4: DECON with 200 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2b.1.1.14	Off Gas Holdup	-	333	20	26	238	174	-	168	960	960	-	-	2,755	630	-	-	-	152,277	4,769	-
2b.1.1.15	Primary Containment	-	443	43	59	536	412	-	308	1,801	1,801	-	-	6,201	1,506	-	-	-	347,704	6,454	-
2b.1.1.16	Process Radiation Monitors	-	45	2	2	12	14	-	17	92	92	-	-	142	52	-	-	-	9,115	649	-
2b.1.1.17	Rx Bldg Closed Clng Water - Insul - RCA	-	111	2	6	85	-	-	42	245	245	-	-	977	-	-	-	-	39,675	1,484	-
2b.1.1.18	Rx Bldg Closed Clng Water - RCA	-	178	12	43	614	-	-	144	991	991	-	-	7,093	-	-	-	-	288,031	2,489	-
2b.1.1.19	Rx Component Handling Equip	26	138	19	19	100	227	-	124	653	653	-	-	1,158	829	-	-	-	99,730	2,462	-
2b.1.1.20	Rx Pressure Vessel	28	46	6	4	7	63	-	43	196	196	-	-	75	230	-	-	-	17,816	1,051	-
2b.1.1.21	Rx Water Cleanup	169	258	19	11	11	204	-	205	877	877	-	-	130	737	-	-	-	52,670	5,736	-
2b.1.1.22	Secondary Containment	-	121	7	10	88	70	-	63	360	360	-	-	1,017	255	-	-	-	57,567	1,763	-
2b.1.1.23	Service & Seal Water - Insulated - RCA	-	117	2	7	102	-	-	46	274	274	-	-	1,180	-	-	-	-	47,917	1,565	-
2b.1.1.24	Service & Seal Water - RCA	-	155	3	11	156	-	-	64	390	390	-	-	1,809	-	-	-	-	73,453	2,016	-
2b.1.1.25	Service Air Blower - RCA	-	15	0	1	18	-	-	7	41	41	-	-	206	-	-	-	-	8,364	206	-
2b.1.1.26	Solid Radwaste	327	483	36	34	206	380	-	419	1,885	1,885	-	-	2,387	1,380	-	-	-	185,221	10,820	-
2b.1.1.27	Structures & Buildings	-	76	2	3	31	23	-	30	166	166	-	-	357	85	-	-	-	19,933	1,128	-
2b.1.1.28	Wells & Domestic Water	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	144	-
2b.1.1.29	Wells & Domestic Water - RCA	-	51	1	2	30	-	-	18	101	101	-	-	342	-	-	-	-	13,874	633	-
2b.1.1	Totals	1,122	7,707	299	537	6,032	2,160	-	4,042	21,900	21,890	-	10	69,735	7,859	-	-	-	3,334,244	122,835	-
2b.1.2	Scaffolding in support of decommissioning	-	2,735	31	10	123	31	-	715	3,645	3,645	-	-	1,287	114	-	-	-	65,139	28,205	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor Building	5,006	2,817	155	347	4,159	1,007	-	4,150	17,641	17,641	-	-	48,077	7,014	-	-	-	2,317,670	112,518	-
2b.1.3.2	Admin	103	6	0	2	-	14	-	57	182	182	-	-	-	145	-	-	-	6,840	1,600	-
2b.1.3.3	HPCI Room	28	27	1	2	10	13	-	26	107	107	-	-	118	125	-	-	-	10,759	789	-
2b.1.3.4	Hot Shop	16	4	0	1	-	10	-	12	43	43	-	-	-	103	-	-	-	4,860	286	-
2b.1.3.5	LLRW Storage & Shipping	56	23	1	6	3	41	-	46	176	176	-	-	31	433	-	-	-	21,708	1,127	-
2b.1.3.6	Offgas Stack	360	256	6	16	116	73	-	283	1,109	1,109	-	-	1,343	669	-	-	-	87,045	8,860	-
2b.1.3.7	Offgas Storage & Compressor	39	17	1	4	2	30	-	32	125	125	-	-	25	316	-	-	-	15,948	785	-
2b.1.3.8	Radwaste	117	59	3	13	15	86	-	100	393	393	-	-	172	910	-	-	-	49,943	2,503	-
2b.1.3.9	Radwaste Material Storage Warehouse	62	23	1	6	-	47	-	49	189	189	-	-	-	495	-	-	-	23,400	1,197	-
2b.1.3.10	Recombiner	26	24	1	4	17	22	-	28	122	122	-	-	199	216	-	-	-	18,405	695	-
2b.1.3.11	Turbine	684	341	18	76	111	507	-	583	2,319	2,319	-	-	1,283	5,299	-	-	-	303,150	14,443	-
2b.1.3.12	Turbine Building Addition	56	20	1	6	-	41	-	44	169	169	-	-	-	434	-	-	-	20,478	1,087	-
2b.1.3	Totals	6,554	3,618	188	483	4,433	1,889	-	5,410	22,574	22,574	-	-	51,247	16,159	-	-	-	2,880,206	145,889	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan									a											
2b.1	Subtotal Period 2b Activity Costs	7,676	14,060	518	1,031	10,588	4,079	481	10,239	48,672	48,662	-	10	122,269	24,132	-	-	-	6,279,589	296,929	4,096
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	3,241	972	4,213	4,213	-	-	-	-	-	-	-	-	42,370	-
2b.2.2	Operational Equipment	-	-	19	60	624	-	-	104	807	807	-	-	11,710	-	-	-	-	292,750	32	-
2b.2.3	Security Modifications	-	-	-	-	-	-	8,696	1,304	10,000	10,000	-	-	-	-	-	-	-	-	-	-
2b.2	Subtotal Period 2b Additional Costs	-	-	19	60	624	-	11,937	2,381	15,020	15,020	-	-	11,710	-	-	-	-	292,750	42,402	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	173	-	117	299	-	474	-	261	1,325	1,325	-	-	-	1,133	-	-	-	67,962	221	-
2b.3.2	Process decommissioning chemical flush waste	1	-	41	153	-	307	-	104	606	606	-	-	-	413	-	-	-	43,978	77	-
2b.3.3	Small tool allowance	-	341	-	-	-	-	-	51	392	392	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	65,919	9,888	75,807	-	75,807	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	8,665	1,300	9,964	9,964	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	174	341	159	452	-	781	74,584	11,604	88,094	12,287	75,807	-	-	1,545	-	-	-	111,940	298	-

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Monticello Nuclear Generating Plant
Scenario 4: DECON with 200 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,361	-	-	-	-	-	-	340	1,701	1,701	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	1,470	147	1,617	1,617	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	3,915	391	4,306	4,306	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,681	-	-	-	-	-	670	3,352	3,352	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	4,602	-	-	-	-	-	690	5,292	5,292	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	124	38	-	463	-	134	759	759	-	-	-	5,690	-	-	-	113,799	186	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	2,645	397	3,041	3,041	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,180	118	1,298	1,298	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	5,234	523	5,758	-	5,758	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	4,725	709	5,434	5,434	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,636	245	1,881	-	1,881	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	412	62	474	474	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	210	32	242	-	242	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	26,840	4,026	30,867	30,867	-	-	-	-	-	-	-	-	-	457,896
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	27,122	4,068	31,191	31,191	-	-	-	-	-	-	-	-	-	309,504
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	35,641	5,346	40,988	40,988	-	-	-	-	-	-	-	-	-	574,490
2b.4	Subtotal Period 2b Period-Dependent Costs	1,361	7,283	124	38	-	463	111,268	17,935	138,473	130,592	7,881	-	-	5,690	-	-	-	113,799	186	1,341,891
2b.0	TOTAL PERIOD 2b COST	9,211	21,684	820	1,580	11,212	5,324	198,269	42,159	290,260	206,561	83,688	10	133,979	31,367	-	-	-	6,798,079	339,814	1,345,987
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	634	56	114	109	-	2,091	-	881	3,884	3,884	-	-	-	7,653	-	-	-	486,170	906	-
Disposal of Plant Systems																					
2d.1.2.1	Cranes/Heavy Loads/Rigging - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2d.1.2.2	Electrical - Contaminated Fuel Pool	-	46	1	2	21	2	-	16	87	87	-	-	240	9	-	-	-	10,334	665	-
2d.1.2.3	Electrical - Decontam. Fuel Pool Area	-	293	4	15	213	-	-	108	633	633	-	-	2,457	-	-	-	-	99,783	4,090	-
2d.1.2.4	Fire - RCA - Fuel Pool Area	-	11	0	0	5	-	-	4	20	20	-	-	62	-	-	-	-	2,499	143	-
2d.1.2.5	Fuel Pool Cooling & Cleanup	240	419	34	26	102	370	-	340	1,531	1,531	-	-	1,179	1,341	-	-	-	133,939	8,380	-
2d.1.2.6	Fuel Pool Cooling & Cleanup - Insulated	26	40	3	2	6	32	-	33	143	143	-	-	67	117	-	-	-	10,220	848	-
2d.1.2.7	HVAC Ductwork - Fuel Pool Area	-	34	1	2	26	3	-	14	79	79	-	-	296	11	-	-	-	12,733	457	-
2d.1.2.8	HVAC/Chilled Water - RCA Fuel Pool Area	-	32	0	1	19	-	-	11	64	64	-	-	223	-	-	-	-	9,072	397	-
2d.1.2.9	Instrument & Service Air-RCA-Fuel Pool	-	28	0	2	23	-	-	11	64	64	-	-	267	-	-	-	-	10,841	357	-
2d.1.2	Totals	266	907	44	51	423	408	-	537	2,637	2,637	-	-	4,894	1,479	-	-	-	293,606	15,385	-
Decontamination of Site Buildings																					
2d.1.3.1	Reactor (Post Fuel)	911	2,485	145	669	170	8,544	-	3,353	16,277	16,277	-	-	1,969	62,698	-	-	-	2,732,406	45,703	-
2d.1.3	Totals	911	2,485	145	669	170	8,544	-	3,353	16,277	16,277	-	-	1,969	62,698	-	-	-	2,732,406	45,703	-
2d.1.4	Scaffolding in support of decommissioning	-	547	6	2	25	6	-	143	729	729	-	-	257	23	-	-	-	13,028	5,641	-
2d.1	Subtotal Period 2d Activity Costs	1,811	3,994	309	831	618	11,049	-	4,915	23,527	23,527	-	-	7,120	71,852	-	-	-	3,525,210	67,635	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,291	387	1,678	1,678	-	-	-	-	-	-	-	-	-	12,480
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,198	359	1,557	1,557	-	-	-	-	-	-	-	-	15,661	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,489	747	3,235	3,235	-	-	-	-	-	-	-	-	15,661	12,480
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	69	-	47	120	-	191	-	105	533	533	-	-	-	457	-	-	-	27,391	89	-
2d.3.2	Process decommissioning chemical flush waste	1	-	25	92	-	185	-	63	366	366	-	-	-	249	-	-	-	26,553	47	-
2d.3.3	Small tool allowance	-	88	-	-	-	-	-	13	101	101	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	143	55	575	145	-	145	1,062	1,062	-	-	6,000	529	-	-	-	303,608	147	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	27,061	4,059	31,120	-	31,120	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	70	88	216	267	575	521	27,061	4,385	33,182	2,062	31,120	-	6,000	1,235	-	-	-	357,552	283	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table F
Monticello Nuclear Generating Plant
Scenario 4: DECON with 200 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	219	-	-	-	-	-	-	55	274	274	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,336	134	1,470	1,470	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	752	-	-	-	-	-	188	940	940	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,701	-	-	-	-	-	255	1,956	1,956	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	44	14	-	165	-	48	271	271	-	-	-	2,030	-	-	-	40,600	66	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	521	78	600	600	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	369	37	405	405	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,935	193	2,128	-	2,128	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	305	46	351	351	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	9,608	1,441	11,049	7,668	3,381	-	-	-	-	-	-	-	-	162,981
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,941	1,041	7,982	7,982	-	-	-	-	-	-	-	-	-	78,356
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	9,556	1,433	10,989	10,132	857	-	-	-	-	-	-	-	-	149,660
2d.4	Subtotal Period 2d Period-Dependent Costs	219	2,453	44	14	-	165	33,025	5,290	41,210	34,754	6,456	-	-	2,030	-	-	-	40,600	66	390,997
2d.0	TOTAL PERIOD 2d COST	2,099	6,535	569	1,112	1,193	11,735	62,574	15,337	101,154	63,579	37,575	-	13,120	75,117	-	-	-	3,923,362	83,645	403,477
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	43	7	50	-	50	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,232	185	1,417	1,367	50	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,285	128	1,413	1,413	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	597	-	-	-	-	-	149	747	747	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	8	2	-	29	-	8	47	47	-	-	-	355	-	-	-	7,097	12	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	261	39	300	300	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	420	42	463	463	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	103	10	113	-	113	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	9,608	1,441	11,049	7,668	3,381	-	-	-	-	-	-	-	-	162,981
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	5,174	776	5,950	5,950	-	-	-	-	-	-	-	-	-	57,200
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	5,456	818	6,274	5,415	860	-	-	-	-	-	-	-	-	80,707
2f.4	Subtotal Period 2f Period-Dependent Costs	-	597	8	2	-	29	24,761	3,754	29,152	24,708	4,443	-	-	355	-	-	-	7,097	12	300,888
2f.0	TOTAL PERIOD 2f COST	-	597	8	2	-	29	33,511	6,194	40,341	35,848	4,493	-	-	355	-	-	-	7,097	96,208	307,128
PERIOD 2 TOTALS		13,170	62,856	20,629	9,399	25,814	56,415	416,166	122,242	726,692	568,562	158,062	68	288,110	174,575	1,481	1,010	-	21,522,450	804,895	3,049,889

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Scenario 4: DECON with 200 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor Building	-	1,881	-	-	-	-	-	282	2,163	-	-	2,163	-	-	-	-	-	-	13,966	-
3b.1.1.2	Condensate Tanks Foundation	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	50	-
3b.1.1.3	Discharge Retention Basin	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	25	-
3b.1.1.4	HPCI Room	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	97	-
3b.1.1.5	Hot Shop	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	177	-
3b.1.1.6	Hydrogen & Oxygen Storage	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	19	-
3b.1.1.7	LLRW Storage & Shipping	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	662	-
3b.1.1.8	MSIV	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	42	-
3b.1.1.9	Misc Structures 2017	-	759	-	-	-	-	-	114	872	-	-	872	-	-	-	-	-	-	7,919	-
3b.1.1.10	Offgas Stack	-	104	-	-	-	-	-	16	120	-	-	120	-	-	-	-	-	-	544	-
3b.1.1.11	Offgas Storage & Compressor	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	199	-
3b.1.1.12	Radwaste	-	219	-	-	-	-	-	33	252	-	-	252	-	-	-	-	-	-	1,220	-
3b.1.1.13	Recombiner	-	123	-	-	-	-	-	18	141	-	-	141	-	-	-	-	-	-	713	-
3b.1.1.14	Security Barrier	-	179	-	-	-	-	-	27	206	-	-	206	-	-	-	-	-	-	933	-
3b.1.1.15	Structures Greater than 3' Below Grade	-	2,380	-	-	-	-	-	357	2,738	-	-	2,738	-	-	-	-	-	-	12,649	-
3b.1.1.16	Tank Farm	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	21	-
3b.1.1.17	Turbine	-	1,175	-	-	-	-	-	176	1,351	-	-	1,351	-	-	-	-	-	-	13,091	-
3b.1.1.18	Turbine Building Addition	-	51	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	618	-
3b.1.1.19	Turbine Pedestal	-	175	-	-	-	-	-	26	202	-	-	202	-	-	-	-	-	-	926	-
3b.1.1	Totals	-	7,219	-	-	-	-	-	1,083	8,302	-	-	8,302	-	-	-	-	-	-	53,870	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	864	-	-	-	-	-	130	994	-	-	994	-	-	-	-	-	-	1,841	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,083	-	-	-	-	183	1,240	9,506	211	-	9,295	-	-	-	-	-	-	55,711	1,560
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	3,297	-	-	-	-	11	496	3,805	-	-	3,805	-	-	-	-	-	-	12	-
3b.2.2	Excavation of Underground Services	-	1,380	-	-	-	-	947	349	2,677	-	-	2,677	-	-	-	-	-	-	13,475	-
3b.2.3	Intake Structure Cofferdam	-	320	-	-	-	-	-	48	368	-	-	368	-	-	-	-	-	-	2,584	-
3b.2.4	Construction Debris	-	-	-	-	-	-	350	53	403	-	-	403	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	5,102	-	-	-	-	-	765	5,868	-	-	5,868	-	-	-	-	-	-	5,422	-
3b.2	Subtotal Period 3b Additional Costs	-	10,100	-	-	-	-	1,309	1,711	13,120	-	-	13,120	-	-	-	-	-	-	21,493	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	97	-	-	-	-	-	15	111	-	-	111	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	100	15	115	-	115	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	97	-	-	-	-	100	30	226	-	115	111	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	1,251	125	1,376	-	1,376	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	2,737	274	3,011	-	3,011	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	5,455	-	-	-	-	-	818	6,273	-	-	6,273	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	300	45	345	-	-	345	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	386	39	424	-	424	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	237	24	261	-	261	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	1,260	189	1,450	-	-	1,450	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	179	27	206	-	206	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	497	75	572	-	-	572	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	22,115	3,317	25,432	(0)	7,782	17,650	-	-	-	-	-	-	-	375,152
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	11,290	1,693	12,983	-	-	12,983	-	-	-	-	-	-	-	122,646
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	6,830	1,024	7,854	-	2,050	5,804	-	-	-	-	-	-	-	101,904
3b.4	Subtotal Period 3b Period-Dependent Costs	-	5,455	-	-	-	-	47,083	7,650	60,188	(0)	15,110	45,077	-	-	-	-	-	-	-	599,702
3b.0	TOTAL PERIOD 3b COST	-	23,734	-	-	-	-	48,675	10,631	83,040	211	15,226	67,604	-	-	-	-	-	-	77,204	601,262

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Monticello Nuclear Generating Plant
Scenario 4: DECON with 200 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3c - Fuel Storage Operations																					
Period 3c Additional Costs																					
3c.2.1	ISFSI Disposition of Retired MPC Canisters	-	-	-	293	-	7,257	-	1,844	9,395	-	9,395	-	-	23,007	-	-	-	1,317,864	-	-
3c.2	Subtotal Period 3c Additional Costs	-	-	-	293	-	7,257	-	1,844	9,395	-	9,395	-	-	23,007	-	-	-	1,317,864	-	-
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,251,066	187,660	1,438,726	-	1,438,726	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	1,251,066	187,660	1,438,726	-	1,438,726	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	129,251	12,925	142,177	-	142,177	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	96,984	9,698	106,683	-	106,683	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	39,856	3,986	43,841	-	43,841	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	24,506	2,451	26,957	-	26,957	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	44,547	6,682	51,229	-	51,229	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	18,500	2,775	21,275	-	21,275	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	20,668	3,100	23,768	-	23,768	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	698,888	104,833	803,721	-	803,721	-	-	-	-	-	-	-	-	9,690,840
3c.4.10	DOC Staff Cost	-	-	-	-	-	-	34,551	5,183	39,733	-	39,733	-	-	-	-	-	-	-	-	372,725
3c.4.11	Utility Staff Cost	-	-	-	-	-	-	335,821	50,373	386,194	-	386,194	-	-	-	-	-	-	-	-	4,938,601
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	1,443,572	202,006	1,645,578	-	1,645,578	-	-	-	-	-	-	-	-	15,002,170
3c.0	TOTAL PERIOD 3c COST	-	-	-	293	-	7,257	2,694,638	391,510	3,093,699	-	3,093,699	-	-	23,007	-	-	-	1,317,864	-	15,002,170
PERIOD 3d - Spent Fuel/GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
3d.1.1	Totals	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	51,320	7,698	59,018	-	59,018	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	51,320	7,698	59,018	-	59,018	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	9,383	938	10,321	-	10,321	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	6,703	670	7,374	-	7,374	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4,257	426	4,683	-	4,683	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,779	178	1,957	-	1,957	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	3,234	485	3,719	-	3,719	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,343	201	1,544	-	1,544	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,500	225	1,725	-	1,725	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	50,734	7,610	58,344	-	58,344	-	-	-	-	-	-	-	-	703,485
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	12,865	1,930	14,795	-	14,795	-	-	-	-	-	-	-	-	182,635
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	91,799	12,664	104,462	-	104,462	-	-	-	-	-	-	-	-	886,120
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	6,552	143,119	21,677	172,679	9,199	163,481	-	-	-	-	-	1,547	311,184	-	886,120
PERIOD 3e - ISFSI Decontamination																					
Period 3e Additional Costs																					
3e.2.1	Decommissioning of ISFSI	30	2	6	14	-	208	1,867	532	2,659	2,659	-	-	-	834	-	-	-	220,333	10,633	1,848
3e.2	Subtotal Period 3e Additional Costs	30	2	6	14	-	208	1,867	532	2,659	2,659	-	-	-	834	-	-	-	220,333	10,633	1,848
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	110	28	138	138	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	244	61	304	304	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	82	21	103	103	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	38	10	48	48	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	308	77	385	385	-	-	-	-	-	-	-	-	-	4,999
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	260	65	325	325	-	-	-	-	-	-	-	-	-	3,792
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	1,042	261	1,303	1,303	-	-	-	-	-	-	-	-	-	8,792
3e.0	TOTAL PERIOD 3e COST	30	2	6	14	-	208	2,909	792	3,962	3,962	-	-	-	834	-	-	-	220,333	10,633	10,640

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Table F
Monticello Nuclear Generating Plant
Scenario 4: DECON with 200 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	1,882	-	-	-	-	201	312	2,396	-	-	2,396	-	-	-	-	-	-	9,097	160
3f.2	Subtotal Period 3f Additional Costs	-	1,882	-	-	-	-	201	312	2,396	-	-	2,396	-	-	-	-	-	-	9,097	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	123	12	135	-	-	135	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	123	-	-	-	-	-	19	142	-	-	142	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	29	4	33	-	-	33	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	42	6	48	-	-	48	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	19	3	22	-	-	22	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	155	23	179	-	-	179	-	-	-	-	-	-	-	2,520
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	103	16	119	-	-	119	-	-	-	-	-	-	-	1,564
3f.4	Subtotal Period 3f Period-Dependent Costs	-	123	-	-	-	-	471	83	678	-	-	678	-	-	-	-	-	-	-	4,084
3f.0	TOTAL PERIOD 3f COST	-	2,018	-	-	-	-	673	398	3,088	-	-	3,088	-	-	-	-	-	-	9,097	4,244
PERIOD 3 TOTALS		30	25,755	1,337	308	-	14,017	2,890,014	425,008	3,356,469	13,372	3,272,405	70,692	-	23,841	-	-	1,547	1,849,382	96,934	16,504,430
TOTAL COST TO DECOMMISSION		16,519	91,470	22,063	9,880	25,828	71,578	3,453,065	571,040	4,261,443	748,155	3,441,602	71,685	288,153	199,616	1,711	1,010	1,547	23,435,020	933,679	20,749,020

TOTAL COST TO DECOMMISSION WITH 15.47% CONTINGENCY:	\$4,261,443	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 17.56% OR:	\$748,155	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 80.76% OR:	\$3,441,602	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 1.68% OR:	\$71,685	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	202,337	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	1,547	cubic feet
TOTAL SCRAP METAL REMOVED:	22,696	tons
TOTAL CRAFT LABOR REQUIREMENTS:	933,679	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

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APPENDIX G

DETAILED COST ANALYSIS

SCENARIO 5: DECON with 60 Year DFS with Recasking

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Table G
Monticello Nuclear Generating Plant
Scenario 5: DECON with 60 Year DFS and Recasking Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	578	87	664	598	-	66	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Sacrificial shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Moisture separators/reheaters	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1a.1.17.10	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1a.1.17.11	Pressure suppression structure	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.17.12	Drywell	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	1,600
1a.1.17.13	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
1a.1.17.14	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.15	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	5,010	752	5,762	5,260	-	502	-	-	-	-	-	-	-	42,683
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlp/s/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	15,344	2,302	17,646	17,144	-	502	-	-	-	-	-	-	-	83,013
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,221	183	1,404	-	1,404	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	9,892	1,484	11,376	11,376	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,113	1,667	12,779	11,376	1,404	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	2,408	241	2,649	2,649	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,242	224	2,466	2,466	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,730	259	1,989	1,989	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	3,166	317	3,482	-	3,482	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	2,833	425	3,258	3,258	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	803	120	923	-	923	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	115	17	133	133	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	14,260	2,139	16,399	16,399	-	-	-	-	-	-	-	-	-	245,440
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	54,561	7,966	63,676	59,153	4,524	-	-	610	-	-	-	12,190	20	667,680

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Table G
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Scenario 5: DECON with 60 Year DFS and Recasking Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/ Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	81,017	11,935	94,101	87,672	5,927	502	-	610	-	-	-	12,190	20	750,693
PERIOD 1b - Decommissioning Preparations																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	470	70	540	540	-	-	-	-	-	-	-	-	-	4,000
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD housings & NIs	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Removal primary containment	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
1b.1.1.10	Sacrificial shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.11	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
1b.1.1.12	Main Turbine	-	-	-	-	-	-	244	37	281	281	-	-	-	-	-	-	-	-	-	2,080
1b.1.1.13	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
1b.1.1.14	Moisture separators & reheaters	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1b.1.1.15	Radwaste building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1.16	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,961	594	4,555	4,132	-	423	-	-	-	-	-	-	-	33,741
1b.1.2	Decon NSSS	286	-	-	-	-	-	-	143	429	429	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	286	-	-	-	-	-	3,961	737	4,984	4,561	-	423	-	-	-	-	-	-	1,067	33,741
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	6,446	1,934	8,380	8,380	-	-	-	-	-	-	-	-	30,500	10,852
1b.2.3	Mixed & RCRA Waste	-	-	29	19	13	-	-	8	69	69	-	-	43	-	-	-	-	5,253	163	-
1b.2	Subtotal Period 1b Additional Costs	-	-	29	19	13	-	18,137	3,695	21,894	21,894	-	-	43	-	-	-	-	5,253	30,663	10,852
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	37	-	24	61	-	98	-	54	275	275	-	-	-	233	-	-	-	13,986	45	-
1b.3.4	Process decommissioning chemical flush waste	1	-	23	85	-	969	-	258	1,336	1,336	-	-	-	-	231	-	-	24,599	43	-
1b.3.5	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,557	383	2,940	-	2,940	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	6,362	954	7,316	7,316	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,997	1,202	47	147	-	1,067	10,107	2,453	18,020	15,080	2,940	-	-	233	231	-	-	38,585	89	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	1,207	121	1,328	1,328	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,104	110	1,214	1,214	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	290	-	-	-	-	-	73	363	363	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	284	-	-	-	-	-	43	327	327	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	8	2	-	29	-	8	48	48	-	-	-	358	-	-	-	7,159	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,735	260	1,995	1,995	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	321	32	353	353	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,587	159	1,746	-	1,746	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	1,420	213	1,633	1,633	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	402	60	463	-	463	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	52	8	60	-	60	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	58	9	67	67	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	7,150	1,072	8,222	8,222	-	-	-	-	-	-	-	-	-	123,056
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	5,625	844	6,469	6,469	-	-	-	-	-	-	-	-	-	63,614
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	13,003	1,950	14,953	14,953	-	-	-	-	-	-	-	-	-	212,741
1b.4	Subtotal Period 1b Period-Dependent Costs	35	575	8	2	-	29	33,663	4,971	39,283	37,015	2,268	-	-	358	-	-	-	7,159	12	399,411
1b.0	TOTAL PERIOD 1b COST	3,318	1,777	84	169	13	1,096	65,868	11,856	84,181	78,550	5,208	423	43	591	231	-	-	50,997	31,830	444,004
PERIOD 1 TOTALS		3,318	2,859	97	173	13	1,146	146,886	23,790	178,282	166,222	11,136	925	43	1,201	231	-	-	63,188	31,850	1,194,697

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table G
Monticello Nuclear Generating Plant
Scenario 5: DECON with 60 Year DFS and Recasking Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2a - Large Component Removal																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Recirculation System Piping & Valves	107	92	30	39	-	429	-	192	888	888	-	-	-	1,430	-	-	-	99,742	2,905	-
2a.1.1.2	Recirculation Pumps & Motors	38	59	16	40	22	438	-	154	767	767	-	-	96	945	-	-	-	112,200	1,563	-
2a.1.1.3	CRDMs & NIs Removal	187	1,022	402	105	-	919	-	635	3,269	3,269	-	-	-	3,741	-	-	-	213,700	17,768	-
2a.1.1.4	Reactor Vessel Internals	222	6,378	12,908	2,835	-	20,148	356	18,958	61,806	61,806	-	-	-	1,252	1,481	1,010	-	312,338	30,765	1,389
2a.1.1.5	Reactor Vessel	109	8,595	2,644	1,170	-	5,294	356	10,155	28,323	28,323	-	-	-	16,169	-	-	-	1,105,210	30,765	1,389
2a.1.1	Totals	663	16,147	15,999	4,189	22	27,228	711	30,094	95,053	95,053	-	-	96	23,536	1,481	1,010	-	1,843,190	83,767	2,778
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	362	1,496	349	3,174	357	-	858	6,596	6,596	-	-	24,835	1,383	-	-	-	1,577,959	5,438	-
2a.1.3	Main Condensers	-	1,245	397	128	1,667	198	-	670	4,306	4,306	-	-	17,396	727	-	-	-	828,955	18,831	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor Building	-	317	-	-	-	-	-	48	364	364	-	-	-	-	-	-	-	-	2,217	-
2a.1.4.2	Radwaste	-	24	-	-	-	-	-	4	27	27	-	-	-	-	-	-	-	-	127	-
2a.1.4.3	Turbine	-	118	-	-	-	-	-	18	136	136	-	-	-	-	-	-	-	-	1,254	-
2a.1.4	Totals	-	459	-	-	-	-	-	69	528	528	-	-	-	-	-	-	-	-	3,598	-
Disposal of Plant Systems																					
2a.1.5.1	Automatic Press Relief	-	115	7	8	69	57	-	55	311	311	-	-	803	206	-	-	-	45,852	1,656	-
2a.1.5.2	Chemistry Sampling	-	27	1	1	13	10	-	12	65	65	-	-	156	37	-	-	-	8,681	400	-
2a.1.5.3	Chemistry Sampling - Insulated	-	2	0	0	-	0	-	1	3	3	-	-	-	1	-	-	-	72	28	-
2a.1.5.4	Circulating Water - RCA	-	202	12	41	576	-	-	144	974	974	-	-	6,656	-	-	-	-	270,307	2,860	-
2a.1.5.5	Combustible Gas Control - Insul - RCA	-	29	0	1	18	-	-	10	59	59	-	-	212	-	-	-	-	8,617	378	-
2a.1.5.6	Combustible Gas Control - RCA	-	18	0	2	25	-	-	8	53	53	-	-	285	-	-	-	-	11,577	245	-
2a.1.5.7	Condensate & Feedwater	-	946	189	226	1,725	2,003	-	1,049	6,138	6,138	-	-	19,947	7,319	-	-	-	1,275,810	14,196	-
2a.1.5.8	Condensate & Feedwater - Insulated	-	480	34	43	361	332	-	267	1,517	1,517	-	-	4,176	1,207	-	-	-	246,693	6,964	-
2a.1.5.9	Condensate Demin	-	533	29	35	289	276	-	254	1,416	1,416	-	-	3,346	1,000	-	-	-	199,936	7,618	-
2a.1.5.10	Condensate Storage	-	706	31	55	617	219	-	335	1,963	1,963	-	-	7,131	795	-	-	-	340,568	10,345	-
2a.1.5.11	Control Rod Drive	-	3	0	0	2	1	-	1	7	7	-	-	19	4	-	-	-	1,009	41	-
2a.1.5.12	Control Rod Drive Hydraulic	-	405	16	18	143	155	-	166	902	902	-	-	1,658	562	-	-	-	103,306	5,898	-
2a.1.5.13	Core Spray	-	75	19	34	379	143	-	119	770	770	-	-	4,384	521	-	-	-	211,329	1,163	-
2a.1.5.14	Core Spray - Insulated	-	141	8	9	71	73	-	66	368	368	-	-	818	264	-	-	-	50,149	2,033	-
2a.1.5.15	Demin Water - Insulated - RCA	-	15	0	1	7	-	-	5	27	27	-	-	85	-	-	-	-	3,445	181	-
2a.1.5.16	Demin Water - RCA	-	40	0	2	22	-	-	14	78	78	-	-	253	-	-	-	-	10,278	508	-
2a.1.5.17	Diesel Oil - RCA	-	2	0	0	2	-	-	1	5	5	-	-	23	-	-	-	-	931	25	-
2a.1.5.18	Drywell Atmosphere Cooling - RCA	-	37	1	3	47	-	-	17	105	105	-	-	548	-	-	-	-	22,244	550	-
2a.1.5.19	EDG Emerg Service Water - Insul - RCA	-	0	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	84	4	-
2a.1.5.20	Electrical - Clean	-	12	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	182	-
2a.1.5.21	Emergency Service Water - Insul - RCA	-	21	0	1	12	-	-	7	41	41	-	-	137	-	-	-	-	5,544	281	-
2a.1.5.22	Emergency Service Water - RCA	-	2	0	0	1	-	-	1	4	4	-	-	13	-	-	-	-	512	22	-
2a.1.5.23	GEZIP - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2a.1.5.24	Generator Physical Design - RCA	-	5	0	0	3	-	-	2	9	9	-	-	31	-	-	-	-	1,250	67	-
2a.1.5.25	H2-O2 Control Analyzing	-	6	0	0	0	4	-	3	13	13	-	-	6	13	-	-	-	1,080	81	-
2a.1.5.26	H2-O2 Control Analyzing - Insulated	-	6	0	0	0	4	-	3	13	13	-	-	6	13	-	-	-	1,080	81	-
2a.1.5.27	High Pressure Coolant Injection	-	64	6	9	84	57	-	45	266	266	-	-	972	209	-	-	-	52,792	966	-
2a.1.5.28	High Pressure Coolant Injection - Insula	-	214	14	17	138	133	-	111	627	627	-	-	1,598	481	-	-	-	95,733	3,079	-
2a.1.5.29	Hydrogen Cooling	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	118	-
2a.1.5.30	Hydrogen Cooling - RCA	-	7	0	0	3	-	-	2	13	13	-	-	39	-	-	-	-	1,600	79	-
2a.1.5.31	Hydrogen Seal Oil - RCA	-	17	0	1	16	-	-	7	42	42	-	-	189	-	-	-	-	7,669	212	-
2a.1.5.32	Hydrogen Water Chemistry - RCA	-	24	0	1	12	-	-	8	45	45	-	-	140	-	-	-	-	5,672	304	-
2a.1.5.33	Instrument & Service Air - RCA	-	220	3	11	153	-	-	80	466	466	-	-	1,768	-	-	-	-	71,810	2,733	-
2a.1.5.34	Main Condenser	-	191	12	14	115	113	-	97	542	542	-	-	1,333	411	-	-	-	80,439	2,746	-
2a.1.5.35	Main Steam	-	243	17	22	186	163	-	134	764	764	-	-	2,148	594	-	-	-	125,135	3,512	-
2a.1.5.36	Main Turbine	-	972	214	244	1,709	2,375	-	1,151	6,665	6,665	-	-	19,760	8,687	-	-	-	1,354,661	14,733	-
2a.1.5.37	Main Turbine - Insulated	-	209	19	25	219	183	-	136	790	790	-	-	2,530	667	-	-	-	145,208	3,069	-
2a.1.5.38	Miscellaneous	-	42	1	2	26	-	-	15	85	85	-	-	302	-	-	-	-	12,283	622	-
2a.1.5.39	Off Gas Recombiner	-	182	19	22	155	209	-	126	714	714	-	-	1,795	764	-	-	-	121,554	2,708	-
2a.1.5.40	Off Gas Recombiner - Insulated	-	379	19	19	118	195	-	166	897	897	-	-	1,366	709	-	-	-	100,933	5,385	-
2a.1.5.41	Post Accident Sampling	-	24	1	1	5	9	-	9	50	50	-	-	53	33	-	-	-	4,318	345	-
2a.1.5.42	Post Accident Sampling - Insulated	-	16	1	1	1	11	-	7	37	37	-	-	17	37	-	-	-	3,116	212	-
2a.1.5.43	RHR Service Water - Insulated - RCA	-	81	3	9	128	-	-	41	262	262	-	-	1,485	-	-	-	-	60,293	1,125	-
2a.1.5.44	RHR Service Water - RCA	-	4	0	0	3	-	-	1	9	9	-	-	35	-	-	-	-	1,410	57	-
2a.1.5.45	Reactor Feedwater Pump Seal	-	55	3	3	17	26	-	23	126	126	-	-	193	96	-	-	-	14,009	773	-
2a.1.5.46	Residual Heat Removal	349	240	168	126	554	1,667	-	770	3,875	3,875	-	-	6,406	6,012	-	-	-	647,941	4,135	-
2a.1.5.47	Residual Heat Removal - Insulated	602	540	64	58	291	715	-	674	2,944	2,944	-	-	3,367	2,607	-	-	-	303,087	10,340	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

Table G
Monticello Nuclear Generating Plant
Scenario 5: DECON with 60 Year DFS and Recasking Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2a.1.5.48	Rx Core Isolation Cooling	-	47	2	3	22	21	-	21	116	116	-	-	259	76	-	-	-	15,396	691	-
2a.1.5.49	Rx Core Isolation Cooling - Insulated	-	105	5	5	25	55	-	45	240	240	-	-	288	198	-	-	-	24,419	1,479	-
2a.1.5.50	Rx Recirculation	56	57	6	3	4	53	-	57	235	235	-	-	43	190	-	-	-	14,095	1,580	-
2a.1.5.51	Snubbers	-	168	2	4	33	25	-	54	285	285	-	-	377	90	-	-	-	21,009	2,548	-
2a.1.5.52	Standby Liquid Control - Insul - RCA	-	4	0	0	2	-	-	1	7	7	-	-	22	-	-	-	-	904	48	-
2a.1.5.53	Standby Liquid Control - RCA	-	26	0	1	21	-	-	10	59	59	-	-	245	-	-	-	-	9,969	341	-
2a.1.5.54	Stator Cooling - RCA	-	7	0	1	11	-	-	4	23	23	-	-	126	-	-	-	-	5,135	98	-
2a.1.5.55	Traversing Incore Probe	0	4	0	0	0	2	-	1	7	7	-	-	1	5	-	-	-	386	51	-
2a.1.5	Totals	1,007	7,978	931	1,079	8,447	9,287	-	6,340	35,068	35,046	-	22	97,654	33,808	-	-	-	6,125,515	119,943	-
2a.1.6	Scaffolding in support of decommissioning	-	2,188	25	8	99	25	-	572	2,916	2,916	-	-	1,030	91	-	-	-	52,111	22,564	-
2a.1	Subtotal Period 2a Activity Costs	1,669	28,379	18,848	5,754	13,409	37,095	711	38,602	144,467	144,445	-	22	141,010	59,545	1,481	1,010	-	10,427,730	254,140	2,778
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,326	698	3,024	3,024	-	-	-	-	-	-	-	-	30,411	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	2,326	698	3,024	3,024	-	-	-	-	-	-	-	-	30,411	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	83	-	55	140	-	222	-	123	623	623	-	-	-	531	-	-	-	31,838	103	-
2a.3.2	Process decommissioning chemical flush waste	6	-	208	774	-	1,557	-	529	3,075	3,075	-	-	-	2,093	-	-	-	223,008	392	-
2a.3.3	Small tool allowance	-	315	-	-	-	-	-	47	363	326	-	36	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	23,173	3,476	26,649	-	26,649	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	13,235	1,985	15,221	15,221	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	89	315	263	914	-	1,779	36,408	6,161	45,930	19,245	26,649	36	-	2,623	-	-	-	254,846	495	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	102	-	-	-	-	-	-	25	127	127	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	1,055	106	1,161	1,161	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	3,061	306	3,367	3,367	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,133	-	-	-	-	-	533	2,666	2,666	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,212	-	-	-	-	-	482	3,694	3,694	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	122	37	-	453	-	131	743	743	-	-	-	5,567	-	-	-	111,335	182	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	2,404	361	2,765	2,765	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	847	85	932	932	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	3,757	376	4,133	-	4,133	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	3,392	509	3,900	3,900	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,174	176	1,350	-	1,350	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	151	23	174	-	174	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	466	70	536	536	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	19,265	2,890	22,154	22,154	-	-	-	-	-	-	-	-	-	328,651
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	20,125	3,019	23,144	23,144	-	-	-	-	-	-	-	-	-	231,273
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	26,670	4,000	30,670	30,670	-	-	-	-	-	-	-	-	-	430,594
2a.4	Subtotal Period 2a Period-Dependent Costs	102	5,345	122	37	-	453	82,366	13,090	101,515	95,858	5,657	-	-	5,567	-	-	-	111,335	182	990,519
2a.0	TOTAL PERIOD 2a COST	1,860	34,039	19,233	6,705	13,409	39,327	121,812	58,551	294,937	262,573	32,305	58	141,010	67,735	1,481	1,010	-	10,793,910	285,228	993,297

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table G
Monticello Nuclear Generating Plant
Scenario 5: DECON with 60 Year DFS and Recasking Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2b - Site Decontamination																					
Disposal of Plant Systems																					
2b.1.1.1	ALARA/Radiological	-	18	0	0	3	3	-	6	30	30	-	-	35	10	-	-	-	2,060	277	-
2b.1.1.2	Alternate N2 - RCA	-	16	0	1	8	-	-	5	30	30	-	-	93	-	-	-	-	3,765	185	-
2b.1.1.3	Decontamination Projects	-	1	0	0	0	0	-	0	2	2	-	-	2	0	-	-	-	129	17	-
2b.1.1.4	Electrical - Contaminated	-	439	6	16	207	25	-	150	841	841	-	-	2,389	90	-	-	-	102,726	6,325	-
2b.1.1.5	Electrical - Decontaminated	-	2,657	41	142	2,019	-	-	993	5,852	5,852	-	-	23,344	-	-	-	-	948,013	37,107	-
2b.1.1.6	Fire - RCA	-	99	1	4	53	-	-	33	191	191	-	-	614	-	-	-	-	24,917	1,324	-
2b.1.1.7	HVAC Ductwork	-	309	7	18	231	27	-	122	713	713	-	-	2,665	100	-	-	-	114,598	4,111	-
2b.1.1.8	HVAC/Chilled Water - RCA	-	317	5	17	238	-	-	118	694	694	-	-	2,752	-	-	-	-	111,779	3,985	-
2b.1.1.9	Heating & Ventilation	-	473	15	40	521	62	-	219	1,329	1,329	-	-	6,018	227	-	-	-	258,789	7,101	-
2b.1.1.10	Heating Boiler - Insulated - RCA	-	3	0	0	2	-	-	1	6	6	-	-	26	-	-	-	-	1,058	35	-
2b.1.1.11	Liquid Radwaste	572	669	46	44	266	476	-	623	2,697	2,697	-	-	3,073	1,728	-	-	-	235,484	17,194	-
2b.1.1.12	Makeup Demin - RCA	-	101	3	9	127	-	-	46	286	286	-	-	1,471	-	-	-	-	59,747	1,412	-
2b.1.1.13	Non-Essential Diesel Generator - RCA	-	26	2	9	123	-	-	27	187	187	-	-	1,424	-	-	-	-	57,832	395	-
2b.1.1.14	Off Gas Holdup	-	333	20	26	238	174	-	168	960	960	-	-	2,755	630	-	-	-	152,277	4,769	-
2b.1.1.15	Primary Containment	-	443	43	59	536	412	-	308	1,801	1,801	-	-	6,201	1,506	-	-	-	347,704	6,454	-
2b.1.1.16	Process Radiation Monitors	-	45	2	2	12	14	-	17	92	92	-	-	142	52	-	-	-	9,115	649	-
2b.1.1.17	Rx Bldg Closed Clng Water - Insul - RCA	-	111	2	6	85	-	-	42	245	245	-	-	977	-	-	-	-	39,675	1,484	-
2b.1.1.18	Rx Bldg Closed Clng Water - RCA	-	178	12	43	614	-	-	144	991	991	-	-	7,093	-	-	-	-	288,031	2,489	-
2b.1.1.19	Rx Component Handling Equip	26	138	19	19	100	227	-	124	653	653	-	-	1,158	829	-	-	-	99,730	2,462	-
2b.1.1.20	Rx Pressure Vessel	28	46	6	4	7	63	-	43	196	196	-	-	75	230	-	-	-	17,816	1,051	-
2b.1.1.21	Rx Water Cleanup	169	258	19	11	11	204	-	205	877	877	-	-	130	737	-	-	-	52,670	5,736	-
2b.1.1.22	Secondary Containment	-	121	7	10	88	70	-	63	360	360	-	-	1,017	255	-	-	-	57,567	1,763	-
2b.1.1.23	Service & Seal Water - Insulated - RCA	-	117	2	7	102	-	-	46	274	274	-	-	1,180	-	-	-	-	47,917	1,565	-
2b.1.1.24	Service & Seal Water - RCA	-	155	3	11	156	-	-	64	390	390	-	-	1,809	-	-	-	-	73,453	2,016	-
2b.1.1.25	Service Air Blower - RCA	-	15	0	1	18	-	-	7	41	41	-	-	206	-	-	-	-	8,364	206	-
2b.1.1.26	Solid Radwaste	327	483	36	34	206	380	-	419	1,885	1,885	-	-	2,387	1,380	-	-	-	185,221	10,820	-
2b.1.1.27	Structures & Buildings	-	76	2	3	31	23	-	30	166	166	-	-	357	85	-	-	-	19,933	1,128	-
2b.1.1.28	Wells & Domestic Water	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	144	-
2b.1.1.29	Wells & Domestic Water - RCA	-	51	1	2	30	-	-	18	101	101	-	-	342	-	-	-	-	13,874	633	-
2b.1.1	Totals	1,122	7,707	299	537	6,032	2,160	-	4,042	21,900	21,890	-	10	69,735	7,859	-	-	-	3,334,244	122,835	-
2b.1.2	Scaffolding in support of decommissioning	-	2,735	31	10	123	31	-	715	3,645	3,645	-	-	1,287	114	-	-	-	65,139	28,205	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor Building	5,006	2,817	155	347	4,159	1,007	-	4,150	17,641	17,641	-	-	48,077	7,014	-	-	-	2,317,670	112,518	-
2b.1.3.2	Admin	103	6	0	2	-	14	-	57	182	182	-	-	-	145	-	-	-	6,840	1,600	-
2b.1.3.3	HPCI Room	28	27	1	2	10	13	-	26	107	107	-	-	118	125	-	-	-	10,759	789	-
2b.1.3.4	Hot Shop	16	4	0	1	-	10	-	12	43	43	-	-	-	103	-	-	-	4,860	286	-
2b.1.3.5	LLRW Storage & Shipping	56	23	1	6	3	41	-	46	176	176	-	-	31	433	-	-	-	21,708	1,127	-
2b.1.3.6	Offgas Stack	360	256	6	16	116	73	-	283	1,109	1,109	-	-	1,343	669	-	-	-	87,045	8,860	-
2b.1.3.7	Offgas Storage & Compressor	39	17	1	4	2	30	-	32	125	125	-	-	25	316	-	-	-	15,948	785	-
2b.1.3.8	Radwaste	117	59	3	13	15	86	-	100	393	393	-	-	172	910	-	-	-	49,943	2,503	-
2b.1.3.9	Radwaste Material Storage Warehouse	62	23	1	6	-	47	-	49	189	189	-	-	-	495	-	-	-	23,400	1,197	-
2b.1.3.10	Recombiner	26	24	1	4	17	22	-	28	122	122	-	-	199	216	-	-	-	18,405	695	-
2b.1.3.11	Turbine	684	341	18	76	111	507	-	583	2,319	2,319	-	-	1,283	5,299	-	-	-	303,150	14,443	-
2b.1.3.12	Turbine Building Addition	56	20	1	6	-	41	-	44	169	169	-	-	-	434	-	-	-	20,478	1,087	-
2b.1.3	Totals	6,554	3,618	188	483	4,433	1,889	-	5,410	22,574	22,574	-	-	51,247	16,159	-	-	-	2,880,206	145,889	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan									a											
2b.1	Subtotal Period 2b Activity Costs	7,676	14,060	518	1,031	10,588	4,079	481	10,239	48,672	48,662	-	10	122,269	24,132	-	-	-	6,279,589	296,929	4,096
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	3,241	972	4,213	4,213	-	-	-	-	-	-	-	-	42,370	-
2b.2.2	Operational Equipment	-	-	19	60	624	-	-	104	807	807	-	-	11,710	-	-	-	-	292,750	32	-
2b.2.3	Security Modifications	-	-	-	-	-	-	8,696	1,304	10,000	10,000	-	-	-	-	-	-	-	-	-	-
2b.2	Subtotal Period 2b Additional Costs	-	-	19	60	624	-	11,937	2,381	15,020	15,020	-	-	11,710	-	-	-	-	292,750	42,402	-

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Table G
Monticello Nuclear Generating Plant
Scenario 5: DECON with 60 Year DFS and Recasking Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	173	-	117	299	-	474	-	261	1,325	1,325	-	-	-	1,133	-	-	-	67,962	221	-
2b.3.2	Process decommissioning chemical flush waste	1	-	41	153	-	307	-	104	606	606	-	-	-	413	-	-	-	43,978	77	-
2b.3.3	Small tool allowance	-	341	-	-	-	-	-	51	392	392	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	65,919	9,888	75,807	-	75,807	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	8,665	1,300	9,964	9,964	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	174	341	159	452	-	781	74,584	11,604	88,094	12,287	75,807	-	-	1,545	-	-	-	111,940	298	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,361	-	-	-	-	-	-	340	1,701	1,701	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	1,470	147	1,617	1,617	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	3,915	391	4,306	4,306	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,681	-	-	-	-	-	670	3,352	3,352	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	4,602	-	-	-	-	-	690	5,292	5,292	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	124	38	-	463	-	134	759	759	-	-	-	5,690	-	-	-	113,799	186	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	2,645	397	3,041	3,041	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,180	118	1,298	1,298	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	5,234	523	5,758	-	5,758	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	4,725	709	5,434	5,434	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,636	245	1,881	-	1,881	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	412	62	474	474	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	210	32	242	-	242	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	26,840	4,026	30,867	30,867	-	-	-	-	-	-	-	-	-	457,896
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	27,122	4,068	31,191	31,191	-	-	-	-	-	-	-	-	-	309,504
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	35,641	5,346	40,988	40,988	-	-	-	-	-	-	-	-	-	574,490
2b.4	Subtotal Period 2b Period-Dependent Costs	1,361	7,283	124	38	-	463	111,268	17,935	138,473	130,592	7,881	-	-	5,690	-	-	-	113,799	186	1,341,891
2b.0	TOTAL PERIOD 2b COST	9,211	21,684	820	1,580	11,212	5,324	198,269	42,159	290,260	206,561	83,688	10	133,979	31,367	-	-	-	6,798,079	339,814	1,345,987
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	634	56	114	109	-	2,091	-	881	3,884	3,884	-	-	-	7,653	-	-	-	486,170	906	-
Disposal of Plant Systems																					
2d.1.2.1	Cranes/Heavy Loads/Rigging - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2d.1.2.2	Electrical - Contaminated Fuel Pool	-	46	1	2	21	2	-	16	87	87	-	-	240	9	-	-	-	10,334	665	-
2d.1.2.3	Electrical - Decontam. Fuel Pool Area	-	293	4	15	213	-	-	108	633	633	-	-	2,457	-	-	-	-	99,783	4,090	-
2d.1.2.4	Fire - RCA - Fuel Pool Area	-	11	0	0	5	-	-	4	20	20	-	-	62	-	-	-	-	2,499	143	-
2d.1.2.5	Fuel Pool Cooling & Cleanup	240	419	34	26	102	370	-	340	1,531	1,531	-	-	1,179	1,341	-	-	-	133,939	8,380	-
2d.1.2.6	Fuel Pool Cooling & Cleanup - Insulated	26	40	3	2	6	32	-	33	143	143	-	-	67	117	-	-	-	10,220	848	-
2d.1.2.7	HVAC Ductwork - Fuel Pool Area	-	34	1	2	26	3	-	14	79	79	-	-	296	11	-	-	-	12,733	457	-
2d.1.2.8	HVAC/Chilled Water - RCA Fuel Pool Area	-	32	0	1	19	-	-	11	64	64	-	-	223	-	-	-	-	9,072	397	-
2d.1.2.9	Instrument & Service Air-RCA-Fuel Pool	-	28	0	2	23	-	-	11	64	64	-	-	267	-	-	-	-	10,841	357	-
2d.1.2	Totals	266	907	44	51	423	408	-	537	2,637	2,637	-	-	4,894	1,479	-	-	-	293,606	15,385	-
Decontamination of Site Buildings																					
2d.1.3.1	Reactor (Post Fuel)	911	2,485	145	669	170	8,544	-	3,353	16,277	16,277	-	-	1,969	62,698	-	-	-	2,732,406	45,703	-
2d.1.3	Totals	911	2,485	145	669	170	8,544	-	3,353	16,277	16,277	-	-	1,969	62,698	-	-	-	2,732,406	45,703	-
2d.1.4	Scaffolding in support of decommissioning	-	547	6	2	25	6	-	143	729	729	-	-	257	23	-	-	-	13,028	5,641	-
2d.1	Subtotal Period 2d Activity Costs	1,811	3,994	309	831	618	11,049	-	4,915	23,527	23,527	-	-	7,120	71,852	-	-	-	3,525,210	67,635	-

Monticello Nuclear Generating Plant
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Table G
Monticello Nuclear Generating Plant
Scenario 5: DECON with 60 Year DFS and Recasking Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,291	387	1,678	1,678	-	-	-	-	-	-	-	-	-	12,480
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,198	359	1,557	1,557	-	-	-	-	-	-	-	-	15,661	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,489	747	3,235	3,235	-	-	-	-	-	-	-	-	15,661	12,480
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	69	-	47	120	-	191	-	105	533	533	-	-	-	457	-	-	-	27,391	89	-
2d.3.2	Process decommissioning chemical flush waste	1	-	25	92	-	185	-	63	366	366	-	-	-	249	-	-	-	26,553	47	-
2d.3.3	Small tool allowance	-	88	-	-	-	-	-	13	101	101	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	143	55	575	145	-	145	1,062	1,062	-	-	6,000	529	-	-	-	303,608	147	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	27,061	4,059	31,120	-	31,120	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	70	88	216	267	575	521	27,061	4,385	33,182	2,062	31,120	-	6,000	1,235	-	-	-	357,552	283	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	219	-	-	-	-	-	-	55	274	274	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,336	134	1,470	1,470	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	752	-	-	-	-	-	188	940	940	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,701	-	-	-	-	-	255	1,956	1,956	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	44	14	-	165	-	48	271	271	-	-	-	2,030	-	-	-	40,600	66	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	521	78	600	600	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	369	37	405	405	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,935	193	2,128	-	2,128	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	305	46	351	351	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	9,608	1,441	11,049	7,668	3,381	-	-	-	-	-	-	-	-	162,981
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,941	1,041	7,982	7,982	-	-	-	-	-	-	-	-	-	78,356
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	9,556	1,433	10,989	10,132	857	-	-	-	-	-	-	-	-	149,660
2d.4	Subtotal Period 2d Period-Dependent Costs	219	2,453	44	14	-	165	33,025	5,290	41,210	34,754	6,456	-	-	2,030	-	-	-	40,600	66	390,997
2d.0	TOTAL PERIOD 2d COST	2,099	6,535	569	1,112	1,193	11,735	62,574	15,337	101,154	63,579	37,575	-	13,120	75,117	-	-	-	3,923,362	83,645	403,477
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	43	7	50	-	50	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,232	185	1,417	1,367	50	-	-	-	-	-	-	-	-	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

Table G
Monticello Nuclear Generating Plant
Scenario 5: DECON with 60 Year DFS and Recasking Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/ Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,285	128	1,413	1,413	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	597	-	-	-	-	-	149	747	747	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	8	2	-	29	-	8	47	47	-	-	-	355	-	-	-	7,097	12	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	261	39	300	300	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	420	42	463	463	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	103	10	113	-	113	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	9,608	1,441	11,049	7,668	3,381	-	-	-	-	-	-	-	-	162,981
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	5,174	776	5,950	5,950	-	-	-	-	-	-	-	-	-	57,200
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	5,456	818	6,274	5,415	860	-	-	-	-	-	-	-	-	80,707
2f.4	Subtotal Period 2f Period-Dependent Costs	-	597	8	2	-	29	24,761	3,754	29,152	24,708	4,443	-	-	355	-	-	-	7,097	12	300,888
2f.0	TOTAL PERIOD 2f COST	-	597	8	2	-	29	33,511	6,194	40,341	35,848	4,493	-	-	355	-	-	-	7,097	96,208	307,128
PERIOD 2 TOTALS		13,170	62,856	20,629	9,399	25,814	56,415	416,166	122,242	726,692	568,562	158,062	68	288,110	174,575	1,481	1,010	-	21,522,450	804,895	3,049,889
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor Building	-	1,881	-	-	-	-	-	282	2,163	-	-	2,163	-	-	-	-	-	-	13,966	-
3b.1.1.2	Condensate Tanks Foundation	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	50	-
3b.1.1.3	Discharge Retention Basin	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	25	-
3b.1.1.4	HPCI Room	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	97	-
3b.1.1.5	Hot Shop	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	177	-
3b.1.1.6	Hydrogen & Oxygen Storage	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	19	-
3b.1.1.7	LLRW Storage & Shipping	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	662	-
3b.1.1.8	MSIV	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	42	-
3b.1.1.9	Misc Structures 2017	-	759	-	-	-	-	-	114	872	-	-	872	-	-	-	-	-	-	7,919	-
3b.1.1.10	Offgas Stack	-	104	-	-	-	-	-	16	120	-	-	120	-	-	-	-	-	-	544	-
3b.1.1.11	Offgas Storage & Compressor	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	199	-
3b.1.1.12	Radwaste	-	219	-	-	-	-	-	33	252	-	-	252	-	-	-	-	-	-	1,220	-
3b.1.1.13	Recombiner	-	123	-	-	-	-	-	18	141	-	-	141	-	-	-	-	-	-	713	-
3b.1.1.14	Security Barrier	-	179	-	-	-	-	-	27	206	-	-	206	-	-	-	-	-	-	933	-
3b.1.1.15	Structures Greater than 3' Below Grade	-	2,380	-	-	-	-	-	357	2,738	-	-	2,738	-	-	-	-	-	-	12,649	-
3b.1.1.16	Tank Farm	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	21	-
3b.1.1.17	Turbine	-	1,175	-	-	-	-	-	176	1,351	-	-	1,351	-	-	-	-	-	-	13,091	-
3b.1.1.18	Turbine Building Addition	-	51	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	618	-
3b.1.1.19	Turbine Pedestal	-	175	-	-	-	-	-	26	202	-	-	202	-	-	-	-	-	-	926	-
3b.1.1	Totals	-	7,219	-	-	-	-	-	1,083	8,302	-	-	8,302	-	-	-	-	-	-	53,870	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	864	-	-	-	-	-	130	994	-	-	994	-	-	-	-	-	-	1,841	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,083	-	-	-	-	183	1,240	9,506	211	-	9,295	-	-	-	-	-	-	55,711	1,560
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	3,297	-	-	-	-	11	496	3,805	-	-	3,805	-	-	-	-	-	-	12	-
3b.2.2	Excavation of Underground Services	-	1,380	-	-	-	-	947	349	2,677	-	-	2,677	-	-	-	-	-	-	13,475	-
3b.2.3	Intake Structure Cofferdam	-	320	-	-	-	-	-	48	368	-	-	368	-	-	-	-	-	-	2,584	-
3b.2.4	Construction Debris	-	-	-	-	-	-	350	53	403	-	-	403	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	5,102	-	-	-	-	-	765	5,868	-	-	5,868	-	-	-	-	-	-	5,422	-
3b.2	Subtotal Period 3b Additional Costs	-	10,100	-	-	-	-	1,309	1,711	13,120	-	-	13,120	-	-	-	-	-	-	21,493	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	97	-	-	-	-	-	15	111	-	-	111	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	100	15	115	-	115	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	97	-	-	-	-	100	30	226	-	115	111	-	-	-	-	-	-	-	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table G
Monticello Nuclear Generating Plant
Scenario 5: DECON with 60 Year DFS and Recasking Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	1,251	125	1,376	-	1,376	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	2,737	274	3,011	-	3,011	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	5,455	-	-	-	-	-	818	6,273	-	-	6,273	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	300	45	345	-	-	345	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	386	39	424	-	424	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	237	24	261	-	261	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	1,260	189	1,450	-	-	1,450	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	179	27	206	-	206	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	497	75	572	-	-	572	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	22,115	3,317	25,432	(0)	7,782	17,650	-	-	-	-	-	-	-	375,152
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	11,290	1,693	12,983	-	-	12,983	-	-	-	-	-	-	-	122,646
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	6,583	987	7,571	-	1,976	5,595	-	-	-	-	-	-	-	98,297
3b.4	Subtotal Period 3b Period-Dependent Costs	-	5,455	-	-	-	-	46,836	7,613	59,904	(0)	15,036	44,868	-	-	-	-	-	-	-	596,095
3b.0	TOTAL PERIOD 3b COST	-	23,734	-	-	-	-	48,428	10,594	82,756	211	15,152	67,394	-	-	-	-	-	-	77,204	597,655
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	122,822	18,423	141,246	-	141,246	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	122,822	18,423	141,246	-	141,246	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	28,205	2,821	31,026	-	31,026	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	24,796	2,480	27,276	-	27,276	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	8,697	870	9,567	-	9,567	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	5,348	535	5,883	-	5,883	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	9,721	1,458	11,179	-	11,179	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	4,037	606	4,643	-	4,643	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	4,510	677	5,187	-	5,187	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	152,513	22,877	175,389	-	175,389	-	-	-	-	-	-	-	-	2,114,750
3c.4.10	Utility Staff Cost	-	-	-	-	-	-	38,674	5,801	44,475	-	44,475	-	-	-	-	-	-	-	-	549,022
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	276,502	38,123	314,624	-	314,624	-	-	-	-	-	-	-	-	2,663,772
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	399,324	56,546	455,870	-	455,870	-	-	-	-	-	-	-	-	2,663,772
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
3d.1.1	Totals	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	6,552	-	1,316	9,199	9,199	-	-	-	-	-	-	1,547	311,184	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	23,942	3,591	27,533	-	27,533	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	23,942	3,591	27,533	-	27,533	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	9,383	938	10,321	-	10,321	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	6,703	670	7,374	-	7,374	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4,257	426	4,683	-	4,683	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,779	178	1,957	-	1,957	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	3,234	485	3,719	-	3,719	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,343	201	1,544	-	1,544	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,500	225	1,725	-	1,725	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	50,734	7,610	58,344	-	58,344	-	-	-	-	-	-	-	-	703,485
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	12,865	1,930	14,795	-	14,795	-	-	-	-	-	-	-	-	182,635
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	91,799	12,664	104,462	-	104,462	-	-	-	-	-	-	-	-	886,120
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	6,552	115,740	17,571	141,194	9,199	131,995	-	-	-	-	-	1,547	311,184	-	886,120

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

Table G
Monticello Nuclear Generating Plant
Scenario 5: DECON with 60 Year DFS and Recasking Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	Decommissioning of ISFSI	30	133	8	788	-	8,077	1,865	2,725	13,626	13,626	-	-	-	27,473	-	-	-	3,877,048	11,519	1,848
3e.2	Subtotal Period 3e Additional Costs	30	133	8	788	-	8,077	1,865	2,725	13,626	13,626	-	-	-	27,473	-	-	-	3,877,048	11,519	1,848
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	110	28	138	138	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	244	61	304	304	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	82	21	103	103	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	38	10	48	48	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	308	77	385	385	-	-	-	-	-	-	-	-	-	4,999
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	260	65	325	325	-	-	-	-	-	-	-	-	-	3,792
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	1,042	261	1,303	1,303	-	-	-	-	-	-	-	-	-	8,792
3e.0	TOTAL PERIOD 3e COST	30	133	8	788	-	8,077	2,907	2,986	14,929	14,929	-	-	-	27,473	-	-	-	3,877,048	11,519	10,640
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	1,766	-	-	-	-	185	293	2,244	-	-	2,244	-	-	-	-	-	-	8,537	160
3f.2	Subtotal Period 3f Additional Costs	-	1,766	-	-	-	-	185	293	2,244	-	-	2,244	-	-	-	-	-	-	8,537	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	123	12	135	-	-	135	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	123	-	-	-	-	-	19	142	-	-	142	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	29	4	33	-	-	33	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	42	6	48	-	-	48	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	19	3	22	-	-	22	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	155	23	179	-	-	179	-	-	-	-	-	-	-	2,520
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	103	16	119	-	-	119	-	-	-	-	-	-	-	1,564
3f.4	Subtotal Period 3f Period-Dependent Costs	-	123	-	-	-	-	471	83	678	-	-	678	-	-	-	-	-	-	-	4,084
3f.0	TOTAL PERIOD 3f COST	-	1,903	-	-	-	-	656	378	2,937	-	-	2,937	-	-	-	-	-	-	8,537	4,244
PERIOD 3 TOTALS		30	25,770	1,339	788	-	14,629	567,055	88,074	697,686	24,338	603,017	70,331	-	27,473	-	-	1,547	4,188,233	97,261	4,162,431
TOTAL COST TO DECOMMISSION		16,519	91,485	22,065	10,360	25,828	72,190	1,130,107	234,106	1,602,660	759,122	772,214	71,324	288,153	203,249	1,711	1,010	1,547	25,773,870	934,006	8,407,016
TOTAL COST TO DECOMMISSION WITH 17.11% CONTINGENCY:					\$1,602,660 thousands of 2017 dollars																
TOTAL NRC LICENSE TERMINATION COST IS 47.37% OR:					\$759,122 thousands of 2017 dollars																
SPENT FUEL MANAGEMENT COST IS 48.18% OR:					\$772,214 thousands of 2017 dollars																
NON-NUCLEAR DEMOLITION COST IS 4.45% OR:					\$71,324 thousands of 2017 dollars																
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):					205,970 cubic feet																
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:					1,547 cubic feet																
TOTAL SCRAP METAL REMOVED:					22,696 tons																
TOTAL CRAFT LABOR REQUIREMENTS:					934,006 man-hours																

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

***Monticello Nuclear Generating Plant
Decommissioning Cost Analysis***

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APPENDIX H

DETAILED COST ANALYSIS

SCENARIO 6: SAFSTOR with 32 Year DFS

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	380	114	494	494	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	176	26	202	202	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.16	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.17	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.18.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	578	87	664	664	-	-	-	-	-	-	-	-	-	4,920
1a.1.18.2	Plant systems	-	-	-	-	-	-	489	73	562	562	-	-	-	-	-	-	-	-	-	4,167
1a.1.18.3	Plant structures and buildings	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
1a.1.18.4	Waste management	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.18.5	Facility and site dormancy	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.18	Total	-	-	-	-	-	-	1,902	285	2,188	2,188	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.19.1	Plant systems	-	-	-	-	-	-	139	21	160	160	-	-	-	-	-	-	-	-	-	1,183
1a.1.19.2	Facility closeout & dormancy	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1a.1.19	Total	-	-	-	-	-	-	280	42	322	322	-	-	-	-	-	-	-	-	-	2,383
1a.1.20	Procure vacuum drying system	-	-	-	-	-	-	12	2	13	13	-	-	-	-	-	-	-	-	-	100
1a.1.21	Drain/de-energize non-cont. systems									a											
1a.1.22	Drain & dry NSSS									a											
1a.1.23	Drain/de-energize contaminated systems									a											
1a.1.24	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	5,590	896	6,486	6,486	-	-	-	-	-	-	-	-	-	44,390
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,181	1,077	8,258	-	8,258	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	9,892	1,484	11,376	11,376	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	17,073	2,561	19,634	11,376	8,258	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	2,408	241	2,649	2,649	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,242	224	2,466	2,466	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,730	259	1,989	1,989	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	3,166	317	3,482	-	3,482	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	2,833	425	3,258	3,258	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	803	120	923	-	923	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	115	17	133	133	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	14,260	2,139	16,399	16,399	-	-	-	-	-	-	-	-	-	245,440
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	54,561	7,966	63,676	59,152	4,524	-	-	610	-	-	-	12,190	20	667,680
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	77,224	11,423	89,796	77,014	12,782	-	-	610	-	-	-	12,190	20	712,070

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor Building	4,303	-	-	-	-	-	-	2,152	6,455	6,455	-	-	-	-	-	-	-	-	70,157	-
1b.1.1.2	Admin	81	-	-	-	-	-	-	41	122	122	-	-	-	-	-	-	-	-	1,357	-
1b.1.1.3	HPCI Room	21	-	-	-	-	-	-	11	32	32	-	-	-	-	-	-	-	-	350	-
1b.1.1.4	Hot Shop	12	-	-	-	-	-	-	6	19	19	-	-	-	-	-	-	-	-	208	-
1b.1.1.5	LLRW Storage & Shipping	42	-	-	-	-	-	-	21	63	63	-	-	-	-	-	-	-	-	705	-
1b.1.1.6	Offgas Stack	276	-	-	-	-	-	-	138	414	414	-	-	-	-	-	-	-	-	4,575	-
1b.1.1.7	Offgas Storage & Compressor	29	-	-	-	-	-	-	15	44	44	-	-	-	-	-	-	-	-	488	-
1b.1.1.8	Radwaste	88	-	-	-	-	-	-	44	132	132	-	-	-	-	-	-	-	-	1,473	-
1b.1.1.9	Radwaste Material Storage Warehouse	46	-	-	-	-	-	-	23	69	69	-	-	-	-	-	-	-	-	768	-
1b.1.1.10	Recombiner	19	-	-	-	-	-	-	10	29	29	-	-	-	-	-	-	-	-	323	-
1b.1.1.11	Turbine	512	-	-	-	-	-	-	256	768	768	-	-	-	-	-	-	-	-	8,583	-
1b.1.1.12	Turbine Building Addition	42	-	-	-	-	-	-	21	63	63	-	-	-	-	-	-	-	-	709	-
1b.1.1.13	Reactor (Post Fuel)	695	-	-	-	-	-	-	347	1,042	1,042	-	-	-	-	-	-	-	-	11,337	-
1b.1.1	Totals	6,167	-	-	-	-	-	-	3,084	9,251	9,251	-	-	-	-	-	-	-	-	101,033	-
1b.1	Subtotal Period 1b Activity Costs	6,167	-	-	-	-	-	-	3,084	9,251	9,251	-	-	-	-	-	-	-	-	101,033	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	214	-	138	356	-	566	-	316	1,589	1,589	-	-	-	1,350	-	-	-	81,018	263	-
1b.3.4	Small tool allowance	-	105	-	-	-	-	-	16	121	121	-	-	-	-	-	-	-	-	-	-
1b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	168	25	193	-	193	-	-	-	-	-	-	-	-	-
1b.3.6	Retention and Severance	-	-	-	-	-	-	3,640	546	4,186	4,186	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,187	105	138	356	-	566	3,808	1,049	7,209	7,016	193	-	-	1,350	-	-	-	81,018	263	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	1,264	-	-	-	-	-	-	316	1,580	1,580	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	607	61	668	668	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	565	57	622	622	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	614	-	-	-	-	-	153	767	767	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	143	-	-	-	-	-	21	164	164	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	12	4	-	45	-	13	74	74	-	-	-	556	-	-	-	11,126	18	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	436	65	501	501	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	161	16	178	178	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	798	80	878	-	878	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	714	107	821	821	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,594	539	4,134	4,134	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	6,501	975	7,476	7,476	-	-	-	-	-	-	-	-	-	106,428
1b.4	Subtotal Period 1b Period-Dependent Costs	1,264	757	12	4	-	45	13,634	2,442	18,157	17,017	1,140	-	-	556	-	-	-	11,126	18	168,292
1b.0	TOTAL PERIOD 1b COST	8,618	862	150	360	-	611	29,134	8,328	48,062	46,729	1,333	-	-	1,907	-	-	-	92,144	101,314	168,292
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	470	-	-	-	-	-	71	541	541	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	44	-	-	-	-	-	7	51	51	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	14,124	-
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	68	10	79	79	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	514	-	-	-	-	801	307	1,623	1,623	-	-	-	-	-	-	-	-	17,824	583

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1c Collateral Costs																					
1c.3.1	Process decommissioning water waste	157	-	102	262	-	416	-	232	1,170	1,170	-	-	-	994	-	-	-	59,665	194	-
1c.3.3	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	166	25	191	-	191	-	-	-	-	-	-	-	-	-
1c.3.5	Retention and Severance	-	-	-	-	-	-	2,722	408	3,130	3,130	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	157	4	102	262	-	416	2,887	666	4,495	4,304	191	-	-	994	-	-	-	59,665	194	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	600	60	660	660	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	558	56	614	614	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	215	-	-	-	-	-	54	268	268	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	141	-	-	-	-	-	21	163	163	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	1	-	12	-	4	20	20	-	-	-	152	-	-	-	3,039	5	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	431	65	496	496	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	160	16	176	176	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	789	79	868	-	868	-	-	-	-	-	-	-	-	-
1c.4.9	Fixed Overhead	-	-	-	-	-	-	706	106	812	812	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	200	30	230	-	230	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1c.4.12	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1c.4.13	Security Staff Cost	-	-	-	-	-	-	3,555	533	4,089	4,089	-	-	-	-	-	-	-	-	-	61,192
1c.4.14	Utility Staff Cost	-	-	-	-	-	-	6,430	965	7,395	7,395	-	-	-	-	-	-	-	-	-	105,271
1c.4	Subtotal Period 1c Period-Dependent Costs	-	356	3	1	-	12	13,485	1,996	15,853	14,725	1,128	-	-	152	-	-	-	3,039	5	166,463
1c.0	TOTAL PERIOD 1c COST	157	874	105	263	-	429	17,173	2,969	21,971	20,652	1,319	-	-	1,146	-	-	-	62,705	18,023	167,046
PERIOD 1 TOTALS		8,775	2,819	268	627	-	1,089	123,531	22,720	159,829	144,395	15,434	-	-	3,662	-	-	-	167,039	119,357	1,047,408
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	216	32	248	248	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	480	120	599	599	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	695	152	848	848	-	-	-	-	-	-	-	-	-	-
Period 2a Additional Costs																					
2a.2.1	Security Modifications	-	-	-	-	-	-	8,696	1,304	10,000	10,000	-	-	-	-	-	-	-	-	-	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	8,696	1,304	10,000	10,000	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	77,276	11,591	88,867	-	88,867	-	-	-	-	-	-	-	-	-
2a.3.2	Retention and Severance	-	-	-	-	-	-	21,900	3,285	25,185	25,185	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	99,176	14,876	114,052	25,185	88,867	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	2,526	253	2,778	2,778	-	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	7,844	784	8,628	8,628	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	724	-	-	-	-	-	181	905	905	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	17	5	-	66	-	19	107	107	-	-	-	806	-	-	-	16,112	26	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,211	182	1,393	1,393	-	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	898	90	988	988	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	8,991	899	9,891	-	9,891	-	-	-	-	-	-	-	-	-
2a.4.8	Fixed Overhead	-	-	-	-	-	-	9,919	1,488	11,407	11,407	-	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	2,810	422	3,232	-	3,232	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	361	54	416	-	416	-	-	-	-	-	-	-	-	-
2a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	701	105	806	806	-	-	-	-	-	-	-	-	-	-
2a.4.12	Security Staff Cost	-	-	-	-	-	-	46,105	6,916	53,021	37,327	15,694	-	-	-	-	-	-	-	-	786,548
2a.4.13	Utility Staff Cost	-	-	-	-	-	-	17,653	2,648	20,301	16,322	3,979	-	-	-	-	-	-	-	-	287,673
2a.4	Subtotal Period 2a Period-Dependent Costs	-	724	17	5	-	66	99,020	14,040	113,872	80,661	33,211	-	-	806	-	-	-	16,112	26	1,074,220
2a.0	TOTAL PERIOD 2a COST	-	724	17	5	-	66	207,587	30,373	238,772	116,694	122,078	-	-	806	-	-	-	16,112	26	1,074,220

Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection										a										
2b.1.2	Semi-annual environmental survey										a										
2b.1.3	Prepare reports										a										
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	1,685	253	1,937	1,937	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	3,744	936	4,680	4,680	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	5,428	1,189	6,617	6,617	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	50,959	7,644	58,603	-	58,603	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	50,959	7,644	58,603	-	58,603	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	19,716	1,972	21,688	21,688	-	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	61,232	6,123	67,355	67,355	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	2,741	-	-	-	-	-	685	3,427	3,427	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	63	20	-	246	-	71	400	400	-	-	-	3,021	-	-	-	60,421	99	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	4,728	709	5,438	5,438	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	6,663	666	7,329	7,329	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	3,738	374	4,112	-	4,112	-	-	-	-	-	-	-	-	-
2b.4.8	Fixed Overhead	-	-	-	-	-	-	6,795	1,019	7,814	7,814	-	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	2,822	423	3,245	-	3,245	-	-	-	-	-	-	-	-	-
2b.4.10	Railroad Track Maintenance	-	-	-	-	-	-	3,153	473	3,626	3,626	-	-	-	-	-	-	-	-	-	-
2b.4.11	Security Staff Cost	-	-	-	-	-	-	135,018	20,253	155,271	32,607	122,664	-	-	-	-	-	-	-	-	2,046,789
2b.4.12	Utility Staff Cost	-	-	-	-	-	-	57,735	8,660	66,395	35,322	31,073	-	-	-	-	-	-	-	-	909,684
2b.4	Subtotal Period 2b Period-Dependent Costs	-	2,741	63	20	-	246	301,600	41,429	346,099	185,005	161,094	-	-	3,021	-	-	-	60,421	99	2,956,472
2b.0	TOTAL PERIOD 2b COST	-	2,741	63	20	-	246	357,987	50,261	411,319	191,622	219,697	-	-	3,021	-	-	-	60,421	99	2,956,472
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection										a										
2c.1.2	Semi-annual environmental survey										a										
2c.1.3	Prepare reports										a										
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	1,359	204	1,563	1,563	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	3,021	755	3,776	3,776	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	4,380	959	5,339	5,339	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	15,623	1,562	17,185	17,185	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	49,403	4,940	54,343	54,343	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	2,080	-	-	-	-	-	520	2,601	2,601	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	47	15	-	183	-	53	297	297	-	-	-	2,245	-	-	-	44,899	73	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	3,815	572	4,387	4,387	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	4,905	491	5,396	5,396	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	3,016	302	3,318	-	3,318	-	-	-	-	-	-	-	-	-
2c.4.8	Fixed Overhead	-	-	-	-	-	-	5,483	822	6,305	6,305	-	-	-	-	-	-	-	-	-	-
2c.4.9	ISFSI Operating Costs	-	-	-	-	-	-	2,277	342	2,619	-	2,619	-	-	-	-	-	-	-	-	-
2c.4.10	Railroad Track Maintenance	-	-	-	-	-	-	2,544	382	2,925	2,925	-	-	-	-	-	-	-	-	-	-
2c.4.11	Utility Staff Cost	-	-	-	-	-	-	24,505	3,676	28,181	28,181	-	-	-	-	-	-	-	-	-	401,397
2c.4	Subtotal Period 2c Period-Dependent Costs	-	2,080	47	15	-	183	111,571	13,661	127,557	121,620	5,936	-	-	2,245	-	-	-	44,899	73	401,397
2c.0	TOTAL PERIOD 2c COST	-	2,080	47	15	-	183	115,951	14,620	132,896	126,959	5,936	-	-	2,245	-	-	-	44,899	73	401,397
PERIOD 2 TOTALS		-	5,546	126	40	-	494	681,525	95,254	782,986	435,275	347,711	-	-	6,072	-	-	-	121,431	198	4,432,090
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey										a										
3a.1.4	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
3a.1.7	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
3a.1.9.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	865	130	995	895	-	99	-	-	-	-	-	-	-	7,370
3a.1.9.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
3a.1.9.3	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
3a.1.9.4	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
3a.1.9.5	Sacrificial shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
3a.1.9.6	Moisture separators/reheaters	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3a.1.9.7	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
3a.1.9.8	Main Turbine	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
3a.1.9.9	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
3a.1.9.10	Pressure suppression structure	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
3a.1.9.11	Drywell	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	1,600
3a.1.9.12	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
3a.1.9.13	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
3a.1.9.14	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
3a.1.9	Total	-	-	-	-	-	-	5,239	786	6,025	5,490	-	535	-	-	-	-	-	-	-	44,633
Planning & Site Preparations																					
3a.1.10	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
3a.1.11	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
3a.1.12	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
3a.1.13	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
3a.1.14	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	14,223	2,133	16,357	15,821	-	535	-	-	-	-	-	-	-	73,463
Period 3a Additional Costs																					
3a.2.1	Site Characterization	-	-	-	-	-	-	6,446	1,934	8,380	8,380	-	-	-	-	-	-	-	-	30,500	10,852
3a.2.2	Mixed & RCRA Waste	-	-	29	19	13	-	-	8	69	69	-	-	43	-	-	-	-	5,253	163	-
3a.2	Subtotal Period 3a Additional Costs	-	-	29	19	13	-	6,446	1,942	8,449	8,449	-	-	43	-	-	-	-	5,253	30,663	10,852
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	708	71	779	779	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	2,232	223	2,455	2,455	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	451	-	-	-	-	-	113	564	564	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	11	3	-	42	-	12	68	68	-	-	-	514	-	-	-	10,287	17	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,730	259	1,989	1,989	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	341	34	376	376	-	-	-	-	-	-	-	-	-	-
3a.4.8	Emergency Planning Fees	-	-	-	-	-	-	137	14	150	-	150	-	-	-	-	-	-	-	-	-
3a.4.9	Fixed Overhead	-	-	-	-	-	-	2,833	425	3,258	3,258	-	-	-	-	-	-	-	-	-	-
3a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-	-	-	-	-
3a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	115	17	133	133	-	-	-	-	-	-	-	-	-	-
3a.4.12	Utility Staff Cost	-	-	-	-	-	-	15,819	2,373	18,191	18,191	-	-	-	-	-	-	-	-	-	257,920
3a.4	Subtotal Period 3a Period-Dependent Costs	-	1,018	11	3	-	42	24,019	3,642	28,735	28,466	269	-	-	514	-	-	-	10,287	17	257,920
3a.0	TOTAL PERIOD 3a COST	-	1,018	39	23	13	42	44,688	7,717	53,540	52,736	269	535	43	514	-	-	-	15,540	30,680	342,235
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor internals	-	-	-	-	-	-	470	70	540	540	-	-	-	-	-	-	-	-	-	4,000
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD housings & NIs	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Removal primary containment	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
3b.1.1.9	Sacrificial shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.10	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
3b.1.1.11	Main Turbine	-	-	-	-	-	-	244	37	281	281	-	-	-	-	-	-	-	-	-	2,080
3b.1.1.12	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
3b.1.1.13	Moisture separators & reheaters	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Detailed Work Procedures (continued)																					
3b.1.1.14	Radwaste building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
3b.1.1.15	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	3,843	576	4,420	3,997	-	423	-	-	-	-	-	-	-	32,741
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,843	576	4,420	3,997	-	423	-	-	-	-	-	-	-	32,741
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	973	1,200	-	-	-	-	1,189	504	3,866	3,866	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	35	-	-	-	-	-	-	9	43	43	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	360	36	396	396	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	995	99	1,094	1,094	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	248	-	-	-	-	-	62	309	309	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	283	-	-	-	-	-	42	325	325	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	6	2	-	24	-	7	38	38	-	-	-	290	-	-	-	5,802	9	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	863	129	992	992	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	170	17	187	187	-	-	-	-	-	-	-	-	-	-
3b.4.9	Emergency Planning Fees	-	-	-	-	-	-	68	7	75	-	75	-	-	-	-	-	-	-	-	-
3b.4.10	Fixed Overhead	-	-	-	-	-	-	1,413	212	1,625	1,625	-	-	-	-	-	-	-	-	-	-
3b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	51	8	59	-	59	-	-	-	-	-	-	-	-	-
3b.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
3b.4.13	DOC Staff Cost	-	-	-	-	-	-	5,123	769	5,892	5,892	-	-	-	-	-	-	-	-	-	58,080
3b.4.14	Utility Staff Cost	-	-	-	-	-	-	7,888	1,183	9,071	9,071	-	-	-	-	-	-	-	-	-	128,607
3b.4	Subtotal Period 3b Period-Dependent Costs	35	530	6	2	-	24	16,988	2,588	20,173	20,039	134	-	-	290	-	-	-	5,802	9	186,687
3b.0	TOTAL PERIOD 3b COST	1,008	1,730	6	2	-	24	22,020	3,669	28,459	27,902	134	423	-	290	-	-	-	5,802	9	219,428
PERIOD 3 TOTALS		1,008	2,749	45	25	13	65	66,708	11,386	81,999	80,638	403	958	43	804	-	-	-	21,343	30,690	561,663
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Recirculation System Piping & Valves	20	71	28	22	96	214	-	102	553	553	-	-	676	715	-	-	-	94,867	1,594	-
4a.1.1.2	Recirculation Pumps & Motors	7	47	15	26	130	219	-	95	539	539	-	-	568	473	-	-	-	112,200	1,049	-
4a.1.1.3	CRDMs & NIs Removal	35	674	400	72	-	919	-	466	2,565	2,565	-	-	-	3,741	-	-	-	213,700	12,506	-
4a.1.1.4	Reactor Vessel Internals	102	5,782	8,903	1,187	-	14,647	275	14,274	45,170	45,170	-	-	-	2,943	1,127	643	-	306,123	22,915	1,075
4a.1.1.5	Vessel & Internals GTCC Disposal	-	-	-	-	-	6,552	-	983	7,535	7,535	-	-	-	-	-	-	1,547	311,184	-	-
4a.1.1.6	Reactor Vessel	-	7,999	1,877	606	-	5,622	275	9,472	25,852	25,852	-	-	-	17,823	-	-	-	1,110,260	22,915	1,075
4a.1.1	Totals	163	14,571	11,223	1,914	226	28,174	551	25,392	82,215	82,215	-	-	1,244	25,695	1,127	643	1,547	2,148,335	60,979	2,150
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	282	1,424	349	3,174	357	-	831	6,417	6,417	-	-	24,835	1,383	-	-	-	1,577,959	4,796	-
4a.1.3	Main Condensers	-	994	378	128	1,667	198	-	605	3,970	3,970	-	-	17,396	727	-	-	-	828,955	16,823	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor Building	-	611	-	-	-	-	-	92	703	703	-	-	-	-	-	-	-	-	6,238	-
4a.1.4.2	Radwaste	-	53	-	-	-	-	-	8	61	61	-	-	-	-	-	-	-	-	569	-
4a.1.4.3	Turbine	-	157	-	-	-	-	-	24	180	180	-	-	-	-	-	-	-	-	1,884	-
4a.1.4	Totals	-	821	-	-	-	-	-	123	944	944	-	-	-	-	-	-	-	-	8,691	-
Disposal of Plant Systems																					
4a.1.5.1	Automatic Press Relief	-	88	2	7	94	-	-	37	228	228	-	-	1,088	-	-	-	-	44,184	1,468	-
4a.1.5.2	Chemistry Sampling	-	20	0	1	18	-	-	8	48	48	-	-	207	-	-	-	-	8,422	356	-
4a.1.5.3	Chemistry Sampling - Insulated	-	1	0	0	0	-	-	0	2	2	-	-	1	-	-	-	-	61	25	-
4a.1.5.4	Circulating Water - RCA	-	172	10	41	576	-	-	136	935	935	-	-	6,656	-	-	-	-	270,307	2,860	-
4a.1.5.5	Combustible Gas Control - Insul - RCA	-	24	0	1	18	-	-	9	53	53	-	-	212	-	-	-	-	8,617	378	-
4a.1.5.6	Combustible Gas Control - RCA	-	15	0	2	25	-	-	8	50	50	-	-	285	-	-	-	-	11,577	245	-
4a.1.5.7	Condensate & Feedwater	-	736	45	184	2,609	-	-	607	4,181	4,181	-	-	30,157	-	-	-	-	1,224,704	12,501	-
4a.1.5.8	Condensate & Feedwater - Insulated	-	368	9	36	506	-	-	174	1,093	1,093	-	-	5,855	-	-	-	-	237,764	6,185	-
4a.1.5.9	Condensate Demin	-	408	7	29	410	-	-	168	1,022	1,022	-	-	4,735	-	-	-	-	192,293	6,784	-
4a.1.5.10	Condensate Storage	-	546	12	50	712	-	-	252	1,573	1,573	-	-	8,237	-	-	-	-	334,489	9,265	-
4a.1.5.11	Control Rod Drive	-	2	0	0	2	-	-	1	5	5	-	-	24	-	-	-	-	976	36	-

Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4a.1.5.12	Control Rod Drive Hydraulic	-	309	4	15	211	-	-	112	651	651	-	-	2,440	-	-	-	-	99,094	5,255	-
4a.1.5.13	Core Spray	-	59	8	31	442	-	-	86	626	626	-	-	5,109	-	-	-	-	207,487	1,026	-
4a.1.5.14	Core Spray - Insulated	-	108	2	7	102	-	-	44	263	263	-	-	1,184	-	-	-	-	48,081	1,806	-
4a.1.5.15	Demin Water - Insulated - RCA	-	12	0	1	7	-	-	4	25	25	-	-	85	-	-	-	-	3,445	181	-
4a.1.5.16	Demin Water - RCA	-	34	0	2	22	-	-	12	70	70	-	-	253	-	-	-	-	10,278	508	-
4a.1.5.17	Diesel Oil - RCA	-	2	0	0	2	-	-	1	4	4	-	-	23	-	-	-	-	931	25	-
4a.1.5.18	Drywell Atmosphere Cooling - RCA	-	31	1	3	47	-	-	15	98	98	-	-	548	-	-	-	-	22,244	550	-
4a.1.5.19	EDG Emerg Service Water - Insul - RCA	-	0	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	84	4	-
4a.1.5.20	Electrical - Clean	-	11	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	182	-
4a.1.5.21	Emergency Service Water - Insul - RCA	-	18	0	1	12	-	-	6	37	37	-	-	137	-	-	-	-	5,544	281	-
4a.1.5.22	Emergency Service Water - RCA	-	1	0	0	1	-	-	1	3	3	-	-	13	-	-	-	-	512	22	-
4a.1.5.23	GEZIP - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
4a.1.5.24	Generator Physical Design - RCA	-	4	0	0	3	-	-	1	8	8	-	-	31	-	-	-	-	1,250	67	-
4a.1.5.25	H2-O2 Control Analyzing	-	5	0	0	2	-	-	1	8	8	-	-	23	-	-	-	-	948	72	-
4a.1.5.26	H2-O2 Control Analyzing - Insulated	-	5	0	0	2	-	-	1	8	8	-	-	23	-	-	-	-	948	72	-
4a.1.5.27	High Pressure Coolant Injection	-	50	2	8	109	-	-	30	199	199	-	-	1,262	-	-	-	-	51,257	850	-
4a.1.5.28	High Pressure Coolant Injection - Insula	-	164	3	14	196	-	-	73	450	450	-	-	2,266	-	-	-	-	92,018	2,734	-
4a.1.5.29	Hydrogen Cooling	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	118	-
4a.1.5.30	Hydrogen Cooling - RCA	-	6	0	0	3	-	-	2	11	11	-	-	39	-	-	-	-	1,600	79	-
4a.1.5.31	Hydrogen Seal Oil - RCA	-	14	0	1	16	-	-	6	38	38	-	-	189	-	-	-	-	7,669	212	-
4a.1.5.32	Hydrogen Water Chemistry - RCA	-	20	0	1	12	-	-	7	40	40	-	-	140	-	-	-	-	5,672	304	-
4a.1.5.33	Instrument & Service Air - RCA	-	185	3	11	153	-	-	71	423	423	-	-	1,768	-	-	-	-	71,810	2,733	-
4a.1.5.34	Main Condenser	-	147	3	12	165	-	-	63	389	389	-	-	1,903	-	-	-	-	77,301	2,443	-
4a.1.5.35	Main Steam	-	186	4	18	257	-	-	88	554	554	-	-	2,975	-	-	-	-	120,806	3,122	-
4a.1.5.36	Main Turbine	-	754	48	194	2,758	-	-	636	4,391	4,391	-	-	31,885	-	-	-	-	1,294,866	12,952	-
4a.1.5.37	Main Turbine - Insulated	-	160	5	21	299	-	-	89	574	574	-	-	3,460	-	-	-	-	140,506	2,725	-
4a.1.5.38	Miscellaneous	-	32	0	2	26	-	-	12	72	72	-	-	302	-	-	-	-	12,283	556	-
4a.1.5.39	Off Gas Recombiner	-	140	4	17	247	-	-	75	485	485	-	-	2,861	-	-	-	-	116,194	2,387	-
4a.1.5.40	Off Gas Recombiner - Insulated	-	289	4	14	203	-	-	105	616	616	-	-	2,350	-	-	-	-	95,441	4,785	-
4a.1.5.41	Post Accident Sampling	-	19	0	1	9	-	-	6	34	34	-	-	99	-	-	-	-	4,004	306	-
4a.1.5.42	Post Accident Sampling - Insulated	-	13	0	0	6	-	-	4	23	23	-	-	67	-	-	-	-	2,737	190	-
4a.1.5.43	RHR Service Water - Insulated - RCA	-	69	2	9	128	-	-	38	246	246	-	-	1,485	-	-	-	-	60,293	1,125	-
4a.1.5.44	RHR Service Water - RCA	-	3	0	0	3	-	-	1	8	8	-	-	35	-	-	-	-	1,410	57	-
4a.1.5.45	Reactor Feedwater Pump Seal	-	42	0	2	28	-	-	15	87	87	-	-	327	-	-	-	-	13,295	687	-
4a.1.5.46	Residual Heat Removal	-	187	52	99	1,091	418	-	335	2,181	2,181	-	-	12,609	1,519	-	-	-	609,174	3,282	-
4a.1.5.47	Residual Heat Removal - Insulated	-	415	37	51	440	377	-	275	1,595	1,595	-	-	5,084	1,374	-	-	-	294,206	7,027	-
4a.1.5.48	Rx Core Isolation Cooling	-	36	1	2	31	-	-	14	84	84	-	-	364	-	-	-	-	14,781	609	-
4a.1.5.49	Rx Core Isolation Cooling - Insulated	-	80	1	3	49	-	-	28	161	161	-	-	563	-	-	-	-	22,843	1,315	-
4a.1.5.50	Rx Recirculation	-	44	5	3	8	43	-	24	126	126	-	-	96	152	-	-	-	13,794	691	-
4a.1.5.51	Snubbers	-	126	1	3	43	-	-	39	212	212	-	-	502	-	-	-	-	20,395	2,272	-
4a.1.5.52	Standby Liquid Control - Insul - RCA	-	3	0	0	2	-	-	1	6	6	-	-	22	-	-	-	-	904	48	-
4a.1.5.53	Standby Liquid Control - RCA	-	22	0	1	21	-	-	9	54	54	-	-	245	-	-	-	-	9,969	341	-
4a.1.5.54	Stator Cooling - RCA	-	6	0	1	11	-	-	3	21	21	-	-	126	-	-	-	-	5,135	98	-
4a.1.5.55	Traversing Incore Probe	-	3	0	0	0	1	-	1	5	5	-	-	2	5	-	-	-	379	46	-
4a.1.5	Totals	-	6,203	280	899	12,150	839	-	3,744	24,114	24,094	-	20	140,459	3,050	-	-	-	5,899,167	104,297	-
4a.1.6	Scaffolding in support of decommissioning	-	1,778	23	8	99	25	-	469	2,402	2,402	-	-	1,030	91	-	-	-	52,111	19,968	-
4a.1	Subtotal Period 4a Activity Costs	163	24,648	13,329	3,299	17,316	29,592	551	31,164	120,062	120,042	-	20	184,963	30,945	1,127	643	1,547	10,506,530	215,555	2,150
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,161	648	2,809	2,809	-	-	-	-	-	-	-	-	28,247	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	2,161	648	2,809	2,809	-	-	-	-	-	-	-	-	28,247	-
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	4	-	7	17	-	27	-	12	66	66	-	-	-	64	-	-	-	3,860	13	-
4a.3.3	Small tool allowance	-	240	-	-	-	-	-	36	276	248	-	28	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	4	240	7	17	-	27	-	48	342	314	-	28	-	64	-	-	-	3,860	13	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	94	-	-	-	-	-	-	24	118	118	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	980	98	1,078	1,078	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	2,674	267	2,942	2,942	-	-	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,855	-	-	-	-	-	464	2,318	2,318	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,984	-	-	-	-	-	448	3,431	3,431	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	97	31	-	378	-	109	614	614	-	-	-	4,639	-	-	-	92,777	151	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	2,233	335	2,568	2,568	-	-	-	-	-	-	-	-	-	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 4a Period-Dependent Costs (continued)																					
4a.4.8	NRC Fees	-	-	-	-	-	-	757	76	833	833	-	-	-	-	-	-	-	-	-	-
4a.4.9	Emergency Planning Fees	-	-	-	-	-	-	186	19	204	-	204	-	-	-	-	-	-	-	-	-
4a.4.10	Fixed Overhead	-	-	-	-	-	-	3,150	473	3,623	3,623	-	-	-	-	-	-	-	-	-	-
4a.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	550	82	632	632	-	-	-	-	-	-	-	-	-	-
4a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	140	21	161	-	161	-	-	-	-	-	-	-	-	-
4a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	157	24	180	180	-	-	-	-	-	-	-	-	-	-
4a.4.14	DOC Staff Cost	-	-	-	-	-	-	16,810	2,522	19,332	19,332	-	-	-	-	-	-	-	-	-	195,030
4a.4.15	Utility Staff Cost	-	-	-	-	-	-	21,650	3,247	24,897	24,897	-	-	-	-	-	-	-	-	-	353,315
4a.4	Subtotal Period 4a Period-Dependent Costs	94	4,838	97	31	-	378	49,288	8,207	62,932	62,567	366	-	-	4,639	-	-	-	92,777	151	548,345
4a.0	TOTAL PERIOD 4a COST	262	29,726	13,432	3,346	17,316	29,997	51,999	40,067	186,146	185,732	366	48	184,963	35,648	1,127	643	1,547	10,603,160	243,966	550,495
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	504	49	108	109	-	2,091	-	814	3,675	3,675	-	-	-	7,653	-	-	-	486,170	906	-
Disposal of Plant Systems																					
4b.1.2.1	ALARA/Radiological	-	14	0	0	4	-	-	4	22	22	-	-	49	-	-	-	-	1,987	247	-
4b.1.2.2	Alternate N2 - RCA	-	13	0	1	8	-	-	5	27	27	-	-	93	-	-	-	-	3,765	185	-
4b.1.2.3	Cranes/Heavy Loads/Rigging - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
4b.1.2.4	Decontamination Projects	-	1	0	0	0	-	-	0	1	1	-	-	3	-	-	-	-	125	15	-
4b.1.2.5	Electrical - Contaminated	-	328	4	15	217	-	-	117	682	682	-	-	2,514	-	-	-	-	102,112	5,633	-
4b.1.2.6	Electrical - Contaminated Fuel Pool	-	34	0	2	22	-	-	12	70	70	-	-	253	-	-	-	-	10,272	592	-
4b.1.2.7	Electrical - Decontam. Fuel Pool Area	-	242	4	15	213	-	-	95	568	568	-	-	2,457	-	-	-	-	99,783	4,090	-
4b.1.2.8	Electrical - Decontaminated	-	2,195	36	142	2,019	-	-	877	5,269	5,269	-	-	23,344	-	-	-	-	948,013	37,107	-
4b.1.2.9	Fire - RCA	-	84	1	4	53	-	-	30	171	171	-	-	614	-	-	-	-	24,917	1,324	-
4b.1.2.10	Fire - RCA - Fuel Pool Area	-	9	0	0	5	-	-	3	18	18	-	-	62	-	-	-	-	2,499	143	-
4b.1.2.11	Fuel Pool Cooling & Cleanup	-	319	19	23	177	196	-	161	895	895	-	-	2,051	712	-	-	-	128,918	5,363	-
4b.1.2.12	Fuel Pool Cooling & Cleanup - Insulated	-	31	2	2	11	20	-	15	80	80	-	-	130	71	-	-	-	9,830	514	-
4b.1.2.13	HVAC Ductwork	-	238	4	17	243	-	-	99	601	601	-	-	2,805	-	-	-	-	113,913	3,539	-
4b.1.2.14	HVAC Ductwork - Fuel Pool Area	-	26	0	2	27	-	-	11	67	67	-	-	312	-	-	-	-	12,657	393	-
4b.1.2.15	HVAC/Chilled Water - RCA	-	267	4	17	238	-	-	105	631	631	-	-	2,752	-	-	-	-	111,779	3,985	-
4b.1.2.16	HVAC/Chilled Water - RCA Fuel Pool Area	-	27	0	1	19	-	-	10	58	58	-	-	223	-	-	-	-	9,072	397	-
4b.1.2.17	Heating & Ventilation	-	359	10	39	548	-	-	179	1,134	1,134	-	-	6,334	-	-	-	-	257,243	6,340	-
4b.1.2.18	Heating Boiler - Insulated - RCA	-	2	0	0	2	-	-	1	6	6	-	-	26	-	-	-	-	1,058	35	-
4b.1.2.19	Instrument & Service Air-RCA-Fuel Pool	-	24	0	2	23	-	-	10	58	58	-	-	267	-	-	-	-	10,841	357	-
4b.1.2.20	Liquid Radwaste	-	515	28	39	364	253	-	255	1,453	1,453	-	-	4,203	915	-	-	-	229,422	8,550	-
4b.1.2.21	Makeup Demin - RCA	-	86	2	9	127	-	-	42	266	266	-	-	1,471	-	-	-	-	59,747	1,412	-
4b.1.2.22	Non-Essential Diesel Generator - RCA	-	23	2	9	123	-	-	26	183	183	-	-	1,424	-	-	-	-	57,832	395	-
4b.1.2.23	Off Gas Holdup	-	257	5	22	314	-	-	115	713	713	-	-	3,629	-	-	-	-	147,355	4,256	-
4b.1.2.24	Primary Containment	-	341	13	51	718	-	-	202	1,324	1,324	-	-	8,302	-	-	-	-	337,148	5,729	-
4b.1.2.25	Process Radiation Monitors	-	34	0	1	18	-	-	12	66	66	-	-	213	-	-	-	-	8,667	577	-
4b.1.2.26	Rx Bldg Closed Clngr Water - Insul - RCA	-	93	2	6	85	-	-	37	222	222	-	-	977	-	-	-	-	39,675	1,484	-
4b.1.2.27	Rx Bldg Closed Clngr Water - RCA	-	152	11	43	614	-	-	138	957	957	-	-	7,093	-	-	-	-	288,031	2,489	-
4b.1.2.28	Rx Component Handling Equip	-	105	11	16	150	113	-	81	477	477	-	-	1,737	415	-	-	-	96,901	1,839	-
4b.1.2.29	Rx Pressure Vessel	-	35	4	3	14	47	-	24	127	127	-	-	161	169	-	-	-	17,375	578	-
4b.1.2.30	Rx Water Cleanup	-	198	16	11	24	174	-	100	523	523	-	-	278	630	-	-	-	51,819	3,264	-
4b.1.2.31	Secondary Containment	-	93	2	8	119	-	-	42	264	264	-	-	1,372	-	-	-	-	55,702	1,569	-
4b.1.2.32	Service & Seal Water - Insulated - RCA	-	99	2	7	102	-	-	41	252	252	-	-	1,180	-	-	-	-	47,917	1,565	-
4b.1.2.33	Service & Seal Water - RCA	-	131	3	11	156	-	-	58	360	360	-	-	1,809	-	-	-	-	73,453	2,016	-
4b.1.2.34	Service Air Blower - RCA	-	13	0	1	18	-	-	6	38	38	-	-	206	-	-	-	-	8,364	206	-
4b.1.2.35	Solid Radwaste	-	369	20	30	293	181	-	188	1,081	1,081	-	-	3,390	659	-	-	-	179,772	6,270	-
4b.1.2.36	Structures & Buildings	-	58	1	3	41	-	-	21	124	124	-	-	477	-	-	-	-	19,351	1,005	-
4b.1.2.37	Wells & Domestic Water	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	144	-
4b.1.2.38	Wells & Domestic Water - RCA	-	43	1	2	30	-	-	16	91	91	-	-	342	-	-	-	-	13,874	633	-
4b.1.2	Totals	-	6,869	208	555	7,150	984	-	3,139	18,904	18,894	-	9	82,654	3,571	-	-	-	3,585,374	114,290	-
4b.1.3	Scaffolding in support of decommissioning	-	2,667	35	12	148	37	-	704	3,603	3,603	-	-	1,545	136	-	-	-	78,166	29,953	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor Building	3,881	2,049	138	314	4,159	765	-	3,329	14,634	14,634	-	-	48,077	4,434	-	-	-	2,195,768	98,722	-
4b.1.4.2	Admin	82	2	0	1	-	7	-	43	135	135	-	-	-	72	-	-	-	3,420	1,389	-
4b.1.4.3	HPCI Room	22	19	0	1	10	7	-	19	78	78	-	-	118	65	-	-	-	7,927	664	-
4b.1.4.4	Hot Shop	13	2	0	1	-	5	-	8	28	28	-	-	-	51	-	-	-	2,430	231	-
4b.1.4.5	LLRW Storage & Shipping	43	11	1	3	3	21	-	30	111	111	-	-	31	217	-	-	-	11,532	875	-
4b.1.4.6	Offgas Stack	280	127	4	12	116	44	-	202	786	786	-	-	1,343	361	-	-	-	72,483	6,692	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours		
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet					
Decontamination of Site Buildings (continued)																							
4b.1.4.7	Offgas Storage & Compressor	30	7	0	2	2	15	-	21	79	79	-	-	25	159	-	-	-	8,502	603	-		
4b.1.4.8	Radwaste	91	30	2	7	15	44	-	67	255	255	-	-	172	460	-	-	-	28,679	1,960	-		
4b.1.4.9	Radwaste Material Storage Warehouse	48	9	1	3	-	23	-	32	116	116	-	-	-	248	-	-	-	11,700	915	-		
4b.1.4.10	Recombiner	20	15	1	3	17	12	-	20	87	87	-	-	199	112	-	-	-	13,491	554	-		
4b.1.4.11	Turbine	528	172	9	42	111	260	-	396	1,517	1,517	-	-	1,283	2,675	-	-	-	179,172	11,286	-		
4b.1.4.12	Turbine Building Addition	44	8	1	3	-	20	-	29	105	105	-	-	-	217	-	-	-	10,248	838	-		
4b.1.4.13	Reactor (Post Fuel)	703	1,924	129	656	170	4,681	-	2,140	10,403	10,403	-	-	1,969	49,647	-	-	-	2,426,544	39,766	-		
4b.1.4	Totals	5,783	4,375	286	1,047	4,603	5,903	-	6,337	28,334	28,334	-	-	53,216	58,718	-	-	-	4,971,896	164,495			
4b.1.5	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096		
4b.1.6	Receive NRC approval of termination plan									a													
4b.1	Subtotal Period 4b Activity Costs	6,287	13,960	637	1,723	11,901	9,015	481	11,066	55,069	55,060	-	9	137,414	70,078	-	-	-	9,121,606	309,644	4,096		
Period 4b Additional Costs																							
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,291	387	1,678	1,678	-	-	-	-	-	-	-	-	-	12,480		
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	3,241	972	4,213	4,213	-	-	-	-	-	-	-	-	42,370	-		
4b.2.3	Operational Equipment	-	-	19	60	624	-	-	104	807	807	-	-	11,710	-	-	-	-	292,750	32	-		
4b.2	Subtotal Period 4b Additional Costs	-	-	19	60	624	-	4,532	1,464	6,698	6,698	-	-	11,710	-	-	-	-	292,750	42,402	12,480		
Period 4b Collateral Costs																							
4b.3.1	Process decommissioning water waste	12	-	21	53	-	84	-	37	207	207	-	-	-	201	-	-	-	12,055	39	-		
4b.3.3	Small tool allowance	-	314	-	-	-	-	-	47	361	361	-	-	-	-	-	-	-	-	-	-		
4b.3.4	Decommissioning Equipment Disposition	-	-	137	55	575	145	-	144	1,055	1,055	-	-	6,000	529	-	-	-	303,608	147	-		
4b.3	Subtotal Period 4b Collateral Costs	12	314	157	108	575	229	-	228	1,622	1,622	-	-	6,000	730	-	-	-	315,663	186	-		
Period 4b Period-Dependent Costs																							
4b.4.1	Decon supplies	1,388	-	-	-	-	-	-	347	1,735	1,735	-	-	-	-	-	-	-	-	-	-		
4b.4.2	Insurance	-	-	-	-	-	-	1,470	147	1,617	1,617	-	-	-	-	-	-	-	-	-	-		
4b.4.3	Property taxes	-	-	-	-	-	-	3,786	379	4,165	4,165	-	-	-	-	-	-	-	-	-	-		
4b.4.4	Health physics supplies	-	2,702	-	-	-	-	-	676	3,378	3,378	-	-	-	-	-	-	-	-	-	-		
4b.4.5	Heavy equipment rental	-	4,602	-	-	-	-	-	690	5,292	5,292	-	-	-	-	-	-	-	-	-	-		
4b.4.6	Disposal of DAW generated	-	-	121	39	-	472	-	136	767	767	-	-	-	5,798	-	-	-	115,951	189	-		
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,645	397	3,041	3,041	-	-	-	-	-	-	-	-	-	-		
4b.4.8	NRC Fees	-	-	-	-	-	-	1,136	114	1,250	1,250	-	-	-	-	-	-	-	-	-	-		
4b.4.9	Emergency Planning Fees	-	-	-	-	-	-	279	28	307	-	307	-	-	-	-	-	-	-	-	-		
4b.4.10	Fixed Overhead	-	-	-	-	-	-	4,725	709	5,434	5,434	-	-	-	-	-	-	-	-	-	-		
4b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	825	124	949	949	-	-	-	-	-	-	-	-	-	-		
4b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	210	32	242	-	242	-	-	-	-	-	-	-	-	-		
4b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	-		
4b.4.14	DOC Staff Cost	-	-	-	-	-	-	24,690	3,704	28,394	28,394	-	-	-	-	-	-	-	-	-	284,065		
4b.4.15	Utility Staff Cost	-	-	-	-	-	-	30,782	4,617	35,399	35,399	-	-	-	-	-	-	-	-	-	500,294		
4b.4	Subtotal Period 4b Period-Dependent Costs	1,388	7,304	121	39	-	472	70,783	12,133	92,240	91,691	549	-	-	5,798	-	-	-	115,951	189	784,360		
4b.0	TOTAL PERIOD 4b COST	7,687	21,578	934	1,929	13,100	9,715	75,796	24,891	155,630	155,072	549	9	155,124	76,605	-	-	-	9,845,969	352,420	800,936		
PERIOD 4f - License Termination																							
Period 4f Direct Decommissioning Activities																							
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	159	48	207	207	-	-	-	-	-	-	-	-	-	-		
4f.1.2	Terminate license	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-		
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	159	48	207	207	-	-	-	-	-	-	-	-	-	-		
Period 4f Additional Costs																							
4f.2.1	License Termination Survey	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240		
4f.2.2	License Termination ISFSI	-	131	3	784	-	8,058	2,875	2,963	14,815	14,815	-	-	-	27,284	-	-	-	3,860,412	11,022	10,640		
4f.2	Subtotal Period 4f Additional Costs	-	131	3	784	-	8,058	10,217	5,165	24,358	24,358	-	-	-	27,284	-	-	-	3,860,412	107,218	16,880		
Period 4f Collateral Costs																							
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-		
4f.3.2	Small tool allowance	-	1	-	-	-	-	-	0	1	1	-	-	-	-	-	-	-	-	-	-		
4f.3	Subtotal Period 4f Collateral Costs	-	1	-	-	-	-	1,189	178	1,368	1,368	-	-	-	-	-	-	-	-	-	-		
Period 4f Period-Dependent Costs																							
4f.4.1	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-		
4f.4.2	Property taxes	-	-	-	-	-	-	1,265	127	1,392	1,392	-	-	-	-	-	-	-	-	-	-		
4f.4.3	Health physics supplies	-	648	-	-	-	-	-	162	809	809	-	-	-	-	-	-	-	-	-	-		

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 4f Period-Dependent Costs (continued)																					
4f.4.4	Disposal of DAW generated	-	-	7	2	-	29	-	8	46	46	-	-	-	351	-	-	-	7,025	11	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	261	39	300	300	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	420	42	463	463	-	-	-	-	-	-	-	-	-	-
4f.4.7	Emergency Planning Fees	-	-	-	-	-	-	103	10	113	-	113	-	-	-	-	-	-	-	-	-
4f.4.8	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
4f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
4f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
4f.4.11	DOC Staff Cost	-	-	-	-	-	-	5,174	776	5,950	5,950	-	-	-	-	-	-	-	-	-	57,200
4f.4.12	Utility Staff Cost	-	-	-	-	-	-	5,003	750	5,754	5,754	-	-	-	-	-	-	-	-	-	74,438
4f.4	Subtotal Period 4f Period-Dependent Costs	-	648	7	2	-	29	14,681	2,256	17,623	17,420	203	-	-	351	-	-	-	7,025	11	131,638
4f.0	TOTAL PERIOD 4f COST	-	779	11	787	-	8,087	26,246	7,647	43,556	43,354	203	-	-	27,635	-	-	-	3,867,437	107,230	148,518
PERIOD 4 TOTALS		7,949	52,083	14,377	6,063	30,416	47,799	154,041	72,605	385,332	384,157	1,117	57	340,088	139,889	1,127	643	1,547	24,316,570	703,616	1,499,949
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor Building	-	3,541	-	-	-	-	-	531	4,073	-	-	4,073	-	-	-	-	-	-	36,752	-
5b.1.1.2	Condensate Tanks Foundation	-	19	-	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	219	-
5b.1.1.3	Discharge Retention Basin	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	110	-
5b.1.1.4	HPCI Room	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	401	-
5b.1.1.5	Hot Shop	-	21	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	298	-
5b.1.1.6	Hydrogen & Oxygen Storage	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	21	-
5b.1.1.7	LLRW Storage & Shipping	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	1,794	-
5b.1.1.8	MSIV	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	59	-
5b.1.1.9	Misc Structures 2017	-	1,075	-	-	-	-	-	161	1,236	-	-	1,236	-	-	-	-	-	-	13,787	-
5b.1.1.10	Offgas Stack	-	232	-	-	-	-	-	35	267	-	-	267	-	-	-	-	-	-	2,668	-
5b.1.1.11	Offgas Storage & Compressor	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	963	-
5b.1.1.12	Radwaste	-	482	-	-	-	-	-	72	554	-	-	554	-	-	-	-	-	-	5,196	-
5b.1.1.13	Recombiner	-	258	-	-	-	-	-	39	297	-	-	297	-	-	-	-	-	-	2,490	-
5b.1.1.14	Security Barrier	-	362	-	-	-	-	-	54	416	-	-	416	-	-	-	-	-	-	4,083	-
5b.1.1.15	Structures Greater than 3' Below Grade	-	4,946	-	-	-	-	-	742	5,688	-	-	5,688	-	-	-	-	-	-	46,737	-
5b.1.1.16	Tank Farm	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	121	-
5b.1.1.17	Turbine	-	1,514	-	-	-	-	-	227	1,741	-	-	1,741	-	-	-	-	-	-	18,764	-
5b.1.1.18	Turbine Building Addition	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	971	-
5b.1.1.19	Turbine Pedestal	-	415	-	-	-	-	-	62	478	-	-	478	-	-	-	-	-	-	3,762	-
5b.1.1	Totals	-	13,228	-	-	-	-	-	1,984	15,212	-	-	15,212	-	-	-	-	-	-	139,199	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	864	-	-	-	-	-	130	994	-	-	994	-	-	-	-	-	-	1,841	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	14,092	-	-	-	-	183	2,141	16,417	211	-	16,206	-	-	-	-	-	-	141,040	1,560
Period 5b Additional Costs																					
5b.2.1	Clean Concrete Disposal	-	3,297	-	-	-	-	11	496	3,805	-	-	3,805	-	-	-	-	-	-	12	-
5b.2.2	Cofferdam	-	320	-	-	-	-	-	48	368	368	-	-	-	-	-	-	-	-	2,584	-
5b.2.3	Excavation of Underground Services	-	1,380	-	-	-	-	947	349	2,677	-	-	2,677	-	-	-	-	-	-	13,475	-
5b.2.4	Constnution Debris	-	-	-	-	-	-	350	53	403	-	-	403	-	-	-	-	-	-	-	-
5b.2.5	Backfill	-	5,102	-	-	-	-	-	765	5,868	-	-	5,868	-	-	-	-	-	-	5,422	-
5b.2.6	Demolition and Site Restoration ISFSI	-	1,733	-	-	-	-	185	288	2,205	-	-	2,205	-	-	-	-	-	-	8,390	160
5b.2	Subtotal Period 5b Additional Costs	-	11,833	-	-	-	-	1,493	1,999	15,325	368	-	14,957	-	-	-	-	-	-	29,883	160
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	192	-	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	192	-	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	-	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H
Monticello Nuclear Generating Plant
Scenario 6: SAFSTOR with 32 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b.4.2	Property taxes	-	-	-	-	-	-	2,419	242	2,661	-	-	2,661	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	5,455	-	-	-	-	-	818	6,273	-	-	6,273	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	300	45	345	-	-	345	-	-	-	-	-	-	-	-
5b.4.5	Fixed Overhead	-	-	-	-	-	-	1,260	189	1,450	-	-	1,450	-	-	-	-	-	-	-	-
5b.4.6	Railroad Track Maintenance	-	-	-	-	-	-	200	30	230	-	-	230	-	-	-	-	-	-	-	-
5b.4.7	Security Staff Cost	-	-	-	-	-	-	2,739	411	3,150	-	-	3,150	-	-	-	-	-	-	-	43,287
Period 5b Period-Dependent Costs (continued)																					
5b.4.8	DOC Staff Cost	-	-	-	-	-	-	11,290	1,693	12,983	-	-	12,983	-	-	-	-	-	-	-	122,646
5b.4.9	Utility Staff Cost	-	-	-	-	-	-	4,718	708	5,426	-	-	5,426	-	-	-	-	-	-	-	70,341
5b.4	Subtotal Period 5b Period-Dependent Costs	-	5,455	-	-	-	-	22,927	4,136	32,517	-	-	32,517	-	-	-	-	-	-	-	236,274
5b.0	TOTAL PERIOD 5b COST	-	31,572	-	-	-	-	24,603	8,305	64,481	578	-	63,902	-	-	-	-	-	-	170,923	237,994
PERIOD 5 TOTALS		-	31,572	-	-	-	-	24,603	8,305	64,481	578	-	63,902	-	-	-	-	-	-	170,923	237,994
TOTAL COST TO DECOMMISSION		17,731	94,769	14,816	6,755	30,429	49,448	1,050,409	210,270	1,474,626	1,045,043	364,666	64,917	340,130	150,427	1,127	643	1,547	24,626,380	1,024,783	7,779,103

TOTAL COST TO DECOMMISSION WITH 16.63% CONTINGENCY:	\$1,474,626	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 70.87% OR:	\$1,045,043	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 24.73% OR:	\$364,666	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 4.4% OR:	\$64,917	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	152,197	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	1,547	cubic feet
TOTAL SCRAP METAL REMOVED:	22,696	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,024,783	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

***Monticello Nuclear Generating Plant
Decommissioning Cost Analysis***

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APPENDIX I

DETAILED COST ANALYSIS

SCENARIO 7: SAFSTOR with 60 Year DFS

Table I
Monticello Nuclear Generating Plant
Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	380	114	494	494	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	176	26	202	202	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.16	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.17	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.18.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	578	87	664	664	-	-	-	-	-	-	-	-	-	4,920
1a.1.18.2	Plant systems	-	-	-	-	-	-	489	73	562	562	-	-	-	-	-	-	-	-	-	4,167
1a.1.18.3	Plant structures and buildings	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
1a.1.18.4	Waste management	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.18.5	Facility and site dormancy	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.18	Total	-	-	-	-	-	-	1,902	285	2,188	2,188	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.19.1	Plant systems	-	-	-	-	-	-	139	21	160	160	-	-	-	-	-	-	-	-	-	1,183
1a.1.19.2	Facility closeout & dormancy	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1a.1.19	Total	-	-	-	-	-	-	280	42	322	322	-	-	-	-	-	-	-	-	-	2,383
1a.1.20	Procure vacuum drying system	-	-	-	-	-	-	12	2	13	13	-	-	-	-	-	-	-	-	-	100
1a.1.21	Drain/de-energize non-cont. systems									a											
1a.1.22	Drain & dry NSSS									a											
1a.1.23	Drain/de-energize contaminated systems									a											
1a.1.24	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	5,590	896	6,486	6,486	-	-	-	-	-	-	-	-	-	44,390
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,221	183	1,404	-	1,404	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	9,892	1,484	11,376	11,376	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,113	1,667	12,779	11,376	1,404	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	2,408	241	2,649	2,649	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,242	224	2,466	2,466	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,730	259	1,989	1,989	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	3,166	317	3,482	-	3,482	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	2,833	425	3,258	3,258	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	803	120	923	-	923	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	115	17	133	133	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	14,260	2,139	16,399	16,399	-	-	-	-	-	-	-	-	-	245,440
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	54,561	7,966	63,676	59,152	4,524	-	-	610	-	-	-	12,190	20	667,680
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	71,264	10,528	82,941	77,014	5,927	-	-	610	-	-	-	12,190	20	712,070

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

Table I
Monticello Nuclear Generating Plant
Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor Building	4,303	-	-	-	-	-	-	2,152	6,455	6,455	-	-	-	-	-	-	-	-	70,157	-
1b.1.1.2	Admin	81	-	-	-	-	-	-	41	122	122	-	-	-	-	-	-	-	-	1,357	-
1b.1.1.3	HPCI Room	21	-	-	-	-	-	-	11	32	32	-	-	-	-	-	-	-	-	350	-
1b.1.1.4	Hot Shop	12	-	-	-	-	-	-	6	19	19	-	-	-	-	-	-	-	-	208	-
1b.1.1.5	LLRW Storage & Shipping	42	-	-	-	-	-	-	21	63	63	-	-	-	-	-	-	-	-	705	-
1b.1.1.6	Offgas Stack	276	-	-	-	-	-	-	138	414	414	-	-	-	-	-	-	-	-	4,575	-
1b.1.1.7	Offgas Storage & Compressor	29	-	-	-	-	-	-	15	44	44	-	-	-	-	-	-	-	-	488	-
1b.1.1.8	Radwaste	88	-	-	-	-	-	-	44	132	132	-	-	-	-	-	-	-	-	1,473	-
1b.1.1.9	Radwaste Material Storage Warehouse	46	-	-	-	-	-	-	23	69	69	-	-	-	-	-	-	-	-	768	-
1b.1.1.10	Recombiner	19	-	-	-	-	-	-	10	29	29	-	-	-	-	-	-	-	-	323	-
1b.1.1.11	Turbine	512	-	-	-	-	-	-	256	768	768	-	-	-	-	-	-	-	-	8,583	-
1b.1.1.12	Turbine Building Addition	42	-	-	-	-	-	-	21	63	63	-	-	-	-	-	-	-	-	709	-
1b.1.1.13	Reactor (Post Fuel)	695	-	-	-	-	-	-	347	1,042	1,042	-	-	-	-	-	-	-	-	11,337	-
1b.1.1	Totals	6,167	-	-	-	-	-	-	3,084	9,251	9,251	-	-	-	-	-	-	-	-	101,033	-
1b.1	Subtotal Period 1b Activity Costs	6,167	-	-	-	-	-	-	3,084	9,251	9,251	-	-	-	-	-	-	-	-	101,033	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	214	-	138	356	-	566	-	316	1,589	1,589	-	-	-	1,350	-	-	-	81,018	263	-
1b.3.4	Small tool allowance	-	105	-	-	-	-	-	16	121	121	-	-	-	-	-	-	-	-	-	-
1b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	183	27	210	-	210	-	-	-	-	-	-	-	-	-
1b.3.6	Retention and Severance	-	-	-	-	-	-	3,640	546	4,186	4,186	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,187	105	138	356	-	566	3,823	1,051	7,226	7,016	210	-	-	1,350	-	-	-	81,018	263	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	1,264	-	-	-	-	-	-	316	1,580	1,580	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	607	61	668	668	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	565	57	622	622	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	614	-	-	-	-	-	153	767	767	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	143	-	-	-	-	-	21	164	164	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	12	4	-	45	-	13	74	74	-	-	-	556	-	-	-	11,126	18	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	436	65	501	501	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	161	16	178	178	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	798	80	878	-	878	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	714	107	821	821	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,594	539	4,134	4,134	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	6,501	975	7,476	7,476	-	-	-	-	-	-	-	-	-	106,428
1b.4	Subtotal Period 1b Period-Dependent Costs	1,264	757	12	4	-	45	13,634	2,442	18,157	17,017	1,140	-	-	556	-	-	-	11,126	18	168,292
1b.0	TOTAL PERIOD 1b COST	8,618	862	150	360	-	611	29,148	8,330	48,079	46,729	1,350	-	-	1,907	-	-	-	92,144	101,314	168,292
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	470	-	-	-	-	-	71	541	541	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	44	-	-	-	-	-	7	51	51	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	14,124	-
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	68	10	79	79	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	514	-	-	-	-	801	307	1,623	1,623	-	-	-	-	-	-	-	-	17,824	583

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Table I
Monticello Nuclear Generating Plant
Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity		Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Index	Activity Description														Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1c Collateral Costs																					
1c.3.1	Process decommissioning water waste	157	-	102	262	-	416	-	232	1,170	1,170	-	-	-	994	-	-	-	59,665	194	-
1c.3.3	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	180	27	207	-	207	-	-	-	-	-	-	-	-	-
1c.3.5	Retention and Severance	-	-	-	-	-	-	2,722	408	3,130	3,130	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	157	4	102	262	-	416	2,902	668	4,512	4,304	207	-	-	994	-	-	-	59,665	194	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	600	60	660	660	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	558	56	614	614	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	215	-	-	-	-	-	54	268	268	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	141	-	-	-	-	-	21	163	163	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	1	-	12	-	4	20	20	-	-	-	152	-	-	-	3,039	5	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	431	65	496	496	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	160	16	176	176	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	789	79	868	-	868	-	-	-	-	-	-	-	-	-
1c.4.9	Fixed Overhead	-	-	-	-	-	-	706	106	812	812	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	200	30	230	-	230	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1c.4.12	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1c.4.13	Security Staff Cost	-	-	-	-	-	-	3,555	533	4,089	4,089	-	-	-	-	-	-	-	-	-	61,192
1c.4.14	Utility Staff Cost	-	-	-	-	-	-	6,430	965	7,395	7,395	-	-	-	-	-	-	-	-	-	105,271
1c.4	Subtotal Period 1c Period-Dependent Costs	-	356	3	1	-	12	13,485	1,996	15,853	14,725	1,128	-	-	152	-	-	-	3,039	5	166,463
1c.0	TOTAL PERIOD 1c COST	157	874	105	263	-	429	17,188	2,971	21,987	20,652	1,335	-	-	1,146	-	-	-	62,705	18,023	167,046
PERIOD 1 TOTALS		8,775	2,819	268	627	-	1,089	117,600	21,830	153,007	144,395	8,613	-	-	3,662	-	-	-	167,039	119,357	1,047,408
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	216	32	248	248	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	480	120	599	599	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	695	152	848	848	-	-	-	-	-	-	-	-	-	-
Period 2a Additional Costs																					
2a.2.1	Security Modifications	-	-	-	-	-	-	8,696	1,304	10,000	10,000	-	-	-	-	-	-	-	-	-	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	8,696	1,304	10,000	10,000	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	79,478	11,922	91,399	-	91,399	-	-	-	-	-	-	-	-	-
2a.3.2	Retention and Severance	-	-	-	-	-	-	21,900	3,285	25,185	25,185	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	101,378	15,207	116,584	25,185	91,399	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	2,526	253	2,778	2,778	-	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	7,844	784	8,628	8,628	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	724	-	-	-	-	-	181	905	905	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	17	5	-	66	-	19	107	107	-	-	-	806	-	-	-	16,112	26	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,211	182	1,393	1,393	-	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	898	90	988	988	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	8,991	899	9,891	-	9,891	-	-	-	-	-	-	-	-	-
2a.4.8	Fixed Overhead	-	-	-	-	-	-	9,919	1,488	11,407	11,407	-	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	2,810	422	3,232	-	3,232	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	361	54	416	-	416	-	-	-	-	-	-	-	-	-
2a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	701	105	806	806	-	-	-	-	-	-	-	-	-	-
2a.4.12	Security Staff Cost	-	-	-	-	-	-	46,105	6,916	53,021	37,327	15,694	-	-	-	-	-	-	-	-	786,548
2a.4.13	Utility Staff Cost	-	-	-	-	-	-	17,653	2,648	20,301	16,322	3,979	-	-	-	-	-	-	-	-	287,673
2a.4	Subtotal Period 2a Period-Dependent Costs	-	724	17	5	-	66	99,020	14,040	113,872	80,661	33,211	-	-	806	-	-	-	16,112	26	1,074,220
2a.0	TOTAL PERIOD 2a COST	-	724	17	5	-	66	209,789	30,703	241,304	116,694	124,610	-	-	806	-	-	-	16,112	26	1,074,220

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Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection									a											
2b.1.2	Semi-annual environmental survey									a											
2b.1.3	Prepare reports									a											
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	3,044	457	3,500	3,500	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	6,765	1,691	8,456	8,456	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	9,808	2,148	11,956	11,956	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	98,790	14,819	113,609	-	113,609	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	98,790	14,819	113,609	-	113,609	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	35,624	3,562	39,186	39,186	-	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	110,635	11,064	121,699	121,699	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	4,953	-	-	-	-	-	1,238	6,192	6,192	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	114	36	-	444	-	128	722	722	-	-	-	5,459	-	-	-	109,172	178	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	8,544	1,282	9,825	9,825	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	12,039	1,204	13,243	13,243	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	6,754	675	7,430	-	7,430	-	-	-	-	-	-	-	-	-
2b.4.8	Fixed Overhead	-	-	-	-	-	-	12,278	1,842	14,120	14,120	-	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	5,099	765	5,864	-	5,864	-	-	-	-	-	-	-	-	-
2b.4.10	Railroad Track Maintenance	-	-	-	-	-	-	5,696	854	6,551	6,551	-	-	-	-	-	-	-	-	-	-
2b.4.11	Security Staff Cost	-	-	-	-	-	-	243,958	36,594	280,552	58,916	221,636	-	-	-	-	-	-	-	-	3,698,252
2b.4.12	Utility Staff Cost	-	-	-	-	-	-	104,318	15,648	119,966	63,822	56,144	-	-	-	-	-	-	-	-	1,643,667
2b.4	Subtotal Period 2b Period-Dependent Costs	-	4,953	114	36	-	444	544,946	74,855	625,348	334,275	291,074	-	-	5,459	-	-	-	109,172	178	5,341,919
2b.0	TOTAL PERIOD 2b COST	-	4,953	114	36	-	444	653,544	91,822	750,913	346,231	404,682	-	-	5,459	-	-	-	109,172	178	5,341,919
PERIOD 2 TOTALS		-	5,677	130	42	-	510	863,333	122,525	992,217	462,925	529,292	-	-	6,264	-	-	-	125,283	204	6,416,139
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
3a.1.9.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	865	130	995	895	-	99	-	-	-	-	-	-	-	7,370
3a.1.9.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
3a.1.9.3	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
3a.1.9.4	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
3a.1.9.5	Sacrificial shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
3a.1.9.6	Moisture separators/reheaters	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3a.1.9.7	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
3a.1.9.8	Main Turbine	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
3a.1.9.9	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
3a.1.9.10	Pressure suppression structure	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
3a.1.9.11	Drywell	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	1,600
3a.1.9.12	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
3a.1.9.13	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
3a.1.9.14	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
3a.1.9	Total	-	-	-	-	-	-	5,239	786	6,025	5,490	-	535	-	-	-	-	-	-	-	44,633
Planning & Site Preparations																					
3a.1.10	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
3a.1.11	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
3a.1.12	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
3a.1.13	Rigging/Cont. Cntrl Envlp/s/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
3a.1.14	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230

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Table I
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Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	14,223	2,133	16,357	15,821	-	535	-	-	-	-	-	-	-	73,463
Period 3a Additional Costs																					
3a.2.1	Site Characterization	-	-	-	-	-	-	6,446	1,934	8,380	8,380	-	-	-	-	-	-	-	-	30,500	10,852
3a.2.2	Mixed & RCRA Waste	-	-	29	19	13	-	-	8	69	69	-	-	43	-	-	-	-	5,253	163	-
3a.2	Subtotal Period 3a Additional Costs	-	-	29	19	13	-	6,446	1,942	8,449	8,449	-	-	43	-	-	-	-	5,253	30,663	10,852
Period 3a Collateral Costs																					
3a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,664	250	1,914	-	1,914	-	-	-	-	-	-	-	-	-
3a.3	Subtotal Period 3a Collateral Costs	-	-	-	-	-	-	1,664	250	1,914	-	1,914	-	-	-	-	-	-	-	-	-
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	708	71	779	779	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	2,232	223	2,455	2,455	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	452	-	-	-	-	-	113	565	565	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	11	3	-	42	-	12	68	68	-	-	-	516	-	-	-	10,311	17	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,730	259	1,989	1,989	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	341	34	376	376	-	-	-	-	-	-	-	-	-	-
3a.4.8	Emergency Planning Fees	-	-	-	-	-	-	137	14	150	-	150	-	-	-	-	-	-	-	-	-
3a.4.9	Fixed Overhead	-	-	-	-	-	-	2,833	425	3,258	3,258	-	-	-	-	-	-	-	-	-	-
3a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	103	15	119	-	119	-	-	-	-	-	-	-	-	-
3a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	115	17	133	133	-	-	-	-	-	-	-	-	-	-
3a.4.12	Security Staff Cost	-	-	-	-	-	-	3,900	585	4,485	4,485	-	-	-	-	-	-	-	-	-	54,080
3a.4.13	Utility Staff Cost	-	-	-	-	-	-	16,027	2,404	18,431	18,431	-	-	-	-	-	-	-	-	-	260,000
3a.4	Subtotal Period 3a Period-Dependent Costs	-	1,019	11	3	-	42	28,127	4,258	33,461	33,192	269	-	-	516	-	-	-	10,311	17	314,080
3a.0	TOTAL PERIOD 3a COST	-	1,019	39	23	13	42	50,461	8,583	60,180	57,462	2,183	535	43	516	-	-	-	15,565	30,680	398,395
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor internals	-	-	-	-	-	-	470	70	540	540	-	-	-	-	-	-	-	-	-	4,000
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD housings & NIs	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Removal primary containment	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
3b.1.1.9	Sacrificial shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.10	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
3b.1.1.11	Main Turbine	-	-	-	-	-	-	244	37	281	281	-	-	-	-	-	-	-	-	-	2,080
3b.1.1.12	Main Condensers	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	2,088
3b.1.1.13	Moisture separators & reheaters	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
3b.1.1.14	Radwaste building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
3b.1.1.15	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	3,843	576	4,420	3,997	-	423	-	-	-	-	-	-	-	32,741
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,843	576	4,420	3,997	-	423	-	-	-	-	-	-	-	32,741
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
3b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	830	124	954	-	954	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	973	1,200	-	-	-	-	2,018	629	4,820	3,866	954	-	-	-	-	-	-	-	-	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

Table I
Monticello Nuclear Generating Plant
Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	35	-	-	-	-	-	-	9	43	43	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	360	36	396	396	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	995	99	1,094	1,094	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	248	-	-	-	-	-	62	310	310	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	283	-	-	-	-	-	42	325	325	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	6	2	-	24	-	7	38	38	-	-	-	291	-	-	-	5,814	9	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	863	129	992	992	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	170	17	187	187	-	-	-	-	-	-	-	-	-	-
3b.4.9	Emergency Planning Fees	-	-	-	-	-	-	68	7	75	-	75	-	-	-	-	-	-	-	-	-
3b.4.10	Fixed Overhead	-	-	-	-	-	-	1,413	212	1,625	1,625	-	-	-	-	-	-	-	-	-	-
3b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	51	8	59	-	59	-	-	-	-	-	-	-	-	-
3b.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
3b.4.13	Security Staff Cost	-	-	-	-	-	-	1,945	292	2,236	2,236	-	-	-	-	-	-	-	-	-	26,966
3b.4.14	DOC Staff Cost	-	-	-	-	-	-	5,123	769	5,892	5,892	-	-	-	-	-	-	-	-	-	58,080
3b.4.15	Utility Staff Cost	-	-	-	-	-	-	7,992	1,199	9,190	9,190	-	-	-	-	-	-	-	-	-	129,644
3b.4	Subtotal Period 3b Period-Dependent Costs	35	531	6	2	-	24	19,037	2,896	22,530	22,396	134	-	-	291	-	-	-	5,814	9	214,690
3b.0	TOTAL PERIOD 3b COST	1,008	1,731	6	2	-	24	24,898	4,101	31,769	30,258	1,088	423	-	291	-	-	-	5,814	9	247,431
PERIOD 3 TOTALS		1,008	2,750	45	25	13	66	75,359	12,684	91,949	87,720	3,271	958	43	806	-	-	-	21,379	30,690	645,826
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Recirculation System Piping & Valves	20	71	28	22	96	214	-	102	553	553	-	-	676	715	-	-	-	94,867	1,594	-
4a.1.1.2	Recirculation Pumps & Motors	7	47	15	26	130	219	-	95	539	539	-	-	568	473	-	-	-	112,200	1,049	-
4a.1.1.3	CRDMs & NIs Removal	35	674	400	72	-	919	-	466	2,565	2,565	-	-	-	3,741	-	-	-	213,700	12,506	-
4a.1.1.4	Reactor Vessel Internals	102	5,782	8,903	1,187	-	14,647	275	14,274	45,170	45,170	-	-	-	2,943	1,127	643	-	306,123	22,915	1,075
4a.1.1.5	Vessel & Internals GTCC Disposal	-	-	-	-	-	6,552	-	983	7,535	7,535	-	-	-	-	-	-	1,547	311,184	-	-
4a.1.1.6	Reactor Vessel	-	7,999	1,877	606	-	5,622	275	9,472	25,852	25,852	-	-	-	17,823	-	-	-	1,110,260	22,915	1,075
4a.1.1	Totals	163	14,571	11,223	1,914	226	28,174	551	25,392	82,215	82,215	-	-	1,244	25,695	1,127	643	1,547	2,148,335	60,979	2,150
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	282	1,424	349	3,174	357	-	831	6,417	6,417	-	-	24,835	1,383	-	-	-	1,577,959	4,796	-
4a.1.3	Main Condensers	-	994	378	128	1,667	198	-	605	3,970	3,970	-	-	17,396	727	-	-	-	828,955	16,823	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor Building	-	611	-	-	-	-	-	92	703	703	-	-	-	-	-	-	-	-	6,238	-
4a.1.4.2	Radwaste	-	53	-	-	-	-	-	8	61	61	-	-	-	-	-	-	-	-	569	-
4a.1.4.3	Turbine	-	157	-	-	-	-	-	24	180	180	-	-	-	-	-	-	-	-	1,884	-
4a.1.4	Totals	-	821	-	-	-	-	-	123	944	944	-	-	-	-	-	-	-	-	8,691	-
Disposal of Plant Systems																					
4a.1.5.1	Automatic Press Relief	-	88	2	7	94	-	-	37	228	228	-	-	1,088	-	-	-	-	44,184	1,468	-
4a.1.5.2	Chemistry Sampling	-	20	0	1	18	-	-	8	48	48	-	-	207	-	-	-	-	8,422	356	-
4a.1.5.3	Chemistry Sampling - Insulated	-	1	0	0	0	-	-	0	2	2	-	-	1	-	-	-	-	61	25	-
4a.1.5.4	Circulating Water - RCA	-	172	10	41	576	-	-	136	935	935	-	-	6,656	-	-	-	-	270,307	2,860	-
4a.1.5.5	Combustible Gas Control - Insul - RCA	-	24	0	1	18	-	-	9	53	53	-	-	212	-	-	-	-	8,617	378	-
4a.1.5.6	Combustible Gas Control - RCA	-	15	0	2	25	-	-	8	50	50	-	-	285	-	-	-	-	11,577	245	-
4a.1.5.7	Condensate & Feedwater	-	736	45	184	2,609	-	-	607	4,181	4,181	-	-	30,157	-	-	-	-	1,224,704	12,501	-
4a.1.5.8	Condensate & Feedwater - Insulated	-	368	9	36	506	-	-	174	1,093	1,093	-	-	5,855	-	-	-	-	237,764	6,185	-
4a.1.5.9	Condensate Demin	-	408	7	29	410	-	-	168	1,022	1,022	-	-	4,735	-	-	-	-	192,293	6,784	-
4a.1.5.10	Condensate Storage	-	546	12	50	712	-	-	252	1,573	1,573	-	-	8,237	-	-	-	-	334,489	9,265	-
4a.1.5.11	Control Rod Drive	-	2	0	0	2	-	-	1	5	5	-	-	24	-	-	-	-	976	36	-
4a.1.5.12	Control Rod Drive Hydraulic	-	309	4	15	211	-	-	112	651	651	-	-	2,440	-	-	-	-	99,094	5,255	-

Table I
Monticello Nuclear Generating Plant
Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed Volume Cu. Feet	Burial Volumes				Burial /	Craft Manhours	Utility and
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs		Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.		Contractor Manhours
Disposal of Plant Systems (continued)																					
4a.1.5.13	Core Spray	-	59	8	31	442	-	-	86	626	626	-	-	5,109	-	-	-	-	207,487	1,026	-
4a.1.5.14	Core Spray - Insulated	-	108	2	7	102	-	-	44	263	263	-	-	1,184	-	-	-	-	48,081	1,806	-
4a.1.5.15	Demin Water - Insulated - RCA	-	12	0	1	7	-	-	4	25	25	-	-	85	-	-	-	-	3,445	181	-
4a.1.5.16	Demin Water - RCA	-	34	0	2	22	-	-	12	70	70	-	-	253	-	-	-	-	10,278	508	-
4a.1.5.17	Diesel Oil - RCA	-	2	0	0	2	-	-	1	4	4	-	-	23	-	-	-	-	931	25	-
4a.1.5.18	Drywell Atmosphere Cooling - RCA	-	31	1	3	47	-	-	15	98	98	-	-	548	-	-	-	-	22,244	550	-
4a.1.5.19	EDG Emerg Service Water - Insul - RCA	-	0	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	84	4	-
4a.1.5.20	Electrical - Clean	-	11	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	182	-
4a.1.5.21	Emergency Service Water - Insul - RCA	-	18	0	1	12	-	-	6	37	37	-	-	137	-	-	-	-	5,544	281	-
4a.1.5.22	Emergency Service Water - RCA	-	1	0	0	1	-	-	1	3	3	-	-	13	-	-	-	-	512	22	-
4a.1.5.23	GEZIP - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
4a.1.5.24	Generator Physical Design - RCA	-	4	0	0	3	-	-	1	8	8	-	-	31	-	-	-	-	1,250	67	-
4a.1.5.25	H2-O2 Control Analyzing	-	5	0	0	2	-	-	1	8	8	-	-	23	-	-	-	-	948	72	-
4a.1.5.26	H2-O2 Control Analyzing - Insulated	-	5	0	0	2	-	-	1	8	8	-	-	23	-	-	-	-	948	72	-
4a.1.5.27	High Pressure Coolant Injection	-	50	2	8	109	-	-	30	199	199	-	-	1,262	-	-	-	-	51,257	850	-
4a.1.5.28	High Pressure Coolant Injection - Insula	-	164	3	14	196	-	-	73	450	450	-	-	2,266	-	-	-	-	92,018	2,734	-
4a.1.5.29	Hydrogen Cooling	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	118	-
4a.1.5.30	Hydrogen Cooling - RCA	-	6	0	0	3	-	-	2	11	11	-	-	39	-	-	-	-	1,600	79	-
4a.1.5.31	Hydrogen Seal Oil - RCA	-	14	0	1	16	-	-	6	38	38	-	-	189	-	-	-	-	7,669	212	-
4a.1.5.32	Hydrogen Water Chemistry - RCA	-	20	0	1	12	-	-	7	40	40	-	-	140	-	-	-	-	5,672	304	-
4a.1.5.33	Instrument & Service Air - RCA	-	185	3	11	153	-	-	71	423	423	-	-	1,768	-	-	-	-	71,810	2,733	-
4a.1.5.34	Main Condenser	-	147	3	12	165	-	-	63	389	389	-	-	1,903	-	-	-	-	77,301	2,443	-
4a.1.5.35	Main Steam	-	186	4	18	257	-	-	88	554	554	-	-	2,975	-	-	-	-	120,806	3,122	-
4a.1.5.36	Main Turbine	-	754	48	194	2,758	-	-	636	4,391	4,391	-	-	31,885	-	-	-	-	1,294,866	12,952	-
4a.1.5.37	Main Turbine - Insulated	-	160	5	21	299	-	-	89	574	574	-	-	3,460	-	-	-	-	140,506	2,725	-
4a.1.5.38	Miscellaneous	-	32	0	2	26	-	-	12	72	72	-	-	302	-	-	-	-	12,283	556	-
4a.1.5.39	Off Gas Recombiner	-	140	4	17	247	-	-	75	485	485	-	-	2,861	-	-	-	-	116,194	2,387	-
4a.1.5.40	Off Gas Recombiner - Insulated	-	289	4	14	203	-	-	105	616	616	-	-	2,350	-	-	-	-	95,441	4,785	-
4a.1.5.41	Post Accident Sampling	-	19	0	1	9	-	-	6	34	34	-	-	99	-	-	-	-	4,004	306	-
4a.1.5.42	Post Accident Sampling - Insulated	-	13	0	0	6	-	-	4	23	23	-	-	67	-	-	-	-	2,737	190	-
4a.1.5.43	RHR Service Water - Insulated - RCA	-	69	2	9	128	-	-	38	246	246	-	-	1,485	-	-	-	-	60,293	1,125	-
4a.1.5.44	RHR Service Water - RCA	-	3	0	0	3	-	-	1	8	8	-	-	35	-	-	-	-	1,410	57	-
4a.1.5.45	Reactor Feedwater Pump Seal	-	42	0	2	28	-	-	15	87	87	-	-	327	-	-	-	-	13,295	687	-
4a.1.5.46	Residual Heat Removal	-	187	52	99	1,091	418	-	335	2,181	2,181	-	-	12,609	1,519	-	-	-	609,174	3,282	-
4a.1.5.47	Residual Heat Removal - Insulated	-	415	37	51	440	377	-	275	1,595	1,595	-	-	5,084	1,374	-	-	-	294,206	7,027	-
4a.1.5.48	Rx Core Isolation Cooling	-	36	1	2	31	-	-	14	84	84	-	-	364	-	-	-	-	14,781	609	-
4a.1.5.49	Rx Core Isolation Cooling - Insulated	-	80	1	3	49	-	-	28	161	161	-	-	563	-	-	-	-	22,843	1,315	-
4a.1.5.50	Rx Recirculation	-	44	5	3	8	43	-	24	126	126	-	-	96	152	-	-	-	13,794	691	-
4a.1.5.51	Snubbers	-	126	1	3	43	-	-	39	212	212	-	-	502	-	-	-	-	20,395	2,272	-
4a.1.5.52	Standby Liquid Control - Insul - RCA	-	3	0	0	2	-	-	1	6	6	-	-	22	-	-	-	-	904	48	-
4a.1.5.53	Standby Liquid Control - RCA	-	22	0	1	21	-	-	9	54	54	-	-	245	-	-	-	-	9,969	341	-
4a.1.5.54	Stator Cooling - RCA	-	6	0	1	11	-	-	3	21	21	-	-	126	-	-	-	-	5,135	98	-
4a.1.5.55	Traversing Incore Probe	-	3	0	0	0	1	-	1	5	5	-	-	2	5	-	-	-	379	46	-
4a.1.5	Totals	-	6,203	280	899	12,150	839	-	3,744	24,114	24,094	-	20	140,459	3,050	-	-	-	5,899,167	104,297	-
4a.1.6	Scaffolding in support of decommissioning	-	1,778	23	8	99	25	-	469	2,402	2,402	-	-	1,030	91	-	-	-	52,111	19,968	-
4a.1	Subtotal Period 4a Activity Costs	163	24,648	13,329	3,299	17,316	29,592	551	31,164	120,062	120,042	-	20	184,963	30,945	1,127	643	1,547	10,506,530	215,555	2,150
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,161	648	2,809	2,809	-	-	-	-	-	-	-	-	28,247	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	2,161	648	2,809	2,809	-	-	-	-	-	-	-	-	28,247	-
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	4	-	7	17	-	27	-	12	66	66	-	-	-	64	-	-	-	3,860	13	-
4a.3.3	Small tool allowance	-	240	-	-	-	-	-	36	276	248	-	28	-	-	-	-	-	-	-	-
4a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,560	384	2,943	-	2,943	-	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	4	240	7	17	-	27	2,560	432	3,285	314	2,943	28	-	64	-	-	-	3,860	13	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

Table I
Monticello Nuclear Generating Plant
Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	94	-	-	-	-	-	-	24	118	118	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	980	98	1,078	1,078	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	2,674	267	2,942	2,942	-	-	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,856	-	-	-	-	-	464	2,320	2,320	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,984	-	-	-	-	-	448	3,431	3,431	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	97	31	-	378	-	109	614	614	-	-	-	4,640	-	-	-	92,810	151	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	2,233	335	2,568	2,568	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	757	76	833	833	-	-	-	-	-	-	-	-	-	-
4a.4.9	Emergency Planning Fees	-	-	-	-	-	-	186	19	204	-	204	-	-	-	-	-	-	-	-	-
4a.4.10	Fixed Overhead	-	-	-	-	-	-	3,150	473	3,623	3,623	-	-	-	-	-	-	-	-	-	-
4a.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	550	82	632	632	-	-	-	-	-	-	-	-	-	-
4a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	140	21	161	-	161	-	-	-	-	-	-	-	-	-
4a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	157	24	180	180	-	-	-	-	-	-	-	-	-	-
4a.4.14	Security Staff Cost	-	-	-	-	-	-	5,300	795	6,095	6,095	-	-	-	-	-	-	-	-	-	73,490
4a.4.15	DOC Staff Cost	-	-	-	-	-	-	16,810	2,522	19,332	19,332	-	-	-	-	-	-	-	-	-	195,030
4a.4.16	Utility Staff Cost	-	-	-	-	-	-	21,933	3,290	25,223	25,223	-	-	-	-	-	-	-	-	-	356,142
4a.4	Subtotal Period 4a Period-Dependent Costs	94	4,839	97	31	-	378	54,871	9,045	69,355	68,989	366	-	-	4,640	-	-	-	92,810	151	624,661
4a.0	TOTAL PERIOD 4a COST	262	29,727	13,432	3,346	17,316	29,997	60,142	41,289	195,511	192,155	3,309	48	184,963	35,649	1,127	643	1,547	10,603,200	243,966	626,811
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	504	49	108	109	-	2,091	-	814	3,675	3,675	-	-	-	7,653	-	-	-	486,170	906	-
Disposal of Plant Systems																					
4b.1.2.1	ALARA/Radiological	-	14	0	0	4	-	-	4	22	22	-	-	49	-	-	-	-	1,987	247	-
4b.1.2.2	Alternate N2 - RCA	-	13	0	1	8	-	-	5	27	27	-	-	93	-	-	-	-	3,765	185	-
4b.1.2.3	Cranes/Heavy Loads/Rigging - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
4b.1.2.4	Decontamination Projects	-	1	0	0	0	-	-	0	1	1	-	-	3	-	-	-	-	125	15	-
4b.1.2.5	Electrical - Contaminated	-	328	4	15	217	-	-	117	682	682	-	-	2,514	-	-	-	-	102,112	5,633	-
4b.1.2.6	Electrical - Contaminated Fuel Pool	-	34	0	2	22	-	-	12	70	70	-	-	253	-	-	-	-	10,272	592	-
4b.1.2.7	Electrical - Decontam. Fuel Pool Area	-	242	4	15	213	-	-	95	568	568	-	-	2,457	-	-	-	-	99,783	4,090	-
4b.1.2.8	Electrical - Decontaminated	-	2,195	36	142	2,019	-	-	877	5,269	5,269	-	-	23,344	-	-	-	-	948,013	37,107	-
4b.1.2.9	Fire - RCA	-	84	1	4	53	-	-	30	171	171	-	-	614	-	-	-	-	24,917	1,324	-
4b.1.2.10	Fire - RCA - Fuel Pool Area	-	9	0	0	5	-	-	3	18	18	-	-	62	-	-	-	-	2,499	143	-
4b.1.2.11	Fuel Pool Cooling & Cleanup	-	319	19	23	177	196	-	161	895	895	-	-	2,051	712	-	-	-	128,918	5,363	-
4b.1.2.12	Fuel Pool Cooling & Cleanup - Insulated	-	31	2	2	11	20	-	15	80	80	-	-	130	71	-	-	-	9,830	514	-
4b.1.2.13	HVAC Ductwork	-	238	4	17	243	-	-	99	601	601	-	-	2,805	-	-	-	-	113,913	3,539	-
4b.1.2.14	HVAC Ductwork - Fuel Pool Area	-	26	0	2	27	-	-	11	67	67	-	-	312	-	-	-	-	12,657	393	-
4b.1.2.15	HVAC/Chilled Water - RCA	-	267	4	17	238	-	-	105	631	631	-	-	2,752	-	-	-	-	111,779	3,985	-
4b.1.2.16	HVAC/Chilled Water - RCA Fuel Pool Area	-	27	0	1	19	-	-	10	58	58	-	-	223	-	-	-	-	9,072	397	-
4b.1.2.17	Heating & Ventilation	-	359	10	39	548	-	-	179	1,134	1,134	-	-	6,334	-	-	-	-	257,243	6,340	-
4b.1.2.18	Heating Boiler - Insulated - RCA	-	2	0	0	2	-	-	1	6	6	-	-	26	-	-	-	-	1,058	35	-
4b.1.2.19	Instrument & Service Air-RCA-Fuel Pool	-	24	0	2	23	-	-	10	58	58	-	-	267	-	-	-	-	10,841	357	-
4b.1.2.20	Liquid Radwaste	-	515	28	39	364	253	-	255	1,453	1,453	-	-	4,203	915	-	-	-	229,422	8,550	-
4b.1.2.21	Makeup Demin - RCA	-	86	2	9	127	-	-	42	266	266	-	-	1,471	-	-	-	-	59,747	1,412	-
4b.1.2.22	Non-Essential Diesel Generator - RCA	-	23	2	9	123	-	-	26	183	183	-	-	1,424	-	-	-	-	57,832	395	-
4b.1.2.23	Off Gas Holdup	-	257	5	22	314	-	-	115	713	713	-	-	3,629	-	-	-	-	147,355	4,256	-
4b.1.2.24	Primary Containment	-	341	13	51	718	-	-	202	1,324	1,324	-	-	8,302	-	-	-	-	337,148	5,729	-
4b.1.2.25	Process Radiation Monitors	-	34	0	1	18	-	-	12	66	66	-	-	213	-	-	-	-	8,667	577	-
4b.1.2.26	Rx Bldg Closed Clng Water - Insul - RCA	-	93	2	6	85	-	-	37	222	222	-	-	977	-	-	-	-	39,675	1,484	-
4b.1.2.27	Rx Bldg Closed Clng Water - RCA	-	152	11	43	614	-	-	138	957	957	-	-	7,093	-	-	-	-	288,031	2,489	-
4b.1.2.28	Rx Component Handling Equip	-	105	11	16	150	113	-	81	477	477	-	-	1,737	415	-	-	-	96,901	1,839	-
4b.1.2.29	Rx Pressure Vessel	-	35	4	3	14	47	-	24	127	127	-	-	161	169	-	-	-	17,375	578	-
4b.1.2.30	Rx Water Cleanup	-	198	16	11	24	174	-	100	523	523	-	-	278	630	-	-	-	51,819	3,264	-
4b.1.2.31	Secondary Containment	-	93	2	8	119	-	-	42	264	264	-	-	1,372	-	-	-	-	55,702	1,569	-
4b.1.2.32	Service & Seal Water - Insulated - RCA	-	99	2	7	102	-	-	41	252	252	-	-	1,180	-	-	-	-	47,917	1,565	-
4b.1.2.33	Service & Seal Water - RCA	-	131	3	11	156	-	-	58	360	360	-	-	1,809	-	-	-	-	73,453	2,016	-
4b.1.2.34	Service Air Blower - RCA	-	13	0	1	18	-	-	6	38	38	-	-	206	-	-	-	-	8,364	206	-
4b.1.2.35	Solid Radwaste	-	369	20	30	293	181	-	188	1,081	1,081	-	-	3,390	659	-	-	-	179,772	6,270	-
4b.1.2.36	Structures & Buildings	-	58	1	3	41	-	-	21	124	124	-	-	477	-	-	-	-	19,351	1,005	-
4b.1.2.37	Wells & Domestic Water	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	144	-
4b.1.2.38	Wells & Domestic Water - RCA	-	43	1	2	30	-	-	16	91	91	-	-	342	-	-	-	-	13,874	633	-
4b.1.2	Totals	-	6,869	208	555	7,150	984	-	3,139	18,904	18,894	-	9	82,654	3,571	-	-	-	3,585,374	114,290	-
4b.1.3	Scaffolding in support of decommissioning	-	2,667	35	12	148	37	-	704	3,603	3,603	-	-	1,545	136	-	-	-	78,166	29,953	-

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table I
Monticello Nuclear Generating Plant
Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
4b.1.4.1	Reactor Building	3,881	2,049	138	314	4,159	765	-	3,329	14,634	14,634	-	-	48,077	4,434	-	-	-	2,195,768	98,722	-
4b.1.4.2	Admin	82	2	0	1	-	7	-	43	135	135	-	-	-	72	-	-	-	3,420	1,389	-
4b.1.4.3	HPCI Room	22	19	0	1	10	7	-	19	78	78	-	-	118	65	-	-	-	7,927	664	-
4b.1.4.4	Hot Shop	13	2	0	1	-	5	-	8	28	28	-	-	-	51	-	-	-	2,430	231	-
4b.1.4.5	LLRW Storage & Shipping	43	11	1	3	3	21	-	30	111	111	-	-	31	217	-	-	-	11,532	875	-
4b.1.4.6	Offgas Stack	280	127	4	12	116	44	-	202	786	786	-	-	1,343	361	-	-	-	72,483	6,692	-
4b.1.4.7	Offgas Storage & Compressor	30	7	0	2	2	15	-	21	79	79	-	-	25	159	-	-	-	8,502	603	-
4b.1.4.8	Radwaste	91	30	2	7	15	44	-	67	255	255	-	-	172	460	-	-	-	28,679	1,960	-
4b.1.4.9	Radwaste Material Storage Warehouse	48	9	1	3	-	23	-	32	116	116	-	-	-	248	-	-	-	11,700	915	-
4b.1.4.10	Recombiner	20	15	1	3	17	12	-	20	87	87	-	-	199	112	-	-	-	13,491	554	-
4b.1.4.11	Turbine	528	172	9	42	111	260	-	396	1,517	1,517	-	-	1,283	2,675	-	-	-	179,172	11,286	-
4b.1.4.12	Turbine Building Addition	44	8	1	3	-	20	-	29	105	105	-	-	-	217	-	-	-	10,248	838	-
4b.1.4.13	Reactor (Post Fuel)	703	1,924	129	656	170	4,681	-	2,140	10,403	10,403	-	-	1,969	49,647	-	-	-	2,426,544	39,766	-
4b.1.4	Totals	5,783	4,375	286	1,047	4,603	5,903	-	6,337	28,334	28,334	-	-	53,216	58,718	-	-	-	4,971,896	164,495	-
4b.1.5	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096
4b.1.6	Receive NRC approval of termination plan									a											
4b.1	Subtotal Period 4b Activity Costs	6,287	13,960	637	1,723	11,901	9,015	481	11,066	55,069	55,060	-	9	137,414	70,078	-	-	-	9,121,606	309,644	4,096
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,291	387	1,678	1,678	-	-	-	-	-	-	-	-	-	12,480
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	3,241	972	4,213	4,213	-	-	-	-	-	-	-	-	42,370	-
4b.2.3	Operational Equipment	-	-	19	60	624	-	-	104	807	807	-	-	11,710	-	-	-	-	292,750	32	-
4b.2	Subtotal Period 4b Additional Costs	-	-	19	60	624	-	4,532	1,464	6,698	6,698	-	-	11,710	-	-	-	-	292,750	42,402	12,480
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	12	-	21	53	-	84	-	37	207	207	-	-	-	201	-	-	-	12,055	39	-
4b.3.3	Small tool allowance	-	314	-	-	-	-	-	47	361	361	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	137	55	575	145	-	144	1,055	1,055	-	-	6,000	529	-	-	-	303,608	147	-
4b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	5,730	860	6,590	-	6,590	-	-	-	-	-	-	-	-	-
4b.3	Subtotal Period 4b Collateral Costs	12	314	157	108	575	229	5,730	1,088	8,212	1,622	6,590	-	6,000	730	-	-	-	315,663	186	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	1,388	-	-	-	-	-	-	347	1,735	1,735	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	1,470	147	1,617	1,617	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	3,786	379	4,165	4,165	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	2,704	-	-	-	-	-	676	3,380	3,380	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	4,602	-	-	-	-	-	690	5,292	5,292	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	121	39	-	472	-	136	767	767	-	-	-	5,800	-	-	-	116,000	189	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,645	397	3,041	3,041	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,136	114	1,250	1,250	-	-	-	-	-	-	-	-	-	-
4b.4.9	Emergency Planning Fees	-	-	-	-	-	-	279	28	307	-	307	-	-	-	-	-	-	-	-	-
4b.4.10	Fixed Overhead	-	-	-	-	-	-	4,725	709	5,434	5,434	-	-	-	-	-	-	-	-	-	-
4b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	825	124	949	949	-	-	-	-	-	-	-	-	-	-
4b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	210	32	242	-	242	-	-	-	-	-	-	-	-	-
4b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	-
4b.4.14	Security Staff Cost	-	-	-	-	-	-	7,950	1,192	9,142	9,142	-	-	-	-	-	-	-	-	-	110,234
4b.4.15	DOC Staff Cost	-	-	-	-	-	-	24,690	3,704	28,394	28,394	-	-	-	-	-	-	-	-	-	284,065
4b.4.16	Utility Staff Cost	-	-	-	-	-	-	31,207	4,681	35,888	35,888	-	-	-	-	-	-	-	-	-	504,534
4b.4	Subtotal Period 4b Period-Dependent Costs	1,388	7,306	121	39	-	472	79,158	13,389	101,873	101,325	549	-	-	5,800	-	-	-	116,000	189	898,834
4b.0	TOTAL PERIOD 4b COST	7,687	21,579	934	1,929	13,100	9,716	89,901	27,007	171,853	164,705	7,139	9	155,124	76,608	-	-	-	9,846,018	352,420	915,410
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	159	48	207	207	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license									a											
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	159	48	207	207	-	-	-	-	-	-	-	-	-	-

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Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
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Activity		Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Index	Activity Description														Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	7,341	2,202	9,544	9,544	-	-	-	-	-	-	-	-	96,197	6,240
4f.2.2	License Termination ISFSI	-	131	3	784	-	8,058	2,907	2,971	14,854	14,854	-	-	-	27,284	-	-	-	3,860,412	11,160	10,640
4f.2	Subtotal Period 4f Additional Costs	-	131	3	784	-	8,058	10,248	5,173	24,398	24,398	-	-	-	27,284	-	-	-	3,860,412	107,357	16,880
Period 4f Collateral Costs																					
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
4f.3.2	Small tool allowance	-	1	-	-	-	-	-	0	1	1	-	-	-	-	-	-	-	-	-	-
4f.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	570	85	655	-	655	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	1	-	-	-	-	1,758	264	2,024	1,368	655	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f.4.1	Insurance	-	-	-	-	-	-	543	54	598	598	-	-	-	-	-	-	-	-	-	-
4f.4.2	Property taxes	-	-	-	-	-	-	1,265	127	1,392	1,392	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	651	-	-	-	-	-	163	813	813	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	7	2	-	29	-	8	47	47	-	-	-	355	-	-	-	7,097	12	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	261	39	300	300	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	420	42	463	463	-	-	-	-	-	-	-	-	-	-
4f.4.7	Emergency Planning Fees	-	-	-	-	-	-	103	10	113	-	113	-	-	-	-	-	-	-	-	-
4f.4.8	Fixed Overhead	-	-	-	-	-	-	1,747	262	2,009	2,009	-	-	-	-	-	-	-	-	-	-
4f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	78	12	89	-	89	-	-	-	-	-	-	-	-	-
4f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
4f.4.11	Security Staff Cost	-	-	-	-	-	-	2,938	441	3,379	3,379	-	-	-	-	-	-	-	-	-	40,745
4f.4.12	DOC Staff Cost	-	-	-	-	-	-	5,174	776	5,950	5,950	-	-	-	-	-	-	-	-	-	57,200
4f.4.13	Utility Staff Cost	-	-	-	-	-	-	5,456	818	6,274	6,274	-	-	-	-	-	-	-	-	-	80,707
4f.4	Subtotal Period 4f Period-Dependent Costs	-	651	7	2	-	29	18,072	2,765	21,527	21,324	203	-	-	355	-	-	-	7,097	12	178,652
4f.0	TOTAL PERIOD 4f COST	-	782	11	787	-	8,087	30,238	8,250	48,155	47,297	858	-	-	27,639	-	-	-	3,867,510	107,369	195,532
PERIOD 4 TOTALS		7,949	52,089	14,377	6,063	30,416	47,800	180,282	76,546	415,520	404,157	11,306	57	340,088	139,896	1,127	643	1,547	24,316,720	703,755	1,737,752
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor Building	-	3,541	-	-	-	-	-	531	4,073	-	-	4,073	-	-	-	-	-	-	36,752	-
5b.1.1.2	Condensate Tanks Foundation	-	19	-	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	219	-
5b.1.1.3	Discharge Retention Basin	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	110	-
5b.1.1.4	HPCI Room	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	401	-
5b.1.1.5	Hot Shop	-	21	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	298	-
5b.1.1.6	Hydrogen & Oxygen Storage	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	21	-
5b.1.1.7	LLRW Storage & Shipping	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	1,794	-
5b.1.1.8	MSIV	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	59	-
5b.1.1.9	Misc Structures 2017	-	1,075	-	-	-	-	-	161	1,236	-	-	1,236	-	-	-	-	-	-	13,787	-
5b.1.1.10	Offgas Stack	-	232	-	-	-	-	-	35	267	-	-	267	-	-	-	-	-	-	2,668	-
5b.1.1.11	Offgas Storage & Compressor	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	963	-
5b.1.1.12	Radwaste	-	482	-	-	-	-	-	72	554	-	-	554	-	-	-	-	-	-	5,196	-
5b.1.1.13	Recombiner	-	258	-	-	-	-	-	39	297	-	-	297	-	-	-	-	-	-	2,490	-
5b.1.1.14	Security Barrier	-	362	-	-	-	-	-	54	416	-	-	416	-	-	-	-	-	-	4,083	-
5b.1.1.15	Structures Greater than 3' Below Grade	-	4,946	-	-	-	-	-	742	5,688	-	-	5,688	-	-	-	-	-	-	46,737	-
5b.1.1.16	Tank Farm	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	121	-
5b.1.1.17	Turbine	-	1,514	-	-	-	-	-	227	1,741	-	-	1,741	-	-	-	-	-	-	18,764	-
5b.1.1.18	Turbine Building Addition	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	971	-
5b.1.1.19	Turbine Pedestal	-	415	-	-	-	-	-	62	478	-	-	478	-	-	-	-	-	-	3,762	-
5b.1.1	Totals	-	13,228	-	-	-	-	-	1,984	15,212	-	-	15,212	-	-	-	-	-	-	139,199	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	864	-	-	-	-	-	130	994	-	-	994	-	-	-	-	-	-	1,841	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	14,092	-	-	-	-	183	2,141	16,417	211	-	16,206	-	-	-	-	-	-	141,040	1,560

Monticello Nuclear Generating Plant
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Table I
Monticello Nuclear Generating Plant
Scenario 7: SAFSTOR with 60 Year DFS Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 5b Additional Costs																					
5b.2.1	Clean Concrete Disposal	-	3,297	-	-	-	-	11	496	3,805	-	-	3,805	-	-	-	-	-	-	12	-
5b.2.2	Cofferdam	-	320	-	-	-	-	-	48	368	368	-	-	-	-	-	-	-	-	2,584	-
5b.2.3	Excavation of Underground Services	-	1,380	-	-	-	-	947	349	2,677	-	-	2,677	-	-	-	-	-	-	13,475	-
5b.2.4	Constrution Debris	-	-	-	-	-	-	350	53	403	-	-	403	-	-	-	-	-	-	-	-
5b.2.5	Backfill	-	5,102	-	-	-	-	-	765	5,868	-	-	5,868	-	-	-	-	-	-	5,422	-
5b.2.6	Demolition and Site Restoration ISFSI	-	1,766	-	-	-	-	185	293	2,244	-	-	2,244	-	-	-	-	-	-	8,537	160
5b.2	Subtotal Period 5b Additional Costs	-	11,866	-	-	-	-	1,493	2,004	15,364	368	-	14,996	-	-	-	-	-	-	30,030	160
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	193	-	-	-	-	-	29	222	-	-	222	-	-	-	-	-	-	-	-
5b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	210	31	241	-	241	-	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	193	-	-	-	-	210	60	463	-	241	222	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.2	Property taxes	-	-	-	-	-	-	2,419	242	2,661	-	-	2,661	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	5,455	-	-	-	-	-	818	6,273	-	-	6,273	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	300	45	345	-	-	345	-	-	-	-	-	-	-	-
5b.4.5	Fixed Overhead	-	-	-	-	-	-	1,260	189	1,450	-	-	1,450	-	-	-	-	-	-	-	-
5b.4.6	Railroad Track Maintenance	-	-	-	-	-	-	200	30	230	-	-	230	-	-	-	-	-	-	-	-
5b.4.7	Security Staff Cost	-	-	-	-	-	-	2,739	411	3,150	-	-	3,150	-	-	-	-	-	-	-	43,287
5b.4.8	DOC Staff Cost	-	-	-	-	-	-	11,290	1,693	12,983	-	-	12,983	-	-	-	-	-	-	-	122,646
5b.4.9	Utility Staff Cost	-	-	-	-	-	-	4,718	708	5,426	-	-	5,426	-	-	-	-	-	-	-	70,341
5b.4	Subtotal Period 5b Period-Dependent Costs	-	5,455	-	-	-	-	22,927	4,136	32,517	-	-	32,517	-	-	-	-	-	-	-	236,274
5b.0	TOTAL PERIOD 5b COST	-	31,606	-	-	-	-	24,813	8,342	64,761	578	241	63,941	-	-	-	-	-	-	171,070	237,994
PERIOD 5 TOTALS		-	31,606	-	-	-	-	24,813	8,342	64,761	578	241	63,941	-	-	-	-	-	-	171,070	237,994
TOTAL COST TO DECOMMISSION		17,731	94,941	14,820	6,756	30,429	49,464	1,261,386	241,927	1,717,454	1,099,775	552,724	64,956	340,130	150,629	1,127	643	1,547	24,630,430	1,025,076	10,085,120

TOTAL COST TO DECOMMISSION WITH 16.4% CONTINGENCY:	\$1,717,454	thousands of 2017	dollars
TOTAL NRC LICENSE TERMINATION COST IS 64.04% OR:	\$1,099,775	thousands of 2017	dollars
SPENT FUEL MANAGEMENT COST IS 32.18% OR:	\$552,724	thousands of 2017	dollars
NON-NUCLEAR DEMOLITION COST IS 3.78% OR:	\$64,956	thousands of 2017	dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	152,399	cubic feet	
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	1,547	cubic feet	
TOTAL SCRAP METAL REMOVED:	22,696	tons	
TOTAL CRAFT LABOR REQUIREMENTS:	1,025,076	man-hours	

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

***Monticello Nuclear Generating Plant
Decommissioning Cost Analysis***

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ISFSI DECOMMISSIONING

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Decommissioning Cost Analysis

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Table J-1
Monticello Nuclear Generating Plant
ISFSI Decommissioning Cost Estimate
Scenarios 1 and 6
(thousands of 2017 dollars)

Activity Description	Decon Costs	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor										
Planning (characterization, specs and procedures)	-	-	-	-	-	241	241	-	-	1,072
Decontamination (activated disposition)	-	131	3	784	8,058	-	8,976	27,284	965	-
License Termination (radiological surveys)	-	-	-	-	-	1,245	1,245	-	10,057	-
Subtotal	-	131	3	784	8,058	1,486	10,462	27,284	11,022	1,072
Supporting Costs										
NRC and NRC Contractor Fees and Costs	-	-	-	-	-	364	364	-	-	776
Insurance	-	-	-	-	-	110	110	-	-	-
Property taxes	-	-	-	-	-	226	226	-	-	-
Plant energy budget	-	-	-	-	-	-	-	-	-	-
Fixed Overhead	-	-	-	-	-	82	82	-	-	-
Railroad Track Maintenance	-	-	-	-	-	38	38	-	-	-
Security Staff Cost	-	-	-	-	-	308	308	-	-	4,999
Oversight Staff	-	-	-	-	-	260	260	-	-	3,792
Subtotal	-	-	-	-	-	1,389	1,389	-	-	9,568
Total (w/o contingency)	-	131	3	784	8,058	2,875	11,852	27,284	11,022	10,640
Total (w/25% contingency)							14,815			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table J-2
Monticello Nuclear Generating Plant
ISFSI Decommissioning Cost Estimate
Scenarios 2 and 7
(thousands of 2017 dollars)

Activity Description	Decon Costs	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor										
Planning (characterization, specs and procedures)	-	-	-	-	-	241	241	-	-	1,072
Decontamination (activated disposition)	-	131	3	784	8,058	-	8,976	27,284	965	-
License Termination (radiological surveys)	-	-	-	-	-	1,259	1,259	-	10,196	-
Subtotal	-	131	3	784	8,058	1,500	10,476	27,284	11,160	1,072
Supporting Costs										
NRC and NRC Contractor Fees and Costs	-	-	-	-	-	364	364	-	-	776
Insurance	-	-	-	-	-	110	110	-	-	-
Property taxes	-	-	-	-	-	244	244	-	-	-
Plant energy budget	-	-	-	-	-	-	-	-	-	-
Fixed Overhead	-	-	-	-	-	82	82	-	-	-
Railroad Track Maintenance	-	-	-	-	-	38	38	-	-	-
Security Staff Cost	-	-	-	-	-	308	308	-	-	4,999
Oversight Staff	-	-	-	-	-	260	260	-	-	3,792
Subtotal	-	-	-	-	-	1,407	1,407	-	-	9,568
Total (w/o contingency)	-	131	3	784	8,058	2,907	11,883	27,284	11,160	10,640
Total (w/25% contingency)							14,854			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

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Decommissioning Cost Analysis

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Table J-3
Monticello Nuclear Generating Plant
ISFSI Decommissioning Cost Estimate
Scenarios 3 and 4
(thousands of 2017 dollars)

Activity Description	Decon Costs	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor										
Planning (characterization, specs and procedures)	-	-	-	-	-	241	241	-	-	1,072
Decontamination (activated disposition)	30	2	6	14	208	-	260	834	365	-
License Termination (radiological surveys)	-	-	-	-	-	1,262	1,262	-	10,268	-
Subtotal	30	2	6	14	208	1,503	1,763	834	10,633	1,072
Supporting Costs										
NRC and NRC Contractor Fees and Costs	-	-	-	-	-	364	364	-	-	776
Insurance	-	-	-	-	-	110	110	-	-	-
Property taxes	-	-	-	-	-	244	244	-	-	-
Plant energy budget	-	-	-	-	-	-	-	-	-	-
Fixed Overhead	-	-	-	-	-	82	82	-	-	-
Railroad Track Maintenance	-	-	-	-	-	38	38	-	-	-
Security Staff Cost	-	-	-	-	-	308	308	-	-	4,999
Oversight Staff	-	-	-	-	-	260	260	-	-	3,792
Subtotal	-	-	-	-	-	1,407	1,407	-	-	9,568
Total (w/o contingency)	30	2	6	14	208	2,909	3,170	834	10,633	10,640
Total (w/25% contingency)							3,962			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

Monticello Nuclear Generating Plant
Decommissioning Cost Analysis

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Table J-4
Monticello Nuclear Generating Plant
ISFSI Decommissioning Cost Estimate
Scenario 5
(thousands of 2017 dollars)

Activity Description	Decon Costs	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor										
Planning (characterization, specs and procedures)	-	-	-	-	-	241	241	-	-	1,072
Decontamination (activated disposition)	30	133	8	788	8,078	-	9,036	27,473	1,324	-
License Termination (radiological surveys)	-	-	-	-	-	1,259	1,259	-	10,196	-
Subtotal	30	133	8	788	8,078	1,500	10,536	27,473	11,519	1,072
Supporting Costs										
NRC and NRC Contractor Fees and Costs	-	-	-	-	-	364	364	-	-	776
Insurance	-	-	-	-	-	110	110	-	-	-
Property taxes	-	-	-	-	-	244	244	-	-	-
Plant energy budget	-	-	-	-	-	-	-	-	-	-
Fixed Overhead	-	-	-	-	-	82	82	-	-	-
Railroad Track Maintenance	-	-	-	-	-	38	38	-	-	-
Security Staff Cost	-	-	-	-	-	308	308	-	-	4,999
Oversight Staff	-	-	-	-	-	260	260	-	-	3,792
Subtotal	-	-	-	-	-	1,407	1,407	-	-	9,568
Total (w/o contingency)	30	133	8	788	8,078	2,907	11,943	27,473	11,519	10,640
Total (w/25% contingency)							14,929			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

CERTIFICATE OF SERVICE

I, Lynnette Sweet, hereby certify that I have this day served copies or summaries of the foregoing document on the attached list of persons.

xx by depositing a true and correct copy thereof, properly enveloped with postage paid in the United States Mail at Minneapolis, Minnesota

xx electronic filing

Docket No. E002/M-14-761
Xcel Energy's Miscellaneous Electric Service List

Dated this 1st day of December 2017

/s/

Lynnette Sweet
Regulatory Administrator

[illegible]

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Andrew	Moratzka	andrew.moratzka@stoel.com	Steel Rives LLP	33 South Sixth St Ste 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_14-761_Official
Jeff	O'Neill	jeff.oneill@ci.monticello.mn.us	City of Monticello	505 Walnut Street Suite 1 Monticello, Minnesota 55362	Electronic Service	No	OFF_SL_14-761_Official
Carol A.	Overland	overland@legalectric.org	Legalelectric - Overland Law Office	1110 West Avenue Red Wing, MN 55066	Electronic Service	No	OFF_SL_14-761_Official
Lisa	Perkett	lisa.h.perkett@xcelenergy.com	Xcel Energy Inc.	Capital Asset Acctg Dept 7th Floor 414 Nicollet Mall Minneapolis, MN 554011993	Electronic Service	No	OFF_SL_14-761_Official
Laureen	Ross McCalib	lrossmccalib@greenergy.com	Great River Energy	12300 Elm Creek Boulevard Maple Grove, MN 55369-4718	Electronic Service	No	OFF_SL_14-761_Official
Daniel P	Wolf	dan.wolf@state.mn.us	Public Utilities Commission	121 7th Place East Suite 350 St. Paul, MN 551012147	Electronic Service	Yes	OFF_SL_14-761_Official

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
David	Aafedt	daafedt@winthrop.com	Winthrop & Weinstine, P.A.	Suite 3500, 225 South Sixth Street Minneapolis, MN 554024629	Electronic Service	No	GEN_SL_Northern States Power Company dba Xcel Energy-Elec_Xcel Miscl Electric
Christopher	Anderson	canderson@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022191	Electronic Service	No	GEN_SL_Northern States Power Company dba Xcel Energy-Elec_Xcel Miscl Electric
Alison C	Archer	aarcher@misoenergy.org	MISO	2985 Ames Crossing Rd Eagan, MN 55121	Electronic Service	No	GEN_SL_Northern States Power Company dba Xcel Energy-Elec_Xcel Miscl Electric
Ryan	Barlow	Ryan.Barlow@ag.state.mn.us	Office of the Attorney General-RUD	445 Minnesota Street Bremer Tower, Suite 1400 St. Paul, Minnesota 55101	Electronic Service	No	GEN_SL_Northern States Power Company dba Xcel Energy-Elec_Xcel Miscl Electric
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DECOMMISSIONING COST ANALYSIS
for the
PRAIRIE ISLAND NUCLEAR GENERATING PLANT



prepared for

Xcel Energy

prepared by

TLG Services, Inc.
Bridgewater, Connecticut

October 2017

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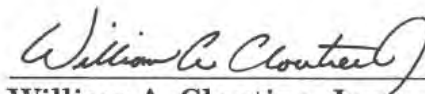
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REVISION LOG

No.	Date	Item Revised	Reason for Revision
0	10-17-2017		Original Issue

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EXECUTIVE SUMMARY

This report presents estimates of the cost to decommission the Prairie Island Nuclear Generating Plant (Prairie Island) for the identified decommissioning scenarios following a cessation of plant operations and the operation and eventual decommissioning of the on-site Independent Spent Fuel Storage Installation (ISFSI). The estimates are designed to provide Xcel Energy with the information to assess its current decommissioning liability, as it relates to Prairie Island.

The analysis relies upon site-specific, technical information from an evaluation prepared in 2014,^[1] updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

The analysis is not a detailed engineering evaluation, but an estimate prepared in advance of the detailed engineering required to carry out the decommissioning of the nuclear units. It may also not reflect the actual plan to decommission Prairie Island; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The primary goal of the decommissioning is the removal and disposal of the contaminated systems and structures so that the plant's operating licenses can be terminated. The analysis recognizes that spent fuel will be stored at the site in the plant's storage pool and/or in an Independent Spent Fuel Storage Installation (ISFSI) until such time that it can be transferred to a Department of Energy (DOE) facility. Consequently, the estimates also include those costs to manage and subsequently decommission these storage facilities.

The current cost estimates assume that Prairie Island Unit 1 ceases operations in 2033, and 2034 for Unit 2. The cost estimates assume that the shutdown dates of the nuclear units are scheduled and pre-planned (i.e., there is no delay in transitioning the plant and workforce from operations or in obtaining regulatory relief from operating requirements, etc.). This estimate includes additional resources to support the engineering, planning, and licensing efforts for the station; this is done to support a decommissioning schedule similar to the prior estimate. The estimates include the continued operation of the auxiliary building as an interim wet fuel storage facility for

¹ "Decommissioning Cost Analysis for the Prairie Island Nuclear Generating Plant," Document No. X01-1617-007, Rev. 0, TLG Services, Inc., September 2014

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approximately five years after operations cease. The spent fuel will remain in the ISFSI until the DOE is able to complete the transfer of the fuel to a federal facility (e.g., a monitored retrievable storage facility).^[2] The estimates also include the dismantling of non-essential structures and limited restoration of the site.

The costs to decommission Prairie Island, for the scenarios evaluated, are tabulated at the end of this section. Costs are reported in 2017 dollars and include monies anticipated to be spent for radiological remediation and operating license termination, spent fuel management, and site restoration activities.

A complete discussion of the assumptions relied upon in this analysis is provided in Section 3, along with schedules of annual expenditures for each scenario. A sequence of significant project activities is provided in Section 4 with a timeline for each scenario. Detailed cost reports used to generate the summary tables contained within this document are provided in Appendices C through J.

Alternatives and Regulations

The ultimate objective of the decommissioning process is to reduce the inventory of contaminated and activated material so that the licenses can be terminated. The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule adopted on June 27, 1988.^[3] In this rule, the NRC set forth technical and financial criteria for decommissioning licensed nuclear power facilities. The regulations addressed planning needs, timing, funding methods, and environmental review requirements for decommissioning. The rule also defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB.

DECON is defined as "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations."^[4]

² Projected expenditures for spent fuel management identified in the cost analysis do not consider any compensation for damages with regard to the delays incurred by Xcel Energy in the timely removal of spent fuel by the DOE.

³ U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72, "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, 53 Fed. Reg. 24018, June 27, 1988

⁴ Ibid. Page FR24022, Column 3

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SAFSTOR is defined as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use."^[5] Decommissioning is to be completed within 60 years, although longer time periods will be considered when necessary to protect public health and safety.

ENTOMB is defined as "the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained and continued surveillance is carried out until the radioactivity decays to a level permitting unrestricted release of the property."^[6] As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years, although longer time periods will also be considered when necessary to protect public health and safety.

The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 1997, the Commission directed its staff to re-evaluate this alternative and identify the technical requirements and regulatory actions that would be necessary for entombment to become a viable option. The resulting evaluation provided several recommendations, however, rulemaking has been deferred based upon several factors (e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities) at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation. In a draft regulatory basis document published in March 2017 in support of rulemaking that would amend NRC regulations concerning nuclear plant decommissioning, the NRC staff proposes removing any discussion of the ENTOMB option from existing guidance documents since the method is not deemed practically feasible.

In 1996, the NRC published revisions to its general requirements for decommissioning nuclear power plants to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process.^[7] The amendments allow for greater public participation and better define the transition

⁵ Ibid.

⁶ Ibid. Page FR24023, Column 2

⁷ U.S. Code of Federal Regulations, Title 10, Parts 2, 50 and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, 61 Fed. Reg. 39278, July 29, 1996

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process from operations to decommissioning. Regulatory Guide 1.184 Revision 1, issued in October 2013, further described the methods and procedures that are acceptable to the NRC staff for implementing the requirements of the 1996 revised rule that relate to the initial activities and the major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and sequence in the amended regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202, issued February 2005.^[8]

In 2011, the NRC published amended regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.^[9] The amended regulations require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, which includes the site's subsurface soil and groundwater. Licensees also may be required to perform site surveys to determine whether residual radioactivity is present in subsurface areas and to keep records of these surveys with records important for decommissioning. The amended regulations require licensees to report additional details in their decommissioning cost estimate as well as requiring additional financial reporting and assurances. These additional details are included in this analysis, including the ISFSI decommissioning estimate (Appendix J).

Decommissioning Scenarios

The following scenarios were evaluated and are intended to bound the liability associated with the removal of spent fuel from the site. The current operating licenses expires in 2033 and 2034 for Units 1 and 2, respectively. The scenarios consist of five DECON scenarios, with differing spent fuel management assumptions, but essentially no changes to the decommissioning costs and timing of the power block. There are also two SAFSTOR scenarios (Scenarios 6 and 7) each corresponding to the first two DECON scenario spent fuel management assumptions. The spent fuel in the plant's spent fuel storage pool is transferred to the ISFSI within the first five years. The equipment, structures, and portions of the plant containing radioactive contaminants are removed or decontaminated to a level that permits the facility to be released for unrestricted use. Non-essential structures are then demolished. Spent fuel storage operations continue at the ISFSI until the transfer of the fuel to the DOE is completed (2064 in Scenarios 1 & 6, 2077 in Scenarios 2, 5 & 7, 2117 in Scenario 3, and 2217 in Scenario 4).

⁸ "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, Nuclear Regulatory Commission, February 2005

⁹ U.S. Code of Federal Regulations, Title 10, Parts 20, 30, 40, 50, 70, and 72, "Decommissioning Planning," Nuclear Regulatory Commission, Federal Register Volume 76, (p 35512 et seq.), June 17, 2011

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Scenario	1 st Spent Fuel Canister Replacement	1 st Spent Fuel Assembly Removed from Prairie Island	Last Spent Fuel Assembly Removed from Prairie Island	Scenario Identification
1	n/a	2027	2064	DECON with 32 Year DFS ⁺
2	n/a	2053	2077	DECON with 60 Year DFS
3	2045	2093	2117	DECON with 100 Year DFS
4	2045	2193	2217	DECON with 200 Year DFS
5	2045	2053	2077	DECON with 60 Year DFS and recasking
6	n/a	2027	2064	SAFSTOR with 32 Year DFS
7	n/a	2053	2077	SAFSTOR with 60 Year DFS

⁺ Dry Fuel Storage

For Scenarios 1 and 6, although they only provide a total fuel storage period of 32 years following plant shutdown, some of the Prairie Island casks have been in storage since 1995. Xcel Energy directed TLG Services to not include the cost of transferring the spent fuel in dry storage to new canisters for those casks that exceed 50 years. The assumption to not transfer spent fuel at 50 years total storage duration for these two scenarios was premised on the likelihood that the life of the canisters could be successfully managed for the additional years.

For Scenarios 2 and 7, although they provide a total fuel storage period of 60 years following plant shutdown, Xcel Energy directed TLG Services to not include the cost of transferring the spent fuel in dry storage to new canisters at 50 years after plant shutdown.

In Scenarios 3, 4 and 5, the DSCs are assumed to be replaced after fifty years of use. Since the auxiliary building spent fuel storage pool and fuel handling facilities are removed by the year 2040, a dry fuel transfer facility is assumed to be constructed on site to perform the transfers from the old to the new DSCs. For Scenarios 3 and 5, only one such transfer is needed over the time frame assumed (some fuel canisters in Scenario 5 will not require recasking). For Scenario 4, the spent fuel will be transferred three times following initial placement in the ISFSI.

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Methodology

The methodology used to develop the estimates follows the basic approach originally presented in the cost estimating guidelines^[10] developed by the Atomic Industrial Forum (now Nuclear Energy Institute). This reference describes a unit cost factor method for estimating decommissioning activity costs. The unit cost factors used in this analysis incorporate site-specific costs and the latest available information about worker productivity in decommissioning.

An activity duration critical path is used to determine the total decommissioning program schedule. This is required for calculating the carrying costs, which include program management, administration, field engineering, equipment rental, quality assurance, and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

The estimates also reflect lessons learned from previously completed decommissioning projects, including TLG's involvement in the Shippingport Station decommissioning, completed in 1989, and the decommissioning of the Cintichem reactor, hot cells and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, Vermont Yankee and Fort Calhoun nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

Contingency

Consistent with cost estimating practice, contingencies are applied to the decontamination and dismantling costs developed as "specific provision for unforeseeable elements of cost within the defined project scope, particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur."^[11] The cost elements in the estimates are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in

¹⁰ T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

¹¹ Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, p. 239

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this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station, or duration of the decommissioning program and dry fuel storage period.

Contingency funds are expected to be fully expended throughout the program. As such, inclusion of contingency is necessary to provide assurance that sufficient funding will be available to accomplish the intended tasks.

Low-Level Radioactive Waste Disposal

The contaminated and neutron-activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for “shallow-land” disposal. With the passage of the “Low-Level Radioactive Waste Policy Act” in 1980,^[12] and its Amendments of 1985,^[13] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders. It was expected that groups of states would combine together to jointly deal with their radioactive wastes; these organizations are referred to as waste disposal compacts.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to Xcel Energy. The majority of the low-level radioactive waste designated for direct disposal (Class A^[14]) can be sent to EnergySolutions’ facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon representative rates. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The Texas facility is licensed to receive the higher activity waste forms (Classes B and C). As such, for this analysis, disposal costs for the Class B and C waste were based upon the preliminary and indicative information on the cost for such from WCS.

¹² “Low-Level Radioactive Waste Policy Act,” Public Law 96-573, 1980

¹³ “Low-Level Radioactive Waste Policy Amendments Act of 1985,” Public Law 99-240, 1986

¹⁴ Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55

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The dismantling of the components residing closest to the reactor core generates radioactive waste considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in the same canisters used for spent fuel and either stored on site or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to isolate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates reflect the savings from waste recovery/volume reduction.

High-Level Radioactive Waste Management

Congress passed the “Nuclear Waste Policy Act”^[15] (NWP) in 1982, assigning the federal government’s long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The NWP provided that DOE would enter into contracts with utilities in which DOE would promise to take the utilities’ spent fuel and high-level radioactive waste and utilities would pay the cost of the disposition services for that material. NWP, along with the individual contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

¹⁵ “Nuclear Waste Policy Act of 1982 and Amendments,” DOE’s Office of Civilian Radioactive Management, 1982

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Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to accept any spent fuel or high-level waste, as required by the NWPAs and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to obtain compensation for DOE's partial breach of contract. To date no spent fuel has been accepted from commercial generating sites for disposal.

In 2010 the Obama Administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter includes a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."¹⁶

On January 26, 2012, the Blue Ribbon Commission issued its "Report to the Secretary of Energy" containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- "[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities"¹⁷
- "[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste."¹⁸

In January 2013, the DOE issued the "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," in response to the recommendations made by the Blue Ribbon Commission and as "a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel..."¹⁹ This document states:

"With the appropriate authorizations from Congress, the Obama Administration planned to implement a program over the next 10 years that would have:

¹⁶ Charter of the Blue Ribbon Commission on America's Nuclear Future, "Objectives and Scope of Activities," 2010

¹⁷ "Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy," p. 32, January 2012

¹⁸ *Ibid.*, p.27

¹⁹ "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," U.S. DOE, January 11, 2013

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- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.”^[20]

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Obama Administration slashed the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013) ^[21] ordering NRC to comply with federal law and restart its review of DOE’s Yucca Mountain repository license application to the extent of previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A supplement to DOE’s environmental impact statement and an adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

The state of Minnesota directed the Public Utilities Commission, “when considering approval of a plan for the accrual of funds for the decommissioning of nuclear facilities” ...to “include an evaluation of the costs, if any, arising from storage of used nuclear fuel that may be incurred by the state of Minnesota, and any tribal community, county, city, or township where used nuclear fuel is located following the cessation of operations at a nuclear plant.”^[22]

The state of Minnesota statute also prescribed the parameters to be used in evaluating spent fuel management costs. “To assist the commission in making the determination ... the filing shall provide cost estimates, including ratepayer impacts, assuming used

²⁰ *Ibid.*, p.2

²¹ United States Court of Appeals for the District Of Columbia Circuit, In Re: Aiken County, et al, August 2013

²² Minnesota Statute 216B.1614, “Nuclear Power Plant Decommissioning and Storage of Used Nuclear Fuel”

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nuclear fuel will be stored in the state for 60 years, 100 years, and 200 years following the cessation of operation of the nuclear plant.”^[23]

Xcel Energy’s current spent fuel management plan for the Prairie Island spent fuel is based in general upon:

- 1) Fuel transferred from the pool to the ISFSI within 5 years of shutdown;
- 2) Exchange of Prairie Island and Monticello spent fuel acceptance rights to best manage the overall cost of spent fuel storage for both plants;
- 3) Fuel will be shipped in the existing NUHOMS DSCs (Scenarios 1, 2, 6, and 7); the canisters and NUHOMS are periodically replaced in Scenarios 3, 4 and 5. Canisters that are unloaded in the spent fuel transfer operation will be surveyed for neutron activation.
- 4) As an allowance, some of these canisters and NUHOMS modules from the first off-load operation are assumed to be mildly neutron activated and therefore must be disposed of as radioactive waste.

The NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy, pursuant to 10 CFR Part 50.54(bb).^[24] This requirement is prepared for through inclusion of certain cost elements in the decommissioning estimates, for example, associated with the isolation and continued operation of the spent fuel pool and the ISFSI.

The spent fuel pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor cores at shutdown. The assemblies are packaged into dry shielded canisters (DSCs) over the first five years after shutdown for transfer to the ISFSI for interim storage. It is assumed that this period provides the necessary cooling for the final cores to meet the transport and/or storage requirements for decay heat.

An ISFSI, operated under a Part 72 Site Specific License (in accordance with 10 CFR 72^[25]), has been constructed to support continued plant operations. The facility is assumed to be expanded to support decommissioning. This will allow decommissioning activities to proceed within the auxiliary building.

²³ Ibid.

²⁴ U.S. Code of Federal Regulations, Title 10, Part 50, “Domestic Licensing of Production and Utilization Facilities,” Subpart 54 (bb), “Conditions of Licenses”

²⁵ U.S. Code of Federal Regulations, Title 10, Part 72.40

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DOE has breached its obligations to remove fuel from reactor sites, and has also failed to provide the plant owners with information about how it will ultimately perform. DOE officials have stated that DOE does not have an obligation to accept already-canistered fuel without an amendment to DOE's contracts with plant licensees to remove the fuel (the "Standard Contract"), but DOE has not explained what any such amendment would involve. Consequently, Xcel Energy has no information or expectations on how DOE will remove fuel from the site in the future. In the absence of information about how DOE will perform, and for purposes of this analysis only, it is assumed that DOE will accept already-canistered fuel. If this assumption is incorrect, it is assumed that DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers.

Xcel Energy's position is that the DOE has a contractual obligation to accept Prairie Island's fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, including the cost of storing spent fuel in this study is appropriate to ensure the availability of sufficient decommissioning funds at the end of the station's life if the DOE has not met its obligation. The cost for the interim storage of spent fuel has been calculated and is separately presented as "Spent Fuel Management" expenditures in this report.

Site Restoration

The efficient removal of the contaminated materials at the site may result in damage to many of the site structures. Blasting, coring, drilling, and the other decontamination activities can substantially damage power block structures, potentially weakening the footings and structural supports. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized is more efficient and less costly than if the process were deferred. Experience at shutdown generating stations has shown that plant facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public and the demolition work force.

This estimate assumes that some site features will remain following the decommissioning project. These include the existing electrical switchyard, which is assumed to remain functional in support of the regional electrical distribution system. The existing shoreline will also be left intact.

Consequently, non-essential site structures addressed by this analysis are completely removed (including foundations) as required by Minnesota statute ^[26].

²⁶ Minnesota Administrative Rule part 7035.0400 "General Requirements"

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The site is then graded and stabilized. The cost for the site restoration of non-essential and/or non-contaminated structures has been calculated and is separately presented as "Site Restoration" expenditures in this report.

Summary

The costs to decommission the Prairie Island station were evaluated for several decommissioning scenarios, based upon the DECON and SAFSTOR decommissioning alternatives. Regardless of the timing of the decommissioning activities, the estimates to decommission Prairie Island assume the removal of all contaminated and activated plant components and structural materials such that Xcel Energy may then have unrestricted use of the site with no further requirements for any operating license. In most of the scenarios, spent fuel remains on site following the decommissioning and site restoration of the power block structures. The spent fuel remains in storage at the site until such time that the transfer to a DOE facility can be completed. Once the transfer is complete, the storage facilities are also decommissioned.

The alternatives evaluated in this analysis are described in Section 2. The assumptions are presented in Section 3, along with schedules of annual expenditures. The major cost contributors are identified in Section 6, with detailed activity costs, waste volumes, and associated manpower requirements delineated in Appendices C through J. The major cost components are also identified in the cost summary provided at the end of this section.

The estimates presented in this document reflects the total cost to decontaminate the nuclear units, manage the spent fuel until the DOE is able to complete the transfer to a federal facility, dismantle the plant and restore the site for alternative use.

The cost elements in the estimates for the five DECON and two SAFSTOR alternatives are assigned to one of three subcategories: NRC License Termination (radiological remediation), Spent Fuel Management, and Site Restoration. The subcategory "NRC License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the unit's operating license, recognizing that there may be some additional cost impact from spent fuel management. The License Termination cost subcategory also includes costs to decommission the ISFSI (as required by 10 CFR §72.30). Section 3.4.1 provides the basis for the ISFSI decommissioning cost.

The "Spent Fuel Management" subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pool to a DOE

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transport cask or to the ISFSI for interim storage, as well as the transfer of the spent fuel in storage at the ISFSI to the DOE. Costs are included for the operation of the storage pool and the management of the ISFSI until such time that the transfer is complete. It does not include any spent fuel management expenses incurred prior to the cessation of plant operations, nor does it include any costs related to the final disposal of the spent fuel.

“Site Restoration” is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are completely removed (including foundations) and backfilled to conform to local surface elevation.

It should be noted that the costs assigned to these subcategories are allocations. Delegation of cost elements is for the purposes of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., Asset Retirement Obligation determinations). In reality, there can be considerable interaction between the activities in the three subcategories. For example, Xcel Energy may decide to remove non-contaminated structures early in the project to improve access to highly contaminated facilities or plant components. In these instances, the non-contaminated removal costs could be reassigned from Site Restoration to an NRC License Termination support activity. However, in general, the allocations represent a reasonable accounting of those costs that can be expected to be incurred for the specific subcomponents of the total estimated program cost, if executed as described.

As noted within this document, the estimates were developed and costs are presented in 2017 dollars. As such, the estimates do not reflect the escalation of costs (due to inflationary and market forces) over the remaining operating life of the plant or during the decommissioning period.

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**SCENARIO 1: DECON WITH 32 YEARS DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	11,899	18,712	30,611
Removal	103,458	132,270	235,727
Packaging	37,613	37,981	75,594
Transportation	8,386	8,908	17,294
Waste Disposal	65,232	68,234	133,465
Off-site Waste Processing	13,548	16,016	29,565
Program Management [1]	224,195	206,995	431,191
Site Security	116,834	106,450	223,284
Spent Fuel Pool Isolation	13,445	8,963	22,409
Spent Fuel Management	120,903	118,936	239,839
Insurance and Regulatory Fees	17,840	15,425	33,266
Energy	9,248	8,349	17,597
Characterization and Licensing Surveys	17,216	19,157	36,374
Property Taxes	54,492	51,594	106,086
Miscellaneous	7,188	7,147	14,335
Railroad Track Maintenance	2,598	2,517	5,116
Retention and Severance	28,423	28,423	56,845
Security Modifications	5,000	5,000	10,000
Prairie Island Indian Community Payments	40,000	38,750	78,750
Total [3]	897,520	899,828	1,797,347

Cost Element	Unit 1	Unit 2	Total
NRC License Termination	571,980	561,832	1,133,812
Spent Fuel Management	274,479	271,262	545,741
Site Restoration	51,061	66,733	117,795
Total [3]	897,520	899,828	1,797,347

[1] Includes engineering costs

[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

[3] Columns may not add due to rounding

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**SCENARIO 2: DECON WITH 60 YEAR DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	11,899	18,711	30,610
Removal	103,561	132,372	235,933
Packaging	37,613	37,981	75,594
Transportation	8,386	8,908	17,294
Waste Disposal	65,232	68,234	133,465
Off-site Waste Processing	13,548	16,016	29,565
Program Management [1]	233,817	216,617	450,434
Site Security	146,769	136,385	283,153
Spent Fuel Pool Isolation	13,445	8,963	22,409
Spent Fuel Management	144,710	142,743	287,453
Insurance and Regulatory Fees	21,494	19,079	40,573
Energy	9,246	8,347	17,593
Characterization and Licensing Surveys	17,216	19,157	36,374
Property Taxes	69,785	66,180	135,965
Miscellaneous	7,187	7,145	14,332
Railroad Track Maintenance	3,461	3,380	6,841
Retention and Severance	28,423	28,423	56,845
Security Modifications	5,000	5,000	10,000
Prairie Island Indian Community Payments	56,250	55,000	111,250
Total [3]	997,041	998,643	1,995,684

Cost Element	Unit 1	Unit 2	Total
NRC License Termination	572,618	561,764	1,134,382
Spent Fuel Management	373,251	370,034	743,284
Site Restoration	51,173	66,845	118,017
Total [3]	997,041	998,643	1,995,684

[1] Includes engineering costs

[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

[3] Columns may not add due to rounding

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**SCENARIO 3: DECON WITH 100 YEAR DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	11,918	18,730	30,648
Removal	104,039	132,850	236,889
Packaging	37,611	37,979	75,590
Transportation	8,270	8,792	17,061
Waste Disposal	64,469	67,471	131,940
Off-site Waste Processing	13,548	16,016	29,565
Program Management [1]	294,495	277,295	571,790
Site Security	236,616	226,232	462,847
Spent Fuel Pool Isolation	13,445	8,963	22,409
Spent Fuel Management	592,003	590,037	1,182,040
Insurance and Regulatory Fees	32,742	30,327	63,069
Energy	9,246	8,347	17,593
Characterization and Licensing Surveys	17,216	19,157	36,374
Property Taxes	112,875	109,977	222,852
Miscellaneous	7,187	7,145	14,332
Railroad Track Maintenance	6,115	6,034	12,150
Retention and Severance	28,423	28,423	56,845
Security Modifications	5,000	5,000	10,000
Prairie Island Indian Community Payments	106,250	105,000	211,250
Total [3]	1,701,468	1,703,777	3,405,245

Cost Element	Unit 1	Unit 2	Total
NRC License Termination	568,261	558,114	1,126,374
Spent Fuel Management	1,082,353	1,079,137	2,161,490
Site Restoration	50,855	66,527	117,381
Total [3]	1,701,468	1,703,777	3,405,245

[1] Includes engineering costs

[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

[3] Columns may not add due to rounding

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**SCENARIO 4: DECON WITH 200 YEAR DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	11,918	18,730	30,648
Removal	104,037	132,849	236,887
Packaging	37,611	37,979	75,590
Transportation	8,270	8,792	17,061
Waste Disposal	64,469	67,471	131,940
Off-site Waste Processing	13,548	16,016	29,565
Program Management [1]	430,976	413,776	844,751
Site Security	466,998	456,614	923,613
Spent Fuel Pool Isolation	13,445	8,963	22,409
Spent Fuel Management	1,229,254	1,227,287	2,456,541
Insurance and Regulatory Fees	60,862	58,448	119,310
Energy	9,246	8,347	17,593
Characterization and Licensing Surveys	17,216	19,157	36,374
Property Taxes	225,076	222,177	447,253
Miscellaneous	7,187	7,145	14,332
Railroad Track Maintenance	12,752	12,671	25,422
Retention and Severance	28,423	28,423	56,845
Security Modifications	5,000	5,000	10,000
Prairie Island Indian Community Payments	231,250	230,000	461,250
Total [3]	2,977,539	2,979,847	5,957,385

Cost Element	Unit 1	Unit 2	Total
NRC License Termination	568,259	558,112	1,126,371
Spent Fuel Management	2,358,425	2,355,208	4,713,633
Site Restoration	50,855	66,527	117,381
Total [3]	2,977,539	2,979,847	5,957,385

[1] Includes engineering costs

[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

[3] Columns may not add due to rounding

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**SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	11,918	18,730	30,648
Removal	103,830	132,642	236,472
Packaging	37,614	37,982	75,596
Transportation	8,389	8,911	17,300
Waste Disposal	65,396	68,398	133,795
Off-site Waste Processing	13,548	16,016	29,565
Program Management [1]	233,817	216,617	450,434
Site Security	146,769	136,385	283,153
Spent Fuel Pool Isolation	13,445	8,963	22,409
Spent Fuel Management	230,141	228,174	458,315
Insurance and Regulatory Fees	21,494	19,079	40,573
Energy	9,246	8,347	17,593
Characterization and Licensing Surveys	17,216	19,157	36,374
Property Taxes	69,078	66,180	135,258
Miscellaneous	7,187	7,145	14,332
Railroad Track Maintenance	3,461	3,380	6,841
Retention and Severance	28,423	28,423	56,845
Security Modifications	5,000	5,000	10,000
Prairie Island Indian Community Payments	56,250	55,000	111,250
Total [3]	1,082,223	1,084,531	2,166,754

Cost Element	Unit 1	Unit 2	Total
NRC License Termination	572,323	562,164	1,134,487
Spent Fuel Management	458,457	455,241	913,698
Site Restoration	51,443	67,126	118,569
Total [3]	1,082,223	1,084,531	2,166,754

[1] Includes engineering costs

[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

[3] Columns may not add due to rounding

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**SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	7,828	16,467	24,295
Removal	108,449	137,038	245,487
Packaging	34,003	34,343	68,345
Transportation	6,683	7,171	13,854
Waste Disposal	53,612	55,346	108,959
Off-site Waste Processing	13,846	16,314	30,160
Program Management [1]	312,153	278,025	590,178
Site Security	194,238	129,474	323,713
Spent Fuel Pool Isolation	13,445	8,963	22,409
Spent Fuel Management	117,316	114,954	232,270
Insurance and Regulatory Fees	53,753	50,594	104,346
Energy	20,162	19,753	39,915
Characterization and Licensing Surveys	18,118	20,359	38,478
Property Taxes	156,602	156,387	312,989
Miscellaneous	17,651	21,979	39,630
Railroad Track Maintenance	4,362	4,281	8,644
Retention and Severance	28,423	28,423	56,845
Security Modifications	5,000	5,000	10,000
Prairie Island Indian Community Payments	40,000	38,750	78,750
Total [3]	1,205,645	1,143,621	2,349,266

Cost Element	Unit 1	Unit 2	Total
NRC License Termination	908,226	841,160	1,749,386
Spent Fuel Management	242,850	233,483	476,333
Site Restoration	54,569	68,978	123,547
Total [3]	1,205,645	1,143,621	2,349,266

[1] Includes engineering costs

[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

[3] Columns may not add due to rounding

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**SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
DECOMMISSIONING COST ELEMENTS**
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	7,825	16,452	24,276
Removal	108,474	136,691	245,165
Packaging	34,003	34,343	68,346
Transportation	6,683	7,171	13,854
Waste Disposal	53,613	55,347	108,960
Off-site Waste Processing	13,846	16,314	30,160
Program Management [1]	313,922	284,127	598,049
Site Security	200,143	166,411	366,553
Spent Fuel Pool Isolation	13,445	8,963	22,409
Spent Fuel Management	138,784	136,422	275,207
Insurance and Regulatory Fees	54,180	50,827	105,007
Energy	20,134	19,489	39,623
Characterization and Licensing Surveys	18,118	20,359	38,478
Property Taxes	161,296	156,387	317,682
Miscellaneous	17,668	21,945	39,613
Railroad Track Maintenance	4,362	4,281	8,644
Retention and Severance	28,423	28,423	56,845
Security Modifications	5,000	5,000	10,000
Prairie Island Indian Community Payments	56,250	55,000	111,250
Total [3]	1,256,169	1,223,951	2,480,120

Cost Element	Unit 1	Unit 2	Total
NRC License Termination	883,602	846,342	1,729,944
Spent Fuel Management	317,887	308,520	626,407
Site Restoration	54,680	69,089	123,769
Total [3]	1,256,169	1,223,951	2,480,120

[1] Includes engineering costs

[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

[3] Columns may not add due to rounding

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1. INTRODUCTION

This report presents estimates of the cost to decommission the Prairie Island Nuclear Generating Plant (Prairie Island) and the operation and eventual decommissioning of the on-site Independent Spent Fuel Storage Installation (ISFSI) for the selected decommissioning scenarios following the scheduled cessation of plant operations. The estimates are designed to provide Xcel Energy with the information to assess its current decommissioning liability, as it relates to Prairie Island.

The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2014,^{[1]*} updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

The analysis is not a detailed engineering evaluation, but an estimate prepared in advance of the detailed engineering required to carry out the decommissioning of the nuclear units. It may also not reflect the actual plan to decommission Prairie Island; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The 2014 plant inventory was reviewed for this analysis. It serves as the basis for the decontamination and dismantling requirements, cost, and the decommissioning waste streams. The review confirmed that there were no substantive changes to the configuration of the plant or site facilities that would impact decommissioning over the last three years. Removal of new FLEX facilities was included.

1.1 OBJECTIVES OF STUDY

The objectives of this study are to prepare comprehensive estimates of the cost to decommission Prairie Island, to provide a sequence or schedule for the associated activities, and to develop waste stream projections from the decontamination and dismantling activities.

The operating licenses were originally issued for the plant in August 1973 and October 1974 for Units 1 and 2, respectively, and were valid for a period of 40

* Annotated references for citations in Sections 1-6 are provided in Section 7

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years. In April 2008, Nuclear Management Company (as agent for Xcel Energy), submitted an application for renewed licenses (i.e., 20 year extensions). The application was approved by the NRC in June 2011. Therefore, for the purposes of this study, final shutdown dates (license expiration) for Unit 1 and Unit 2 are August 9, 2033 and October 29, 2034, respectively, assuming a 60-year operating life (the current operating licenses' expiration dates).

1.2 SITE DESCRIPTION

Prairie Island is located on the west bank of the Mississippi River, approximately 26 miles southeast of the Twin City Metropolitan Area and within the city limits of Red Wing. The site is in Goodhue County, Minnesota.

The Nuclear Steam Supply System (NSSS) consists of a pressurized water reactor and a two-loop reactor coolant system. The system is comprised of the reactor vessel and two closed reactor coolant loops connected in parallel to the reactor vessel, each containing a reactor coolant pump and a steam generator. An electrically heated pressurizer is connected to one of the loops.

The system is housed within the reactor containment vessel, a free-standing cylindrical steel shell with a hemispherical dome and ellipsoidal bottom designed to withstand the internal pressure accompanying a loss-of-coolant accident. The reactor containment vessel is surrounded by a cylindrical shield building constructed of reinforced concrete, which serves as a radiation shielding for normal operations and for the loss-of-coolant condition.

Heat produced in the reactor is converted to electrical energy by the plant's power conversion system. A turbine-generator converts the thermal energy of steam produced in the steam generators into mechanical shaft power and then into electrical energy. The turbine-generator consists of one high-pressure, double-flow and two low-pressure, double-flow elements driving a direct-coupled generator at 1800 rpm. The turbines are operated in a closed feedwater cycle in which the steam is condensed and returned to the steam generators by the feedwater system.

Heat rejected in the main condensers is removed by the circulating water system, which provides the heat sink for the removal of the waste heat in the power plant's thermal cycle. The majority of the heat is removed through dilution with river water in the discharge canal. Forced draft cooling towers provided supplemental heat removal.

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1.3 REGULATORY GUIDANCE

The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988.^[2] This rule set forth financial criteria for decommissioning licensed nuclear power facilities. The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely manner and that adequate funds would be available for this purpose. Subsequent to the rule, the NRC issued Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors,^[3]" which provided additional guidance to the licensees of nuclear facilities on the financial methods acceptable to the NRC staff for complying with the requirements of the rule. The regulatory guide addressed the funding requirements and provided guidance on the content and form of the financial assurance mechanisms indicated in the rule.

The rule defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB. The DECON alternative assumes that any contaminated or activated portion of the plant's systems, structures, and facilities are removed or decontaminated to levels that permit the site to be released for unrestricted use shortly after the cessation of plant operations while the SAFSTOR and ENTOMB alternatives defer the process.

The rule also placed limits on the time allowed to complete the decommissioning process. For the SAFSTOR alternative, the process is restricted in overall duration to 60 years, unless it can be shown that a longer duration is necessary to protect public health and safety. The guidelines for ENTOMB are similar, providing the NRC with both sufficient leverage and flexibility to ensure that these deferred options are only used in situations where it is reasonable and consistent with the definition of decommissioning. At the conclusion of a 50 to 60-year dormancy period (or longer for ENTOMB if the NRC approves such a case), the site would still require significant remediation to meet the unrestricted release limits for license termination.

The ENTOMB alternative has not been viewed as a viable option for power reactors due to the significant time required to isolate the long-lived radionuclides for decay to permissible levels. However, with rulemaking permitting the controlled release of a site,^[4] the NRC did re-evaluate the alternative. The resulting feasibility study, based upon an assessment by Pacific Northwest National Laboratory, concluded that the method did have conditional merit for some, if not most reactors. The staff also found that

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additional rulemaking would be needed before this option could be treated as a generic alternative.

The NRC had considered rulemaking to alter the 60-year time for completing decommissioning and to clarify the use of engineered barriers for reactor entombments.^[5] However, the NRC's staff has recommended that rulemaking be deferred, based upon several factors, e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities, at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation. In a draft regulatory basis document published in March 2017 in support of rulemaking that would amend NRC regulations concerning nuclear plant decommissioning, the NRC staff proposes removing any discussion of the ENTOMB option from existing guidance documents since the method is not deemed practically feasible.

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants.^[6] When the regulations were originally adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the facility's operating licensed life. Since that time, several licensees permanently and prematurely ceased operations. Exemptions from certain operating requirements were required once the reactor was defueled to facilitate the decommissioning. Each case was handled individually, without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The new amendments allow for greater public participation and better define the transition process from operations to decommissioning.

Under the revised regulations, licensees will submit written certification to the NRC within 30 days after permanent shutdown. Certification will also be required once the fuel is permanently removed from the reactor vessels. Submittal of these notices will entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Within two years of submitting notice of permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. The PSDAR describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing decommissioning, the licensee is required to submit applications to the NRC to terminate the license, which will include a License Termination Plan (LTP).

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In 2011, the NRC published amended regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.^[7] The amended regulations require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, which includes the site's subsurface soil and groundwater. Licensees also may be required to perform site surveys to determine whether residual radioactivity is present in subsurface areas and to keep records of these surveys with records important for decommissioning. The amended regulations require licensees to report additional details in their decommissioning cost estimate as well as requiring additional financial reporting and assurances. These additional details, including an ISFSI decommissioning estimate, are included in this analysis.

1.3.1 High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act"^[8] (NWP) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The NWP provided that DOE would enter into contracts with utilities in which DOE would promise to take the utilities' spent fuel and high-level radioactive waste and utilities would pay the cost of the disposition services for that material. NWP, along with the individual contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to accept any spent fuel or high level waste, as required by the NWP and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to obtain compensation for DOE's partial breach of contract. To date no spent fuel has been accepted from commercial generating sites for disposal.

In 2010, the Obama Administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter includes a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."^[9]

On January 26, 2012, the Blue Ribbon Commission issued its "Report to the Secretary of Energy" containing a number of recommendations on

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nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- “[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities”^[10]
- “[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste.”

In January 2013, the DOE issued the “Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste,” in response to the recommendations made by the Blue Ribbon Commission and as “a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel...”^[11] This document states:

“With the appropriate authorizations from Congress, the Obama Administration planned to implement a program over the next 10 years that would have:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.”

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Obama Administration slashed the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013) ^[12] ordering NRC to comply with federal law and restart its review of DOE’s Yucca Mountain repository license application to the extent of previously appropriated funding for the review. That review is now complete with the publication of the five-

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volume safety evaluation report. A supplement to DOE's environmental impact statement and an adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

The state of Minnesota directed the Public Utilities Commission, "when considering approval of a plan for the accrual of funds for the decommissioning of nuclear facilities" ...to "include an evaluation of the costs, if any, arising from storage of used nuclear fuel that may be incurred by the state of Minnesota, and any tribal community, county, city, or township where used nuclear fuel is located following the cessation of operations at a nuclear plant."^[13]

The state of Minnesota statute also prescribed the parameters to be used in evaluating spent fuel management costs. "To assist the commission in making the determination ... the filing shall provide cost estimates, including ratepayer impacts, assuming used nuclear fuel will be stored in the state for 60 years, 100 years, and 200 years following the cessation of operation of the nuclear plant."

Xcel Energy's current spent fuel management plan for the Prairie Island spent fuel is based in general upon:

- 1) Fuel transferred from the pool to the ISFSI within 5 years of shutdown;
- 2) Exchange of Prairie Island and Monticello spent fuel acceptance rights to best manage the overall cost of spent fuel storage for both plants;
- 3) Fuel assemblies currently stored in the ISFSI use TN-40 casks. It's assumed that, starting with final shutdown, and for future recasking, that a NUHOMS system (with a capacity of 37 fuel assemblies, and similar in dimensions to the existing Monticello NUHOMS design) will be used instead of the TN-40 casks. Fuel will be shipped in the existing TN-40s or NUHOMS DSCs (Scenarios 1, 2, 6, and 7); the TN-40s are replaced with NUHOMS in Scenarios 3, 4 and 5. Canisters that are unloaded in the spent fuel transfer operation will be surveyed for neutron activation.
- 4) This estimate does not include any costs for replacing cask head bolts, gaskets, or installation of spacers within the existing TN-40 cask prior to shipment to DOE.

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- 5) As an allowance, some of these canisters and NUHOMS modules from the first off-load operation are assumed to be mildly neutron activated and therefore must be disposed of as radioactive waste.

The NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy, pursuant to 10 CFR Part 50.54(bb).^[14] This requirement is prepared for through inclusion of certain cost elements in the decommissioning estimates, for example, associated with the isolation and continued operation of the spent fuel pool and the ISFSI.

The spent fuel pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor cores at shutdown. In the DECON and SAFSTOR scenarios, the assemblies are packaged into dry shielded canisters (DSCs) over the first five years after shutdown for transfer to the ISFSI for interim storage. It is assumed that this period provides the necessary cooling for the final cores to meet the transport and/or storage requirements for decay heat.

An ISFSI, operated under a Part 72 Site Specific License (in accordance with 10 CFR 72^[15]), has been constructed to support continued plant operations. The facility is assumed to be expanded to support decommissioning. This will allow decommissioning activities to proceed within the auxiliary building.

DOE has breached its obligations to remove fuel from reactor sites, and has also failed to provide the plant owners with information about how it will ultimately perform. DOE officials have stated that DOE does not have an obligation to accept already-canistered fuel without an amendment to DOE's contracts with plant licensees to remove the fuel (the "Standard Contract"), but DOE has not explained what any such amendment would involve. Consequently, Xcel Energy has no information or expectations on how DOE will remove fuel from the site in the future. In the absence of information about how DOE will perform, and for purposes of this analysis only, it is assumed that DOE will accept already-canistered fuel. If this assumption is incorrect, it is assumed that DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers.

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Xcel Energy's position is that the DOE has a contractual obligation to accept Prairie Island's fuel earlier than the projections set out above, consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, including the cost of storing spent fuel in this study is appropriate to ensure the availability of sufficient decommissioning funds at the end of the station's life if the DOE has not met its obligation. The cost for the interim storage of spent fuel has been calculated and is separately presented as "Spent Fuel Management" expenditures in this report.

1.3.2 Low-Level Radioactive Waste Disposal

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Policy Act" in 1980,^[16] and its Amendments of 1985,^[17] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders. It was expected that groups of states would combine together to jointly deal with their radioactive wastes; these organizations are referred to as waste disposal compacts.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to Xcel Energy. The majority of the low-level radioactive waste designated for direct disposal (Class A^[18]) can be sent to EnergySolutions' facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon representative rates. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The Texas facility is licensed to receive the higher activity waste forms (Classes B and C). As such, for this analysis, disposal costs for the Class B and C waste were based upon the preliminary and indicative information on the cost for such from WCS.

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The dismantling of the components residing closest to the reactor core generates radioactive waste considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste (i.e., in a geologic repository) and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in the same canisters used for spent fuel and either stored on site or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the metallic waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be surveyed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to isolate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates reflect the savings from waste recovery/volume reduction.

1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, “Radiological Criteria for License Termination,”^[19] amending 10 CFR §20. This subpart provides radiological criteria for releasing a facility for unrestricted use. The regulation states that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year, and provided that residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA).

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The decommissioning estimates for Prairie Island assume that the site will be remediated to a residual level consistent with the NRC-prescribed level for radioactive material.

It should be noted that the NRC and the Environmental Protection Agency (EPA) differ on the amount of residual radioactivity considered acceptable in site remediation. The EPA has two limits that apply to radioactive materials. An EPA limit of 15 millirem per year is derived from criteria established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund).^[20] An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.66, is applied to drinking water.^[21]

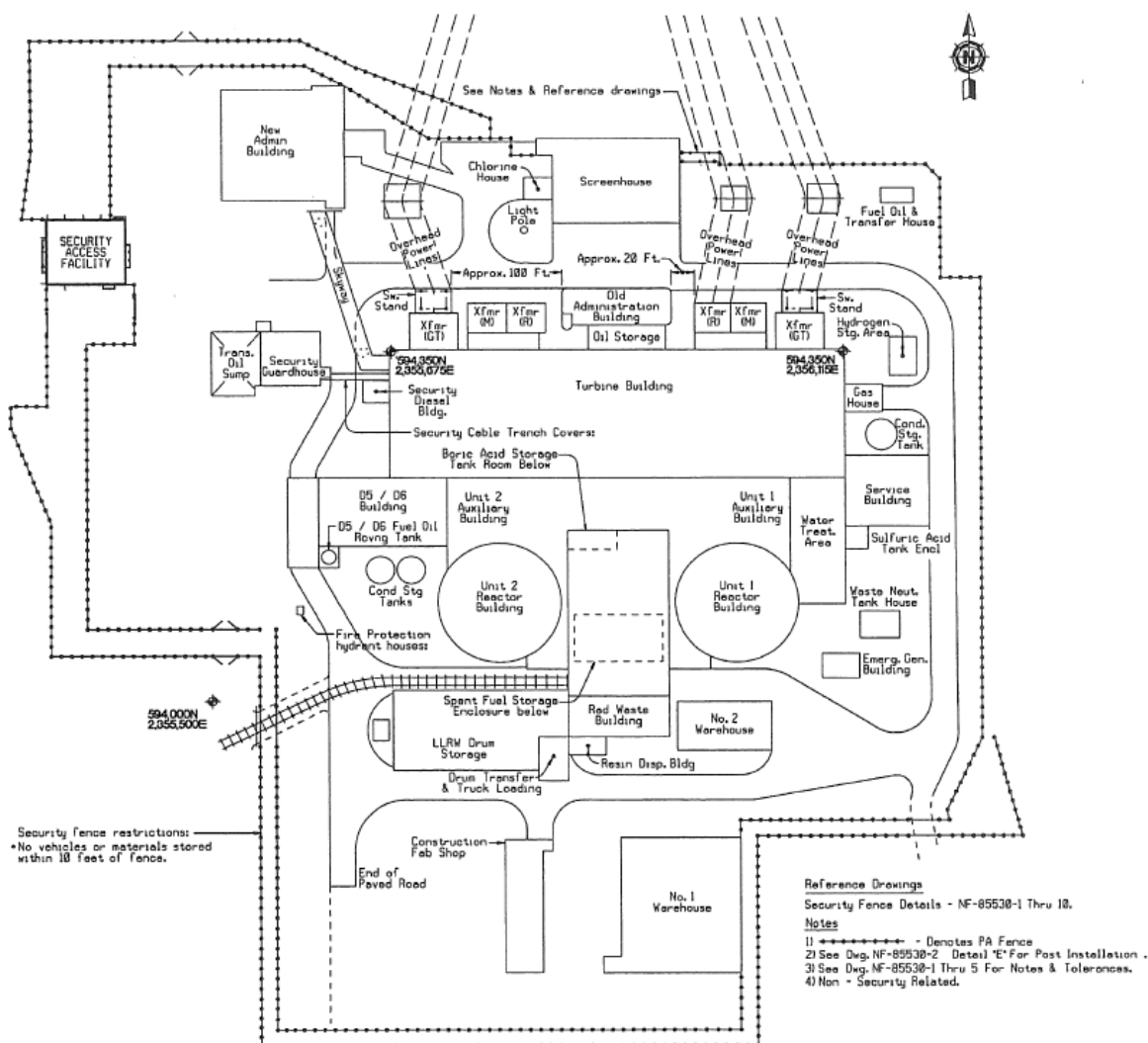
On October 9, 2002, the NRC signed an agreement with the EPA on the radiological decommissioning and decontamination of NRC-licensed sites. The Memorandum of Understanding (MOU)^[22] provides that EPA will defer exercise of authority under CERCLA for the majority of facilities decommissioned under NRC authority. The MOU also includes provisions for NRC and EPA consultation for certain sites when, at the time of license termination, (1) groundwater contamination exceeds EPA-permitted levels; (2) NRC contemplates restricted release of the site; and/or (3) residual radioactive soil concentrations exceed levels defined in the MOU.

The MOU does not impose any new requirements on NRC licensees and should reduce the involvement of the EPA with NRC licensees who are decommissioning. Most sites are expected to meet the NRC criteria for unrestricted use, and the NRC believes that only a few sites will have groundwater or soil contamination in excess of the levels specified in the MOU that trigger consultation with the EPA. However, if there are other hazardous materials on the site, the EPA may be involved in the cleanup. As such, the possibility of dual regulation remains for certain licensees. The present study does not include any costs for this occurrence.

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**FIGURE 1.1
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
GENERAL PLAN**



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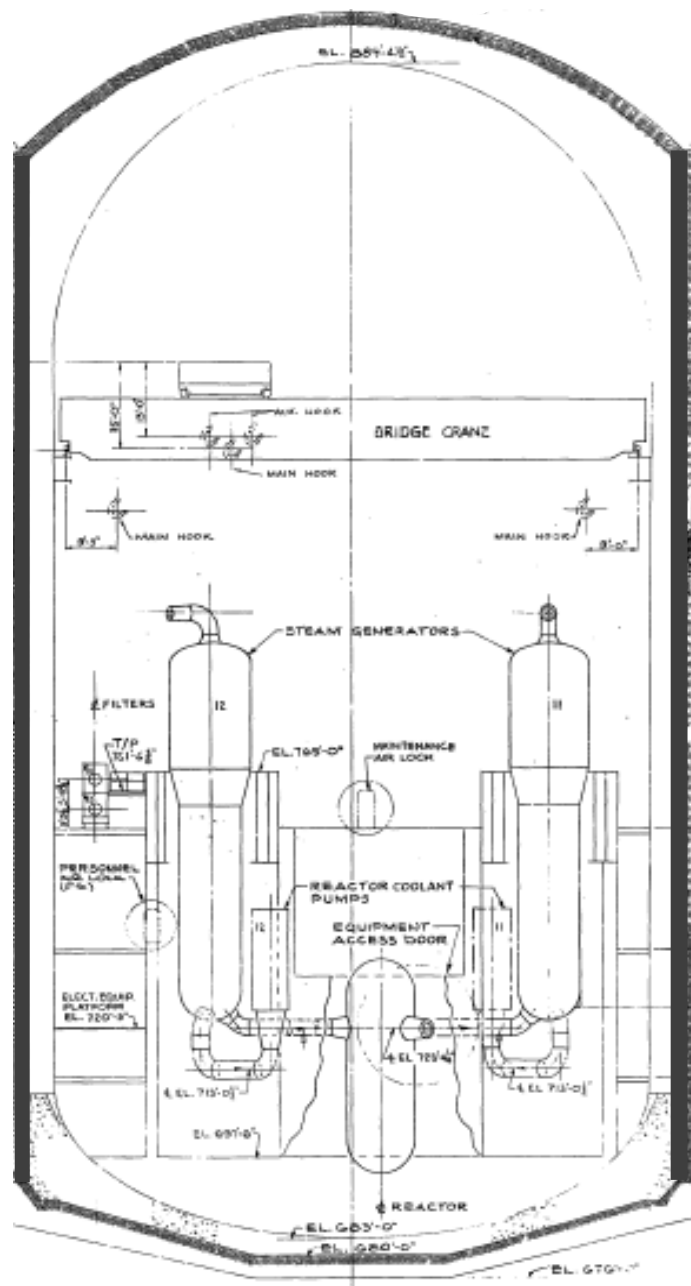
**FIGURE 1.2
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
AERIAL VIEW**



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**FIGURE 1.3
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
REACTOR BUILDING SECTION**



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2. DECOMMISSIONING ALTERNATIVES

Detailed cost estimates were developed to decommission Prairie Island based upon the approved decommissioning alternatives: DECON and SAFSTOR. Although the alternatives differ with respect to technique, process, cost, and schedule, they attain the same result: the ultimate release of the site for unrestricted use.

The following scenarios were evaluated and are intended to bound the liability associated with the removal of spent fuel from the site. The current operating licenses expire in 2033 and 2034. The scenarios consist of five DECON scenarios, with differing spent fuel management assumptions, but essentially no changes to the decommissioning costs and timing of the power block. There are also two SAFSTOR scenarios (Scenarios 6 and 7) each corresponding to the first two DECON scenario spent fuel management assumptions. The spent fuel in the plant's spent fuel storage pool is transferred to the ISFSI within the first five years. The equipment, structures, and portions of the plant containing radioactive contaminants are removed or decontaminated to a level that permits the facility to be released for unrestricted use. Non-essential structures are then demolished. Spent fuel storage operations continue at the ISFSI until the transfer of the fuel to the DOE is completed (2064 in Scenarios 1 & 6, 2077 in Scenarios 2, 5 & 7, 2117 in Scenario 3, and 2217 in Scenario 4).

Scenario	1 st Spent Fuel Canister Replacement	1 st Spent Fuel Assembly Removed from Prairie Island	Last Spent Fuel Assembly Removed from Prairie Island	Scenario Identification
1	n/a	2027	2064	DECON with 32 Year DFS ⁺
2	n/a	2053	2077	DECON with 60 Year DFS
3	2045	2093	2117	DECON with 100 Year DFS
4	2045	2193	2217	DECON with 200 Year DFS
5	2045	2053	2077	DECON with 60 Year DFS and recasking
6	n/a	2027	2064	SAFSTOR with 32 Year DFS
7	n/a	2053	2077	SAFSTOR with 60 Year DFS

⁺ Dry Fuel Storage

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For Scenarios 1 and 6, although they only provide a total fuel storage period of 32 years following plant shutdown, some of the Prairie Island casks have been in storage since 1995. Xcel Energy directed TLG Services to not include the cost of transferring the spent fuel in dry storage to new canisters for those casks that exceed 50 years. The assumption to not transfer spent fuel at 50 years total storage duration for these two scenarios was premised on the likelihood that the life of the canisters could be successfully managed for the additional years.

For Scenarios 2 and 7, although they provide a total fuel storage period of 60 years following plant shutdown, Xcel Energy directed TLG Services to not include the cost of transferring the spent fuel in dry storage to new canisters at 50 years after plant shutdown.

In Scenarios 3, 4 and 5, the DSCs are assumed to be replaced after fifty years of use. Since the auxiliary building spent fuel storage pool and fuel handling facilities are removed by the year 2040, a dry fuel transfer facility is assumed to be constructed on site to perform the transfers from the old to the new DSCs. For Scenarios 3 and 5, only one such transfer is needed over the time frame assumed (some fuel canisters in Scenario 5 will not require recasking). For Scenario 4, the spent fuel will be transferred three times following initial placement in the ISFSI.

The following sections describe the basic activities associated with each alternative. Although detailed procedures for each activity identified are not provided, and the actual sequence of work may vary, the activity descriptions provide a basis not only for estimating but also for the expected scope of work (i.e., engineering and planning at the time of decommissioning).

The conceptual approach that the NRC has described in its regulations divides decommissioning into three phases. The initial phase commences with the effective date of permanent cessation of operations and involves the transition of both plant and licensee from reactor operations (i.e., power production) to facilitate deactivation and closure. During the first phase, notification is to be provided to the NRC certifying the permanent cessation of operations and the removal of fuel from the reactor vessels. The licensee would then be prohibited from reactor operation.

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. The decommissioning estimates developed for Prairie Island are also divided into phases or periods; however, demarcation of the phases is based upon major milestones within the project or significant changes in the projected expenditures.

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2.1 DECON

The DECON alternative, as defined by the NRC, is "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." This study does not address the cost to dispose of the spent fuel residing at the site; such costs are funded through a surcharge on electrical generation. However, the study does estimate the costs incurred with the interim on-site storage of the fuel pending shipment by the DOE to an off-site disposal facility. Those costs are separately presented as "Spent Fuel Management" expenditures in this report.

2.1.1 Period 1 - Preparations

In anticipation of the cessation of plant operations, detailed preparations are undertaken to provide a smooth transition from plant operations to site decommissioning. Through implementation of a staffing transition plan, the organization required to manage the intended decommissioning activities is assembled from available plant staff and outside resources. Preparations include the planning for permanent defueling of the reactor, revision of technical specifications applicable to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

Engineering and Planning

The PSDAR, required prior to, or within two years of permanent cessation of operations, provides a description of the licensee's planned decommissioning activities, a timetable, a site-specific decommissioning cost estimate, and the associated financial requirements of the intended decommissioning program. Upon receipt of the PSDAR, the NRC will make the document available to the public for comment in a local meeting to be held in the vicinity of the reactor site. Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a modified 10 CFR §50.59 procedure, (10 CFR §50.59 establishes the conditions under which licensees may make changes to the facility or procedures and conduct test or experiments, i.e., without prior NRC approval). Major activities are defined as any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components (for shipment)

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containing GTCC, as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor coolant system piping, and other large components that are radioactive. The NRC includes the following additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

- foreclose release of the site for possible unrestricted use,
- significantly increase decommissioning costs,
- cause any significant environmental impact not previously reviewed, or
- result in there no longer being reasonable assurance that adequate funds will be available for decommissioning

Existing operational technical specifications are reviewed and modified to reflect plant conditions and the safety concerns associated with permanent cessation of operations. The environmental impact associated with the planned decommissioning activities is also considered. Typically, a licensee will not be allowed to proceed if the consequences of a particular decommissioning activity are greater than that bounded by previously evaluated environmental assessments or impact statements. In this instance, the licensee would have to submit a license amendment for the specific activity and update the environmental report.

The decommissioning program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines (as defined in 10 CFR §20) for protection of personnel from exposure to radiation hazards. It will also address the continued protection of the health and safety of the public and the environment during the dismantling activity. Consequently, with the development of the PSDAR, activity specifications, cost-benefit and safety analyses, and work packages and procedures, would be assembled to support the proposed decontamination and dismantling activities.

Site Preparations

Following final plant shutdown, and in preparation for actual decommissioning activities, the following activities are initiated:

- Characterization of the site and surrounding environs. This includes radiation surveys of work areas, major components (including the

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reactor vessel and its internals), internal piping, and primary shield cores.

- An ISFSI has been constructed to support continued plant operation and will need to be expanded following the cessation of operations to offload the spent fuel pool in support of the decommissioning program.
- Isolation of the spent fuel storage pool and fuel handling systems, such that decommissioning operations can commence on the balance of the plant. Decommissioning operations are scheduled around the fuel handling area to optimize the overall project schedule. It is assumed that the fuel pool remains operational for the transfer of fuel for approximately five years following the cessation of operations.
- Specification of transport and disposal requirements for activated materials and/or hazardous materials, including shielding and waste stabilization.
- Development of procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste (including dry-active waste, resins, filter media, metallic and non-metallic components generated in decommissioning), site security and emergency programs, and industrial safety.
- Perform chemical decontamination of the NSSS to reduce radiation levels in support of removal operations

2.1.2 Period 2 - Decommissioning Operations

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful amendment of the 10 CFR §50 operating licenses (releasing the site, exclusive of the ISFSI). Significant decommissioning activities in this phase include:

- Construction of temporary facilities and/or modification of existing facilities to support dismantling activities. This may include a centralized processing area to facilitate equipment removal and component preparations for off-site disposal.
- Reconfiguration and modification of site structures and facilities as needed to support decommissioning operations. This may include the upgrading of roads (on- and off-site) to facilitate hauling and transport. Modifications may be required to the containment

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structure to facilitate access of large/heavy equipment. Modifications may also be required to the refueling area of the building to support the segmentation of the reactor vessel internals and component extraction.

- Transfer of the spent fuel from the storage pool to the ISFSI pad for interim storage.
- Design and fabrication of temporary and permanent shielding to support removal and transportation activities, construction of contamination control envelopes, and the procurement of specialty tooling.
- Procurement (lease or purchase) of shipping canisters, cask liners, and industrial packages.
- Decontamination of components and piping systems as required to control (minimize) worker exposure.
- Removal of piping and components no longer essential to support decommissioning operations.
- Removal of control rod drive housings and the head service structure from reactor vessel head. Segment the vessel closure head.
- Removal and segmentation of the upper internals assemblies. Segmentation will maximize the loading of the shielded transport casks, (i.e., by weight and activity). The operations are conducted under water using remotely operated tooling and contamination controls.
- Disassembly and segmentation of the remaining reactor internals, including the core former and lower core support assembly. Some material is expected to exceed Class C disposal requirements. As such, the segments will be packaged in modified spent fuel storage canisters for geologic disposal.
- Segmentation of the reactor vessel. A shielded platform is installed for segmentation as cutting operations are performed in air using remotely operated equipment within a contamination control envelope. The water level is maintained just below the cut to minimize the working area dose rates. Segments are transferred in-air to containers that are stored under water, for example, in an isolated area of the refueling canal.
- Removal of the activated portions of the concrete biological shield and accessible contaminated concrete surfaces. If dictated by the steam generator and pressurizer removal scenarios, those portions of the

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associated cubicles necessary for access and component extraction are removed.

- Removal of the steam generators and pressurizer for material recovery and controlled disposal. The generators will be moved to an on-site processing center, the steam domes are removed and the internal components segregated for off-site processing. The lower shell and tube bundle will be packaged for direct disposal. These components can serve as their own burial containers provided that all penetrations are properly sealed and the internal contaminants are stabilized. Steel shielding is added, as necessary, to those external areas of the steam generators to meet transportation limits and regulations.
- Expansion of the ISFSI and transfer of the spent fuel from the storage pool to the ISFSI pad for interim storage. Spent fuel storage operations continue throughout the active decommissioning period. Fuel transfer to DOE is expected to be completed by the end of the year 2064 (Scenario 1).

At least two years prior to the anticipated date of license termination, an LTP is required. Submitted as a supplement to the Final Safety Analysis Report (FSAR) or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local meeting. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission. The licensee may then commence with the final remediation of site facilities and services, including:

- Removal of remaining plant systems and associated components as they become nonessential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).
- Removal of the steel liners from the refueling canal, disposing of the activated and contaminated sections as radioactive waste. Removal of any activated/contaminated concrete.
- Surveys of the decontaminated areas of the containment structure.
- Removal of the contaminated equipment and material from the auxiliary building and any other contaminated facility. Use radiation

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and contamination control techniques until radiation surveys indicate that the structures can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and components (both clean and contaminated) located within these buildings. This activity will facilitate surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.

- Removal of the remaining components, equipment, and plant services in support of the area release survey(s).
- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination is released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material is characterized and segregated for additional off-site processing (disassembly, chemical cleaning, volume reduction, and waste treatment), and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.

Incorporated into the LTP is the Final Survey Plan. This plan identifies the radiological surveys to be performed once the decontamination activities are completed and is developed using the guidance provided in the "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)."^[23] This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on the requested change to the operating licenses (that would release the property, exclusive of the ISFSI, for unrestricted use).

The NRC will amend the operating licenses to reduce the licensed area to the ISFSI area if it determines that site remediation has been performed in accordance with the LTP, and that the terminal radiation survey and associated documentation demonstrate that the property (exclusive of the ISFSI) is suitable for release.

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2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities will begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits will result in substantial damage to many of the structures. Although performed in a controlled and safe manner, blasting, coring, drilling, scarification (surface removal), and the other decontamination activities will substantially degrade power block structures including the reactor and auxiliary buildings. Under certain circumstances, verifying that subsurface radionuclide concentrations meet NRC site release requirements will require removal of grade slabs and lower floors, potentially weakening footings and structural supports. This removal activity will be necessary for those facilities and plant areas where historical records, when available, indicate the potential for radionuclides having been present in the soil, where system failures have been recorded, or where it is required to confirm that subsurface process and drain lines were not breached over the operating life of the station.

Dismantling of site structures following decommissioning is clearly the most appropriate and cost-effective option. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The effort to dismantle site structures with a work force already mobilized on site is more efficient than if the process were deferred. Site facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public as well as to future workers. Abandonment creates a breeding ground for vermin infestation as well as other biological hazards.

This cost study presumes that non-essential structures and site facilities are dismantled as a continuation of the decommissioning activity. Foundations and exterior walls are completely removed, including foundations and basemats as required by Minnesota regulations.^[24] Site areas affected by the dismantling activities are restored and the plant area graded as required to prevent ponding, establish erosion control by the planting of native vegetation, and inhibit the refloating of subsurface materials.

Non-contaminated concrete rubble produced by demolition activities is processed to remove reinforcing steel and miscellaneous embedments. All non-contaminated materials are trucked to an off-site area for

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disposal as construction debris. Subgrade voids are backfilled with clean construction fill, suitable under Minnesota regulations.

2.1.4 ISFSI Operations and Decommissioning

The ISFSI will continue to operate under a site-specific license as authorized by 10 CFR Part 72 following the amendment of the operating license to release the adjacent (power block) property. Assuming that Prairie Island spent fuel shipments begin in 2027, the process is not expected to be completed until 2064 (Scenario 1). Any delay in the transfer process, for example, due to a delay in the scheduled opening of the geologic repository, a slower acceptance rate, or a combination of both, can result in a longer on-site residence time for the fuel discharge from the reactor, as well as additional caretaking expenses. Scenarios 3 and 4 address extended delay periods. Scenarios 3, 4 and 5 also reflect an assumption that the spent fuel DSCs will need to be replaced every fifty years.

The assumed design for the ISFSI is based upon the use of the existing TN-40 casks from Transnuclear, plus the use of a multi-purpose dry shielded storage canister and a horizontal storage module for pad storage for those fuel assemblies packaged after plant shutdown.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The Commission will terminate the license if it determines that the remediation of the ISFSI has been performed in accordance with an ISFSI license termination plan and that the final radiation survey and associated documentation demonstrate that the facility is suitable for release. Once the requirements are satisfied, the NRC can terminate the license for the ISFSI.

For purposes of this cost analysis, it is assumed that once the TN-40s and DSCs containing the spent fuel assemblies have been removed, any required decontamination is performed on the storage overpacks (some minor neutron-induced activation is assumed), and the license for the facility terminated, the concrete overpacks can be dismantled using conventional techniques for the demolition of reinforced concrete. The concrete storage pad is then removed and the area regraded. This topic is discussed in greater detail in section 3.4.1.

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2.2 SAFSTOR

The NRC defines SAFSTOR as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." The facility is left intact (during the dormancy period), with structures maintained in a sound condition. Systems not required to operate in support of the spent fuel pool or site surveillance and security are drained, de-energized, and secured. Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination are performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

The engineering and planning requirements are similar to those for the DECON alternative. Site preparations are also similar to those for the DECON alternative. However, with the exception of the required radiation surveys and site characterizations, the mobilization and preparation of site facilities is less extensive.

2.2.1 Period 1 - Preparations

Preparations for long-term storage include the planning for permanent defueling of the reactors, revision of technical specifications appropriate to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

The process of placing the plant in safe-storage includes, but is not limited to, the following activities:

- Isolation of the spent fuel storage services and fuel handling systems located in the auxiliary building so that safe-storage operations may commence on the balance of the plant. This activity may be carried out by plant personnel in accordance with existing operating technical specifications. Activities are scheduled around the fuel handling systems to the greatest extent possible.
- Draining and de-energizing of the non-contaminated systems not required to support continued site operations or maintenance.
- Disposing of contaminated filter elements and resin beds not required for processing wastes from layup activities for future operations.
- Draining of the reactor vessels, with the internals left in place and the vessel heads secured.

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- Draining and de-energizing non-essential, contaminated systems with decontamination as required for future maintenance and inspection.
- Preparing lighting and alarm systems whose continued use is required; de-energizing portions of fire protection, electric power, and HVAC systems whose continued use is not required.
- Cleaning of the loose surface contamination from building access pathways.
- Performing an interim radiation survey of plant, posting warning signs where appropriate.
- Erecting physical barriers and/or securing all access to radioactive or contaminated areas, except as required for inspection and maintenance.
- Installing security and surveillance monitoring equipment and relocating security fence around secured structures, as required.

2.2.2 Period 2 - Dormancy

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the deferred decommissioning alternatives. Dormancy activities include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. Resident maintenance personnel perform equipment maintenance, inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services.

An environmental surveillance program is carried out during the dormancy period to ensure that releases of radioactive material to the environment are prevented and/or detected and controlled. Appropriate emergency procedures are established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal plant operations.

Security during the dormancy period is conducted primarily to protect the spent nuclear fuel while it is on site, prevent unauthorized entry,

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and to protect the public from the consequences of their own actions. The security fence, sensors, alarms, and other surveillance equipment provide security. Fire and radiation alarms are also monitored and maintained. While remote surveillance is an option, it does not offer the immediate response time of a physical presence.

During Scenario 6, the transfer of the spent fuel to a DOE facility continues during this period until complete. In Scenario 7, ISFSI operations and fuel transfer to the DOE continue through delayed decommissioning.

The length of the dormancy period is such that decommissioning (license termination) of the station (excluding the ISFSI) is accomplished within 60 years of final shutdown. The Scenario 6 SAFSTOR has the site remain in dormancy following spent fuel removal to the maximum extent possible, such that the licenses are terminated within the required 60-year time period.

It is required that the licensee submit an application to terminate each license, along with a LTP (described in Section 2.1.2), thereby initiating the third phase.

2.2.3 Periods 3 and 4 - Delayed Decommissioning

Prior to the commencement of decommissioning operations, preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning management organization. Final planning for activities and the writing of activity specifications and detailed procedures are also initiated at this time.

Much of the work in developing a termination plan is relevant to the development of the detailed engineering plans and procedures. The activities associated with this phase and the follow-on decontamination and dismantling processes are detailed in Sections 2.1.1 and 2.1.2. The primary difference between the sequences anticipated for the DECON and SAFSTOR scenarios is the absence, in the latter, of any constraint on the availability of the fuel storage pool located within the auxiliary building for decommissioning.

ISFSI decommissioning begins immediately upon completion of final shipment of the spent fuel and GTCC canisters.

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Variations in the length of the dormancy period are expected to have some effect upon the quantities of radioactive wastes generated from system and structure removal operations. However, given the levels of radioactivity and spectrum of radionuclides expected from approximately sixty years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone. (i.e., there is no significant reduction in the waste generated from the decommissioning activities). Due to the lower activity levels, a greater percentage of the waste volume can be designated for off-site processing and recovery.

The delay in decommissioning also yields lower working area radiation levels. As such, the estimate for the delayed scenarios incorporate reduced ALARA controls for the SAFSTOR's lower occupational exposure potential.

Although the initial radiation levels due to ^{60}Co will substantially decrease during the dormancy period, the internal components of the reactor vessels will still exhibit sufficiently high radiation dose rates to require remote sectioning under water due to the presence of long-lived radionuclides such as ^{94}Nb , ^{59}Ni , and ^{63}Ni . Therefore, the dismantling procedures described for the DECON alternative would still be employed during this scenario. Portions of the biological shield wall will still be radioactive due to the presence of activated trace elements with long half-lives (^{152}Eu and ^{154}Eu). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal. These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

2.2.4 Period 5 - Site Restoration

Following completion of decommissioning operations, site-restoration activities can begin. Dismantling, as a continuation of the decommissioning process, is a cost-effective option, as described in Section 2.1.3. The basis for the dismantling cost in this scenario is consistent with that described for DECON, presuming the removal of structures and site facilities to include the existing foundations and basemats, and the limited restoration of the site.

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3. COST ESTIMATES

The cost estimates prepared for decommissioning Prairie Island consider the unique features of the site, including the NSSS, power generation systems, support services, site buildings, and ancillary facilities. The basis of the estimates, including the sources of information relied upon, the estimating methodology employed, site-specific considerations, and other pertinent assumptions, is described in this section.

3.1 BASIS OF ESTIMATES

The estimates were developed using the site-specific, technical information from the 2014 analysis. The plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, was reviewed for this analysis; no substantive changes were identified over the three-year period to the configuration of the plant or site facilities that would impact decommissioning. The site-specific considerations and assumptions used in the previous evaluation were also revisited; no necessary modifications were identified. Modifications such as new FLEX facilities were incorporated where new information was available or experience from ongoing decommissioning programs provided viable alternatives or improved processes.

3.2 METHODOLOGY

The methodology used to develop the estimates follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"^[24] and the DOE "Decommissioning Handbook."^[25] These documents present a unit factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit factors for concrete removal (\$/cubic yard), steel removal (\$/ton), and cutting costs (\$/inch) were developed using local labor rates. The activity-dependent costs were estimated with the item quantities (cubic yards and tons), developed from plant drawings and inventory documents. Removal rates and material costs for the conventional disposition of components and structures relied upon information available in the industry publication, "Building Construction Cost Data," published by RSMeans.^[26]

The unit factor method provides a demonstrable basis for establishing reliable cost estimates. The detail provided in the unit factors, including activity duration, labor costs (by craft), and equipment and consumable costs, ensures

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that essential elements have not been omitted. Appendix A presents the detailed development of a typical unit factor. Appendix B provides the values contained within one set of factors developed for this analysis.

Regulatory Guide 1.184 ^[27] describes the methods and procedures that are acceptable to the NRC staff for implementing the requirements that relate to the initial activities and the major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and sequence in the regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202. ^[28]

This analysis reflects lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, Vermont Yankee and Fort Calhoun nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

Work Difficulty Factors

TLG has historically applied work difficulty adjustment factors (WDFs) to account for the inefficiencies in working in a power plant environment. WDFs were assigned to each unique set of unit factors, commensurate with the inefficiencies associated with working in confined, hazardous environments. The ranges used for the WDFs are as follows:

• Access Factor	10% to 20%
• Respiratory Protection Factor	10% to 50%
• Radiation/ALARA Factor	10% to 40%
• Protective Clothing Factor	10% to 30%
• Work Break Factor	8.33%

The factors and their associated range of values were developed in conjunction with the AIF/NESP-036 study. The application of the factors is discussed in more detail in that publication.

Scheduling Program Durations

The unit factors, adjusted by the WDFs as described above, are applied against the inventory of materials to be removed in the radiologically controlled areas.

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The resulting man-hours, or crew-hours, are used in the development of the decommissioning program schedule, using resource loading and event sequencing considerations. The scheduling of conventional removal and dismantling activities are based upon productivity information available from the RSMeans "Building Construction Cost Data" publication. Dismantling of the fuel handling systems and decontamination of the spent fuel pool is also dependent upon the timetable for the transfer of the spent fuel assemblies from the pool to the ISFSI or the DOE.

The program schedule is used to determine the period-dependent costs for program management, administration, field engineering, equipment rental, contracted services, etc. The study relies upon regional or site-specific salary and wage rates for the personnel associated with the intended program.

3.3 IMPACT OF DECOMMISSIONING MULTIPLE REACTOR UNITS

In estimating the near simultaneous decommissioning of two co-located reactor units there can be opportunities to achieve economies of scale, by sharing costs between units, and coordinating the sequence of work activities. There will also be schedule constraints, particularly where there are requirements for specialty equipment and staff, or practical limitations on when final status surveys can take place. For purposes of the estimates, Units 1 and 2 are assumed to be essentially identical. Common facilities have been assigned to Unit 2. A summary of the principal impacts is listed below.

- The sequence of work generally follows the principal that the work is done at Unit 1 first, followed by similar work at Unit 2. This permits the experience gained at Unit 1 to be applied by the workforce at the second unit. It should be noted however, that the estimates do not consider productivity improvements at the second unit, since there is little documented experience with decommissioning two units simultaneously. The work associated with developing activity specifications and procedures can be considered essentially identical between the two units, therefore the second unit costs are assumed to be a fraction of the first unit (~ 43%).
- Segmenting the reactor vessel and internals will require the use of special equipment. The cost of procuring that equipment is assumed to be shared on an equal basis between the two units. In addition, the decommissioning project will be scheduled such that Unit 2's reactor internals and vessel are segmented immediately after the activities at Unit 1 have been completed.
- Duplication of some program management and support costs, particularly costs associated with the more senior positions, can be avoided with two reactors undergoing decommissioning simultaneously. As a result, the

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estimates are based on a “lead” unit that includes these senior positions, and a “second” unit that excludes these positions. The designation as lead is based on the unit undertaking the most complex tasks (for instance vessel segmentation) or performing tasks for the first time.

- The final radiological survey schedule is also affected by a two-unit decommissioning schedule. Trying to complete the final status survey of Unit 1, while Unit 2 still has ongoing radiological remediation work and waste handling in process is considered impractical. As a result, Unit 1 and Unit 2 delay durations awaiting spent fuel pool availability for decommissioning are synchronized, such that the spent fuel pool area decommissioning and subsequent final status survey can be completed for the station. During the spent fuel storage period, program management costs are reduced accordingly.
- The final demolition of buildings at Units 1 and 2 are considered to take place concurrently.
- Unit 1, as the first unit to enter decommissioning, incurs the majority of site characterization costs.
- Shared systems and structures are generally assigned to Unit 2.
- Station costs such as ISFSI operations, emergency response fees, regulatory agency fees, and insurance are generally allocated on an equal basis between the two units.

3.4 FINANCIAL COMPONENTS OF THE COST MODEL

TLG’s proprietary decommissioning cost model, DECCER, produces a number of distinct cost elements. These direct expenditures, however, do not comprise the total cost to accomplish the project goal, i.e., license termination and site restoration.

3.4.1 Contingency

Inherent in any cost estimate that does not rely on historical data is the inability to specify the precise source of costs imposed by factors such as tool breakage, accidents, illnesses, weather delays, and labor stoppages. In the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes funds to cover these types of expenses.

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The activity- and period-dependent costs are combined to develop the total decommissioning cost. A contingency is then applied on a line-item basis, using one or more of the contingency types listed in the AIF/NESP-036 study. "Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook"^[29] as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this analysis are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice, a contingency factor has been applied. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and guidelines are provided for percentage contingency in each category. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

The use and role of contingency within decommissioning estimates is not a "safety factor issue." Safety factors provide additional security and address situations that may never occur. Contingency funds are expected to be fully expended throughout the program. They also provide assurance that sufficient funding is available to accomplish the intended tasks. An estimate without contingency, or from which contingency has been removed, can disrupt the orderly progression of events and jeopardize a successful conclusion to the decommissioning process.

For example, the most technologically challenging task in decommissioning a commercial nuclear plant is the disposition of the reactor vessels and internal components, now highly radioactive after a lifetime of exposure to core activity. The disposition of these components forms the basis of the critical path (schedule) for decommissioning operations. Cost and schedule are interdependent, and any deviation in schedule has a significant impact on cost for performing a specific activity.

Disposition of the reactor vessel internals involves the underwater cutting of complex components that are highly radioactive. Costs are based upon optimum segmentation, handling, and packaging scenarios. The schedule is primarily dependent upon the turnaround time for the heavily shielded shipping casks, including preparation, loading, and decontamination of the containers for transport. The number of casks

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required is a function of the pieces generated in the segmentation activity, a value calculated on optimum performance of the tooling employed in cutting the various subassemblies. The expected optimization, however, may not be achieved, resulting in delays and additional program costs. For this reason, contingency must be included to mitigate the consequences of the expected inefficiencies inherent in this complex activity, along with related concerns associated with the operation of highly specialized tooling, field conditions, and water clarity.

Contingency funds are an integral part of the total cost to complete the decommissioning process. Exclusion of this component puts at risk a successful completion of the intended tasks and, potentially, subsequent related activities. For this study, TLG examined the major activity-related problems (decontamination, segmentation, equipment handling, packaging, transport, and waste disposal) that necessitate a contingency. Individual activity contingencies ranged from 10% to 75%, depending on the degree of difficulty judged to be appropriate from TLG's actual decommissioning experience. The contingency values used in this study are as follows:

Decontamination	50%
Contaminated Component Removal	25%
Contaminated Component Packaging	10%
Contaminated Component Transport	15%
Low-Level Radioactive Waste Disposal	25%
Reactor Segmentation	75%
NSSS Component Removal	25%
Reactor Waste Packaging	25%
Reactor Waste Transport	25%
Reactor Vessel Component Disposal	50%
GTCC Disposal	15%
Non-Radioactive Component Removal	15%
Heavy Equipment and Tooling	15%
Supplies	25%
Engineering	15%
Energy	15%
Characterization and Termination Surveys	30%
Construction	15%
Asbestos	15%

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Taxes and Fees	10%
Insurance	10%
Staffing	15%
Spent Fuel Storage (Dry) Systems	15%
Spent Fuel Transfer Costs	15%
Operations and Maintenance Expenses	15%
ISFSI Decommissioning	25%

The contingency values are applied to the appropriate components of the estimates on a line item basis. A composite value is then reported at the end of each detailed estimate (as provided in Appendices C through I). Appendix J, the ISFSI decommissioning calculation, uses a flat 25% contingency added at the end of the calculation.

3.4.2 Financial Risk

In addition to the routine uncertainties addressed by contingency, another cost element that is sometimes necessary to consider when bounding decommissioning costs relates to uncertainty, or risk. Examples can include changes in work scope, pricing, job performance, and other variations that could conceivably, but not necessarily, occur. Consideration is sometimes necessary to generate a level of confidence in the estimate, within a range of probabilities. TLG considers these types of costs under the broad term “financial risk.” Included within the category of financial risk are:

- Transition activities and costs: ancillary expenses associated with eliminating 50% to 80% of the site labor force shortly after the cessation of plant operations, added cost for worker separation packages throughout the decommissioning program, national or company-mandated retraining, and retention incentives for key personnel.
- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, and national and local hearings.
- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), variations in plant inventory or configuration not indicated by the as-built drawings.

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- Regulatory changes (e.g., affecting worker health and safety, site release criteria, waste transportation, and disposal).
- Policy decisions altering national commitments (e.g., in the ability to accommodate certain waste forms for disposition) or in the timetable for such, for example, the start and rate of acceptance of spent fuel by the DOE.
- Pricing changes for basic inputs such as labor, energy, materials, and disposal. Items subject to widespread price competition (such as materials) may not show significant variation; however, others such as waste disposal could exhibit large pricing uncertainties, particularly in markets where limited access to services is available.

This cost study does not add any additional costs to the estimate for financial risk, since there is insufficient historical data from which to project future liabilities. Consequently, the areas of uncertainty or risk are revisited periodically and addressed through repeated revisions or updates of the base estimates.

3.5 SITE-SPECIFIC CONSIDERATIONS

There are a number of site-specific considerations that affect the method for dismantling and removal of equipment from the site and the degree of restoration required. The cost impacts of the considerations identified below are included in this cost study.

3.5.1 Spent Fuel Management

The cost to dispose of spent fuel generated from plant operations is not reflected within the estimates to decommission Prairie Island. Ultimate disposition of the spent fuel is within the province of the DOE's Waste Management System, as defined by the Nuclear Waste Policy Act. As such, the disposal cost was financed by a 1 mill/kWhr surcharge paid into the DOE's waste fund during operations. On November 19, 2013, the U.S. Court of Appeals for the D.C. Circuit ordered the Secretary of the Department of Energy to suspend collecting annual fees for nuclear waste disposal from nuclear power plant operators until the DOE has conducted a legally adequate fee assessment.

The NRC does, however, require licensees to establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of

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Energy. This requirement is prepared for through inclusion of certain high-level waste cost elements within the estimates, as described below.

Xcel Energy's current spent fuel management plan for the Prairie Island spent fuel is based in general upon:

- 1) Fuel transferred from the pool to the ISFSI within 5 years of shutdown;
- 2) Exchange of Prairie Island and Monticello spent fuel acceptance rights to best manage the overall cost of spent fuel storage for both plants;
- 3) Fuel will be shipped in the existing Transnuclear TN-40 casks, plus NUHOMS DSCs for fuel removed after final plant shutdown (Scenarios 1, 2, 6, and 7); the canisters and NUHOMS are periodically replaced in Scenarios 3, 4 and 5. Spent fuel assemblies from TN-40 casks that are replaced will be put into NUHOMS DSCs. Canisters that are unloaded in the spent fuel transfer operation will be surveyed for neutron activation.
- 4) As an allowance, some of these canisters and NUHOMS modules from the first off-load operation are assumed to be mildly neutron activated and therefore must be disposed of as radioactive waste.

This analysis assumes that the existing ISFSI is modified at the cessation of plant operations to accommodate the fuel present in the storage pool at shutdown.

The DOE's repository program assumes that spent fuel will be accepted for disposal from the nation's commercial nuclear plants in the order (the "queue") in which it was removed from service ("oldest fuel first").^[31] Repository operations were based upon annual industry-wide receipt of 400 Metric Tons Heavy Metal (MTHM) in the first year of operation, a total of 3,800 MTHM in years 2 through 4 and 3,000 MTHM for year 5 and beyond.^[32] This logic supports the spent fuel schedules for Scenarios 1 and 6. All other spent fuel scenarios are consistent with those identified by the Minnesota PSC.

Operation and maintenance costs for the spent fuel pool and ISFSI are included within the estimates and address the costs for staffing the facility, as well as security, insurance, and licensing fees. The estimates also include the costs to purchase, load, and transfer the NUHOMS DSCs from the pool to the ISFSI. Costs are also provided for the final

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disposition of the ISFSI once the transfer of the TN-40s and DSCs from the ISFSI to the DOE is complete.

Storage Canister Design

The design and capacity of the ISFSI is based upon the Transnuclear NUHOMS system (with a 61-fuel assembly capacity). The system consists of a multi-purpose (storage and transport) dry shielded storage canister (DSC) and a horizontal storage module (HSM). The existing TN-40 casks will remain in the ISFSI until either shipment to the DOE, or until recasked.

Canister Loading and Transfer

The estimates include an average cost of \$1,000,000 for the labor to load/transport the spent fuel from the pool to the ISFSI pad. For estimating purposes an allowance of \$332,800 is used for the cost to transfer each fuel canister from the ISFSI pad to the DOE transport vehicle.

Operations and Maintenance

An annual cost (excluding labor) of approximately \$803,000 and \$103,000 are used for operation and maintenance of the spent fuel pool and the ISFSI, respectively.

At shutdown, the spent fuel pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles). Over the next five years the assemblies are packaged into DSCs for transfer to the ISFSI for transfer to the DOE. It is assumed that the five years provides the necessary cooling period for the final cores to meet the decay heat requirements for dry storage. Once the pool is emptied, the spent fuel storage and handling facilities are available for decommissioning.

Replacement of DSCs during ISFSI fuel storage period

Scenarios 1, 2, 6, and 7 do not assume any replacement of the spent fuel storage DSCs (recasking).

Three of the cost estimates, Scenarios 3, 4 and 5, include costs to recask the spent fuel, based upon an assumption that the DSC has a limited lifetime of approximately 50 years.

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Scenario 3, which is 100 years (nominally) in length, considers a single repackaging effort for each DSC in the ISFSI.

Scenario 4, which is a (nominal) 200-year scenario, assumes that when any DSC in the ISFSI reaches the 50 years of storage milestone, the DSC is replaced. In Scenario 4, the fuel will be recasked three times following final shutdown of Prairie Island.

Scenario 5, which is 60 years (nominally) in length, considers a single repackaging effort for each DSC in the ISFSI. Not all fuel will be recasked.

Since the auxiliary building, spent fuel storage pool, and fuel handling facilities are removed by the year 2040, a dry fuel transfer facility is assumed to be constructed on site to perform the transfers from the old to the new DSCs. Scenarios 3, 4 and 5 include the cost to construct such a transfer facility, as well as additional staffing positions for support of the dry transfer activities, and additional NRC oversight associated with the transfer operations. The decommissioning of this transfer facility is also included in Scenarios 3, 4 and 5.

ISFSI Decommissioning

In accordance with 10 CFR §72.30, licensees must have a proposed decommissioning plan for the ISFSI site and facilities that includes a cost estimate for the plan. The plan should contain sufficient information on the proposed practices and procedures for the decontamination of the ISFSI and for the disposal of residual radioactive materials after all spent fuel, high-level radioactive waste, and reactor-related GTCC waste have been removed.

The NUHOMS multi-purpose dry shielded storage canister with a horizontal, reinforced concrete storage module is used as a basis for the ISFSI decommissioning cost analyses. The modules are assumed to have some level of neutron-induced activation, as a result of the long-term storage of the fuel, i.e., to levels exceeding free-release limits. As an allowance, 8 modules are assumed to require remediation, equivalent to the number of modules required to accommodate the final core offloads at Prairie Island (121 assemblies per unit). The cost of the disposition of this material, as well as the demolition of the ISFSI facility, is included in the estimates.

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The existing ISFSI pad, supporting the TN-40 casks, is not expected to be contaminated and will be demolished accordingly after a confirmation survey.

In accordance with the specific requirements of 10 CFR §72.30 for the ISFSI work scope, the cost estimate for decommissioning the ISFSI reflects: 1) the cost of an independent contractor performing the decommissioning activities; 2) an adequate contingency factor; and 3) the cost of meeting the criteria for unrestricted use. The cost summary for decommissioning the ISFSI is presented in Appendix J. It contains four different scenarios reflecting the different number of casks present at the end of the ISFSI operations. The demolition of the ISFSI for all seven scenarios is reflected within the estimates.

GTCC

The dismantling of the reactor internals is expected to generate radioactive waste considered unsuitable for shallow land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). Although the material is not classified as high-level waste, federal regulations under the LLRW Policy Amendments Act specifies the GTCC LLRW is designated a federal responsibility under Section 3(b)(1)(D). However, the DOE has not been forthcoming with an acceptance criteria or disposition schedule for this material, and numerous questions remain as to the ultimate disposal cost and waste form requirements. As such, for purposes of this study, the GTCC has been packaged and disposed of in the same manner as high-level waste, at a cost equivalent to that envisioned for the spent fuel. This is consistent with the concept that the generator of GTCC waste will bear all reasonable costs of disposing of such wastes. ^[32]

The number of DSCs required and the packaged volume for GTCC was based upon experience at Maine Yankee (e.g., the constraints on loading as identified in the canister's certificate of compliance), but adjusted for the increased spent fuel capacity of the 32 assembly DSCs.

It is assumed that the DOE would not accept this waste prior to completing the transfer of spent fuel. Therefore, until such time the DOE is ready to accept GTCC waste, it is reasonable to assume that this material would remain in storage at Prairie Island (for the DECON alternatives). In the SAFSTOR alternatives, the GTCC material is shipped directly to a DOE facility as it is generated. GTCC costs have

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been segregated and included within the "License Termination" expenditures.

3.5.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented for disposal in shielded, reusable transportation casks. Segmentation is performed underwater in the refueling canal, where a turntable and remote cutter are installed. The vessels are segmented in place, using a mast-mounted cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor cavity. Transportation cask specifications and transportation regulations dictate the segmentation and packaging methodology. The control elements are disposed of along with the spent fuel; there is no additional cost provided for their disposal.

Intact disposal of reactor vessel shells has been successfully demonstrated at several of the sites that have been decommissioned. Access to navigable waterways has allowed these large packages to be transported to the Barnwell disposal site with minimal overland travel. Intact disposal of the reactor vessel and internal components can provide savings in cost and worker exposure by eliminating the complex segmentation requirements, isolation of the GTCC material, and transport/storage of the resulting waste packages. Portland General Electric (PGE) was able to dispose of the Trojan reactor as an intact package (including the internals). However, its location on the Columbia River simplified the transportation analysis since:

- the reactor package could be secured to the transport vehicle for the entire journey, i.e., the package was not lifted during transport,
- there were no man-made or natural terrain features between the plant site and the disposal location that could produce a large drop, and
- transport speeds were very low, limited by the overland transport vehicle and the river barge.

As a member of the Northwest Compact, PGE had a site available for disposal of the package - the US Ecology facility in Washington State. The characteristics of this arid site proved favorable in demonstrating compliance with land disposal regulations.

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It is not known whether this option will be available when Prairie Island ceases operation. Future viability of this option will depend upon the ultimate location of the disposal site, as well as the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. As such, the estimates assume segmentation of the reactor vessel, as a bounding condition. With lower levels of activation, the vessel shell can be packaged more efficiently than the curie-limited internal components. This will allow the use of more conventional waste packages rather than shielded casks for transport.

3.5.3 Primary System Components

The reactor coolant system components are assumed to be decontaminated using chemical agents prior to the start of cutting operations. This type of decontamination can be expected to have a significant ALARA impact in the DECON scenario, since in this scenario the removal work is done within the first few years of shutdown. A decontamination factor (average reduction) of 10 is assumed for the process. Disposal of the decontamination solution effluent is included within the estimate as a "process liquid waste" charge. The SAFSTOR scenarios do not include any decontamination of the reactor system; radioactive decay from the delay period in the dormancy results in similar results.

The following discussion deals with the removal and disposition of the steam generators, but the techniques involved are also applicable to other large radioactively-contaminated components, such as heat exchangers, component coolers, and the pressurizer. The steam generators' size and weight, their location within the reactor building, as well as the disposal facility waste acceptance criteria, and access to transportation will ultimately determine the removal, transportation, and disposal strategy.

A trolley crane is set up for the removal of the generators. It can also be used to move portions of the steam generator cubicle walls and floor slabs from the reactor building to a location where they can be decontaminated and transported to the material handling area. Interferences within the work area, such as grating, piping, and other components are removed to create sufficient lay-down space for processing these large components.

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The generators are rigged for removal, disconnected from the surrounding piping and supports, and maneuvered into the open area where they are lowered onto a down-ending cradle. Each generator is rotated into the horizontal position for extraction from the containment and placed onto a multi-wheeled vehicle for transport to an on-site preparation area.

The generators are disassembled on-site with the outer shell and lightly contaminated subassemblies designated for off-site recycling. The more highly contaminated tube sheet and tube bundle are packaged for direct disposal.

Disposal costs are based upon the displaced volume and weight of the primary side portions of the steam generators. Each component is then loaded onto a rail car for transport to the disposal facility. The secondary side is assumed to be sent to an off-site waste processor.

Reactor coolant piping is cut from the reactor vessel once the water level in the vessel (used for personnel shielding during dismantling and cutting operations in and around the vessel) is dropped below the nozzle zone. The piping is boxed and transported by shielded van. The reactor coolant pumps and motors are lifted out intact, packaged, and transported for processing and/or disposal.

3.5.4 Main Turbine and Condenser

The main turbine and condenser are assumed to have only minor levels of contamination. As such, the components are dismantled using conventional maintenance procedures. The turbine rotors and shafts will be removed to a laydown area. The lower turbine casings will be removed from their anchors by controlled demolition. The main condensers will also be disassembled and moved to a laydown area. Material is then prepared for transportation to an off-site recycling facility where it will be surveyed and designated for either decontamination or volume reduction, or controlled disposal. Components will be packaged and readied for transport in accordance with the intended disposition.

3.5.5 Transportation Methods

Contaminated piping, components, and structural material other than the highly activated reactor vessels and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as

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described in Title 49.^[34] The contaminated material will be packaged in Industrial Packages (IP-1, IP-2, or IP-3, as defined in subpart 173.411) for transport unless demonstrated to qualify as their own shipping containers. The reactor vessel and internal components are expected to be transported in accordance with 10 CFR Part 71, as Type B. It is conceivable that the reactor, due to its limited specific activity, could qualify as LSA II or III. However, the high radiation levels on the outer surface would require that additional shielding be incorporated within the packaging so as to attenuate the dose to levels acceptable for transport.

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ¹³⁷Cs, ⁹⁰Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major reactor components to be shipped under current transportation regulations and disposal requirements.

Transport of the highly activated metal, produced in the segmentation of the reactor vessel and internal components, will be by shielded truck cask. Cask shipments may exceed 95,000 pounds, including vessel segment(s), supplementary shielding, cask tie-downs, and tractor-trailer. The maximum level of activity per shipment assumed permissible was based upon the license limits of the available shielded transport casks. The segmentation scheme for the vessel and internal segments is designed to meet these limits.

The transport of large intact components (e.g., large heat exchangers and other oversized components) will be by a combination of truck, rail, and/or multi-wheeled transporter. Transportation costs for Class A radioactive material requiring controlled disposal are based upon the mileage to the EnergySolutions facility in Clive, Utah. Transportation costs for the higher activity Class B and C radioactive material are based upon the mileage to the WCS facility in Andrews County, Texas. The transportation cost for the GTCC material is assumed to be contained within the disposal cost. Transportation costs for off-site waste processing are based upon the mileage to Oak Ridge, Tennessee. Truck transport costs were estimated using published tariffs from Tri-State Motor Transit.^[35]

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3.5.6 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is processed to reduce the total cost of controlled disposal. Material meeting the regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning (preparing the material to meet the waste acceptance criteria of the disposal site) and recovery of the waste stream is performed off site at a licensed processing center. Any material leaving the site is subject to a survey and release charge, at a minimum.

The mass of radioactive waste generated during the various decommissioning activities at the site is shown on a line-item basis in the detailed Appendices C through J, and summarized in Section 5. The quantified waste summaries shown in these tables are consistent with 10 CFR Part 61 classifications. Commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations. The volumes are calculated based on the exterior package dimensions for containerized material or a specific calculation for components serving as their own waste containers.

The more highly activated reactor components will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume and weight, with surcharges added for the special handling requirements and the radiological characteristics of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

The cost to dispose of the lowest level and majority of the material generated from the decontamination and dismantling activities is based upon representative costs for disposal at EnergySolutions facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) were based upon preliminary and indicative information from WCS for the Andrews County facility

Material exceeding Class C limits (limited to material closest to the reactor core and comprising less than 1% of the total waste volume) is generally not suitable for shallow-land disposal. This material is

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packaged in the same multipurpose canisters used for spent fuel storage/transport, for eventual transfer to the DOE for disposal.

3.5.7 Site Conditions Following Decommissioning

The NRC will amend or terminate each unit's license if it determines that site remediation has been performed in accordance with the license termination plan, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release. The NRC's involvement in the decommissioning process will end at this point. Building codes and environmental regulations will dictate the next step in the decommissioning process, as well as Xcel Energy's own future plans for the site, e.g., the electrical switchyard will remain in support of the regional transmission and distribution system.

Asphalt surfaces in the immediate vicinity of site buildings are broken up and the material disposed of as construction debris. The site access road will remain.

Only existing site structures are considered in the dismantling cost. All subgrade structures are removed. The voids are backfilled with clean debris and capped with soil. The site is then re-graded to conform to the adjacent landscape. Vegetation is established to inhibit erosion. These "non-radiological costs" are included in the total cost of decommissioning.

Bulk excavation of soil and material in the immediate vicinity of the power block is included to remove various duct banks, catch basins, and underground utilities that may exist.

The estimates do not assume the remediation of any significant volume of contaminated soil. This assumption may be affected by continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria.

3.6 ASSUMPTIONS

The following are the major assumptions made in the development of the estimates for decommissioning the site.

3.6.1 Estimating Basis

The study follows the principles of ALARA through the use of work duration adjustment factors. These factors address the impact of

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activities such as radiological protection instruction, mock-up training, and the use of respiratory protection and protective clothing. The factors lengthen a task's duration, increasing costs and lengthening the overall schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to worker exposure limits may impact the decommissioning cost and project schedule.

3.6.2 Labor Costs

For purposes of this analysis, it is assumed that Xcel Energy will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. Xcel Energy will provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Contract personnel will provide engineering services (e.g., for preparing the activity specifications, work procedures, neutron activation, and structural analyses) under the direction of Xcel Energy.

Utility labor costs were provided by Xcel Energy. Average costs were provided by department or work group and included payroll overheads. Decommissioning Operations Contractor (DOC) labor costs were based on utility labor costs with modified markups to account for employee benefits, DOC overhead and profit.

The craft labor required to decontaminate and dismantle the nuclear station will be acquired through standard site contracting practices. Craft labor costs were based upon information from Xcel Energy. Craft labor costs include applicable overheads and profit.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel.

Staffing levels are assigned by sub-period and functional area. Economies of a multi-unit decommissioning are recognized by establishing a primary and a secondary staff level. The unit assigned the primary staff will include common supervisory positions and positions that may be shared across both units. The types of positions and staffing levels are adjusted based upon the type of activity occurring in each sub-period.

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Representative profiles of the staffing level for decommissioning, including contractors and craft, is provided in Figures 3.1 and 3.2 for the DECON (Scenario 2) and SAFSTOR (Scenario 7) estimates. Utility staffing levels will gradually decrease after completing the removal of physical systems. Staffing levels and management support will vary based upon the amount and type of decommissioning work. Craft manpower levels decrease after systems removal and structures decontamination and drop substantially during the delay period and the license termination survey period. However, craft levels increase again during the site restoration period due to the work associated with structures demolition. During SAFSTOR dormancy, following transfer of the spent fuel to the ISFSI, staffing levels for the power block are reduced to a minimum, then rise as the delayed dismantling operations begin.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel (in accordance with the requirements of 10 CFR Part 37, Part 72, and Part 73). Once the fuel has been transferred to the DOE, the security organization will be reduced to Part 37 requirements for Scenario 6.

3.6.3 Design Conditions

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ¹³⁷Cs, ⁹⁰Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major NSSS components to be shipped under current transportation regulations and disposal requirements.

The curie contents of the vessels and internals at final shutdown are derived from those listed in NUREG/CR-3474.^[35] Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the Prairie Island components, projected operating life, and different periods of decay. Additional short-lived isotopes were derived from NUREG/CR-0130^[36] and NUREG/CR-0672,^[37] and benchmarked to the long-lived values from NUREG/CR-3474.

It is anticipated that there will be control element assemblies (CEAs) in the spent fuel pool at the cessation of operations, including those CEAs from the final core. This analysis assumes that the CEAs can be

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disposed of along with the spent fuel at no additional cost (in accordance with Appendix E of the Standard Contract ^[38])

Neutron activation of the reactor building structure is confined to the reactor biological shield.

3.6.4 General

Transition Activities

Existing warehouses will be cleared of non-essential material and remain for use by Xcel Energy and subcontractors. The plant's operating staff will perform the following activities at no additional cost or credit to the project during the transition period:

- Drain and collect fuel oils, lubricating oils, and transformer oils for recycle and/or sale.
- Drain and collect acids, caustics, and other chemical stores for recycle and/or sale.
- Processes operating waste inventories, i.e., the estimates do not address the disposition of any legacy wastes; the disposal of operating wastes during this initial period is not considered a decommissioning expense.

Scrap and Salvage

The existing plant equipment is considered obsolete and suitable for scrap as deadweight quantities only. Xcel Energy will make economically reasonable efforts to salvage equipment following final plant shutdown. However, dismantling techniques assumed by TLG for equipment in this analysis are not consistent with removal techniques required for salvage (resale) of equipment. Experience has indicated that some buyers wanted equipment stripped down to very specific requirements before they would consider purchase. This required expensive rework after the equipment had been removed from its installed location. Since placing a salvage value on this machinery and equipment would be speculative, and the value would be small in comparison to the overall decommissioning expenses, this analysis does not attempt to quantify the possible salvage value that Xcel Energy may realize based upon those efforts.

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It is assumed, for purposes of this analysis, that any value received from the sale of scrap generated in the dismantling process would be offset by the on-site processing costs. The dismantling techniques assumed in the decommissioning estimates do not include the additional cost for size reduction and preparation to meet “furnace ready” conditions. For example, the recovery of copper from electrical cabling may require the removal and disposition of any contaminated insulation, an added expense. With a volatile market, the potential profit margin in scrap recovery is highly speculative, regardless of the ability to free release this material. This assumption is an implicit recognition of scrap value in the disposal of clean metallic waste at no additional cost to the project.

Furniture, tools, mobile equipment such as forklifts, trucks, bulldozers, and other property will be removed at no cost or credit to the decommissioning project. Disposition may include relocation to other facilities. Spare parts will also be made available for alternative use.

The concrete debris resulting from building demolition activities is crushed on site to reduce the size of the debris. The resulting crushed concrete is disposed offsite as construction debris. The rebar removed from the concrete crushing process is disposed of as scrap steel in a similar fashion as other scrap metal as discussed previously.

Asbestos

At the time of Prairie Island’s construction, asbestos was still being used for system component and piping insulation, and as fireproofing material for structures. No inventory of asbestos at Prairie Island was available, so TLG developed an estimated quantity. The allowance for the remediation of this asbestos is captured in the detailed cost analyses (Appendices C through I).

Energy

For estimating purposes, the plant is assumed to be de-energized, with the exception of those facilities associated with spent fuel storage. Replacement power costs are used for the cost of energy consumption during decommissioning for tooling, lighting, ventilation, and essential services.

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Emergency Planning

FEMA and state fees associated with emergency planning are assumed to continue for approximately 18 months following the cessation of operations. At this time, the FEMA fees are discontinued. The timing is based upon the anticipated condition of the spent fuel (i.e., the hottest spent fuel assemblies are assumed to be cool enough that no substantial Zircaloy oxidation and off-site event would occur with the loss of spent fuel pool water). State and local fees are continued until all spent fuel is transferred out of the spent fuel pool.

Insurance

Costs for continuing coverage (nuclear liability and property insurance) following cessation of plant operations and during decommissioning are included and based upon current operating premiums. Reductions in premiums throughout the decommissioning process are based upon guidance provided by Xcel Energy. Reductions in premiums, throughout the decommissioning process, are based upon the guidance provided in SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning."^[39] The NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

Xcel Energy Corporate Overhead

Corporate overhead charges for site support activities are not included in these estimates.

Site Non-Labor Overhead

These estimates include costs for site non-labor overhead charges. These costs include telephones, copy machines, computers, IT infrastructure, office supplies, janitorial supplies, training expenses, etc. Xcel Energy provided a two-part cost to address these costs. A variable charge of \$3,936 per person per year of the Xcel Energy staff is included throughout the estimate. A fixed annual overhead charge is also included, starting at \$1.5 million per reactor at the time of unit shut down and decreasing to approximately \$467 thousand per reactor.

Taxes

Property taxes are included for all decommissioning periods. Xcel Energy provided a schedule of decreasing tax payments against the

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current tax assessment. These payments are maintained for the balance of the decommissioning program.

NRC Fees

These estimates include charges from the NRC to support the Prairie Island decommissioning program. Charges are included for the yearly license held by Xcel Energy for the Part 50 licenses, as well as engineering support charges by the NRC to review activities at the site. The Part 50 license fee for a reactor in a decommissioning or possession-only status and which has spent fuel onsite is \$194 thousand per year. Once the reactors have been decommissioned, the site Part 50 license continues at the same fee until final removal of the spent fuel. The hourly rate for NRC review is \$267.00. The level of effort of NRC participation is commensurate with the decommissioning alternative and schedule. For example, Scenario 2 has an estimated NRC support requirement of approximately 16,800 hours from Unit 1 shutdown until termination of the ISFSI license

Disposal of Processed Water

This estimate assumes that processed water which meets state and federal release limits can be disposed of without additional cost.

Site Modifications

The perimeter fence and in-plant security barriers will be moved, as appropriate, to conform to the Site Security Plan in force during the various stages of the project.

Prairie Island Indian Community Payments

This estimate includes a \$2.5 million annual payment to the Prairie Island Indian Community while spent fuel is still on the Prairie Island site.

Minnesota state regulations regarding concrete

This estimate complies with the Minnesota state regulations regarding the removal of all subterranean concrete during demolition, plus the survey and confirmation of the suitability of the clean fill used for backfill of the subgrade structures following concrete removal.

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3.7 COST ESTIMATE SUMMARY

The estimates presented in this document reflects the total cost to decontaminate the nuclear units, manage the spent fuel until the DOE is able to complete the transfer to a federal facility, dismantle the plant and restore the site for alternative use.

Schedules of expenditures are provided in Tables 3.1 through 3.14. The tables delineate the cost contributors by year of expenditures as well as cost contributor (e.g., labor, materials, and waste disposal).

Additional tables in Appendices C through I provide detailed costs elements. The cost elements are also assigned to one of three subcategories: “License Termination,” “Spent Fuel Management,” and “Site Restoration.” The subcategory “License Termination” is used to accumulate costs that are consistent with “decommissioning” as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). In situations where the long-term management of spent fuel is not an issue, the cost reported for this subcategory is generally sufficient to terminate each unit’s operating license, recognizing that there may be some additional cost impact from spent fuel management.

The “Spent Fuel Management” subcategory contains costs associated with the containerization and transfer of spent fuel from the pool to the DOE or to the ISFSI for interim storage, and the transfer of the multipurpose canisters from the ISFSI to the DOE. Costs are also included for the operations of the pool and management of the ISFSI until such time that the transfer of all fuel from this facility to an off-site location (e.g., interim storage facility) is complete.

“Site Restoration” is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are completely removed, including foundations and basemats and backfilled to conform to local grade.

As discussed in Section 3.5.1, it is assumed that the DOE will not accept the GTCC waste prior to completing the transfer of spent fuel. Therefore, the cost of GTCC disposal is shown in the final year of ISFSI operation (for the DECON alternative). While designated for disposal at a federal facility along with the spent fuel, GTCC waste is still classified as low-level radioactive waste and, as such, included as a “License Termination” expense.

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Decommissioning costs are reported in 2017 dollars. Costs are not inflated, escalated, or discounted over the period of expenditure (or projected lifetime of the plant).

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TABLE 3.1
SCENARIO 1: DECON WITH 32 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	22,324	776	692	25	9,206	33,023
2034	63,582	8,741	2,434	4,050	18,997	97,804
2035	66,069	37,773	1,850	20,920	22,520	149,133
2036	57,951	22,861	1,465	22,493	20,601	125,370
2037	38,254	6,920	984	15,000	15,667	76,825
2038	10,524	808	348	38	10,999	22,718
2039	35,902	65,387	409	817	10,713	113,229
2040	32,068	4,105	560	2,732	7,666	47,132
2041	19,800	6,499	235	16	4,502	31,053
2042	14,925	8,952	174	0	4,223	28,275
2043	8,672	4,303	82	0	3,719	16,776
2044	3,150	287	0	0	3,279	6,716
2045	3,142	287	0	0	3,270	6,699
2046	3,046	0	0	0	3,270	6,316
2047	3,046	0	0	0	3,270	6,316
2048	3,055	0	0	0	3,279	6,333
2049	3,046	0	0	0	3,270	6,316
2050	3,142	287	0	0	3,270	6,699
2051	3,142	287	0	0	3,270	6,699
2052	3,150	287	0	0	3,279	6,716
2053	3,142	287	0	0	3,270	6,699
2054	3,142	287	0	0	3,270	6,699
2055	3,142	287	0	0	3,270	6,699
2056	3,150	287	0	0	3,279	6,716
2057	3,142	287	0	0	3,270	6,699
2058	3,142	287	0	0	3,270	6,699
2059	3,142	287	0	0	3,270	6,699
2060	3,150	287	0	0	3,279	6,716
2061	3,142	287	0	0	3,270	6,699
2062	3,142	287	0	0	3,270	6,699

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TABLE 3.1 (continued)
SCENARIO 1: DECON WITH 32 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	3,142	287	0	0	3,270	6,699
2064	3,147	1,940	0	0	13,259	18,345
2065	796	381	15	2,697	1,418	5,306
Total	436,517	174,040	9,248	68,788	208,927	897,520

Note: Columns may not add due to rounding

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TABLE 3.2
SCENARIO 1: DECON WITH 32 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	7,760	336	305	10	5,078	13,490
2035	47,103	6,322	2,047	1,819	27,237	84,528
2036	67,705	41,230	2,261	23,855	20,777	155,828
2037	71,040	25,567	1,413	27,883	17,376	143,278
2038	43,920	7,411	847	13,940	13,784	79,901
2039	40,527	65,576	409	930	11,387	118,830
2040	37,549	4,783	560	3,109	7,440	53,440
2041	23,571	10,022	235	16	4,588	38,433
2042	16,800	14,214	174	0	4,470	35,659
2043	9,556	6,782	82	0	3,836	20,256
2044	3,150	287	0	0	3,279	6,716
2045	3,142	287	0	0	3,270	6,699
2046	3,046	0	0	0	3,270	6,316
2047	3,046	0	0	0	3,270	6,316
2048	3,055	0	0	0	3,279	6,333
2049	3,046	0	0	0	3,270	6,316
2050	3,142	287	0	0	3,270	6,699
2051	3,142	287	0	0	3,270	6,699
2052	3,150	287	0	0	3,279	6,716
2053	3,142	287	0	0	3,270	6,699
2054	3,142	287	0	0	3,270	6,699
2055	3,142	287	0	0	3,270	6,699
2056	3,150	287	0	0	3,279	6,716
2057	3,142	287	0	0	3,270	6,699
2058	3,142	287	0	0	3,270	6,699
2059	3,142	287	0	0	3,270	6,699
2060	3,150	287	0	0	3,279	6,716
2061	3,142	287	0	0	3,270	6,699
2062	3,142	287	0	0	3,270	6,699
2063	3,142	287	0	0	3,270	6,699

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TABLE 3.2 (continued)
SCENARIO 1: DECON WITH 32 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2064	3,147	1,940	0	0	13,259	18,345
2065	796	381	15	2,697	1,418	5,306
Total	431,975	189,158	8,349	74,258	196,087	899,828

Note: Columns may not add due to rounding

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TABLE 3.3
SCENARIO 2: DECON WITH 60 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	22,324	776	692	25	9,486	33,303
2034	63,582	8,741	2,434	4,050	19,423	98,230
2035	65,877	37,199	1,850	20,920	22,520	148,367
2036	57,759	22,286	1,465	22,493	20,601	124,604
2037	38,111	6,490	984	15,000	15,667	76,251
2038	13,208	8,859	348	38	10,999	33,453
2039	36,036	65,782	409	820	10,715	113,763
2040	31,920	3,668	559	2,729	7,660	46,535
2041	19,571	5,945	235	16	4,500	30,267
2042	14,782	8,522	174	0	4,223	27,701
2043	8,544	3,992	82	0	3,669	16,287
2044	3,055	0	0	0	3,189	6,244
2045	3,046	0	0	0	3,180	6,227
2046	3,046	0	0	0	3,180	6,227
2047	3,046	0	0	0	3,180	6,227
2048	3,055	0	0	0	3,189	6,244
2049	3,046	0	0	0	3,180	6,227
2050	3,046	0	0	0	3,180	6,227
2051	3,046	0	0	0	3,180	6,227
2052	3,055	0	0	0	3,189	6,244
2053	3,142	287	0	0	3,180	6,609
2054	3,238	574	0	0	3,180	6,992
2055	3,238	574	0	0	3,180	6,992
2056	3,294	718	0	0	3,189	7,201
2057	3,190	431	0	0	3,180	6,801
2058	3,334	861	0	0	3,180	7,375
2059	3,190	431	0	0	3,180	6,801
2060	3,150	287	0	0	3,189	6,627
2061	3,238	574	0	0	3,180	6,992
2062	3,238	574	0	0	3,180	6,992

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TABLE 3.3 (continued)
SCENARIO 2: DECON WITH 60 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	3,190	431	0	0	3,180	6,801
2064	3,246	574	0	0	3,189	7,009
2065	3,238	574	0	0	3,180	6,992
2066	3,190	431	0	0	3,180	6,801
2067	3,238	574	0	0	3,180	6,992
2068	3,246	574	0	0	3,189	7,009
2069	3,190	431	0	0	3,180	6,801
2070	3,238	574	0	0	3,180	6,992
2071	3,238	574	0	0	3,180	6,992
2072	3,246	574	0	0	3,189	7,009
2073	3,238	574	0	0	3,180	6,992
2074	3,238	574	0	0	3,180	6,992
2075	3,570	1,570	0	0	3,180	8,320
2076	3,246	574	0	0	3,189	7,009
2077	3,238	2,238	0	0	13,165	18,641
2078	833	455	15	2,697	1,453	5,453
Total	481,032	188,867	9,246	68,788	249,109	997,041

Note: Columns may not add due to rounding

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TABLE 3.4
SCENARIO 2: DECON WITH 60 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	7,760	336	305	10	5,078	13,490
2035	46,911	5,748	2,047	1,819	27,237	83,763
2036	67,514	40,656	2,261	23,855	20,777	155,063
2037	70,896	25,136	1,413	27,883	17,376	142,704
2038	46,604	15,462	847	13,940	13,784	90,636
2039	40,664	65,972	409	933	11,388	119,366
2040	37,417	4,345	559	3,106	7,433	52,861
2041	23,328	9,482	235	16	4,587	37,648
2042	16,657	13,784	174	0	4,471	35,086
2043	9,423	6,458	82	0	3,785	19,747
2044	3,055	0	0	0	3,189	6,244
2045	3,046	0	0	0	3,180	6,227
2046	3,046	0	0	0	3,180	6,227
2047	3,046	0	0	0	3,180	6,227
2048	3,055	0	0	0	3,189	6,244
2049	3,046	0	0	0	3,180	6,227
2050	3,046	0	0	0	3,180	6,227
2051	3,046	0	0	0	3,180	6,227
2052	3,055	0	0	0	3,189	6,244
2053	3,142	287	0	0	3,180	6,609
2054	3,238	574	0	0	3,180	6,992
2055	3,238	574	0	0	3,180	6,992
2056	3,294	718	0	0	3,189	7,201
2057	3,190	431	0	0	3,180	6,801
2058	3,334	861	0	0	3,180	7,375
2059	3,190	431	0	0	3,180	6,801
2060	3,150	287	0	0	3,189	6,627
2061	3,238	574	0	0	3,180	6,992
2062	3,238	574	0	0	3,180	6,992
2063	3,190	431	0	0	3,180	6,801

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TABLE 3.4 (continued)
SCENARIO 2: DECON WITH 60 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2064	3,246	574	0	0	3,189	7,009
2065	3,238	574	0	0	3,180	6,992
2066	3,190	431	0	0	3,180	6,801
2067	3,238	574	0	0	3,180	6,992
2068	3,246	574	0	0	3,189	7,009
2069	3,190	431	0	0	3,180	6,801
2070	3,238	574	0	0	3,180	6,992
2071	3,238	574	0	0	3,180	6,992
2072	3,246	574	0	0	3,189	7,009
2073	3,238	574	0	0	3,180	6,992
2074	3,238	574	0	0	3,180	6,992
2075	3,570	1,570	0	0	3,180	8,320
2076	3,246	574	0	0	3,189	7,009
2077	3,238	2,238	0	0	13,164	18,640
2078	833	455	15	2,697	1,453	5,453
Total	476,490	203,985	8,347	74,258	235,562	998,643

Note: Columns may not add due to rounding

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TABLE 3.5
SCENARIO 3: DECON WITH 100 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	22,324	776	692	25	9,206	33,023
2034	63,582	8,741	2,434	4,050	18,997	97,804
2035	65,877	37,199	1,850	20,920	22,520	148,367
2036	57,759	22,286	1,465	22,493	20,601	124,604
2037	39,808	11,582	984	15,000	15,667	83,040
2038	13,208	8,859	348	38	10,999	33,453
2039	35,713	64,815	409	820	10,715	112,472
2040	31,920	3,668	559	2,729	7,660	46,535
2041	19,625	5,945	235	16	4,500	30,321
2042	14,864	8,522	174	0	4,223	27,782
2043	8,912	3,992	82	0	3,646	16,633
2044	3,676	0	0	0	3,147	6,823
2045	5,973	6,921	0	0	3,138	16,032
2046	5,204	4,614	0	0	3,138	12,956
2047	5,204	4,614	0	0	3,138	12,956
2048	3,676	0	0	0	3,147	6,823
2049	5,204	4,614	0	0	3,138	12,956
2050	5,973	6,921	0	0	3,138	16,032
2051	5,779	6,339	0	0	3,138	15,256
2052	5,983	6,921	0	0	3,147	16,051
2053	3,666	0	0	0	3,138	6,805
2054	3,666	0	0	0	3,138	6,805
2055	5,973	6,921	0	0	3,138	16,032
2056	5,214	4,614	0	0	3,147	12,975
2057	5,204	4,614	0	0	3,138	12,956
2058	3,666	0	0	0	3,138	6,805
2059	5,010	4,032	0	0	3,138	12,180
2060	5,214	4,614	0	0	3,147	12,975
2061	5,204	4,614	0	0	3,138	12,956
2062	3,666	0	0	0	3,138	6,805

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Decommissioning Cost Analysis***

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TABLE 3.5 (continued)
SCENARIO 3: DECON WITH 100 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	8,280	13,841	0	0	3,138	25,259
2064	6,558	8,646	0	0	3,147	18,351
2065	5,204	4,614	0	0	3,138	12,956
2066	3,666	0	0	0	3,138	6,805
2067	3,666	0	0	0	3,138	6,805
2068	6,752	9,227	0	0	3,147	19,126
2069	5,973	6,921	0	0	3,138	16,032
2070	3,666	0	0	0	3,138	6,805
2071	3,666	0	0	0	3,138	6,805
2072	7,327	10,952	0	0	3,147	21,426
2073	3,666	0	0	0	3,138	6,805
2074	3,666	0	0	0	3,138	6,805
2075	7,843	12,530	0	0	3,138	23,511
2076	3,676	0	0	0	3,147	6,823
2077	3,666	0	0	0	3,138	6,805
2078	7,511	11,534	0	0	3,138	22,184
2079	3,666	0	0	0	3,138	6,805
2080	3,676	0	0	0	3,147	6,823
2081	3,666	0	0	0	3,138	6,805
2082	7,123	10,371	0	0	3,138	20,632
2083	3,666	0	0	0	3,138	6,805
2084	3,676	0	0	0	3,147	6,823
2085	3,666	0	0	0	3,138	6,805
2086	3,666	0	0	0	3,138	6,805
2087	3,666	0	0	0	3,138	6,805
2088	3,676	0	0	0	3,147	6,823
2089	26,816	69,448	0	1,934	3,138	101,337
2090	3,666	0	0	0	3,138	6,805
2091	3,666	0	0	0	3,138	6,805
2092	3,676	0	0	0	3,147	6,823

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Decommissioning Cost Analysis***

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TABLE 3.5 (continued)
SCENARIO 3: DECON WITH 100 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	3,050	287	0	0	2,934	6,271
2094	3,146	574	0	0	2,934	6,653
2095	5,453	7,495	0	0	2,934	15,881
2096	4,740	5,331	0	0	2,942	13,013
2097	4,636	5,044	0	0	2,934	12,614
2098	3,241	861	0	0	2,934	7,036
2099	3,098	431	0	0	2,934	6,462
2100	5,357	7,208	0	0	2,934	15,498
2101	5,453	7,495	0	0	2,934	15,881
2102	5,453	7,495	0	0	2,934	15,881
2103	3,098	431	0	0	2,934	6,462
2104	3,154	574	0	0	2,942	6,670
2105	5,453	7,495	0	0	2,934	15,881
2106	4,636	5,044	0	0	2,934	12,614
2107	4,684	5,188	0	0	2,934	12,805
2108	3,154	574	0	0	2,942	6,670
2109	4,636	5,044	0	0	2,934	12,614
2110	4,677	5,166	0	0	2,934	12,776
2111	4,669	5,145	0	0	2,934	12,748
2112	3,140	531	0	0	2,942	6,612
2113	7,745	14,372	0	0	2,934	25,051
2114	6,207	9,759	0	0	2,934	18,899
2115	5,001	6,140	0	0	2,934	14,075
2116	3,140	2,195	0	0	12,934	18,268
2117	3,128	520	0	0	2,934	6,582
2118	1,058	725	15	0	1,545	3,343
Total	740,717	515,942	9,246	68,025	367,538	1,701,468

Note: Columns may not add due to rounding

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TABLE 3.6
SCENARIO 3: DECON WITH 100 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	7,760	336	305	10	5,078	13,490
2035	46,911	5,748	2,047	1,819	27,237	83,763
2036	67,514	40,656	2,261	23,855	20,777	155,063
2037	72,593	30,228	1,413	27,883	17,376	149,494
2038	46,604	15,462	847	13,940	13,784	90,636
2039	40,341	65,004	409	933	11,388	118,076
2040	37,417	4,345	559	3,106	7,433	52,861
2041	23,381	9,482	235	16	4,587	37,701
2042	16,739	13,784	174	0	4,471	35,167
2043	9,791	6,458	82	0	3,763	20,092
2044	3,676	0	0	0	3,147	6,823
2045	5,973	6,921	0	0	3,138	16,032
2046	5,204	4,614	0	0	3,138	12,956
2047	5,204	4,614	0	0	3,138	12,956
2048	3,676	0	0	0	3,147	6,823
2049	5,204	4,614	0	0	3,138	12,956
2050	5,973	6,921	0	0	3,138	16,032
2051	5,779	6,339	0	0	3,138	15,256
2052	5,983	6,921	0	0	3,147	16,051
2053	3,666	0	0	0	3,138	6,805
2054	3,666	0	0	0	3,138	6,805
2055	5,973	6,921	0	0	3,138	16,032
2056	5,214	4,614	0	0	3,147	12,975
2057	5,204	4,614	0	0	3,138	12,956
2058	3,666	0	0	0	3,138	6,805
2059	5,010	4,032	0	0	3,138	12,180
2060	5,214	4,614	0	0	3,147	12,975
2061	5,204	4,614	0	0	3,138	12,956
2062	3,666	0	0	0	3,138	6,805
2063	8,280	13,841	0	0	3,138	25,259

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Decommissioning Cost Analysis***

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TABLE 3.6 (continued)
SCENARIO 3: DECON WITH 100 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2064	6,558	8,646	0	0	3,147	18,351
2065	5,204	4,614	0	0	3,138	12,956
2066	3,666	0	0	0	3,138	6,805
2067	3,666	0	0	0	3,138	6,805
2068	6,752	9,227	0	0	3,147	19,126
2069	5,973	6,921	0	0	3,138	16,032
2070	3,666	0	0	0	3,138	6,805
2071	3,666	0	0	0	3,138	6,805
2072	7,327	10,952	0	0	3,147	21,426
2073	3,666	0	0	0	3,138	6,805
2074	3,666	0	0	0	3,138	6,805
2075	7,843	12,530	0	0	3,138	23,511
2076	3,676	0	0	0	3,147	6,823
2077	3,666	0	0	0	3,138	6,805
2078	7,511	11,534	0	0	3,138	22,184
2079	3,666	0	0	0	3,138	6,805
2080	3,676	0	0	0	3,147	6,823
2081	3,666	0	0	0	3,138	6,805
2082	7,123	10,371	0	0	3,138	20,632
2083	3,666	0	0	0	3,138	6,805
2084	3,676	0	0	0	3,147	6,823
2085	3,666	0	0	0	3,138	6,805
2086	3,666	0	0	0	3,138	6,805
2087	3,666	0	0	0	3,138	6,805
2088	3,676	0	0	0	3,147	6,823
2089	26,816	69,448	0	0	3,138	99,403
2090	3,666	0	0	1,934	3,138	8,739
2091	3,666	0	0	0	3,138	6,805
2092	3,676	0	0	0	3,147	6,823
2093	3,050	287	0	0	2,934	6,271

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TABLE 3.6 (continued)
SCENARIO 3: DECON WITH 100 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2094	3,146	574	0	0	2,934	6,653
2095	5,453	7,495	0	0	2,934	15,881
2096	4,740	5,331	0	0	2,942	13,013
2097	4,636	5,044	0	0	2,934	12,614
2098	3,241	861	0	0	2,934	7,036
2099	3,098	431	0	0	2,934	6,462
2100	5,357	7,208	0	0	2,934	15,498
2101	5,453	7,495	0	0	2,934	15,881
2102	5,453	7,495	0	0	2,934	15,881
2103	3,098	431	0	0	2,934	6,462
2104	3,154	574	0	0	2,942	6,670
2105	5,453	7,495	0	0	2,934	15,881
2106	4,636	5,044	0	0	2,934	12,614
2107	4,684	5,188	0	0	2,934	12,805
2108	3,154	574	0	0	2,942	6,670
2109	4,636	5,044	0	0	2,934	12,614
2110	4,677	5,166	0	0	2,934	12,776
2111	4,669	5,145	0	0	2,934	12,748
2112	3,140	531	0	0	2,942	6,612
2113	7,745	14,372	0	0	2,934	25,051
2114	6,207	9,759	0	0	2,934	18,899
2115	5,001	6,140	0	0	2,934	14,075
2116	3,140	2,195	0	0	12,934	18,268
2117	3,128	520	0	0	2,934	6,582
2118	1,058	725	15	0	1,545	3,343
Total	736,175	531,061	8,347	73,496	354,698	1,703,777

Note: Columns may not add due to rounding

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Decommissioning Cost Analysis***

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**TABLE 3.7
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)**

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	22,324	776	692	25	9,206	33,023
2034	63,582	8,741	2,434	4,050	18,997	97,804
2035	65,877	37,199	1,850	20,920	22,520	148,367
2036	57,759	22,286	1,465	22,493	20,601	124,604
2037	39,808	11,582	984	15,000	15,667	83,040
2038	13,208	8,859	348	38	10,999	33,453
2039	35,713	64,815	409	820	10,715	112,472
2040	31,920	3,668	559	2,729	7,660	46,535
2041	19,625	5,945	235	16	4,500	30,321
2042	14,864	8,522	174	0	4,223	27,782
2043	8,912	3,992	82	0	3,608	16,594
2044	3,676	0	0	0	3,075	6,751
2045	5,973	6,921	0	0	3,066	15,960
2046	5,204	4,614	0	0	3,066	12,884
2047	5,204	4,614	0	0	3,066	12,884
2048	3,676	0	0	0	3,075	6,751
2049	5,204	4,614	0	0	3,066	12,884
2050	5,973	6,921	0	0	3,066	15,960
2051	5,779	6,339	0	0	3,066	15,184
2052	5,983	6,921	0	0	3,075	15,979
2053	3,666	0	0	0	3,066	6,733
2054	3,666	0	0	0	3,066	6,733
2055	5,973	6,921	0	0	3,066	15,960
2056	5,214	4,614	0	0	3,075	12,903
2057	5,204	4,614	0	0	3,066	12,884
2058	3,666	0	0	0	3,066	6,733
2059	5,010	4,032	0	0	3,066	12,109
2060	5,214	4,614	0	0	3,075	12,903
2061	5,204	4,614	0	0	3,066	12,884
2062	3,666	0	0	0	3,066	6,733

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Decommissioning Cost Analysis**

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TABLE 3.7 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	8,280	13,841	0	0	3,066	25,188
2064	6,558	8,646	0	0	3,075	18,279
2065	5,204	4,614	0	0	3,066	12,884
2066	3,666	0	0	0	3,066	6,733
2067	3,666	0	0	0	3,066	6,733
2068	6,752	9,227	0	0	3,075	19,054
2069	5,973	6,921	0	0	3,066	15,960
2070	3,666	0	0	0	3,066	6,733
2071	3,666	0	0	0	3,066	6,733
2072	7,327	10,952	0	0	3,075	21,354
2073	3,666	0	0	0	3,066	6,733
2074	3,666	0	0	0	3,066	6,733
2075	7,843	12,530	0	0	3,066	23,439
2076	3,676	0	0	0	3,075	6,751
2077	3,666	0	0	0	3,066	6,733
2078	7,511	11,534	0	0	3,066	22,112
2079	3,666	0	0	0	3,066	6,733
2080	3,676	0	0	0	3,075	6,751
2081	3,666	0	0	0	3,066	6,733
2082	7,123	10,371	0	0	3,066	20,560
2083	3,666	0	0	0	3,066	6,733
2084	3,676	0	0	0	3,075	6,751
2085	3,666	0	0	0	3,066	6,733
2086	3,666	0	0	0	3,066	6,733
2087	3,666	0	0	0	3,066	6,733
2088	3,676	0	0	0	3,075	6,751
2089	26,770	69,311	0	1,934	3,214	101,230
2090	3,666	0	0	0	3,066	6,733
2091	3,666	0	0	0	3,066	6,733
2092	3,676	0	0	0	3,075	6,751

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Decommissioning Cost Analysis***

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TABLE 3.7 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	3,666	0	0	0	3,066	6,733
2094	3,666	0	0	0	3,066	6,733
2095	5,973	6,921	0	0	3,066	15,960
2096	5,214	4,614	0	0	3,075	12,903
2097	5,204	4,614	0	0	3,066	12,884
2098	3,666	0	0	0	3,066	6,733
2099	3,666	0	0	0	3,066	6,733
2100	5,973	6,921	0	0	3,066	15,960
2101	5,973	6,921	0	0	3,066	15,960
2102	5,973	6,921	0	0	3,066	15,960
2103	3,666	0	0	0	3,066	6,733
2104	3,676	0	0	0	3,075	6,751
2105	5,973	6,921	0	0	3,066	15,960
2106	5,204	4,614	0	0	3,066	12,884
2107	5,204	4,614	0	0	3,066	12,884
2108	3,676	0	0	0	3,075	6,751
2109	5,204	4,614	0	0	3,066	12,884
2110	5,204	4,614	0	0	3,066	12,884
2111	5,204	4,614	0	0	3,066	12,884
2112	3,676	0	0	0	3,075	6,751
2113	8,280	13,841	0	0	3,066	25,188
2114	6,742	9,227	0	0	3,066	19,036
2115	5,536	5,609	0	0	3,066	14,212
2116	3,676	0	0	0	3,075	6,751
2117	3,666	0	0	0	3,066	6,733
2118	6,742	9,227	0	0	3,066	19,036
2119	5,973	6,921	0	0	3,066	15,960
2120	3,676	0	0	0	3,075	6,751
2121	3,666	0	0	0	3,066	6,733
2122	7,511	11,534	0	0	3,066	22,112

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Decommissioning Cost Analysis***

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TABLE 3.7 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2123	3,666	0	0	0	3,066	6,733
2124	3,676	0	0	0	3,075	6,751
2125	7,511	11,534	0	0	3,066	22,112
2126	3,666	0	0	0	3,066	6,733
2127	3,666	0	0	0	3,066	6,733
2128	7,521	11,534	0	0	3,075	22,130
2129	3,666	0	0	0	3,066	6,733
2130	3,666	0	0	0	3,066	6,733
2131	3,666	0	0	0	3,066	6,733
2132	7,521	11,534	0	0	3,075	22,130
2133	3,666	0	0	0	3,066	6,733
2134	3,666	0	0	0	3,066	6,733
2135	3,666	0	0	0	3,066	6,733
2136	3,676	0	0	0	3,075	6,751
2137	3,666	0	0	0	3,066	6,733
2138	3,666	0	0	0	3,066	6,733
2139	26,781	69,344	0	0	3,066	99,191
2140	3,676	0	0	0	3,075	6,751
2141	3,666	0	0	0	3,066	6,733
2142	3,666	0	0	0	3,066	6,733
2143	3,666	0	0	0	3,066	6,733
2144	3,676	0	0	0	3,075	6,751
2145	5,973	6,921	0	0	3,066	15,960
2146	5,204	4,614	0	0	3,066	12,884
2147	5,204	4,614	0	0	3,066	12,884
2148	3,676	0	0	0	3,075	6,751
2149	3,666	0	0	0	3,066	6,733
2150	5,973	6,921	0	0	3,066	15,960
2151	5,973	6,921	0	0	3,066	15,960
2152	5,983	6,921	0	0	3,075	15,979

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TABLE 3.7 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2153	3,666	0	0	0	3,066	6,733
2154	3,666	0	0	0	3,066	6,733
2155	6,305	7,916	0	0	3,066	17,287
2156	5,214	4,614	0	0	3,075	12,903
2157	5,204	4,614	0	0	3,066	12,884
2158	3,666	0	0	0	3,066	6,733
2159	5,204	4,614	0	0	3,066	12,884
2160	5,214	4,614	0	0	3,075	12,903
2161	5,204	4,614	0	0	3,066	12,884
2162	3,666	0	0	0	3,066	6,733
2163	8,280	13,841	0	0	3,066	25,188
2164	6,752	9,227	0	0	3,075	19,054
2165	5,204	4,614	0	0	3,066	12,884
2166	3,666	0	0	0	3,066	6,733
2167	3,666	0	0	0	3,066	6,733
2168	6,752	9,227	0	0	3,075	19,054
2169	5,973	6,921	0	0	3,066	15,960
2170	3,666	0	0	0	3,066	6,733
2171	3,666	0	0	0	3,066	6,733
2172	7,521	11,534	0	0	3,075	22,130
2173	3,666	0	0	0	3,066	6,733
2174	3,666	0	0	0	3,066	6,733
2175	7,511	11,534	0	0	3,066	22,112
2176	3,676	0	0	0	3,075	6,751
2177	3,666	0	0	0	3,066	6,733
2178	7,511	11,534	0	0	3,066	22,112
2179	3,666	0	0	0	3,066	6,733
2180	3,676	0	0	0	3,075	6,751
2181	3,666	0	0	0	3,066	6,733
2182	7,511	11,534	0	0	3,066	22,112

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TABLE 3.7 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2183	3,666	0	0	0	3,066	6,733
2184	3,676	0	0	0	3,075	6,751
2185	3,666	0	0	0	3,066	6,733
2186	3,666	0	0	0	3,066	6,733
2187	3,666	0	0	0	3,066	6,733
2188	3,676	0	0	0	3,075	6,751
2189	26,781	69,344	0	0	3,066	99,191
2190	3,666	0	0	0	3,066	6,733
2191	3,666	0	0	0	3,066	6,733
2192	3,676	0	0	0	3,075	6,751
2193	3,050	287	0	0	2,934	6,271
2194	3,146	574	0	0	2,934	6,653
2195	5,784	8,490	0	0	2,934	17,208
2196	4,740	5,331	0	0	2,942	13,013
2197	4,636	5,044	0	0	2,934	12,614
2198	3,241	861	0	0	2,934	7,036
2199	3,098	431	0	0	2,934	6,462
2200	5,357	7,208	0	0	2,934	15,498
2201	5,453	7,495	0	0	2,934	15,881
2202	5,453	7,495	0	0	2,934	15,881
2203	3,098	431	0	0	2,934	6,462
2204	3,154	574	0	0	2,942	6,670
2205	5,453	7,495	0	0	2,934	15,881
2206	4,636	5,044	0	0	2,934	12,614
2207	4,684	5,188	0	0	2,934	12,805
2208	3,154	574	0	0	2,942	6,670
2209	4,636	5,044	0	0	2,934	12,614
2210	4,677	5,166	0	0	2,934	12,776
2211	4,669	5,145	0	0	2,934	12,748
2212	3,140	531	0	0	2,942	6,612

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TABLE 3.7 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2213	7,745	14,372	0	0	2,934	25,051
2214	6,207	9,759	0	0	2,934	18,899
2215	4,669	5,145	0	0	2,934	12,748
2216	3,140	2,195	0	0	12,934	18,268
2217	3,146	574	0	0	2,934	6,653
2218	1,058	724	15	0	1,545	3,342
Total	1,259,023	970,270	9,246	68,025	670,974	2,977,538

Note: Columns may not add due to rounding

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**TABLE 3.8
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)**

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	7,760	336	305	10	5,078	13,490
2035	46,911	5,748	2,047	1,819	27,237	83,763
2036	67,514	40,656	2,261	23,855	20,777	155,063
2037	72,593	30,228	1,413	27,883	17,376	149,494
2038	46,604	15,462	847	13,940	13,784	90,636
2039	40,341	65,004	409	933	11,388	118,076
2040	37,417	4,345	559	3,106	7,433	52,861
2041	23,381	9,482	235	16	4,587	37,701
2042	16,739	13,784	174	0	4,471	35,167
2043	9,791	6,458	82	0	3,725	20,055
2044	3,676	0	0	0	3,076	6,752
2045	5,973	6,921	0	0	3,067	15,961
2046	5,204	4,614	0	0	3,067	12,885
2047	5,204	4,614	0	0	3,067	12,885
2048	3,676	0	0	0	3,076	6,752
2049	5,204	4,614	0	0	3,067	12,885
2050	5,973	6,921	0	0	3,067	15,961
2051	5,779	6,339	0	0	3,067	15,185
2052	5,983	6,921	0	0	3,076	15,980
2053	3,666	0	0	0	3,067	6,734
2054	3,666	0	0	0	3,067	6,734
2055	5,973	6,921	0	0	3,067	15,961
2056	5,214	4,614	0	0	3,076	12,904
2057	5,204	4,614	0	0	3,067	12,885
2058	3,666	0	0	0	3,067	6,734
2059	5,010	4,032	0	0	3,067	12,110
2060	5,214	4,614	0	0	3,076	12,904
2061	5,204	4,614	0	0	3,067	12,885
2062	3,666	0	0	0	3,067	6,734
2063	8,280	13,841	0	0	3,067	25,189

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TABLE 3.8 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2064	6,558	8,646	0	0	3,076	18,280
2065	5,204	4,614	0	0	3,067	12,885
2066	3,666	0	0	0	3,067	6,734
2067	3,666	0	0	0	3,067	6,734
2068	6,752	9,227	0	0	3,076	19,055
2069	5,973	6,921	0	0	3,067	15,961
2070	3,666	0	0	0	3,067	6,734
2071	3,666	0	0	0	3,067	6,734
2072	7,327	10,952	0	0	3,076	21,355
2073	3,666	0	0	0	3,067	6,734
2074	3,666	0	0	0	3,067	6,734
2075	7,843	12,530	0	0	3,067	23,440
2076	3,676	0	0	0	3,076	6,752
2077	3,666	0	0	0	3,067	6,734
2078	7,511	11,534	0	0	3,067	22,113
2079	3,666	0	0	0	3,067	6,734
2080	3,676	0	0	0	3,076	6,752
2081	3,666	0	0	0	3,067	6,734
2082	7,123	10,371	0	0	3,067	20,561
2083	3,666	0	0	0	3,067	6,734
2084	3,676	0	0	0	3,076	6,752
2085	3,666	0	0	0	3,067	6,734
2086	3,666	0	0	0	3,067	6,734
2087	3,666	0	0	0	3,067	6,734
2088	3,676	0	0	0	3,076	6,752
2089	26,770	69,311	0	1,934	3,067	101,083
2090	3,666	0	0	0	3,067	6,734
2091	3,666	0	0	0	3,067	6,734
2092	3,676	0	0	0	3,076	6,752
2093	3,666	0	0	0	3,067	6,734

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TABLE 3.8 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2094	3,666	0	0	0	3,067	6,734
2095	5,973	6,921	0	0	3,067	15,961
2096	5,214	4,614	0	0	3,076	12,904
2097	5,204	4,614	0	0	3,067	12,885
2098	3,666	0	0	0	3,067	6,734
2099	3,666	0	0	0	3,067	6,734
2100	5,973	6,921	0	0	3,067	15,961
2101	5,973	6,921	0	0	3,067	15,961
2102	5,973	6,921	0	0	3,067	15,961
2103	3,666	0	0	0	3,067	6,734
2104	3,676	0	0	0	3,076	6,752
2105	5,973	6,921	0	0	3,067	15,961
2106	5,204	4,614	0	0	3,067	12,885
2107	5,204	4,614	0	0	3,067	12,885
2108	3,676	0	0	0	3,076	6,752
2109	5,204	4,614	0	0	3,067	12,885
2110	5,204	4,614	0	0	3,067	12,885
2111	5,204	4,614	0	0	3,067	12,885
2112	3,676	0	0	0	3,076	6,752
2113	8,280	13,841	0	0	3,067	25,189
2114	6,742	9,227	0	0	3,067	19,037
2115	5,536	5,609	0	0	3,067	14,213
2116	3,676	0	0	0	3,076	6,752
2117	3,666	0	0	0	3,067	6,734
2118	6,742	9,227	0	0	3,067	19,037
2119	5,973	6,921	0	0	3,067	15,961
2120	3,676	0	0	0	3,076	6,752
2121	3,666	0	0	0	3,067	6,734
2122	7,511	11,534	0	0	3,067	22,113
2123	3,666	0	0	0	3,067	6,734

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Decommissioning Cost Analysis***

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TABLE 3.8 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2124	3,676	0	0	0	3,076	6,752
2125	7,511	11,534	0	0	3,067	22,113
2126	3,666	0	0	0	3,067	6,734
2127	3,666	0	0	0	3,067	6,734
2128	7,521	11,534	0	0	3,076	22,131
2129	3,666	0	0	0	3,067	6,734
2130	3,666	0	0	0	3,067	6,734
2131	3,666	0	0	0	3,067	6,734
2132	7,521	11,534	0	0	3,076	22,131
2133	3,666	0	0	0	3,067	6,734
2134	3,666	0	0	0	3,067	6,734
2135	3,666	0	0	0	3,067	6,734
2136	3,676	0	0	0	3,076	6,752
2137	3,666	0	0	0	3,067	6,734
2138	3,666	0	0	0	3,067	6,734
2139	26,781	69,344	0	0	3,067	99,192
2140	3,676	0	0	0	3,076	6,752
2141	3,666	0	0	0	3,067	6,734
2142	3,666	0	0	0	3,067	6,734
2143	3,666	0	0	0	3,067	6,734
2144	3,676	0	0	0	3,076	6,752
2145	5,973	6,921	0	0	3,067	15,961
2146	5,204	4,614	0	0	3,067	12,885
2147	5,204	4,614	0	0	3,067	12,885
2148	3,676	0	0	0	3,076	6,752
2149	3,666	0	0	0	3,067	6,734
2150	5,973	6,921	0	0	3,067	15,961
2151	5,973	6,921	0	0	3,067	15,961
2152	5,983	6,921	0	0	3,076	15,980
2153	3,666	0	0	0	3,067	6,734

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TABLE 3.8 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2154	3,666	0	0	0	3,067	6,734
2155	6,305	7,916	0	0	3,067	17,288
2156	5,214	4,614	0	0	3,076	12,904
2157	5,204	4,614	0	0	3,067	12,885
2158	3,666	0	0	0	3,067	6,734
2159	5,204	4,614	0	0	3,067	12,885
2160	5,214	4,614	0	0	3,076	12,904
2161	5,204	4,614	0	0	3,067	12,885
2162	3,666	0	0	0	3,067	6,734
2163	8,280	13,841	0	0	3,067	25,189
2164	6,752	9,227	0	0	3,076	19,055
2165	5,204	4,614	0	0	3,067	12,885
2166	3,666	0	0	0	3,067	6,734
2167	3,666	0	0	0	3,067	6,734
2168	6,752	9,227	0	0	3,076	19,055
2169	5,973	6,921	0	0	3,067	15,961
2170	3,666	0	0	0	3,067	6,734
2171	3,666	0	0	0	3,067	6,734
2172	7,521	11,534	0	0	3,076	22,131
2173	3,666	0	0	0	3,067	6,734
2174	3,666	0	0	0	3,067	6,734
2175	7,511	11,534	0	0	3,067	22,113
2176	3,676	0	0	0	3,076	6,752
2177	3,666	0	0	0	3,067	6,734
2178	7,511	11,534	0	0	3,067	22,113
2179	3,666	0	0	0	3,067	6,734
2180	3,676	0	0	0	3,076	6,752
2181	3,666	0	0	0	3,067	6,734
2182	7,511	11,534	0	0	3,067	22,113
2183	3,666	0	0	0	3,067	6,734

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Decommissioning Cost Analysis***

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TABLE 3.8 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2184	3,676	0	0	0	3,076	6,752
2185	3,666	0	0	0	3,067	6,734
2186	3,666	0	0	0	3,067	6,734
2187	3,666	0	0	0	3,067	6,734
2188	3,676	0	0	0	3,076	6,752
2189	26,781	69,344	0	0	3,067	99,192
2190	3,666	0	0	0	3,067	6,734
2191	3,666	0	0	0	3,067	6,734
2192	3,676	0	0	0	3,076	6,752
2193	3,050	287	0	0	2,934	6,271
2194	3,146	574	0	0	2,934	6,653
2195	5,784	8,490	0	0	2,934	17,208
2196	4,740	5,331	0	0	2,942	13,013
2197	4,636	5,044	0	0	2,934	12,614
2198	3,241	861	0	0	2,934	7,036
2199	3,098	431	0	0	2,934	6,462
2200	5,357	7,208	0	0	2,934	15,498
2201	5,453	7,495	0	0	2,934	15,881
2202	5,453	7,495	0	0	2,934	15,881
2203	3,098	431	0	0	2,934	6,462
2204	3,154	574	0	0	2,942	6,670
2205	5,453	7,495	0	0	2,934	15,881
2206	4,636	5,044	0	0	2,934	12,614
2207	4,684	5,188	0	0	2,934	12,805
2208	3,154	574	0	0	2,942	6,670
2209	4,636	5,044	0	0	2,934	12,614
2210	4,677	5,166	0	0	2,934	12,776
2211	4,669	5,145	0	0	2,934	12,748
2212	3,140	531	0	0	2,942	6,612
2213	7,745	14,372	0	0	2,934	25,051

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TABLE 3.8 (continued)
SCENARIO 4: DECON WITH 200 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2214	6,207	9,759	0	0	2,934	18,899
2215	4,669	5,145	0	0	2,934	12,748
2216	3,140	2,195	0	0	12,934	18,268
2217	3,146	574	0	0	2,934	6,653
2218	1,058	724	15	0	1,545	3,342
2214	6,207	9,759	0	0	2,934	18,899
2215	4,669	5,145	0	0	2,934	12,748
2216	3,140	2,195	0	0	12,934	18,268
2217	3,146	574	0	0	2,934	6,653
2218	1,058	724	15	0	1,545	3,342
Total	1,254,481	985,388	8,347	73,496	658,134	2,979,847

Note: Columns may not add due to rounding

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TABLE 3.9
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	22,324	776	692	25	9,206	33,023
2034	63,582	8,741	2,434	4,050	18,997	97,804
2035	65,877	37,199	1,850	20,920	22,520	148,367
2036	57,759	22,286	1,465	22,493	20,601	124,604
2037	39,808	11,582	984	15,000	15,667	83,040
2038	13,208	8,859	348	38	10,999	33,453
2039	36,036	65,782	409	820	10,715	113,763
2040	31,920	3,668	559	2,729	7,660	46,535
2041	19,571	5,945	235	16	4,500	30,267
2042	14,782	8,522	174	0	4,223	27,701
2043	8,544	3,992	82	0	3,669	16,287
2044	3,055	0	0	0	3,189	6,244
2045	5,353	6,921	0	0	3,180	15,454
2046	4,584	4,614	0	0	3,180	12,378
2047	4,584	4,614	0	0	3,180	12,378
2048	3,055	0	0	0	3,189	6,244
2049	4,584	4,614	0	0	3,180	12,378
2050	5,353	6,921	0	0	3,180	15,454
2051	5,159	6,339	0	0	3,180	14,678
2052	5,362	6,921	0	0	3,189	15,471
2053	3,142	287	0	0	3,180	6,609
2054	3,238	574	0	0	3,180	6,992
2055	5,545	7,495	0	0	3,180	16,220
2056	4,832	5,331	0	0	3,189	13,352
2057	5,303	6,769	0	0	3,180	15,253
2058	3,334	861	0	0	3,180	7,375
2059	3,190	431	0	0	3,180	6,801
2060	3,150	287	0	0	3,189	6,627
2061	3,238	574	0	0	3,180	6,992
2062	3,238	574	0	0	3,180	6,992

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TABLE 3.9 (continued)
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	3,190	431	0	0	3,180	6,801
2064	3,246	574	0	0	3,189	7,009
2065	3,238	574	0	0	3,180	6,992
2066	3,190	431	0	0	3,180	6,801
2067	3,238	574	0	0	3,180	6,992
2068	3,246	574	0	0	3,189	7,009
2069	3,190	431	0	0	3,180	6,801
2070	3,238	574	0	0	3,180	6,992
2071	3,238	574	0	0	3,180	6,992
2072	3,246	574	0	0	3,189	7,009
2073	3,238	574	0	0	3,180	6,992
2074	3,238	574	0	0	3,180	6,992
2075	3,570	1,570	0	0	3,180	8,320
2076	3,246	574	0	0	3,189	7,009
2077	3,238	2,238	0	0	13,164	18,641
2078	983	594	15	2,862	1,678	6,132
Total	502,484	252,913	9,246	68,953	248,627	1,082,223

Note: Columns may not add due to rounding

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TABLE 3.10
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	7,760	336	305	10	5,078	13,490
2035	46,911	5,748	2,047	1,819	27,237	83,763
2036	67,514	40,656	2,261	23,855	20,777	155,063
2037	72,593	30,228	1,413	27,883	17,376	149,494
2038	46,604	15,462	847	13,940	13,784	90,636
2039	40,664	65,972	409	933	11,388	119,366
2040	37,417	4,345	559	3,106	7,433	52,861
2041	23,328	9,482	235	16	4,587	37,648
2042	16,657	13,784	174	0	4,471	35,086
2043	9,423	6,458	82	0	3,785	19,747
2044	3,055	0	0	0	3,189	6,244
2045	5,353	6,921	0	0	3,180	15,454
2046	4,584	4,614	0	0	3,180	12,378
2047	4,584	4,614	0	0	3,180	12,378
2048	3,055	0	0	0	3,189	6,244
2049	4,584	4,614	0	0	3,180	12,378
2050	5,353	6,921	0	0	3,180	15,454
2051	5,159	6,339	0	0	3,180	14,678
2052	5,362	6,921	0	0	3,189	15,471
2053	3,142	287	0	0	3,180	6,609
2054	3,238	574	0	0	3,180	6,992
2055	5,545	7,495	0	0	3,180	16,220
2056	4,832	5,331	0	0	3,189	13,352
2057	5,303	6,769	0	0	3,180	15,253
2058	3,334	861	0	0	3,180	7,375
2059	3,190	431	0	0	3,180	6,801
2060	3,150	287	0	0	3,189	6,627
2061	3,238	574	0	0	3,180	6,992
2062	3,238	574	0	0	3,180	6,992
2063	3,190	431	0	0	3,180	6,801

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TABLE 3.10 (continued)
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2064	3,246	574	0	0	3,189	7,009
2065	3,238	574	0	0	3,180	6,992
2066	3,190	431	0	0	3,180	6,801
2067	3,238	574	0	0	3,180	6,992
2068	3,246	574	0	0	3,189	7,009
2069	3,190	431	0	0	3,180	6,801
2070	3,238	574	0	0	3,180	6,992
2071	3,238	574	0	0	3,180	6,992
2072	3,246	574	0	0	3,189	7,009
2073	3,238	574	0	0	3,180	6,992
2074	3,238	574	0	0	3,180	6,992
2075	3,570	1,570	0	0	3,180	8,320
2076	3,246	574	0	0	3,189	7,009
2077	3,238	2,238	0	0	13,164	18,641
2078	983	594	15	2,862	1,678	6,132
Total	497,942	268,032	8,347	74,423	235,787	1,084,531

Note: Columns may not add due to rounding

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TABLE 3.11
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	18,447	579	692	25	4,145	23,888
2034	46,143	3,822	1,742	503	24,345	76,555
2035	16,590	2,662	497	150	14,007	33,906
2036	12,851	1,279	349	21	13,950	28,450
2037	12,769	1,134	348	21	13,912	28,184
2038	12,721	990	348	21	13,912	27,992
2039	32,557	64,654	318	19	12,377	109,925
2040	4,748	727	175	11	5,173	10,832
2041	4,783	870	174	11	5,159	10,996
2042	4,735	726	174	11	5,159	10,804
2043	4,687	582	174	11	5,159	10,613
2044	4,700	583	175	11	5,173	10,641
2045	4,687	582	174	11	5,159	10,613
2046	4,592	295	174	11	5,159	10,230
2047	4,592	295	174	11	5,159	10,230
2048	4,604	296	175	11	5,173	10,258
2049	4,592	295	174	11	5,159	10,230
2050	4,687	582	174	11	5,159	10,613
2051	4,687	582	174	11	5,159	10,613
2052	4,700	583	175	11	5,173	10,641
2053	4,687	582	174	11	5,159	10,613
2054	4,687	582	174	11	5,159	10,613
2055	4,687	582	174	11	5,159	10,613
2056	4,700	583	175	11	5,173	10,641
2057	4,687	582	174	11	5,159	10,613
2058	4,687	582	174	11	5,159	10,613
2059	4,687	582	174	11	5,159	10,613
2060	4,700	583	175	11	5,173	10,641
2061	4,687	582	174	11	5,159	10,613
2062	4,687	582	174	11	5,159	10,613

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TABLE 3.11 (continued)
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	4,687	582	174	11	5,159	10,613
2064	4,696	572	175	11	5,173	10,626
2065	3,942	294	174	10	3,247	7,668
2066	3,942	294	174	10	3,247	7,668
2067	3,942	294	174	10	3,247	7,668
2068	3,953	295	175	10	3,256	7,689
2069	3,942	294	174	10	3,247	7,668
2070	3,942	294	174	10	3,247	7,668
2071	3,942	294	174	10	3,247	7,668
2072	3,953	295	175	10	3,256	7,689
2073	3,942	294	174	10	3,247	7,668
2074	3,942	294	174	10	3,247	7,668
2075	3,942	294	174	10	3,247	7,668
2076	3,953	295	175	10	3,256	7,689
2077	3,942	294	174	10	3,247	7,668
2078	3,942	294	174	10	3,247	7,668
2079	3,942	294	174	10	3,247	7,668
2080	3,953	295	175	10	3,256	7,689
2081	3,942	294	174	10	3,247	7,668
2082	3,942	294	174	10	3,247	7,668
2083	3,942	294	174	10	3,247	7,668
2084	3,953	295	175	10	3,256	7,689
2085	3,942	294	174	10	3,247	7,668
2086	3,942	294	174	10	3,247	7,668
2087	18,999	2,111	758	729	3,199	25,796
2088	45,688	5,640	1,747	1,239	3,031	57,345
2089	52,326	36,394	1,665	20,208	15,137	125,731
2090	41,397	18,920	1,422	17,534	10,610	89,883
2091	35,648	8,162	1,306	14,802	7,509	67,427
2092	8,980	1,167	197	1,677	3,040	15,061

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Decommissioning Cost Analysis***

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TABLE 3.11 (continued)
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	18,089	3,901	279	27	2,021	24,317
2094	12,585	8,129	174	0	962	21,849
2095	9,102	5,880	126	0	695	15,803
Total	598,752	185,878	20,162	57,466	343,387	1,205,645

Note: Columns may not add due to rounding

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Decommissioning Cost Analysis***

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TABLE 3.12
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	7,249	254	305	11	3,507	11,325
2035	45,009	5,734	1,742	336	26,288	79,109
2036	23,213	3,341	807	447	17,173	44,981
2037	10,905	1,140	348	19	12,561	24,974
2038	10,857	996	348	19	12,561	24,782
2039	31,030	64,662	318	18	11,274	107,302
2040	4,803	745	175	11	5,235	10,969
2041	4,838	888	174	11	5,221	11,132
2042	4,791	744	174	11	5,221	10,941
2043	4,743	601	174	11	5,221	10,749
2044	4,756	602	175	11	5,235	10,778
2045	4,743	601	174	11	5,221	10,749
2046	4,647	314	174	11	5,221	10,367
2047	4,647	314	174	11	5,221	10,367
2048	4,660	315	175	11	5,235	10,395
2049	4,647	314	174	11	5,221	10,367
2050	4,743	601	174	11	5,221	10,749
2051	4,743	601	174	11	5,221	10,749
2052	4,756	602	175	11	5,235	10,778
2053	4,743	601	174	11	5,221	10,749
2054	4,743	601	174	11	5,221	10,749
2055	4,743	601	174	11	5,221	10,749
2056	4,756	602	175	11	5,235	10,778
2057	4,743	601	174	11	5,221	10,749
2058	4,743	601	174	11	5,221	10,749
2059	4,743	601	174	11	5,221	10,749
2060	4,756	602	175	11	5,235	10,778
2061	4,743	601	174	11	5,221	10,749
2062	4,743	601	174	11	5,221	10,749
2063	4,743	601	174	11	5,221	10,749

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Decommissioning Cost Analysis***

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TABLE 3.12 (continued)
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2064	4,752	590	175	11	5,235	10,762
2065	823	308	174	10	3,355	4,670
2066	823	308	174	10	3,355	4,670
2067	823	308	174	10	3,355	4,670
2068	826	308	175	10	3,365	4,683
2069	823	308	174	10	3,355	4,670
2070	823	308	174	10	3,355	4,670
2071	823	308	174	10	3,355	4,670
2072	826	308	175	10	3,365	4,683
2073	823	308	174	10	3,355	4,670
2074	823	308	174	10	3,355	4,670
2075	823	308	174	10	3,355	4,670
2076	826	308	175	10	3,365	4,683
2077	823	308	174	10	3,355	4,670
2078	823	308	174	10	3,355	4,670
2079	823	308	174	10	3,355	4,670
2080	826	308	175	10	3,365	4,683
2081	823	308	174	10	3,355	4,670
2082	823	308	174	10	3,355	4,670
2083	823	308	174	10	3,355	4,670
2084	826	308	175	10	3,365	4,683
2085	823	308	174	10	3,355	4,670
2086	823	308	174	10	3,355	4,670
2087	823	308	174	10	3,355	4,670
2088	16,232	2,279	1,042	1,079	3,151	23,784
2089	30,943	7,318	1,737	2,199	3,588	45,784
2090	57,907	44,332	1,655	23,815	17,213	144,922
2091	55,239	13,374	1,333	18,095	8,227	96,268
2092	51,390	9,469	1,171	15,116	6,778	83,924
2093	23,224	6,185	279	27	1,746	31,462

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TABLE 3.12 (continued)
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2094	14,461	13,418	174	0	594	28,648
2095	10,459	9,705	126	0	430	20,720
Total	525,529	203,731	19,753	61,668	332,940	1,143,621

Note: Columns may not add due to rounding

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Decommissioning Cost Analysis***

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TABLE 3.13
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	18,447	579	692	25	4,145	23,888
2034	46,143	3,822	1,742	503	24,345	76,555
2035	16,399	2,087	497	150	14,007	33,141
2036	12,660	705	349	21	13,950	27,684
2037	12,625	704	348	21	13,912	27,610
2038	15,404	9,041	348	21	13,912	38,727
2039	32,688	65,048	318	19	12,390	110,463
2040	4,604	296	175	11	5,246	10,331
2041	4,592	295	174	11	5,231	10,303
2042	4,592	295	174	11	5,231	10,303
2043	4,592	295	174	11	5,231	10,303
2044	4,604	296	175	11	5,246	10,331
2045	4,592	295	174	11	5,231	10,303
2046	4,592	295	174	11	5,231	10,303
2047	4,592	295	174	11	5,231	10,303
2048	4,604	296	175	11	5,246	10,331
2049	4,592	295	174	11	5,231	10,303
2050	4,592	295	174	11	5,231	10,303
2051	4,592	295	174	11	5,231	10,303
2052	4,604	296	175	11	5,246	10,331
2053	4,687	582	174	11	5,231	10,686
2054	4,783	870	174	11	5,231	11,069
2055	4,783	870	174	11	5,231	11,069
2056	4,843	1,014	175	11	5,246	11,288
2057	4,735	726	174	11	5,231	10,877
2058	4,879	1,157	174	11	5,231	11,451
2059	4,735	726	174	11	5,231	10,877
2060	4,700	583	175	11	5,246	10,714
2061	4,783	870	174	11	5,231	11,069
2062	4,783	870	174	11	5,231	11,069

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TABLE 3.13 (continued)
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	4,735	726	174	11	5,231	10,877
2064	4,796	870	175	11	5,246	11,097
2065	4,783	870	174	11	5,231	11,069
2066	4,735	726	174	11	5,231	10,877
2067	4,783	870	174	11	5,231	11,069
2068	4,796	870	175	11	5,246	11,097
2069	4,735	726	174	11	5,231	10,877
2070	4,783	870	174	11	5,231	11,069
2071	4,783	870	174	11	5,231	11,069
2072	4,796	870	175	11	5,246	11,097
2073	4,783	870	174	11	5,231	11,069
2074	4,783	870	174	11	5,231	11,069
2075	5,115	1,865	174	11	5,231	12,396
2076	4,796	870	175	11	5,246	11,097
2077	4,783	870	174	11	5,231	11,069
2078	3,942	294	174	10	2,778	7,199
2079	3,942	294	174	10	2,778	7,199
2080	3,953	295	175	10	2,786	7,219
2081	3,942	294	174	10	2,778	7,199
2082	3,942	294	174	10	2,778	7,199
2083	3,942	294	174	10	2,778	7,199
2084	3,953	295	175	10	2,786	7,219
2085	3,942	294	174	10	2,778	7,199
2086	3,942	294	174	10	2,778	7,199
2087	11,803	1,243	479	386	2,844	16,754
2088	45,111	5,423	1,747	1,574	3,061	56,916
2089	51,818	31,091	1,681	16,603	12,903	114,096
2090	44,188	24,104	1,471	19,038	12,141	100,943
2091	35,668	8,206	1,306	14,802	7,520	67,503
2092	13,716	2,324	383	3,784	3,768	23,975

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Decommissioning Cost Analysis***

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TABLE 3.13 (continued)
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS, UNIT 1
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2093	18,089	3,901	279	27	2,021	24,317
2094	12,585	8,129	174	0	962	21,849
2095	9,102	5,880	126	0	695	15,803
Total	611,385	200,655	20,134	57,467	366,528	1,256,169

Note: Columns may not add due to rounding

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Decommissioning Cost Analysis***

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TABLE 3.14
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	7,249	254	305	11	3,507	11,325
2035	44,818	5,160	1,742	336	26,288	78,343
2036	23,021	2,767	807	447	17,173	44,216
2037	10,761	710	348	19	12,561	24,400
2038	13,540	9,047	348	19	12,561	35,517
2039	31,161	65,056	318	18	11,274	107,827
2040	4,660	315	175	11	5,236	10,395
2041	4,647	314	174	11	5,221	10,367
2042	4,647	314	174	11	5,221	10,367
2043	4,647	314	174	11	5,221	10,367
2044	4,660	315	175	11	5,236	10,395
2045	4,647	314	174	11	5,221	10,367
2046	4,647	314	174	11	5,221	10,367
2047	4,647	314	174	11	5,221	10,367
2048	4,660	315	175	11	5,236	10,395
2049	4,647	314	174	11	5,221	10,367
2050	4,647	314	174	11	5,221	10,367
2051	4,647	314	174	11	5,221	10,367
2052	4,660	315	175	11	5,236	10,395
2053	4,743	601	174	11	5,221	10,750
2054	4,838	888	174	11	5,221	11,132
2055	4,838	888	174	11	5,221	11,132
2056	4,899	1,032	175	11	5,236	11,352
2057	4,791	744	174	11	5,221	10,941
2058	4,934	1,175	174	11	5,221	11,515
2059	4,791	744	174	11	5,221	10,941
2060	4,756	602	175	11	5,236	10,778
2061	4,838	888	174	11	5,221	11,132
2062	4,838	888	174	11	5,221	11,132
2063	4,791	744	174	11	5,221	10,941

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TABLE 3.14 (continued)
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2064	4,851	889	175	11	5,236	11,161
2065	4,838	888	174	11	5,221	11,132
2066	4,791	744	174	11	5,221	10,941
2067	4,838	888	174	11	5,221	11,132
2068	4,851	889	175	11	5,236	11,161
2069	4,791	744	174	11	5,221	10,941
2070	4,838	888	174	11	5,221	11,132
2071	4,838	888	174	11	5,221	11,132
2072	4,851	889	175	11	5,236	11,161
2073	4,838	888	174	11	5,221	11,132
2074	4,838	888	174	11	5,221	11,132
2075	5,170	1,883	174	11	5,221	12,460
2076	4,851	889	175	11	5,236	11,161
2077	4,838	888	174	11	5,221	11,132
2078	823	308	174	10	2,781	4,096
2079	823	308	174	10	2,781	4,096
2080	826	308	175	10	2,789	4,107
2081	823	308	174	10	2,781	4,096
2082	823	308	174	10	2,781	4,096
2083	823	308	174	10	2,781	4,096
2084	826	308	175	10	2,789	4,107
2085	823	308	174	10	2,781	4,096
2086	823	308	174	10	2,781	4,096
2087	823	308	174	10	2,781	4,096
2088	11,275	1,645	763	735	2,844	17,262
2089	29,172	4,796	1,742	1,233	2,820	39,763
2090	57,665	46,374	1,665	24,775	17,714	148,193
2091	55,538	14,003	1,333	18,435	8,446	97,755
2092	51,408	9,507	1,171	15,116	6,795	83,997
2093	23,224	6,185	279	27	1,746	31,462

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TABLE 3.14 (continued)
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS, UNIT 2
TOTAL ANNUAL EXPENDITURES
(thousands, 2017 dollars)

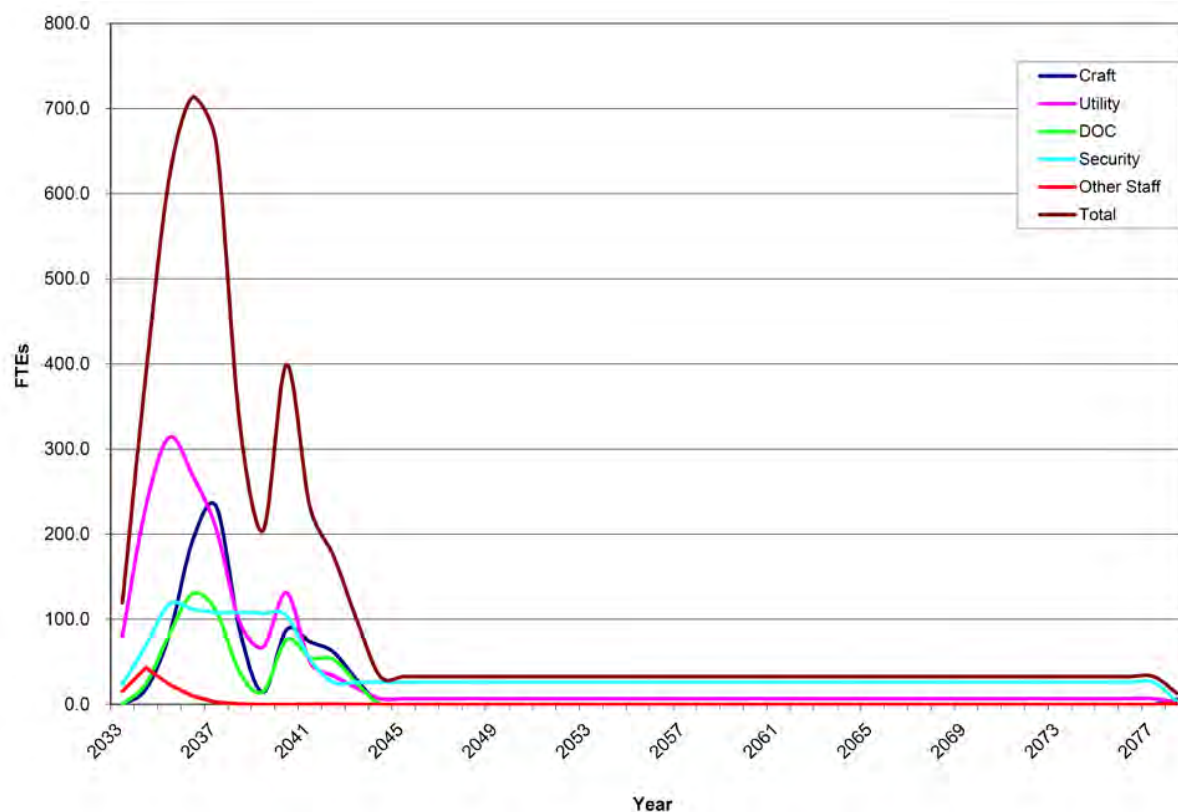
Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2094	14,461	13,418	174	0	594	28,648
2095	10,459	9,705	126	0	430	20,720
Total	573,537	218,128	19,489	61,669	351,128	1,223,951

Note: Columns may not add due to rounding

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**FIGURE 3.1
SCENARIO 2: DECON WITH 60 YEAR DFS
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
MANPOWER LEVELS**

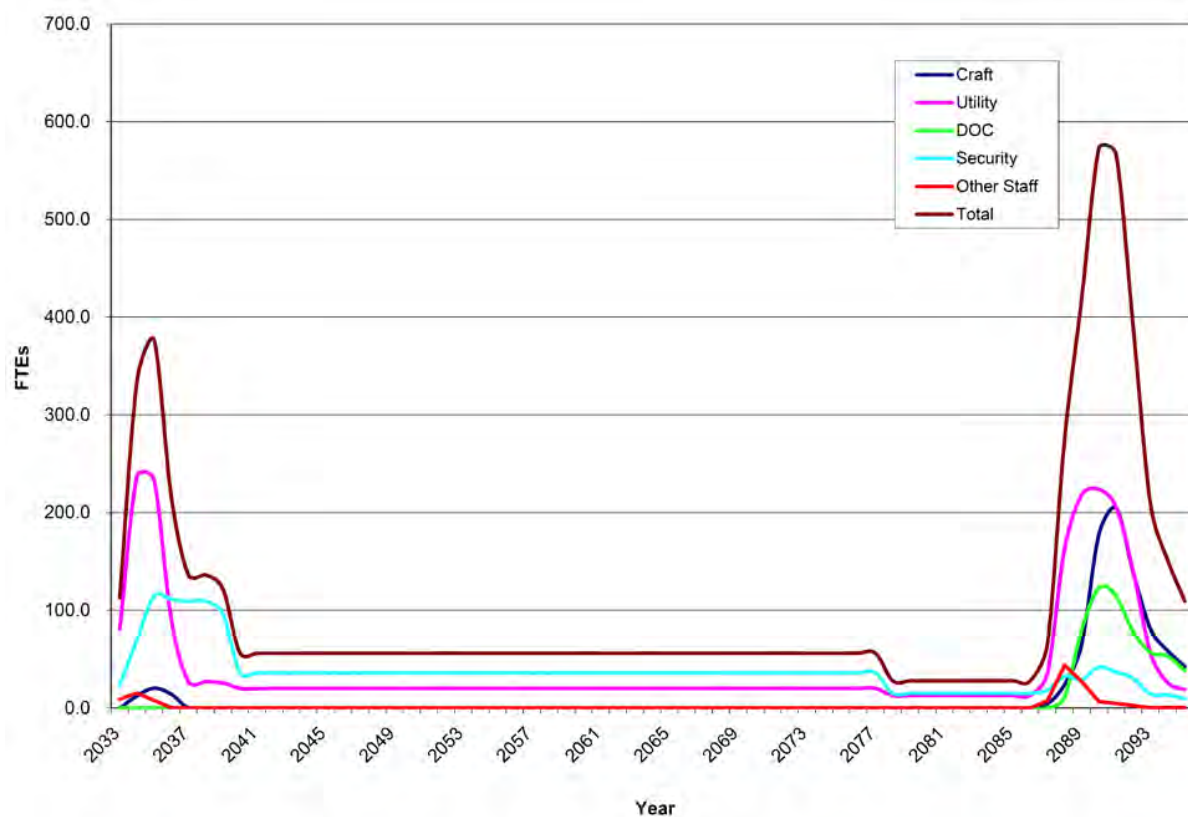


Note that the labor hour basis of this chart was taken from Appendix D; however not all line items in Appendix D have labor hour values available (e.g. spent fuel canister loading estimates from Xcel Energy)

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FIGURE 3.2
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
MANPOWER LEVELS



Note that the labor hour basis of this chart was taken from Appendix I; however not all line items in Appendix I have labor hour values available (e.g. spent fuel canister loading estimates from Xcel Energy)

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4. SCHEDULE ESTIMATE

The schedules for the decommissioning scenarios considered in this study follow the sequence presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management plans described in Section 3.4.1.

A schedule or sequence of activities for the DECON alternative is presented in Figure 4.1. The schedule is also representative of the work activities identified in the delayed dismantling scenarios, absent any spent fuel constraints. The scheduling sequence is based on the fuel being removed from the spent fuel pool within the first five years after operations cease. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the cost tables, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the "Microsoft Project Professional" computer software.^[40]

4.1 SCHEDULE ESTIMATE ASSUMPTIONS

The schedule reflects the results of a precedence network developed for the site decommissioning activities, i.e., a PERT (Program Evaluation and Review Technique) Software Package. The work activity durations used in the precedence network reflect the actual man-hour estimates from the cost table, adjusted by stretching certain activities over their slack range and shifting the start and end dates of others. The following assumptions were made in the development of the decommissioning schedule:

- The fuel handling area of the auxiliary building is isolated until such time that all spent fuel has been discharged from the storage pool to the DOE or to the ISFSI. Decontamination and dismantling of the spent fuel storage pool is initiated once the transfer of spent fuel is complete (DECON option).
- All work (except vessel and internals removal) is performed during an 8-hour workday, 5 days per week, with no overtime. There are eleven paid holidays per year.
- Reactor and internals removal activities are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.
- Multiple crews work parallel activities to the maximum extent possible, consistent with optimum efficiency, adequate access for cutting, removal and laydown space, and with the stringent safety measures necessary during demolition of heavy components and structures.

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- For plant systems removal, the systems with the longest removal durations in areas on the critical path are considered to determine the duration of the activity.

4.2 PROJECT SCHEDULE

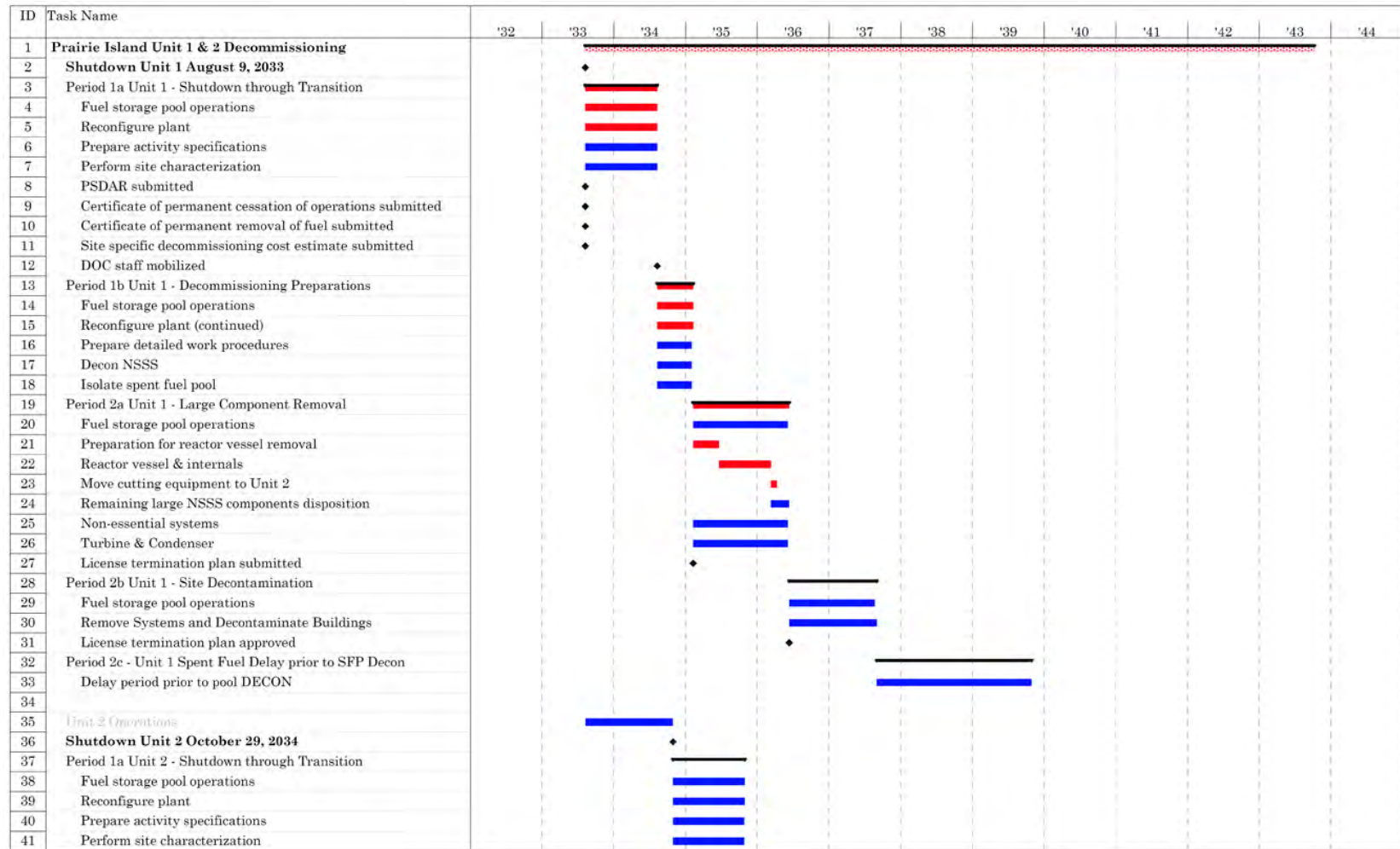
The period-dependent costs presented in the detailed cost tables are based upon the durations developed in the schedules for decommissioning Prairie Island. Durations are established between several milestones in each project period; these durations are used to establish a critical path for the entire project. In turn, the critical path duration for each period is used as the basis for determining the period-dependent costs. A second parallel path is also shown for the spent fuel cooling period, which determines the release of the auxiliary building for final decontamination.

Project timelines are provided in Figures 4.2 through 4.8, with milestone dates based on a 2033/2034 shutdown dates. The fuel pool is emptied approximately five years after shutdown, while ISFSI operations continue until the DOE completes the transfer of assemblies. Deferred decommissioning operations in the SAFSTOR scenarios are assumed to commence so that the operating licenses are terminated within a 60-year period from the cessation of operations

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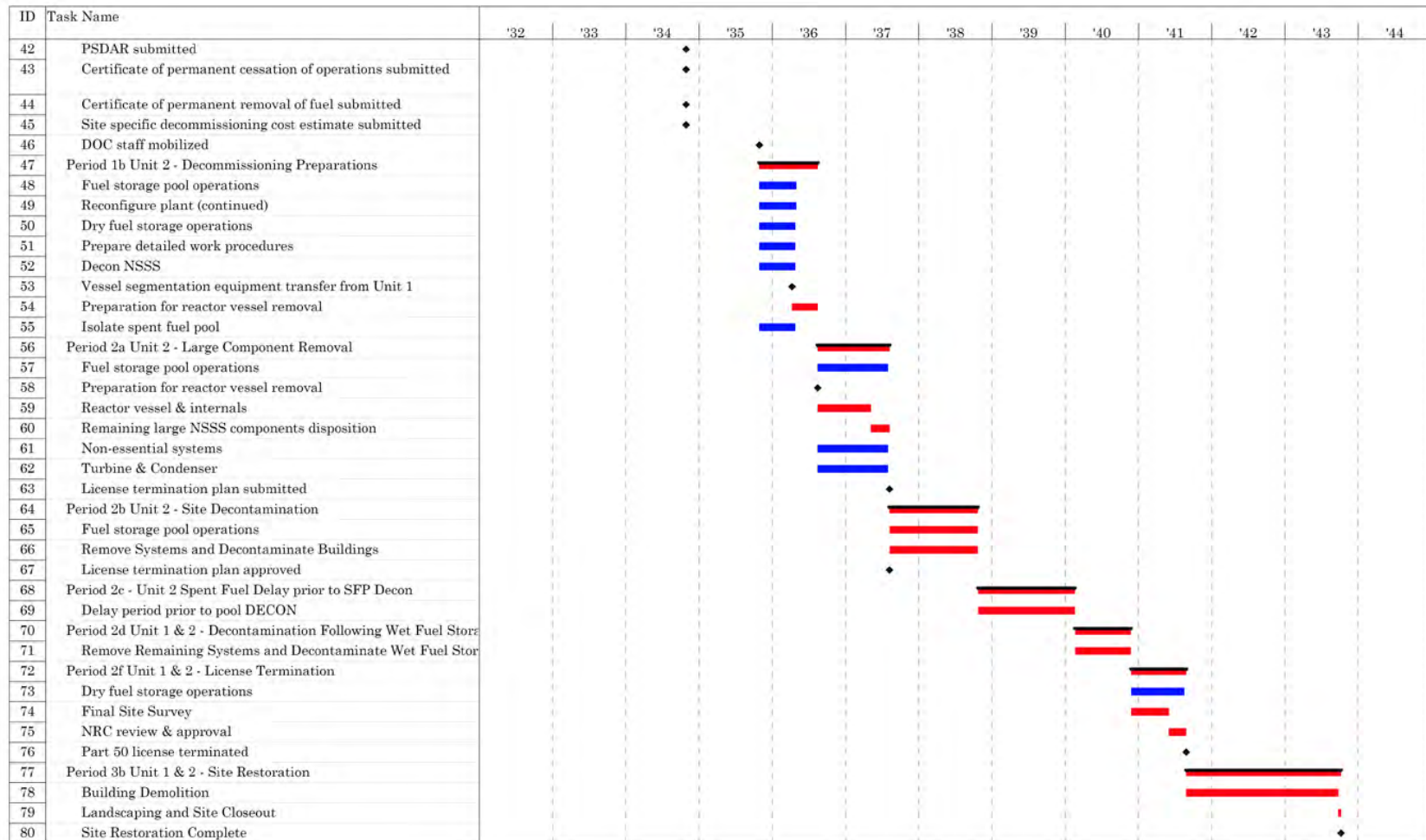
**FIGURE 4.1
DECON ACTIVITY SCHEDULE**



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**FIGURE 4.1 (continued)
DECON ACTIVITY SCHEDULE**



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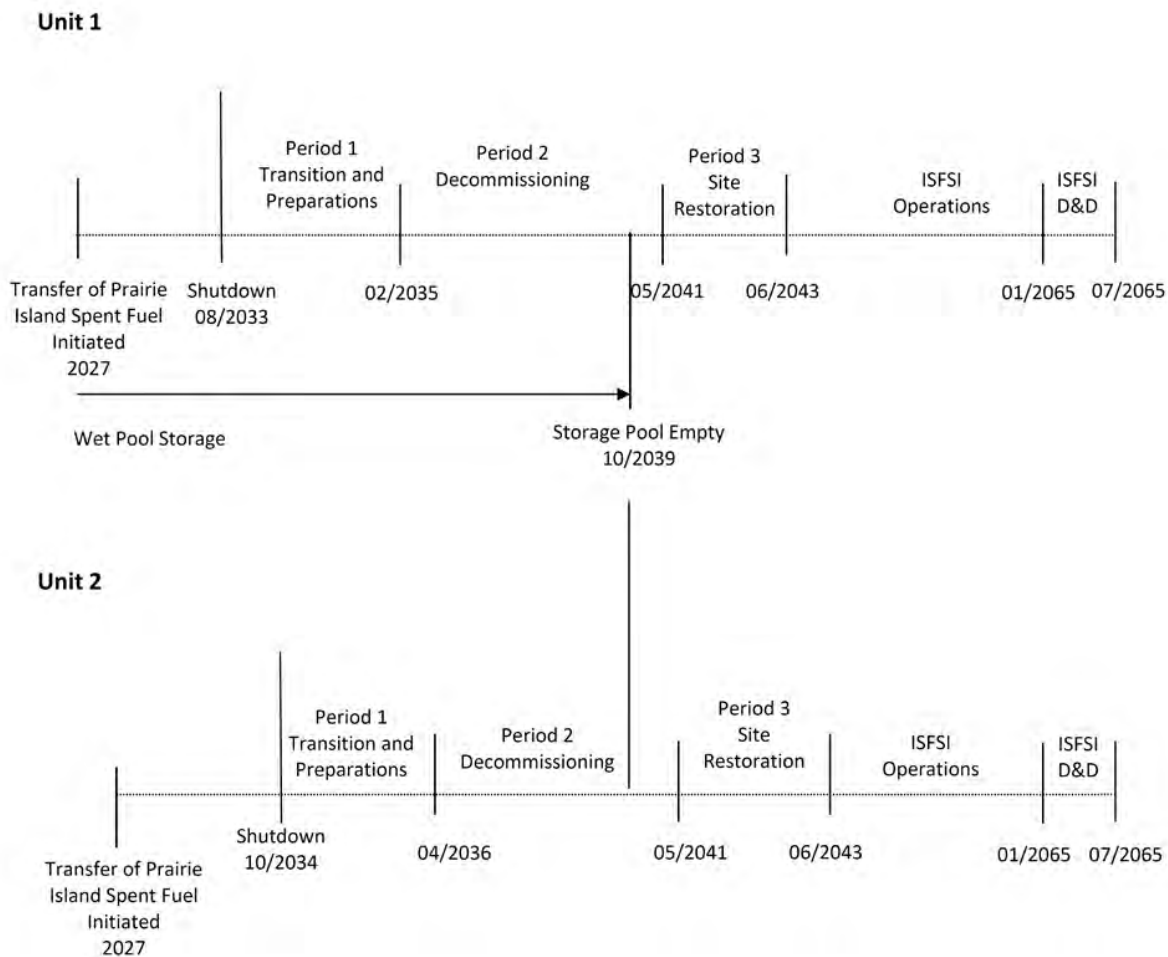
**FIGURE 4.1 (continued)
LEGEND**

1. Red scheduling bars indicate critical path activities
2. Blue scheduling bars associated with non-critical path activities
3. Diamond symbols indicate major milestones

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**FIGURE 4.2
SCENARIO 1: DECON WITH 32 YEAR DFS
DECOMMISSIONING TIMELINE**
(not to scale)

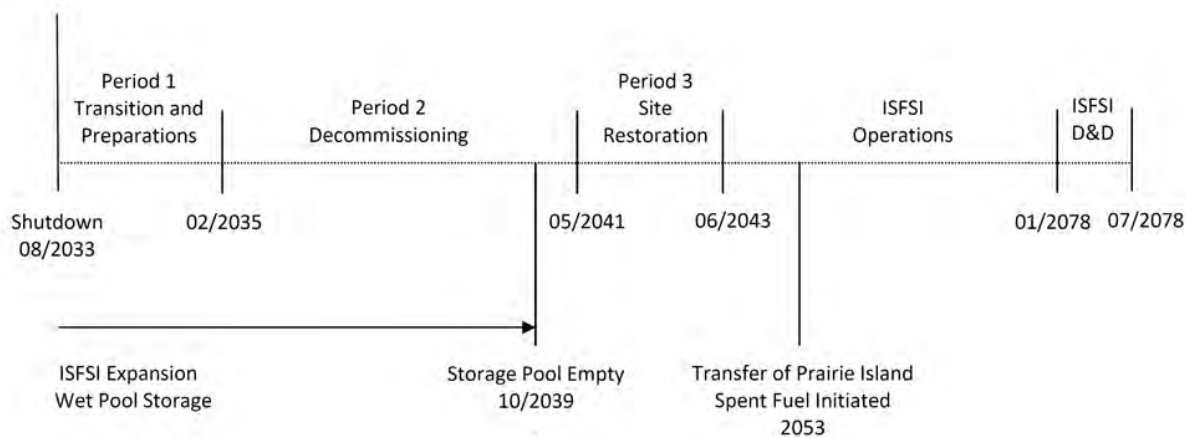


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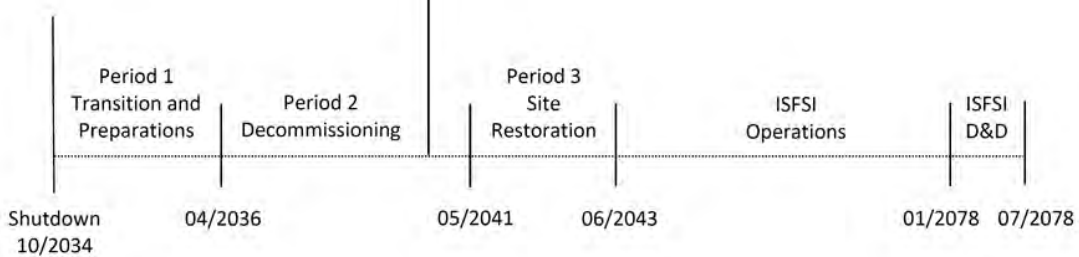
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**FIGURE 4.3
SCENARIO 2: DECON WITH 60 YEAR DFS
DECOMMISSIONING TIMELINE
(not to scale)**

Unit 1



Unit 2

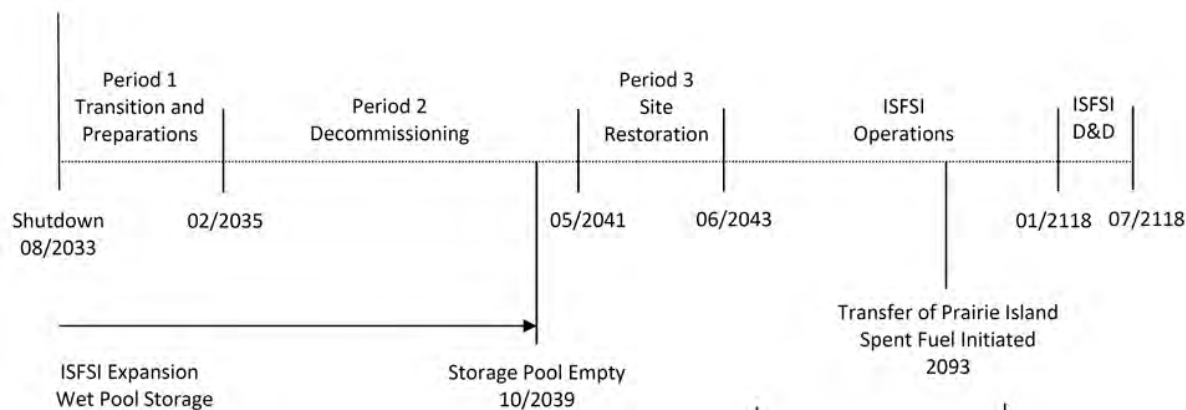


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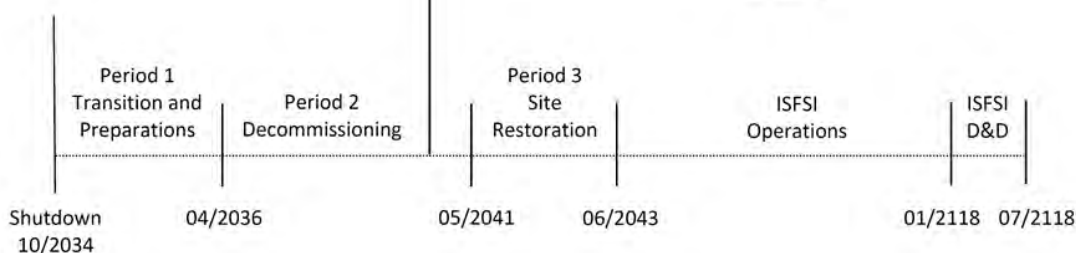
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FIGURE 4.4
SCENARIO 3: DECON WITH 100 YEAR DFS
DECOMMISSIONING TIMELINE
(not to scale)

Unit 1



Unit 2

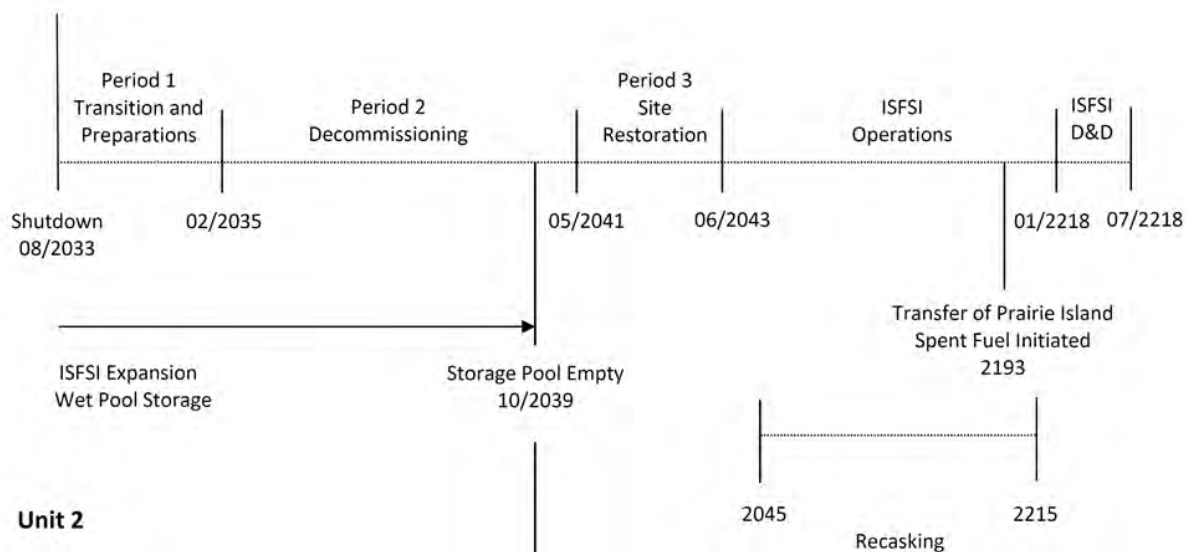


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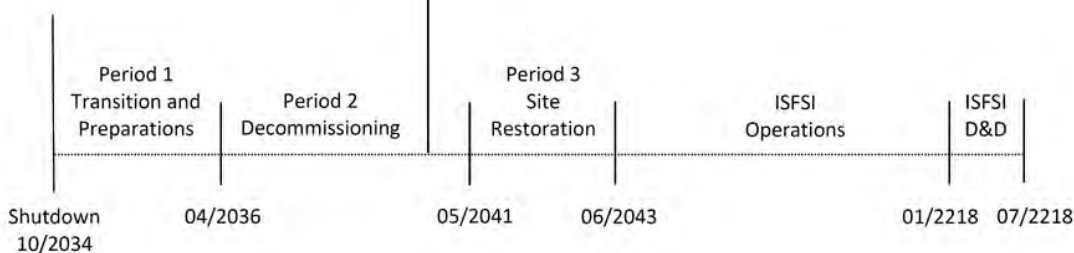
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FIGURE 4.5
SCENARIO 4: DECON WITH 200 YEAR DFS
DECOMMISSIONING TIMELINE
(not to scale)

Unit 1



Unit 2

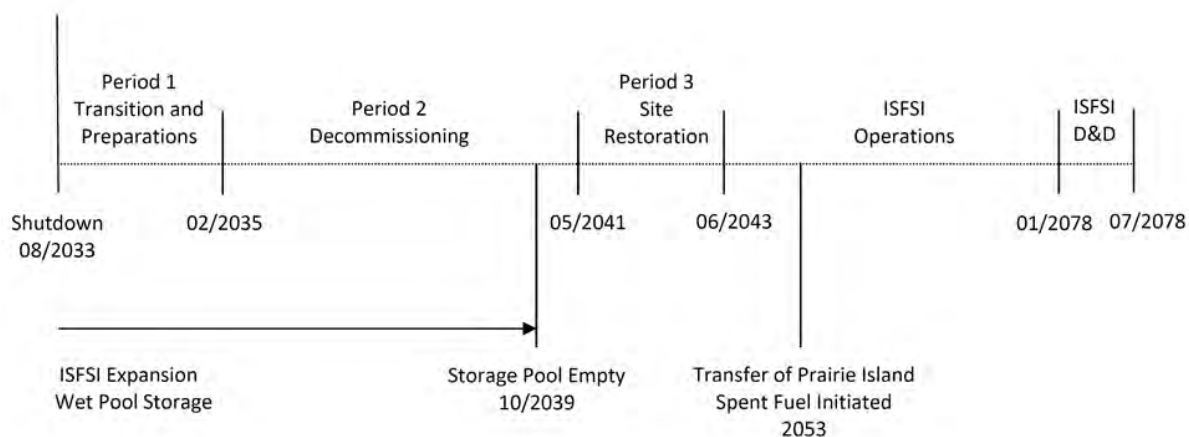


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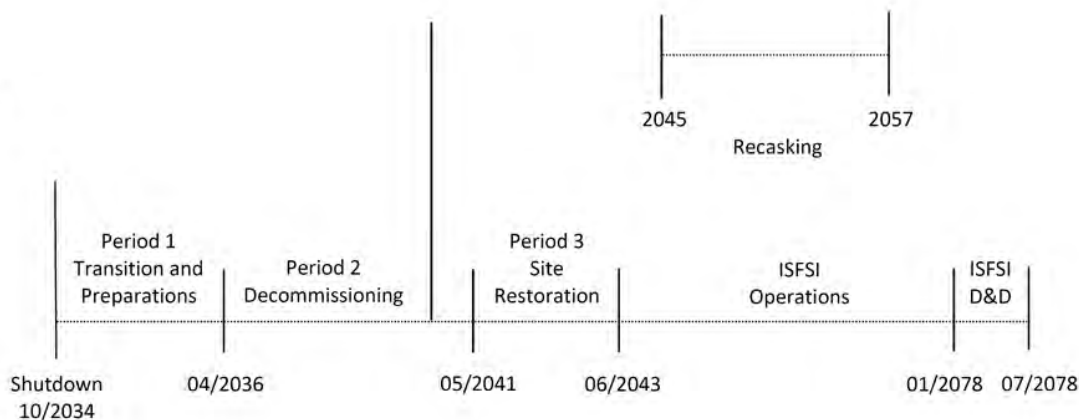
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FIGURE 4.6
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
DECOMMISSIONING TIMELINE
(not to scale)

Unit 1



Unit 2

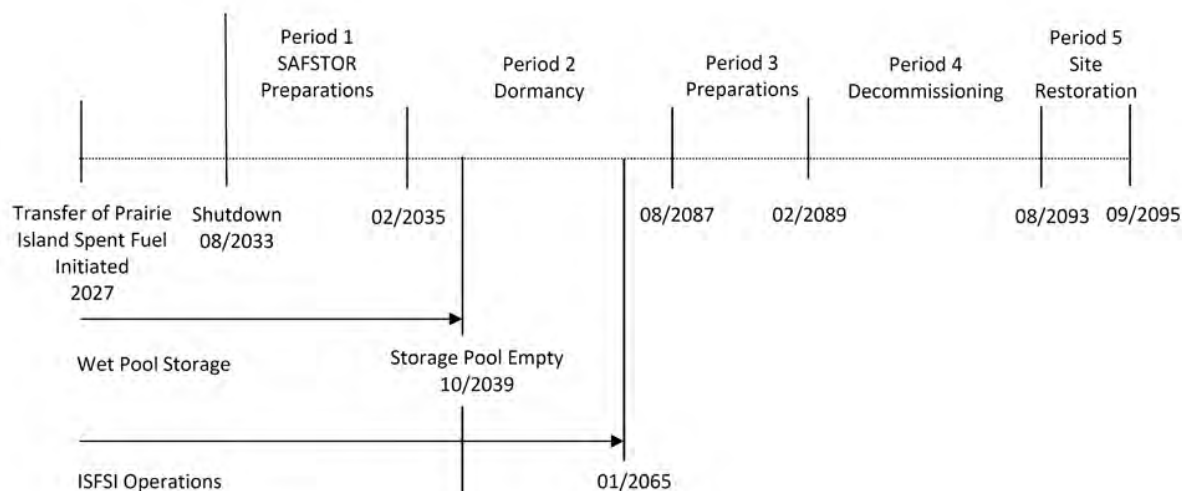


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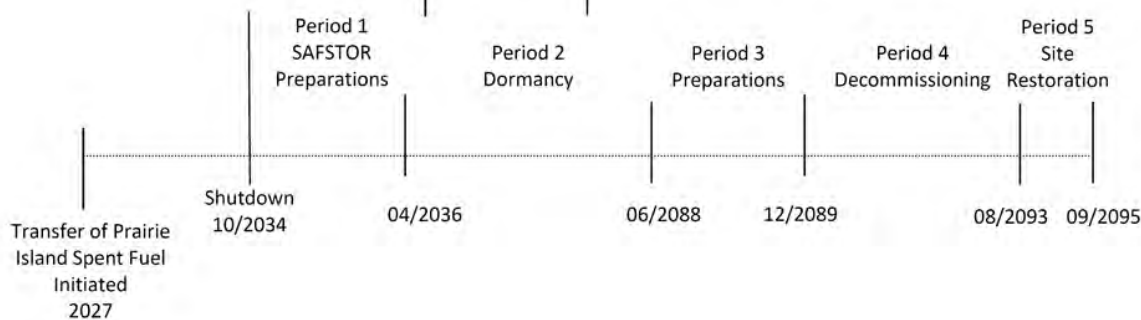
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FIGURE 4.7
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
DECOMMISSIONING TIMELINE
(not to scale)

Unit 1



Unit 2

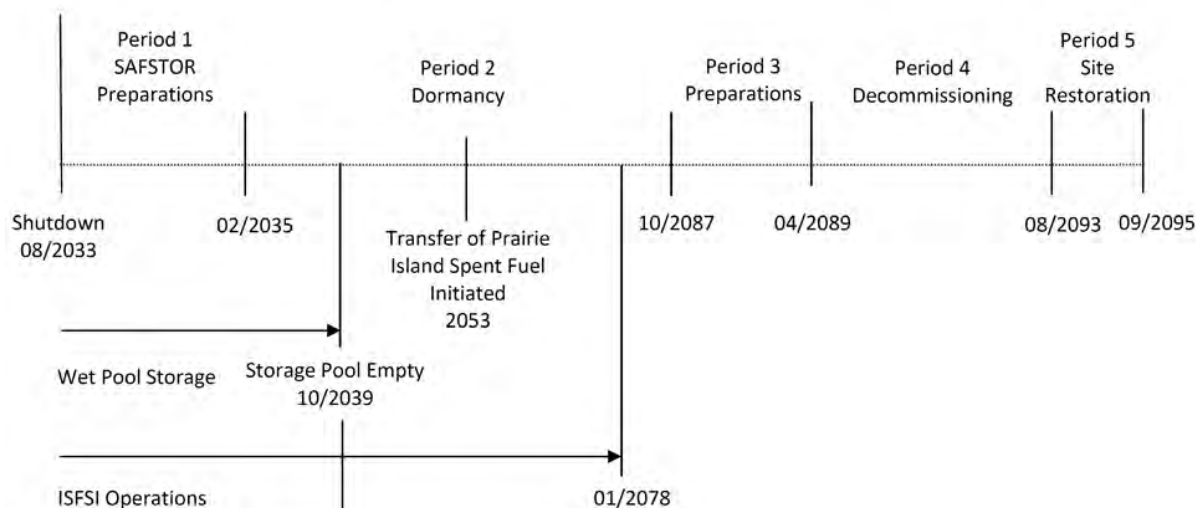


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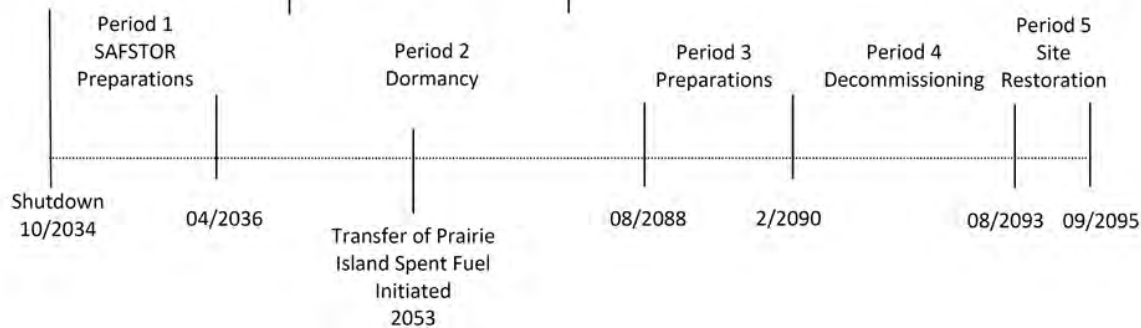
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FIGURE 4.8
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
DECOMMISSIONING TIMELINE
(not to scale)

Unit 1



Unit 2



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5. RADIOACTIVE WASTES

The objectives of the decommissioning process are the removal of all radioactive material from the site that would restrict its future use and the termination of the NRC licenses. This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act,^[41] the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, Part 71 defines radioactive material as it pertains to transportation and Part 61 specifies its disposition.

Most of the materials being transported for controlled burial are categorized as Low Specific Activity (LSA) or Surface Contaminated Object (SCO) materials containing Type A quantities, as defined in 49 CFR Parts 173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3, as defined in 10 CFR §173.411). For this study, commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations.

The destinations for the various waste streams from decommissioning are identified in Figures 5.1 and 5.2. The volumes of radioactive waste generated during the various decommissioning activities at the site are shown on a line-item basis in Appendices C through J and summarized in Tables 5.1 through 5.7. The quantified waste volume summaries shown in these tables are consistent with §61 classifications. The volumes are calculated based on the exterior dimensions for containerized material and on the displaced volume of components serving as their own waste containers.

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

No process system containing/handling radioactive substances at shutdown is presumed to meet material release criteria by decay alone, i.e., systems radioactive at shutdown will still be radioactive over the time period during which the decommissioning is accomplished, due to the presence of long-lived radionuclides.

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While the dose rates decrease with time, radionuclides such as ^{137}Cs will still control the disposition requirements.

The waste material generated in the decontamination and dismantling of Prairie Island is primarily generated during Period 2 of the DECON alternatives and Period 4 of the SAFSTOR alternatives. Material that is considered potentially contaminated when removed from the radiologically controlled area is sent to processing facilities in Tennessee for conditioning and disposal. Heavily contaminated components and activated materials are routed for controlled disposal. The disposal volumes reported in the tables reflect the savings resulting from reprocessing and recycling.

Disposal fees are calculated using representative costs, with surcharges added for the highly activated components, for example, generated in the segmentation of the reactor vessels. The cost to dispose of the majority of the material generated from the decontamination and dismantling activities is based upon representative rates.

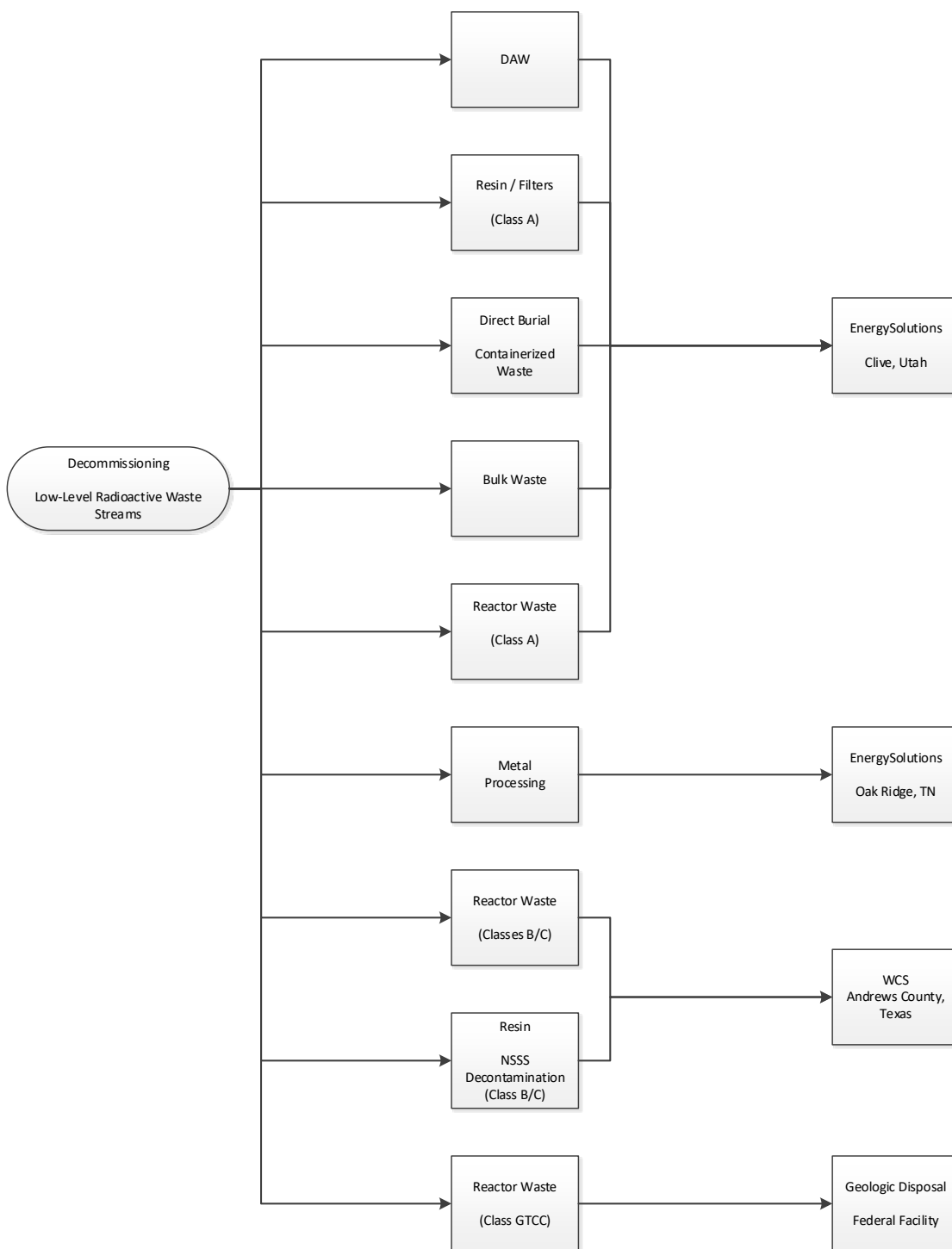
EnergySolutions is not able to accept the higher activity waste (Class B and C) generated in the decontamination of the NSSS and segmentation of the components closest to the core. Waste disposal costs for the higher activity waste (Class B and C) are based upon preliminary and indicative information on the cost for such from WCS.

A small quantity of material generated during the Prairie Island decommissioning will not be considered suitable for near-surface disposal, and is assumed to be disposed of in a geologic repository, in a manner similar to that envisioned for spent fuel disposal. Such material, known as Greater-Than-Class-C or GTCC material, is estimated to require eight spent fuel storage canisters (or the equivalent) to dispose of the most radioactive portions of the reactor vessel internals. The volume and weight reported in Tables 5.1 through 5.7 represent the packaged weight and volume of the spent fuel storage canisters.

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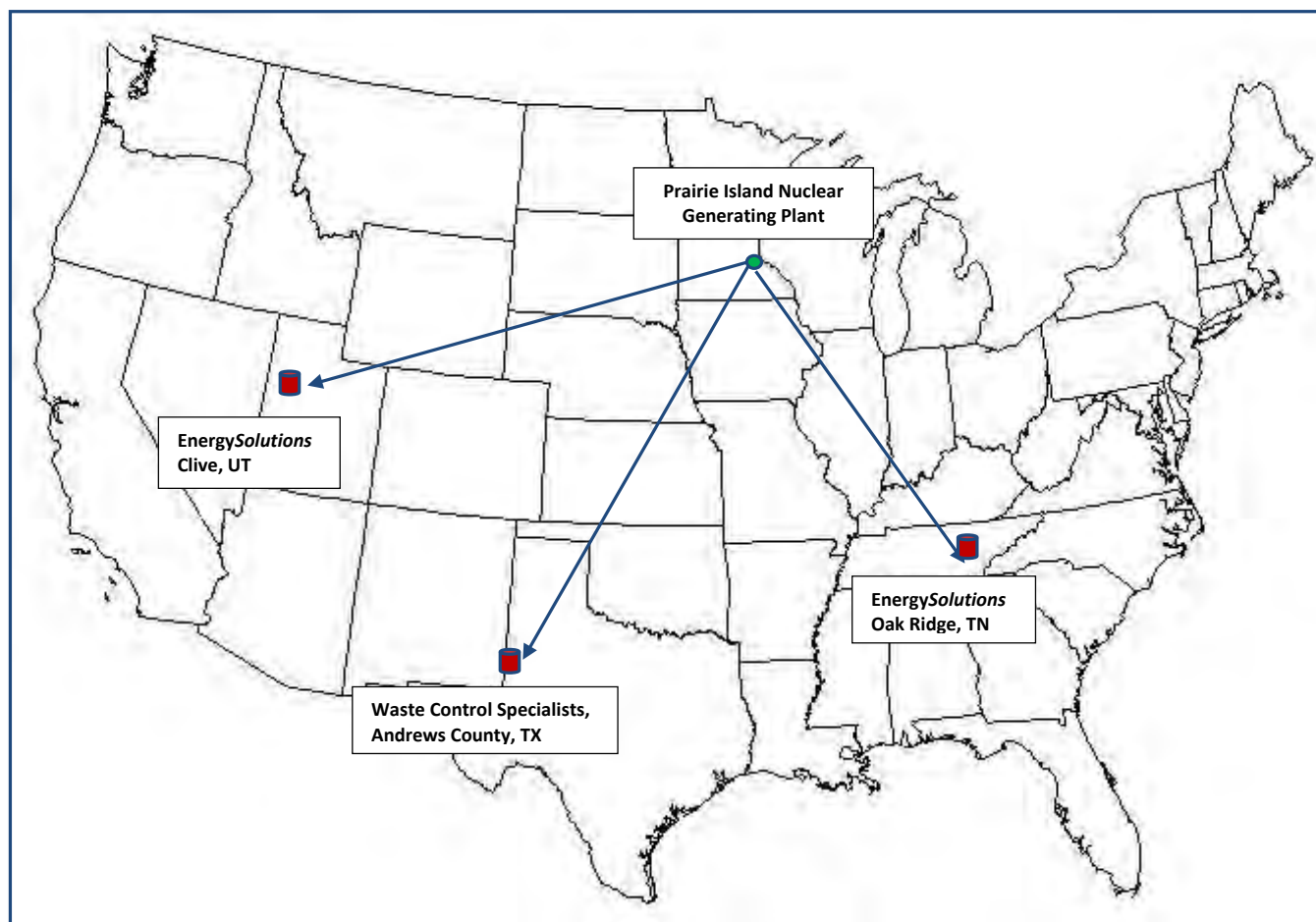
**FIGURE 5.1
RADIOACTIVE WASTE DISPOSITION**



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**FIGURE 5.2
DECOMMISSIONING WASTE DESTINATIONS
RADIOLOGICAL**



The figure indicates the destinations for the low-level radioactive waste designated for direct disposal (Clive, Utah) and processing/recovery (Oak Ridge, Tennessee).

Disposition of the Class B and C low-level radioactive waste will be at the Waste Control Specialists site in Andrews County, Texas.

Disposition options (and destinations) for GTCC are still being evaluated.

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**TABLE 5.1
SCENARIO 1: DECON WITH 32 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	183,939	12,318,693
	EnergySolutions Bulk	A	105,585	6,473,765
	Future LLRW Disposal Facility (Proxy)	B	1,677	168,873
	Future LLRW Disposal Facility (Proxy)	C	1,346	199,444
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	7,493	1,675,192
Total ^[2]			300,041	20,835,967
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	314,393	12,585,953
Scrap Metal				148,880,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.2
SCENARIO 2: DECON WITH 60 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	183,940	12,318,700
	EnergySolutions Bulk	A	105,582	6,473,709
	Future LLRW Disposal Facility (Proxy)	B	1,677	168,873
	Future LLRW Disposal Facility (Proxy)	C	1,346	199,444
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	7,493	1,675,192
Total ^[2]			300,038	20,835,918
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	314,393	12,585,953
Scrap Metal				148,880,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.3
SCENARIO 3: DECON WITH 100 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	191,080	13,155,878
	EnergySolutions Bulk	A	93,337	4,645,691
	Future LLRW Disposal Facility (Proxy)	B	1,677	168,873
	Future LLRW Disposal Facility (Proxy)	C	1,346	199,444
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	7,493	1,675,192
Total ^[2]			294,934	19,845,078
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	314,393	12,585,953
Scrap Metal				148,880,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.4
SCENARIO 4: DECON WITH 200 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	191,080	13,155,878
	EnergySolutions Bulk	A	93,337	4,645,691
	Future LLRW Disposal Facility (Proxy)	B	1,677	168,873
	Future LLRW Disposal Facility (Proxy)	C	1,346	199,444
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	7,493	1,675,192
Total ^[2]			294,934	19,845,078
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	314,393	12,585,953
Scrap Metal				148,880,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.5
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	185,223	12,395,738
	EnergySolutions Bulk	A	105,840	6,491,706
	Future LLRW Disposal Facility (Proxy)	B	1,677	168,873
	Future LLRW Disposal Facility (Proxy)	C	1,346	199,444
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	7,493	1,675,192
Total ^[2]			301,580	20,930,953
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	314,393	12,585,953
Scrap Metal				148,880,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.6
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	93,221	7,572,368
	EnergySolutions Bulk	A	149,706	9,708,164
	Future LLRW Disposal Facility (Proxy)	B	250	22,188
	Future LLRW Disposal Facility (Proxy)	C	1,416	199,712
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	7,493	1,675,192
Total ^[2]			252,086	19,177,624
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	319,773	12,829,050
Scrap Metal				149,192,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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**TABLE 5.7
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
DECOMMISSIONING WASTE SUMMARY**

Waste	Cost Basis	Class ^[1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions Containerized	A	93,221	7,572,361
	EnergySolutions Bulk	A	149,713	9,708,310
	Future LLRW Disposal Facility (Proxy)	B	250	22,188
	Future LLRW Disposal Facility (Proxy)	C	1,416	199,712
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	7,493	1,675,192
Total ^[2]			252,093	19,177,763
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	319,773	12,829,050
Scrap Metal				149,192,000

^[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

^[2] Columns may not add due to rounding

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6. RESULTS

This report presents estimates of the cost to decommission Prairie Island for the selected decommissioning scenarios following the cessation of plant operations. The estimates are based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. While not an engineering study, the estimates provide Xcel Energy with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The decommissioning scenarios assume continued operation of the station's spent fuel pool for a minimum of five years following the cessation of operations for continued cooling of the assemblies. The existing ISFSI is expanded to accommodate the spent fuel, once sufficiently cooled, until such time that the DOE can complete the transfer of the assemblies to its repository.

Using Scenario 2 as the base case, the cost projected to promptly decommission the station, restore the site, and manage the spent fuel is estimated to be \$1.996 billion (2017 dollars). The majority of this cost (approximately 56.8%) is associated with the physical decontamination and dismantling of the nuclear plant so that the operating licenses can be terminated. Another 37.2% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 5.9% is for the demolition of the designated structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 through 6.7, are either labor-related or associated with the management and disposition of the spent fuel or radioactive waste. Program management (including security) is the largest single contributor to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning, as well as the duration of the program. It is assumed, for purposes of this analysis, that Xcel Energy will hire a contractor to manage the decommissioning labor force. The size and composition of the management organizations varies with the decommissioning phase and associated site activities. However, once the operating licenses are amended or terminated, the staff is substantially reduced for the conventional demolition and restoration of the site, and the long-term care of the spent fuel (for the DECON alternative).

As described in this report, the spent fuel pool will remain operational for a minimum of five years following the cessation of operations. The pool will be isolated and an independent spent fuel island created. This will allow

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decommissioning operations to proceed in and around the pool areas. Over the five-year period, the spent fuel will be packaged into transportable canisters for future loading into a DOE-provided transport cask or relocation to the ISFSI (DECON and both SAFSTOR alternatives). The canisters will be stored in horizontal storage casks at the ISFSI until the DOE is able to receive them. Dry storage of the fuel provides additional flexibility in the event the DOE is not able to meet the current timetable for completing the transfer of assemblies to an off-site facility and minimizes the associated caretaking expenses.

The cost for waste disposal includes only those costs associated with the controlled disposition of the low-level radioactive waste generated from decontamination and dismantling activities, including plant equipment and components, structural material, filters, resins and dry-active waste. As described in Section 5, disposition of the majority of the low-level radioactive material requiring controlled disposal is at the EnergySolutions facility, with higher-activity waste sent to the WCS facility. Highly activated components, requiring additional isolation from the environment (GTCC), are packaged for geologic disposal. The cost of geologic disposal is based upon a cost equivalent for spent fuel.

A significant portion of the metallic waste is designated for additional processing and treatment at an off-site facility. Processing reduces the volume of material requiring controlled disposal through such techniques and processes as survey and sorting, decontamination, and volume reduction. The material that cannot be unconditionally released is packaged for controlled disposal at one of the currently operating facilities. The cost identified in the summary tables for processing is all-inclusive, incorporating the ultimate disposition of the material.

Removal costs reflect the labor-intensive nature of the decommissioning process, as well as the management controls required to ensure a safe and successful program. Decontamination and packaging costs also have a large labor component that is based upon prevailing wages. Non-radiological demolition is a natural extension of the decommissioning process. The methods employed in decontamination and dismantling are generally destructive and indiscriminate in inflicting collateral damage. With a work force mobilized to support decommissioning operations, non-radiological demolition can be an integrated activity and a logical expansion of the work being performed in the process of terminating the operating licenses.

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, as well as the general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is moved overland by truck.

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Decontamination is used to reduce the plant's radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area is sent to an off-site processing center, i.e., this analysis does not assume that contaminated plant components and equipment can be decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more economical means of handling the large volumes of material produced in the dismantling of a nuclear plant.

License termination survey costs are associated with the labor intensive and complex activity of verifying that contamination has been removed from the site to the levels specified by the regulating agency. This process involves a systematic survey of all remaining plant surface areas and surrounding environs, sampling, isotopic analysis, and documentation of the findings. The status of any plant components and materials not removed in the decommissioning process will also require confirmation and will add to the expense of surveying the facilities alone.

The remaining costs include allocations for heavy equipment and temporary services, as well as for other expenses such as regulatory fees and the premiums for nuclear insurance. While site operating costs are greatly reduced following the final cessation of plant operations, certain administrative functions do need to be maintained either at a basic functional or regulatory level.

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TABLE 6.1
SCENARIO 1: DECON WITH 32 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total	Percentage
Decontamination	11,899	18,712	30,611	1.7%
Removal	103,458	132,270	235,727	13.1%
Packaging	37,613	37,981	75,594	4.2%
Transportation	8,386	8,908	17,294	1.0%
Waste Disposal	65,232	68,234	133,465	7.4%
Off-site Waste Processing	13,548	16,016	29,565	1.6%
Program Management ^[1]	224,195	206,995	431,191	24.0%
Security	116,834	106,450	223,284	12.4%
Spent Fuel Pool Isolation	13,445	8,963	22,409	1.2%
Spent Fuel Storage (Direct Costs) ^[2]	120,903	118,936	239,839	13.3%
Insurance and Regulatory Fees	17,840	15,425	33,266	1.9%
Energy	9,248	8,349	17,597	1.0%
Characterization and Licensing Surveys	17,216	19,157	36,374	2.0%
Property Taxes	54,492	51,594	106,086	5.9%
Miscellaneous	7,188	7,147	14,335	0.8%
Railroad Track Maintenance	2,598	2,517	5,116	0.3%
Retention and Severance	28,423	28,423	56,845	3.2%
Security Modifications	5,000	5,000	10,000	0.6%
Prairie Island Indian Community Payments	40,000	38,750	78,750	4.4%
Total [2]	897,520	899,828	1,797,347	100.0%

Cost Element	Unit 1	Unit 2	Total	Percentage
NRC License Termination	571,980	561,832	1,133,812	63.1%
Spent Fuel Management	274,479	271,262	545,741	30.4%
Site Restoration	51,061	66,733	117,795	6.6%
Total ^[3]	897,520	899,828	1,797,347	100.0%

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.2
SCENARIO 2: DECON WITH 60 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total	Percentage
Decontamination	11,899	18,711	30,610	1.5%
Removal	103,561	132,372	235,933	11.8%
Packaging	37,613	37,981	75,594	3.8%
Transportation	8,386	8,908	17,294	0.9%
Waste Disposal	65,232	68,234	133,465	6.7%
Off-site Waste Processing	13,548	16,016	29,565	1.5%
Program Management ^[1]	233,817	216,617	450,434	22.6%
Security	146,769	136,385	283,153	14.2%
Spent Fuel Pool Isolation	13,445	8,963	22,409	1.1%
Spent Fuel Storage (Direct Costs) ^[2]	144,710	142,743	287,453	14.4%
Insurance and Regulatory Fees	21,494	19,079	40,573	2.0%
Energy	9,246	8,347	17,593	0.9%
Characterization and Licensing Surveys	17,216	19,157	36,374	1.8%
Property Taxes	69,785	66,180	135,965	6.8%
Miscellaneous	7,187	7,145	14,332	0.7%
Railroad Track Maintenance	3,461	3,380	6,841	0.3%
Retention and Severance	28,423	28,423	56,845	2.8%
Security Modifications	5,000	5,000	10,000	0.5%
Prairie Island Indian Community Payments	56,250	55,000	111,250	5.6%
Total ^[3]	997,041	998,643	1,995,684	100.0%

Cost Element	Unit 1	Unit 2	Total	Percentage
NRC License Termination	572,618	561,764	1,134,382	56.8%
Spent Fuel Management	373,251	370,034	743,284	37.2%
Site Restoration	51,173	66,845	118,017	5.9%
Total ^[3]	997,041	998,643	1,995,684	100.0%

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.3
SCENARIO 3: DECON WITH 100 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total	Percentage
Decontamination	11,918	18,730	30,648	0.9%
Removal	104,039	132,850	236,889	7.0%
Packaging	37,611	37,979	75,590	2.2%
Transportation	8,270	8,792	17,061	0.5%
Waste Disposal	64,469	67,471	131,940	3.9%
Off-site Waste Processing	13,548	16,016	29,565	0.9%
Program Management ^[1]	294,495	277,295	571,790	16.8%
Security	236,616	226,232	462,847	13.6%
Spent Fuel Pool Isolation	13,445	8,963	22,409	0.7%
Spent Fuel Storage (Direct Costs) ^[2]	592,003	590,037	1,182,040	34.7%
Insurance and Regulatory Fees	32,742	30,327	63,069	1.9%
Energy	9,246	8,347	17,593	0.5%
Characterization and Licensing Surveys	17,216	19,157	36,374	1.1%
Property Taxes	112,875	109,977	222,852	6.5%
Miscellaneous	7,187	7,145	14,332	0.4%
Railroad Track Maintenance	6,115	6,034	12,150	0.4%
Retention and Severance	28,423	28,423	56,845	1.7%
Security Modifications	5,000	5,000	10,000	0.3%
Prairie Island Indian Community Payments	106,250	105,000	211,250	6.2%
Total ^[3]	1,701,468	1,703,777	3,405,245	100.0%

Cost Element	Unit 1	Unit 2	Total	Percentage
NRC License Termination	568,261	558,114	1,126,374	33.1%
Spent Fuel Management	1,082,353	1,079,137	2,161,490	63.5%
Site Restoration	50,855	66,527	117,381	3.4%
Total ^[3]	1,701,468	1,703,777	3,405,245	100.0%

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.4
SCENARIO 4: DECON WITH 200 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total	Percentage
Decontamination	11,918	18,730	30,648	0.5%
Removal	104,037	132,849	236,887	4.0%
Packaging	37,611	37,979	75,590	1.3%
Transportation	8,270	8,792	17,061	0.3%
Waste Disposal	64,469	67,471	131,940	2.2%
Off-site Waste Processing	13,548	16,016	29,565	0.5%
Program Management ^[1]	430,976	413,776	844,751	14.2%
Security	466,998	456,614	923,613	15.5%
Spent Fuel Pool Isolation	13,445	8,963	22,409	0.4%
Spent Fuel Storage (Direct Costs) ^[2]	1,229,254	1,227,287	2,456,541	41.2%
Insurance and Regulatory Fees	60,862	58,448	119,310	2.0%
Energy	9,246	8,347	17,593	0.3%
Characterization and Licensing Surveys	17,216	19,157	36,374	0.6%
Property Taxes	225,076	222,177	447,253	7.5%
Miscellaneous	7,187	7,145	14,332	0.2%
Railroad Track Maintenance	12,752	12,671	25,422	0.4%
Retention and Severance	28,423	28,423	56,845	1.0%
Security Modifications	5,000	5,000	10,000	0.2%
Prairie Island Indian Community Payments	231,250	230,000	461,250	7.7%
Total ^[3]	2,977,539	2,979,847	5,957,385	100.0%

Cost Element	Unit 1	Unit 2	Total	Percentage
NRC License Termination	568,259	558,112	1,126,371	18.9%
Spent Fuel Management	2,358,425	2,355,208	4,713,633	79.1%
Site Restoration	50,855	66,527	117,381	2.0%
Total ^[3]	2,977,539	2,979,847	5,957,385	100.0%

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.5
SCENARIO 5: DECON WITH 60 YEAR DFS WITH RECASKING
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total	Percentage
Decontamination	11,918	18,730	30,648	1.4%
Removal	103,830	132,642	236,472	10.9%
Packaging	37,614	37,982	75,596	3.5%
Transportation	8,389	8,911	17,300	0.8%
Waste Disposal	65,396	68,398	133,795	6.2%
Off-site Waste Processing	13,548	16,016	29,565	1.4%
Program Management ^[1]	233,817	216,617	450,434	20.8%
Security	146,769	136,385	283,153	13.1%
Spent Fuel Pool Isolation	13,445	8,963	22,409	1.0%
Spent Fuel Storage (Direct Costs) ^[2]	230,141	228,174	458,315	21.2%
Insurance and Regulatory Fees	21,494	19,079	40,573	1.9%
Energy	9,246	8,347	17,593	0.8%
Characterization and Licensing Surveys	17,216	19,157	36,374	1.7%
Property Taxes	69,078	66,180	135,258	6.2%
Miscellaneous	7,187	7,145	14,332	0.7%
Railroad Track Maintenance	3,461	3,380	6,841	0.3%
Retention and Severance	28,423	28,423	56,845	2.6%
Security Modifications	5,000	5,000	10,000	0.5%
Prairie Island Indian Community Payments	56,250	55,000	111,250	5.1%
Total ^[3]	1,082,223	1,084,531	2,166,754	100.0%

Cost Element	Unit 1	Unit 2	Total	Percentage
NRC License Termination	572,323	562,164	1,134,487	52.4%
Spent Fuel Management	458,457	455,241	913,698	42.2%
Site Restoration	51,443	67,126	118,569	5.5%
Total ^[3]	1,082,223	1,084,531	2,166,754	100.0%

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.6
SCENARIO 6: SAFSTOR WITH 32 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total	Percentage
Decontamination	7,828	16,467	24,295	1.0%
Removal	108,449	137,038	245,487	10.4%
Packaging	34,003	34,343	68,345	2.9%
Transportation	6,683	7,171	13,854	0.6%
Waste Disposal	53,612	55,346	108,959	4.6%
Off-site Waste Processing	13,846	16,314	30,160	1.3%
Program Management ^[1]	312,153	278,025	590,178	25.1%
Security	194,238	129,474	323,713	13.8%
Spent Fuel Pool Isolation	13,445	8,963	22,409	1.0%
Spent Fuel Storage (Direct Costs) ^[2]	117,316	114,954	232,270	9.9%
Insurance and Regulatory Fees	53,753	50,594	104,346	4.4%
Energy	20,162	19,753	39,915	1.7%
Characterization and Licensing Surveys	18,118	20,359	38,478	1.6%
Property Taxes	156,602	156,387	312,989	13.3%
Miscellaneous	17,651	21,979	39,630	1.7%
Railroad Track Maintenance	4,362	4,281	8,644	0.4%
Retention and Severance	28,423	28,423	56,845	2.4%
Security Modifications	5,000	5,000	10,000	0.4%
Prairie Island Indian Community Payments	40,000	38,750	78,750	3.4%
Total ^[3]	1,205,645	1,143,621	2,349,266	100.0%

Cost Element	Unit 1	Unit 2	Total	Percentage
NRC License Termination	908,226	841,160	1,749,386	74.5%
Spent Fuel Management	242,850	233,483	476,333	20.3%
Site Restoration	54,569	68,978	123,547	5.3%
Total ^[3]	1,205,645	1,143,621	2,349,266	100.0%

^[1] Includes engineering

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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TABLE 6.7
SCENARIO 7: SAFSTOR WITH 60 YEAR DFS
DECOMMISSIONING COST ELEMENTS
(thousands of 2017 dollars)

Cost Element	Unit 1	Unit 2	Total	Percentage
Decontamination	7,825	16,452	24,276	1.0%
Removal	108,474	136,691	245,165	9.9%
Packaging	34,003	34,343	68,346	2.8%
Transportation	6,683	7,171	13,854	0.6%
Waste Disposal	53,613	55,347	108,960	4.4%
Off-site Waste Processing	13,846	16,314	30,160	1.2%
Program Management ^[1]	313,922	284,127	598,049	24.1%
Security	200,143	166,411	366,553	14.8%
Spent Fuel Pool Isolation	13,445	8,963	22,409	0.9%
Spent Fuel Storage (Direct Costs) ^[2]	138,784	136,422	275,207	11.1%
Insurance and Regulatory Fees	54,180	50,827	105,007	4.2%
Energy	20,134	19,489	39,623	1.6%
Characterization and Licensing Surveys	18,118	20,359	38,478	1.6%
Property Taxes	161,296	156,387	317,682	12.8%
Miscellaneous	17,668	21,945	39,613	1.6%
Railroad Track Maintenance	4,362	4,281	8,644	0.3%
Retention and Severance	28,423	28,423	56,845	2.3%
Security Modifications	5,000	5,000	10,000	0.4%
Prairie Island Indian Community Payments	56,250	55,000	111,250	4.5%
Total ^[3]	1,256,169	1,223,951	2,480,120	100.0%

Cost Element	Unit 1	Unit 2	Total	Percentage
NRC License Termination	883,602	846,342	1,729,944	69.8%
Spent Fuel Management	317,887	308,520	626,407	25.3%
Site Restoration	54,680	69,089	123,769	5.0%
Total ^[3]	1,256,169	1,223,951	2,480,120	100.0%

^[1] Includes engineering costs

^[2] Includes costs for the dry storage system components, spent fuel loading and transfer, spent fuel pool O&M and EP fees, but excludes program management costs (staffing), security and other related costs

^[3] Columns may not add due to rounding

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7. REFERENCES

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APPENDIX A

UNIT COST FACTOR DEVELOPMENT

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APPENDIX A
UNIT COST FACTOR DEVELOPMENT

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

1. SCOPE

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the waste processing area.

2. CALCULATIONS

Act ID	Activity Description	Activity Duration (minutes)	Critical Duration (minutes)*
a	Remove insulation	60	(b)
b	Mount pipe cutters	60	60
c	Install contamination controls	20	(b)
d	Disconnect inlet and outlet lines	60	60
e	Cap openings	20	(d)
f	Rig for removal	30	30
g	Unbolt from mounts	30	30
h	Remove contamination controls	15	15
i	Remove, wrap, send to waste processing area	<u>60</u>	<u>60</u>
Totals (Activity/Critical)		355	255

Duration adjustment(s):

+ Respiratory protection adjustment (50 of critical duration) 128

+ Radiation/ALARA adjustment (37.1 of critical duration) 95

Adjusted work duration 478

+ Protective clothing adjustment (30 of adjusted duration) 143

Productive work duration 621

+ Work break adjustment (8.33 of productive duration) 52

Total work duration (minutes) 673

***** Total duration = 11.217 hr *****

* alpha designators indicate activities that can be performed in parallel

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3. LABOR REQUIRED

Crew	Number	Duration (hours)	Rate (\$/hr)	Cost
Laborers	3.00	11.217	\$52.61	\$1,770.38
Craftsmen	2.00	11.217	\$68.16	\$1,529.10
Foreman	1.00	11.217	\$71.37	\$800.56
General Foreman	0.25	11.217	\$73.67	\$206.59
Fire Watch	0.05	11.217	\$52.61	\$29.61
Health Physics Technician	1.00	11.217	\$76.50	<u>\$858.10</u>
Total Labor Cost				\$5,194.24

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs none

Consumables/Materials Costs

- Universal Sorbent 50 @ \$0.61 sq ft ^{1} \$30.50
- Tarpaulins (oil resistant/fire retardant) 50 @ \$0.46/sq ft ^{2} \$23.00
- Gas torch consumables 1 @ \$20.45/hr x 1 hr ^{3} \$20.45

Subtotal cost of equipment and materials \$73.95

Overhead & profit on equipment and materials @ 16.88% \$12.48

Total costs, equipment & material \$86.43

TOTAL COST:

Removal of contaminated heat exchanger <3000 pounds: \$5,280.67

Total labor cost: \$5,194.24

Total equipment/material costs: \$86.43

Total craft labor man-hours required per unit: 81.88

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5. NOTES AND REFERENCES

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum's (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.
- References for equipment & consumables costs:
 1. www.mcmaster.com online catalog, McMaster Carr Spill Control (7193T88)
 2. R.S. Means (2017) Division 01 56, Section 13.60-0600, page 23
 3. R.S. Means (2017) Division 01 54 33, Section 40-6360, page 718
- Material and consumable costs were adjusted using the regional indices for Minneapolis, Minnesota.

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APPENDIX B

**UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)**

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APPENDIX B

**UNIT COST FACTOR LISTING
(Power Block Structures Only)**

Unit Cost Factor	Cost/Unit
Removal of clean instrument and sampling tubing, \$/linear foot	0.58
Removal of clean pipe 0.25 to 2 inches diameter, \$/linear foot	6.16
Removal of clean pipe >2 to 4 inches diameter, \$/linear foot	8.78
Removal of clean pipe >4 to 8 inches diameter, \$/linear foot	17.10
Removal of clean pipe >8 to 14 inches diameter, \$/linear foot	33.02
Removal of clean pipe >14 to 20 inches diameter, \$/linear foot	42.99
Removal of clean pipe >20 to 36 inches diameter, \$/linear foot	63.24
Removal of clean pipe >36 inches diameter, \$/linear foot	75.11
Removal of clean valve >2 to 4 inches	113.25
Removal of clean valve >4 to 8 inches	171.03
Removal of clean valve >8 to 14 inches	330.21
Removal of clean valve >14 to 20 inches	429.92
Removal of clean valve >20 to 36 inches	632.40
Removal of clean valve >36 inches	751.10
Removal of clean pipe hanger for small bore piping	39.61
Removal of clean pipe hanger for large bore piping	140.05
Removal of clean pump, <300 pound	289.85
Removal of clean pump, 300-1000 pound	801.33
Removal of clean pump, 1000-10,000 pound	3,160.77
Removal of clean pump, >10,000 pound	6,117.66
Removal of clean pump motor, 300-1000 pound	334.27
Removal of clean pump motor, 1000-10,000 pound	1,312.24
Removal of clean pump motor, >10,000 pound	2,952.53
Removal of clean heat exchanger <3000 pound	1,698.90
Removal of clean heat exchanger >3000 pound	4,283.30
Removal of clean feedwater heater/deaerator	12,062.93
Removal of clean moisture separator/reheater	24,783.03
Removal of clean tank, <300 gallons	372.70
Removal of clean tank, 300-3000 gallon	1,172.60
Removal of clean tank, >3000 gallons, \$/square foot surface area	9.85

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APPENDIX B

**UNIT COST FACTOR LISTING
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Unit Cost Factor	Cost/Unit
Removal of clean electrical equipment, <300 pound	156.50
Removal of clean electrical equipment, 300-1000 pound	544.23
Removal of clean electrical equipment, 1000-10,000 pound	1,088.45
Removal of clean electrical equipment, >10,000 pound	2,584.37
Removal of clean electrical transformer < 30 tons	1,794.81
Removal of clean electrical transformer > 30 tons	5,168.70
Removal of clean standby diesel generator, <100 kW	1,833.23
Removal of clean standby diesel generator, 100 kW to 1 MW	4,091.90
Removal of clean standby diesel generator, >1 MW	8,471.05
Removal of clean electrical cable tray, \$/linear foot	14.76
Removal of clean electrical conduit, \$/linear foot	6.45
Removal of clean mechanical equipment, <300 pound	156.50
Removal of clean mechanical equipment, 300-1000 pound	544.23
Removal of clean mechanical equipment, 1000-10,000 pound	1,088.45
Removal of clean mechanical equipment, >10,000 pound	2,584.37
Removal of clean HVAC equipment, <300 pound	189.24
Removal of clean HVAC equipment, 300-1000 pound	653.93
Removal of clean HVAC equipment, 1000-10,000 pound	1,303.28
Removal of clean HVAC equipment, >10,000 pound	2,584.37
Removal of clean HVAC ductwork, \$/pound	0.61
Removal of contaminated instrument and sampling tubing, \$/linear foot	1.95
Removal of contaminated pipe 0.25 to 2 inches diameter, \$/linear foot	26.56
Removal of contaminated pipe >2 to 4 inches diameter, \$/linear foot	45.20
Removal of contaminated pipe >4 to 8 inches diameter, \$/linear foot	72.68
Removal of contaminated pipe >8 to 14 inches diameter, \$/linear foot	141.06
Removal of contaminated pipe >14 to 20 inches diameter, \$/linear foot	169.46
Removal of contaminated pipe >20 to 36 inches diameter, \$/linear foot	234.41
Removal of contaminated pipe >36 inches diameter, \$/linear foot	276.97
Removal of contaminated valve >2 to 4 inches	553.32
Removal of contaminated valve >4 to 8 inches	662.47

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**UNIT COST FACTOR LISTING
(Power Block Structures Only)**

Unit Cost Factor	Cost/Unit
Removal of contaminated valve >8 to 14 inches	1,348.03
Removal of contaminated valve >14 to 20 inches	1,713.56
Removal of contaminated valve >20 to 36 inches	2,281.53
Removal of contaminated valve >36 inches	2,707.15
Removal of contaminated pipe hanger for small bore piping	184.64
Removal of contaminated pipe hanger for large bore piping	596.64
Removal of contaminated pump, <300 pound	1,182.71
Removal of contaminated pump, 300-1000 pound	2,706.17
Removal of contaminated pump, 1000-10,000 pound	8,653.74
Removal of contaminated pump, >10,000 pound	21,079.34
Removal of contaminated pump motor, 300-1000 pound	1,153.25
Removal of contaminated pump motor, 1000-10,000 pound	3,525.11
Removal of contaminated pump motor, >10,000 pound	7,914.39
Removal of contaminated heat exchanger <3000 pound	5,280.67
Removal of contaminated heat exchanger >3000 pound	15,319.98
Removal of contaminated tank, <300 gallons	1,966.05
Removal of contaminated tank, >300 gallons, \$/square foot	37.92
Removal of contaminated electrical equipment, <300 pound	917.52
Removal of contaminated electrical equipment, 300-1000 pound	2,207.05
Removal of contaminated electrical equipment, 1000-10,000 pound	4,251.16
Removal of contaminated electrical equipment, >10,000 pound	8,289.57
Removal of contaminated electrical cable tray, \$/linear foot	44.36
Removal of contaminated electrical conduit, \$/linear foot	21.71
Removal of contaminated mechanical equipment, <300 pound	1,020.69
Removal of contaminated mechanical equipment, 300-1000 pound	2,437.14
Removal of contaminated mechanical equipment, 1000-10,000 pound	4,686.67
Removal of contaminated mechanical equipment, >10,000 pound	8,289.57
Removal of contaminated HVAC equipment, <300 pound	1,020.69
Removal of contaminated HVAC equipment, 300-1000 pound	2,437.14
Removal of contaminated HVAC equipment, 1000-10,000 pound	4,686.67

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**UNIT COST FACTOR LISTING
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Unit Cost Factor	Cost/Unit
Removal of contaminated HVAC equipment, >10,000 pound	8,289.57
Removal of contaminated HVAC ductwork, \$/pound	2.66
Removal/plasma arc cut of contaminated thin metal components, \$/linear in.	4.78
Additional decontamination of surface by washing, \$/square foot	9.88
Additional decontamination of surfaces by hydrolasing, \$/square foot	42.77
Decontamination rig hook up and flush, \$/ 250-foot length	8,602.39
Chemical flush of components/systems, \$/gallon	20.62
Removal of clean standard reinforced concrete, \$/cubic yard	76.22
Removal of grade slab concrete, \$/cubic yard	86.70
Removal of clean concrete floors, \$/cubic yard	424.96
Removal of sections of clean concrete floors, \$/cubic yard	1,277.24
Removal of clean heavily rein concrete w/#9 rebar, \$/cubic yard	110.08
Removal of contaminated heavily rein concrete w/#9 rebar, \$/cubic yard	2,525.79
Removal of clean heavily rein concrete w/#18 rebar, \$/cubic yard	149.21
Removal of contaminated heavily rein concrete w/#18 rebar, \$/cubic yard	3,340.90
Removal heavily rein concrete w/#18 rebar & steel embedments, \$/cubic yard	518.41
Removal of below-grade suspended floors, \$/cubic yard	209.25
Removal of clean monolithic concrete structures, \$/cubic yard	1,049.70
Removal of contaminated monolithic concrete structures, \$/cubic yard	2,512.62
Removal of clean foundation concrete, \$/cubic yard	825.21
Removal of contaminated foundation concrete, \$/cubic yard	2,340.94
Explosive demolition of bulk concrete, \$/cubic yard	56.10
Removal of clean hollow masonry block wall, \$/cubic yard	26.77
Removal of contaminated hollow masonry block wall, \$/cubic yard	71.77
Removal of clean solid masonry block wall, \$/cubic yard	26.77
Removal of contaminated solid masonry block wall, \$/cubic yard	71.77
Backfill of below-grade voids, \$/cubic yard	32.20
Removal of subterranean tunnels/voids, \$/linear foot	131.51
Placement of concrete for below-grade voids, \$/cubic yard	150.52
Excavation of clean material, \$/cubic yard	3.35

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**UNIT COST FACTOR LISTING
(Power Block Structures Only)**

Unit Cost Factor	Cost/Unit
Excavation of contaminated material, \$/cubic yard	48.54
Removal of clean concrete rubble (tipping fee included), \$/cubic yard	27.60
Removal of contaminated concrete rubble, \$/cubic yard	30.99
Removal of building by volume, \$/cubic foot	0.35
Removal of clean building metal siding, \$/square foot	1.58
Removal of contaminated building metal siding, \$/square foot	5.71
Removal of standard asphalt roofing, \$/square foot	2.70
Removal of transite panels, \$/square foot	2.45
Scarifying contaminated concrete surfaces (drill & spall), \$/square foot	14.89
Scabbling contaminated concrete floors, \$/square foot	9.21
Scabbling contaminated concrete walls, \$/square foot	24.59
Scabbling contaminated ceilings, \$/square foot	84.63
Scabbling structural steel, \$/square foot	7.64
Removal of clean overhead crane/monorail < 10 ton capacity	759.93
Removal of contaminated overhead crane/monorail < 10 ton capacity	2,265.36
Removal of clean overhead crane/monorail >10-50 ton capacity	1,823.83
Removal of contaminated overhead crane/monorail >10-50 ton capacity	5,435.94
Removal of polar crane > 50 ton capacity	7,608.99
Removal of gantry crane > 50 ton capacity	32,304.44
Removal of structural steel, \$/pound	0.23
Removal of clean steel floor grating, \$/square foot	5.53
Removal of contaminated steel floor grating, \$/square foot	16.69
Removal of clean free-standing steel liner, \$/square foot	14.77
Removal of contaminated free-standing steel liner, \$/square foot	44.38
Removal of clean concrete-anchored steel liner, \$/square foot	7.39
Removal of contaminated concrete-anchored steel liner, \$/square foot	51.73
Placement of scaffolding in clean areas, \$/square foot	17.11
Placement of scaffolding in contaminated areas, \$/square foot	30.30
Landscaping with topsoil, \$/acre	24,605.57
Cost of CPC B-88 LSA box & preparation for use	2,083.43

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APPENDIX B

**UNIT COST FACTOR LISTING
(Power Block Structures Only)**

Unit Cost Factor	Cost/Unit
Cost of CPC B-25 LSA box & preparation for use	1,963.90
Cost of CPC B-12V 12-gauge LSA box & preparation for use	1,565.90
Cost of CPC B-144 LSA box & preparation for use	10,460.39
Cost of LSA drum & preparation for use	230.20
Cost of cask liner for CNSI 8 120A cask (resins)	12,394.60
Cost of cask liner for CNSI 8 120A cask (filters)	8,981.65
Decontamination of surfaces with vacuuming, \$/square foot	0.93

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APPENDIX C

DETAILED COST ANALYSIS

SCENARIO 1: DECON with 32 Year DFS

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Table C-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	578	87	664	598	-	66	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,440	666	5,106	4,496	-	610	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlp/s/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	14,774	2,216	16,990	16,380	-	610	-	-	-	-	-	-	-	78,157
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,040	204	2,244	2,244	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	43,160	6,378	50,687	48,402	2,286	-	-	610	-	-	-	12,190	20	544,960

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	71,629	10,348	83,126	78,227	4,289	610	-	610	-	-	-	12,190	20	623,117
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	293	44	337	337	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,902	585	4,487	3,643	-	844	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	552	-	-	-	-	-	-	276	828	828	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	552	-	-	-	-	-	3,902	861	5,315	4,471	-	844	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	3,700	1,110	4,810	4,810	-	-	-	-	-	-	-	-	21,020	8,332
1b.2.2	Mixed/Hazardous Waste	-	-	318	75	164	-	-	68	624	624	-	-	6,133	-	-	-	-	351,986	2,361	-
1b.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
1b.2	Subtotal Period 1b Additional Costs	-	2,364	320	185	164	1,359	3,700	2,125	10,216	10,216	-	-	6,133	12,843	-	-	-	518,945	44,288	8,332
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	24	-	16	41	-	64	-	36	180	180	-	-	-	152	-	-	-	9,121	30	-
1b.3.4	Process decommissioning chemical flush waste	2	-	58	220	-	2,471	-	657	3,408	3,408	-	-	-	-	588	-	-	62,689	110	-
1b.3.5	Small tool allowance	-	34	-	-	-	-	-	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	230	35	265	-	265	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	1,088	163	1,251	1,251	-	-	-	-	-	-	-	-	-	-
1b.3.10	Prairie Island Indian Community Payments	-	-	-	-	-	-	630	-	630	-	630	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,986	1,234	74	261	-	2,534	3,136	1,698	11,923	11,028	895	-	-	-	152	588	-	71,810	140	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	872	87	959	959	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,352	135	1,487	1,487	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	402	-	-	-	-	-	101	503	503	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	286	-	-	-	-	-	43	329	329	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	8	2	-	29	-	8	48	48	-	-	-	360	-	-	-	7,197	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,527	229	1,756	1,756	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	323	32	355	355	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	809	81	890	-	890	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	741	111	852	852	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,725	559	4,284	4,284	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	5,656	848	6,504	6,504	-	-	-	-	-	-	-	-	-	63,961
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	13,074	1,961	15,035	15,035	-	-	-	-	-	-	-	-	-	213,904
1b.4	Subtotal Period 1b Period-Dependent Costs	35	688	8	2	-	29	28,336	4,243	33,341	32,189	1,152	-	-	360	-	-	-	7,197	12	339,730
1b.0	TOTAL PERIOD 1b COST	3,573	4,286	402	447	164	3,923	39,074	8,927	60,795	57,904	2,047	844	6,133	13,355	588	-	-	597,952	45,506	381,305

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
PERIOD 1 TOTALS		3,573	5,368	415	451	164	3,972	110,702	19,275	143,921	136,131	6,336	1,454	6,133	13,964	588	-	-	610,142	45,526	1,004,421
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	51	45	6	8	-	150	-	76	336	336	-	-	-	305	-	-	-	34,809	1,414	-
2a.1.1.2	Pressurizer Relief Tank	22	20	4	5	-	100	-	42	193	193	-	-	-	203	-	-	-	23,193	625	-
2a.1.1.3	Reactor Coolant Pumps & Motors	54	63	101	83	-	736	-	249	1,287	1,287	-	-	-	2,332	-	-	-	295,800	2,049	100
2a.1.1.4	Pressurizer	48	68	467	88	-	693	-	274	1,639	1,639	-	-	-	2,196	-	-	-	185,015	2,355	938
2a.1.1.5	Steam Generators	225	2,943	2,093	1,638	1,246	3,570	-	2,383	14,097	14,097	-	-	18,672	11,316	-	-	-	1,668,341	14,819	2,875
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	286	277	211	48	-	763	-	431	2,016	2,016	-	-	-	4,797	-	-	-	177,400	8,104	-
2a.1.1.7	Reactor Vessel Internals	78	4,468	21,874	1,072	-	7,946	277	13,141	48,856	48,856	-	-	-	501	125	673	-	164,987	23,040	1,080
2a.1.1.8	Reactor Vessel	89	5,717	1,754	719	-	1,956	277	5,970	16,483	16,483	-	-	-	5,690	-	-	-	570,074	23,040	1,080
2a.1.1	Totals	855	13,600	26,512	3,662	1,246	15,913	553	22,568	84,908	84,908	-	-	18,672	27,341	125	673	-	3,119,620	75,446	6,073
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	305	189	55	272	306	-	221	1,348	1,348	-	-	2,131	1,187	-	-	-	206,316	4,667	-
2a.1.3	Main Condensers	-	2,532	121	49	364	451	-	820	4,336	4,336	-	-	3,800	1,587	-	-	-	275,903	39,151	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
2a.1.4	Totals	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
Disposal of Plant Systems																					
2a.1.5.1	Air Removal	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	452	-
2a.1.5.2	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	670	-
2a.1.5.3	Auxiliary Feedwater - RCA	-	45	0	1	19	-	-	14	79	79	-	-	215	-	-	-	-	8,722	601	-
2a.1.5.4	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,335	-
2a.1.5.5	Caustic Addition - RCA	-	36	0	1	20	-	-	12	71	71	-	-	233	-	-	-	-	9,453	444	-
2a.1.5.6	Chemical Feed	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	304	-
2a.1.5.7	Chemical Feed - RCA	-	1	0	0	1	-	-	0	2	2	-	-	6	-	-	-	-	243	12	-
2a.1.5.8	Circulating Water	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	619	-
2a.1.5.9	Condensate	-	414	-	-	-	-	-	62	476	-	-	476	-	-	-	-	-	-	6,837	-
2a.1.5.10	Condensate Polishing	-	205	-	-	-	-	-	31	236	-	-	236	-	-	-	-	-	-	3,420	-
2a.1.5.11	Condensate Polishing - RCA	-	176	4	12	180	-	-	73	444	444	-	-	2,078	-	-	-	-	84,395	2,329	-
2a.1.5.12	Electro-hydraulic	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	127	-
2a.1.5.13	Feedwater	-	133	-	-	-	-	-	20	153	-	-	153	-	-	-	-	-	-	2,215	-
2a.1.5.14	Feedwater - RCA	-	186	6	19	278	-	-	91	579	579	-	-	3,208	-	-	-	-	130,294	2,651	-
2a.1.5.15	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	505	-
2a.1.5.16	Heater Drain	-	349	-	-	-	-	-	52	401	-	-	401	-	-	-	-	-	-	5,881	-
2a.1.5.17	Internal Circ Water & CDSR	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	389	-
2a.1.5.18	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2a.1.5.19	Main Steam	-	101	-	-	-	-	-	15	116	-	-	116	-	-	-	-	-	-	1,690	-
2a.1.5.20	Main Steam - RCA	-	350	9	29	436	-	-	158	983	983	-	-	5,044	-	-	-	-	204,825	4,956	-
2a.1.5.21	Steam Generator Blowdown	-	459	21	22	176	195	-	195	1,067	1,067	-	-	2,031	686	-	-	-	127,773	6,667	-
2a.1.5.22	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2a.1.5.23	Turbine & Moisture Separators	-	337	-	-	-	-	-	51	388	-	-	388	-	-	-	-	-	-	5,609	-
2a.1.5.24	Turbine Oil Purification	-	61	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	1,003	-
2a.1.5	Totals	-	3,117	40	85	1,108	195	-	825	5,370	3,226	-	2,145	12,815	686	-	-	-	565,705	48,794	-
2a.1.6	Scaffolding in support of decommissioning	-	854	3	1	13	3	-	217	1,092	1,092	-	-	138	12	-	-	-	7,016	6,368	-
2a.1	Subtotal Period 2a Activity Costs	855	21,136	26,865	3,852	3,004	16,868	553	24,759	97,891	95,747	-	2,145	37,556	30,812	125	673	-	4,174,560	182,015	6,073
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,126	638	2,764	2,764	-	-	-	-	-	-	-	-	27,791	-
2a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
2a.2	Subtotal Period 2a Additional Costs	1	659	785	107	-	1,439	2,126	2,075	7,191	7,191	-	-	-	2,097	125	-	-	205,890	29,966	87
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	47	-	31	81	-	126	-	70	356	356	-	-	-	302	-	-	-	18,119	59	-
2a.3.3	Small tool allowance	-	223	-	-	-	-	-	33	257	231	-	26	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,365	355	2,720	-	2,720	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	12,156	1,823	13,980	13,980	-	-	-	-	-	-	-	-	-	-
2a.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,670	-	1,670	-	1,670	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	47	223	31	81	-	126	16,191	2,282	18,982	14,567	4,390	26	-	302	-	-	-	18,119	59	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	93	-	-	-	-	-	-	23	116	116	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	683	68	751	751	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	3,542	354	3,896	3,896	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,717	-	-	-	-	-	429	2,146	2,146	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,935	-	-	-	-	-	440	3,376	3,376	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	79	23	-	295	-	85	482	482	-	-	-	3,623	-	-	-	72,452	118	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,924	289	2,212	2,212	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	774	77	851	851	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,717	172	1,888	-	1,888	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	1,655	248	1,904	1,904	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	537	80	617	-	617	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	69	10	79	-	79	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	286	43	328	328	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	9,811	1,472	11,283	11,283	-	-	-	-	-	-	-	-	-	162,878
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	18,392	2,759	21,150	21,150	-	-	-	-	-	-	-	-	-	211,351
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	24,265	3,640	27,904	27,904	-	-	-	-	-	-	-	-	-	392,305
2a.4	Subtotal Period 2a Period-Dependent Costs	93	4,652	79	23	-	295	63,653	10,190	78,986	76,401	2,585	-	-	3,623	-	-	-	72,452	118	766,534
2a.0	TOTAL PERIOD 2a COST	995	26,670	27,760	4,062	3,004	18,729	82,524	39,305	203,050	193,905	6,974	2,170	37,556	36,834	250	673	-	4,471,020	212,158	772,694
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Aux Bldg Normal Ventilation	-	2	0	0	0	-	-	1	3	3	-	-	3	-	-	-	-	140	29	-
2b.1.1.2	Battery Rm Special Ventilation	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
2b.1.1.3	Buildings Maintenance	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	65	-
2b.1.1.4	Chemical & Volume Control	1,077	1,331	83	69	389	802	-	1,149	4,901	4,901	-	-	4,498	2,846	-	-	-	369,246	34,533	-
2b.1.1.5	Component Cooling - RCA	-	821	22	72	1,075	-	-	379	2,369	2,369	-	-	12,427	-	-	-	-	504,675	11,242	-
2b.1.1.6	Containment Cooling	-	65	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	1,086	-
2b.1.1.7	Containment Cooling - RCA	-	290	6	20	294	-	-	120	730	730	-	-	3,400	-	-	-	-	138,090	3,971	-
2b.1.1.8	Containment Hydrogen Control - RCA	-	29	0	1	9	-	-	9	48	48	-	-	105	-	-	-	-	4,278	401	-
2b.1.1.9	Containment Spray - RCA	-	90	2	5	75	-	-	35	206	206	-	-	868	-	-	-	-	35,249	1,217	-
2b.1.1.10	Containment Ventilation	-	243	24	40	428	209	-	186	1,130	1,130	-	-	4,951	737	-	-	-	249,786	3,668	-
2b.1.1.11	Cooling Water	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	2,396	-
2b.1.1.12	Cooling Water - RCA	-	629	14	45	668	-	-	266	1,622	1,622	-	-	7,728	-	-	-	-	313,832	8,594	-
2b.1.1.13	D1 Emergency Diesel	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	730	-
2b.1.1.14	D2 Emergency Diesel	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	522	-
2b.1.1.15	Diesel Rooms Ventilation	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	135	-
2b.1.1.16	Electrical - Clean	-	1,669	-	-	-	-	-	250	1,919	-	-	1,919	-	-	-	-	-	-	26,981	-
2b.1.1.17	Electrical - Contaminated	-	592	6	16	219	27	-	191	1,051	1,051	-	-	2,527	95	-	-	-	108,935	8,377	-
2b.1.1.18	Electrical - Decontaminated	-	3,674	41	137	2,037	-	-	1,249	7,138	7,138	-	-	23,551	-	-	-	-	956,401	49,378	-
2b.1.1.19	Fuel Handling	-	116	6	9	79	62	-	58	329	329	-	-	908	218	-	-	-	51,280	1,784	-
2b.1.1.20	Fuel Oil	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	1,697	-
2b.1.1.21	HVAC - Clean	-	105	-	-	-	-	-	16	121	-	-	121	-	-	-	-	-	-	1,891	-
2b.1.1.22	HVAC - Contaminated	-	371	8	21	282	35	-	148	864	864	-	-	3,261	123	-	-	-	140,573	5,032	-
2b.1.1.23	Incore Instrumentation	0	27	1	1	5	16	-	12	64	64	-	-	60	57	-	-	-	6,177	425	-
2b.1.1.24	Misc Drains & Vents	-	222	14	10	34	146	-	100	527	527	-	-	390	514	-	-	-	49,900	3,091	-
2b.1.1.25	Reactor Coolant	148	298	21	14	30	221	-	213	945	945	-	-	344	777	-	-	-	65,413	6,470	-
2b.1.1.26	Reactor Hot Sampling	144	131	11	6	6	98	-	132	527	527	-	-	66	342	-	-	-	25,347	3,946	-
2b.1.1.27	Reactor Makeup	-	64	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	1,042	-
2b.1.1.28	Reactor Vessel	9	20	1	0	2	4	-	11	47	47	-	-	26	14	-	-	-	2,011	425	-
2b.1.1.29	Residual Heat Removal	344	399	85	66	250	926	-	559	2,630	2,630	-	-	2,895	3,252	-	-	-	332,849	7,621	-
2b.1.1.30	Safeguards Chilled Water	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	259	-
2b.1.1.31	Safety Injection	-	853	40	57	587	327	-	396	2,261	2,261	-	-	6,788	1,156	-	-	-	351,793	12,561	-
2b.1.1.32	Sampling	-	58	4	2	5	31	-	23	122	122	-	-	59	107	-	-	-	9,505	811	-
2b.1.1.33	Shield Bldg Ventilation	-	133	14	20	186	139	-	100	593	593	-	-	2,152	491	-	-	-	119,838	2,030	-
2b.1.1.34	Station & Instrument Air	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	300	-
2b.1.1.35	Station & Instrument Air - RCA	-	79	1	2	29	-	-	24	135	135	-	-	332	-	-	-	-	13,496	1,053	-
2b.1.1.36	Turbine Bldg Traps & Drains	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	767	-
2b.1.1.37	Unit Coolers	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	611	-
2b.1.1.38	Unit Coolers - RCA	-	53	0	1	20	-	-	16	91	91	-	-	230	-	-	-	-	9,348	683	-
2b.1.1	Totals	1,724	12,813	403	614	6,710	3,044	-	5,730	31,037	28,333	-	2,704	77,571	10,728	-	-	-	3,858,165	205,829	-
2b.1.2	Scaffolding in support of decommissioning	-	1,067	4	1	17	4	-	271	1,364	1,364	-	-	173	15	-	-	-	8,770	7,960	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,150	2,623	139	852	193	11,079	-	4,171	20,208	20,208	-	-	2,230	57,414	-	-	-	3,559,624	50,842	-
2b.1.3.2	Backwash Waste Receiving Tank	-	27	1	11	-	87	-	30	158	158	-	-	-	507	-	-	-	43,896	299	-
2b.1.3	Totals	1,150	2,650	141	864	193	11,166	-	4,202	20,366	20,366	-	-	2,230	57,921	-	-	-	3,603,520	51,140	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan									a											
2b.1	Subtotal Period 2b Activity Costs	2,874	16,530	547	1,479	6,919	14,215	481	10,275	53,320	50,616	-	2,704	79,974	68,664	-	-	-	7,470,455	264,930	4,096
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,943	583	2,526	2,526	-	-	-	-	-	-	-	-	25,399	-
2b.2.2	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
2b.2	Subtotal Period 2b Additional Costs	-	-	9	29	312	-	1,943	635	2,928	2,928	-	-	5,855	-	-	-	-	146,375	25,415	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	105	-	70	182	-	285	-	158	800	800	-	-	-	680	-	-	-	40,799	133	-
2b.3.2	Process decommissioning chemical flush waste	3	-	87	327	-	651	-	222	1,289	1,289	-	-	-	875	-	-	-	93,252	164	-
2b.3.3	Small tool allowance	-	289	-	-	-	-	-	43	332	332	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,109	166	1,275	-	1,275	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	6,994	1,049	8,043	8,043	-	-	-	-	-	-	-	-	-	-
2b.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,525	-	1,525	-	1,525	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	107	289	157	509	-	936	9,628	1,638	13,264	10,463	2,801	-	-	1,555	-	-	-	134,051	296	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	482	-	-	-	-	-	-	121	603	603	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	624	62	687	687	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	3,099	310	3,409	3,409	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	1,969	-	-	-	-	-	492	2,461	2,461	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	2,759	-	-	-	-	-	414	3,173	3,173	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	78	23	-	293	-	85	479	479	-	-	-	3,600	-	-	-	71,996	117	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,388	208	1,596	1,596	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	707	71	778	778	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,569	157	1,726	-	1,726	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	1,513	227	1,740	1,740	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	490	74	564	-	564	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	247	37	284	284	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	63	9	73	-	73	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	8,299	1,245	9,544	9,544	-	-	-	-	-	-	-	-	-	137,246
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	11,450	1,718	13,168	13,168	-	-	-	-	-	-	-	-	-	137,246
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	15,293	2,294	17,586	17,586	-	-	-	-	-	-	-	-	-	255,430
2b.4	Subtotal Period 2b Period-Dependent Costs	482	4,728	78	23	-	293	44,813	7,533	57,951	55,588	2,362	-	-	3,600	-	-	-	71,996	117	529,921
2b.0	TOTAL PERIOD 2b COST	3,464	21,546	792	2,040	7,231	15,444	56,865	20,081	127,463	119,596	5,163	2,704	85,829	73,819	-	-	-	7,822,876	290,758	534,017
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	62,386	9,358	71,744	-	71,744	-	-	-	-	-	-	-	-	-
2c.3.2	Retention and Severance	-	-	-	-	-	-	4,478	672	5,149	5,149	-	-	-	-	-	-	-	-	-	-
2c.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,702	-	2,702	-	2,702	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	69,565	10,030	79,595	5,149	74,446	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	1,104	110	1,215	1,215	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	5,154	515	5,669	5,669	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	390	-	-	-	-	-	98	488	488	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	18	5	-	66	-	19	108	108	-	-	-	809	-	-	-	16,171	26	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	655	98	753	753	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	555	55	610	610	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	2,776	278	3,053	-	3,053	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2c Period-Dependent Costs (continued)																					
2c.4.8	Fixed Overhead	-	-	-	-	-	-	2,676	401	3,078	3,078	-	-	-	-	-	-	-	-	-	-
2c.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	87	13	101	101	-	-	-	-	-	-	-	-	-	-
2c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	112	17	128	-	128	-	-	-	-	-	-	-	-	-
2c.4.11	Railroad Track Maintenance	-	-	-	-	-	-	125	19	143	143	-	-	-	-	-	-	-	-	-	-
2c.4.12	Security Staff Cost	-	-	-	-	-	-	14,681	2,202	16,883	16,883	-	-	-	-	-	-	-	-	-	242,796
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	2,064	310	2,374	2,374	-	-	-	-	-	-	-	-	-	33,722
2c.4	Subtotal Period 2c Period-Dependent Costs	-	390	18	5	-	66	29,988	4,135	34,602	31,421	3,181	-	-	809	-	-	-	16,171	26	276,518
2c.0	TOTAL PERIOD 2c COST	-	390	18	5	-	66	103,902	14,817	119,197	41,570	77,627	-	-	809	-	-	-	16,171	26	276,518
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	328	32	94	32	-	595	-	335	1,416	1,416	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical - Contaminated - Fuel Pool	-	147	2	4	53	7	-	47	259	259	-	-	615	23	-	-	-	26,508	2,077	-
2d.1.2.2	Electrical - Decontaminated - Fuel Pool	-	918	10	34	510	-	-	312	1,785	1,785	-	-	5,893	-	-	-	-	239,327	12,340	-
2d.1.2.3	HVAC - Contaminated - Fuel Pool	-	159	3	9	121	15	-	63	370	370	-	-	1,398	53	-	-	-	60,246	2,157	-
2d.1.2.4	Safeguards Chilled Water - RCA	-	82	1	3	43	-	-	27	155	155	-	-	495	-	-	-	-	20,100	1,019	-
2d.1.2.5	Spent Fuel Pool Cooling	293	342	34	25	70	377	-	344	1,484	1,484	-	-	806	1,325	-	-	-	120,439	7,613	-
2d.1.2.6	Station & Instrument Air - RCA Fuel Pool	-	20	0	0	7	-	-	6	34	34	-	-	83	-	-	-	-	3,374	263	-
2d.1.2	Totals	293	1,668	50	75	804	399	-	800	4,088	4,088	-	-	9,290	1,401	-	-	-	469,994	25,468	-
2d.1.4	Scaffolding in support of decommissioning	-	213	1	0	3	1	-	54	273	273	-	-	35	3	-	-	-	1,754	1,592	-
2d.1	Subtotal Period 2d Activity Costs	621	1,913	145	107	807	994	-	1,189	5,777	5,777	-	-	9,325	3,496	-	-	-	610,046	27,637	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	16,173	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,082	625	2,706	2,706	-	-	-	-	-	-	-	-	16,173	6,240
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	27	-	18	48	-	75	-	41	209	209	-	-	-	179	-	-	-	10,721	35	-
2d.3.2	Process decommissioning chemical flush waste	1	-	32	121	-	241	-	82	478	478	-	-	-	324	-	-	-	34,576	61	-
2d.3.3	Small tool allowance	-	35	-	-	-	-	-	5	41	41	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13,365	2,005	15,370	-	15,370	-	-	-	-	-	-	-	-	-
2d.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	974	-	974	-	974	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	27	35	194	224	575	467	14,339	2,280	18,142	1,798	16,344	-	6,000	1,032	-	-	-	350,265	184	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	54	-	-	-	-	-	-	14	68	68	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	399	40	439	439	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,746	175	1,921	1,921	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	560	-	-	-	-	-	140	700	700	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,763	-	-	-	-	-	264	2,027	2,027	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	18	5	-	68	-	20	111	111	-	-	-	830	-	-	-	16,609	27	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	473	71	544	544	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,003	100	1,103	-	1,103	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	967	145	1,112	1,112	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	316	47	363	363	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	40	6	46	-	46	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	5,141	771	5,912	5,912	-	-	-	-	-	-	-	-	-	84,454
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,087	913	7,000	7,000	-	-	-	-	-	-	-	-	-	70,243
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	7,824	1,174	8,997	8,557	441	-	-	-	-	-	-	-	-	126,681
2d.4	Subtotal Period 2d Period-Dependent Costs	54	2,323	18	5	-	68	24,422	3,924	30,815	29,225	1,590	-	-	830	-	-	-	16,609	27	281,377
2d.0	TOTAL PERIOD 2d COST	703	4,272	357	337	1,382	1,528	40,843	8,018	57,440	39,507	17,934	-	15,325	5,359	-	-	-	976,920	44,021	287,617

Table C-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	431	65	496	-	496	-	-	-	-	-	-	-	-	-
2f.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	934	-	934	-	934	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,553	243	2,796	1,367	1,429	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,626	163	1,789	1,789	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	420	-	-	-	-	-	105	524	524	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	334	-	-	-	6,685	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	417	42	459	459	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	51	5	56	-	56	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	39	6	44	-	44	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	4,924	739	5,663	5,663	-	-	-	-	-	-	-	-	-	80,898
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	3,854	578	4,433	4,007	426	-	-	-	-	-	-	-	-	59,507
2f.4	Subtotal Period 2f Period-Dependent Costs	-	420	7	2	-	27	16,590	2,477	19,524	18,998	526	-	-	334	-	-	-	6,685	11	186,687
2f.0	TOTAL PERIOD 2f COST	-	420	7	2	-	27	22,537	3,738	26,731	24,776	1,956	-	-	334	-	-	-	6,685	40,183	189,807
PERIOD 2 TOTALS		5,162	53,298	28,935	6,446	11,617	35,794	306,671	85,960	533,881	419,353	109,654	4,875	138,709	117,154	250	673	-	13,293,670	587,146	2,060,653
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	4,255	-	-	-	-	-	638	4,894	-	-	4,894	-	-	-	-	-	-	44,669	-
3b.1.1.2	Condensate Storage Tank Foundation	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	16	-
3b.1.1.3	Structures below 3' below grade	-	1,581	-	-	-	-	-	237	1,818	-	-	1,818	-	-	-	-	-	-	8,411	-
3b.1.1.4	Turbine	-	1,983	-	-	-	-	-	297	2,280	-	-	2,280	-	-	-	-	-	-	22,040	-
3b.1.1.5	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
3b.1.1	Totals	-	8,171	-	-	-	-	-	1,226	9,397	-	-	9,397	-	-	-	-	-	-	76,993	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,602	-	-	-	-	183	1,318	10,102	211	-	9,892	-	-	-	-	-	-	77,914	1,560
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	2,213	-	-	-	-	3	332	2,549	-	-	2,549	-	-	-	-	-	-	8,386	-
3b.2.2	Underground Services Excavations	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
3b.2.3	Intake Structure Cofferdam	-	596	-	-	-	-	-	89	686	-	-	686	-	-	-	-	-	-	5,168	-
3b.2.4	Construction Debris	-	-	-	-	-	-	10	2	12	-	-	12	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	2,751	-	-	-	-	-	413	3,164	-	-	3,164	-	-	-	-	-	-	2,904	-
3b.2	Subtotal Period 3b Additional Costs	-	6,371	-	-	-	-	534	1,036	7,941	-	-	7,941	-	-	-	-	-	-	23,865	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	110	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,088	163	1,252	-	1,252	-	-	-	-	-	-	-	-	-
3b.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,651	-	2,651	-	2,651	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	110	-	-	-	-	3,739	180	4,028	-	3,902	126	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	542	54	596	-	596	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	4,333	433	4,767	-	4,767	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	236	24	259	-	259	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	145	14	159	-	159	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	331	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	4,245	637	4,882	-	4,882	-	-	-	-	-	-	-	-	57,340
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	4,813	722	5,535	(0)	1,207	4,329	-	-	-	-	-	-	-	74,431
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,670	-	-	-	-	26,533	4,718	37,920	(0)	11,996	25,924	-	-	-	-	-	-	-	248,656
3b.0	TOTAL PERIOD 3b COST	-	21,752	-	-	-	-	30,989	7,251	59,992	211	15,899	43,882	-	-	-	-	-	-	101,779	250,216
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	5,808	871	6,679	-	6,679	-	-	-	-	-	-	-	-	-
3c.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	26,863	-	26,863	-	26,863	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	32,671	871	33,543	-	33,543	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	5,494	549	6,044	-	6,044	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	26,564	2,656	29,221	-	29,221	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	3,519	352	3,871	-	3,871	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,471	147	1,618	-	1,618	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	3,281	492	3,774	-	3,774	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,110	167	1,277	-	1,277	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,240	186	1,426	-	1,426	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	43,057	6,459	49,516	-	49,516	-	-	-	-	-	-	-	-	581,545
3c.4.10	Utility Staff Cost	-	-	-	-	-	-	10,635	1,595	12,230	-	12,230	-	-	-	-	-	-	-	-	150,978
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	96,373	12,603	108,976	-	108,976	-	-	-	-	-	-	-	-	732,523
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	129,044	13,475	142,519	-	142,519	-	-	-	-	-	-	-	-	732,523
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1.1	Totals	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-
3d.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	48	-	48	-	48	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	60	2	62	-	62	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	10	1	11	11	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	39	4	43	43	-	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	3	0	3	-	3	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	2	0	3	3	-	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	77	12	88	88	-	-	-	-	-	-	-	-	-	1,037
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	19	3	22	22	-	-	-	-	-	-	-	-	-	269
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	162	21	183	173	10	-	-	-	-	-	-	-	-	1,306
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	8,689	222	1,659	11,901	11,829	72	-	-	-	-	-	3,746	837,596	-	1,306

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	-	37	2	211	-	2,157	682	772	3,861	3,861	-	-	-	7,458	-	-	-	1,071,985	3,403	888
3e.2	Subtotal Period 3e Additional Costs	-	37	2	211	-	2,157	682	772	3,861	3,861	-	-	-	7,458	-	-	-	1,071,985	3,403	888
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	96	24	121	121	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	26	6	32	32	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	51	13	63	63	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	19	5	24	24	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	154	38	192	192	-	-	-	-	-	-	-	-	-	2,500
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	130	33	163	163	-	-	-	-	-	-	-	-	-	1,896
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	476	119	595	595	-	-	-	-	-	-	-	-	-	4,396
3e.0	TOTAL PERIOD 3e COST	-	37	2	211	-	2,157	1,158	891	4,456	4,456	-	-	-	7,458	-	-	-	1,071,985	3,403	5,284
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	399	-	-	-	-	87	73	558	-	-	558	-	-	-	-	-	-	1,900	160
3f.2	Subtotal Period 3f Additional Costs	-	399	-	-	-	-	87	73	558	-	-	558	-	-	-	-	-	-	1,900	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	13	1	14	-	-	14	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	25	4	29	-	-	29	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	10	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	78	12	89	-	-	89	-	-	-	-	-	-	-	1,260
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	782
3f.4	Subtotal Period 3f Period-Dependent Costs	-	62	-	-	-	-	190	37	289	-	-	289	-	-	-	-	-	-	-	2,042
3f.0	TOTAL PERIOD 3f COST	-	463	-	-	-	-	277	110	851	-	-	851	-	-	-	-	-	-	1,900	2,202
PERIOD 3 TOTALS		-	22,252	1,333	211	-	10,846	161,689	23,386	219,717	16,495	158,489	44,733	-	7,458	-	-	3,746	1,909,581	107,082	991,531
TOTAL COST TO DECOMMISSION		8,734	80,918	30,683	7,109	11,781	50,612	579,062	128,621	897,520	571,980	274,479	51,061	144,842	138,577	839	673	3,746	15,813,390	739,753	4,056,605

TOTAL COST TO DECOMMISSION WITH 16.73% CONTINGENCY:	\$897,520	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 63.73% OR:	\$571,980	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 30.58% OR:	\$274,479	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 5.69% OR:	\$51,061	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	140,089	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	32,925	tons
TOTAL CRAFT LABOR REQUIREMENTS:	739,753	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.13	Perform SER and EA	-	-	-	-	-	-	156	23	179	179	-	-	-	-	-	-	-	-	-	1,326
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	251	38	289	289	-	-	-	-	-	-	-	-	-	2,138
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	247	37	284	256	-	28	-	-	-	-	-	-	-	2,104
1a.1.17.2	Plant systems	-	-	-	-	-	-	209	31	241	216	-	24	-	-	-	-	-	-	-	1,782
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,036
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	326	49	375	375	-	-	-	-	-	-	-	-	-	2,779
1a.1.17.6	Biological shield	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,334
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	80	12	92	46	-	46	-	-	-	-	-	-	-	684
1a.1.17.9	Main Turbine	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	157	23	180	90	-	90	-	-	-	-	-	-	-	1,334
1a.1.17.12	Waste management	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	45	7	52	26	-	26	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	1,899	285	2,183	1,923	-	261	-	-	-	-	-	-	-	16,175
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	120	18	139	139	-	-	-	-	-	-	-	-	-	1,026
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlp/s/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	9,523	1,428	10,951	10,690	-	261	-	-	-	-	-	-	-	33,420
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,776	266	2,042	-	2,042	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	8,394	1,259	9,653	9,653	-	-	-	-	-	-	-	-	-	-
1a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,281	-	2,281	-	2,281	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	12,450	1,525	13,976	9,653	4,323	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,682	268	2,950	2,950	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	485	-	-	-	-	-	121	606	606	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	12	4	-	46	-	13	75	75	-	-	-	565	-	-	-	11,299	18	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	778	78	855	855	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
Period 1a Period-Dependent Costs (continued)																					
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	20,662	3,099	23,761	23,761	-	-	-	-	-	-	-	-	-	345,280
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,052	12	4	-	46	38,340	5,631	45,085	42,800	2,286	-	-	565	-	-	-	11,299	18	468,000
1a.0	TOTAL PERIOD 1a COST	-	1,052	12	4	-	46	68,108	9,754	78,976	72,107	6,608	261	-	565	-	-	-	11,299	18	501,420
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	238	36	273	246	-	27	-	-	-	-	-	-	-	2,024
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	1,069
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	68	10	78	19	-	58	-	-	-	-	-	-	-	577
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	182	27	210	210	-	-	-	-	-	-	-	-	-	1,552
1b.1.1.9	Facility closeout	-	-	-	-	-	-	60	9	69	35	-	35	-	-	-	-	-	-	-	513
1b.1.1.10	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	192
1b.1.1.11	Biological shield	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	513
1b.1.1.12	Steam generators	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	50	8	58	29	-	29	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
1b.1.1.15	Main Condensers	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
1b.1.1.17	Reactor building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
1b.1.1	Total	-	-	-	-	-	-	1,669	250	1,919	1,558	-	361	-	-	-	-	-	-	-	14,215
1b.1.2	Decon primary loop	552	-	-	-	-	-	-	276	828	828	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	552	-	-	-	-	-	1,669	526	2,747	2,386	-	361	-	-	-	-	-	-	1,067	14,215
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	1,582	475	2,057	2,057	-	-	-	-	-	-	-	-	8,988	3,563
1b.2.2	Mixed/Hazardous Waste	-	-	326	75	169	-	-	69	639	639	-	-	6,324	-	-	-	-	362,914	2,410	-
1b.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
1b.2	Subtotal Period 1b Additional Costs	-	2,364	328	185	169	1,359	1,582	1,491	7,478	7,478	-	-	6,324	12,843	-	-	-	529,873	32,305	3,563
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	24	-	16	41	-	64	-	36	180	180	-	-	-	152	-	-	-	9,121	30	-
1b.3.4	Process decommissioning chemical flush waste	2	-	58	220	-	2,471	-	657	3,408	3,408	-	-	-	-	588	-	-	62,689	110	-
1b.3.5	Small tool allowance	-	34	-	-	-	-	-	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	705	106	811	-	811	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	4,055	608	4,664	4,664	-	-	-	-	-	-	-	-	-	-
1b.3.10	Prairie Island Indian Community Payments	-	-	-	-	-	-	629	-	629	-	629	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,986	1,234	74	261	-	2,534	6,578	2,214	15,881	14,441	1,440	-	-	152	588	-	-	71,810	140	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	872	87	959	959	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,319	132	1,451	1,451	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	380	-	-	-	-	-	95	475	475	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	286	-	-	-	-	-	43	329	329	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	327	-	-	-	6,541	11	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,527	229	1,756	1,756	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	214	21	236	236	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	809	81	890	-	890	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	741	111	852	852	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,725	559	4,284	4,284	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	4,009	601	4,610	4,610	-	-	-	-	-	-	-	-	-	47,185

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Decommissioning Cost Analysis

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Table C-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
Period 1b Period-Dependent Costs (continued)																					
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	10,416	1,562	11,978	11,978	-	-	-	-	-	-	-	-	-	174,059
1b.4	Subtotal Period 1b Period-Dependent Costs	35	666	7	2	-	27	23,890	3,577	28,204	27,052	1,152	-	-	327	-	-	-	6,541	11	283,108
1b.0	TOTAL PERIOD 1b COST	3,573	4,264	410	447	169	3,920	33,718	7,809	54,309	51,356	2,592	361	6,324	13,322	588	-	-	608,224	33,522	300,885
PERIOD 1 TOTALS		3,573	5,316	422	451	169	3,966	101,826	17,563	133,285	123,462	9,200	622	6,324	13,887	588	-	-	619,523	33,540	802,305
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	51	45	6	8	-	150	-	76	336	336	-	-	-	305	-	-	-	34,809	1,414	-
2a.1.1.2	Pressurizer Relief Tank	22	20	4	5	-	100	-	42	193	193	-	-	-	203	-	-	-	23,193	625	-
2a.1.1.3	Reactor Coolant Pumps & Motors	54	63	101	83	-	736	-	249	1,287	1,287	-	-	-	2,332	-	-	-	295,800	2,049	100
2a.1.1.4	Pressurizer	48	68	467	88	-	693	-	274	1,639	1,639	-	-	-	2,196	-	-	-	185,015	2,355	938
2a.1.1.5	Steam Generators	225	2,943	2,093	1,638	1,246	3,570	-	2,383	14,097	14,097	-	-	18,672	11,316	-	-	-	1,668,341	14,819	2,875
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	286	277	211	48	-	763	-	431	2,016	2,016	-	-	-	4,797	-	-	-	177,400	8,104	-
2a.1.1.7	Reactor Vessel Internals	78	4,468	21,874	1,072	-	7,946	277	13,141	48,856	48,856	-	-	-	501	125	673	-	164,987	23,040	1,080
2a.1.1.8	Reactor Vessel	89	5,717	1,754	719	-	1,956	277	5,970	16,483	16,483	-	-	-	5,690	-	-	-	570,074	23,040	1,080
2a.1.1	Totals	855	13,600	26,512	3,662	1,246	15,913	553	22,568	84,908	84,908	-	-	18,672	27,341	125	673	-	3,119,620	75,446	6,073
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	305	189	55	272	306	-	221	1,348	1,348	-	-	2,131	1,187	-	-	-	206,316	4,667	-
2a.1.3	Main Condensers	-	2,532	121	49	364	451	-	820	4,336	4,336	-	-	3,800	1,587	-	-	-	275,903	39,151	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
2a.1.4.2	Auxiliary	-	210	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	1,309	-
2a.1.4.3	Radwaste	-	8	-	-	-	-	-	1	9	9	-	-	-	-	-	-	-	-	65	-
2a.1.4	Totals	-	946	-	-	-	-	-	142	1,088	1,088	-	-	-	-	-	-	-	-	8,963	-
Disposal of Plant Systems																					
2a.1.5.1	Admin Bldg Ventilation	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	90	-
2a.1.5.2	Air Removal	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	422	-
2a.1.5.3	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	676	-
2a.1.5.4	Auxiliary Feedwater - RCA	-	36	0	1	15	-	-	12	65	65	-	-	178	-	-	-	-	7,214	486	-
2a.1.5.5	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,331	-
2a.1.5.6	Caustic Addition - RCA	-	38	0	1	21	-	-	13	74	74	-	-	240	-	-	-	-	9,761	468	-
2a.1.5.7	Chemical Feed	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	261	-
2a.1.5.8	Chemical Feed - RCA	-	3	0	0	1	-	-	1	5	5	-	-	16	-	-	-	-	634	31	-
2a.1.5.9	Circulating Water	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	401	-
2a.1.5.10	Condensate	-	459	-	-	-	-	-	69	527	-	-	527	-	-	-	-	-	-	7,537	-
2a.1.5.11	Condensate Polishing	-	181	-	-	-	-	-	27	209	-	-	209	-	-	-	-	-	-	2,987	-
2a.1.5.12	Condensate Polishing - RCA	-	36	1	3	42	-	-	16	98	98	-	-	483	-	-	-	-	19,616	493	-
2a.1.5.13	Electro-Hydraulic	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	143	-
2a.1.5.14	External Circulating Water	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	385	-
2a.1.5.15	External Circulating Water - RCA	-	70	1	4	62	-	-	28	165	165	-	-	721	-	-	-	-	29,284	938	-
2a.1.5.16	Feedwater	-	111	-	-	-	-	-	17	128	-	-	128	-	-	-	-	-	-	1,840	-
2a.1.5.17	Feedwater - RCA	-	236	7	24	359	-	-	117	744	744	-	-	4,147	-	-	-	-	168,414	3,377	-
2a.1.5.18	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	504	-
2a.1.5.19	Heater Drain	-	334	-	-	-	-	-	50	384	-	-	384	-	-	-	-	-	-	5,638	-
2a.1.5.20	Hypobromous Acid Feed	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	86	-
2a.1.5.21	Hypobromous Acid Feed - RCA	-	1	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	100	12	-
2a.1.5.22	Internal Circ Water & CDSR	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	366	-
2a.1.5.23	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2a.1.5.24	Main Steam	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	1,482	-
2a.1.5.25	Main Steam - RCA	-	364	9	30	447	-	-	163	1,013	1,013	-	-	5,166	-	-	-	-	209,799	5,146	-
2a.1.5.26	Repairable Spare Snubbers	-	6	0	0	1	-	-	2	8	8	-	-	12	-	-	-	-	490	82	-
2a.1.5.27	Steam Exclusion	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	32	-
2a.1.5.28	Steam Exclusion - RCA	-	4	0	0	2	-	-	1	8	8	-	-	24	-	-	-	-	966	47	-
2a.1.5.29	Steam Generator Blowdown	-	398	20	21	165	179	-	174	957	957	-	-	1,906	631	-	-	-	119,126	5,778	-
2a.1.5.30	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2a.1.5.31	Turbine & Moisture Separators	-	329	-	-	-	-	-	49	379	-	-	379	-	-	-	-	-	-	5,472	-
2a.1.5.32	Turbine Oil Purification	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	757	-
2a.1.5.33	Water Treatment	-	394	-	-	-	-	-	59	453	-	-	453	-	-	-	-	-	-	6,677	-
2a.1.5.34	Water Treatment - RCA	-	19	0	1	10	-	-	6	37	37	-	-	115	-	-	-	-	4,652	252	-

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Decommissioning Cost Analysis

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Table C-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Wt., Lbs.	Craft Manhours	
2a.1.5	Totals	-	3,437	39	85	1,125	179	-	867	5,733	3,174	-	2,559	13,010	631	-	-	-	570,056	54,280	-
2a.1.6	Scaffolding in support of decommissioning	-	2,833	24	8	97	25	-	733	3,721	3,721	-	-	1,012	89	-	-	-	51,445	26,270	-
2a.1	Subtotal Period 2a Activity Costs	855	23,653	26,885	3,859	3,105	16,875	553	25,350	101,134	98,575	-	2,559	38,625	30,835	125	673	-	4,223,340	208,777	6,073
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,560	468	2,027	2,027	-	-	-	-	-	-	-	-	20,388	-
2a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
2a.2	Subtotal Period 2a Additional Costs	1	659	785	107	-	1,439	1,560	1,905	6,454	6,454	-	-	-	2,097	125	-	-	205,890	22,562	87
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	51	-	33	86	-	135	-	75	381	381	-	-	-	323	-	-	-	19,358	63	-
2a.3.3	Small tool allowance	-	251	-	-	-	-	-	38	289	260	-	29	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	927	139	1,066	-	1,066	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	6,105	916	7,021	7,021	-	-	-	-	-	-	-	-	-	-
2a.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,224	-	1,224	-	1,224	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	51	251	33	86	-	135	8,256	1,168	9,980	7,661	2,290	29	-	323	-	-	-	19,358	63	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	68	-	-	-	-	-	-	17	85	85	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	501	50	551	551	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	2,507	251	2,758	2,758	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,622	-	-	-	-	-	406	2,028	2,028	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,153	-	-	-	-	-	323	2,477	2,477	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	89	26	-	331	-	95	541	541	-	-	-	4,063	-	-	-	81,252	133	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,411	212	1,623	1,623	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	389	39	428	428	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,259	126	1,385	-	1,385	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	1,214	182	1,396	1,396	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	394	59	453	-	453	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	51	8	58	-	58	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	265	40	305	305	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	6,661	999	7,661	7,661	-	-	-	-	-	-	-	-	-	110,166
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	13,492	2,024	15,516	15,516	-	-	-	-	-	-	-	-	-	155,048
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	17,880	2,682	20,562	20,562	-	-	-	-	-	-	-	-	-	288,676
2a.4	Subtotal Period 2a Period-Dependent Costs	68	3,776	89	26	-	331	46,025	7,512	57,825	55,929	1,896	-	-	4,063	-	-	-	81,252	133	553,890
2a.0	TOTAL PERIOD 2a COST	974	28,339	27,792	4,078	3,105	18,780	56,393	35,934	175,394	168,620	4,186	2,588	38,625	37,317	250	673	-	4,529,841	231,534	560,049
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	ADT & Misc Ventilation	-	24	0	1	13	3	-	9	50	50	-	-	153	9	-	-	-	6,814	363	-
2b.1.1.2	Aux Bldg Normal Ventilation	-	67	2	5	60	11	-	29	174	174	-	-	692	39	-	-	-	30,671	1,013	-
2b.1.1.3	Aux Bldg Special Ventilation	-	13	0	0	6	2	-	5	26	26	-	-	70	6	-	-	-	3,243	197	-
2b.1.1.4	Battery Rm Special Ventilation	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	24	-
2b.1.1.5	Boron Recycle	0	4	0	0	0	3	-	2	9	9	-	-	3	9	-	-	-	709	50	-
2b.1.1.6	Chemical & Volume Control	722	902	59	44	204	560	-	770	3,260	3,260	-	-	2,356	1,977	-	-	-	225,854	23,197	-
2b.1.1.7	Cold Chemical Lab Ventilation	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
2b.1.1.8	Component Cooling - RCA	-	617	21	70	1,038	-	-	322	2,068	2,068	-	-	11,996	-	-	-	-	487,169	8,583	-
2b.1.1.9	Containment Cooling	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	502	-
2b.1.1.10	Containment Cooling - RCA	-	288	5	16	237	-	-	110	656	656	-	-	2,743	-	-	-	-	111,390	3,949	-
2b.1.1.11	Containment Hydrogen Control - RCA	-	35	0	1	12	-	-	11	60	60	-	-	141	-	-	-	-	5,742	494	-
2b.1.1.12	Containment Spray - RCA	-	186	3	8	126	-	-	67	389	389	-	-	1,453	-	-	-	-	59,019	2,617	-
2b.1.1.13	Containment Ventilation	-	224	23	38	408	205	-	177	1,075	1,075	-	-	4,721	722	-	-	-	239,450	3,375	-
2b.1.1.14	Control/Relay/Cmptr Rm Vent	-	30	1	2	23	6	-	13	74	74	-	-	260	20	-	-	-	11,915	454	-
2b.1.1.15	Cooling Water	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	2,344	-
2b.1.1.16	Cooling Water - RCA	-	456	15	49	730	-	-	232	1,482	1,482	-	-	8,442	-	-	-	-	342,822	6,311	-
2b.1.1.17	Cranes/Hoists/Elevators - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2b.1.1.18	D3 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
2b.1.1.19	D4 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
2b.1.1.20	D5 Emergency Diesel	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2b.1.1.21	Electrical - Clean	-	1,502	-	-	-	-	-	225	1,727	-	-	1,727	-	-	-	-	-	-	24,276	-
2b.1.1.22	Electrical - Contaminated	-	461	5	13	173	21	-	149	821	821	-	-	1,997	75	-	-	-	86,080	6,503	-
2b.1.1.23	Electrical - Decontaminated	-	2,866	33	109	1,622	-	2,866	980	5,610	5,610	-	-	18,753	-	-	-	-	761,569	38,423	-

Table C-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Wt., Lbs.	Craft Manhours	
Disposal of Plant Systems (continued)																					
2b.1.1.24	Filter Rm Ventilation	-	4	0	0	2	0	-	2	9	9	-	-	24	1	-	-	-	1,020	69	-
2b.1.1.25	Fire Protection & Detection	-	178	-	-	-	-	-	27	205	-	-	205	-	-	-	-	-	-	3,009	-
2b.1.1.26	Fire Protection & Detection - RCA	-	236	3	11	158	-	-	85	492	492	-	-	1,828	-	-	-	-	74,245	3,134	-
2b.1.1.27	Fuel Handling	-	71	1	2	17	14	-	24	130	130	-	-	200	49	-	-	-	11,396	1,101	-
2b.1.1.28	Fuel Oil	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
2b.1.1.29	HVAC - Clean	-	132	-	-	-	-	-	20	151	-	-	151	-	-	-	-	-	-	2,373	-
2b.1.1.30	HVAC - Contaminated	-	1,222	26	69	929	115	-	487	2,848	2,848	-	-	10,745	405	-	-	-	463,144	16,579	-
2b.1.1.31	Heating	-	279	-	-	-	-	-	42	321	-	-	321	-	-	-	-	-	-	4,804	-
2b.1.1.32	Heating - RCA	-	323	3	11	165	-	-	107	609	609	-	-	1,907	-	-	-	-	77,458	4,086	-
2b.1.1.33	Hot Lab & Sample Rm Ventilation	-	19	0	1	9	1	-	6	37	37	-	-	107	4	-	-	-	4,632	285	-
2b.1.1.34	Incore Instrumentation	0	29	1	1	5	16	-	13	67	67	-	-	60	58	-	-	-	6,264	458	-
2b.1.1.35	Misc Drains & Vents	-	223	12	9	40	121	-	95	500	500	-	-	458	426	-	-	-	46,850	3,180	-
2b.1.1.36	Misc Lab & Service Areas Vent	-	123	8	6	32	70	-	55	293	293	-	-	370	244	-	-	-	31,186	1,713	-
2b.1.1.37	Miscellaneous Gas	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	1,073	-
2b.1.1.38	Miscellaneous Gas - RCA	-	129	1	3	52	-	-	41	226	226	-	-	600	-	-	-	-	24,378	1,636	-
2b.1.1.39	Radiation Monitoring	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	111	-
2b.1.1.40	Radiation Monitoring - RCA	-	62	1	2	27	-	-	20	112	112	-	-	316	-	-	-	-	12,826	782	-
2b.1.1.41	Reactor Coolant	158	227	20	12	20	208	-	195	839	839	-	-	229	730	-	-	-	57,672	5,517	-
2b.1.1.42	Reactor Hot Sampling	135	121	10	5	5	89	-	123	489	489	-	-	54	312	-	-	-	22,919	3,686	-
2b.1.1.43	Reactor Makeup	-	36	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	583	-
2b.1.1.44	Reactor Makeup - RCA	-	4	0	0	2	-	-	1	8	8	-	-	28	-	-	-	-	1,148	47	-
2b.1.1.45	Reactor Vessel	9	17	0	0	2	4	-	10	43	43	-	-	22	14	-	-	-	1,826	385	-
2b.1.1.46	Residual Heat Removal	336	374	84	66	247	924	-	548	2,578	2,578	-	-	2,853	3,244	-	-	-	330,651	7,112	-
2b.1.1.47	Safeguards Chilled Water	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2b.1.1.48	Safety Injection	-	836	40	56	577	329	-	390	2,228	2,228	-	-	6,676	1,161	-	-	-	347,600	12,284	-
2b.1.1.49	Sampling	-	51	3	2	3	27	-	20	105	105	-	-	37	93	-	-	-	7,697	714	-
2b.1.1.50	Service Bldg & New Cmptr Vent	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
2b.1.1.51	Shield Bldg Ventilation	-	114	13	19	175	138	-	94	554	554	-	-	2,028	484	-	-	-	114,378	1,743	-
2b.1.1.52	Station & Instrument Air	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	2,424	-
2b.1.1.53	Station & Instrument Air - RCA	-	288	3	9	141	-	-	95	535	535	-	-	1,625	-	-	-	-	65,986	3,638	-
2b.1.1.54	Turbine Bldg Traps & Drains	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	462	-
2b.1.1.55	Turbine Bldg Traps & Drains - RCA	-	28	0	1	16	-	-	10	55	55	-	-	180	-	-	-	-	7,321	344	-
2b.1.1.56	Turbine Bldg Ventilation	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	655	-
2b.1.1.57	Unit Coolers	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	332	-
2b.1.1.58	Unit Coolers - RCA	-	54	0	1	20	-	-	17	93	93	-	-	232	-	-	-	-	9,413	690	-
2b.1.1.59	Waste Gas Disposal	531	457	40	35	212	381	-	516	2,173	2,173	-	-	2,453	1,358	-	-	-	188,334	14,308	-
2b.1.1.60	Waste Liquid Disposal	1,386	1,733	108	76	316	1,019	-	1,451	6,089	6,089	-	-	3,655	3,594	-	-	-	385,370	44,485	-
2b.1.1.61	Waste Solid Disposal	111	139	11	8	34	112	-	126	541	541	-	-	389	393	-	-	-	41,732	3,481	-
2b.1.1	Totals	3,390	15,678	558	763	7,868	4,377	-	7,798	40,433	37,423	-	3,010	90,963	15,429	-	-	-	4,712,076	270,390	-
2b.1.2	Scaffolding in support of decommissioning	-	3,542	30	10	121	32	-	916	4,651	4,651	-	-	1,265	112	-	-	-	64,307	32,837	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,150	2,624	139	853	193	11,080	-	4,172	20,210	20,210	-	-	2,230	57,418	-	-	-	3,559,977	50,853	-
2b.1.3.2	Auxiliary	1,223	400	12	80	92	582	-	884	3,272	3,272	-	-	1,060	3,355	-	-	-	332,498	23,808	-
2b.1.3.3	Backwash Waste Receiving Tank	-	27	1	11	-	87	-	30	158	158	-	-	-	507	-	-	-	43,896	299	-
2b.1.3.4	Drum Transfer & Truck Loading Enclosure	17	8	0	2	2	13	-	14	56	56	-	-	19	74	-	-	-	7,118	368	-
2b.1.3.5	LLRW Storage Enclosure	117	51	1	11	3	87	-	95	366	366	-	-	38	502	-	-	-	44,971	2,424	-
2b.1.3.6	Radwaste	52	23	1	5	4	39	-	43	166	166	-	-	42	225	-	-	-	21,136	1,082	-
2b.1.3.7	Resin Disposal	15	11	0	2	7	12	-	15	64	64	-	-	83	69	-	-	-	9,271	383	-
2b.1.3	Totals	2,574	3,145	155	964	300	11,900	-	5,253	24,292	24,292	-	-	3,471	62,151	-	-	-	4,018,868	79,216	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	206	31	236	236	-	-	-	-	-	-	-	-	-	1,751
2b.1.5	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	5,965	22,365	744	1,737	8,290	16,309	206	13,998	69,612	66,602	-	3,010	95,700	77,691	-	-	-	8,795,250	382,443	1,751
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,930	579	2,509	2,509	-	-	-	-	-	-	-	-	25,228	-
2b.2.2	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
2b.2	Subtotal Period 2b Additional Costs	-	-	9	29	312	-	1,930	631	2,911	2,911	-	-	5,855	-	-	-	-	146,375	25,244	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	167	-	112	289	-	453	-	251	1,272	1,272	-	-	-	1,081	-	-	-	64,837	211	-
2b.3.2	Process decommissioning chemical flush waste	3	-	114	431	-	858	-	292	1,700	1,700	-	-	-	1,154	-	-	-	122,948	216	-
2b.3.3	Small tool allowance	-	414	-	-	-	-	-	62	476	476	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	924	139	1,062	-	1,062	-	-	-	-	-	-	-	-	-

Table C-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
Period 2b Collateral Costs (continued)																					
2b.3.5	Retention and Severance	-	-	-	-	-	-	4,127	619	4,746	4,746	-	-	-	-	-	-	-	-	-	-
2b.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,517	-	1,517	-	1,517	-	-	-	-	-	-	-	-	-
2b.3.7	On-site survey and release of 0.437 tons clean metallic waste	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	170	414	226	721	-	1,311	6,569	1,363	10,774	8,195	2,579	-	-	2,234	-	-	-	187,785	427	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,135	-	-	-	-	-	-	284	1,419	1,419	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	620	62	682	682	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	2,983	298	3,281	3,281	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,580	-	-	-	-	-	645	3,225	3,225	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	2,740	-	-	-	-	-	411	3,151	3,151	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	115	34	-	431	-	124	704	704	-	-	-	5,291	-	-	-	105,826	173	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,379	207	1,586	1,586	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	481	48	529	529	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,558	156	1,714	-	1,714	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	1,503	225	1,728	1,728	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	487	73	560	-	560	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	246	37	282	282	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	63	9	72	-	72	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	70	10	80	80	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	8,243	1,236	9,479	9,479	-	-	-	-	-	-	-	-	-	136,323
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	16,150	2,422	18,572	18,572	-	-	-	-	-	-	-	-	-	184,288
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	21,222	3,183	24,405	24,405	-	-	-	-	-	-	-	-	-	342,069
2b.4	Subtotal Period 2b Period-Dependent Costs	1,135	5,320	115	34	-	431	55,004	9,432	71,472	69,125	2,346	-	-	5,291	-	-	-	105,826	173	662,680
2b.0	TOTAL PERIOD 2b COST	7,270	28,099	1,095	2,520	8,602	18,050	63,708	25,425	154,768	146,833	4,926	3,010	101,555	85,217	-	-	-	9,235,236	408,286	664,431
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	61,759	9,264	71,023	-	71,023	-	-	-	-	-	-	-	-	-
2c.3.2	Retention and Severance	-	-	-	-	-	-	2,034	305	2,339	2,339	-	-	-	-	-	-	-	-	-	-
2c.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,630	-	1,630	-	1,630	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	65,423	9,569	74,991	2,339	72,653	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	666	67	733	733	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	3,060	306	3,366	3,366	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	270	-	-	-	-	-	67	337	337	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	12	3	-	44	-	13	72	72	-	-	-	538	-	-	-	10,761	18	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	395	59	454	454	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	305	31	336	336	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,674	167	1,842	-	1,842	-	-	-	-	-	-	-	-	-
2c.4.8	Fixed Overhead	-	-	-	-	-	-	1,615	242	1,857	1,857	-	-	-	-	-	-	-	-	-	-
2c.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	-
2c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	67	10	77	-	77	-	-	-	-	-	-	-	-	-
2c.4.11	Railroad Track Maintenance	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	-
2c.4.12	Security Staff Cost	-	-	-	-	-	-	8,857	1,329	10,185	10,185	-	-	-	-	-	-	-	-	-	146,478
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	6,575	986	7,561	7,561	-	-	-	-	-	-	-	-	-	107,146
2c.4	Subtotal Period 2c Period-Dependent Costs	-	270	12	3	-	44	23,343	3,296	26,968	25,049	1,919	-	-	538	-	-	-	10,761	18	253,623
2c.0	TOTAL PERIOD 2c COST	-	270	12	3	-	44	93,114	13,517	106,959	32,387	74,572	-	-	538	-	-	-	10,761	18	253,623
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	328	32	94	32	-	595	-	335	1,416	1,416	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical - Contaminated - Fuel Pool	-	197	2	6	75	9	-	64	353	353	-	-	864	33	-	-	-	37,250	2,783	-
2d.1.2.2	Electrical - Decontaminated - Fuel Pool	-	1,230	14	47	698	-	-	421	2,410	2,410	-	-	8,069	-	-	-	-	327,668	16,495	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Wt., Lbs.	Craft Manhours	
Disposal of Plant Systems (continued)																					
2d.1.2.3	Fire Protection & Detection - RCA Fuel P	-	36	1	2	25	-	-	13	76	76	-	-	286	-	-	-	-	11,622	476	-
2d.1.2.4	HVAC - Contaminated - Fuel Pool	-	549	12	31	418	52	-	219	1,280	1,280	-	-	4,828	182	-	-	-	208,080	7,448	-
2d.1.2.5	Safeguards Chilled Water - RCA	-	4	0	0	2	-	-	1	8	8	-	-	26	-	-	-	-	1,045	51	-
2d.1.2.6	Spent Fuel Pool Cooling	31	35	3	2	3	30	-	33	137	137	-	-	39	107	-	-	-	8,635	882	-
2d.1.2.7	Spent Fuel Pool Normal Ventilation	-	26	1	2	23	3	-	11	66	66	-	-	265	12	-	-	-	11,532	394	-
2d.1.2	Totals	31	2,077	32	89	1,244	95	-	761	4,328	4,328	-	-	14,376	333	-	-	-	605,832	28,530	-
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Handling of Aux Building	975	1,082	9	32	209	173	-	838	3,319	3,319	-	-	2,417	944	-	-	-	177,818	30,401	-
2d.1.3	Totals	975	1,082	9	32	209	173	-	838	3,319	3,319	-	-	2,417	944	-	-	-	177,818	30,401	-
2d.1.4	Scaffolding in support of decommissioning	-	708	6	2	24	6	-	183	930	930	-	-	253	22	-	-	-	12,861	6,567	-
2d.1	Subtotal Period 2d Activity Costs	1,334	3,900	142	155	1,477	868	-	2,118	9,994	9,994	-	-	17,046	3,391	-	-	-	934,809	66,074	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	16,173	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,082	625	2,706	2,706	-	-	-	-	-	-	-	-	16,173	6,240
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	39	-	27	70	-	109	-	60	306	306	-	-	-	261	-	-	-	15,666	51	-
2d.3.2	Process decommissioning chemical flush waste	0	-	1	5	-	10	-	3	20	20	-	-	-	13	-	-	-	1,422	2	-
2d.3.3	Small tool allowance	-	79	-	-	-	-	-	12	91	91	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13,365	2,005	15,370	-	15,370	-	-	-	-	-	-	-	-	-
2d.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	974	-	974	-	974	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	39	79	172	130	575	270	14,339	2,227	17,831	1,488	16,344	-	6,000	803	-	-	-	322,056	142	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	218	-	-	-	-	-	-	54	272	272	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	399	40	439	439	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,746	175	1,921	1,921	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	743	-	-	-	-	-	186	929	929	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,763	-	-	-	-	-	264	2,027	2,027	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	44	13	-	163	-	47	266	266	-	-	-	2,002	-	-	-	40,031	65	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	473	71	544	544	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	257	26	283	283	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,003	100	1,103	-	1,103	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	967	145	1,112	1,112	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	316	47	363	363	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	40	6	46	-	46	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	5,141	771	5,912	5,912	-	-	-	-	-	-	-	-	-	84,454
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,087	913	7,000	7,000	-	-	-	-	-	-	-	-	-	70,243
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	7,824	1,174	8,997	8,557	441	-	-	-	-	-	-	-	-	126,681
2d.4	Subtotal Period 2d Period-Dependent Costs	218	2,506	44	13	-	163	24,297	4,026	31,267	29,677	1,590	-	-	2,002	-	-	-	40,031	65	281,377
2d.0	TOTAL PERIOD 2d COST	1,591	6,486	357	298	2,052	1,301	40,718	8,995	61,799	43,865	17,934	-	23,046	6,196	-	-	-	1,296,896	82,455	287,617
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	431	65	496	-	496	-	-	-	-	-	-	-	-	-
2f.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	934	-	934	-	934	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,553	243	2,796	1,367	1,429	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,626	163	1,789	1,789	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	602	-	-	-	-	-	150	752	752	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	334	-	-	-	6,685	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	272	27	299	299	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	51	5	56	-	56	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	39	6	44	-	44	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	4,924	739	5,663	5,663	-	-	-	-	-	-	-	-	-	80,898
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	3,854	578	4,433	4,007	426	-	-	-	-	-	-	-	-	59,507
2f.4	Subtotal Period 2f Period-Dependent Costs	-	602	7	2	-	27	16,445	2,508	19,592	19,065	526	-	-	334	-	-	-	6,685	11	186,687
2f.0	TOTAL PERIOD 2f COST	-	602	7	2	-	27	26,581	5,026	32,245	30,290	1,956	-	-	334	-	-	-	6,685	102,653	189,807
PERIOD 2 TOTALS		9,835	63,795	29,263	6,901	13,758	38,202	280,514	88,898	531,166	421,995	103,573	5,598	163,227	129,603	250	673	-	15,079,420	824,945	1,955,528
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	4,256	-	-	-	-	-	638	4,895	-	-	4,895	-	-	-	-	-	-	44,679	-
3b.1.1.2	Auxiliary	-	1,897	-	-	-	-	-	285	2,182	-	-	2,182	-	-	-	-	-	-	11,902	-
3b.1.1.3	Condensate Storage Tank Foundation	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	33	-
3b.1.1.4	Construction Warehouse & Fab Shop	-	118	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	1,405	-
3b.1.1.5	D3/D4 Emergency Generator	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	84	-
3b.1.1.6	Drum Transfer & Truck Loading Enclosure	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	221	-
3b.1.1.7	Hydrogen House	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	47	-
3b.1.1.8	LLRW Storage Enclosure	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	853	-
3b.1.1.9	Misc Structures 2017	-	1,391	-	-	-	-	-	209	1,599	-	-	1,599	-	-	-	-	-	-	12,939	-
3b.1.1.10	Radwaste	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	1,400	-
3b.1.1.11	Resin Disposal	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	120	-
3b.1.1.12	Structures below 3' below grade	-	1,713	-	-	-	-	-	257	1,969	-	-	1,969	-	-	-	-	-	-	9,238	-
3b.1.1.13	Sulfuric Acid Tank Enclosure	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	35	-
3b.1.1.14	Turbine	-	1,983	-	-	-	-	-	298	2,281	-	-	2,281	-	-	-	-	-	-	22,052	-
3b.1.1.15	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
3b.1.1.16	Warehouse #2	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	213	-
3b.1.1.17	Waste Neutralizing Tank House	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	56	-
3b.1.1.18	Waste Oil Storage	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	70	-
3b.1.1.19	Water Treatment	-	303	-	-	-	-	-	46	349	-	-	349	-	-	-	-	-	-	2,690	-
3b.1.1.20	Fuel Handling of Aux Building	-	1,032	-	-	-	-	-	155	1,186	-	-	1,186	-	-	-	-	-	-	8,240	-
3b.1.1	Totals	-	13,424	-	-	-	-	-	2,014	15,438	-	-	15,438	-	-	-	-	-	-	118,134	-
Site Closeout Activities																					
3b.1.2	Remove Rubble	-	1,308	-	-	-	-	-	196	1,505	-	-	1,505	-	-	-	-	-	-	6,495	-
3b.1.3	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	78	12	90	90	-	-	-	-	-	-	-	-	-	667
3b.1	Subtotal Period 3b Activity Costs	-	15,163	-	-	-	-	78	2,286	17,528	90	-	17,438	-	-	-	-	-	-	125,549	667
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	3,313	-	-	-	-	8	498	3,818	-	-	3,818	-	-	-	-	-	-	12,824	-
3b.2.2	Underground Services Excavations	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
3b.2.3	Intake Structure Cofferdam	-	423	-	-	-	-	-	63	486	-	-	486	-	-	-	-	-	-	3,552	-
3b.2.4	Construction Debris	-	-	-	-	-	-	463	69	532	-	-	532	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	8,465	-	-	-	-	-	1,270	9,735	-	-	9,735	-	-	-	-	-	-	9,327	-
3b.2	Subtotal Period 3b Additional Costs	-	13,012	-	-	-	-	991	2,100	16,103	-	-	16,103	-	-	-	-	-	-	33,110	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	172	-	-	-	-	-	26	198	-	-	198	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,088	163	1,252	-	1,252	-	-	-	-	-	-	-	-	-
3b.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,651	-	2,651	-	2,651	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	172	-	-	-	-	3,739	189	4,100	-	3,902	198	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	542	54	596	-	596	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	4,333	433	4,767	-	4,767	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	236	24	259	-	259	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	145	14	159	-	159	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	331	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	4,245	637	4,882	-	4,882	-	-	-	-	-	-	-	-	57,340
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	4,813	722	5,535	(0)	1,207	4,329	-	-	-	-	-	-	-	74,431
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,670	-	-	-	-	26,533	4,718	37,920	(0)	11,996	25,924	-	-	-	-	-	-	-	248,656
3b.0	TOTAL PERIOD 3b COST	-	35,017	-	-	-	-	31,341	9,293	75,652	90	15,899	59,663	-	-	-	-	-	-	158,659	249,323
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	5,808	871	6,679	-	6,679	-	-	-	-	-	-	-	-	-
3c.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	26,863	-	26,863	-	26,863	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	32,671	871	33,543	-	33,543	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	5,494	549	6,044	-	6,044	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	26,564	2,656	29,221	-	29,221	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	3,519	352	3,871	-	3,871	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,471	147	1,618	-	1,618	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	3,281	492	3,774	-	3,774	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,110	167	1,277	-	1,277	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,240	186	1,426	-	1,426	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	43,057	6,459	49,516	-	49,516	-	-	-	-	-	-	-	-	581,545
3c.4.10	Utility Staff Cost	-	-	-	-	-	-	10,635	1,595	12,230	-	12,230	-	-	-	-	-	-	-	-	150,978
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	96,373	12,603	108,976	-	108,976	-	-	-	-	-	-	-	-	732,523
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	129,044	13,475	142,519	-	142,519	-	-	-	-	-	-	-	-	732,523
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1.1	Totals	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-
3d.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	48	-	48	-	48	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	60	2	62	-	62	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	10	1	11	11	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	39	4	43	43	-	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	3	0	3	-	3	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	2	0	3	3	-	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	77	12	88	88	-	-	-	-	-	-	-	-	-	1,037
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	19	3	22	22	-	-	-	-	-	-	-	-	-	269
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	162	21	183	173	10	-	-	-	-	-	-	-	-	1,306
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	8,689	222	1,659	11,901	11,829	72	-	-	-	-	-	3,746	837,596	-	1,306

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table C-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	-	37	2	211	-	2,157	682	772	3,861	3,861	-	-	-	7,458	-	-	-	1,071,985	3,403	888
3e.2	Subtotal Period 3e Additional Costs	-	37	2	211	-	2,157	682	772	3,861	3,861	-	-	-	7,458	-	-	-	1,071,985	3,403	888
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	96	24	121	121	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	26	6	32	32	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	51	13	63	63	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	19	5	24	24	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	154	38	192	192	-	-	-	-	-	-	-	-	-	2,500
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	130	33	163	163	-	-	-	-	-	-	-	-	-	1,896
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	476	119	595	595	-	-	-	-	-	-	-	-	-	4,396
3e.0	TOTAL PERIOD 3e COST	-	37	2	211	-	2,157	1,158	891	4,456	4,456	-	-	-	7,458	-	-	-	1,071,985	3,403	5,284
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	399	-	-	-	-	87	73	558	-	-	558	-	-	-	-	-	-	1,900	160
3f.2	Subtotal Period 3f Additional Costs	-	399	-	-	-	-	87	73	558	-	-	558	-	-	-	-	-	-	1,900	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	13	1	14	-	-	14	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	25	4	29	-	-	29	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	10	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	78	12	89	-	-	89	-	-	-	-	-	-	-	1,260
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	782
3f.4	Subtotal Period 3f Period-Dependent Costs	-	62	-	-	-	-	190	37	289	-	-	289	-	-	-	-	-	-	-	2,042
3f.0	TOTAL PERIOD 3f COST	-	463	-	-	-	-	277	110	851	-	-	851	-	-	-	-	-	-	1,900	2,202
PERIOD 3 TOTALS		-	35,517	1,333	211	-	10,846	162,042	25,429	235,377	16,375	158,489	60,514	-	7,458	-	-	3,746	1,909,581	163,962	990,638
TOTAL COST TO DECOMMISSION		13,408	104,627	31,018	7,562	13,927	53,014	544,382	131,890	899,828	561,832	271,262	66,733	169,551	150,948	839	673	3,746	17,608,520	1,022,448	3,748,471

TOTAL COST TO DECOMMISSION WITH 17.17% CONTINGENCY:	\$899,828	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 62.44% OR:	\$561,832	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 30.15% OR:	\$271,262	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 7.42% OR:	\$66,733	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	152,460	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	41,515	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,022,448	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

APPENDIX D

DETAILED COST ANALYSIS

SCENARIO 2: DECON with 60 Year DFS

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Prairie Island Nuclear Generating Plant, Unit 2	D-10

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	578	87	664	598	-	66	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,440	666	5,106	4,496	-	610	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	14,774	2,216	16,990	16,380	-	610	-	-	-	-	-	-	-	78,157
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,682	268	2,950	2,950	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	43,802	6,442	51,394	49,108	2,286	-	-	610	-	-	-	12,190	20	544,960

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	72,271	10,412	83,832	78,933	4,289	610	-	610	-	-	-	12,190	20	623,117
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	293	44	337	337	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,902	585	4,487	3,643	-	844	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	552	-	-	-	-	-	-	276	828	828	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	552	-	-	-	-	-	3,902	861	5,315	4,471	-	844	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	3,700	1,110	4,810	4,810	-	-	-	-	-	-	-	-	21,020	8,332
1b.2.2	Mixed/Hazardous Waste	-	-	318	75	164	-	-	68	624	624	-	-	6,133	-	-	-	-	351,986	2,361	-
1b.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
1b.2	Subtotal Period 1b Additional Costs	-	2,364	320	185	164	1,359	3,700	2,125	10,216	10,216	-	-	6,133	12,843	-	-	-	518,945	44,288	8,332
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	24	-	16	41	-	64	-	36	180	180	-	-	-	152	-	-	-	9,121	30	-
1b.3.4	Process decommissioning chemical flush waste	2	-	58	220	-	2,471	-	657	3,408	3,408	-	-	-	-	588	-	-	62,689	110	-
1b.3.5	Small tool allowance	-	34	-	-	-	-	-	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	159	24	183	-	183	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	1,088	163	1,251	1,251	-	-	-	-	-	-	-	-	-	-
1b.3.10	Prairie Island Indian Community Payments	-	-	-	-	-	-	630	-	630	-	630	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,986	1,234	74	261	-	2,534	3,065	1,687	11,841	11,028	813	-	-	152	588	-	-	71,810	140	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	872	87	959	959	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,352	135	1,487	1,487	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	402	-	-	-	-	-	101	503	503	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	286	-	-	-	-	-	43	329	329	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	8	2	-	29	-	8	48	48	-	-	-	360	-	-	-	7,197	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,527	229	1,756	1,756	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	323	32	355	355	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	809	81	890	-	890	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	741	111	852	852	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,725	559	4,284	4,284	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	5,656	848	6,504	6,504	-	-	-	-	-	-	-	-	-	63,961
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	13,074	1,961	15,035	15,035	-	-	-	-	-	-	-	-	-	213,904
1b.4	Subtotal Period 1b Period-Dependent Costs	35	688	8	2	-	29	28,336	4,243	33,341	32,189	1,152	-	-	360	-	-	-	7,197	12	339,730
1b.0	TOTAL PERIOD 1b COST	3,573	4,286	402	447	164	3,923	39,002	8,917	60,713	57,904	1,965	844	6,133	13,355	588	-	-	597,952	45,506	381,305

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1 TOTALS		3,573	5,368	415	451	164	3,972	111,274	19,329	144,546	136,838	6,254	1,454	6,133	13,964	588	-	-	610,142	45,526	1,004,421
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	51	45	6	8	-	150	-	76	336	336	-	-	-	305	-	-	-	34,809	1,414	-
2a.1.1.2	Pressurizer Relief Tank	22	20	4	5	-	100	-	42	193	193	-	-	-	203	-	-	-	23,193	625	-
2a.1.1.3	Reactor Coolant Pumps & Motors	54	63	101	83	-	736	-	249	1,287	1,287	-	-	-	2,332	-	-	-	295,800	2,049	100
2a.1.1.4	Pressurizer	48	68	467	88	-	693	-	274	1,639	1,639	-	-	-	2,196	-	-	-	185,015	2,355	938
2a.1.1.5	Steam Generators	225	2,943	2,093	1,638	1,246	3,570	-	2,383	14,097	14,097	-	-	18,672	11,316	-	-	-	1,668,341	14,819	2,875
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	286	277	211	48	-	763	-	431	2,016	2,016	-	-	-	4,797	-	-	-	177,400	8,104	-
2a.1.1.7	Reactor Vessel Internals	78	4,468	21,874	1,072	-	7,946	277	13,141	48,856	48,856	-	-	-	501	125	673	-	164,987	23,040	1,080
2a.1.1.8	Reactor Vessel	89	5,717	1,754	719	-	1,956	277	5,970	16,483	16,483	-	-	-	5,690	-	-	-	570,074	23,040	1,080
2a.1.1	Totals	855	13,600	26,512	3,662	1,246	15,913	553	22,568	84,908	84,908	-	-	18,672	27,341	125	673	-	3,119,620	75,446	6,073
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	305	189	55	272	306	-	221	1,348	1,348	-	-	2,131	1,187	-	-	-	206,316	4,667	-
2a.1.3	Main Condensers	-	2,532	121	49	364	451	-	820	4,336	4,336	-	-	3,800	1,587	-	-	-	275,903	39,151	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
2a.1.4	Totals	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
Disposal of Plant Systems																					
2a.1.5.1	Air Removal	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	452	-
2a.1.5.2	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	670	-
2a.1.5.3	Auxiliary Feedwater - RCA	-	45	0	1	19	-	-	14	79	79	-	-	215	-	-	-	-	8,722	601	-
2a.1.5.4	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,335	-
2a.1.5.5	Caustic Addition - RCA	-	36	0	1	20	-	-	12	71	71	-	-	233	-	-	-	-	9,453	444	-
2a.1.5.6	Chemical Feed	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	304	-
2a.1.5.7	Chemical Feed - RCA	-	1	0	0	1	-	-	0	2	2	-	-	6	-	-	-	-	243	12	-
2a.1.5.8	Circulating Water	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	619	-
2a.1.5.9	Condensate	-	414	-	-	-	-	-	62	476	-	-	476	-	-	-	-	-	-	6,837	-
2a.1.5.10	Condensate Polishing	-	205	-	-	-	-	-	31	236	-	-	236	-	-	-	-	-	-	3,420	-
2a.1.5.11	Condensate Polishing - RCA	-	176	4	12	180	-	-	73	444	444	-	-	2,078	-	-	-	-	84,395	2,329	-
2a.1.5.12	Electro-hydraulic	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	127	-
2a.1.5.13	Feedwater	-	133	-	-	-	-	-	20	153	-	-	153	-	-	-	-	-	-	2,215	-
2a.1.5.14	Feedwater - RCA	-	186	6	19	278	-	-	91	579	579	-	-	3,208	-	-	-	-	130,294	2,651	-
2a.1.5.15	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	505	-
2a.1.5.16	Heater Drain	-	349	-	-	-	-	-	52	401	-	-	401	-	-	-	-	-	-	5,881	-
2a.1.5.17	Internal Circ Water & CDSR	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	389	-
2a.1.5.18	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2a.1.5.19	Main Steam	-	101	-	-	-	-	-	15	116	-	-	116	-	-	-	-	-	-	1,690	-
2a.1.5.20	Main Steam - RCA	-	350	9	29	436	-	-	158	983	983	-	-	5,044	-	-	-	-	204,825	4,956	-
2a.1.5.21	Steam Generator Blowdown	-	459	21	22	176	195	-	195	1,067	1,067	-	-	2,031	686	-	-	-	127,773	6,667	-
2a.1.5.22	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2a.1.5.23	Turbine & Moisture Separators	-	337	-	-	-	-	-	51	388	-	-	388	-	-	-	-	-	-	5,609	-
2a.1.5.24	Turbine Oil Purification	-	61	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	1,003	-
2a.1.5	Totals	-	3,117	40	85	1,108	195	-	825	5,370	3,226	-	2,145	12,815	686	-	-	-	565,705	48,794	-
2a.1.6	Scaffolding in support of decommissioning	-	854	3	1	13	3	-	217	1,092	1,092	-	-	138	12	-	-	-	7,016	6,368	-
2a.1	Subtotal Period 2a Activity Costs	855	21,136	26,865	3,852	3,004	16,868	553	24,759	97,891	95,747	-	2,145	37,556	30,812	125	673	-	4,174,560	182,015	6,073
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,126	638	2,764	2,764	-	-	-	-	-	-	-	-	27,791	-
2a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
2a.2	Subtotal Period 2a Additional Costs	1	659	785	107	-	1,439	2,126	2,075	7,191	7,191	-	-	-	2,097	125	-	-	205,890	29,966	87
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	47	-	31	81	-	126	-	70	356	356	-	-	-	302	-	-	-	18,119	59	-
2a.3.3	Small tool allowance	-	223	-	-	-	-	-	33	257	231	-	26	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,476	221	1,698	-	1,698	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	12,156	1,823	13,980	13,980	-	-	-	-	-	-	-	-	-	-
2a.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,670	-	1,670	-	1,670	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	47	223	31	81	-	126	15,302	2,149	17,960	14,567	3,367	26	-	302	-	-	-	18,119	59	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table D-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	93	-	-	-	-	-	-	23	116	116	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	683	68	751	751	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	3,542	354	3,896	3,896	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,717	-	-	-	-	-	429	2,146	2,146	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,935	-	-	-	-	-	440	3,376	3,376	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	79	23	-	295	-	85	482	482	-	-	-	3,623	-	-	-	72,452	118	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,924	289	2,212	2,212	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	774	77	851	851	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,717	172	1,888	-	1,888	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	1,655	248	1,904	1,904	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	537	80	617	-	617	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	69	10	79	-	79	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	286	43	328	328	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	9,811	1,472	11,283	11,283	-	-	-	-	-	-	-	-	-	162,878
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	18,392	2,759	21,150	21,150	-	-	-	-	-	-	-	-	-	211,351
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	24,265	3,640	27,904	27,904	-	-	-	-	-	-	-	-	-	392,305
2a.4	Subtotal Period 2a Period-Dependent Costs	93	4,652	79	23	-	295	63,653	10,190	78,986	76,401	2,585	-	-	3,623	-	-	-	72,452	118	766,534
2a.0	TOTAL PERIOD 2a COST	995	26,670	27,760	4,062	3,004	18,729	81,635	39,172	202,027	193,905	5,952	2,170	37,556	36,834	250	673	-	4,471,020	212,158	772,694
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Aux Bldg Normal Ventilation	-	2	0	0	0	-	-	1	3	3	-	-	3	-	-	-	-	140	29	-
2b.1.1.2	Battery Rm Special Ventilation	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
2b.1.1.3	Buildings Maintenance	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	65	-
2b.1.1.4	Chemical & Volume Control	1,077	1,331	83	69	389	802	-	1,149	4,901	4,901	-	-	4,498	2,846	-	-	-	369,246	34,533	-
2b.1.1.5	Component Cooling - RCA	-	821	22	72	1,075	-	-	379	2,369	2,369	-	-	12,427	-	-	-	-	504,675	11,242	-
2b.1.1.6	Containment Cooling	-	65	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	1,086	-
2b.1.1.7	Containment Cooling - RCA	-	290	6	20	294	-	-	120	730	730	-	-	3,400	-	-	-	-	138,090	3,971	-
2b.1.1.8	Containment Hydrogen Control - RCA	-	29	0	1	9	-	-	9	48	48	-	-	105	-	-	-	-	4,278	401	-
2b.1.1.9	Containment Spray - RCA	-	90	2	5	75	-	-	35	206	206	-	-	868	-	-	-	-	35,249	1,217	-
2b.1.1.10	Containment Ventilation	-	243	24	40	428	209	-	186	1,130	1,130	-	-	4,951	737	-	-	-	249,786	3,668	-
2b.1.1.11	Cooling Water	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	2,396	-
2b.1.1.12	Cooling Water - RCA	-	629	14	45	668	-	-	266	1,622	1,622	-	-	7,728	-	-	-	-	313,832	8,594	-
2b.1.1.13	D1 Emergency Diesel	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	730	-
2b.1.1.14	D2 Emergency Diesel	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	522	-
2b.1.1.15	Diesel Rooms Ventilation	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	135	-
2b.1.1.16	Electrical - Clean	-	1,669	-	-	-	-	-	250	1,919	-	-	1,919	-	-	-	-	-	-	26,981	-
2b.1.1.17	Electrical - Contaminated	-	592	6	16	219	27	-	191	1,051	1,051	-	-	2,527	95	-	-	-	108,935	8,377	-
2b.1.1.18	Electrical - Decontaminated	-	3,674	41	137	2,037	-	-	1,249	7,138	7,138	-	-	23,551	-	-	-	-	956,401	49,378	-
2b.1.1.19	Fuel Handling	-	116	6	9	79	62	-	58	329	329	-	-	908	218	-	-	-	51,280	1,784	-
2b.1.1.20	Fuel Oil	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	1,697	-
2b.1.1.21	HVAC - Clean	-	105	-	-	-	-	-	16	121	-	-	121	-	-	-	-	-	-	1,891	-
2b.1.1.22	HVAC - Contaminated	-	371	8	21	282	35	-	148	864	864	-	-	3,261	123	-	-	-	140,573	5,032	-
2b.1.1.23	Incore Instrumentation	0	27	1	1	5	16	-	12	64	64	-	-	60	57	-	-	-	6,177	425	-
2b.1.1.24	Misc Drains & Vents	-	222	14	10	34	146	-	100	527	527	-	-	390	514	-	-	-	49,900	3,091	-
2b.1.1.25	Reactor Coolant	148	298	21	14	30	221	-	213	945	945	-	-	344	777	-	-	-	65,413	6,470	-
2b.1.1.26	Reactor Hot Sampling	144	131	11	6	6	98	-	132	527	527	-	-	66	342	-	-	-	25,347	3,946	-
2b.1.1.27	Reactor Makeup	-	64	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	1,042	-
2b.1.1.28	Reactor Vessel	9	20	1	0	2	4	-	11	47	47	-	-	26	14	-	-	-	2,011	425	-
2b.1.1.29	Residual Heat Removal	344	399	85	66	250	926	-	559	2,630	2,630	-	-	2,895	3,252	-	-	-	332,849	7,621	-
2b.1.1.30	Safeguards Chilled Water	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	259	-
2b.1.1.31	Safety Injection	-	853	40	57	587	327	-	396	2,261	2,261	-	-	6,788	1,156	-	-	-	351,793	12,561	-
2b.1.1.32	Sampling	-	58	4	2	5	31	-	23	122	122	-	-	59	107	-	-	-	9,505	811	-
2b.1.1.33	Shield Bldg Ventilation	-	133	14	20	186	139	-	100	593	593	-	-	2,152	491	-	-	-	119,838	2,030	-
2b.1.1.34	Station & Instrument Air	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	300	-
2b.1.1.35	Station & Instrument Air - RCA	-	79	1	2	29	-	-	24	135	135	-	-	332	-	-	-	-	13,496	1,053	-
2b.1.1.36	Turbine Bldg Traps & Drains	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	767	-
2b.1.1.37	Unit Coolers	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	611	-
2b.1.1.38	Unit Coolers - RCA	-	53	0	1	20	-	-	16	91	91	-	-	230	-	-	-	-	9,348	683	-
2b.1.1	Totals	1,724	12,813	403	614	6,710	3,044	-	5,730	31,037	28,333	-	2,704	77,571	10,728	-	-	-	3,858,165	205,829	-
2b.1.2	Scaffolding in support of decommissioning	-	1,067	4	1	17	4	-	271	1,364	1,364	-	-	173	15	-	-	-	8,770	7,960	-

Table D-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,150	2,623	139	852	193	11,079	-	4,171	20,208	20,208	-	-	2,230	57,414	-	-	-	3,559,624	50,842	-
2b.1.3.2	Backwash Waste Receiving Tank	-	27	1	11	-	87	-	30	158	158	-	-	-	507	-	-	-	43,896	299	-
2b.1.3	Totals	1,150	2,650	141	864	193	11,166	-	4,202	20,366	20,366	-	-	2,230	57,921	-	-	-	3,603,520	51,140	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan									a											
2b.1	Subtotal Period 2b Activity Costs	2,874	16,530	547	1,479	6,919	14,215	481	10,275	53,320	50,616	-	2,704	79,974	68,664	-	-	-	7,470,455	264,930	4,096
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,943	583	2,526	2,526	-	-	-	-	-	-	-	-	25,399	-
2b.2.2	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
2b.2	Subtotal Period 2b Additional Costs	-	-	9	29	312	-	1,943	635	2,928	2,928	-	-	5,855	-	-	-	-	146,375	25,415	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	105	-	70	182	-	285	-	158	800	800	-	-	-	680	-	-	-	40,799	133	-
2b.3.2	Process decommissioning chemical flush waste	3	-	87	327	-	651	-	222	1,289	1,289	-	-	-	875	-	-	-	93,252	164	-
2b.3.3	Small tool allowance	-	289	-	-	-	-	-	43	332	332	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	407	61	468	-	468	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	6,994	1,049	8,043	8,043	-	-	-	-	-	-	-	-	-	-
2b.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,525	-	1,525	-	1,525	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	107	289	157	509	-	936	8,926	1,533	12,457	10,463	1,993	-	-	1,555	-	-	-	134,051	296	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	482	-	-	-	-	-	-	121	603	603	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	624	62	687	687	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	3,099	310	3,409	3,409	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	1,969	-	-	-	-	-	492	2,461	2,461	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	2,759	-	-	-	-	-	414	3,173	3,173	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	78	23	-	293	-	85	479	479	-	-	-	3,600	-	-	-	71,996	117	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,388	208	1,596	1,596	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	707	71	778	778	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,569	157	1,726	-	1,726	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	1,513	227	1,740	1,740	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	490	74	564	-	564	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	247	37	284	284	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	63	9	73	-	73	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	8,299	1,245	9,544	9,544	-	-	-	-	-	-	-	-	-	137,246
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	11,450	1,718	13,168	13,168	-	-	-	-	-	-	-	-	-	137,246
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	15,293	2,294	17,586	17,586	-	-	-	-	-	-	-	-	-	255,430
2b.4	Subtotal Period 2b Period-Dependent Costs	482	4,728	78	23	-	293	44,813	7,533	57,951	55,588	2,362	-	-	3,600	-	-	-	71,996	117	529,921
2b.0	TOTAL PERIOD 2b COST	3,464	21,546	792	2,040	7,231	15,444	56,163	19,976	126,656	119,596	4,356	2,704	85,829	73,819	-	-	-	7,822,876	290,758	534,017
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	71,928	10,789	82,717	-	82,717	-	-	-	-	-	-	-	-	-
2c.3.2	Retention and Severance	-	-	-	-	-	-	4,478	672	5,149	5,149	-	-	-	-	-	-	-	-	-	-
2c.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,702	-	2,702	-	2,702	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	79,108	11,461	90,569	5,149	85,420	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	1,104	110	1,215	1,215	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	5,154	515	5,669	5,669	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	390	-	-	-	-	-	98	488	488	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	18	5	-	66	-	19	108	108	-	-	-	809	-	-	-	16,171	26	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	655	98	753	753	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	555	55	610	610	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	2,776	278	3,053	-	3,053	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2c Period-Dependent Costs (continued)																					
2c.4.8	Fixed Overhead	-	-	-	-	-	-	2,676	401	3,078	3,078	-	-	-	-	-	-	-	-	-	-
2c.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	87	13	101	101	-	-	-	-	-	-	-	-	-	-
2c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	112	17	128	-	128	-	-	-	-	-	-	-	-	-
2c.4.11	Railroad Track Maintenance	-	-	-	-	-	-	125	19	143	143	-	-	-	-	-	-	-	-	-	-
2c.4.12	Security Staff Cost	-	-	-	-	-	-	14,681	2,202	16,883	16,883	-	-	-	-	-	-	-	-	-	242,796
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	2,064	310	2,374	2,374	-	-	-	-	-	-	-	-	-	33,722
2c.4	Subtotal Period 2c Period-Dependent Costs	-	390	18	5	-	66	29,988	4,135	34,602	31,421	3,181	-	-	809	-	-	-	16,171	26	276,518
2c.0	TOTAL PERIOD 2c COST	-	390	18	5	-	66	113,444	16,248	130,171	41,570	88,601	-	-	809	-	-	-	16,171	26	276,518
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	328	32	94	32	-	595	-	335	1,416	1,416	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical - Contaminated - Fuel Pool	-	147	2	4	53	7	-	47	259	259	-	-	615	23	-	-	-	26,508	2,077	-
2d.1.2.2	Electrical - Decontaminated - Fuel Pool	-	918	10	34	510	-	-	312	1,785	1,785	-	-	5,893	-	-	-	-	239,327	12,340	-
2d.1.2.3	HVAC - Contaminated - Fuel Pool	-	159	3	9	121	15	-	63	370	370	-	-	1,398	53	-	-	-	60,246	2,157	-
2d.1.2.4	Safeguards Chilled Water - RCA	-	82	1	3	43	-	-	27	155	155	-	-	495	-	-	-	-	20,100	1,019	-
2d.1.2.5	Spent Fuel Pool Cooling	293	342	34	25	70	377	-	344	1,484	1,484	-	-	806	1,325	-	-	-	120,439	7,613	-
2d.1.2.6	Station & Instrument Air - RCA Fuel Pool	-	20	0	0	7	-	-	6	34	34	-	-	83	-	-	-	-	3,374	263	-
2d.1.2	Totals	293	1,668	50	75	804	399	-	800	4,088	4,088	-	-	9,290	1,401	-	-	-	469,994	25,468	-
2d.1.4	Scaffolding in support of decommissioning	-	213	1	0	3	1	-	54	273	273	-	-	35	3	-	-	-	1,754	1,592	-
2d.1	Subtotal Period 2d Activity Costs	621	1,913	145	107	807	994	-	1,189	5,777	5,777	-	-	9,325	3,496	-	-	-	610,046	27,637	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	16,173	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,082	625	2,706	2,706	-	-	-	-	-	-	-	-	16,173	6,240
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	27	-	18	48	-	75	-	41	209	209	-	-	-	179	-	-	-	10,724	35	-
2d.3.2	Process decommissioning chemical flush waste	1	-	32	121	-	241	-	82	478	478	-	-	-	324	-	-	-	34,576	61	-
2d.3.3	Small tool allowance	-	35	-	-	-	-	-	5	41	41	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13,144	1,972	15,115	-	15,115	-	-	-	-	-	-	-	-	-
2d.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	971	-	971	-	971	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	27	35	194	224	575	467	14,114	2,247	17,884	1,798	16,086	-	6,000	1,032	-	-	-	350,268	184	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	54	-	-	-	-	-	-	14	68	68	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	398	40	437	437	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,740	174	1,914	1,914	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	559	-	-	-	-	-	140	699	699	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,757	-	-	-	-	-	264	2,020	2,020	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	18	5	-	67	-	19	110	110	-	-	-	829	-	-	-	16,581	27	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	471	71	542	542	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	381	38	419	419	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	999	100	1,099	-	1,099	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	963	144	1,108	1,108	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	315	47	362	362	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	40	6	46	-	46	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	5,123	768	5,891	5,891	-	-	-	-	-	-	-	-	-	84,157
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,065	910	6,975	6,975	-	-	-	-	-	-	-	-	-	69,996
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	7,796	1,169	8,966	8,527	439	-	-	-	-	-	-	-	-	126,236
2d.4	Subtotal Period 2d Period-Dependent Costs	54	2,316	18	5	-	67	24,337	3,911	30,708	29,123	1,584	-	-	829	-	-	-	16,581	27	280,390
2d.0	TOTAL PERIOD 2d COST	703	4,264	357	337	1,382	1,528	40,533	7,971	57,075	39,405	17,670	-	15,325	5,357	-	-	-	976,895	44,021	286,630

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Table D-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	934	-	934	-	934	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,122	178	2,300	1,367	934	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,626	163	1,789	1,789	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	420	-	-	-	-	-	105	524	524	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	334	-	-	-	6,685	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	417	42	459	459	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	51	5	56	-	56	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	39	6	44	-	44	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	4,924	739	5,663	5,663	-	-	-	-	-	-	-	-	-	80,898
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	3,854	578	4,433	4,007	426	-	-	-	-	-	-	-	-	59,507
2f.4	Subtotal Period 2f Period-Dependent Costs	-	420	7	2	-	27	16,591	2,477	19,524	18,998	526	-	-	334	-	-	-	6,685	11	186,687
2f.0	TOTAL PERIOD 2f COST	-	420	7	2	-	27	22,106	3,674	26,236	24,776	1,460	-	-	334	-	-	-	6,685	40,183	189,807
PERIOD 2 TOTALS		5,161	53,290	28,935	6,446	11,617	35,794	313,880	87,041	542,165	419,252	118,038	4,875	138,709	117,153	250	673	-	13,293,650	587,146	2,059,666
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	4,255	-	-	-	-	-	638	4,894	-	-	4,894	-	-	-	-	-	-	44,669	-
3b.1.1.2	Condensate Storage Tank Foundation	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	16	-
3b.1.1.3	Structures below 3' below grade	-	1,581	-	-	-	-	-	237	1,818	-	-	1,818	-	-	-	-	-	-	8,411	-
3b.1.1.4	Turbine	-	1,983	-	-	-	-	-	297	2,280	-	-	2,280	-	-	-	-	-	-	22,040	-
3b.1.1.5	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
3b.1.1	Totals	-	8,171	-	-	-	-	-	1,226	9,397	-	-	9,397	-	-	-	-	-	-	76,993	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,602	-	-	-	-	183	1,318	10,102	211	-	9,892	-	-	-	-	-	-	77,914	1,560
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	2,213	-	-	-	-	3	332	2,549	-	-	2,549	-	-	-	-	-	-	8,386	-
3b.2.2	Underground Services Excavations	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
3b.2.3	Intake Structure Cofferdam	-	596	-	-	-	-	-	89	686	-	-	686	-	-	-	-	-	-	5,168	-
3b.2.4	Construction Debris	-	-	-	-	-	-	10	2	12	-	-	12	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	2,751	-	-	-	-	-	413	3,164	-	-	3,164	-	-	-	-	-	-	2,904	-
3b.2	Subtotal Period 3b Additional Costs	-	6,371	-	-	-	-	534	1,036	7,941	-	-	7,941	-	-	-	-	-	-	23,865	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	110	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	-	-
3b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,651	-	2,651	-	2,651	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	110	-	-	-	-	2,651	16	2,777	-	2,651	126	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	542	54	596	-	596	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	4,334	433	4,767	-	4,767	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	236	24	259	-	259	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	145	14	159	-	159	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	331	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	4,245	637	4,882	-	4,882	-	-	-	-	-	-	-	-	57,340
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	4,813	722	5,535	(0)	1,207	4,329	-	-	-	-	-	-	-	74,431
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,670	-	-	-	-	26,534	4,718	37,921	(0)	11,997	25,924	-	-	-	-	-	-	-	248,656
3b.0	TOTAL PERIOD 3b COST	-	21,752	-	-	-	-	29,901	7,088	58,741	211	14,648	43,882	-	-	-	-	-	-	101,779	250,216
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	16,797	2,520	19,316	-	19,316	-	-	-	-	-	-	-	-	-
3c.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	43,116	-	43,116	-	43,116	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	59,913	2,520	62,433	-	62,433	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	8,818	882	9,700	-	9,700	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	39,829	3,983	43,812	-	43,812	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	5,648	565	6,213	-	6,213	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	2,360	236	2,596	-	2,596	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	5,267	790	6,057	-	6,057	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,782	267	2,049	-	2,049	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,991	299	2,289	-	2,289	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	69,105	10,366	79,471	-	79,471	-	-	-	-	-	-	-	-	933,362
3c.4.10	Utility Staff Cost	-	-	-	-	-	-	17,069	2,560	19,629	-	19,629	-	-	-	-	-	-	-	-	242,315
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	151,870	19,948	171,817	-	171,817	-	-	-	-	-	-	-	-	1,175,677
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	211,783	22,467	234,250	-	234,250	-	-	-	-	-	-	-	-	1,175,677
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1.1	Totals	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
Period 3d Collateral Costs																					
3d.3.1	Prairie Island Indian Community Payments	-	-	-	-	-	-	48	-	48	-	48	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	48	-	48	-	48	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	10	1	11	11	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	39	4	43	43	-	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	3	0	3	-	3	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	2	0	3	-	3	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	77	12	88	88	-	-	-	-	-	-	-	-	-	1,037
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	19	3	22	22	-	-	-	-	-	-	-	-	-	269
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	162	21	183	171	12	-	-	-	-	-	-	-	-	1,306
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	8,689	210	1,658	11,887	11,827	60	-	-	-	-	-	3,746	837,596	-	1,306

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	-	37	2	211	-	2,157	710	779	3,896	3,896	-	-	-	7,458	-	-	-	1,071,985	3,670	888
3e.2	Subtotal Period 3e Additional Costs	-	37	2	211	-	2,157	710	779	3,896	3,896	-	-	-	7,458	-	-	-	1,071,985	3,670	888
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	96	24	121	121	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	26	6	32	32	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	51	13	63	63	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	19	5	24	24	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	154	38	192	192	-	-	-	-	-	-	-	-	-	2,500
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	130	33	163	163	-	-	-	-	-	-	-	-	-	1,896
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	476	119	595	595	-	-	-	-	-	-	-	-	-	4,396
3e.0	TOTAL PERIOD 3e COST	-	37	2	211	-	2,157	1,186	898	4,491	4,491	-	-	-	7,458	-	-	-	1,071,985	3,670	5,284
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	495	-	-	-	-	87	87	669	-	-	669	-	-	-	-	-	-	2,308	160
3f.2	Subtotal Period 3f Additional Costs	-	495	-	-	-	-	87	87	669	-	-	669	-	-	-	-	-	-	2,308	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	13	1	14	-	-	14	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	25	4	29	-	-	29	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	10	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	78	12	89	-	-	89	-	-	-	-	-	-	-	1,260
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	782
3f.4	Subtotal Period 3f Period-Dependent Costs	-	62	-	-	-	-	190	37	289	-	-	289	-	-	-	-	-	-	-	2,042
3f.0	TOTAL PERIOD 3f COST	-	560	-	-	-	-	277	125	962	-	-	962	-	-	-	-	-	-	2,308	2,202
PERIOD 3 TOTALS		-	22,349	1,333	211	-	10,846	243,357	32,235	310,331	16,528	248,958	44,844	-	7,458	-	-	3,746	1,909,581	107,756	1,434,684
TOTAL COST TO DECOMMISSION		8,734	81,007	30,683	7,109	11,781	50,612	668,511	138,605	997,041	572,618	373,251	51,173	144,842	138,575	839	673	3,746	15,813,370	740,428	4,498,771

TOTAL COST TO DECOMMISSION WITH 16.15% CONTINGENCY:	\$997,041	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 57.43% OR:	\$572,618	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 37.44% OR:	\$373,250	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 5.13% OR:	\$51,173	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	91,286	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	32,925	tons
TOTAL CRAFT LABOR REQUIREMENTS:	740,428	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

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Decommissioning Cost Analysis

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Table D-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.13	Perform SER and EA	-	-	-	-	-	-	156	23	179	179	-	-	-	-	-	-	-	-	-	1,326
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	251	38	289	289	-	-	-	-	-	-	-	-	-	2,138
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	247	37	284	256	-	28	-	-	-	-	-	-	-	2,104
1a.1.17.2	Plant systems	-	-	-	-	-	-	209	31	241	216	-	24	-	-	-	-	-	-	-	1,782
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,036
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	326	49	375	375	-	-	-	-	-	-	-	-	-	2,779
1a.1.17.6	Biological shield	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,334
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	80	12	92	46	-	46	-	-	-	-	-	-	-	684
1a.1.17.9	Main Turbine	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	157	23	180	90	-	90	-	-	-	-	-	-	-	1,334
1a.1.17.12	Waste management	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	45	7	52	26	-	26	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	1,899	285	2,183	1,923	-	261	-	-	-	-	-	-	-	16,175
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	120	18	139	139	-	-	-	-	-	-	-	-	-	1,026
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlp/s/tooling/etc.	-	-	Cntrl Envlp/s/tooling/etc.	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	9,523	1,428	10,951	10,690	-	261	-	-	-	-	-	-	-	33,420
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,227	184	1,411	-	1,411	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	8,394	1,259	9,653	9,653	-	-	-	-	-	-	-	-	-	-
1a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,281	-	2,281	-	2,281	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,902	1,443	13,345	9,653	3,692	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,682	268	2,950	2,950	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	485	-	-	-	-	-	121	606	606	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	12	4	-	46	-	13	75	75	-	-	-	565	-	-	-	11,299	18	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	778	78	855	855	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1a Period-Dependent Costs (continued)																					
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	20,662	3,099	23,761	23,761	-	-	-	-	-	-	-	-	-	345,280
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,052	12	4	-	46	38,340	5,631	45,085	42,800	2,286	-	-	565	-	-	-	11,299	18	468,000
1a.0	TOTAL PERIOD 1a COST	-	1,052	12	4	-	46	67,559	9,672	78,345	72,107	5,977	261	-	565	-	-	-	11,299	18	501,420
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	238	36	273	246	-	27	-	-	-	-	-	-	-	2,024
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	1,069
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	68	10	78	19	-	58	-	-	-	-	-	-	-	577
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	182	27	210	210	-	-	-	-	-	-	-	-	-	1,552
1b.1.1.9	Facility closeout	-	-	-	-	-	-	60	9	69	35	-	35	-	-	-	-	-	-	-	513
1b.1.1.10	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	192
1b.1.1.11	Biological shield	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	513
1b.1.1.12	Steam generators	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	50	8	58	29	-	29	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
1b.1.1.15	Main Condensers	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
1b.1.1.17	Reactor building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
1b.1.1	Total	-	-	-	-	-	-	1,669	250	1,919	1,558	-	361	-	-	-	-	-	-	-	14,215
1b.1.2	Decon primary loop	552	-	-	-	-	-	-	276	828	828	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	552	-	-	-	-	-	1,669	526	2,747	2,386	-	361	-	-	-	-	-	-	1,067	14,215
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	1,582	475	2,057	2,057	-	-	-	-	-	-	-	-	8,988	3,563
1b.2.2	Mixed/Hazardous Waste	-	-	326	75	169	-	-	69	639	639	-	-	6,324	-	-	-	-	362,914	2,410	-
1b.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
1b.2	Subtotal Period 1b Additional Costs	-	2,364	328	185	169	1,359	1,582	1,491	7,478	7,478	-	-	6,324	12,843	-	-	-	529,873	32,305	3,563
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	24	-	16	41	-	64	-	36	180	180	-	-	-	152	-	-	-	9,121	30	-
1b.3.4	Process decommissioning chemical flush waste	2	-	58	220	-	2,471	-	657	3,408	3,408	-	-	-	-	588	-	-	62,689	110	-
1b.3.5	Small tool allowance	-	34	-	-	-	-	-	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	370	56	426	-	426	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	4,055	608	4,664	4,664	-	-	-	-	-	-	-	-	-	-
1b.3.10	Prairie Island Indian Community Payments	-	-	-	-	-	-	629	-	629	-	629	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,986	1,234	74	261	-	2,534	6,243	2,164	15,495	14,441	1,055	-	-	152	588	-	-	71,810	140	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	872	87	959	959	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,319	132	1,451	1,451	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	380	-	-	-	-	-	95	475	475	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	286	-	-	-	-	-	43	329	329	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	327	-	-	-	6,541	11	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,527	229	1,756	1,756	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	214	21	236	236	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	809	81	890	-	890	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	741	111	852	852	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,725	559	4,284	4,284	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	4,009	601	4,610	4,610	-	-	-	-	-	-	-	-	-	47,185

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity		Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Index	Activity Description														Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1b Period-Dependent Costs (continued)																					
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	10,416	1,562	11,978	11,978	-	-	-	-	-	-	-	-	-	174,059
1b.4	Subtotal Period 1b Period-Dependent Costs	35	666	7	2	-	27	23,890	3,577	28,204	27,052	1,152	-	-	327	-	-	-	6,541	11	283,108
1b.0	TOTAL PERIOD 1b COST	3,573	4,264	410	447	169	3,920	33,383	7,759	53,923	51,356	2,207	361	6,324	13,322	588	-	-	608,224	33,522	300,885
PERIOD 1 TOTALS		3,573	5,316	422	451	169	3,966	100,942	17,430	132,268	123,462	8,184	622	6,324	13,887	588	-	-	619,523	33,540	802,305
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	51	45	6	8	-	150	-	76	336	336	-	-	-	305	-	-	-	34,809	1,414	-
2a.1.1.2	Pressurizer Relief Tank	22	20	4	5	-	100	-	42	193	193	-	-	-	203	-	-	-	23,193	625	-
2a.1.1.3	Reactor Coolant Pumps & Motors	54	63	101	83	-	736	-	249	1,287	1,287	-	-	-	2,332	-	-	-	295,800	2,049	100
2a.1.1.4	Pressurizer	48	68	467	88	-	693	-	274	1,639	1,639	-	-	-	2,196	-	-	-	185,015	2,355	938
2a.1.1.5	Steam Generators	225	2,943	2,093	1,638	1,246	3,570	-	2,383	14,097	14,097	-	-	18,672	11,316	-	-	-	1,668,341	14,819	2,875
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	286	277	211	48	-	763	-	431	2,016	2,016	-	-	-	4,797	-	-	-	177,400	8,104	-
2a.1.1.7	Reactor Vessel Internals	78	4,468	21,874	1,072	-	7,946	277	13,141	48,856	48,856	-	-	-	501	125	673	-	164,987	23,040	1,080
2a.1.1.8	Reactor Vessel	89	5,717	1,754	719	-	1,956	277	5,970	16,483	16,483	-	-	-	5,690	-	-	-	570,074	23,040	1,080
2a.1.1	Totals	855	13,600	26,512	3,662	1,246	15,913	553	22,568	84,908	84,908	-	-	18,672	27,341	125	673	-	3,119,620	75,446	6,073
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	305	189	55	272	306	-	221	1,348	1,348	-	-	2,131	1,187	-	-	-	206,316	4,667	-
2a.1.3	Main Condensers	-	2,532	121	49	364	451	-	820	4,336	4,336	-	-	3,800	1,587	-	-	-	275,903	39,151	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
2a.1.4.2	Auxiliary	-	210	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	1,309	-
2a.1.4.3	Radwaste	-	8	-	-	-	-	-	1	9	9	-	-	-	-	-	-	-	-	65	-
2a.1.4	Totals	-	946	-	-	-	-	-	142	1,088	1,088	-	-	-	-	-	-	-	-	8,963	-
Disposal of Plant Systems																					
2a.1.5.1	Admin Bldg Ventilation	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	90	-
2a.1.5.2	Air Removal	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	422	-
2a.1.5.3	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	676	-
2a.1.5.4	Auxiliary Feedwater - RCA	-	36	0	1	15	-	-	12	65	65	-	-	178	-	-	-	-	7,214	486	-
2a.1.5.5	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,331	-
2a.1.5.6	Caustic Addition - RCA	-	38	0	1	21	-	-	13	74	74	-	-	240	-	-	-	-	9,761	468	-
2a.1.5.7	Chemical Feed	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	261	-
2a.1.5.8	Chemical Feed - RCA	-	3	0	0	1	-	-	1	5	5	-	-	16	-	-	-	-	634	31	-
2a.1.5.9	Circulating Water	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	401	-
2a.1.5.10	Condensate	-	459	-	-	-	-	-	69	527	-	-	527	-	-	-	-	-	-	7,537	-
2a.1.5.11	Condensate Polishing	-	181	-	-	-	-	-	27	209	-	-	209	-	-	-	-	-	-	2,987	-
2a.1.5.12	Condensate Polishing - RCA	-	36	1	3	42	-	-	16	98	98	-	-	483	-	-	-	-	19,616	493	-
2a.1.5.13	Electro-Hydraulic	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	143	-
2a.1.5.14	External Circulating Water	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	385	-
2a.1.5.15	External Circulating Water - RCA	-	70	1	4	62	-	-	28	165	165	-	-	721	-	-	-	-	29,284	938	-
2a.1.5.16	Feedwater	-	111	-	-	-	-	-	17	128	-	-	128	-	-	-	-	-	-	1,840	-
2a.1.5.17	Feedwater - RCA	-	236	7	24	359	-	-	117	744	744	-	-	4,147	-	-	-	-	168,414	3,377	-
2a.1.5.18	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	504	-
2a.1.5.19	Heater Drain	-	334	-	-	-	-	-	50	384	-	-	384	-	-	-	-	-	-	5,638	-
2a.1.5.20	Hypobromous Acid Feed	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	86	-
2a.1.5.21	Hypobromous Acid Feed - RCA	-	1	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	100	12	-
2a.1.5.22	Internal Circ Water & CDSR	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	366	-
2a.1.5.23	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2a.1.5.24	Main Steam	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	1,482	-
2a.1.5.25	Main Steam - RCA	-	364	9	30	447	-	-	163	1,013	1,013	-	-	5,166	-	-	-	-	209,799	5,146	-
2a.1.5.26	Repairable Spare Snubbers	-	6	0	0	1	-	-	2	8	8	-	-	12	-	-	-	-	490	82	-
2a.1.5.27	Steam Exclusion	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	32	-
2a.1.5.28	Steam Exclusion - RCA	-	4	0	0	2	-	-	1	8	8	-	-	24	-	-	-	-	966	47	-
2a.1.5.29	Steam Generator Blowdown	-	398	20	21	165	179	-	174	957	957	-	-	1,906	631	-	-	-	119,126	5,778	-
2a.1.5.30	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2a.1.5.31	Turbine & Moisture Separators	-	329	-	-	-	-	-	49	379	-	-	379	-	-	-	-	-	-	5,472	-
2a.1.5.32	Turbine Oil Purification	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	757	-
2a.1.5.33	Water Treatment	-	394	-	-	-	-	-	59	453	-	-	453	-	-	-	-	-	-	6,677	-
2a.1.5.34	Water Treatment - RCA	-	19	0	1	10	-	-	6	37	37	-	-	115	-	-	-	-	4,652	252	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
2a.1.5	Totals	-	3,437	39	85	1,125	179	-	867	5,733	3,174	-	2,559	13,010	631	-	-	-	570,056	54,280	-
2a.1.6	Scaffolding in support of decommissioning	-	2,833	24	8	97	25	-	733	3,721	3,721	-	-	1,012	89	-	-	-	51,445	26,270	-
2a.1	Subtotal Period 2a Activity Costs	855	23,653	26,885	3,859	3,105	16,875	553	25,350	101,134	98,575	-	2,559	38,625	30,835	125	673	-	4,223,340	208,777	6,073
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,560	468	2,027	2,027	-	-	-	-	-	-	-	-	20,388	-
2a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
2a.2	Subtotal Period 2a Additional Costs	1	659	785	107	-	1,439	1,560	1,905	6,454	6,454	-	-	-	2,097	125	-	-	205,890	22,562	87
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	51	-	33	86	-	135	-	75	381	381	-	-	-	323	-	-	-	19,358	63	-
2a.3.3	Small tool allowance	-	251	-	-	-	-	-	38	289	260	-	29	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	326	49	375	-	375	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	6,105	916	7,021	7,021	-	-	-	-	-	-	-	-	-	-
2a.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,224	-	1,224	-	1,224	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	51	251	33	86	-	135	7,655	1,078	9,289	7,661	1,599	29	-	323	-	-	-	19,358	63	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	68	-	-	-	-	-	-	17	85	85	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	501	50	551	551	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	2,507	251	2,758	2,758	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,622	-	-	-	-	-	406	2,028	2,028	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,153	-	-	-	-	-	323	2,477	2,477	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	89	26	-	331	-	95	541	541	-	-	-	4,063	-	-	-	81,252	133	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,411	212	1,623	1,623	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	389	39	428	428	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,259	126	1,385	-	1,385	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	1,214	182	1,396	1,396	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	394	59	453	-	453	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	51	8	58	-	58	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	265	40	305	305	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	6,661	999	7,661	7,661	-	-	-	-	-	-	-	-	-	110,166
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	13,492	2,024	15,516	15,516	-	-	-	-	-	-	-	-	-	155,048
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	17,880	2,682	20,562	20,562	-	-	-	-	-	-	-	-	-	288,676
2a.4	Subtotal Period 2a Period-Dependent Costs	68	3,776	89	26	-	331	46,025	7,512	57,825	55,929	1,896	-	-	4,063	-	-	-	81,252	133	553,890
2a.0	TOTAL PERIOD 2a COST	974	28,339	27,792	4,078	3,105	18,780	55,792	35,844	174,703	168,620	3,495	2,588	38,625	37,317	250	673	-	4,529,841	231,534	560,049
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	ADT & Misc Ventilation	-	24	0	1	13	3	-	9	50	50	-	-	153	9	-	-	-	6,814	363	-
2b.1.1.2	Aux Bldg Normal Ventilation	-	67	2	5	60	11	-	29	174	174	-	-	692	39	-	-	-	30,671	1,013	-
2b.1.1.3	Aux Bldg Special Ventilation	-	13	0	0	6	2	-	5	26	26	-	-	70	6	-	-	-	3,243	197	-
2b.1.1.4	Battery Rm Special Ventilation	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	24	-
2b.1.1.5	Boron Recycle	0	4	0	0	0	3	-	2	9	9	-	-	3	9	-	-	-	709	50	-
2b.1.1.6	Chemical & Volume Control	722	902	59	44	204	560	-	770	3,260	3,260	-	-	2,356	1,977	-	-	-	225,854	23,197	-
2b.1.1.7	Cold Chemical Lab Ventilation	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
2b.1.1.8	Component Cooling - RCA	-	617	21	70	1,038	-	-	322	2,068	2,068	-	-	11,996	-	-	-	-	487,169	8,583	-
2b.1.1.9	Containment Cooling	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	502	-
2b.1.1.10	Containment Cooling - RCA	-	288	5	16	237	-	-	110	656	656	-	-	2,743	-	-	-	-	111,390	3,949	-
2b.1.1.11	Containment Hydrogen Control - RCA	-	35	0	1	12	-	-	11	60	60	-	-	141	-	-	-	-	5,742	494	-
2b.1.1.12	Containment Spray - RCA	-	186	3	8	126	-	-	67	389	389	-	-	1,453	-	-	-	-	59,019	2,617	-
2b.1.1.13	Containment Ventilation	-	224	23	38	408	205	-	177	1,075	1,075	-	-	4,721	722	-	-	-	239,450	3,375	-
2b.1.1.14	Control/Relay/Cmptr Rm Vent	-	30	1	2	23	6	-	13	74	74	-	-	260	20	-	-	-	11,915	454	-
2b.1.1.15	Cooling Water	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	2,344	-
2b.1.1.16	Cooling Water - RCA	-	456	15	49	730	-	-	232	1,482	1,482	-	-	8,442	-	-	-	-	342,822	6,311	-
2b.1.1.17	Cranes/Hoists/Elevators - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2b.1.1.18	D3 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
2b.1.1.19	D4 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
2b.1.1.20	D5 Emergency Diesel	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2b.1.1.21	Electrical - Clean	-	1,502	-	-	-	-	-	225	1,727	-	-	1,727	-	-	-	-	-	-	24,276	-
2b.1.1.22	Electrical - Contaminated	-	461	5	13	173	21	-	149	821	821	-	-	1,997	75	-	-	-	86,080	6,503	-
2b.1.1.23	Electrical - Decontaminated	-	2,866	33	109	1,622	-	-	980	5,610	5,610	-	-	18,753	-	-	-	-	761,569	38,423	-

Table D-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
Disposal of Plant Systems (continued)																					
2b.1.1.24	Filter Rm Ventilation	-	4	0	0	2	0	-	2	9	9	-	-	24	1	-	-	-	1,020	69	-
2b.1.1.25	Fire Protection & Detection	-	178	-	-	-	-	-	27	205	-	-	205	-	-	-	-	-	-	3,009	-
2b.1.1.26	Fire Protection & Detection - RCA	-	236	3	11	158	-	-	85	492	492	-	-	1,828	-	-	-	-	74,245	3,134	-
2b.1.1.27	Fuel Handling	-	71	1	2	17	14	-	24	130	130	-	-	200	49	-	-	-	11,396	1,101	-
2b.1.1.28	Fuel Oil	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
2b.1.1.29	HVAC - Clean	-	132	-	-	-	-	-	20	151	-	-	151	-	-	-	-	-	-	2,373	-
2b.1.1.30	HVAC - Contaminated	-	1,222	26	69	929	115	-	487	2,848	2,848	-	-	10,745	405	-	-	-	463,144	16,579	-
2b.1.1.31	Heating	-	279	-	-	-	-	-	42	321	-	-	321	-	-	-	-	-	-	4,804	-
2b.1.1.32	Heating - RCA	-	323	3	11	165	-	-	107	609	609	-	-	1,907	-	-	-	-	77,458	4,086	-
2b.1.1.33	Hot Lab & Sample Rm Ventilation	-	19	0	1	9	1	-	6	37	37	-	-	107	4	-	-	-	4,632	285	-
2b.1.1.34	Incore Instrumentation	0	29	1	1	5	16	-	13	67	67	-	-	60	58	-	-	-	6,264	458	-
2b.1.1.35	Misc Drains & Vents	-	223	12	9	40	121	-	95	500	500	-	-	458	426	-	-	-	46,850	3,180	-
2b.1.1.36	Misc Lab & Service Areas Vent	-	123	8	6	32	70	-	55	293	293	-	-	370	244	-	-	-	31,186	1,713	-
2b.1.1.37	Miscellaneous Gas	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	1,073	-
2b.1.1.38	Miscellaneous Gas - RCA	-	129	1	3	52	-	-	41	226	226	-	-	600	-	-	-	-	24,378	1,636	-
2b.1.1.39	Radiation Monitoring	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	111	-
2b.1.1.40	Radiation Monitoring - RCA	-	62	1	2	27	-	-	20	112	112	-	-	316	-	-	-	-	12,826	782	-
2b.1.1.41	Reactor Coolant	158	227	20	12	20	208	-	195	839	839	-	-	229	730	-	-	-	57,672	5,517	-
2b.1.1.42	Reactor Hot Sampling	135	121	10	5	5	89	-	123	489	489	-	-	54	312	-	-	-	22,919	3,686	-
2b.1.1.43	Reactor Makeup	-	36	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	583	-
2b.1.1.44	Reactor Makeup - RCA	-	4	0	0	2	-	-	1	8	8	-	-	28	-	-	-	-	1,148	47	-
2b.1.1.45	Reactor Vessel	9	17	0	0	2	4	-	10	43	43	-	-	22	14	-	-	-	1,826	385	-
2b.1.1.46	Residual Heat Removal	336	374	84	66	247	924	-	548	2,578	2,578	-	-	2,853	3,244	-	-	-	330,651	7,112	-
2b.1.1.47	Safeguards Chilled Water	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2b.1.1.48	Safety Injection	-	836	40	56	577	329	-	390	2,228	2,228	-	-	6,676	1,161	-	-	-	347,600	12,284	-
2b.1.1.49	Sampling	-	51	3	2	3	27	-	20	105	105	-	-	37	93	-	-	-	7,697	714	-
2b.1.1.50	Service Bldg & New Cmptr Vent	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
2b.1.1.51	Shield Bldg Ventilation	-	114	13	19	175	138	-	94	554	554	-	-	2,028	484	-	-	-	114,378	1,743	-
2b.1.1.52	Station & Instrument Air	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	2,424	-
2b.1.1.53	Station & Instrument Air - RCA	-	288	3	9	141	-	-	95	535	535	-	-	1,625	-	-	-	-	65,986	3,638	-
2b.1.1.54	Turbine Bldg Traps & Drains	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	462	-
2b.1.1.55	Turbine Bldg Traps & Drains - RCA	-	28	0	1	16	-	-	10	55	55	-	-	180	-	-	-	-	7,321	344	-
2b.1.1.56	Turbine Bldg Ventilation	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	655	-
2b.1.1.57	Unit Coolers	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	332	-
2b.1.1.58	Unit Coolers - RCA	-	54	0	1	20	-	-	17	93	93	-	-	232	-	-	-	-	9,413	690	-
2b.1.1.59	Waste Gas Disposal	531	457	40	35	212	381	-	516	2,173	2,173	-	-	2,453	1,358	-	-	-	188,334	14,308	-
2b.1.1.60	Waste Liquid Disposal	1,386	1,733	108	76	316	1,019	-	1,451	6,089	6,089	-	-	3,655	3,594	-	-	-	385,370	44,485	-
2b.1.1.61	Waste Solid Disposal	111	139	11	8	34	112	-	126	541	541	-	-	389	393	-	-	-	41,732	3,481	-
2b.1.1	Totals	3,390	15,678	558	763	7,868	4,377	-	7,798	40,433	37,423	-	3,010	90,963	15,429	-	-	-	4,712,076	270,390	-
2b.1.2	Scaffolding in support of decommissioning	-	3,542	30	10	121	32	-	916	4,651	4,651	-	-	1,265	112	-	-	-	64,307	32,837	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,150	2,624	139	853	193	11,080	-	4,172	20,210	20,210	-	-	2,230	57,418	-	-	-	3,559,977	50,853	-
2b.1.3.2	Auxiliary	1,223	400	12	80	92	582	-	884	3,272	3,272	-	-	1,060	3,355	-	-	-	332,498	23,808	-
2b.1.3.3	Backwash Waste Receiving Tank	-	27	1	11	-	87	-	30	158	158	-	-	-	507	-	-	-	43,896	299	-
2b.1.3.4	Drum Transfer & Truck Loading Enclosure	17	8	0	2	2	13	-	14	56	56	-	-	19	74	-	-	-	7,118	368	-
2b.1.3.5	LLRW Storage Enclosure	117	51	1	11	3	87	-	95	366	366	-	-	38	502	-	-	-	44,971	2,424	-
2b.1.3.6	Radwaste	52	23	1	5	4	39	-	43	166	166	-	-	42	225	-	-	-	21,136	1,082	-
2b.1.3.7	Resin Disposal	15	11	0	2	7	12	-	15	64	64	-	-	83	69	-	-	-	9,271	383	-
2b.1.3	Totals	2,574	3,145	155	964	300	11,900	-	5,253	24,292	24,292	-	-	3,471	62,151	-	-	-	4,018,868	79,216	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	206	31	236	236	-	-	-	-	-	-	-	-	-	1,751
2b.1.5	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	5,965	22,365	744	1,737	8,290	16,309	206	13,998	69,612	66,602	-	3,010	95,700	77,691	-	-	-	8,795,250	382,443	1,751
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,930	579	2,509	2,509	-	-	-	-	-	-	-	-	25,228	-
2b.2.2	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
2b.2	Subtotal Period 2b Additional Costs	-	-	9	29	312	-	1,930	631	2,911	2,911	-	-	5,855	-	-	-	-	146,375	25,244	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	167	-	112	289	-	453	-	251	1,272	1,272	-	-	-	1,081	-	-	-	64,837	211	-
2b.3.2	Process decommissioning chemical flush waste	3	-	114	431	-	858	-	292	1,700	1,700	-	-	-	1,154	-	-	-	122,948	216	-
2b.3.3	Small tool allowance	-	414	-	-	-	-	-	62	476	476	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	5,437	815	6,252	-	6,252	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Collateral Costs (continued)																					
2b.3.5	Retention and Severance	-	-	-	-	-	-	4,127	619	4,746	4,746	-	-	-	-	-	-	-	-	-	-
2b.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,517	-	1,517	-	1,517	-	-	-	-	-	-	-	-	-
2b.3.7	On-site survey and release of 0.437 tons clean metallic waste	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	170	414	226	721	-	1,311	11,082	2,040	15,964	8,195	7,769	-	-	2,234	-	-	-	187,785	427	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,135	-	-	-	-	-	-	284	1,419	1,419	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	620	62	682	682	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	2,983	298	3,281	3,281	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,580	-	-	-	-	-	645	3,225	3,225	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	2,740	-	-	-	-	-	411	3,151	3,151	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	115	34	-	431	-	124	704	704	-	-	-	5,291	-	-	-	105,826	173	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,379	207	1,586	1,586	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	481	48	529	529	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,558	156	1,714	-	1,714	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	1,503	225	1,728	1,728	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	487	73	560	-	560	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	246	37	282	282	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	63	9	72	-	72	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	70	10	80	80	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	8,243	1,236	9,479	9,479	-	-	-	-	-	-	-	-	-	136,323
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	16,150	2,422	18,572	18,572	-	-	-	-	-	-	-	-	-	184,288
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	21,222	3,183	24,405	24,405	-	-	-	-	-	-	-	-	-	342,069
2b.4	Subtotal Period 2b Period-Dependent Costs	1,135	5,320	115	34	-	431	55,004	9,432	71,472	69,125	2,346	-	-	5,291	-	-	-	105,826	173	662,680
2b.0	TOTAL PERIOD 2b COST	7,270	28,099	1,095	2,520	8,602	18,050	68,221	26,102	159,958	146,833	10,115	3,010	101,555	85,217	-	-	-	9,235,236	408,286	664,431
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	66,610	9,992	76,602	-	76,602	-	-	-	-	-	-	-	-	-
2c.3.2	Retention and Severance	-	-	-	-	-	-	2,034	305	2,339	2,339	-	-	-	-	-	-	-	-	-	-
2c.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,630	-	1,630	-	1,630	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	70,274	10,297	80,571	2,339	78,232	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	666	67	733	733	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	3,060	306	3,366	3,366	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	270	-	-	-	-	-	67	337	337	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	12	3	-	44	-	13	72	72	-	-	-	538	-	-	-	10,761	18	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	395	59	454	454	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	305	31	336	336	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,674	167	1,842	-	1,842	-	-	-	-	-	-	-	-	-
2c.4.8	Fixed Overhead	-	-	-	-	-	-	1,615	242	1,857	1,857	-	-	-	-	-	-	-	-	-	-
2c.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	-
2c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	67	10	77	-	77	-	-	-	-	-	-	-	-	-
2c.4.11	Railroad Track Maintenance	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	-
2c.4.12	Security Staff Cost	-	-	-	-	-	-	8,857	1,329	10,185	10,185	-	-	-	-	-	-	-	-	-	146,478
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	6,575	986	7,561	7,561	-	-	-	-	-	-	-	-	-	107,146
2c.4	Subtotal Period 2c Period-Dependent Costs	-	270	12	3	-	44	23,343	3,296	26,968	25,049	1,919	-	-	538	-	-	-	10,761	18	253,623
2c.0	TOTAL PERIOD 2c COST	-	270	12	3	-	44	97,965	14,245	112,539	32,387	80,151	-	-	538	-	-	-	10,761	18	253,623
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	328	32	94	32	-	595	-	335	1,416	1,416	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical - Contaminated - Fuel Pool	-	197	2	6	75	9	-	64	353	353	-	-	864	33	-	-	-	37,250	2,783	-
2d.1.2.2	Electrical - Decontaminated - Fuel Pool	-	1,230	14	47	698	-	-	421	2,410	2,410	-	-	8,069	-	-	-	-	327,668	16,495	-

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Table D-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2d.1.2.3	Fire Protection & Detection - RCA Fuel P	-	36	1	2	25	-	-	13	76	76	-	-	286	-	-	-	-	11,622	476	-
2d.1.2.4	HVAC - Contaminated - Fuel Pool	-	549	12	31	418	52	-	219	1,280	1,280	-	-	4,828	182	-	-	-	208,080	7,448	-
2d.1.2.5	Safeguards Chilled Water - RCA	-	4	0	0	2	-	-	1	8	8	-	-	26	-	-	-	-	1,045	51	-
2d.1.2.6	Spent Fuel Pool Cooling	31	35	3	2	3	30	-	33	137	137	-	-	39	107	-	-	-	8,635	882	-
2d.1.2.7	Spent Fuel Pool Normal Ventilation	-	26	1	2	23	3	-	11	66	66	-	-	265	12	-	-	-	11,532	394	-
2d.1.2	Totals	31	2,077	32	89	1,244	95	-	761	4,328	4,328	-	-	14,376	333	-	-	-	605,832	28,530	-
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Handling of Aux Building	975	1,082	9	32	209	173	-	838	3,319	3,319	-	-	2,417	944	-	-	-	177,818	30,401	-
2d.1.3	Totals	975	1,082	9	32	209	173	-	838	3,319	3,319	-	-	2,417	944	-	-	-	177,818	30,401	-
2d.1.4	Scaffolding in support of decommissioning	-	708	6	2	24	6	-	183	930	930	-	-	253	22	-	-	-	12,861	6,567	-
2d.1	Subtotal Period 2d Activity Costs	1,334	3,900	142	155	1,477	868	-	2,118	9,994	9,994	-	-	17,046	3,391	-	-	-	934,809	66,074	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	16,173	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,082	625	2,706	2,706	-	-	-	-	-	-	-	-	16,173	6,240
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	39	-	27	70	-	109	-	60	306	306	-	-	-	261	-	-	-	15,670	51	-
2d.3.2	Process decommissioning chemical flush waste	0	-	1	5	-	10	-	3	20	20	-	-	-	13	-	-	-	1,422	2	-
2d.3.3	Small tool allowance	-	79	-	-	-	-	-	12	91	91	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13,144	1,972	15,115	-	15,115	-	-	-	-	-	-	-	-	-
2d.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	971	-	971	-	971	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	39	79	172	130	575	270	14,114	2,194	17,573	1,488	16,086	-	6,000	804	-	-	-	322,060	142	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	218	-	-	-	-	-	-	54	272	272	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	398	40	437	437	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,740	174	1,914	1,914	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	742	-	-	-	-	-	186	928	928	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,757	-	-	-	-	-	264	2,020	2,020	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	44	13	-	163	-	47	266	266	-	-	-	2,000	-	-	-	40,003	65	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	471	71	542	542	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	256	26	282	282	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	999	100	1,099	-	1,099	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	963	144	1,108	1,108	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	315	47	362	362	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	40	6	46	-	46	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	5,123	768	5,891	5,891	-	-	-	-	-	-	-	-	-	84,157
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,065	910	6,975	6,975	-	-	-	-	-	-	-	-	-	69,996
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	7,796	1,169	8,966	8,527	439	-	-	-	-	-	-	-	-	126,236
2d.4	Subtotal Period 2d Period-Dependent Costs	218	2,499	44	13	-	163	24,212	4,013	31,160	29,576	1,584	-	-	2,000	-	-	-	40,003	65	280,390
2d.0	TOTAL PERIOD 2d COST	1,591	6,478	357	298	2,052	1,301	40,408	8,949	61,434	43,764	17,670	-	23,046	6,195	-	-	-	1,296,872	82,455	286,630
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	934	-	934	-	934	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,122	178	2,300	1,367	934	-	-	-	-	-	-	-	-	-

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Table D-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,626	163	1,789	1,789	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	602	-	-	-	-	-	150	752	752	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	334	-	-	-	6,685	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	272	27	299	299	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	51	5	56	-	56	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	39	6	44	-	44	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	4,924	739	5,663	5,663	-	-	-	-	-	-	-	-	-	80,898
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	3,854	578	4,433	4,007	426	-	-	-	-	-	-	-	-	59,507
2f.4	Subtotal Period 2f Period-Dependent Costs	-	602	7	2	-	27	16,445	2,508	19,592	19,066	526	-	-	334	-	-	-	6,685	11	186,687
2f.0	TOTAL PERIOD 2f COST	-	602	7	2	-	27	26,150	4,962	31,750	30,290	1,460	-	-	334	-	-	-	6,685	102,653	189,807
PERIOD 2 TOTALS		9,835	63,787	29,263	6,901	13,758	38,202	288,537	90,101	540,384	421,894	112,892	5,598	163,227	129,602	250	673	-	15,079,400	824,945	1,954,541
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	4,256	-	-	-	-	-	638	4,895	-	-	4,895	-	-	-	-	-	-	44,679	-
3b.1.1.2	Auxiliary	-	1,897	-	-	-	-	-	285	2,182	-	-	2,182	-	-	-	-	-	-	11,902	-
3b.1.1.3	Condensate Storage Tank Foundation	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	33	-
3b.1.1.4	Construction Warehouse & Fab Shop	-	118	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	1,405	-
3b.1.1.5	D3/D4 Emergency Generator	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	84	-
3b.1.1.6	Drum Transfer & Truck Loading Enclosure	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	221	-
3b.1.1.7	Hydrogen House	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	47	-
3b.1.1.8	LLRW Storage Enclosure	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	853	-
3b.1.1.9	Misc Structures 2017	-	1,391	-	-	-	-	-	209	1,599	-	-	1,599	-	-	-	-	-	-	12,939	-
3b.1.1.10	Radwaste	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	1,400	-
3b.1.1.11	Resin Disposal	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	120	-
3b.1.1.12	Structures below 3' below grade	-	1,713	-	-	-	-	-	257	1,969	-	-	1,969	-	-	-	-	-	-	9,238	-
3b.1.1.13	Sulfuric Acid Tank Enclosure	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	35	-
3b.1.1.14	Turbine	-	1,983	-	-	-	-	-	298	2,281	-	-	2,281	-	-	-	-	-	-	22,052	-
3b.1.1.15	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
3b.1.1.16	Warehouse #2	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	213	-
3b.1.1.17	Waste Neutralizing Tank House	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	56	-
3b.1.1.18	Waste Oil Storage	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	70	-
3b.1.1.19	Water Treatment	-	303	-	-	-	-	-	46	349	-	-	349	-	-	-	-	-	-	2,690	-
3b.1.1.20	Fuel Handling of Aux Building	-	1,032	-	-	-	-	-	155	1,186	-	-	1,186	-	-	-	-	-	-	8,240	-
3b.1.1	Totals	-	13,424	-	-	-	-	-	2,014	15,438	-	-	15,438	-	-	-	-	-	-	118,134	-
Site Closeout Activities																					
3b.1.2	Remove Rubble	-	1,308	-	-	-	-	-	196	1,505	-	-	1,505	-	-	-	-	-	-	6,495	-
3b.1.3	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	78	12	90	90	-	-	-	-	-	-	-	-	-	667
3b.1	Subtotal Period 3b Activity Costs	-	15,163	-	-	-	-	78	2,286	17,528	90	-	17,438	-	-	-	-	-	-	125,549	667
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	3,313	-	-	-	-	8	498	3,818	-	-	3,818	-	-	-	-	-	-	12,824	-
3b.2.2	Underground Services Excavations	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
3b.2.3	Intake Structure Cofferdam	-	423	-	-	-	-	-	63	486	-	-	486	-	-	-	-	-	-	3,552	-
3b.2.4	Construction Debris	-	-	-	-	-	-	463	69	532	-	-	532	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	8,465	-	-	-	-	-	1,270	9,735	-	-	9,735	-	-	-	-	-	-	9,327	-
3b.2	Subtotal Period 3b Additional Costs	-	13,012	-	-	-	-	991	2,100	16,103	-	-	16,103	-	-	-	-	-	-	33,110	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	172	-	-	-	-	-	26	198	-	-	198	-	-	-	-	-	-	-	-
3b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,651	-	2,651	-	2,651	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	172	-	-	-	-	2,651	26	2,848	-	2,651	198	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table D-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	542	54	596	-	596	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	4,334	433	4,767	-	4,767	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	236	24	259	-	259	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	145	14	159	-	159	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	331	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	4,245	637	4,882	-	4,882	-	-	-	-	-	-	-	-	57,340
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	4,813	722	5,535	(0)	1,207	4,329	-	-	-	-	-	-	-	74,431
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,670	-	-	-	-	26,534	4,718	37,921	(0)	11,997	25,924	-	-	-	-	-	-	-	248,656
3b.0	TOTAL PERIOD 3b COST	-	35,017	-	-	-	-	30,253	9,130	74,401	90	14,648	59,663	-	-	-	-	-	-	158,659	249,323
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	16,797	2,520	19,316	-	19,316	-	-	-	-	-	-	-	-	-
3c.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	43,116	-	43,116	-	43,116	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	59,913	2,520	62,433	-	62,433	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	8,818	882	9,700	-	9,700	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	39,829	3,983	43,812	-	43,812	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	5,648	565	6,213	-	6,213	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	2,360	236	2,596	-	2,596	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	5,267	790	6,057	-	6,057	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,782	267	2,049	-	2,049	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,991	299	2,289	-	2,289	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	69,105	10,366	79,471	-	79,471	-	-	-	-	-	-	-	-	933,362
3c.4.10	Utility Staff Cost	-	-	-	-	-	-	17,069	2,560	19,629	-	19,629	-	-	-	-	-	-	-	-	242,315
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	151,870	19,948	171,817	-	171,817	-	-	-	-	-	-	-	-	1,175,677
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	211,783	22,467	234,250	-	234,250	-	-	-	-	-	-	-	-	1,175,677
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	3,746	837,596	-	-	-
3d.1.1	Totals	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	3,746	837,596	-	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	3,746	837,596	-	-	-
Period 3d Collateral Costs																					
3d.3.1	Prairie Island Indian Community Payments	-	-	-	-	-	-	48	-	48	-	48	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	48	-	48	-	48	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	10	1	11	11	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	39	4	43	43	-	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	3	0	3	-	3	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	2	0	3	-	3	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	77	12	88	88	-	-	-	-	-	-	-	-	-	1,037
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	19	3	22	22	-	-	-	-	-	-	-	-	-	269
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	162	21	183	171	12	-	-	-	-	-	-	-	-	1,306
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	8,689	210	1,658	11,887	11,827	60	-	-	-	-	3,746	837,596	-	-	1,306

Prairie Island Nuclear Generating Plant
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Table D-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	-	37	2	211	-	2,157	710	779	3,896	3,896	-	-	-	7,458	-	-	-	1,071,985	3,670	888
3e.2	Subtotal Period 3e Additional Costs	-	37	2	211	-	2,157	710	779	3,896	3,896	-	-	-	7,458	-	-	-	1,071,985	3,670	888
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	96	24	121	121	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	26	6	32	32	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	51	13	63	63	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	19	5	24	24	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	154	38	192	192	-	-	-	-	-	-	-	-	-	2,500
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	130	33	163	163	-	-	-	-	-	-	-	-	-	1,896
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	476	119	595	595	-	-	-	-	-	-	-	-	-	4,396
3e.0	TOTAL PERIOD 3e COST	-	37	2	211	-	2,157	1,186	898	4,491	4,491	-	-	-	7,458	-	-	-	1,071,985	3,670	5,284
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	495	-	-	-	-	87	87	669	-	-	669	-	-	-	-	-	-	2,308	160
3f.2	Subtotal Period 3f Additional Costs	-	495	-	-	-	-	87	87	669	-	-	669	-	-	-	-	-	-	2,308	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	13	1	14	-	-	14	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	25	4	29	-	-	29	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	10	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	78	12	89	-	-	89	-	-	-	-	-	-	-	1,260
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	782
3f.4	Subtotal Period 3f Period-Dependent Costs	-	62	-	-	-	-	190	37	289	-	-	289	-	-	-	-	-	-	-	2,042
3f.0	TOTAL PERIOD 3f COST	-	560	-	-	-	-	277	125	962	-	-	962	-	-	-	-	-	-	2,308	2,202
PERIOD 3 TOTALS		-	35,614	1,333	211	-	10,846	243,709	34,278	325,991	16,408	248,958	60,625	-	7,458	-	-	3,746	1,909,581	164,637	1,433,792
TOTAL COST TO DECOMMISSION		13,408	104,717	31,018	7,562	13,927	53,014	633,188	141,809	998,643	561,764	370,034	66,845	169,551	150,947	839	673	3,746	17,608,500	1,023,123	4,190,637

TOTAL COST TO DECOMMISSION WITH 16.55% CONTINGENCY:	\$998,643	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 56.25% OR:	\$561,764	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 37.05% OR:	\$370,034	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 6.69% OR:	\$66,845	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	152,458	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	41,515	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,023,123	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

***Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis***

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APPENDIX E

DETAILED COST ANALYSIS

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Prairie Island Nuclear Generating Plant, Unit 1	E-2
Prairie Island Nuclear Generating Plant, Unit 2	E-10

Table E-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	578	87	664	598	-	66	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,440	666	5,106	4,496	-	610	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	14,774	2,216	16,990	16,380	-	610	-	-	-	-	-	-	-	78,157
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,040	204	2,244	2,244	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	43,160	6,378	50,687	48,402	2,286	-	-	610	-	-	-	12,190	20	544,960

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table E-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	71,629	10,348	83,126	78,227	4,289	610	-	610	-	-	-	12,190	20	623,117
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	293	44	337	337	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,902	585	4,487	3,643	-	844	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	552	-	-	-	-	-	-	276	828	828	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	552	-	-	-	-	-	3,902	861	5,315	4,471	-	844	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	3,700	1,110	4,810	4,810	-	-	-	-	-	-	-	-	21,020	8,332
1b.2.2	Mixed/Hazardous Waste	-	-	318	75	164	-	-	68	624	624	-	-	6,133	-	-	-	-	351,986	2,361	-
1b.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
1b.2	Subtotal Period 1b Additional Costs	-	2,364	320	185	164	1,359	3,700	2,125	10,216	10,216	-	-	6,133	12,843	-	-	-	518,945	44,288	8,332
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	24	-	16	41	-	64	-	36	180	180	-	-	-	152	-	-	-	9,121	30	-
1b.3.4	Process decommissioning chemical flush waste	2	-	58	220	-	2,471	-	657	3,408	3,408	-	-	-	-	588	-	-	62,689	110	-
1b.3.5	Small tool allowance	-	34	-	-	-	-	-	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	159	24	183	-	183	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	1,088	163	1,251	1,251	-	-	-	-	-	-	-	-	-	-
1b.3.10	Prairie Island Indian Community Payments	-	-	-	-	-	-	630	-	630	-	630	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,986	1,234	74	261	-	2,534	3,065	1,687	11,841	11,028	813	-	-	152	588	-	-	71,810	140	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	872	87	959	959	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,352	135	1,487	1,487	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	402	-	-	-	-	-	101	503	503	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	286	-	-	-	-	-	43	329	329	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	8	2	-	29	-	8	48	48	-	-	-	360	-	-	-	7,197	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,527	229	1,756	1,756	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	323	32	355	355	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	809	81	890	-	890	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	741	111	852	852	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,725	559	4,284	4,284	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	5,656	848	6,504	6,504	-	-	-	-	-	-	-	-	-	63,961
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	13,074	1,961	15,035	15,035	-	-	-	-	-	-	-	-	-	213,904
1b.4	Subtotal Period 1b Period-Dependent Costs	35	688	8	2	-	29	28,336	4,243	33,341	32,189	1,152	-	-	360	-	-	-	7,197	12	339,730
1b.0	TOTAL PERIOD 1b COST	3,573	4,286	402	447	164	3,923	39,002	8,917	60,713	57,904	1,965	844	6,133	13,355	588	-	-	597,952	45,506	381,305

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table E-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1 TOTALS		3,573	5,368	415	451	164	3,972	110,631	19,264	143,839	136,131	6,254	1,454	6,133	13,964	588	-	-	610,142	45,526	1,004,421
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	51	45	6	8	-	150	-	76	336	336	-	-	-	305	-	-	-	34,809	1,414	-
2a.1.1.2	Pressurizer Relief Tank	22	20	4	5	-	100	-	42	193	193	-	-	-	203	-	-	-	23,193	625	-
2a.1.1.3	Reactor Coolant Pumps & Motors	54	63	101	83	-	736	-	249	1,287	1,287	-	-	-	2,332	-	-	-	295,800	2,049	100
2a.1.1.4	Pressurizer	48	68	467	88	-	693	-	274	1,639	1,639	-	-	-	2,196	-	-	-	185,015	2,355	938
2a.1.1.5	Steam Generators	225	2,943	2,093	1,638	1,246	3,570	-	2,383	14,097	14,097	-	-	18,672	11,316	-	-	-	1,668,341	14,819	2,875
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	286	277	211	48	-	763	-	431	2,016	2,016	-	-	-	4,797	-	-	-	177,400	8,104	-
2a.1.1.7	Reactor Vessel Internals	78	4,468	21,874	1,072	-	7,946	277	13,141	48,856	48,856	-	-	-	501	125	673	-	164,987	23,040	1,080
2a.1.1.8	Reactor Vessel	89	5,717	1,754	719	-	1,956	277	5,970	16,483	16,483	-	-	-	5,690	-	-	-	570,074	23,040	1,080
2a.1.1	Totals	855	13,600	26,512	3,662	1,246	15,913	553	22,568	84,908	84,908	-	-	18,672	27,341	125	673	-	3,119,620	75,446	6,073
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	305	189	55	272	306	-	221	1,348	1,348	-	-	2,131	1,187	-	-	-	206,316	4,667	-
2a.1.3	Main Condensers	-	2,532	121	49	364	451	-	820	4,336	4,336	-	-	3,800	1,587	-	-	-	275,903	39,151	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
2a.1.4	Totals	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
Disposal of Plant Systems																					
2a.1.5.1	Air Removal	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	452	-
2a.1.5.2	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	670	-
2a.1.5.3	Auxiliary Feedwater - RCA	-	45	0	1	19	-	-	14	79	79	-	-	215	-	-	-	-	8,722	601	-
2a.1.5.4	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,335	-
2a.1.5.5	Caustic Addition - RCA	-	36	0	1	20	-	-	12	71	71	-	-	233	-	-	-	-	9,453	444	-
2a.1.5.6	Chemical Feed	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	304	-
2a.1.5.7	Chemical Feed - RCA	-	1	0	0	1	-	-	0	2	2	-	-	6	-	-	-	-	243	12	-
2a.1.5.8	Circulating Water	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	619	-
2a.1.5.9	Condensate	-	414	-	-	-	-	-	62	476	-	-	476	-	-	-	-	-	-	6,837	-
2a.1.5.10	Condensate Polishing	-	205	-	-	-	-	-	31	236	-	-	236	-	-	-	-	-	-	3,420	-
2a.1.5.11	Condensate Polishing - RCA	-	176	4	12	180	-	-	73	444	444	-	-	2,078	-	-	-	-	84,395	2,329	-
2a.1.5.12	Electro-hydraulic	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	127	-
2a.1.5.13	Feedwater	-	133	-	-	-	-	-	20	153	-	-	153	-	-	-	-	-	-	2,215	-
2a.1.5.14	Feedwater - RCA	-	186	6	19	278	-	-	91	579	579	-	-	3,208	-	-	-	-	130,294	2,651	-
2a.1.5.15	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	505	-
2a.1.5.16	Heater Drain	-	349	-	-	-	-	-	52	401	-	-	401	-	-	-	-	-	-	5,881	-
2a.1.5.17	Internal Circ Water & CDSR	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	389	-
2a.1.5.18	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2a.1.5.19	Main Steam	-	101	-	-	-	-	-	15	116	-	-	116	-	-	-	-	-	-	1,690	-
2a.1.5.20	Main Steam - RCA	-	350	9	29	436	-	-	158	983	983	-	-	5,044	-	-	-	-	204,825	4,956	-
2a.1.5.21	Steam Generator Blowdown	-	459	21	22	176	195	-	195	1,067	1,067	-	-	2,031	686	-	-	-	127,773	6,667	-
2a.1.5.22	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2a.1.5.23	Turbine & Moisture Separators	-	337	-	-	-	-	-	51	388	-	-	388	-	-	-	-	-	-	5,609	-
2a.1.5.24	Turbine Oil Purification	-	61	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	1,003	-
2a.1.5	Totals	-	3,117	40	85	1,108	195	-	825	5,370	3,226	-	2,145	12,815	686	-	-	-	565,705	48,794	-
2a.1.6	Scaffolding in support of decommissioning	-	854	3	1	13	3	-	217	1,092	1,092	-	-	138	12	-	-	-	7,016	6,368	-
2a.1	Subtotal Period 2a Activity Costs	855	21,136	26,865	3,852	3,004	16,868	553	24,759	97,891	95,747	-	2,145	37,556	30,812	125	673	-	4,174,560	182,015	6,073
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,126	638	2,764	2,764	-	-	-	-	-	-	-	-	27,791	-
2a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
2a.2	Subtotal Period 2a Additional Costs	1	659	785	107	-	1,439	2,126	2,075	7,191	7,191	-	-	-	2,097	125	-	-	205,890	29,966	87
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	47	-	31	81	-	126	-	70	356	356	-	-	-	302	-	-	-	18,119	59	-
2a.3.3	Small tool allowance	-	223	-	-	-	-	-	33	257	231	-	26	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,476	221	1,698	-	1,698	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	12,156	1,823	13,980	13,980	-	-	-	-	-	-	-	-	-	-
2a.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,670	-	1,670	-	1,670	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	47	223	31	81	-	126	15,302	2,149	17,960	14,567	3,367	26	-	302	-	-	-	18,119	59	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table E-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	93	-	-	-	-	-	-	23	116	116	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	683	68	751	751	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	3,542	354	3,896	3,896	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,717	-	-	-	-	-	429	2,146	2,146	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,935	-	-	-	-	-	440	3,376	3,376	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	79	23	-	295	-	85	482	482	-	-	-	3,623	-	-	-	72,452	118	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,924	289	2,212	2,212	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	774	77	851	851	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,717	172	1,888	-	1,888	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	1,655	248	1,904	1,904	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	537	80	617	-	617	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	69	10	79	-	79	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	286	43	328	328	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	9,811	1,472	11,283	11,283	-	-	-	-	-	-	-	-	-	162,878
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	18,392	2,759	21,150	21,150	-	-	-	-	-	-	-	-	-	211,351
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	24,265	3,640	27,904	27,904	-	-	-	-	-	-	-	-	-	392,305
2a.4	Subtotal Period 2a Period-Dependent Costs	93	4,652	79	23	-	295	63,653	10,190	78,986	76,401	2,585	-	-	3,623	-	-	-	72,452	118	766,534
2a.0	TOTAL PERIOD 2a COST	995	26,670	27,760	4,062	3,004	18,729	81,635	39,172	202,027	193,905	5,952	2,170	37,556	36,834	250	673	-	4,471,020	212,158	772,694
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Aux Bldg Normal Ventilation	-	2	0	0	0	-	-	1	3	3	-	-	3	-	-	-	-	140	29	-
2b.1.1.2	Battery Rm Special Ventilation	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
2b.1.1.3	Buildings Maintenance	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	65	-
2b.1.1.4	Chemical & Volume Control	1,077	1,331	83	69	389	802	-	1,149	4,901	4,901	-	-	4,498	2,846	-	-	-	369,246	34,533	-
2b.1.1.5	Component Cooling - RCA	-	821	22	72	1,075	-	-	379	2,369	2,369	-	-	12,427	-	-	-	-	504,675	11,242	-
2b.1.1.6	Containment Cooling	-	65	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	1,086	-
2b.1.1.7	Containment Cooling - RCA	-	290	6	20	294	-	-	120	730	730	-	-	3,400	-	-	-	-	138,090	3,971	-
2b.1.1.8	Containment Hydrogen Control - RCA	-	29	0	1	9	-	-	9	48	48	-	-	105	-	-	-	-	4,278	401	-
2b.1.1.9	Containment Spray - RCA	-	90	2	5	75	-	-	35	206	206	-	-	868	-	-	-	-	35,249	1,217	-
2b.1.1.10	Containment Ventilation	-	243	24	40	428	209	-	186	1,130	1,130	-	-	4,951	737	-	-	-	249,786	3,668	-
2b.1.1.11	Cooling Water	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	2,396	-
2b.1.1.12	Cooling Water - RCA	-	629	14	45	668	-	-	266	1,622	1,622	-	-	7,728	-	-	-	-	313,832	8,594	-
2b.1.1.13	D1 Emergency Diesel	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	730	-
2b.1.1.14	D2 Emergency Diesel	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	522	-
2b.1.1.15	Diesel Rooms Ventilation	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	135	-
2b.1.1.16	Electrical - Clean	-	1,669	-	-	-	-	-	250	1,919	-	-	1,919	-	-	-	-	-	-	26,981	-
2b.1.1.17	Electrical - Contaminated	-	592	6	16	219	27	-	191	1,051	1,051	-	-	2,527	95	-	-	-	108,935	8,377	-
2b.1.1.18	Electrical - Decontaminated	-	3,674	41	137	2,037	-	-	1,249	7,138	7,138	-	-	23,551	-	-	-	-	956,401	49,378	-
2b.1.1.19	Fuel Handling	-	116	6	9	79	62	-	58	329	329	-	-	908	218	-	-	-	51,280	1,784	-
2b.1.1.20	Fuel Oil	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	1,697	-
2b.1.1.21	HVAC - Clean	-	105	-	-	-	-	-	16	121	-	-	121	-	-	-	-	-	-	1,891	-
2b.1.1.22	HVAC - Contaminated	-	371	8	21	282	35	-	148	864	864	-	-	3,261	123	-	-	-	140,573	5,032	-
2b.1.1.23	Incore Instrumentation	0	27	1	1	5	16	-	12	64	64	-	-	60	57	-	-	-	6,177	425	-
2b.1.1.24	Misc Drains & Vents	-	222	14	10	34	146	-	100	527	527	-	-	390	514	-	-	-	49,900	3,091	-
2b.1.1.25	Reactor Coolant	148	298	21	14	30	221	-	213	945	945	-	-	344	777	-	-	-	65,413	6,470	-
2b.1.1.26	Reactor Hot Sampling	144	131	11	6	6	98	-	132	527	527	-	-	66	342	-	-	-	25,347	3,946	-
2b.1.1.27	Reactor Makeup	-	64	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	1,042	-
2b.1.1.28	Reactor Vessel	9	20	1	0	2	4	-	11	47	47	-	-	26	14	-	-	-	2,011	425	-
2b.1.1.29	Residual Heat Removal	344	399	85	66	250	926	-	559	2,630	2,630	-	-	2,895	3,252	-	-	-	332,849	7,621	-
2b.1.1.30	Safeguards Chilled Water	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	259	-
2b.1.1.31	Safety Injection	-	853	40	57	587	327	-	396	2,261	2,261	-	-	6,788	1,156	-	-	-	351,793	12,561	-
2b.1.1.32	Sampling	-	58	4	2	5	31	-	23	122	122	-	-	59	107	-	-	-	9,505	811	-
2b.1.1.33	Shield Bldg Ventilation	-	133	14	20	186	139	-	100	593	593	-	-	2,152	491	-	-	-	119,838	2,030	-
2b.1.1.34	Station & Instrument Air	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	300	-
2b.1.1.35	Station & Instrument Air - RCA	-	79	1	2	29	-	-	24	135	135	-	-	332	-	-	-	-	13,496	1,053	-
2b.1.1.36	Turbine Bldg Traps & Drains	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	767	-
2b.1.1.37	Unit Coolers	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	611	-
2b.1.1.38	Unit Coolers - RCA	-	53	0	1	20	-	-	16	91	91	-	-	230	-	-	-	-	9,348	683	-
2b.1.1	Totals	1,724	12,813	403	614	6,710	3,044	-	5,730	31,037	28,333	-	2,704	77,571	10,728	-	-	-	3,858,165	205,829	-
2b.1.2	Scaffolding in support of decommissioning	-	1,067	4	1	17	4	-	271	1,364	1,364	-	-	173	15	-	-	-	8,770	7,960	-

Table E-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,150	2,623	139	852	193	11,079	-	4,171	20,208	20,208	-	-	2,230	57,414	-	-	-	3,559,624	50,842	-
2b.1.3.2	Backwash Waste Receiving Tank	-	27	1	11	-	87	-	30	158	158	-	-	-	507	-	-	-	43,896	299	-
2b.1.3	Totals	1,150	2,650	141	864	193	11,166	-	4,202	20,366	20,366	-	-	2,230	57,921	-	-	-	3,603,520	51,140	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan									a											
2b.1	Subtotal Period 2b Activity Costs	2,874	16,530	547	1,479	6,919	14,215	481	10,275	53,320	50,616	-	2,704	79,974	68,664	-	-	-	7,470,455	264,930	4,096
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,943	583	2,526	2,526	-	-	-	-	-	-	-	-	25,399	-
2b.2.2	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
2b.2	Subtotal Period 2b Additional Costs	-	-	9	29	312	-	1,943	635	2,928	2,928	-	-	5,855	-	-	-	-	146,375	25,415	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	105	-	70	182	-	285	-	158	800	800	-	-	-	680	-	-	-	40,799	133	-
2b.3.2	Process decommissioning chemical flush waste	3	-	87	327	-	651	-	222	1,289	1,289	-	-	-	875	-	-	-	93,252	164	-
2b.3.3	Small tool allowance	-	289	-	-	-	-	-	43	332	332	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	4,321	648	4,969	-	4,969	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	6,994	1,049	8,043	8,043	-	-	-	-	-	-	-	-	-	-
2b.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,525	-	1,525	-	1,525	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	107	289	157	509	-	936	12,841	2,120	16,958	10,463	6,495	-	-	1,555	-	-	-	134,051	296	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	482	-	-	-	-	-	-	121	603	603	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	624	62	687	687	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	3,099	310	3,409	3,409	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	1,969	-	-	-	-	-	492	2,461	2,461	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	2,759	-	-	-	-	-	414	3,173	3,173	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	78	23	-	293	-	85	479	479	-	-	-	3,600	-	-	-	71,996	117	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,388	208	1,596	1,596	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	707	71	778	778	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,569	157	1,726	-	1,726	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	1,513	227	1,740	1,740	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	490	74	564	-	564	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	247	37	284	284	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	63	9	73	-	73	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	8,299	1,245	9,544	9,544	-	-	-	-	-	-	-	-	-	137,246
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	11,450	1,718	13,168	13,168	-	-	-	-	-	-	-	-	-	137,246
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	15,293	2,294	17,586	17,586	-	-	-	-	-	-	-	-	-	255,430
2b.4	Subtotal Period 2b Period-Dependent Costs	482	4,728	78	23	-	293	44,813	7,533	57,951	55,588	2,362	-	-	3,600	-	-	-	71,996	117	529,921
2b.0	TOTAL PERIOD 2b COST	3,464	21,546	792	2,040	7,231	15,444	60,078	20,563	131,157	119,596	8,857	2,704	85,829	73,819	-	-	-	7,822,876	290,758	534,017
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	72,993	10,949	83,941	-	83,941	-	-	-	-	-	-	-	-	-
2c.3.2	Retention and Severance	-	-	-	-	-	-	4,478	672	5,149	5,149	-	-	-	-	-	-	-	-	-	-
2c.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,702	-	2,702	-	2,702	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	80,172	11,621	91,793	5,149	86,643	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	1,104	110	1,215	1,215	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	5,154	515	5,669	5,669	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	390	-	-	-	-	-	98	488	488	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	18	5	-	66	-	19	108	108	-	-	-	809	-	-	-	16,171	26	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	655	98	753	753	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	555	55	610	610	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	2,776	278	3,053	-	3,053	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table E-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				GTCC Cu. Feet	Burial /		Utility and Contractor Manhours
						Processing Costs	Disposal Costs				Lic. Term. Costs				Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	Processed Wt., Lbs.		Craft Manhours		
Period 2c Period-Dependent Costs (continued)																						
2c.4.8	Fixed Overhead	-	-	-	-	-	-	2,676	401	3,078	3,078	-	-	-	-	-	-	-	-	-	-	
2c.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	87	13	101	101	-	-	-	-	-	-	-	-	-	-	
2c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	112	17	128	-	128	-	-	-	-	-	-	-	-	-	
2c.4.11	Railroad Track Maintenance	-	-	-	-	-	-	125	19	143	143	-	-	-	-	-	-	-	-	-	-	
2c.4.12	Security Staff Cost	-	-	-	-	-	-	14,681	2,202	16,883	16,883	-	-	-	-	-	-	-	-	-	242,796	
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	2,064	310	2,374	2,374	-	-	-	-	-	-	-	-	-	33,722	
2c.4	Subtotal Period 2c Period-Dependent Costs	-	390	18	5	-	66	29,988	4,135	34,602	31,421	3,181	-	-	809	-	-	-	16,171	26	276,518	
2c.0	TOTAL PERIOD 2c COST	-	390	18	5	-	66	114,508	16,408	131,395	41,570	89,825	-	-	809	-	-	-	16,171	26	276,518	
PERIOD 2d - Decontamination Following Wet Fuel Storage																						
Period 2d Direct Decommissioning Activities																						
2d.1.1	Remove spent fuel racks	328	32	94	32	-	595	-	335	1,416	1,416	-	-	-	2,092	-	-	-	138,298	576	-	
Disposal of Plant Systems																						
2d.1.2.1	Electrical - Contaminated - Fuel Pool	-	147	2	4	53	7	-	47	259	259	-	-	615	23	-	-	-	26,508	2,077	-	
2d.1.2.2	Electrical - Decontaminated - Fuel Pool	-	918	10	34	510	-	-	312	1,785	1,785	-	-	5,893	-	-	-	-	239,327	12,340	-	
2d.1.2.3	HVAC - Contaminated - Fuel Pool	-	159	3	9	121	15	-	63	370	370	-	-	1,398	53	-	-	-	60,246	2,157	-	
2d.1.2.4	Safeguards Chilled Water - RCA	-	82	1	3	43	-	-	27	155	155	-	-	495	-	-	-	-	20,100	1,019	-	
2d.1.2.5	Spent Fuel Pool Cooling	293	342	34	25	70	377	-	344	1,484	1,484	-	-	806	1,325	-	-	-	120,439	7,613	-	
2d.1.2.6	Station & Instrument Air - RCA Fuel Pool	-	20	0	0	7	-	-	6	34	34	-	-	83	-	-	-	-	3,374	263	-	
2d.1.2	Totals	293	1,668	50	75	804	399	-	800	4,088	4,088	-	-	9,290	1,401	-	-	-	469,994	25,468	-	
2d.1.4	Scaffolding in support of decommissioning	-	213	1	0	3	1	-	54	273	273	-	-	35	3	-	-	-	1,754	1,592	-	
2d.1	Subtotal Period 2d Activity Costs	621	1,913	145	107	807	994	-	1,189	5,777	5,777	-	-	9,325	3,496	-	-	-	610,046	27,637	-	
Period 2d Additional Costs																						
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240	
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	16,173	-	
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,082	625	2,706	2,706	-	-	-	-	-	-	-	-	16,173	6,240	
Period 2d Collateral Costs																						
2d.3.1	Process decommissioning water waste	27	-	18	48	-	75	-	41	209	209	-	-	-	179	-	-	-	10,724	35	-	
2d.3.2	Process decommissioning chemical flush waste	1	-	32	121	-	241	-	82	478	478	-	-	-	324	-	-	-	34,576	61	-	
2d.3.3	Small tool allowance	-	35	-	-	-	-	-	5	41	41	-	-	-	-	-	-	-	-	-	-	
2d.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-	
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	12,947	1,942	14,889	-	14,889	-	-	-	-	-	-	-	-	-	
2d.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	971	-	971	-	971	-	-	-	-	-	-	-	-	-	
2d.3	Subtotal Period 2d Collateral Costs	27	35	194	224	575	467	13,917	2,217	17,658	1,798	15,859	-	6,000	1,032	-	-	-	350,268	184	-	
Period 2d Period-Dependent Costs																						
2d.4.1	Decon supplies	54	-	-	-	-	-	-	14	68	68	-	-	-	-	-	-	-	-	-	-	
2d.4.2	Insurance	-	-	-	-	-	-	398	40	437	437	-	-	-	-	-	-	-	-	-	-	
2d.4.3	Property taxes	-	-	-	-	-	-	1,740	174	1,914	1,914	-	-	-	-	-	-	-	-	-	-	
2d.4.4	Health physics supplies	-	559	-	-	-	-	-	140	699	699	-	-	-	-	-	-	-	-	-	-	
2d.4.5	Heavy equipment rental	-	1,757	-	-	-	-	-	264	2,020	2,020	-	-	-	-	-	-	-	-	-	-	
2d.4.6	Disposal of DAW generated	-	-	18	5	-	67	-	19	110	110	-	-	-	829	-	-	-	16,581	27	-	
2d.4.7	Plant energy budget	-	-	-	-	-	-	471	71	542	542	-	-	-	-	-	-	-	-	-	-	
2d.4.8	NRC Fees	-	-	-	-	-	-	381	38	419	419	-	-	-	-	-	-	-	-	-	-	
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	999	100	1,099	-	1,099	-	-	-	-	-	-	-	-	-	
2d.4.10	Fixed Overhead	-	-	-	-	-	-	963	144	1,108	1,108	-	-	-	-	-	-	-	-	-	-	
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	315	47	362	362	-	-	-	-	-	-	-	-	-	-	
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	40	6	46	-	46	-	-	-	-	-	-	-	-	-	
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	-	
2d.4.14	Security Staff Cost	-	-	-	-	-	-	5,123	768	5,891	5,891	-	-	-	-	-	-	-	-	-	84,157	
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,065	910	6,975	6,975	-	-	-	-	-	-	-	-	-	69,996	
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	7,796	1,169	8,966	8,123	843	-	-	-	-	-	-	-	-	126,236	
2d.4	Subtotal Period 2d Period-Dependent Costs	54	2,316	18	5	-	67	24,337	3,911	30,708	28,720	1,988	-	-	829	-	-	-	16,581	27	280,390	
2d.0	TOTAL PERIOD 2d COST	703	4,264	357	337	1,382	1,528	40,336	7,942	56,849	39,002	17,847	-	15,325	5,357	-	-	-	976,895	44,021	286,630	
PERIOD 2f - License Termination																						
Period 2f Direct Decommissioning Activities																						
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-	
2f.1.2	Terminate license	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-	
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-	

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Table E-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed Volume Cu. Feet	Burial Volumes					Burial /	Craft Manhours	Utility and
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs		Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Contractor Manhours		
Period 2f Additional Costs																						
2f.2.1	License Termination Survey	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	-	40,172	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	-	40,172	3,120
Period 2f Collateral Costs																						
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-	-
2f.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	934	-	934	-	934	-	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,122	178	2,300	1,367	934	-	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																						
2f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,626	163	1,789	1,789	-	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	420	-	-	-	-	-	105	524	524	-	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	334	-	-	-	-	6,685	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	417	42	459	459	-	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	51	5	56	-	56	-	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	39	6	44	-	44	-	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	4,924	739	5,663	5,663	-	-	-	-	-	-	-	-	-	-	80,898
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	-	46,283
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	3,854	578	4,433	3,626	807	-	-	-	-	-	-	-	-	-	59,507
2f.4	Subtotal Period 2f Period-Dependent Costs	-	420	7	2	-	27	16,591	2,477	19,524	18,617	907	-	-	334	-	-	-	-	6,685	11	186,687
2f.0	TOTAL PERIOD 2f COST	-	420	7	2	-	27	22,106	3,674	26,236	24,395	1,841	-	-	334	-	-	-	-	6,685	40,183	189,807
PERIOD 2 TOTALS		5,161	53,290	28,935	6,446	11,617	35,794	318,662	87,758	547,664	418,467	124,322	4,875	138,709	117,153	250	673	-	13,293,650	587,146	2,059,666	
PERIOD 3b - Site Restoration																						
Period 3b Direct Decommissioning Activities																						
Demolition of Remaining Site Buildings																						
3b.1.1.1	Reactor	-	4,255	-	-	-	-	-	638	4,894	-	-	4,894	-	-	-	-	-	-	-	44,669	-
3b.1.1.2	Condensate Storage Tank Foundation	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	-	16	-
3b.1.1.3	Structures below 3' below grade	-	1,581	-	-	-	-	-	237	1,818	-	-	1,818	-	-	-	-	-	-	-	8,411	-
3b.1.1.4	Turbine	-	1,983	-	-	-	-	-	297	2,280	-	-	2,280	-	-	-	-	-	-	-	22,040	-
3b.1.1.5	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	-	1,857	-
3b.1.1	Totals	-	8,171	-	-	-	-	-	1,226	9,397	-	-	9,397	-	-	-	-	-	-	-	76,993	-
Site Closeout Activities																						
3b.1.2	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	-	921	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,602	-	-	-	-	183	1,318	10,102	211	-	9,892	-	-	-	-	-	-	-	77,914	1,560
Period 3b Additional Costs																						
3b.2.1	Clean Concrete Disposal	-	2,213	-	-	-	-	3	332	2,549	-	-	2,549	-	-	-	-	-	-	-	8,386	-
3b.2.2	Underground Services Excavations	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	-	7,407	-
3b.2.3	Intake Structure Cofferdam	-	596	-	-	-	-	-	89	686	-	-	686	-	-	-	-	-	-	-	5,168	-
3b.2.4	Construction Debris	-	-	-	-	-	-	10	2	12	-	-	12	-	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	2,751	-	-	-	-	-	413	3,164	-	-	3,164	-	-	-	-	-	-	-	2,904	-
3b.2	Subtotal Period 3b Additional Costs	-	6,371	-	-	-	-	534	1,036	7,941	-	-	7,941	-	-	-	-	-	-	-	23,865	-
Period 3b Collateral Costs																						
3b.3.1	Small tool allowance	-	110	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	-	-	-
3b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,651	-	2,651	-	2,651	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	110	-	-	-	-	2,651	16	2,777	-	2,651	126	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																						
3b.4.1	Insurance	-	-	-	-	-	-	542	54	596	-	596	-	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	4,334	433	4,767	-	4,767	-	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	236	24	259	-	259	-	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	145	14	159	-	159	-	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-	-

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Table E-1
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DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs (continued)																					
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	331	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	4,245	637	4,882	-	4,882	-	-	-	-	-	-	-	-	57,340
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	4,964	745	5,709	(0)	2,283	3,425	-	-	-	-	-	-	-	76,637
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,670	-	-	-	-	26,684	4,740	38,094	(0)	13,074	25,021	-	-	-	-	-	-	-	250,861
3b.0	TOTAL PERIOD 3b COST	-	21,752	-	-	-	-	30,052	7,110	58,914	211	15,724	42,979	-	-	-	-	-	-	101,779	252,421
PERIOD 3c - Fuel Storage Operations																					
Period 3c Direct Decommissioning Activities																					
Period 3c Additional Costs																					
3c.2.1	ISFSI Disposition of Original Casks	-	-	-	128	-	1,548	-	406	2,082	-	2,082	-	-	4,906	-	-	-	576,566	-	-
3c.2	Subtotal Period 3c Additional Costs	-	-	-	128	-	1,548	-	406	2,082	-	2,082	-	-	4,906	-	-	-	576,566	-	-
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	264,850	39,728	304,578	-	304,578	-	-	-	-	-	-	-	-	-
3c.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	61,914	-	61,914	-	61,914	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	326,765	39,728	366,492	-	366,492	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	12,663	1,266	13,929	-	13,929	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	55,169	5,517	60,685	-	60,685	-	-	-	-	-	-	-	-	-
3c.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	8,111	811	8,922	-	8,922	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	3,389	339	3,728	-	3,728	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	7,563	1,134	8,697	-	8,697	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2,559	384	2,942	-	2,942	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	2,858	429	3,287	-	3,287	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	99,234	14,885	114,119	-	114,119	-	-	-	-	-	-	-	-	1,340,295
3c.4.10	DOC Staff Cost	-	-	-	-	-	-	4,779	717	5,495	-	5,495	-	-	-	-	-	-	-	-	51,550
3c.4.11	Utility Staff Cost	-	-	-	-	-	-	46,446	6,967	53,413	-	53,413	-	-	-	-	-	-	-	-	683,035
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	242,770	32,449	275,219	-	275,219	-	-	-	-	-	-	-	-	2,074,880
3c.0	TOTAL PERIOD 3c COST	-	-	-	128	-	1,548	569,535	72,583	643,794	-	643,794	-	-	4,906	-	-	-	576,566	-	2,074,880
PERIOD 3d - Spent Fuel/GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1.1	Totals	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	126,070	18,910	144,980	-	144,980	-	-	-	-	-	-	-	-	-
3d.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	31,250	-	31,250	-	31,250	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	157,320	18,910	176,230	-	176,230	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	6,390	639	7,029	-	7,029	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	24,558	2,456	27,013	-	27,013	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	2,782	278	3,060	-	3,060	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,710	171	1,881	-	1,881	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	3,816	572	4,389	-	4,389	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,291	194	1,485	-	1,485	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,443	216	1,659	-	1,659	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs (continued)																					
3d.4.9	Security Staff Cost	-	-	-	-	-	-	48,076	7,211	55,287	-	55,287	-	-	-	-	-	-	-	-	676,370
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	12,369	1,855	14,225	-	14,225	-	-	-	-	-	-	-	-	175,596
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	102,435	13,593	116,029	-	116,029	-	-	-	-	-	-	-	-	851,967
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	8,689	259,755	34,140	303,915	11,656	292,259	-	-	-	-	-	3,746	837,596	-	851,967

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table E-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	15	1	-	-	-	-	970	247	1,233	1,233	-	-	-	-	-	-	-	-	5,604	972
3e.2	Subtotal Period 3e Additional Costs	15	1	-	-	-	-	970	247	1,233	1,233	-	-	-	-	-	-	-	-	5,604	972
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	96	24	121	121	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	51	13	63	63	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	19	5	24	24	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	154	38	192	192	-	-	-	-	-	-	-	-	-	2,500
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	130	33	163	163	-	-	-	-	-	-	-	-	-	1,896
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	450	113	563	563	-	-	-	-	-	-	-	-	-	4,396
3e.0	TOTAL PERIOD 3e COST	15	1	-	-	-	-	1,420	359	1,795	1,795	-	-	-	-	-	-	-	-	5,604	5,368
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	946	-	-	-	-	154	165	1,265	-	-	1,265	-	-	-	-	-	-	4,922	160
3f.2	Subtotal Period 3f Additional Costs	-	946	-	-	-	-	154	165	1,265	-	-	1,265	-	-	-	-	-	-	4,922	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.3	Heavy equipment rental	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	25	4	29	-	-	29	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	10	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	78	12	89	-	-	89	-	-	-	-	-	-	-	1,260
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	782
3f.4	Subtotal Period 3f Period-Dependent Costs	-	62	-	-	-	-	177	36	275	-	-	275	-	-	-	-	-	-	-	2,042
3f.0	TOTAL PERIOD 3f COST	-	1,014	-	-	-	-	331	202	1,547	-	-	1,547	-	-	-	-	-	-	4,922	2,202
PERIOD 3 TOTALS		15	22,767	1,331	128	-	10,236	861,093	114,394	1,009,965	13,662	951,777	44,526	-	4,906	-	-	3,746	1,414,161	112,304	3,186,837
TOTAL COST TO DECOMMISSION		8,749	81,426	30,681	7,026	11,781	50,002	1,290,387	221,416	1,701,468	568,261	1,082,353	50,855	144,842	136,023	839	673	3,746	15,317,950	744,976	6,250,924

TOTAL COST TO DECOMMISSION WITH 14.96% CONTINGENCY:	\$1,701,468	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 33.4% OR:	\$568,261	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 63.61% OR:	\$1,082,353	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 2.99% OR:	\$50,855	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	137,535	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	32,925	tons
TOTAL CRAFT LABOR REQUIREMENTS:	744,976	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table E-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.13	Perform SER and EA	-	-	-	-	-	-	156	23	179	179	-	-	-	-	-	-	-	-	-	1,326
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	251	38	289	289	-	-	-	-	-	-	-	-	-	2,138
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	247	37	284	256	-	28	-	-	-	-	-	-	-	2,104
1a.1.17.2	Plant systems	-	-	-	-	-	-	209	31	241	216	-	24	-	-	-	-	-	-	-	1,782
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,036
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	326	49	375	375	-	-	-	-	-	-	-	-	-	2,779
1a.1.17.6	Biological shield	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,334
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	80	12	92	46	-	46	-	-	-	-	-	-	-	684
1a.1.17.9	Main Turbine	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	157	23	180	90	-	90	-	-	-	-	-	-	-	1,334
1a.1.17.12	Waste management	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	45	7	52	26	-	26	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	1,899	285	2,183	1,923	-	261	-	-	-	-	-	-	-	16,175
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	120	18	139	139	-	-	-	-	-	-	-	-	-	1,026
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	9,523	1,428	10,951	10,690	-	261	-	-	-	-	-	-	-	33,420
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,227	184	1,411	-	1,411	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	8,394	1,259	9,653	9,653	-	-	-	-	-	-	-	-	-	-
1a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,281	-	2,281	-	2,281	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,902	1,443	13,345	9,653	3,692	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,682	268	2,950	2,950	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	485	-	-	-	-	-	121	606	606	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	12	4	-	46	-	13	75	75	-	-	-	565	-	-	-	11,299	18	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	778	78	855	855	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	20,662	3,099	23,761	23,761	-	-	-	-	-	-	-	-	-	345,280

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table E-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,052	12	4	-	46	38,340	5,631	45,085	42,800	2,286	-	-	565	-	-	-	11,299	18	468,000
1a.0	TOTAL PERIOD 1a COST	-	1,052	12	4	-	46	67,559	9,672	78,345	72,107	5,977	261	-	565	-	-	-	11,299	18	501,420
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	238	36	273	246	-	27	-	-	-	-	-	-	-	2,024
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	1,069
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	68	10	78	19	-	58	-	-	-	-	-	-	-	577
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	182	27	210	210	-	-	-	-	-	-	-	-	-	1,552
1b.1.1.9	Facility closeout	-	-	-	-	-	-	60	9	69	35	-	35	-	-	-	-	-	-	-	513
1b.1.1.10	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	192
1b.1.1.11	Biological shield	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	513
1b.1.1.12	Steam generators	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	50	8	58	29	-	29	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
1b.1.1.15	Main Condensers	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
1b.1.1.17	Reactor building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
1b.1.1	Total	-	-	-	-	-	-	1,669	250	1,919	1,558	-	361	-	-	-	-	-	-	-	14,215
1b.1.2	Decon primary loop	552	-	-	-	-	-	-	276	828	828	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	552	-	-	-	-	-	1,669	526	2,747	2,386	-	361	-	-	-	-	-	-	1,067	14,215
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	1,582	475	2,057	2,057	-	-	-	-	-	-	-	-	8,988	3,563
1b.2.2	Mixed/Hazardous Waste	-	-	326	75	169	-	-	69	639	639	-	-	6,324	-	-	-	-	362,914	2,410	-
1b.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
1b.2	Subtotal Period 1b Additional Costs	-	2,364	328	185	169	1,359	1,582	1,491	7,478	7,478	-	-	6,324	12,843	-	-	-	529,873	32,305	3,563
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	24	-	16	41	-	64	-	36	180	180	-	-	-	152	-	-	-	9,121	30	-
1b.3.4	Process decommissioning chemical flush waste	2	-	58	220	-	2,471	-	657	3,408	3,408	-	-	-	-	588	-	-	62,689	110	-
1b.3.5	Small tool allowance	-	34	-	-	-	-	-	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	370	56	426	-	426	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	4,055	608	4,664	4,664	-	-	-	-	-	-	-	-	-	-
1b.3.10	Prairie Island Indian Community Payments	-	-	-	-	-	-	629	-	629	-	629	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,986	1,234	74	261	-	2,534	6,243	2,164	15,495	14,441	1,055	-	-	152	588	-	-	71,810	140	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	872	87	959	959	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,319	132	1,451	1,451	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	380	-	-	-	-	-	95	475	475	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	286	-	-	-	-	-	43	329	329	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	327	-	-	-	6,541	11	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,527	229	1,756	1,756	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	214	21	236	236	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	809	81	890	-	890	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	741	111	852	852	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,725	559	4,284	4,284	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	4,009	601	4,610	4,610	-	-	-	-	-	-	-	-	-	47,185
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	10,416	1,562	11,978	11,978	-	-	-	-	-	-	-	-	-	174,059
1b.4	Subtotal Period 1b Period-Dependent Costs	35	666	7	2	-	27	23,890	3,577	28,204	27,052	1,152	-	-	327	-	-	-	6,541	11	283,108

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Table E-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index		Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
																Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1b.0	TOTAL PERIOD 1b COST		3,573	4,264	410	447	169	3,920	33,383	7,759	53,923	51,356	2,207	361	6,324	13,322	588	-	-	608,224	33,522	300,885
PERIOD 1 TOTALS			3,573	5,316	422	451	169	3,966	100,942	17,430	132,268	123,462	8,184	622	6,324	13,887	588	-	-	619,523	33,540	802,305
PERIOD 2a - Large Component Removal																						
Period 2a Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
2a.1.1.1	Reactor Coolant Piping	51	45	6	8	-	150	-	76	336	336	-	-	-	305	-	-	-	34,809	1,414	-	
2a.1.1.2	Pressurizer Relief Tank	22	20	4	5	-	100	-	42	193	193	-	-	-	203	-	-	-	23,193	625	-	
2a.1.1.3	Reactor Coolant Pumps & Motors	54	63	101	83	-	736	-	249	1,287	1,287	-	-	-	2,332	-	-	-	295,800	2,049	100	
2a.1.1.4	Pressurizer	48	68	467	88	-	693	-	274	1,639	1,639	-	-	-	2,196	-	-	-	185,015	2,355	938	
2a.1.1.5	Steam Generators	225	2,943	2,093	1,638	1,246	3,570	-	2,383	14,097	14,097	-	-	-	18,672	11,316	-	-	1,668,341	14,819	2,875	
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	286	277	211	48	-	763	-	431	2,016	2,016	-	-	-	4,797	-	-	-	177,400	8,104	-	
2a.1.1.7	Reactor Vessel Internals	78	4,468	21,874	1,072	-	7,946	277	13,141	48,856	48,856	-	-	-	501	125	673	-	164,987	23,040	1,080	
2a.1.1.8	Reactor Vessel	89	5,717	1,754	719	-	1,956	277	5,970	16,483	16,483	-	-	-	5,690	-	-	-	570,074	23,040	1,080	
2a.1.1	Totals	855	13,600	26,512	3,662	1,246	15,913	553	22,568	84,908	84,908	-	-	-	18,672	27,341	125	673	3,119,620	75,446	6,073	
Removal of Major Equipment																						
2a.1.2	Main Turbine/Generator	-	305	189	55	272	306	-	221	1,348	1,348	-	-	-	2,131	1,187	-	-	206,316	4,667	-	
2a.1.3	Main Condensers	-	2,532	121	49	364	451	-	820	4,336	4,336	-	-	-	3,800	1,587	-	-	275,903	39,151	-	
Cascading Costs from Clean Building Demolition																						
2a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-	
2a.1.4.2	Auxiliary	-	210	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	1,309	-	
2a.1.4.3	Radwaste	-	8	-	-	-	-	-	1	9	9	-	-	-	-	-	-	-	-	65	-	
2a.1.4	Totals	-	946	-	-	-	-	-	142	1,088	1,088	-	-	-	-	-	-	-	-	8,963	-	
Disposal of Plant Systems																						
2a.1.5.1	Admin Bldg Ventilation	-	6	-	-	-	-	-	1	6	-	-	-	6	-	-	-	-	-	90	-	
2a.1.5.2	Air Removal	-	25	-	-	-	-	-	4	29	-	-	-	29	-	-	-	-	-	422	-	
2a.1.5.3	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	-	46	-	-	-	-	-	676	-	
2a.1.5.4	Auxiliary Feedwater - RCA	-	36	0	1	15	-	-	12	65	65	-	-	-	178	-	-	-	7,214	486	-	
2a.1.5.5	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	-	90	-	-	-	-	-	1,331	-	
2a.1.5.6	Caustic Addition - RCA	-	38	0	1	21	-	-	13	74	74	-	-	-	240	-	-	-	9,761	468	-	
2a.1.5.7	Chemical Feed	-	15	-	-	-	-	-	2	17	-	-	-	17	-	-	-	-	-	261	-	
2a.1.5.8	Chemical Feed - RCA	-	3	0	0	1	-	-	1	5	5	-	-	-	16	-	-	-	634	31	-	
2a.1.5.9	Circulating Water	-	24	-	-	-	-	-	4	28	-	-	-	28	-	-	-	-	-	401	-	
2a.1.5.10	Condensate	-	459	-	-	-	-	-	69	527	-	-	-	527	-	-	-	-	-	7,537	-	
2a.1.5.11	Condensate Polishing	-	181	-	-	-	-	-	27	209	-	-	-	209	-	-	-	-	-	2,987	-	
2a.1.5.12	Condensate Polishing - RCA	-	36	1	3	42	-	-	16	98	98	-	-	-	483	-	-	-	19,616	493	-	
2a.1.5.13	Electro-Hydraulic	-	8	-	-	-	-	-	1	10	-	-	-	10	-	-	-	-	-	143	-	
2a.1.5.14	External Circulating Water	-	23	-	-	-	-	-	3	26	-	-	-	26	-	-	-	-	-	385	-	
2a.1.5.15	External Circulating Water - RCA	-	70	1	4	62	-	-	28	165	165	-	-	-	721	-	-	-	29,284	938	-	
2a.1.5.16	Feedwater	-	111	-	-	-	-	-	17	128	-	-	-	128	-	-	-	-	-	1,840	-	
2a.1.5.17	Feedwater - RCA	-	236	7	24	359	-	-	117	744	744	-	-	-	4,147	-	-	-	168,414	3,377	-	
2a.1.5.18	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	-	34	-	-	-	-	-	504	-	
2a.1.5.19	Heater Drain	-	334	-	-	-	-	-	50	384	-	-	-	384	-	-	-	-	-	5,638	-	
2a.1.5.20	Hypobromous Acid Feed	-	5	-	-	-	-	-	1	6	-	-	-	6	-	-	-	-	-	86	-	
2a.1.5.21	Hypobromous Acid Feed - RCA	-	1	0	0	0	-	-	0	1	1	-	-	-	2	-	-	-	100	12	-	
2a.1.5.22	Internal Circ Water & CDSR	-	22	-	-	-	-	-	3	25	-	-	-	25	-	-	-	-	-	366	-	
2a.1.5.23	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	-	0	-	-	-	-	-	5	-	
2a.1.5.24	Main Steam	-	88	-	-	-	-	-	13	101	-	-	-	101	-	-	-	-	-	1,482	-	
2a.1.5.25	Main Steam - RCA	-	364	9	30	447	-	-	163	1,013	1,013	-	-	-	5,166	-	-	-	209,799	5,146	-	
2a.1.5.26	Repairable Spare Snubbers	-	6	0	0	1	-	-	2	8	8	-	-	-	12	-	-	-	490	82	-	
2a.1.5.27	Steam Exclusion	-	2	-	-	-	-	-	0	2	-	-	-	2	-	-	-	-	-	32	-	
2a.1.5.28	Steam Exclusion - RCA	-	4	0	0	2	-	-	1	8	8	-	-	-	24	-	-	-	966	47	-	
2a.1.5.29	Steam Generator Blowdown	-	398	20	21	165	179	-	174	957	957	-	-	-	1,906	631	-	-	119,126	5,778	-	
2a.1.5.30	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	-	5	-	-	-	-	-	75	-	
2a.1.5.31	Turbine & Moisture Separators	-	329	-	-	-	-	-	49	379	-	-	-	379	-	-	-	-	-	5,472	-	
2a.1.5.32	Turbine Oil Purification	-	46	-	-	-	-	-	7	53	-	-	-	53	-	-	-	-	-	757	-	
2a.1.5.33	Water Treatment	-	394	-	-	-	-	-	59	453	-	-	-	453	-	-	-	-	-	6,677	-	
2a.1.5.34	Water Treatment - RCA	-	19	0	1	10	-	-	6	37	37	-	-	-	115	-	-	-	4,652	252	-	
2a.1.5	Totals	-	3,437	39	85	1,125	179	-	867	5,733	3,174	-	-	2,559	13,010	631	-	-	570,056	54,280	-	
2a.1.6	Scaffolding in support of decommissioning		-	2,833	24	8	97	25	-	733	3,721	3,721	-	-	1,012	89	-	-	-	51,445	26,270	-
2a.1	Subtotal Period 2a Activity Costs		855	23,653	26,885	3,859	3,105	16,875	553	25,350	101,134	98,575	-	2,559	38,625	30,835	125	673	-	4,223,340	208,777	6,073

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Table E-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,560	468	2,027	2,027	-	-	-	-	-	-	-	-	20,388	-
2a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
2a.2	Subtotal Period 2a Additional Costs	1	659	785	107	-	1,439	1,560	1,905	6,454	6,454	-	-	-	2,097	125	-	-	205,890	22,562	87
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	51	-	33	86	-	135	-	75	381	381	-	-	-	323	-	-	-	19,358	63	-
2a.3.3	Small tool allowance	-	251	-	-	-	-	-	38	289	260	-	29	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,138	321	2,459	-	2,459	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	6,105	916	7,021	7,021	-	-	-	-	-	-	-	-	-	-
2a.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,224	-	1,224	-	1,224	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	51	251	33	86	-	135	9,467	1,349	11,373	7,661	3,682	29	-	323	-	-	-	19,358	63	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	68	-	-	-	-	-	-	17	85	85	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	501	50	551	551	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	2,507	251	2,758	2,758	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,622	-	-	-	-	-	406	2,028	2,028	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,153	-	-	-	-	-	323	2,477	2,477	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	89	26	-	331	-	95	541	541	-	-	-	4,063	-	-	-	81,252	133	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,411	212	1,623	1,623	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	389	39	428	428	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,259	126	1,385	-	1,385	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	1,214	182	1,396	1,396	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	394	59	453	-	453	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	51	8	58	-	58	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	265	40	305	305	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	6,661	999	7,661	7,661	-	-	-	-	-	-	-	-	-	110,166
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	13,492	2,024	15,516	15,516	-	-	-	-	-	-	-	-	-	155,048
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	17,880	2,682	20,562	20,562	-	-	-	-	-	-	-	-	-	288,676
2a.4	Subtotal Period 2a Period-Dependent Costs	68	3,776	89	26	-	331	46,025	7,512	57,825	55,929	1,896	-	-	4,063	-	-	-	81,252	133	553,890
2a.0	TOTAL PERIOD 2a COST	974	28,339	27,792	4,078	3,105	18,780	57,604	36,116	176,787	168,620	5,579	2,588	38,625	37,317	250	673	-	4,529,841	231,534	560,049
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	ADT & Misc Ventilation	-	24	0	1	13	3	-	9	50	50	-	-	153	9	-	-	-	6,814	363	-
2b.1.1.2	Aux Bldg Normal Ventilation	-	67	2	5	60	11	-	29	174	174	-	-	692	39	-	-	-	30,671	1,013	-
2b.1.1.3	Aux Bldg Special Ventilation	-	13	0	0	6	2	-	5	26	26	-	-	70	6	-	-	-	3,243	197	-
2b.1.1.4	Battery Rm Special Ventilation	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	24	-
2b.1.1.5	Boron Recycle	0	4	0	0	0	3	-	2	9	9	-	-	3	9	-	-	-	709	50	-
2b.1.1.6	Chemical & Volume Control	722	902	59	44	204	560	-	770	3,260	3,260	-	-	2,356	1,977	-	-	-	225,854	23,197	-
2b.1.1.7	Cold Chemical Lab Ventilation	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
2b.1.1.8	Component Cooling - RCA	-	617	21	70	1,038	-	-	322	2,068	2,068	-	-	11,996	-	-	-	-	487,169	8,583	-
2b.1.1.9	Containment Cooling	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	502	-
2b.1.1.10	Containment Cooling - RCA	-	288	5	16	237	-	-	110	656	656	-	-	2,743	-	-	-	-	111,390	3,949	-
2b.1.1.11	Containment Hydrogen Control - RCA	-	35	0	1	12	-	-	11	60	60	-	-	141	-	-	-	-	5,742	494	-
2b.1.1.12	Containment Spray - RCA	-	186	3	8	126	-	-	67	389	389	-	-	1,453	-	-	-	-	59,019	2,617	-
2b.1.1.13	Containment Ventilation	-	224	23	38	408	205	-	177	1,075	1,075	-	-	4,721	722	-	-	-	239,450	3,375	-
2b.1.1.14	Control/Relay/Cmptr Rm Vent	-	30	1	2	23	6	-	13	74	74	-	-	260	20	-	-	-	11,915	454	-
2b.1.1.15	Cooling Water	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	2,344	-
2b.1.1.16	Cooling Water - RCA	-	456	15	49	730	-	-	232	1,482	1,482	-	-	8,442	-	-	-	-	342,822	6,311	-
2b.1.1.17	Cranes/Hoists/Elevators - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2b.1.1.18	D3 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
2b.1.1.19	D4 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
2b.1.1.20	D5 Emergency Diesel	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2b.1.1.21	Electrical - Clean	-	1,502	-	-	-	-	-	225	1,727	-	-	1,727	-	-	-	-	-	-	24,276	-
2b.1.1.22	Electrical - Contaminated	-	461	5	13	173	21	-	149	821	821	-	-	1,997	75	-	-	-	86,080	6,503	-
2b.1.1.23	Electrical - Decontaminated	-	2,866	33	109	1,622	-	-	980	5,610	5,610	-	-	18,753	-	-	-	-	761,569	38,423	-
2b.1.1.24	Filter Rm Ventilation	-	4	0	0	2	0	-	2	9	9	-	-	24	1	-	-	-	1,020	69	-
2b.1.1.25	Fire Protection & Detection	-	178	-	-	-	-	-	27	205	-	-	205	-	-	-	-	-	-	3,009	-
2b.1.1.26	Fire Protection & Detection - RCA	-	236	3	11	158	-	-	85	492	492	-	-	1,828	-	-	-	-	74,245	3,134	-
2b.1.1.27	Fuel Handling	-	71	1	2	17	14	-	24	130	130	-	-	200	49	-	-	-	11,396	1,101	-
2b.1.1.28	Fuel Oil	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
2b.1.1.29	HVAC - Clean	-	132	-	-	-	-	-	20	151	-	-	151	-	-	-	-	-	-	2,373	-
2b.1.1.30	HVAC - Contaminated	-	1,222	26	69	929	115	-	487	2,848	2,848	-	-	-	10,745	405	-	-	463,144	16,579	-

Table E-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2b.1.1.31	Heating	-	279	-	-	-	-	-	42	321	-	-	321	-	-	-	-	-	-	4,804	-
2b.1.1.32	Heating - RCA	-	323	3	11	165	-	-	107	609	609	-	-	1,907	-	-	-	-	77,458	4,086	-
2b.1.1.33	Hot Lab & Sample Rm Ventilation	-	19	0	1	9	1	-	6	37	37	-	-	107	4	-	-	-	4,632	285	-
2b.1.1.34	Incore Instrumentation	0	29	1	1	5	16	-	13	67	67	-	-	60	58	-	-	-	6,264	458	-
2b.1.1.35	Misc Drains & Vents	-	223	12	9	40	121	-	95	500	500	-	-	458	426	-	-	-	46,850	3,180	-
2b.1.1.36	Misc Lab & Service Areas Vent	-	123	8	6	32	70	-	55	293	293	-	-	370	244	-	-	-	31,186	1,713	-
2b.1.1.37	Miscellaneous Gas	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	1,073	-
2b.1.1.38	Miscellaneous Gas - RCA	-	129	1	3	52	-	-	41	226	226	-	-	600	-	-	-	-	24,378	1,636	-
2b.1.1.39	Radiation Monitoring	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	111	-
2b.1.1.40	Radiation Monitoring - RCA	-	62	1	2	27	-	-	20	112	112	-	-	316	-	-	-	-	12,826	782	-
2b.1.1.41	Reactor Coolant	158	227	20	12	20	208	-	195	839	839	-	-	229	730	-	-	-	57,672	5,517	-
2b.1.1.42	Reactor Hot Sampling	135	121	10	5	5	89	-	123	489	489	-	-	54	312	-	-	-	22,919	3,686	-
2b.1.1.43	Reactor Makeup	-	36	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	583	-
2b.1.1.44	Reactor Makeup - RCA	-	4	0	0	2	-	-	1	8	8	-	-	28	-	-	-	-	1,148	47	-
2b.1.1.45	Reactor Vessel	9	17	0	0	2	4	-	10	43	43	-	-	22	14	-	-	-	1,826	385	-
2b.1.1.46	Residual Heat Removal	336	374	84	66	247	924	-	548	2,578	2,578	-	-	2,853	3,244	-	-	-	330,651	7,112	-
2b.1.1.47	Safeguards Chilled Water	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2b.1.1.48	Safety Injection	-	836	40	56	577	329	-	390	2,228	2,228	-	-	6,676	1,161	-	-	-	347,600	12,284	-
2b.1.1.49	Sampling	-	51	3	2	3	27	-	20	105	105	-	-	37	93	-	-	-	7,697	714	-
2b.1.1.50	Service Bldg & New Cmpt'r Vent	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
2b.1.1.51	Shield Bldg Ventilation	-	114	13	19	175	138	-	94	554	554	-	-	2,028	484	-	-	-	114,378	1,743	-
2b.1.1.52	Station & Instrument Air	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	2,424	-
2b.1.1.53	Station & Instrument Air - RCA	-	288	3	9	141	-	-	95	535	535	-	-	1,625	-	-	-	-	65,986	3,638	-
2b.1.1.54	Turbine Bldg Traps & Drains	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	462	-
2b.1.1.55	Turbine Bldg Traps & Drains - RCA	-	28	0	1	16	-	-	10	55	55	-	-	180	-	-	-	-	7,321	344	-
2b.1.1.56	Turbine Bldg Ventilation	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	655	-
2b.1.1.57	Unit Coolers	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	332	-
2b.1.1.58	Unit Coolers - RCA	-	54	0	1	20	-	-	17	93	93	-	-	232	-	-	-	-	9,413	690	-
2b.1.1.59	Waste Gas Disposal	531	457	40	35	212	381	-	516	2,173	2,173	-	-	2,453	1,358	-	-	-	188,334	14,308	-
2b.1.1.60	Waste Liquid Disposal	1,386	1,733	108	76	316	1,019	-	1,451	6,089	6,089	-	-	3,655	3,594	-	-	-	385,370	44,485	-
2b.1.1.61	Waste Solid Disposal	111	139	11	8	34	112	-	126	541	541	-	-	389	393	-	-	-	41,732	3,481	-
2b.1.1	Totals	3,390	15,678	558	763	7,868	4,377	-	7,798	40,433	37,423	-	3,010	90,963	15,429	-	-	-	4,712,076	270,390	-
2b.1.2	Scaffolding in support of decommissioning	-	3,542	30	10	121	32	-	916	4,651	4,651	-	-	1,265	112	-	-	-	64,307	32,837	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,150	2,624	139	853	193	11,080	-	4,172	20,210	20,210	-	-	2,230	57,418	-	-	-	3,559,977	50,853	-
2b.1.3.2	Auxiliary	1,223	400	12	80	92	582	-	884	3,272	3,272	-	-	1,060	3,355	-	-	-	332,498	23,808	-
2b.1.3.3	Backwash Waste Receiving Tank	-	27	1	11	-	87	-	30	158	158	-	-	-	507	-	-	-	43,896	299	-
2b.1.3.4	Drum Transfer & Truck Loading Enclosure	17	8	0	2	2	13	-	14	56	56	-	-	19	74	-	-	-	7,118	368	-
2b.1.3.5	LLRW Storage Enclosure	117	51	1	11	3	87	-	95	366	366	-	-	38	502	-	-	-	44,971	2,424	-
2b.1.3.6	Radwaste	52	23	1	5	4	39	-	43	166	166	-	-	42	225	-	-	-	21,136	1,082	-
2b.1.3.7	Resin Disposal	15	11	0	2	7	12	-	15	64	64	-	-	83	69	-	-	-	9,271	383	-
2b.1.3	Totals	2,574	3,145	155	964	300	11,900	-	5,253	24,292	24,292	-	-	3,471	62,151	-	-	-	4,018,868	79,216	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	206	31	236	236	-	-	-	-	-	-	-	-	-	1,751
2b.1.5	Receive NRC approval of termination plan								a												
2b.1	Subtotal Period 2b Activity Costs	5,965	22,365	744	1,737	8,290	16,309	206	13,998	69,612	66,602	-	3,010	95,700	77,691	-	-	-	8,795,250	382,443	1,751
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,930	579	2,509	2,509	-	-	-	-	-	-	-	-	25,228	-
2b.2.2	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
2b.2	Subtotal Period 2b Additional Costs	-	-	9	29	312	-	1,930	631	2,911	2,911	-	-	5,855	-	-	-	-	146,375	25,244	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	167	-	112	289	-	453	-	251	1,272	1,272	-	-	-	1,081	-	-	-	64,837	211	-
2b.3.2	Process decommissioning chemical flush waste	3	-	114	431	-	858	-	292	1,700	1,700	-	-	-	1,154	-	-	-	122,948	216	-
2b.3.3	Small tool allowance	-	414	-	-	-	-	-	62	476	476	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	9,529	1,429	10,958	-	10,958	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	4,127	619	4,746	4,746	-	-	-	-	-	-	-	-	-	-
2b.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,517	-	1,517	-	1,517	-	-	-	-	-	-	-	-	-
2b.3.7	On-site survey and release of 0.437 tons clean metallic waste	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	170	414	226	721	-	1,311	15,174	2,654	20,670	8,195	12,475	-	-	2,234	-	-	-	187,785	427	-

Table E-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,135	-	-	-	-	-	-	284	1,419	1,419	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	620	62	682	682	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	2,983	298	3,281	3,281	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,580	-	-	-	-	-	645	3,225	3,225	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	2,740	-	-	-	-	-	411	3,151	3,151	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	115	34	-	431	-	124	704	704	-	-	-	5,291	-	-	-	105,826	173	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,379	207	1,586	1,586	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	481	48	529	529	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,558	156	1,714	-	1,714	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	1,503	225	1,728	1,728	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	487	73	560	-	560	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	246	37	282	282	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	63	9	72	-	72	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	70	10	80	80	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	8,243	1,236	9,479	9,479	-	-	-	-	-	-	-	-	-	136,323
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	16,150	2,422	18,572	18,572	-	-	-	-	-	-	-	-	-	184,288
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	21,222	3,183	24,405	24,405	-	-	-	-	-	-	-	-	-	342,069
2b.4	Subtotal Period 2b Period-Dependent Costs	1,135	5,320	115	34	-	431	55,004	9,432	71,472	69,125	2,346	-	-	5,291	-	-	-	105,826	173	662,680
2b.0	TOTAL PERIOD 2b COST	7,270	28,099	1,095	2,520	8,602	18,050	72,314	26,716	164,664	146,833	14,822	3,010	101,555	85,217	-	-	-	9,235,236	408,286	664,431
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	65,685	9,853	75,538	-	75,538	-	-	-	-	-	-	-	-	-
2c.3.2	Retention and Severance	-	-	-	-	-	-	2,034	305	2,339	2,339	-	-	-	-	-	-	-	-	-	-
2c.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,630	-	1,630	-	1,630	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	69,349	10,158	79,507	2,339	77,168	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	666	67	733	733	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	3,060	306	3,366	3,366	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	270	-	-	-	-	-	67	337	337	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	12	3	-	44	-	13	72	72	-	-	-	538	-	-	-	10,761	18	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	395	59	454	454	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	305	31	336	336	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,674	167	1,842	-	1,842	-	-	-	-	-	-	-	-	-
2c.4.8	Fixed Overhead	-	-	-	-	-	-	1,615	242	1,857	1,857	-	-	-	-	-	-	-	-	-	-
2c.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	-
2c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	67	10	77	-	77	-	-	-	-	-	-	-	-	-
2c.4.11	Railroad Track Maintenance	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	-
2c.4.12	Security Staff Cost	-	-	-	-	-	-	8,857	1,329	10,185	10,185	-	-	-	-	-	-	-	-	-	146,478
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	6,575	986	7,561	7,561	-	-	-	-	-	-	-	-	-	107,146
2c.4	Subtotal Period 2c Period-Dependent Costs	-	270	12	3	-	44	23,343	3,296	26,968	25,049	1,919	-	-	538	-	-	-	10,761	18	253,623
2c.0	TOTAL PERIOD 2c COST	-	270	12	3	-	44	97,040	14,106	111,475	32,387	79,087	-	-	538	-	-	-	10,761	18	253,623
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	328	32	94	32	-	595	-	335	1,416	1,416	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical - Contaminated - Fuel Pool	-	197	2	6	75	9	-	64	353	353	-	-	864	33	-	-	-	37,250	2,783	-
2d.1.2.2	Electrical - Decontaminated - Fuel Pool	-	1,230	14	47	698	-	-	421	2,410	2,410	-	-	8,069	-	-	-	-	327,668	16,495	-
2d.1.2.3	Fire Protection & Detection - RCA Fuel P	-	36	1	2	25	-	-	13	76	76	-	-	286	-	-	-	-	11,622	476	-
2d.1.2.4	HVAC - Contaminated - Fuel Pool	-	549	12	31	418	52	-	219	1,280	1,280	-	-	4,828	182	-	-	-	208,080	7,448	-
2d.1.2.5	Safeguards Chilled Water - RCA	-	4	0	0	2	-	-	1	8	8	-	-	26	-	-	-	-	1,045	51	-
2d.1.2.6	Spent Fuel Pool Cooling	31	35	3	2	3	30	-	33	137	137	-	-	39	107	-	-	-	8,635	882	-
2d.1.2.7	Spent Fuel Pool Normal Ventilation	-	26	1	2	23	3	-	11	66	66	-	-	265	12	-	-	-	11,532	394	-
2d.1.2	Totals	31	2,077	32	89	1,244	95	-	761	4,328	4,328	-	-	14,376	333	-	-	-	605,832	28,530	-

Table E-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Handling of Aux Building	975	1,082	9	32	209	173	-	838	3,319	3,319	-	-	2,417	944	-	-	-	177,818	30,401	-
2d.1.3	Totals	975	1,082	9	32	209	173	-	838	3,319	3,319	-	-	2,417	944	-	-	-	177,818	30,401	-
2d.1.4	Scaffolding in support of decommissioning	-	708	6	2	24	6	-	183	930	930	-	-	253	22	-	-	-	12,861	6,567	-
2d.1	Subtotal Period 2d Activity Costs	1,334	3,900	142	155	1,477	868	-	2,118	9,994	9,994	-	-	17,046	3,391	-	-	-	934,809	66,074	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	16,173	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,082	625	2,706	2,706	-	-	-	-	-	-	-	-	16,173	6,240
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	39	-	27	70	-	109	-	60	306	306	-	-	-	261	-	-	-	15,670	51	-
2d.3.2	Process decommissioning chemical flush waste	0	-	1	5	-	10	-	3	20	20	-	-	-	13	-	-	-	1,422	2	-
2d.3.3	Small tool allowance	-	79	-	-	-	-	-	12	91	91	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	12,947	1,942	14,889	-	14,889	-	-	-	-	-	-	-	-	-
2d.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	971	-	971	-	971	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	39	79	172	130	575	270	13,917	2,164	17,347	1,488	15,859	-	6,000	804	-	-	-	322,060	142	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	218	-	-	-	-	-	-	54	272	272	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	398	40	437	437	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,740	174	1,914	1,914	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	742	-	-	-	-	-	186	928	928	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,757	-	-	-	-	-	264	2,020	2,020	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	44	13	-	163	-	47	266	266	-	-	-	2,000	-	-	-	40,003	65	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	471	71	542	542	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	256	26	282	282	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	999	100	1,099	-	1,099	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	963	144	1,108	1,108	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	315	47	362	362	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	40	6	46	-	46	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	5,123	768	5,891	5,891	-	-	-	-	-	-	-	-	-	84,157
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,065	910	6,975	6,975	-	-	-	-	-	-	-	-	-	69,996
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	7,796	1,169	8,966	8,123	843	-	-	-	-	-	-	-	-	126,236
2d.4	Subtotal Period 2d Period-Dependent Costs	218	2,499	44	13	-	163	24,212	4,013	31,160	29,173	1,988	-	-	2,000	-	-	-	40,003	65	280,390
2d.0	TOTAL PERIOD 2d COST	1,591	6,478	357	298	2,052	1,301	40,212	8,919	61,208	43,361	17,847	-	23,046	6,195	-	-	-	1,296,872	82,455	286,630
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	934	-	934	-	934	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,122	178	2,300	1,367	934	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,626	163	1,789	1,789	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	602	-	-	-	-	-	150	752	752	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	334	-	-	-	6,685	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	272	27	299	299	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	51	5	56	-	56	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	39	6	44	-	44	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table E-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2f Period-Dependent Costs (continued)																					
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	4,924	739	5,663	5,663	-	-	-	-	-	-	-	-	-	80,898
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	3,854	578	4,433	3,626	807	-	-	-	-	-	-	-	-	59,507
2f.4	Subtotal Period 2f Period-Dependent Costs	-	602	7	2	-	27	16,445	2,508	19,592	18,684	907	-	-	334	-	-	-	6,685	11	186,687
2f.0	TOTAL PERIOD 2f COST	-	602	7	2	-	27	26,150	4,962	31,750	29,909	1,841	-	-	334	-	-	-	6,685	102,653	189,807
PERIOD 2 TOTALS		9,835	63,787	29,263	6,901	13,758	38,202	293,319	90,819	545,884	421,110	119,176	5,598	163,227	129,602	250	673	-	15,079,400	824,945	1,954,541
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	4,256	-	-	-	-	-	638	4,895	-	-	4,895	-	-	-	-	-	-	44,679	-
3b.1.1.2	Auxiliary	-	1,897	-	-	-	-	-	285	2,182	-	-	2,182	-	-	-	-	-	-	11,902	-
3b.1.1.3	Condensate Storage Tank Foundation	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	33	-
3b.1.1.4	Construction Warehouse & Fab Shop	-	118	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	1,405	-
3b.1.1.5	D3/D4 Emergency Generator	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	84	-
3b.1.1.6	Drum Transfer & Truck Loading Enclosure	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	221	-
3b.1.1.7	Hydrogen House	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	47	-
3b.1.1.8	LLRW Storage Enclosure	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	853	-
3b.1.1.9	Misc Structures 2017	-	1,391	-	-	-	-	-	209	1,599	-	-	1,599	-	-	-	-	-	-	12,939	-
3b.1.1.10	Radwaste	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	1,400	-
3b.1.1.11	Resin Disposal	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	120	-
3b.1.1.12	Structures below 3' below grade	-	1,713	-	-	-	-	-	257	1,969	-	-	1,969	-	-	-	-	-	-	9,238	-
3b.1.1.13	Sulfuric Acid Tank Enclosure	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	35	-
3b.1.1.14	Turbine	-	1,983	-	-	-	-	-	298	2,281	-	-	2,281	-	-	-	-	-	-	22,052	-
3b.1.1.15	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
3b.1.1.16	Warehouse #2	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	213	-
3b.1.1.17	Waste Neutralizing Tank House	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	56	-
3b.1.1.18	Waste Oil Storage	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	70	-
3b.1.1.19	Water Treatment	-	303	-	-	-	-	-	46	349	-	-	349	-	-	-	-	-	-	2,690	-
3b.1.1.20	Fuel Handling of Aux Building	-	1,032	-	-	-	-	-	155	1,186	-	-	1,186	-	-	-	-	-	-	8,240	-
3b.1.1	Totals	-	13,424	-	-	-	-	-	2,014	15,438	-	-	15,438	-	-	-	-	-	-	118,134	-
Site Closeout Activities																					
3b.1.2	Remove Rubble	-	1,308	-	-	-	-	-	196	1,505	-	-	1,505	-	-	-	-	-	-	6,495	-
3b.1.3	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	78	12	90	90	-	-	-	-	-	-	-	-	-	667
3b.1	Subtotal Period 3b Activity Costs	-	15,163	-	-	-	-	78	2,286	17,528	90	-	17,438	-	-	-	-	-	-	125,549	667
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	3,313	-	-	-	-	8	498	3,818	-	-	3,818	-	-	-	-	-	-	12,824	-
3b.2.2	Underground Services Excavations	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
3b.2.3	Intake Structure Cofferdam	-	423	-	-	-	-	-	63	486	-	-	486	-	-	-	-	-	-	3,552	-
3b.2.4	Construction Debris	-	-	-	-	-	-	463	69	532	-	-	532	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	8,465	-	-	-	-	-	1,270	9,735	-	-	9,735	-	-	-	-	-	-	9,327	-
3b.2	Subtotal Period 3b Additional Costs	-	13,012	-	-	-	-	991	2,100	16,103	-	-	16,103	-	-	-	-	-	-	33,110	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	172	-	-	-	-	-	26	198	-	-	198	-	-	-	-	-	-	-	-
3b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,651	-	2,651	-	2,651	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	172	-	-	-	-	2,651	26	2,848	-	2,651	198	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	542	54	596	-	596	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	4,334	433	4,767	-	4,767	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	236	24	259	-	259	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	145	14	159	-	159	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	331	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	4,245	637	4,882	-	4,882	-	-	-	-	-	-	-	-	57,340
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885

Prairie Island Nuclear Generating Plant
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Table E-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs (continued)																					
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	4,964	745	5,709	(0)	2,283	3,425	-	-	-	-	-	-	-	76,637
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,670	-	-	-	-	26,684	4,740	38,094	(0)	13,074	25,021	-	-	-	-	-	-	-	250,861
3b.0	TOTAL PERIOD 3b COST	-	35,017	-	-	-	-	30,404	9,153	74,574	90	15,724	58,760	-	-	-	-	-	-	158,659	251,528
PERIOD 3c - Fuel Storage Operations																					
Period 3c Direct Decommissioning Activities																					
Period 3c Additional Costs																					
3c.2.1	ISFSI Disposition of Original Casks	-	-	-	128	-	1,548	-	406	2,082	-	2,082	-	-	4,906	-	-	-	576,566	-	-
3c.2	Subtotal Period 3c Additional Costs	-	-	-	128	-	1,548	-	406	2,082	-	2,082	-	-	4,906	-	-	-	576,566	-	-
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	264,850	39,728	304,578	-	304,578	-	-	-	-	-	-	-	-	-
3c.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	61,914	-	61,914	-	61,914	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	326,765	39,728	366,492	-	366,492	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	12,663	1,266	13,929	-	13,929	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	55,169	5,517	60,685	-	60,685	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	8,111	811	8,922	-	8,922	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	3,389	339	3,728	-	3,728	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	7,563	1,134	8,697	-	8,697	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2,559	384	2,942	-	2,942	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	2,858	429	3,287	-	3,287	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	99,234	14,885	114,119	-	114,119	-	-	-	-	-	-	-	-	1,340,295
3c.4.10	DOC Staff Cost	-	-	-	-	-	-	4,779	717	5,495	-	5,495	-	-	-	-	-	-	-	-	51,550
3c.4.11	Utility Staff Cost	-	-	-	-	-	-	46,446	6,967	53,413	-	53,413	-	-	-	-	-	-	-	-	683,035
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	242,770	32,449	275,219	-	275,219	-	-	-	-	-	-	-	-	2,074,880
3c.0	TOTAL PERIOD 3c COST	-	-	-	128	-	1,548	569,535	72,583	643,794	-	643,794	-	-	4,906	-	-	-	576,566	-	2,074,880
PERIOD 3d - Spent Fuel/GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1.1	Totals	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	126,070	18,910	144,980	-	144,980	-	-	-	-	-	-	-	-	-
3d.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	31,250	-	31,250	-	31,250	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	157,320	18,910	176,230	-	176,230	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	6,390	639	7,029	-	7,029	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	24,558	2,456	27,013	-	27,013	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	2,782	278	3,060	-	3,060	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,710	171	1,881	-	1,881	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	3,816	572	4,389	-	4,389	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,291	194	1,485	-	1,485	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,443	216	1,659	-	1,659	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	48,076	7,211	55,287	-	55,287	-	-	-	-	-	-	-	-	676,370
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	12,369	1,855	14,225	-	14,225	-	-	-	-	-	-	-	-	175,596
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	102,435	13,593	116,029	-	116,029	-	-	-	-	-	-	-	-	851,967
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	8,689	259,755	34,140	303,915	11,656	292,259	-	-	-	-	-	3,746	837,596	-	851,967
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	15	1	-	-	-	-	970	247	1,233	1,233	-	-	-	-	-	-	-	-	5,604	972
3e.2	Subtotal Period 3e Additional Costs	15	1	-	-	-	-	970	247	1,233	1,233	-	-	-	-	-	-	-	-	5,604	972

Prairie Island Nuclear Generating Plant
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Table E-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 100 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	96	24	121	121	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	51	13	63	63	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	19	5	24	24	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	154	38	192	192	-	-	-	-	-	-	-	-	-	2,500
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	130	33	163	163	-	-	-	-	-	-	-	-	-	1,896
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	450	113	563	563	-	-	-	-	-	-	-	-	-	4,396
3e.0	TOTAL PERIOD 3e COST	15	1	-	-	-	-	1,420	359	1,795	1,795	-	-	-	-	-	-	-	-	5,604	5,368
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	946	-	-	-	-	154	165	1,265	-	-	1,265	-	-	-	-	-	-	4,922	160
3f.2	Subtotal Period 3f Additional Costs	-	946	-	-	-	-	154	165	1,265	-	-	1,265	-	-	-	-	-	-	4,922	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.3	Heavy equipment rental	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	25	4	29	-	-	29	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	10	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	78	12	89	-	-	89	-	-	-	-	-	-	-	1,260
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	782
3f.4	Subtotal Period 3f Period-Dependent Costs	-	62	-	-	-	-	177	36	275	-	-	275	-	-	-	-	-	-	-	2,042
3f.0	TOTAL PERIOD 3f COST	-	1,014	-	-	-	-	331	202	1,547	-	-	1,547	-	-	-	-	-	-	4,922	2,202
PERIOD 3 TOTALS		15	36,032	1,331	128	-	10,236	861,445	116,436	1,025,625	13,541	951,777	60,307	-	4,906	-	-	3,746	1,414,161	169,184	3,185,944
TOTAL COST TO DECOMMISSION		13,423	105,135	31,016	7,480	13,927	52,404	1,255,707	224,685	1,703,777	558,114	1,079,137	66,527	169,551	148,394	839	673	3,746	17,113,080	1,027,670	5,942,790

TOTAL COST TO DECOMMISSION WITH 15.19% CONTINGENCY:	\$1,703,777	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 32.76% OR:	\$558,114	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 63.34% OR:	\$1,079,137	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 3.9% OR:	\$66,527	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	149,906	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	41,515	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,027,670	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

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APPENDIX F

DETAILED COST ANALYSIS

SCENARIO 4: DECON with 200 Year DFS

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Prairie Island Nuclear Generating Plant, Unit 2	F-10

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Table F-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	578	87	664	598	-	66	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,440	666	5,106	4,496	-	610	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	14,774	2,216	16,990	16,380	-	610	-	-	-	-	-	-	-	78,157
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,040	204	2,244	2,244	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	43,160	6,378	50,687	48,402	2,286	-	-	610	-	-	-	12,190	20	544,960

Table F-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	71,629	10,348	83,126	78,227	4,289	610	-	610	-	-	-	12,190	20	623,117
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	293	44	337	337	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,902	585	4,487	3,643	-	844	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	552	-	-	-	-	-	-	276	828	828	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	552	-	-	-	-	-	3,902	861	5,315	4,471	-	844	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	3,700	1,110	4,810	4,810	-	-	-	-	-	-	-	-	21,020	8,332
1b.2.2	Mixed/Hazardous Waste	-	-	318	75	164	-	-	68	624	624	-	-	6,133	-	-	-	-	351,986	2,361	-
1b.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
1b.2	Subtotal Period 1b Additional Costs	-	2,364	320	185	164	1,359	3,700	2,125	10,216	10,216	-	-	6,133	12,843	-	-	-	518,945	44,288	8,332
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	24	-	16	41	-	64	-	36	180	180	-	-	-	152	-	-	-	9,121	30	-
1b.3.4	Process decommissioning chemical flush waste	2	-	58	220	-	2,471	-	657	3,408	3,408	-	-	-	-	588	-	-	62,689	110	-
1b.3.5	Small tool allowance	-	34	-	-	-	-	-	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	159	24	183	-	183	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	1,088	163	1,251	1,251	-	-	-	-	-	-	-	-	-	-
1b.3.10	Prairie Island Indian Community Payments	-	-	-	-	-	-	630	-	630	-	630	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,986	1,234	74	261	-	2,534	3,065	1,687	11,841	11,028	813	-	-	152	588	-	-	71,810	140	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	872	87	959	959	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,352	135	1,487	1,487	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	402	-	-	-	-	-	101	503	503	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	286	-	-	-	-	-	43	329	329	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	8	2	-	29	-	8	48	48	-	-	-	360	-	-	-	7,197	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,527	229	1,756	1,756	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	323	32	355	355	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	809	81	890	-	890	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	741	111	852	852	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,725	559	4,284	4,284	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	5,656	848	6,504	6,504	-	-	-	-	-	-	-	-	-	63,961
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	13,074	1,961	15,035	15,035	-	-	-	-	-	-	-	-	-	213,904
1b.4	Subtotal Period 1b Period-Dependent Costs	35	688	8	2	-	29	28,336	4,243	33,341	32,189	1,152	-	-	360	-	-	-	7,197	12	339,730
1b.0	TOTAL PERIOD 1b COST	3,573	4,286	402	447	164	3,923	39,002	8,917	60,713	57,904	1,965	844	6,133	13,355	588	-	-	597,952	45,506	381,305

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table F-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
PERIOD 1 TOTALS		3,573	5,368	415	451	164	3,972	110,631	19,264	143,839	136,131	6,254	1,454	6,133	13,964	588	-	-	610,142	45,526	1,004,421
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	51	45	6	8	-	150	-	76	336	336	-	-	-	305	-	-	-	34,809	1,414	-
2a.1.1.2	Pressurizer Relief Tank	22	20	4	5	-	100	-	42	193	193	-	-	-	203	-	-	-	23,193	625	-
2a.1.1.3	Reactor Coolant Pumps & Motors	54	63	101	83	-	736	-	249	1,287	1,287	-	-	-	2,332	-	-	-	295,800	2,049	100
2a.1.1.4	Pressurizer	48	68	467	88	-	693	-	274	1,639	1,639	-	-	-	2,196	-	-	-	185,015	2,355	938
2a.1.1.5	Steam Generators	225	2,943	2,093	1,638	1,246	3,570	-	2,383	14,097	14,097	-	-	18,672	11,316	-	-	-	1,668,341	14,819	2,875
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	286	277	211	48	-	763	-	431	2,016	2,016	-	-	-	4,797	-	-	-	177,400	8,104	-
2a.1.1.7	Reactor Vessel Internals	78	4,468	21,874	1,072	-	7,946	277	13,141	48,856	48,856	-	-	-	501	125	673	-	164,987	23,040	1,080
2a.1.1.8	Reactor Vessel	89	5,717	1,754	719	-	1,956	277	5,970	16,483	16,483	-	-	-	5,690	-	-	-	570,074	23,040	1,080
2a.1.1	Totals	855	13,600	26,512	3,662	1,246	15,913	553	22,568	84,908	84,908	-	-	18,672	27,341	125	673	-	3,119,620	75,446	6,073
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	305	189	55	272	306	-	221	1,348	1,348	-	-	2,131	1,187	-	-	-	206,316	4,667	-
2a.1.3	Main Condensers	-	2,532	121	49	364	451	-	820	4,336	4,336	-	-	3,800	1,587	-	-	-	275,903	39,151	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
2a.1.4	Totals	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
Disposal of Plant Systems																					
2a.1.5.1	Air Removal	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	452	-
2a.1.5.2	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	670	-
2a.1.5.3	Auxiliary Feedwater - RCA	-	45	0	1	19	-	-	14	79	79	-	-	215	-	-	-	-	8,722	601	-
2a.1.5.4	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,335	-
2a.1.5.5	Caustic Addition - RCA	-	36	0	1	20	-	-	12	71	71	-	-	233	-	-	-	-	9,453	444	-
2a.1.5.6	Chemical Feed	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	304	-
2a.1.5.7	Chemical Feed - RCA	-	1	0	0	1	-	-	0	2	2	-	-	6	-	-	-	-	243	12	-
2a.1.5.8	Circulating Water	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	619	-
2a.1.5.9	Condensate	-	414	-	-	-	-	-	62	476	-	-	476	-	-	-	-	-	-	6,837	-
2a.1.5.10	Condensate Polishing	-	205	-	-	-	-	-	31	236	-	-	236	-	-	-	-	-	-	3,420	-
2a.1.5.11	Condensate Polishing - RCA	-	176	4	12	180	-	-	73	444	444	-	-	2,078	-	-	-	-	84,395	2,329	-
2a.1.5.12	Electro-hydraulic	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	127	-
2a.1.5.13	Feedwater	-	133	-	-	-	-	-	20	153	-	-	153	-	-	-	-	-	-	2,215	-
2a.1.5.14	Feedwater - RCA	-	186	6	19	278	-	-	91	579	579	-	-	3,208	-	-	-	-	130,294	2,651	-
2a.1.5.15	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	505	-
2a.1.5.16	Heater Drain	-	349	-	-	-	-	-	52	401	-	-	401	-	-	-	-	-	-	5,881	-
2a.1.5.17	Internal Circ Water & CDSR	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	389	-
2a.1.5.18	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2a.1.5.19	Main Steam	-	101	-	-	-	-	-	15	116	-	-	116	-	-	-	-	-	-	1,690	-
2a.1.5.20	Main Steam - RCA	-	350	9	29	436	-	-	158	983	983	-	-	5,044	-	-	-	-	204,825	4,956	-
2a.1.5.21	Steam Generator Blowdown	-	459	21	22	176	195	-	195	1,067	1,067	-	-	2,031	686	-	-	-	127,773	6,667	-
2a.1.5.22	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2a.1.5.23	Turbine & Moisture Separators	-	337	-	-	-	-	-	51	388	-	-	388	-	-	-	-	-	-	5,609	-
2a.1.5.24	Turbine Oil Purification	-	61	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	1,003	-
2a.1.5	Totals	-	3,117	40	85	1,108	195	-	825	5,370	3,226	-	2,145	12,815	686	-	-	-	565,705	48,794	-
2a.1.6	Scaffolding in support of decommissioning	-	854	3	1	13	3	-	217	1,092	1,092	-	-	138	12	-	-	-	7,016	6,368	-
2a.1	Subtotal Period 2a Activity Costs	855	21,136	26,865	3,852	3,004	16,868	553	24,759	97,891	95,747	-	2,145	37,556	30,812	125	673	-	4,174,560	182,015	6,073
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,126	638	2,764	2,764	-	-	-	-	-	-	-	-	27,791	-
2a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
2a.2	Subtotal Period 2a Additional Costs	1	659	785	107	-	1,439	2,126	2,075	7,191	7,191	-	-	-	2,097	125	-	-	205,890	29,966	87
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	47	-	31	81	-	126	-	70	356	356	-	-	-	302	-	-	-	18,119	59	-
2a.3.3	Small tool allowance	-	223	-	-	-	-	-	33	257	231	-	26	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,476	221	1,698	-	1,698	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	12,156	1,823	13,980	13,980	-	-	-	-	-	-	-	-	-	-
2a.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,670	-	1,670	-	1,670	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	47	223	31	81	-	126	15,302	2,149	17,960	14,567	3,367	26	-	302	-	-	-	18,119	59	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table F-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index		Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
																Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2a Period-Dependent Costs																						
2a.4.1	Decon supplies	93	-	-	-	-	-	-	-	23	116	116	-	-	-	-	-	-	-	-	-	
2a.4.2	Insurance	-	-	-	-	-	-	683	-	68	751	751	-	-	-	-	-	-	-	-	-	
2a.4.3	Property taxes	-	-	-	-	-	-	3,542	-	354	3,896	3,896	-	-	-	-	-	-	-	-	-	
2a.4.4	Health physics supplies	-	1,717	-	-	-	-	-	-	429	2,146	2,146	-	-	-	-	-	-	-	-	-	
2a.4.5	Heavy equipment rental	-	2,935	-	-	-	-	-	-	440	3,376	3,376	-	-	-	-	-	-	-	-	-	
2a.4.6	Disposal of DAW generated	-	-	79	23	-	295	-	-	85	482	482	-	-	-	3,623	-	-	-	72,452	118	
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,924	-	289	2,212	2,212	-	-	-	-	-	-	-	-	-	
2a.4.8	NRC Fees	-	-	-	-	-	-	774	-	77	851	851	-	-	-	-	-	-	-	-	-	
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,717	-	172	1,888	-	1,888	-	-	-	-	-	-	-	-	
2a.4.10	Fixed Overhead	-	-	-	-	-	-	1,655	-	248	1,904	1,904	-	-	-	-	-	-	-	-	-	
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	537	-	80	617	-	617	-	-	-	-	-	-	-	-	
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	69	-	10	79	-	79	-	-	-	-	-	-	-	-	
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	286	-	43	328	328	-	-	-	-	-	-	-	-	-	
2a.4.14	Security Staff Cost	-	-	-	-	-	-	9,811	-	1,472	11,283	11,283	-	-	-	-	-	-	-	-	162,878	
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	18,392	-	2,759	21,150	21,150	-	-	-	-	-	-	-	-	211,351	
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	24,265	-	3,640	27,904	27,904	-	-	-	-	-	-	-	-	392,305	
2a.4	Subtotal Period 2a Period-Dependent Costs	93	4,652	79	23	-	295	63,653	-	10,190	78,986	76,401	2,585	-	-	3,623	-	-	-	72,452	118	766,534
2a.0	TOTAL PERIOD 2a COST	995	26,670	27,760	4,062	3,004	18,729	81,635	-	39,172	202,027	193,905	5,952	2,170	37,556	36,834	250	673	-	4,471,020	212,158	772,694
PERIOD 2b - Site Decontamination																						
Period 2b Direct Decommissioning Activities																						
Disposal of Plant Systems																						
2b.1.1.1	Aux Bldg Normal Ventilation	-	2	0	0	0	-	-	-	1	3	3	-	-	3	-	-	-	-	140	29	-
2b.1.1.2	Battery Rm Special Ventilation	-	0	-	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
2b.1.1.3	Buildings Maintenance	-	4	-	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	65	-
2b.1.1.4	Chemical & Volume Control	1,077	1,331	83	69	389	802	-	-	1,149	4,901	4,901	-	-	4,498	2,846	-	-	-	369,246	34,533	-
2b.1.1.5	Component Cooling - RCA	-	821	22	72	1,075	-	-	-	379	2,369	2,369	-	-	12,427	-	-	-	-	504,675	11,242	-
2b.1.1.6	Containment Cooling	-	65	-	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	1,086	-
2b.1.1.7	Containment Cooling - RCA	-	290	6	20	294	-	-	-	120	730	730	-	-	3,400	-	-	-	-	138,090	3,971	-
2b.1.1.8	Containment Hydrogen Control - RCA	-	29	0	1	9	-	-	-	9	48	48	-	-	105	-	-	-	-	4,278	401	-
2b.1.1.9	Containment Spray - RCA	-	90	2	5	75	-	-	-	35	206	206	-	-	868	-	-	-	-	35,249	1,217	-
2b.1.1.10	Containment Ventilation	-	243	24	40	428	209	-	-	186	1,130	1,130	-	-	4,951	737	-	-	-	249,786	3,668	-
2b.1.1.11	Cooling Water	-	142	-	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	2,396	-
2b.1.1.12	Cooling Water - RCA	-	629	14	45	668	-	-	-	266	1,622	1,622	-	-	7,728	-	-	-	-	313,832	8,594	-
2b.1.1.13	D1 Emergency Diesel	-	44	-	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	730	-
2b.1.1.14	D2 Emergency Diesel	-	31	-	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	522	-
2b.1.1.15	Diesel Rooms Ventilation	-	8	-	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	135	-
2b.1.1.16	Electrical - Clean	-	1,669	-	-	-	-	-	-	250	1,919	-	-	1,919	-	-	-	-	-	-	26,981	-
2b.1.1.17	Electrical - Contaminated	-	592	6	16	219	27	-	-	191	1,051	1,051	-	-	2,527	95	-	-	-	108,935	8,377	-
2b.1.1.18	Electrical - Decontaminated	-	3,674	41	137	2,037	-	-	-	1,249	7,138	7,138	-	-	23,551	-	-	-	-	956,401	49,378	-
2b.1.1.19	Fuel Handling	-	116	6	9	79	62	-	-	58	329	329	-	-	908	218	-	-	-	51,280	1,784	-
2b.1.1.20	Fuel Oil	-	106	-	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	1,697	-
2b.1.1.21	HVAC - Clean	-	105	-	-	-	-	-	-	16	121	-	-	121	-	-	-	-	-	-	1,891	-
2b.1.1.22	HVAC - Contaminated	-	371	8	21	282	35	-	-	148	864	864	-	-	3,261	123	-	-	-	140,573	5,032	-
2b.1.1.23	Incore Instrumentation	0	27	1	1	5	16	-	-	12	64	64	-	-	60	57	-	-	-	6,177	425	-
2b.1.1.24	Misc Drains & Vents	-	222	14	10	34	146	-	-	100	527	527	-	-	390	514	-	-	-	49,900	3,091	-
2b.1.1.25	Reactor Coolant	148	298	21	14	30	221	-	-	213	945	945	-	-	344	777	-	-	-	65,413	6,470	-
2b.1.1.26	Reactor Hot Sampling	144	131	11	6	6	98	-	-	132	527	527	-	-	66	342	-	-	-	25,347	3,946	-
2b.1.1.27	Reactor Makeup	-	64	-	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	1,042	-
2b.1.1.28	Reactor Vessel	9	20	1	0	2	4	-	-	11	47	47	-	-	26	14	-	-	-	2,011	425	-
2b.1.1.29	Residual Heat Removal	344	399	85	66	250	926	-	-	559	2,630	2,630	-	-	2,895	3,252	-	-	-	332,849	7,621	-
2b.1.1.30	Safeguards Chilled Water	-	15	-	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	259	-
2b.1.1.31	Safety Injection	-	853	40	57	587	327	-	-	396	2,261	2,261	-	-	6,788	1,156	-	-	-	351,793	12,561	-
2b.1.1.32	Sampling	-	58	4	2	5	31	-	-	23	122	122	-	-	59	107	-	-	-	9,505	811	-
2b.1.1.33	Shield Bldg Ventilation	-	133	14	20	186	139	-	-	100	593	593	-	-	2,152	491	-	-	-	119,838	2,030	-
2b.1.1.34	Station & Instrument Air	-	17	-	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	300	-
2b.1.1.35	Station & Instrument Air - RCA	-	79	1	2	29	-	-	-	24	135	135	-	-	332	-	-	-	-	13,496	1,053	-
2b.1.1.36	Turbine Bldg Traps & Drains	-	44	-	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	767	-
2b.1.1.37	Unit Coolers	-	37	-	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	611	-
2b.1.1.38	Unit Coolers - RCA	-	53	0	1	20	-	-	-	16	91	91	-	-	230	-	-	-	-	9,348	683	-
2b.1.1	Totals	1,724	12,813	403	614	6,710	3,044	-	-	5,730	31,037	28,333	-	2,704	77,571	10,728	-	-	-	3,858,165	205,829	-
2b.1.2	Scaffolding in support of decommissioning	-	1,067	4	1	17	4	-	-	271	1,364	1,364	-	-	173	15	-	-	-	8,770	7,960	-

Table F-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,150	2,623	139	852	193	11,079	-	4,171	20,208	20,208	-	-	2,230	57,414	-	-	-	3,559,624	50,842	-
2b.1.3.2	Backwash Waste Receiving Tank	-	27	1	11	-	87	-	30	158	158	-	-	-	507	-	-	-	43,896	299	-
2b.1.3	Totals	1,150	2,650	141	864	193	11,166	-	4,202	20,366	20,366	-	-	2,230	57,921	-	-	-	3,603,520	51,140	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan									a											
2b.1	Subtotal Period 2b Activity Costs	2,874	16,530	547	1,479	6,919	14,215	481	10,275	53,320	50,616	-	2,704	79,974	68,664	-	-	-	7,470,455	264,930	4,096
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,943	583	2,526	2,526	-	-	-	-	-	-	-	-	25,399	-
2b.2.2	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
2b.2	Subtotal Period 2b Additional Costs	-	-	9	29	312	-	1,943	635	2,928	2,928	-	-	5,855	-	-	-	-	146,375	25,415	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	105	-	70	182	-	285	-	158	800	800	-	-	-	680	-	-	-	40,799	133	-
2b.3.2	Process decommissioning chemical flush waste	3	-	87	327	-	651	-	222	1,289	1,289	-	-	-	875	-	-	-	93,252	164	-
2b.3.3	Small tool allowance	-	289	-	-	-	-	-	43	332	332	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	4,321	648	4,969	-	4,969	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	6,994	1,049	8,043	8,043	-	-	-	-	-	-	-	-	-	-
2b.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,525	-	1,525	-	1,525	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	107	289	157	509	-	936	12,841	2,120	16,958	10,463	6,495	-	-	1,555	-	-	-	134,051	296	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	482	-	-	-	-	-	-	121	603	603	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	624	62	687	687	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	3,099	310	3,409	3,409	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	1,969	-	-	-	-	-	492	2,461	2,461	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	2,759	-	-	-	-	-	414	3,173	3,173	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	78	23	-	293	-	85	479	479	-	-	-	3,600	-	-	-	71,996	117	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,388	208	1,596	1,596	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	707	71	778	778	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,569	157	1,726	-	1,726	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	1,513	227	1,740	1,740	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	490	74	564	-	564	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	247	37	284	284	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	63	9	73	-	73	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	8,299	1,245	9,544	9,544	-	-	-	-	-	-	-	-	-	137,246
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	11,450	1,718	13,168	13,168	-	-	-	-	-	-	-	-	-	137,246
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	15,293	2,294	17,586	17,586	-	-	-	-	-	-	-	-	-	255,430
2b.4	Subtotal Period 2b Period-Dependent Costs	482	4,728	78	23	-	293	44,813	7,533	57,951	55,588	2,362	-	-	3,600	-	-	-	71,996	117	529,921
2b.0	TOTAL PERIOD 2b COST	3,464	21,546	792	2,040	7,231	15,444	60,078	20,563	131,157	119,596	8,857	2,704	85,829	73,819	-	-	-	7,822,876	290,758	534,017
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	72,993	10,949	83,941	-	83,941	-	-	-	-	-	-	-	-	-
2c.3.2	Retention and Severance	-	-	-	-	-	-	4,478	672	5,149	5,149	-	-	-	-	-	-	-	-	-	-
2c.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,702	-	2,702	-	2,702	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	80,172	11,621	91,793	5,149	86,643	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	1,104	110	1,215	1,215	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	5,154	515	5,669	5,669	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	390	-	-	-	-	-	98	488	488	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	18	5	-	66	-	19	108	108	-	-	-	809	-	-	-	16,171	26	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	655	98	753	753	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	555	55	610	610	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	2,776	278	3,053	-	3,053	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table F-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed Volume Cu. Feet	Burial Volumes					Burial /	Utility and Contractor Manhours
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs		Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
Period 2c Period-Dependent Costs (continued)																					
2c.4.8	Fixed Overhead	-	-	-	-	-	-	2,676	401	3,078	3,078	-	-	-	-	-	-	-	-	-	-
2c.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	87	13	101	101	-	-	-	-	-	-	-	-	-	-
2c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	112	17	128	-	128	-	-	-	-	-	-	-	-	-
2c.4.11	Railroad Track Maintenance	-	-	-	-	-	-	125	19	143	143	-	-	-	-	-	-	-	-	-	-
2c.4.12	Security Staff Cost	-	-	-	-	-	-	14,681	2,202	16,883	16,883	-	-	-	-	-	-	-	-	-	242,796
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	2,064	310	2,374	2,374	-	-	-	-	-	-	-	-	-	33,722
2c.4	Subtotal Period 2c Period-Dependent Costs	-	390	18	5	-	66	29,988	4,135	34,602	31,421	3,181	-	-	809	-	-	-	16,171	26	276,518
2c.0	TOTAL PERIOD 2c COST	-	390	18	5	-	66	114,508	16,408	131,395	41,570	89,825	-	-	809	-	-	-	16,171	26	276,518
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	328	32	94	32	-	595	-	335	1,416	1,416	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical - Contaminated - Fuel Pool	-	147	2	4	53	7	-	47	259	259	-	-	615	23	-	-	-	26,508	2,077	-
2d.1.2.2	Electrical - Decontaminated - Fuel Pool	-	918	10	34	510	-	-	312	1,785	1,785	-	-	5,893	-	-	-	-	239,327	12,340	-
2d.1.2.3	HVAC - Contaminated - Fuel Pool	-	159	3	9	121	15	-	63	370	370	-	-	1,398	53	-	-	-	60,246	2,157	-
2d.1.2.4	Safeguards Chilled Water - RCA	-	82	1	3	43	-	-	27	155	155	-	-	495	-	-	-	-	20,100	1,019	-
2d.1.2.5	Spent Fuel Pool Cooling	293	342	34	25	70	377	-	344	1,484	1,484	-	-	806	1,325	-	-	-	120,439	7,613	-
2d.1.2.6	Station & Instrument Air - RCA Fuel Pool	-	20	0	0	7	-	-	6	34	34	-	-	83	-	-	-	-	3,374	263	-
2d.1.2	Totals	293	1,668	50	75	804	399	-	800	4,088	4,088	-	-	9,290	1,401	-	-	-	469,994	25,468	-
2d.1.4	Scaffolding in support of decommissioning	-	213	1	0	3	1	-	54	273	273	-	-	35	3	-	-	-	1,754	1,592	-
2d.1	Subtotal Period 2d Activity Costs	621	1,913	145	107	807	994	-	1,189	5,777	5,777	-	-	9,325	3,496	-	-	-	610,046	27,637	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	16,173	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,082	625	2,706	2,706	-	-	-	-	-	-	-	-	16,173	6,240
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	27	-	18	48	-	75	-	41	209	209	-	-	-	179	-	-	-	10,724	35	-
2d.3.2	Process decommissioning chemical flush waste	1	-	32	121	-	241	-	82	478	478	-	-	-	324	-	-	-	34,576	61	-
2d.3.3	Small tool allowance	-	35	-	-	-	-	-	5	41	41	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	12,947	1,942	14,889	-	14,889	-	-	-	-	-	-	-	-	-
2d.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	971	-	971	-	971	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	27	35	194	224	575	467	13,917	2,217	17,658	1,798	15,859	-	6,000	1,032	-	-	-	350,268	184	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	54	-	-	-	-	-	-	14	68	68	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	398	40	437	437	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,740	174	1,914	1,914	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	559	-	-	-	-	-	140	699	699	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,757	-	-	-	-	-	264	2,020	2,020	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	18	5	-	67	-	19	110	110	-	-	-	829	-	-	-	16,581	27	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	471	71	542	542	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	381	38	419	419	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	999	100	1,099	-	1,099	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	963	144	1,108	1,108	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	315	47	362	362	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	40	6	46	-	46	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	5,123	768	5,891	5,891	-	-	-	-	-	-	-	-	-	84,157
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,065	910	6,975	6,975	-	-	-	-	-	-	-	-	-	69,996
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	7,796	1,169	8,966	8,123	843	-	-	-	-	-	-	-	-	126,236
2d.4	Subtotal Period 2d Period-Dependent Costs	54	2,316	18	5	-	67	24,337	3,911	30,708	28,720	1,988	-	-	829	-	-	-	16,581	27	280,390
2d.0	TOTAL PERIOD 2d COST	703	4,264	357	337	1,382	1,528	40,336	7,942	56,849	39,002	17,847	-	15,325	5,357	-	-	-	976,895	44,021	286,630
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table F-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	934	-	934	-	934	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,122	178	2,300	1,367	934	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,626	163	1,789	1,789	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	420	-	-	-	-	-	105	524	524	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	334	-	-	-	6,685	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	417	42	459	459	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	51	5	56	-	56	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	39	6	44	-	44	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	4,924	739	5,663	5,663	-	-	-	-	-	-	-	-	-	80,898
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	3,854	578	4,433	3,626	807	-	-	-	-	-	-	-	-	59,507
2f.4	Subtotal Period 2f Period-Dependent Costs	-	420	7	2	-	27	16,591	2,477	19,524	18,617	907	-	-	334	-	-	-	6,685	11	186,687
2f.0	TOTAL PERIOD 2f COST	-	420	7	2	-	27	22,106	3,674	26,236	24,395	1,841	-	-	334	-	-	-	6,685	40,183	189,807
PERIOD 2 TOTALS		5,161	53,290	28,935	6,446	11,617	35,794	318,662	87,758	547,664	418,467	124,322	4,875	138,709	117,153	250	673	-	13,293,650	587,146	2,059,666
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	4,255	-	-	-	-	-	638	4,894	-	-	4,894	-	-	-	-	-	-	44,669	-
3b.1.1.2	Condensate Storage Tank Foundation	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	16	-
3b.1.1.3	Structures below 3' below grade	-	1,581	-	-	-	-	-	237	1,818	-	-	1,818	-	-	-	-	-	-	8,411	-
3b.1.1.4	Turbine	-	1,983	-	-	-	-	-	297	2,280	-	-	2,280	-	-	-	-	-	-	22,040	-
3b.1.1.5	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
3b.1.1	Totals	-	8,171	-	-	-	-	-	1,226	9,397	-	-	9,397	-	-	-	-	-	-	76,993	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,602	-	-	-	-	183	1,318	10,102	211	-	9,892	-	-	-	-	-	-	77,914	1,560
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	2,213	-	-	-	-	3	332	2,549	-	-	2,549	-	-	-	-	-	-	8,386	-
3b.2.2	Underground Services Excavations	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
3b.2.3	Intake Structure Cofferdam	-	596	-	-	-	-	-	89	686	-	-	686	-	-	-	-	-	-	5,168	-
3b.2.4	Construction Debris	-	-	-	-	-	-	10	2	12	-	-	12	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	2,751	-	-	-	-	-	413	3,164	-	-	3,164	-	-	-	-	-	-	2,904	-
3b.2	Subtotal Period 3b Additional Costs	-	6,371	-	-	-	-	534	1,036	7,941	-	-	7,941	-	-	-	-	-	-	23,865	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	110	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	-	-
3b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,651	-	2,651	-	2,651	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	110	-	-	-	-	2,651	16	2,777	-	2,651	126	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	542	54	596	-	596	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	4,334	433	4,767	-	4,767	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	236	24	259	-	259	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	145	14	159	-	159	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-

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Decommissioning Cost Analysis

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Table F-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs (continued)																					
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	331	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	4,245	637	4,882	-	4,882	-	-	-	-	-	-	-	-	57,340
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	4,964	745	5,709	(0)	2,283	3,425	-	-	-	-	-	-	-	76,637
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,670	-	-	-	-	26,684	4,740	38,094	(0)	13,074	25,021	-	-	-	-	-	-	-	250,861
3b.0	TOTAL PERIOD 3b COST	-	21,752	-	-	-	-	30,052	7,110	58,914	211	15,724	42,979	-	-	-	-	-	-	101,779	252,421
PERIOD 3c - Fuel Storage Operations																					
Period 3c Direct Decommissioning Activities																					
Period 3c Additional Costs																					
3c.2.1	ISFSI Disposition of Original Casks	-	-	-	128	-	1,548	-	406	2,082	-	2,082	-	-	4,906	-	-	-	576,566	-	-
3c.2	Subtotal Period 3c Additional Costs	-	-	-	128	-	1,548	-	406	2,082	-	2,082	-	-	4,906	-	-	-	576,566	-	-
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	791,546	118,732	910,278	-	910,278	-	-	-	-	-	-	-	-	-
3c.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	186,914	-	186,914	-	186,914	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	978,460	118,732	1,097,192	-	1,097,192	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	38,227	3,823	42,050	-	42,050	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	157,169	15,717	172,886	-	172,886	-	-	-	-	-	-	-	-	-
3c.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	24,486	2,449	26,934	-	26,934	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	10,232	1,023	11,255	-	11,255	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	22,830	3,425	26,255	-	26,255	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	7,724	1,159	8,883	-	8,883	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	8,629	1,294	9,924	-	9,924	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	299,567	44,935	344,502	-	344,502	-	-	-	-	-	-	-	-	4,046,073
3c.4.10	DOC Staff Cost	-	-	-	-	-	-	14,425	2,164	16,589	-	16,589	-	-	-	-	-	-	-	-	155,618
3c.4.11	Utility Staff Cost	-	-	-	-	-	-	140,210	21,032	161,242	-	161,242	-	-	-	-	-	-	-	-	2,061,941
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	723,500	97,019	820,519	-	820,519	-	-	-	-	-	-	-	-	6,263,633
3c.0	TOTAL PERIOD 3c COST	-	-	-	128	-	1,548	1,701,960	216,157	1,919,793	-	1,919,793	-	-	4,906	-	-	-	576,566	-	6,263,633
PERIOD 3d - Spent Fuel/GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1.1	Totals	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	126,132	18,920	145,052	-	145,052	-	-	-	-	-	-	-	-	-
3d.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	31,250	-	31,250	-	31,250	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	157,382	18,920	176,302	-	176,302	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	6,390	639	7,029	-	7,029	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	24,558	2,456	27,013	-	27,013	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	2,782	278	3,060	-	3,060	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,710	171	1,881	-	1,881	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	3,816	572	4,389	-	4,389	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,291	194	1,485	-	1,485	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,443	216	1,659	-	1,659	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs (continued)																					
3d.4.9	Security Staff Cost	-	-	-	-	-	-	48,076	7,211	55,287	-	55,287	-	-	-	-	-	-	-	-	676,370
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	12,369	1,855	14,225	-	14,225	-	-	-	-	-	-	-	-	175,596
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	102,435	13,593	116,029	-	116,029	-	-	-	-	-	-	-	-	851,967
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	8,689	259,817	34,149	303,987	11,656	292,330	-	-	-	-	-	3,746	837,596	-	851,967

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Decommissioning Cost Analysis

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Table F-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	15	-	-	-	-	-	970	246	1,232	1,232	-	-	-	-	-	-	-	-	5,604	972
3e.2	Subtotal Period 3e Additional Costs	15	-	-	-	-	-	970	246	1,232	1,232	-	-	-	-	-	-	-	-	5,604	972
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	96	24	121	121	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	51	13	63	63	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	19	5	24	24	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	154	38	192	192	-	-	-	-	-	-	-	-	-	2,500
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	130	33	163	163	-	-	-	-	-	-	-	-	-	1,896
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	450	113	563	563	-	-	-	-	-	-	-	-	-	4,396
3e.0	TOTAL PERIOD 3e COST	15	-	-	-	-	-	1,420	359	1,794	1,794	-	-	-	-	-	-	-	-	5,604	5,368
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	946	-	-	-	-	154	165	1,265	-	-	1,265	-	-	-	-	-	-	4,922	160
3f.2	Subtotal Period 3f Additional Costs	-	946	-	-	-	-	154	165	1,265	-	-	1,265	-	-	-	-	-	-	4,922	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.3	Heavy equipment rental	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	25	4	29	-	-	29	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	10	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	78	12	89	-	-	89	-	-	-	-	-	-	-	1,260
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	782
3f.4	Subtotal Period 3f Period-Dependent Costs	-	62	-	-	-	-	177	36	275	-	-	275	-	-	-	-	-	-	-	2,042
3f.0	TOTAL PERIOD 3f COST	-	1,014	-	-	-	-	331	202	1,547	-	-	1,547	-	-	-	-	-	-	4,922	2,202
PERIOD 3 TOTALS		15	22,766	1,331	128	-	10,236	1,993,580	257,977	2,286,035	13,661	2,227,848	44,526	-	4,906	-	-	3,746	1,414,161	112,304	7,375,590
TOTAL COST TO DECOMMISSION		8,749	81,425	30,681	7,026	11,781	50,002	2,422,874	365,000	2,977,539	568,259	2,358,425	50,855	144,842	136,023	839	673	3,746	15,317,950	744,976	10,439,680

TOTAL COST TO DECOMMISSION WITH 13.97% CONTINGENCY:	\$2,977,539	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 19.08% OR:	\$568,259	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 79.21% OR:	\$2,358,425	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 1.71% OR:	\$50,855	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	137,535	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	32,925	tons
TOTAL CRAFT LABOR REQUIREMENTS:	744,976	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table F-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.13	Perform SER and EA	-	-	-	-	-	-	156	23	179	179	-	-	-	-	-	-	-	-	-	1,326
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	251	38	289	289	-	-	-	-	-	-	-	-	-	2,138
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	247	37	284	256	-	28	-	-	-	-	-	-	-	2,104
1a.1.17.2	Plant systems	-	-	-	-	-	-	209	31	241	216	-	24	-	-	-	-	-	-	-	1,782
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,036
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	326	49	375	375	-	-	-	-	-	-	-	-	-	2,779
1a.1.17.6	Biological shield	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,334
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	80	12	92	46	-	46	-	-	-	-	-	-	-	684
1a.1.17.9	Main Turbine	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	157	23	180	90	-	90	-	-	-	-	-	-	-	1,334
1a.1.17.12	Waste management	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	45	7	52	26	-	26	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	1,899	285	2,183	1,923	-	261	-	-	-	-	-	-	-	16,175
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	120	18	139	139	-	-	-	-	-	-	-	-	-	1,026
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	9,523	1,428	10,951	10,690	-	261	-	-	-	-	-	-	-	33,420
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,227	184	1,411	-	1,411	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	8,394	1,259	9,653	9,653	-	-	-	-	-	-	-	-	-	-
1a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,281	-	2,281	-	2,281	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,902	1,443	13,345	9,653	3,692	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,682	268	2,950	2,950	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	485	-	-	-	-	-	121	606	606	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	12	4	-	46	-	13	75	75	-	-	-	565	-	-	-	11,299	18	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	778	78	855	855	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	20,662	3,099	23,761	23,761	-	-	-	-	-	-	-	-	-	345,280

Table F-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,052	12	4	-	46	38,340	5,631	45,085	42,800	2,286	-	-	565	-	-	-	11,299	18	468,000
1a.0	TOTAL PERIOD 1a COST	-	1,052	12	4	-	46	67,559	9,672	78,345	72,107	5,977	261	-	565	-	-	-	11,299	18	501,420
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	238	36	273	246	-	27	-	-	-	-	-	-	-	2,024
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	1,069
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	68	10	78	19	-	58	-	-	-	-	-	-	-	577
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	182	27	210	210	-	-	-	-	-	-	-	-	-	1,552
1b.1.1.9	Facility closeout	-	-	-	-	-	-	60	9	69	35	-	35	-	-	-	-	-	-	-	513
1b.1.1.10	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	192
1b.1.1.11	Biological shield	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	513
1b.1.1.12	Steam generators	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	50	8	58	29	-	29	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
1b.1.1.15	Main Condensers	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
1b.1.1.17	Reactor building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
1b.1.1	Total	-	-	-	-	-	-	1,669	250	1,919	1,558	-	361	-	-	-	-	-	-	-	14,215
1b.1.2	Decon primary loop	552	-	-	-	-	-	-	276	828	828	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	552	-	-	-	-	-	1,669	526	2,747	2,386	-	361	-	-	-	-	-	-	1,067	14,215
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	1,582	475	2,057	2,057	-	-	-	-	-	-	-	-	8,988	3,563
1b.2.2	Mixed/Hazardous Waste	-	-	326	75	169	-	-	69	639	639	-	-	6,324	-	-	-	-	362,914	2,410	-
1b.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
1b.2	Subtotal Period 1b Additional Costs	-	2,364	328	185	169	1,359	1,582	1,491	7,478	7,478	-	-	6,324	12,843	-	-	-	529,873	32,305	3,563
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	24	-	16	41	-	64	-	36	180	180	-	-	-	152	-	-	-	9,121	30	-
1b.3.4	Process decommissioning chemical flush waste	2	-	58	220	-	2,471	-	657	3,408	3,408	-	-	-	-	588	-	-	62,689	110	-
1b.3.5	Small tool allowance	-	34	-	-	-	-	-	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	370	56	426	-	426	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	4,055	608	4,664	4,664	-	-	-	-	-	-	-	-	-	-
1b.3.10	Prairie Island Indian Community Payments	-	-	-	-	-	-	629	-	629	-	629	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,986	1,234	74	261	-	2,534	6,243	2,164	15,495	14,441	1,055	-	-	152	588	-	-	71,810	140	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	872	87	959	959	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,319	132	1,451	1,451	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	380	-	-	-	-	-	95	475	475	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	286	-	-	-	-	-	43	329	329	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	327	-	-	-	6,541	11	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,527	229	1,756	1,756	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	214	21	236	236	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	809	81	890	-	890	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	741	111	852	852	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,725	559	4,284	4,284	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	4,009	601	4,610	4,610	-	-	-	-	-	-	-	-	-	47,185
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	10,416	1,562	11,978	11,978	-	-	-	-	-	-	-	-	-	174,059
1b.4	Subtotal Period 1b Period-Dependent Costs	35	666	7	2	-	27	23,890	3,577	28,204	27,052	1,152	-	-	327	-	-	-	6,541	11	283,108

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table F-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
						Processing Costs	Disposal Costs				Lic. Term. Costs				Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet					
1b.0	TOTAL PERIOD 1b COST	3,573	4,264	410	447	169	3,920	33,383	7,759	53,923	51,356	2,207	361	6,324	13,322	588	-	-	608,224	33,522	300,885	
PERIOD 1 TOTALS		3,573	5,316	422	451	169	3,966	100,942	17,430	132,268	123,462	8,184	622	6,324	13,887	588	-	-	619,523	33,540	802,305	
PERIOD 2a - Large Component Removal																						
Period 2a Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
2a.1.1.1	Reactor Coolant Piping	51	45	6	8	-	150	-	76	336	336	-	-	-	305	-	-	-	34,809	1,414	-	
2a.1.1.2	Pressurizer Relief Tank	22	20	4	5	-	100	-	42	193	193	-	-	-	203	-	-	-	23,193	625	-	
2a.1.1.3	Reactor Coolant Pumps & Motors	54	63	101	83	-	736	-	249	1,287	1,287	-	-	-	2,332	-	-	-	295,800	2,049	100	
2a.1.1.4	Pressurizer	48	68	467	88	-	693	-	274	1,639	1,639	-	-	-	2,196	-	-	-	185,015	2,355	938	
2a.1.1.5	Steam Generators	225	2,943	2,093	1,638	1,246	3,570	-	2,383	14,097	14,097	-	-	18,672	11,316	-	-	-	1,668,341	14,819	2,875	
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	286	277	211	48	-	763	-	431	2,016	2,016	-	-	-	4,797	-	-	-	177,400	8,104	-	
2a.1.1.7	Reactor Vessel Internals	78	4,468	21,874	1,072	-	7,946	277	13,141	48,856	48,856	-	-	-	501	125	673	-	164,987	23,040	1,080	
2a.1.1.8	Reactor Vessel	89	5,717	1,754	719	-	1,956	277	5,970	16,483	16,483	-	-	-	5,690	-	-	-	570,074	23,040	1,080	
2a.1.1	Totals	855	13,600	26,512	3,662	1,246	15,913	553	22,568	84,908	84,908	-	-	18,672	27,341	125	673	-	3,119,620	75,446	6,073	
Removal of Major Equipment																						
2a.1.2	Main Turbine/Generator	-	305	189	55	272	306	-	221	1,348	1,348	-	-	2,131	1,187	-	-	-	206,316	4,667	-	
2a.1.3	Main Condensers	-	2,532	121	49	364	451	-	820	4,336	4,336	-	-	3,800	1,587	-	-	-	275,903	39,151	-	
Cascading Costs from Clean Building Demolition																						
2a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-	
2a.1.4.2	Auxiliary	-	210	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	1,309	-	
2a.1.4.3	Radwaste	-	8	-	-	-	-	-	1	9	9	-	-	-	-	-	-	-	-	65	-	
2a.1.4	Totals	-	946	-	-	-	-	-	142	1,088	1,088	-	-	-	-	-	-	-	-	8,963	-	
Disposal of Plant Systems																						
2a.1.5.1	Admin Bldg Ventilation	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	90	-	
2a.1.5.2	Air Removal	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	422	-	
2a.1.5.3	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	676	-	
2a.1.5.4	Auxiliary Feedwater - RCA	-	36	0	1	15	-	-	12	65	65	-	-	178	-	-	-	-	7,214	486	-	
2a.1.5.5	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,331	-	
2a.1.5.6	Caustic Addition - RCA	-	38	0	1	21	-	-	13	74	74	-	-	240	-	-	-	-	9,761	468	-	
2a.1.5.7	Chemical Feed	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	261	-	
2a.1.5.8	Chemical Feed - RCA	-	3	0	0	1	-	-	1	5	5	-	-	16	-	-	-	-	634	31	-	
2a.1.5.9	Circulating Water	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	401	-	
2a.1.5.10	Condensate	-	459	-	-	-	-	-	69	527	-	-	527	-	-	-	-	-	-	7,537	-	
2a.1.5.11	Condensate Polishing	-	181	-	-	-	-	-	27	209	-	-	209	-	-	-	-	-	-	2,987	-	
2a.1.5.12	Condensate Polishing - RCA	-	36	1	3	42	-	-	16	98	98	-	-	483	-	-	-	-	19,616	493	-	
2a.1.5.13	Electro-Hydraulic	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	143	-	
2a.1.5.14	External Circulating Water	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	385	-	
2a.1.5.15	External Circulating Water - RCA	-	70	1	4	62	-	-	28	165	165	-	-	721	-	-	-	-	29,284	938	-	
2a.1.5.16	Feedwater	-	111	-	-	-	-	-	17	128	-	-	128	-	-	-	-	-	-	1,840	-	
2a.1.5.17	Feedwater - RCA	-	236	7	24	359	-	-	117	744	744	-	-	4,147	-	-	-	-	168,414	3,377	-	
2a.1.5.18	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	504	-	
2a.1.5.19	Heater Drain	-	334	-	-	-	-	-	50	384	-	-	384	-	-	-	-	-	-	5,638	-	
2a.1.5.20	Hypobromous Acid Feed	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	86	-	
2a.1.5.21	Hypobromous Acid Feed - RCA	-	1	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	100	12	-	
2a.1.5.22	Internal Circ Water & CDSR	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	366	-	
2a.1.5.23	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-	
2a.1.5.24	Main Steam	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	1,482	-	
2a.1.5.25	Main Steam - RCA	-	364	9	30	447	-	-	163	1,013	1,013	-	-	5,166	-	-	-	-	209,799	5,146	-	
2a.1.5.26	Repairable Spare Snubbers	-	6	0	0	1	-	-	2	8	8	-	-	12	-	-	-	-	490	82	-	
2a.1.5.27	Steam Exclusion	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	32	-	
2a.1.5.28	Steam Exclusion - RCA	-	4	0	0	2	-	-	1	8	8	-	-	24	-	-	-	-	966	47	-	
2a.1.5.29	Steam Generator Blowdown	-	398	20	21	165	179	-	174	957	957	-	-	1,906	631	-	-	-	119,126	5,778	-	
2a.1.5.30	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-	
2a.1.5.31	Turbine & Moisture Separators	-	329	-	-	-	-	-	49	379	-	-	379	-	-	-	-	-	-	5,472	-	
2a.1.5.32	Turbine Oil Purification	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	757	-	
2a.1.5.33	Water Treatment	-	394	-	-	-	-	-	59	453	-	-	453	-	-	-	-	-	-	6,677	-	
2a.1.5.34	Water Treatment - RCA	-	19	0	1	10	-	-	6	37	37	-	-	115	-	-	-	-	4,652	252	-	
2a.1.5	Totals	-	3,437	39	85	1,125	179	-	867	5,733	3,174	-	2,559	13,010	631	-	-	-	570,056	54,280	-	
2a.1.6	Scaffolding in support of decommissioning	-	2,833	24	8	97	25	-	733	3,721	3,721	-	-	1,012	89	-	-	-	51,445	26,270	-	
2a.1	Subtotal Period 2a Activity Costs	855	23,653	26,885	3,859	3,105	16,875	553	25,350	101,134	98,575	-	2,559	38,625	30,835	125	673	-	4,223,340	208,777	6,073	

Table F-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,560	468	2,027	2,027	-	-	-	-	-	-	-	-	20,388	-
2a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
2a.2	Subtotal Period 2a Additional Costs	1	659	785	107	-	1,439	1,560	1,905	6,454	6,454	-	-	-	2,097	125	-	-	205,890	22,562	87
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	51	-	33	86	-	135	-	75	381	381	-	-	-	323	-	-	-	19,358	63	-
2a.3.3	Small tool allowance	-	251	-	-	-	-	-	38	289	260	-	29	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,138	321	2,459	-	2,459	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	6,105	916	7,021	7,021	-	-	-	-	-	-	-	-	-	-
2a.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,224	-	1,224	-	1,224	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	51	251	33	86	-	135	9,467	1,349	11,373	7,661	3,682	29	-	323	-	-	-	19,358	63	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	68	-	-	-	-	-	-	17	85	85	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	501	50	551	551	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	2,507	251	2,758	2,758	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,622	-	-	-	-	-	406	2,028	2,028	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,153	-	-	-	-	-	323	2,477	2,477	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	89	26	-	331	-	95	541	541	-	-	-	4,063	-	-	-	81,252	133	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,411	212	1,623	1,623	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	389	39	428	428	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,259	126	1,385	-	1,385	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	1,214	182	1,396	1,396	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	394	59	453	-	453	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	51	8	58	-	58	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	265	40	305	305	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	6,661	999	7,661	7,661	-	-	-	-	-	-	-	-	-	110,166
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	13,492	2,024	15,516	15,516	-	-	-	-	-	-	-	-	-	155,048
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	17,880	2,682	20,562	20,562	-	-	-	-	-	-	-	-	-	288,676
2a.4	Subtotal Period 2a Period-Dependent Costs	68	3,776	89	26	-	331	46,025	7,512	57,825	55,929	1,896	-	-	4,063	-	-	-	81,252	133	553,890
2a.0	TOTAL PERIOD 2a COST	974	28,339	27,792	4,078	3,105	18,780	57,604	36,116	176,787	168,620	5,579	2,588	38,625	37,317	250	673	-	4,529,841	231,534	560,049
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	ADT & Misc Ventilation	-	24	0	1	13	3	-	9	50	50	-	-	153	9	-	-	-	6,814	363	-
2b.1.1.2	Aux Bldg Normal Ventilation	-	67	2	5	60	11	-	29	174	174	-	-	692	39	-	-	-	30,671	1,013	-
2b.1.1.3	Aux Bldg Special Ventilation	-	13	0	0	6	2	-	5	26	26	-	-	70	6	-	-	-	3,243	197	-
2b.1.1.4	Battery Rm Special Ventilation	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	24	-
2b.1.1.5	Boron Recycle	0	4	0	0	0	3	-	2	9	9	-	-	3	9	-	-	-	709	50	-
2b.1.1.6	Chemical & Volume Control	722	902	59	44	204	560	-	770	3,260	3,260	-	-	2,356	1,977	-	-	-	225,854	23,197	-
2b.1.1.7	Cold Chemical Lab Ventilation	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
2b.1.1.8	Component Cooling - RCA	-	617	21	70	1,038	-	-	322	2,068	2,068	-	-	11,996	-	-	-	-	487,169	8,583	-
2b.1.1.9	Containment Cooling	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	502	-
2b.1.1.10	Containment Cooling - RCA	-	288	5	16	237	-	-	110	656	656	-	-	2,743	-	-	-	-	111,390	3,949	-
2b.1.1.11	Containment Hydrogen Control - RCA	-	35	0	1	12	-	-	11	60	60	-	-	141	-	-	-	-	5,742	494	-
2b.1.1.12	Containment Spray - RCA	-	186	3	8	126	-	-	67	389	389	-	-	1,453	-	-	-	-	59,019	2,617	-
2b.1.1.13	Containment Ventilation	-	224	23	38	408	205	-	177	1,075	1,075	-	-	4,721	722	-	-	-	239,450	3,375	-
2b.1.1.14	Control/Relay/Cmptr Rm Vent	-	30	1	2	23	6	-	13	74	74	-	-	260	20	-	-	-	11,915	454	-
2b.1.1.15	Cooling Water	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	2,344	-
2b.1.1.16	Cooling Water - RCA	-	456	15	49	730	-	-	232	1,482	1,482	-	-	8,442	-	-	-	-	342,822	6,311	-
2b.1.1.17	Cranes/Hoists/Elevators - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2b.1.1.18	D3 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
2b.1.1.19	D4 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
2b.1.1.20	D5 Emergency Diesel	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2b.1.1.21	Electrical - Clean	-	1,502	-	-	-	-	-	225	1,727	-	-	1,727	-	-	-	-	-	-	24,276	-
2b.1.1.22	Electrical - Contaminated	-	461	5	13	173	21	-	149	821	821	-	-	1,997	75	-	-	-	86,080	6,503	-
2b.1.1.23	Electrical - Decontaminated	-	2,866	33	109	1,622	-	-	980	5,610	5,610	-	-	18,753	-	-	-	-	761,569	38,423	-
2b.1.1.24	Filter Rm Ventilation	-	4	0	0	2	0	-	2	9	9	-	-	24	1	-	-	-	1,020	69	-
2b.1.1.25	Fire Protection & Detection	-	178	-	-	-	-	-	27	205	-	-	205	-	-	-	-	-	-	3,009	-
2b.1.1.26	Fire Protection & Detection - RCA	-	236	3	11	158	-	-	85	492	492	-	-	1,828	-	-	-	-	74,245	3,134	-
2b.1.1.27	Fuel Handling	-	71	1	2	17	14	-	24	130	130	-	-	200	49	-	-	-	11,396	1,101	-
2b.1.1.28	Fuel Oil	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
2b.1.1.29	HVAC - Clean	-	132	-	-	-	-	-	20	151	-	-	151	-	-	-	-	-	-	2,373	-
2b.1.1.30	HVAC - Contaminated	-	1,222	26	69	929	115	-	487	2,848	2,848	-	-	-	10,745	405	-	-	463,144	16,579	-

Table F-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
						Processing Costs	Disposal Costs				Lic. Term. Costs				Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2b.1.1.31	Heating	-	279	-	-	-	-	-	42	321	-	-	321	-	-	-	-	-	-	4,804	-
2b.1.1.32	Heating - RCA	-	323	3	11	165	-	-	107	609	609	-	-	1,907	-	-	-	-	77,458	4,086	-
2b.1.1.33	Hot Lab & Sample Rm Ventilation	-	19	0	1	9	1	-	6	37	37	-	-	107	4	-	-	-	4,632	285	-
2b.1.1.34	Incore Instrumentation	0	29	1	1	5	16	-	13	67	67	-	-	60	58	-	-	-	6,264	458	-
2b.1.1.35	Misc Drains & Vents	-	223	12	9	40	121	-	95	500	500	-	-	458	426	-	-	-	46,850	3,180	-
2b.1.1.36	Misc Lab & Service Areas Vent	-	123	8	6	32	70	-	55	293	293	-	-	370	244	-	-	-	31,186	1,713	-
2b.1.1.37	Miscellaneous Gas	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	1,073	-
2b.1.1.38	Miscellaneous Gas - RCA	-	129	1	3	52	-	-	41	226	226	-	-	600	-	-	-	-	24,378	1,636	-
2b.1.1.39	Radiation Monitoring	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	111	-
2b.1.1.40	Radiation Monitoring - RCA	-	62	1	2	27	-	-	20	112	112	-	-	316	-	-	-	-	12,826	782	-
2b.1.1.41	Reactor Coolant	158	227	20	12	20	208	-	195	839	839	-	-	229	730	-	-	-	57,672	5,517	-
2b.1.1.42	Reactor Hot Sampling	135	121	10	5	5	89	-	123	489	489	-	-	54	312	-	-	-	22,919	3,686	-
2b.1.1.43	Reactor Makeup	-	36	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	583	-
2b.1.1.44	Reactor Makeup - RCA	-	4	0	0	2	-	-	1	8	8	-	-	28	-	-	-	-	1,148	47	-
2b.1.1.45	Reactor Vessel	9	17	0	0	2	4	-	10	43	43	-	-	22	14	-	-	-	1,826	385	-
2b.1.1.46	Residual Heat Removal	336	374	84	66	247	924	-	548	2,578	2,578	-	-	2,853	3,244	-	-	-	330,651	7,112	-
2b.1.1.47	Safeguards Chilled Water	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2b.1.1.48	Safety Injection	-	836	40	56	577	329	-	390	2,228	2,228	-	-	6,676	1,161	-	-	-	347,600	12,284	-
2b.1.1.49	Sampling	-	51	3	2	3	27	-	20	105	105	-	-	37	93	-	-	-	7,697	714	-
2b.1.1.50	Service Bldg & New Cmptr Vent	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
2b.1.1.51	Shield Bldg Ventilation	-	114	13	19	175	138	-	94	554	554	-	-	2,028	484	-	-	-	114,378	1,743	-
2b.1.1.52	Station & Instrument Air	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	2,424	-
2b.1.1.53	Station & Instrument Air - RCA	-	288	3	9	141	-	-	95	535	535	-	-	1,625	-	-	-	-	65,986	3,638	-
2b.1.1.54	Turbine Bldg Traps & Drains	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	462	-
2b.1.1.55	Turbine Bldg Traps & Drains - RCA	-	28	0	1	16	-	-	10	55	55	-	-	180	-	-	-	-	7,321	344	-
2b.1.1.56	Turbine Bldg Ventilation	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	655	-
2b.1.1.57	Unit Coolers	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	332	-
2b.1.1.58	Unit Coolers - RCA	-	54	0	1	20	-	-	17	93	93	-	-	232	-	-	-	-	9,413	690	-
2b.1.1.59	Waste Gas Disposal	531	457	40	35	212	381	-	516	2,173	2,173	-	-	2,453	1,358	-	-	-	188,334	14,308	-
2b.1.1.60	Waste Liquid Disposal	1,386	1,733	108	76	316	1,019	-	1,451	6,089	6,089	-	-	3,655	3,594	-	-	-	385,370	44,485	-
2b.1.1.61	Waste Solid Disposal	111	139	11	8	34	112	-	126	541	541	-	-	389	393	-	-	-	41,732	3,481	-
2b.1.1	Totals	3,390	15,678	558	763	7,868	4,377	-	7,798	40,433	37,423	-	3,010	90,963	15,429	-	-	-	4,712,076	270,390	-
2b.1.2	Scaffolding in support of decommissioning	-	3,542	30	10	121	32	-	916	4,651	4,651	-	-	1,265	112	-	-	-	64,307	32,837	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,150	2,624	139	853	193	11,080	-	4,172	20,210	20,210	-	-	2,230	57,418	-	-	-	3,559,977	50,853	-
2b.1.3.2	Auxiliary	1,223	400	12	80	92	582	-	884	3,272	3,272	-	-	1,060	3,355	-	-	-	332,498	23,808	-
2b.1.3.3	Backwash Waste Receiving Tank	-	27	1	11	-	87	-	30	158	158	-	-	-	507	-	-	-	43,896	299	-
2b.1.3.4	Drum Transfer & Truck Loading Enclosure	17	8	0	2	2	13	-	14	56	56	-	-	19	74	-	-	-	7,118	368	-
2b.1.3.5	LLRW Storage Enclosure	117	51	1	11	3	87	-	95	366	366	-	-	38	502	-	-	-	44,971	2,424	-
2b.1.3.6	Radwaste	52	23	1	5	4	39	-	43	166	166	-	-	42	225	-	-	-	21,136	1,082	-
2b.1.3.7	Resin Disposal	15	11	0	2	7	12	-	15	64	64	-	-	83	69	-	-	-	9,271	383	-
2b.1.3	Totals	2,574	3,145	155	964	300	11,900	-	5,253	24,292	24,292	-	-	3,471	62,151	-	-	-	4,018,868	79,216	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	206	31	236	236	-	-	-	-	-	-	-	-	-	1,751
2b.1.5	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	5,965	22,365	744	1,737	8,290	16,309	206	13,998	69,612	66,602	-	3,010	95,700	77,691	-	-	-	8,795,250	382,443	1,751
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,930	579	2,509	2,509	-	-	-	-	-	-	-	-	25,228	-
2b.2.2	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
2b.2	Subtotal Period 2b Additional Costs	-	-	9	29	312	-	1,930	631	2,911	2,911	-	-	5,855	-	-	-	-	146,375	25,244	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	167	-	112	289	-	453	-	251	1,272	1,272	-	-	-	1,081	-	-	-	64,837	211	-
2b.3.2	Process decommissioning chemical flush waste	3	-	114	431	-	858	-	292	1,700	1,700	-	-	-	1,154	-	-	-	122,948	216	-
2b.3.3	Small tool allowance	-	414	-	-	-	-	-	62	476	476	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	9,529	1,429	10,958	-	10,958	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	4,127	619	4,746	4,746	-	-	-	-	-	-	-	-	-	-
2b.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,517	-	1,517	-	1,517	-	-	-	-	-	-	-	-	-
2b.3.7	On-site survey and release of 0.437 tons clean metallic waste	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	170	414	226	721	-	1,311	15,174	2,654	20,670	8,195	12,475	-	-	2,234	-	-	-	187,785	427	-

Table F-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity		Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Index	Activity Description														Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,135	-	-	-	-	-	-	284	1,419	1,419	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	620	62	682	682	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	2,983	298	3,281	3,281	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,580	-	-	-	-	-	645	3,225	3,225	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	2,740	-	-	-	-	-	411	3,151	3,151	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	115	34	-	431	-	124	704	704	-	-	-	5,291	-	-	-	105,826	173	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,379	207	1,586	1,586	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	481	48	529	529	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,558	156	1,714	-	1,714	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	1,503	225	1,728	1,728	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	487	73	560	-	560	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	246	37	282	282	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	63	9	72	-	72	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	70	10	80	80	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	8,243	1,236	9,479	9,479	-	-	-	-	-	-	-	-	-	136,323
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	16,150	2,422	18,572	18,572	-	-	-	-	-	-	-	-	-	184,288
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	21,222	3,183	24,405	24,405	-	-	-	-	-	-	-	-	-	342,069
2b.4	Subtotal Period 2b Period-Dependent Costs	1,135	5,320	115	34	-	431	55,004	9,432	71,472	69,125	2,346	-	-	5,291	-	-	-	105,826	173	662,680
2b.0	TOTAL PERIOD 2b COST	7,270	28,099	1,095	2,520	8,602	18,050	72,314	26,716	164,664	146,833	14,822	3,010	101,555	85,217	-	-	-	9,235,236	408,286	664,431
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	65,685	9,853	75,538	-	75,538	-	-	-	-	-	-	-	-	-
2c.3.2	Retention and Severance	-	-	-	-	-	-	2,034	305	2,339	2,339	-	-	-	-	-	-	-	-	-	-
2c.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,630	-	1,630	-	1,630	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	69,349	10,158	79,507	2,339	77,168	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	666	67	733	733	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	3,060	306	3,366	3,366	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	270	-	-	-	-	-	67	337	337	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	12	3	-	44	-	13	72	72	-	-	-	538	-	-	-	10,761	18	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	395	59	454	454	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	305	31	336	336	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,674	167	1,842	-	1,842	-	-	-	-	-	-	-	-	-
2c.4.8	Fixed Overhead	-	-	-	-	-	-	1,615	242	1,857	1,857	-	-	-	-	-	-	-	-	-	-
2c.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	-
2c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	67	10	77	-	77	-	-	-	-	-	-	-	-	-
2c.4.11	Railroad Track Maintenance	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	-
2c.4.12	Security Staff Cost	-	-	-	-	-	-	8,857	1,329	10,185	10,185	-	-	-	-	-	-	-	-	-	146,478
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	6,575	986	7,561	7,561	-	-	-	-	-	-	-	-	-	107,146
2c.4	Subtotal Period 2c Period-Dependent Costs	-	270	12	3	-	44	23,343	3,296	26,968	25,049	1,919	-	-	538	-	-	-	10,761	18	253,623
2c.0	TOTAL PERIOD 2c COST	-	270	12	3	-	44	97,040	14,106	111,475	32,387	79,087	-	-	538	-	-	-	10,761	18	253,623
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	328	32	94	32	-	595	-	335	1,416	1,416	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical - Contaminated - Fuel Pool	-	197	2	6	75	9	-	64	353	353	-	-	864	33	-	-	-	37,250	2,783	-
2d.1.2.2	Electrical - Decontaminated - Fuel Pool	-	1,230	14	47	698	-	-	421	2,410	2,410	-	-	8,069	-	-	-	-	327,668	16,495	-
2d.1.2.3	Fire Protection & Detection - RCA Fuel P	-	36	1	2	25	-	-	13	76	76	-	-	286	-	-	-	-	11,622	476	-
2d.1.2.4	HVAC - Contaminated - Fuel Pool	-	549	12	31	418	52	-	219	1,280	1,280	-	-	4,828	182	-	-	-	208,080	7,448	-
2d.1.2.5	Safeguards Chilled Water - RCA	-	4	0	0	2	-	-	1	8	8	-	-	26	-	-	-	-	1,045	51	-
2d.1.2.6	Spent Fuel Pool Cooling	31	35	3	2	3	30	-	33	137	137	-	-	39	107	-	-	-	8,635	882	-
2d.1.2.7	Spent Fuel Pool Normal Ventilation	-	26	1	2	23	3	-	11	66	66	-	-	265	12	-	-	-	11,532	394	-
2d.1.2	Totals	31	2,077	32	89	1,244	95	-	761	4,328	4,328	-	-	14,376	333	-	-	-	605,832	28,530	-

Table F-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Handling of Aux Building	975	1,082	9	32	209	173	-	838	3,319	3,319	-	-	2,417	944	-	-	-	177,818	30,401	-
2d.1.3	Totals	975	1,082	9	32	209	173	-	838	3,319	3,319	-	-	2,417	944	-	-	-	177,818	30,401	-
2d.1.4	Scaffolding in support of decommissioning	-	708	6	2	24	6	-	183	930	930	-	-	253	22	-	-	-	12,861	6,567	-
2d.1	Subtotal Period 2d Activity Costs	1,334	3,900	142	155	1,477	868	-	2,118	9,994	9,994	-	-	17,046	3,391	-	-	-	934,809	66,074	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	16,173	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,082	625	2,706	2,706	-	-	-	-	-	-	-	-	16,173	6,240
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	39	-	27	70	-	109	-	60	306	306	-	-	-	261	-	-	-	15,670	51	-
2d.3.2	Process decommissioning chemical flush waste	0	-	1	5	-	10	-	3	20	20	-	-	-	13	-	-	-	1,422	2	-
2d.3.3	Small tool allowance	-	79	-	-	-	-	-	12	91	91	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	12,947	1,942	14,889	-	14,889	-	-	-	-	-	-	-	-	-
2d.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	971	-	971	-	971	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	39	79	172	130	575	270	13,917	2,164	17,347	1,488	15,859	-	6,000	804	-	-	-	322,060	142	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	218	-	-	-	-	-	-	54	272	272	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	398	40	437	437	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,740	174	1,914	1,914	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	742	-	-	-	-	-	186	928	928	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,757	-	-	-	-	-	264	2,020	2,020	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	44	13	-	163	-	47	266	266	-	-	-	2,000	-	-	-	40,003	65	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	471	71	542	542	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	256	26	282	282	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	999	100	1,099	-	1,099	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	963	144	1,108	1,108	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	315	47	362	362	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	40	6	46	-	46	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	5,123	768	5,891	5,891	-	-	-	-	-	-	-	-	-	84,157
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,065	910	6,975	6,975	-	-	-	-	-	-	-	-	-	69,996
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	7,796	1,169	8,966	8,123	843	-	-	-	-	-	-	-	-	126,236
2d.4	Subtotal Period 2d Period-Dependent Costs	218	2,499	44	13	-	163	24,212	4,013	31,160	29,173	1,988	-	-	2,000	-	-	-	40,003	65	280,390
2d.0	TOTAL PERIOD 2d COST	1,591	6,478	357	298	2,052	1,301	40,212	8,919	61,208	43,361	17,847	-	23,046	6,195	-	-	-	1,296,872	82,455	286,630
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	934	-	934	-	934	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,122	178	2,300	1,367	934	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,626	163	1,789	1,789	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	602	-	-	-	-	-	150	752	752	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	334	-	-	-	6,685	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	272	27	299	299	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	51	5	56	-	56	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	39	6	44	-	44	-	-	-	-	-	-	-	-	-

Table F-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2f Period-Dependent Costs (continued)																					
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	4,924	739	5,663	5,663	-	-	-	-	-	-	-	-	-	80,898
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	3,854	578	4,433	3,626	807	-	-	-	-	-	-	-	-	59,507
2f.4	Subtotal Period 2f Period-Dependent Costs	-	602	7	2	-	27	16,445	2,508	19,592	18,684	907	-	-	334	-	-	-	6,685	11	186,687
2f.0	TOTAL PERIOD 2f COST	-	602	7	2	-	27	26,150	4,962	31,750	29,909	1,841	-	-	334	-	-	-	6,685	102,653	189,807
PERIOD 2 TOTALS		9,835	63,787	29,263	6,901	13,758	38,202	293,319	90,819	545,884	421,110	119,176	5,598	163,227	129,602	250	673	-	15,079,400	824,945	1,954,541
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	4,256	-	-	-	-	-	638	4,895	-	-	4,895	-	-	-	-	-	-	44,679	-
3b.1.1.2	Auxiliary	-	1,897	-	-	-	-	-	285	2,182	-	-	2,182	-	-	-	-	-	-	11,902	-
3b.1.1.3	Condensate Storage Tank Foundation	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	33	-
3b.1.1.4	Construction Warehouse & Fab Shop	-	118	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	1,405	-
3b.1.1.5	D3/D4 Emergency Generator	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	84	-
3b.1.1.6	Drum Transfer & Truck Loading Enclosure	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	221	-
3b.1.1.7	Hydrogen House	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	47	-
3b.1.1.8	LLRW Storage Enclosure	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	853	-
3b.1.1.9	Misc Structures 2017	-	1,391	-	-	-	-	-	209	1,599	-	-	1,599	-	-	-	-	-	-	12,939	-
3b.1.1.10	Radwaste	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	1,400	-
3b.1.1.11	Resin Disposal	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	120	-
3b.1.1.12	Structures below 3' below grade	-	1,713	-	-	-	-	-	257	1,969	-	-	1,969	-	-	-	-	-	-	9,238	-
3b.1.1.13	Sulfuric Acid Tank Enclosure	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	35	-
3b.1.1.14	Turbine	-	1,983	-	-	-	-	-	298	2,281	-	-	2,281	-	-	-	-	-	-	22,052	-
3b.1.1.15	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
3b.1.1.16	Warehouse #2	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	213	-
3b.1.1.17	Waste Neutralizing Tank House	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	56	-
3b.1.1.18	Waste Oil Storage	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	70	-
3b.1.1.19	Water Treatment	-	303	-	-	-	-	-	46	349	-	-	349	-	-	-	-	-	-	2,690	-
3b.1.1.20	Fuel Handling of Aux Building	-	1,032	-	-	-	-	-	155	1,186	-	-	1,186	-	-	-	-	-	-	8,240	-
3b.1.1	Totals	-	13,424	-	-	-	-	-	2,014	15,438	-	-	15,438	-	-	-	-	-	-	118,134	-
Site Closeout Activities																					
3b.1.2	Remove Rubble	-	1,308	-	-	-	-	-	196	1,505	-	-	1,505	-	-	-	-	-	-	6,495	-
3b.1.3	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	78	12	90	90	-	-	-	-	-	-	-	-	-	667
3b.1	Subtotal Period 3b Activity Costs	-	15,163	-	-	-	-	78	2,286	17,528	90	-	17,438	-	-	-	-	-	-	125,549	667
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	3,313	-	-	-	-	8	498	3,818	-	-	3,818	-	-	-	-	-	-	12,824	-
3b.2.2	Underground Services Excavations	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
3b.2.3	Intake Structure Cofferdam	-	423	-	-	-	-	-	63	486	-	-	486	-	-	-	-	-	-	3,552	-
3b.2.4	Construction Debris	-	-	-	-	-	-	463	69	532	-	-	532	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	8,465	-	-	-	-	-	1,270	9,735	-	-	9,735	-	-	-	-	-	-	9,327	-
3b.2	Subtotal Period 3b Additional Costs	-	13,012	-	-	-	-	991	2,100	16,103	-	-	16,103	-	-	-	-	-	-	33,110	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	172	-	-	-	-	-	26	198	-	-	198	-	-	-	-	-	-	-	-
3b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,651	-	2,651	-	2,651	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	172	-	-	-	-	2,651	26	2,848	-	2,651	198	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	542	54	596	-	596	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	4,334	433	4,767	-	4,767	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	236	24	259	-	259	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	145	14	159	-	159	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	331	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	4,245	637	4,882	-	4,882	-	-	-	-	-	-	-	-	57,340
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885

Table F-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs (continued)																					
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	4,964	745	5,709	(0)	2,283	3,425	-	-	-	-	-	-	-	76,637
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,670	-	-	-	-	26,684	4,740	38,094	(0)	13,074	25,021	-	-	-	-	-	-	-	250,861
3b.0	TOTAL PERIOD 3b COST	-	35,017	-	-	-	-	30,404	9,153	74,574	90	15,724	58,760	-	-	-	-	-	-	158,659	251,528
PERIOD 3c - Fuel Storage Operations																					
Period 3c Direct Decommissioning Activities																					
Period 3c Additional Costs																					
3c.2.1	ISFSI Disposition of Original Casks	-	-	-	128	-	1,548	-	406	2,082	-	2,082	-	-	4,906	-	-	-	576,566	-	-
3c.2	Subtotal Period 3c Additional Costs	-	-	-	128	-	1,548	-	406	2,082	-	2,082	-	-	4,906	-	-	-	576,566	-	-
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	791,546	118,732	910,278	-	910,278	-	-	-	-	-	-	-	-	-
3c.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	186,914	-	186,914	-	186,914	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	978,460	118,732	1,097,192	-	1,097,192	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	38,227	3,823	42,050	-	42,050	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	157,169	15,717	172,886	-	172,886	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	24,486	2,449	26,934	-	26,934	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	10,232	1,023	11,255	-	11,255	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	22,830	3,425	26,255	-	26,255	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	7,724	1,159	8,883	-	8,883	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	8,629	1,294	9,924	-	9,924	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	299,567	44,935	344,502	-	344,502	-	-	-	-	-	-	-	-	4,046,073
3c.4.10	DOC Staff Cost	-	-	-	-	-	-	14,425	2,164	16,589	-	16,589	-	-	-	-	-	-	-	-	155,618
3c.4.11	Utility Staff Cost	-	-	-	-	-	-	140,210	21,032	161,242	-	161,242	-	-	-	-	-	-	-	-	2,061,941
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	723,500	97,019	820,519	-	820,519	-	-	-	-	-	-	-	-	6,263,633
3c.0	TOTAL PERIOD 3c COST	-	-	-	128	-	1,548	1,701,960	216,157	1,919,793	-	1,919,793	-	-	4,906	-	-	-	576,566	-	6,263,633
PERIOD 3d - Spent Fuel/GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1.1	Totals	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	126,132	18,920	145,052	-	145,052	-	-	-	-	-	-	-	-	-
3d.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	31,250	-	31,250	-	31,250	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	157,382	18,920	176,302	-	176,302	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	6,390	639	7,029	-	7,029	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	24,558	2,456	27,013	-	27,013	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	2,782	278	3,060	-	3,060	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,710	171	1,881	-	1,881	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	3,816	572	4,389	-	4,389	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,291	194	1,485	-	1,485	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,443	216	1,659	-	1,659	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	48,076	7,211	55,287	-	55,287	-	-	-	-	-	-	-	-	676,370
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	12,369	1,855	14,225	-	14,225	-	-	-	-	-	-	-	-	175,596
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	102,435	13,593	116,029	-	116,029	-	-	-	-	-	-	-	-	851,967
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	8,689	259,817	34,149	303,987	11,656	292,330	-	-	-	-	-	3,746	837,596	-	851,967
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	15	-	-	-	-	-	970	246	1,232	1,232	-	-	-	-	-	-	-	-	5,604	972
3e.2	Subtotal Period 3e Additional Costs	15	-	-	-	-	-	970	246	1,232	1,232	-	-	-	-	-	-	-	-	5,604	972

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table F-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 200 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	96	24	121	121	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	51	13	63	63	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	19	5	24	24	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	154	38	192	192	-	-	-	-	-	-	-	-	-	2,500
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	130	33	163	163	-	-	-	-	-	-	-	-	-	1,896
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	450	113	563	563	-	-	-	-	-	-	-	-	-	4,396
3e.0	TOTAL PERIOD 3e COST	15	-	-	-	-	-	1,420	359	1,794	1,794	-	-	-	-	-	-	-	-	5,604	5,368
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	946	-	-	-	-	154	165	1,265	-	-	1,265	-	-	-	-	-	-	4,922	160
3f.2	Subtotal Period 3f Additional Costs	-	946	-	-	-	-	154	165	1,265	-	-	1,265	-	-	-	-	-	-	4,922	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.3	Heavy equipment rental	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	25	4	29	-	-	29	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	10	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	78	12	89	-	-	89	-	-	-	-	-	-	-	1,260
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	782
3f.4	Subtotal Period 3f Period-Dependent Costs	-	62	-	-	-	-	177	36	275	-	-	275	-	-	-	-	-	-	-	2,042
3f.0	TOTAL PERIOD 3f COST	-	1,014	-	-	-	-	331	202	1,547	-	-	1,547	-	-	-	-	-	-	4,922	2,202
PERIOD 3 TOTALS		15	36,032	1,331	128	-	10,236	1,993,933	260,020	2,301,695	13,540	2,227,848	60,307	-	4,906	-	-	3,746	1,414,161	169,184	7,374,698
TOTAL COST TO DECOMMISSION		13,423	105,134	31,016	7,480	13,927	52,404	2,388,194	368,269	2,979,847	558,112	2,355,208	66,527	169,551	148,394	839	673	3,746	17,113,080	1,027,670	10,131,540

TOTAL COST TO DECOMMISSION WITH 14.1% CONTINGENCY:	\$2,979,847	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 18.73% OR:	\$558,112	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 79.04% OR:	\$2,355,208	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 2.23% OR:	\$66,527	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	149,906	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	41,515	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,027,670	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

***Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis***

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APPENDIX G

DETAILED COST ANALYSIS

SCENARIO 5: DECON with 60 Year DFS with Recasking

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Prairie Island Nuclear Generating Plant, Unit 2	G-10

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Decommissioning Cost Analysis

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Table G-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	578	87	664	598	-	66	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,440	666	5,106	4,496	-	610	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlp/s/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	14,774	2,216	16,990	16,380	-	610	-	-	-	-	-	-	-	78,157
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,040	204	2,244	2,244	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	43,160	6,378	50,687	48,402	2,286	-	-	610	-	-	-	12,190	20	544,960

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table G-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	71,629	10,348	83,126	78,227	4,289	610	-	610	-	-	-	12,190	20	623,117
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	293	44	337	337	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,902	585	4,487	3,643	-	844	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	552	-	-	-	-	-	-	276	828	828	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	552	-	-	-	-	-	3,902	861	5,315	4,471	-	844	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	3,700	1,110	4,810	4,810	-	-	-	-	-	-	-	-	21,020	8,332
1b.2.2	Mixed/Hazardous Waste	-	-	318	75	164	-	-	68	624	624	-	-	6,133	-	-	-	-	351,986	2,361	-
1b.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
1b.2	Subtotal Period 1b Additional Costs	-	2,364	320	185	164	1,359	3,700	2,125	10,216	10,216	-	-	6,133	12,843	-	-	-	518,945	44,288	8,332
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	24	-	16	41	-	64	-	36	180	180	-	-	-	152	-	-	-	9,121	30	-
1b.3.4	Process decommissioning chemical flush waste	2	-	58	220	-	2,471	-	657	3,408	3,408	-	-	-	-	588	-	-	62,689	110	-
1b.3.5	Small tool allowance	-	34	-	-	-	-	-	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	159	24	183	-	183	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	1,088	163	1,251	1,251	-	-	-	-	-	-	-	-	-	-
1b.3.10	Prairie Island Indian Community Payments	-	-	-	-	-	-	630	-	630	-	630	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,986	1,234	74	261	-	2,534	3,065	1,687	11,841	11,028	813	-	-	152	588	-	-	71,810	140	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	872	87	959	959	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,352	135	1,487	1,487	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	402	-	-	-	-	-	101	503	503	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	286	-	-	-	-	-	43	329	329	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	8	2	-	29	-	8	48	48	-	-	-	360	-	-	-	7,197	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,527	229	1,756	1,756	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	323	32	355	355	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	809	81	890	-	890	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	741	111	852	852	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,725	559	4,284	4,284	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	5,656	848	6,504	6,504	-	-	-	-	-	-	-	-	-	63,961
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	13,074	1,961	15,035	15,035	-	-	-	-	-	-	-	-	-	213,904
1b.4	Subtotal Period 1b Period-Dependent Costs	35	688	8	2	-	29	28,336	4,243	33,341	32,189	1,152	-	-	360	-	-	-	7,197	12	339,730
1b.0	TOTAL PERIOD 1b COST	3,573	4,286	402	447	164	3,923	39,002	8,917	60,713	57,904	1,965	844	6,133	13,355	588	-	-	597,952	45,506	381,305

Table G-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index		Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
																Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1 TOTALS			3,573	5,368	415	451	164	3,972	110,631	19,264	143,839	136,131	6,254	1,454	6,133	13,964	588	-	-	610,142	45,526	1,004,421
PERIOD 2a - Large Component Removal																						
Period 2a Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
2a.1.1.1	Reactor Coolant Piping		51	45	6	8	-	150	-	76	336	336	-	-	-	305	-	-	-	34,809	1,414	-
2a.1.1.2	Pressurizer Relief Tank		22	20	4	5	-	100	-	42	193	193	-	-	-	203	-	-	-	23,193	625	-
2a.1.1.3	Reactor Coolant Pumps & Motors		54	63	101	83	-	736	-	249	1,287	1,287	-	-	-	2,332	-	-	-	295,800	2,049	100
2a.1.1.4	Pressurizer		48	68	467	88	-	693	-	274	1,639	1,639	-	-	-	2,196	-	-	-	185,015	2,355	938
2a.1.1.5	Steam Generators		225	2,943	2,093	1,638	1,246	3,570	-	2,383	14,097	14,097	-	-	18,672	11,316	-	-	-	1,668,341	14,819	2,875
2a.1.1.6	CRDMs/ICIs/Service Structure Removal		286	277	211	48	-	763	-	431	2,016	2,016	-	-	-	4,797	-	-	-	177,400	8,104	-
2a.1.1.7	Reactor Vessel Internals		78	4,468	21,874	1,072	-	7,946	277	13,141	48,856	48,856	-	-	-	501	125	673	-	164,987	23,040	1,080
2a.1.1.8	Reactor Vessel		89	5,717	1,754	719	-	1,956	277	5,970	16,483	16,483	-	-	-	5,690	-	-	-	570,074	23,040	1,080
2a.1.1	Totals		855	13,600	26,512	3,662	1,246	15,913	553	22,568	84,908	84,908	-	-	18,672	27,341	125	673	-	3,119,620	75,446	6,073
Removal of Major Equipment																						
2a.1.2	Main Turbine/Generator		-	305	189	55	272	306	-	221	1,348	1,348	-	-	2,131	1,187	-	-	-	206,316	4,667	-
2a.1.3	Main Condensers		-	2,532	121	49	364	451	-	820	4,336	4,336	-	-	3,800	1,587	-	-	-	275,903	39,151	-
Cascading Costs from Clean Building Demolition																						
2a.1.4.1	Reactor		-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
2a.1.4	Totals		-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
Disposal of Plant Systems																						
2a.1.5.1	Air Removal		-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	452	-
2a.1.5.2	Auxiliary Feedwater		-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	670	-
2a.1.5.3	Auxiliary Feedwater - RCA		-	45	0	1	19	-	-	14	79	79	-	-	215	-	-	-	-	8,722	601	-
2a.1.5.4	Bleed Steam		-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,335	-
2a.1.5.5	Caustic Addition - RCA		-	36	0	1	20	-	-	12	71	71	-	-	233	-	-	-	-	9,453	444	-
2a.1.5.6	Chemical Feed		-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	304	-
2a.1.5.7	Chemical Feed - RCA		-	1	0	0	1	-	-	0	2	2	-	-	6	-	-	-	-	243	12	-
2a.1.5.8	Circulating Water		-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	619	-
2a.1.5.9	Condensate		-	414	-	-	-	-	-	62	476	-	-	476	-	-	-	-	-	-	6,837	-
2a.1.5.10	Condensate Polishing		-	205	-	-	-	-	-	31	236	-	-	236	-	-	-	-	-	-	3,420	-
2a.1.5.11	Condensate Polishing - RCA		-	176	4	12	180	-	-	73	444	444	-	-	2,078	-	-	-	-	84,395	2,329	-
2a.1.5.12	Electro-hydraulic		-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	127	-
2a.1.5.13	Feedwater		-	133	-	-	-	-	-	20	153	-	-	153	-	-	-	-	-	-	2,215	-
2a.1.5.14	Feedwater - RCA		-	186	6	19	278	-	-	91	579	579	-	-	3,208	-	-	-	-	130,294	2,651	-
2a.1.5.15	Gland Seal		-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	505	-
2a.1.5.16	Heater Drain		-	349	-	-	-	-	-	52	401	-	-	401	-	-	-	-	-	-	5,881	-
2a.1.5.17	Internal Circ Water & CDSR		-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	389	-
2a.1.5.18	Main Gen/Exciter/Transformer		-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2a.1.5.19	Main Steam		-	101	-	-	-	-	-	15	116	-	-	116	-	-	-	-	-	-	1,690	-
2a.1.5.20	Main Steam - RCA		-	350	9	29	436	-	-	158	983	983	-	-	5,044	-	-	-	-	204,825	4,956	-
2a.1.5.21	Steam Generator Blowdown		-	459	21	22	176	195	-	195	1,067	1,067	-	-	2,031	686	-	-	-	127,773	6,667	-
2a.1.5.22	Steam Generators		-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2a.1.5.23	Turbine & Moisture Separators		-	337	-	-	-	-	-	51	388	-	-	388	-	-	-	-	-	-	5,609	-
2a.1.5.24	Turbine Oil Purification		-	61	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	1,003	-
2a.1.5	Totals		-	3,117	40	85	1,108	195	-	825	5,370	3,226	-	2,145	12,815	686	-	-	-	565,705	48,794	-
2a.1.6	Scaffolding in support of decommissioning		-	854	3	1	13	3	-	217	1,092	1,092	-	-	138	12	-	-	-	7,016	6,368	-
2a.1	Subtotal Period 2a Activity Costs		855	21,136	26,865	3,852	3,004	16,868	553	24,759	97,891	95,747	-	2,145	37,556	30,812	125	673	-	4,174,560	182,015	6,073
Period 2a Additional Costs																						
2a.2.1	Remedial Action Surveys		-	-	-	-	-	-	2,126	638	2,764	2,764	-	-	-	-	-	-	-	-	27,791	-
2a.2.2	Retired RPV upper internals package		1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
2a.2	Subtotal Period 2a Additional Costs		1	659	785	107	-	1,439	2,126	2,075	7,191	7,191	-	-	-	2,097	125	-	-	205,890	29,966	87
Period 2a Collateral Costs																						
2a.3.1	Process decommissioning water waste		47	-	31	81	-	126	-	70	356	356	-	-	-	302	-	-	-	18,119	59	-
2a.3.3	Small tool allowance		-	223	-	-	-	-	-	33	257	231	-	26	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer		-	-	-	-	-	-	1,476	221	1,698	-	1,698	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance		-	-	-	-	-	-	12,156	1,823	13,980	13,980	-	-	-	-	-	-	-	-	-	-
2a.3.6	Prairie Island Indian Community Payments		-	-	-	-	-	-	1,670	-	1,670	-	1,670	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs		47	223	31	81	-	126	15,302	2,149	17,960	14,567	3,367	26	-	302	-	-	-	18,119	59	-

Table G-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	93	-	-	-	-	-	-	23	116	116	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	683	68	751	751	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	3,542	354	3,896	3,896	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,717	-	-	-	-	-	429	2,146	2,146	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,935	-	-	-	-	-	440	3,376	3,376	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	79	23	-	295	-	85	482	482	-	-	-	3,623	-	-	-	72,452	118	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,924	289	2,212	2,212	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	774	77	851	851	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,717	172	1,888	-	1,888	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	1,655	248	1,904	1,904	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	537	80	617	-	617	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	69	10	79	-	79	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	286	43	328	328	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	9,811	1,472	11,283	11,283	-	-	-	-	-	-	-	-	-	162,878
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	18,392	2,759	21,150	21,150	-	-	-	-	-	-	-	-	-	211,351
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	24,265	3,640	27,904	27,904	-	-	-	-	-	-	-	-	-	392,305
2a.4	Subtotal Period 2a Period-Dependent Costs	93	4,652	79	23	-	295	63,653	10,190	78,986	76,401	2,585	-	-	3,623	-	-	-	72,452	118	766,534
2a.0	TOTAL PERIOD 2a COST	995	26,670	27,760	4,062	3,004	18,729	81,635	39,172	202,027	193,905	5,952	2,170	37,556	36,834	250	673	-	4,471,020	212,158	772,694
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Aux Bldg Normal Ventilation	-	2	0	0	0	-	-	1	3	3	-	-	3	-	-	-	-	140	29	-
2b.1.1.2	Battery Rm Special Ventilation	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
2b.1.1.3	Buildings Maintenance	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	65	-
2b.1.1.4	Chemical & Volume Control	1,077	1,331	83	69	389	802	-	1,149	4,901	4,901	-	-	4,498	2,846	-	-	-	369,246	34,533	-
2b.1.1.5	Component Cooling - RCA	-	821	22	72	1,075	-	-	379	2,369	2,369	-	-	12,427	-	-	-	-	504,675	11,242	-
2b.1.1.6	Containment Cooling	-	65	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	1,086	-
2b.1.1.7	Containment Cooling - RCA	-	290	6	20	294	-	-	120	730	730	-	-	3,400	-	-	-	-	138,090	3,971	-
2b.1.1.8	Containment Hydrogen Control - RCA	-	29	0	1	9	-	-	9	48	48	-	-	105	-	-	-	-	4,278	401	-
2b.1.1.9	Containment Spray - RCA	-	90	2	5	75	-	-	35	206	206	-	-	868	-	-	-	-	35,249	1,217	-
2b.1.1.10	Containment Ventilation	-	243	24	40	428	209	-	186	1,130	1,130	-	-	4,951	737	-	-	-	249,786	3,668	-
2b.1.1.11	Cooling Water	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	2,396	-
2b.1.1.12	Cooling Water - RCA	-	629	14	45	668	-	-	266	1,622	1,622	-	-	7,728	-	-	-	-	313,832	8,594	-
2b.1.1.13	D1 Emergency Diesel	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	730	-
2b.1.1.14	D2 Emergency Diesel	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	522	-
2b.1.1.15	Diesel Rooms Ventilation	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	135	-
2b.1.1.16	Electrical - Clean	-	1,669	-	-	-	-	-	250	1,919	-	-	1,919	-	-	-	-	-	-	26,981	-
2b.1.1.17	Electrical - Contaminated	-	592	6	16	219	27	-	191	1,051	1,051	-	-	2,527	95	-	-	-	108,935	8,377	-
2b.1.1.18	Electrical - Decontaminated	-	3,674	41	137	2,037	-	-	1,249	7,138	7,138	-	-	23,551	-	-	-	-	956,401	49,378	-
2b.1.1.19	Fuel Handling	-	116	6	9	79	62	-	58	329	329	-	-	908	218	-	-	-	51,280	1,784	-
2b.1.1.20	Fuel Oil	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	1,697	-
2b.1.1.21	HVAC - Clean	-	105	-	-	-	-	-	16	121	-	-	121	-	-	-	-	-	-	1,891	-
2b.1.1.22	HVAC - Contaminated	-	371	8	21	282	35	-	148	864	864	-	-	3,261	123	-	-	-	140,573	5,032	-
2b.1.1.23	Incore Instrumentation	0	27	1	1	5	16	-	12	64	64	-	-	60	57	-	-	-	6,177	425	-
2b.1.1.24	Misc Drains & Vents	-	222	14	10	34	146	-	100	527	527	-	-	390	514	-	-	-	49,900	3,091	-
2b.1.1.25	Reactor Coolant	148	298	21	14	30	221	-	213	945	945	-	-	344	777	-	-	-	65,413	6,470	-
2b.1.1.26	Reactor Hot Sampling	144	131	11	6	6	98	-	132	527	527	-	-	66	342	-	-	-	25,347	3,946	-
2b.1.1.27	Reactor Makeup	-	64	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	1,042	-
2b.1.1.28	Reactor Vessel	9	20	1	0	2	4	-	11	47	47	-	-	26	14	-	-	-	2,011	425	-
2b.1.1.29	Residual Heat Removal	344	399	85	66	250	926	-	559	2,630	2,630	-	-	2,895	3,252	-	-	-	332,849	7,621	-
2b.1.1.30	Safeguards Chilled Water	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	259	-
2b.1.1.31	Safety Injection	-	853	40	57	587	327	-	396	2,261	2,261	-	-	6,788	1,156	-	-	-	351,793	12,561	-
2b.1.1.32	Sampling	-	58	4	2	5	31	-	23	122	122	-	-	59	107	-	-	-	9,505	811	-
2b.1.1.33	Shield Bldg Ventilation	-	133	14	20	186	139	-	100	593	593	-	-	2,152	491	-	-	-	119,838	2,030	-
2b.1.1.34	Station & Instrument Air	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	300	-
2b.1.1.35	Station & Instrument Air - RCA	-	79	1	2	29	-	-	24	135	135	-	-	332	-	-	-	-	13,496	1,053	-
2b.1.1.36	Turbine Bldg Traps & Drains	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	767	-
2b.1.1.37	Unit Coolers	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	611	-
2b.1.1.38	Unit Coolers - RCA	-	53	0	1	20	-	-	16	91	91	-	-	230	-	-	-	-	9,348	683	-
2b.1.1	Totals	1,724	12,813	403	614	6,710	3,044	-	5,730	31,037	28,333	-	2,704	77,571	10,728	-	-	-	3,858,165	205,829	-
2b.1.2	Scaffolding in support of decommissioning	-	1,067	4	1	17	4	-	271	1,364	1,364	-	-	173	15	-	-	-	8,770	7,960	-

Table G-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,150	2,623	139	852	193	11,079	-	4,171	20,208	20,208	-	-	2,230	57,414	-	-	-	3,559,624	50,842	-
2b.1.3.2	Backwash Waste Receiving Tank	-	27	1	11	-	87	-	30	158	158	-	-	-	507	-	-	-	43,896	299	-
2b.1.3	Totals	1,150	2,650	141	864	193	11,166	-	4,202	20,366	20,366	-	-	2,230	57,921	-	-	-	3,603,520	51,140	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan									a											
2b.1	Subtotal Period 2b Activity Costs	2,874	16,530	547	1,479	6,919	14,215	481	10,275	53,320	50,616	-	2,704	79,974	68,664	-	-	-	7,470,455	264,930	4,096
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,943	583	2,526	2,526	-	-	-	-	-	-	-	-	25,399	-
2b.2.2	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
2b.2	Subtotal Period 2b Additional Costs	-	-	9	29	312	-	1,943	635	2,928	2,928	-	-	5,855	-	-	-	-	146,375	25,415	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	105	-	70	182	-	285	-	158	800	800	-	-	-	680	-	-	-	40,799	133	-
2b.3.2	Process decommissioning chemical flush waste	3	-	87	327	-	651	-	222	1,289	1,289	-	-	-	875	-	-	-	93,252	164	-
2b.3.3	Small tool allowance	-	289	-	-	-	-	-	43	332	332	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	4,321	648	4,969	-	4,969	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	6,994	1,049	8,043	8,043	-	-	-	-	-	-	-	-	-	-
2b.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,525	-	1,525	-	1,525	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	107	289	157	509	-	936	12,841	2,120	16,958	10,463	6,495	-	-	1,555	-	-	-	134,051	296	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	482	-	-	-	-	-	-	121	603	603	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	624	62	687	687	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	3,099	310	3,409	3,409	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	1,969	-	-	-	-	-	492	2,461	2,461	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	2,759	-	-	-	-	-	414	3,173	3,173	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	78	23	-	293	-	85	479	479	-	-	-	3,600	-	-	-	71,996	117	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,388	208	1,596	1,596	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	707	71	778	778	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,569	157	1,726	-	1,726	-	-	-	-	-	-	-	-	-
2b.4.10	Fixed Overhead	-	-	-	-	-	-	1,513	227	1,740	1,740	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	490	74	564	-	564	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	247	37	284	284	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	63	9	73	-	73	-	-	-	-	-	-	-	-	-
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	8,299	1,245	9,544	9,544	-	-	-	-	-	-	-	-	-	137,246
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	11,450	1,718	13,168	13,168	-	-	-	-	-	-	-	-	-	137,246
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	15,293	2,294	17,586	17,586	-	-	-	-	-	-	-	-	-	255,430
2b.4	Subtotal Period 2b Period-Dependent Costs	482	4,728	78	23	-	293	44,813	7,533	57,951	55,588	2,362	-	-	3,600	-	-	-	71,996	117	529,921
2b.0	TOTAL PERIOD 2b COST	3,464	21,546	792	2,040	7,231	15,444	60,078	20,563	131,157	119,596	8,857	2,704	85,829	73,819	-	-	-	7,822,876	290,758	534,017
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	73,918	11,088	85,005	-	85,005	-	-	-	-	-	-	-	-	-
2c.3.2	Retention and Severance	-	-	-	-	-	-	4,478	672	5,149	5,149	-	-	-	-	-	-	-	-	-	-
2c.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,702	-	2,702	-	2,702	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	81,097	11,759	92,857	5,149	87,707	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	1,104	110	1,215	1,215	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	5,154	515	5,669	5,669	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	390	-	-	-	-	-	98	488	488	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	18	5	-	66	-	19	108	108	-	-	-	809	-	-	-	16,171	26	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	655	98	753	753	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	555	55	610	610	-	-	-	-	-	-	-	-	-	-
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	2,776	278	3,053	-	3,053	-	-	-	-	-	-	-	-	-

Table G-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2c Period-Dependent Costs (continued)																					
2c.4.8	Fixed Overhead	-	-	-	-	-	-	2,676	401	3,078	3,078	-	-	-	-	-	-	-	-	-	-
2c.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	87	13	101	101	-	-	-	-	-	-	-	-	-	-
2c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	112	17	128	-	128	-	-	-	-	-	-	-	-	-
2c.4.11	Railroad Track Maintenance	-	-	-	-	-	-	125	19	143	143	-	-	-	-	-	-	-	-	-	-
2c.4.12	Security Staff Cost	-	-	-	-	-	-	14,681	2,202	16,883	16,883	-	-	-	-	-	-	-	-	-	242,796
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	2,064	310	2,374	2,374	-	-	-	-	-	-	-	-	-	33,722
2c.4	Subtotal Period 2c Period-Dependent Costs	-	390	18	5	-	66	29,988	4,135	34,602	31,421	3,181	-	-	809	-	-	-	16,171	26	276,518
2c.0	TOTAL PERIOD 2c COST	-	390	18	5	-	66	115,434	16,547	132,459	41,570	90,889	-	-	809	-	-	-	16,171	26	276,518
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	328	32	94	32	-	595	-	335	1,416	1,416	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical - Contaminated - Fuel Pool	-	147	2	4	53	7	-	47	259	259	-	-	615	23	-	-	-	26,508	2,077	-
2d.1.2.2	Electrical - Decontaminated - Fuel Pool	-	918	10	34	510	-	-	312	1,785	1,785	-	-	5,893	-	-	-	-	239,327	12,340	-
2d.1.2.3	HVAC - Contaminated - Fuel Pool	-	159	3	9	121	15	-	63	370	370	-	-	1,398	53	-	-	-	60,246	2,157	-
2d.1.2.4	Safeguards Chilled Water - RCA	-	82	1	3	43	-	-	27	155	155	-	-	495	-	-	-	-	20,100	1,019	-
2d.1.2.5	Spent Fuel Pool Cooling	293	342	34	25	70	377	-	344	1,484	1,484	-	-	806	1,325	-	-	-	120,439	7,613	-
2d.1.2.6	Station & Instrument Air - RCA Fuel Pool	-	20	0	0	7	-	-	6	34	34	-	-	83	-	-	-	-	3,374	263	-
2d.1.2	Totals	293	1,668	50	75	804	399	-	800	4,088	4,088	-	-	9,290	1,401	-	-	-	469,994	25,468	-
2d.1.4	Scaffolding in support of decommissioning	-	213	1	0	3	1	-	54	273	273	-	-	35	3	-	-	-	1,754	1,592	-
2d.1	Subtotal Period 2d Activity Costs	621	1,913	145	107	807	994	-	1,189	5,777	5,777	-	-	9,325	3,496	-	-	-	610,046	27,637	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	16,173	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,082	625	2,706	2,706	-	-	-	-	-	-	-	-	16,173	6,240
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	27	-	18	48	-	75	-	41	209	209	-	-	-	179	-	-	-	10,724	35	-
2d.3.2	Process decommissioning chemical flush waste	1	-	32	121	-	241	-	82	478	478	-	-	-	324	-	-	-	34,576	61	-
2d.3.3	Small tool allowance	-	35	-	-	-	-	-	5	41	41	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13,144	1,972	15,115	-	15,115	-	-	-	-	-	-	-	-	-
2d.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	971	-	971	-	971	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	27	35	194	224	575	467	14,114	2,247	17,884	1,798	16,086	-	6,000	1,032	-	-	-	350,268	184	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	54	-	-	-	-	-	-	14	68	68	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	398	40	437	437	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,740	174	1,914	1,914	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	559	-	-	-	-	-	140	699	699	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,757	-	-	-	-	-	264	2,020	2,020	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	18	5	-	67	-	19	110	110	-	-	-	829	-	-	-	16,581	27	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	471	71	542	542	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	381	38	419	419	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	999	100	1,099	-	1,099	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	963	144	1,108	1,108	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	315	47	362	362	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	40	6	46	-	46	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	5,123	768	5,891	5,891	-	-	-	-	-	-	-	-	-	84,157
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,065	910	6,975	6,975	-	-	-	-	-	-	-	-	-	69,996
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	7,796	1,169	8,966	8,527	439	-	-	-	-	-	-	-	-	126,236
2d.4	Subtotal Period 2d Period-Dependent Costs	54	2,316	18	5	-	67	24,337	3,911	30,708	29,123	1,584	-	-	829	-	-	-	16,581	27	280,390
2d.0	TOTAL PERIOD 2d COST	703	4,264	357	337	1,382	1,528	40,533	7,971	57,075	39,405	17,670	-	15,325	5,357	-	-	-	976,895	44,021	286,630

Table G-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	934	-	934	-	934	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,122	178	2,300	1,367	934	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,626	163	1,789	1,789	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	420	-	-	-	-	-	105	524	524	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	334	-	-	-	6,685	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	417	42	459	459	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	51	5	56	-	56	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	39	6	44	-	44	-	-	-	-	-	-	-	-	-
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	4,924	739	5,663	5,663	-	-	-	-	-	-	-	-	-	80,898
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	3,854	578	4,433	4,007	426	-	-	-	-	-	-	-	-	59,507
2f.4	Subtotal Period 2f Period-Dependent Costs	-	420	7	2	-	27	16,591	2,477	19,524	18,998	526	-	-	334	-	-	-	6,685	11	186,687
2f.0	TOTAL PERIOD 2f COST	-	420	7	2	-	27	22,106	3,674	26,236	24,776	1,460	-	-	334	-	-	-	6,685	40,183	189,807
PERIOD 2 TOTALS		5,161	53,290	28,935	6,446	11,617	35,794	319,784	87,926	548,954	419,252	124,828	4,875	138,709	117,153	250	673	-	13,293,650	587,146	2,059,666
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	4,255	-	-	-	-	-	638	4,894	-	-	4,894	-	-	-	-	-	-	44,669	-
3b.1.1.2	Condensate Storage Tank Foundation	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	16	-
3b.1.1.3	Structures below 3' below grade	-	1,581	-	-	-	-	-	237	1,818	-	-	1,818	-	-	-	-	-	-	8,411	-
3b.1.1.4	Turbine	-	1,983	-	-	-	-	-	297	2,280	-	-	2,280	-	-	-	-	-	-	22,040	-
3b.1.1.5	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
3b.1.1	Totals	-	8,171	-	-	-	-	-	1,226	9,397	-	-	9,397	-	-	-	-	-	-	76,993	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	8,602	-	-	-	-	183	1,318	10,102	211	-	9,892	-	-	-	-	-	-	77,914	1,560
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	2,213	-	-	-	-	3	332	2,549	-	-	2,549	-	-	-	-	-	-	8,386	-
3b.2.2	Underground Services Excavations	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
3b.2.3	Intake Structure Cofferdam	-	596	-	-	-	-	-	89	686	-	-	686	-	-	-	-	-	-	5,168	-
3b.2.4	Construction Debris	-	-	-	-	-	-	10	2	12	12	-	-	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	2,751	-	-	-	-	-	413	3,164	-	-	3,164	-	-	-	-	-	-	2,904	-
3b.2	Subtotal Period 3b Additional Costs	-	6,371	-	-	-	-	534	1,036	7,941	12	-	7,929	-	-	-	-	-	-	23,865	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	110	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	-	-
3b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,651	-	2,651	-	2,651	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	110	-	-	-	-	2,651	16	2,777	-	2,651	126	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table G-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	542	54	596	-	596	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	4,334	433	4,767	-	4,767	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	236	24	259	-	259	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	145	14	159	-	159	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	331	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	4,245	637	4,882	-	4,882	-	-	-	-	-	-	-	-	57,340
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	4,813	722	5,535	(0)	1,207	4,329	-	-	-	-	-	-	-	74,431
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,670	-	-	-	-	26,534	4,718	37,921	(0)	11,997	25,924	-	-	-	-	-	-	-	248,656
3b.0	TOTAL PERIOD 3b COST	-	21,752	-	-	-	-	29,901	7,088	58,741	222	14,648	43,871	-	-	-	-	-	-	101,779	250,216
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	84,962	12,744	97,707	-	97,707	-	-	-	-	-	-	-	-	-
3c.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	43,116	-	43,116	-	43,116	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	128,079	12,744	140,823	-	140,823	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	8,818	882	9,700	-	9,700	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	39,829	3,983	43,812	-	43,812	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	5,648	565	6,213	-	6,213	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	2,360	236	2,596	-	2,596	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	5,267	790	6,057	-	6,057	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,782	267	2,049	-	2,049	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,991	299	2,289	-	2,289	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	69,105	10,366	79,471	-	79,471	-	-	-	-	-	-	-	-	933,362
3c.4.10	Utility Staff Cost	-	-	-	-	-	-	17,069	2,560	19,629	-	19,629	-	-	-	-	-	-	-	-	242,315
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	151,870	19,948	171,817	-	171,817	-	-	-	-	-	-	-	-	1,175,677
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	279,948	32,692	312,640	-	312,640	-	-	-	-	-	-	-	-	1,175,677
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	-	8,689	-	1,636	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1.1	Totals	-	-	1,331	-	-	-	8,689	-	1,636	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	-	8,689	-	1,636	11,656	-	-	-	-	-	-	3,746	837,596	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	26	4	29	-	29	-	-	-	-	-	-	-	-	-
3d.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	48	-	48	-	48	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	73	4	77	-	77	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	10	1	11	11	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	39	4	43	43	-	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	3	0	3	-	3	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	2	0	3	3	-	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	77	12	88	88	-	-	-	-	-	-	-	-	-	1,037
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	19	3	22	22	-	-	-	-	-	-	-	-	-	269
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	162	21	183	173	10	-	-	-	-	-	-	-	-	1,306
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	-	8,689	1,661	11,916	11,829	87	-	-	-	-	-	3,746	837,596	-	1,306

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table G-1
Prairie Island Nuclear Generating Plant, Unit 1
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	15	48	2	214	-	2,289	867	859	4,293	4,293	-	-	-	8,229	-	-	-	1,119,503	5,267	924
3e.2	Subtotal Period 3e Additional Costs	15	48	2	214	-	2,289	867	859	4,293	4,293	-	-	-	8,229	-	-	-	1,119,503	5,267	924
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	96	24	121	121	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	26	6	32	32	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	51	13	63	63	-	-	-	-	-	-	-	-	-	-
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	19	5	24	24	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	154	38	192	192	-	-	-	-	-	-	-	-	-	2,500
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	130	33	163	163	-	-	-	-	-	-	-	-	-	1,896
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	476	119	595	595	-	-	-	-	-	-	-	-	-	4,396
3e.0	TOTAL PERIOD 3e COST	15	48	2	214	-	2,289	1,343	978	4,888	4,888	-	-	-	8,229	-	-	-	1,119,503	5,267	5,320
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	715	-	-	-	-	109	124	948	-	-	948	-	-	-	-	-	-	3,748	160
3f.2	Subtotal Period 3f Additional Costs	-	715	-	-	-	-	109	124	948	-	-	948	-	-	-	-	-	-	3,748	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	13	1	14	-	-	14	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	25	4	29	-	-	29	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	10	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	78	12	89	-	-	89	-	-	-	-	-	-	-	1,260
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	782
3f.4	Subtotal Period 3f Period-Dependent Costs	-	62	-	-	-	-	190	37	289	-	-	289	-	-	-	-	-	-	-	2,042
3f.0	TOTAL PERIOD 3f COST	-	782	-	-	-	-	300	162	1,243	-	-	1,243	-	-	-	-	-	-	3,748	2,202
PERIOD 3 TOTALS		15	22,582	1,333	214	-	10,978	311,727	42,580	389,429	16,940	327,375	45,114	-	8,229	-	-	3,746	1,957,099	110,795	1,434,720
TOTAL COST TO DECOMMISSION		8,749	81,241	30,683	7,111	11,781	50,744	742,143	149,771	1,082,223	572,323	458,457	51,443	144,842	139,346	839	673	3,746	15,860,890	743,467	4,498,807

TOTAL COST TO DECOMMISSION WITH 16.06% CONTINGENCY:	\$1,082,223	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 52.88% OR:	\$572,323	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 42.36% OR:	\$458,457	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 4.75% OR:	\$51,443	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	140,858	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	32,925	tons
TOTAL CRAFT LABOR REQUIREMENTS:	743,467	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table G-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.13	Perform SER and EA	-	-	-	-	-	-	156	23	179	179	-	-	-	-	-	-	-	-	-	1,326
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	251	38	289	289	-	-	-	-	-	-	-	-	-	2,138
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	247	37	284	256	-	28	-	-	-	-	-	-	-	2,104
1a.1.17.2	Plant systems	-	-	-	-	-	-	209	31	241	216	-	24	-	-	-	-	-	-	-	1,782
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,036
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	326	49	375	375	-	-	-	-	-	-	-	-	-	2,779
1a.1.17.6	Biological shield	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,334
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	80	12	92	46	-	46	-	-	-	-	-	-	-	684
1a.1.17.9	Main Turbine	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	157	23	180	90	-	90	-	-	-	-	-	-	-	1,334
1a.1.17.12	Waste management	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	45	7	52	26	-	26	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	1,899	285	2,183	1,923	-	261	-	-	-	-	-	-	-	16,175
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	120	18	139	139	-	-	-	-	-	-	-	-	-	1,026
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	9,523	1,428	10,951	10,690	-	261	-	-	-	-	-	-	-	33,420
Period 1a Additional Costs																					
1a.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,227	184	1,411	-	1,411	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	8,394	1,259	9,653	9,653	-	-	-	-	-	-	-	-	-	-
1a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,281	-	2,281	-	2,281	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,902	1,443	13,345	9,653	3,692	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,682	268	2,950	2,950	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	485	-	-	-	-	-	121	606	606	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	12	4	-	46	-	13	75	75	-	-	-	565	-	-	-	11,299	18	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	778	78	855	855	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	20,662	3,099	23,761	23,761	-	-	-	-	-	-	-	-	-	345,280

Table G-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,052	12	4	-	46	38,340	5,631	45,085	42,800	2,286	-	-	565	-	-	-	11,299	18	468,000
1a.0	TOTAL PERIOD 1a COST	-	1,052	12	4	-	46	67,559	9,672	78,345	72,107	5,977	261	-	565	-	-	-	11,299	18	501,420
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	238	36	273	246	-	27	-	-	-	-	-	-	-	2,024
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	1,069
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	68	10	78	19	-	58	-	-	-	-	-	-	-	577
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	182	27	210	210	-	-	-	-	-	-	-	-	-	1,552
1b.1.1.9	Facility closeout	-	-	-	-	-	-	60	9	69	35	-	35	-	-	-	-	-	-	-	513
1b.1.1.10	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	192
1b.1.1.11	Biological shield	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	513
1b.1.1.12	Steam generators	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	50	8	58	29	-	29	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
1b.1.1.15	Main Condensers	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
1b.1.1.17	Reactor building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
1b.1.1	Total	-	-	-	-	-	-	1,669	250	1,919	1,558	-	361	-	-	-	-	-	-	-	14,215
1b.1.2	Decon primary loop	552	-	-	-	-	-	-	276	828	828	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	552	-	-	-	-	-	1,669	526	2,747	2,386	-	361	-	-	-	-	-	-	1,067	14,215
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	1,582	475	2,057	2,057	-	-	-	-	-	-	-	-	8,988	3,563
1b.2.2	Mixed/Hazardous Waste	-	-	326	75	169	-	-	69	639	639	-	-	6,324	-	-	-	-	362,914	2,410	-
1b.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
1b.2	Subtotal Period 1b Additional Costs	-	2,364	328	185	169	1,359	1,582	1,491	7,478	7,478	-	-	6,324	12,843	-	-	-	529,873	32,305	3,563
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	24	-	16	41	-	64	-	36	180	180	-	-	-	152	-	-	-	9,121	30	-
1b.3.4	Process decommissioning chemical flush waste	2	-	58	220	-	2,471	-	657	3,408	3,408	-	-	-	-	588	-	-	62,689	110	-
1b.3.5	Small tool allowance	-	34	-	-	-	-	-	5	39	39	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,987	-	-	-	-	-	-	298	2,285	2,285	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	370	56	426	-	426	-	-	-	-	-	-	-	-	-
1b.3.9	Retention and Severance	-	-	-	-	-	-	4,055	608	4,664	4,664	-	-	-	-	-	-	-	-	-	-
1b.3.10	Prairie Island Indian Community Payments	-	-	-	-	-	-	629	-	629	-	629	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,986	1,234	74	261	-	2,534	6,243	2,164	15,495	14,441	1,055	-	-	152	588	-	-	71,810	140	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	35	-	-	-	-	-	-	9	44	44	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	872	87	959	959	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,319	132	1,451	1,451	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	380	-	-	-	-	-	95	475	475	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	286	-	-	-	-	-	43	329	329	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	327	-	-	-	6,541	11	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,527	229	1,756	1,756	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	214	21	236	236	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	809	81	890	-	890	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	741	111	852	852	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	202	30	233	-	233	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	26	4	30	-	30	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	3,725	559	4,284	4,284	-	-	-	-	-	-	-	-	-	61,864
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	4,009	601	4,610	4,610	-	-	-	-	-	-	-	-	-	47,185
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	10,416	1,562	11,978	11,978	-	-	-	-	-	-	-	-	-	174,059
1b.4	Subtotal Period 1b Period-Dependent Costs	35	666	7	2	-	27	23,890	3,577	28,204	27,052	1,152	-	-	327	-	-	-	6,541	11	283,108

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table G-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1b.0	TOTAL PERIOD 1b COST	3,573	4,264	410	447	169	3,920	33,383	7,759	53,923	51,356	2,207	361	6,324	13,322	588	-	-	608,224	33,522	300,885
PERIOD 1 TOTALS		3,573	5,316	422	451	169	3,966	100,942	17,430	132,268	123,462	8,184	622	6,324	13,887	588	-	-	619,523	33,540	802,305
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	51	45	6	8	-	150	-	76	336	336	-	-	-	305	-	-	-	34,809	1,414	-
2a.1.1.2	Pressurizer Relief Tank	22	20	4	5	-	100	-	42	193	193	-	-	-	203	-	-	-	23,193	625	-
2a.1.1.3	Reactor Coolant Pumps & Motors	54	63	101	83	-	736	-	249	1,287	1,287	-	-	-	2,332	-	-	-	295,800	2,049	100
2a.1.1.4	Pressurizer	48	68	467	88	-	693	-	274	1,639	1,639	-	-	-	2,196	-	-	-	185,015	2,355	938
2a.1.1.5	Steam Generators	225	2,943	2,093	1,638	1,246	3,570	-	2,383	14,097	14,097	-	-	18,672	11,316	-	-	-	1,668,341	14,819	2,875
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	286	277	211	48	-	763	-	431	2,016	2,016	-	-	-	4,797	-	-	-	177,400	8,104	-
2a.1.1.7	Reactor Vessel Internals	78	4,468	21,874	1,072	-	7,946	277	13,141	48,856	48,856	-	-	-	501	125	673	-	164,987	23,040	1,080
2a.1.1.8	Reactor Vessel	89	5,717	1,754	719	-	1,956	277	5,970	16,483	16,483	-	-	-	5,690	-	-	-	570,074	23,040	1,080
2a.1.1	Totals	855	13,600	26,512	3,662	1,246	15,913	553	22,568	84,908	84,908	-	-	18,672	27,341	125	673	-	3,119,620	75,446	6,073
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	305	189	55	272	306	-	221	1,348	1,348	-	-	2,131	1,187	-	-	-	206,316	4,667	-
2a.1.3	Main Condensers	-	2,532	121	49	364	451	-	820	4,336	4,336	-	-	3,800	1,587	-	-	-	275,903	39,151	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
2a.1.4.2	Auxiliary	-	210	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	1,309	-
2a.1.4.3	Radwaste	-	8	-	-	-	-	-	1	9	9	-	-	-	-	-	-	-	-	65	-
2a.1.4	Totals	-	946	-	-	-	-	-	142	1,088	1,088	-	-	-	-	-	-	-	-	8,963	-
Disposal of Plant Systems																					
2a.1.5.1	Admin Bldg Ventilation	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	90	-
2a.1.5.2	Air Removal	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	422	-
2a.1.5.3	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	676	-
2a.1.5.4	Auxiliary Feedwater - RCA	-	36	0	1	15	-	-	12	65	65	-	-	178	-	-	-	-	7,214	486	-
2a.1.5.5	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,331	-
2a.1.5.6	Caustic Addition - RCA	-	38	0	1	21	-	-	13	74	74	-	-	240	-	-	-	-	9,761	468	-
2a.1.5.7	Chemical Feed	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	261	-
2a.1.5.8	Chemical Feed - RCA	-	3	0	0	1	-	-	1	5	5	-	-	16	-	-	-	-	634	31	-
2a.1.5.9	Circulating Water	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	401	-
2a.1.5.10	Condensate	-	459	-	-	-	-	-	69	527	-	-	527	-	-	-	-	-	-	7,537	-
2a.1.5.11	Condensate Polishing	-	181	-	-	-	-	-	27	209	-	-	209	-	-	-	-	-	-	2,987	-
2a.1.5.12	Condensate Polishing - RCA	-	36	1	3	42	-	-	16	98	98	-	-	483	-	-	-	-	19,616	493	-
2a.1.5.13	Electro-Hydraulic	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	143	-
2a.1.5.14	External Circulating Water	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	385	-
2a.1.5.15	External Circulating Water - RCA	-	70	1	4	62	-	-	28	165	165	-	-	721	-	-	-	-	29,284	938	-
2a.1.5.16	Feedwater	-	111	-	-	-	-	-	17	128	-	-	128	-	-	-	-	-	-	1,840	-
2a.1.5.17	Feedwater - RCA	-	236	7	24	359	-	-	117	744	744	-	-	4,147	-	-	-	-	168,414	3,377	-
2a.1.5.18	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	504	-
2a.1.5.19	Heater Drain	-	334	-	-	-	-	-	50	384	-	-	384	-	-	-	-	-	-	5,638	-
2a.1.5.20	Hypobromous Acid Feed	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	86	-
2a.1.5.21	Hypobromous Acid Feed - RCA	-	1	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	100	12	-
2a.1.5.22	Internal Circ Water & CDSR	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	366	-
2a.1.5.23	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2a.1.5.24	Main Steam	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	1,482	-
2a.1.5.25	Main Steam - RCA	-	364	9	30	447	-	-	163	1,013	1,013	-	-	5,166	-	-	-	-	209,799	5,146	-
2a.1.5.26	Repairable Spare Snubbers	-	6	0	0	1	-	-	2	8	8	-	-	12	-	-	-	-	490	82	-
2a.1.5.27	Steam Exclusion	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	32	-
2a.1.5.28	Steam Exclusion - RCA	-	4	0	0	2	-	-	1	8	8	-	-	24	-	-	-	-	966	47	-
2a.1.5.29	Steam Generator Blowdown	-	398	20	21	165	179	-	174	957	957	-	-	1,906	631	-	-	-	119,126	5,778	-
2a.1.5.30	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2a.1.5.31	Turbine & Moisture Separators	-	329	-	-	-	-	-	49	379	-	-	379	-	-	-	-	-	-	5,472	-
2a.1.5.32	Turbine Oil Purification	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	757	-
2a.1.5.33	Water Treatment	-	394	-	-	-	-	-	59	453	-	-	453	-	-	-	-	-	-	6,677	-
2a.1.5.34	Water Treatment - RCA	-	19	0	1	10	-	-	6	37	37	-	-	115	-	-	-	-	4,652	252	-
2a.1.5	Totals	-	3,437	39	85	1,125	179	-	867	5,733	3,174	-	2,559	13,010	631	-	-	-	570,056	54,280	-
2a.1.6	Scaffolding in support of decommissioning	-	2,833	24	8	97	25	-	733	3,721	3,721	-	-	1,012	89	-	-	-	51,445	26,270	-
2a.1	Subtotal Period 2a Activity Costs	855	23,653	26,885	3,859	3,105	16,875	553	25,350	101,134	98,575	-	2,559	38,625	30,835	125	673	-	4,223,340	208,777	6,073

Table G-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,560	468	2,027	2,027	-	-	-	-	-	-	-	-	20,388	-
2a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
2a.2	Subtotal Period 2a Additional Costs	1	659	785	107	-	1,439	1,560	1,905	6,454	6,454	-	-	-	2,097	125	-	-	205,890	22,562	87
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	51	-	33	86	-	135	-	75	381	381	-	-	-	323	-	-	-	19,358	63	-
2a.3.3	Small tool allowance	-	251	-	-	-	-	-	38	289	260	-	29	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,138	321	2,459	-	2,459	-	-	-	-	-	-	-	-	-
2a.3.5	Retention and Severance	-	-	-	-	-	-	6,105	916	7,021	7,021	-	-	-	-	-	-	-	-	-	-
2a.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,224	-	1,224	-	1,224	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	51	251	33	86	-	135	9,467	1,349	11,373	7,661	3,682	29	-	323	-	-	-	19,358	63	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	68	-	-	-	-	-	-	17	85	85	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	501	50	551	551	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	2,507	251	2,758	2,758	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,622	-	-	-	-	-	406	2,028	2,028	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,153	-	-	-	-	-	323	2,477	2,477	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	89	26	-	331	-	95	541	541	-	-	-	4,063	-	-	-	81,252	133	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,411	212	1,623	1,623	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	389	39	428	428	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,259	126	1,385	-	1,385	-	-	-	-	-	-	-	-	-
2a.4.10	Fixed Overhead	-	-	-	-	-	-	1,214	182	1,396	1,396	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	394	59	453	-	453	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	51	8	58	-	58	-	-	-	-	-	-	-	-	-
2a.4.13	Railroad Track Maintenance	-	-	-	-	-	-	265	40	305	305	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	6,661	999	7,661	7,661	-	-	-	-	-	-	-	-	-	110,166
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	13,492	2,024	15,516	15,516	-	-	-	-	-	-	-	-	-	155,048
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	17,880	2,682	20,562	20,562	-	-	-	-	-	-	-	-	-	288,676
2a.4	Subtotal Period 2a Period-Dependent Costs	68	3,776	89	26	-	331	46,025	7,512	57,825	55,929	1,896	-	-	4,063	-	-	-	81,252	133	553,890
2a.0	TOTAL PERIOD 2a COST	974	28,339	27,792	4,078	3,105	18,780	57,604	36,116	176,787	168,620	5,579	2,588	38,625	37,317	250	673	-	4,529,841	231,534	560,049
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	ADT & Misc Ventilation	-	24	0	1	13	3	-	9	50	50	-	-	153	9	-	-	-	6,814	363	-
2b.1.1.2	Aux Bldg Normal Ventilation	-	67	2	5	60	11	-	29	174	174	-	-	692	39	-	-	-	30,671	1,013	-
2b.1.1.3	Aux Bldg Special Ventilation	-	13	0	0	6	2	-	5	26	26	-	-	70	6	-	-	-	3,243	197	-
2b.1.1.4	Battery Rm Special Ventilation	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	24	-
2b.1.1.5	Boron Recycle	0	4	0	0	0	3	-	2	9	9	-	-	3	9	-	-	-	709	50	-
2b.1.1.6	Chemical & Volume Control	722	902	59	44	204	560	-	770	3,260	3,260	-	-	2,356	1,977	-	-	-	225,854	23,197	-
2b.1.1.7	Cold Chemical Lab Ventilation	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
2b.1.1.8	Component Cooling - RCA	-	617	21	70	1,038	-	-	322	2,068	2,068	-	-	11,996	-	-	-	-	487,169	8,583	-
2b.1.1.9	Containment Cooling	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	502	-
2b.1.1.10	Containment Cooling - RCA	-	288	5	16	237	-	-	110	656	656	-	-	2,743	-	-	-	-	111,390	3,949	-
2b.1.1.11	Containment Hydrogen Control - RCA	-	35	0	1	12	-	-	11	60	60	-	-	141	-	-	-	-	5,742	494	-
2b.1.1.12	Containment Spray - RCA	-	186	3	8	126	-	-	67	389	389	-	-	1,453	-	-	-	-	59,019	2,617	-
2b.1.1.13	Containment Ventilation	-	224	23	38	408	205	-	177	1,075	1,075	-	-	4,721	722	-	-	-	239,450	3,375	-
2b.1.1.14	Control/Relay/Cmptr Rm Vent	-	30	1	2	23	6	-	13	74	74	-	-	260	20	-	-	-	11,915	454	-
2b.1.1.15	Cooling Water	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	2,344	-
2b.1.1.16	Cooling Water - RCA	-	456	15	49	730	-	-	232	1,482	1,482	-	-	8,442	-	-	-	-	342,822	6,311	-
2b.1.1.17	Cranes/Hoists/Elevators - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
2b.1.1.18	D3 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
2b.1.1.19	D4 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
2b.1.1.20	D5 Emergency Diesel	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
2b.1.1.21	Electrical - Clean	-	1,502	-	-	-	-	-	225	1,727	-	-	1,727	-	-	-	-	-	-	24,276	-
2b.1.1.22	Electrical - Contaminated	-	461	5	13	173	21	-	149	821	821	-	-	1,997	75	-	-	-	86,080	6,503	-
2b.1.1.23	Electrical - Decontaminated	-	2,866	33	109	1,622	-	-	980	5,610	5,610	-	-	18,753	-	-	-	-	761,569	38,423	-
2b.1.1.24	Filter Rm Ventilation	-	4	0	0	2	0	-	2	9	9	-	-	24	1	-	-	-	1,020	69	-
2b.1.1.25	Fire Protection & Detection	-	178	-	-	-	-	-	27	205	-	-	205	-	-	-	-	-	-	3,009	-
2b.1.1.26	Fire Protection & Detection - RCA	-	236	3	11	158	-	-	85	492	492	-	-	1,828	-	-	-	-	74,245	3,134	-
2b.1.1.27	Fuel Handling	-	71	1	2	17	14	-	24	130	130	-	-	200	49	-	-	-	11,396	1,101	-
2b.1.1.28	Fuel Oil	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
2b.1.1.29	HVAC - Clean	-	132	-	-	-	-	-	20	151	-	-	151	-	-	-	-	-	-	2,373	-
2b.1.1.30	HVAC - Contaminated	-	1,222	26	69	929	115	-	487	2,848	2,848	-	-	10,745	405	-	-	-	463,144	16,579	-

Table G-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
						Processing Costs	Disposal Costs				Lic. Term. Costs				Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2b.1.1.31	Heating	-	279	-	-	-	-	-	42	321	-	-	321	-	-	-	-	-	-	4,804	-
2b.1.1.32	Heating - RCA	-	323	3	11	165	-	-	107	609	609	-	-	1,907	-	-	-	-	77,458	4,086	-
2b.1.1.33	Hot Lab & Sample Rm Ventilation	-	19	0	1	9	1	-	6	37	37	-	-	107	4	-	-	-	4,632	285	-
2b.1.1.34	Incore Instrumentation	0	29	1	1	5	16	-	13	67	67	-	-	60	58	-	-	-	6,264	458	-
2b.1.1.35	Misc Drains & Vents	-	223	12	9	40	121	-	95	500	500	-	-	458	426	-	-	-	46,850	3,180	-
2b.1.1.36	Misc Lab & Service Areas Vent	-	123	8	6	32	70	-	55	293	293	-	-	370	244	-	-	-	31,186	1,713	-
2b.1.1.37	Miscellaneous Gas	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	1,073	-
2b.1.1.38	Miscellaneous Gas - RCA	-	129	1	3	52	-	-	41	226	226	-	-	600	-	-	-	-	24,378	1,636	-
2b.1.1.39	Radiation Monitoring	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	111	-
2b.1.1.40	Radiation Monitoring - RCA	-	62	1	2	27	-	-	20	112	112	-	-	316	-	-	-	-	12,826	782	-
2b.1.1.41	Reactor Coolant	158	227	20	12	20	208	-	195	839	839	-	-	229	730	-	-	-	57,672	5,517	-
2b.1.1.42	Reactor Hot Sampling	135	121	10	5	5	89	-	123	489	489	-	-	54	312	-	-	-	22,919	3,686	-
2b.1.1.43	Reactor Makeup	-	36	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	583	-
2b.1.1.44	Reactor Makeup - RCA	-	4	0	0	2	-	-	1	8	8	-	-	28	-	-	-	-	1,148	47	-
2b.1.1.45	Reactor Vessel	9	17	0	0	2	4	-	10	43	43	-	-	22	14	-	-	-	1,826	385	-
2b.1.1.46	Residual Heat Removal	336	374	84	66	247	924	-	548	2,578	2,578	-	-	2,853	3,244	-	-	-	330,651	7,112	-
2b.1.1.47	Safeguards Chilled Water	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
2b.1.1.48	Safety Injection	-	836	40	56	577	329	-	390	2,228	2,228	-	-	6,676	1,161	-	-	-	347,600	12,284	-
2b.1.1.49	Sampling	-	51	3	2	3	27	-	20	105	105	-	-	37	93	-	-	-	7,697	714	-
2b.1.1.50	Service Bldg & New Cmptr Vent	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
2b.1.1.51	Shield Bldg Ventilation	-	114	13	19	175	138	-	94	554	554	-	-	2,028	484	-	-	-	114,378	1,743	-
2b.1.1.52	Station & Instrument Air	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	2,424	-
2b.1.1.53	Station & Instrument Air - RCA	-	288	3	9	141	-	-	95	535	535	-	-	1,625	-	-	-	-	65,986	3,638	-
2b.1.1.54	Turbine Bldg Traps & Drains	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	462	-
2b.1.1.55	Turbine Bldg Traps & Drains - RCA	-	28	0	1	16	-	-	10	55	55	-	-	180	-	-	-	-	7,321	344	-
2b.1.1.56	Turbine Bldg Ventilation	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	655	-
2b.1.1.57	Unit Coolers	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	332	-
2b.1.1.58	Unit Coolers - RCA	-	54	0	1	20	-	-	17	93	93	-	-	232	-	-	-	-	9,413	690	-
2b.1.1.59	Waste Gas Disposal	531	457	40	35	212	381	-	516	2,173	2,173	-	-	2,453	1,358	-	-	-	188,334	14,308	-
2b.1.1.60	Waste Liquid Disposal	1,386	1,733	108	76	316	1,019	-	1,451	6,089	6,089	-	-	3,655	3,594	-	-	-	385,370	44,485	-
2b.1.1.61	Waste Solid Disposal	111	139	11	8	34	112	-	126	541	541	-	-	389	393	-	-	-	41,732	3,481	-
2b.1.1	Totals	3,390	15,678	558	763	7,868	4,377	-	7,798	40,433	37,423	-	3,010	90,963	15,429	-	-	-	4,712,076	270,390	-
2b.1.2	Scaffolding in support of decommissioning	-	3,542	30	10	121	32	-	916	4,651	4,651	-	-	1,265	112	-	-	-	64,307	32,837	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,150	2,624	139	853	193	11,080	-	4,172	20,210	20,210	-	-	2,230	57,418	-	-	-	3,559,977	50,853	-
2b.1.3.2	Auxiliary	1,223	400	12	80	92	582	-	884	3,272	3,272	-	-	1,060	3,355	-	-	-	332,498	23,808	-
2b.1.3.3	Backwash Waste Receiving Tank	-	27	1	11	-	87	-	30	158	158	-	-	-	507	-	-	-	43,896	299	-
2b.1.3.4	Drum Transfer & Truck Loading Enclosure	17	8	0	2	2	13	-	14	56	56	-	-	19	74	-	-	-	7,118	368	-
2b.1.3.5	LLRW Storage Enclosure	117	51	1	11	3	87	-	95	366	366	-	-	38	502	-	-	-	44,971	2,424	-
2b.1.3.6	Radwaste	52	23	1	5	4	39	-	43	166	166	-	-	42	225	-	-	-	21,136	1,082	-
2b.1.3.7	Resin Disposal	15	11	0	2	7	12	-	15	64	64	-	-	83	69	-	-	-	9,271	383	-
2b.1.3	Totals	2,574	3,145	155	964	300	11,900	-	5,253	24,292	24,292	-	-	3,471	62,151	-	-	-	4,018,868	79,216	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	206	31	236	236	-	-	-	-	-	-	-	-	-	1,751
2b.1.5	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	5,965	22,365	744	1,737	8,290	16,309	206	13,998	69,612	66,602	-	3,010	95,700	77,691	-	-	-	8,795,250	382,443	1,751
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,930	579	2,509	2,509	-	-	-	-	-	-	-	-	25,228	-
2b.2.2	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
2b.2	Subtotal Period 2b Additional Costs	-	-	9	29	312	-	1,930	631	2,911	2,911	-	-	5,855	-	-	-	-	146,375	25,244	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	167	-	112	289	-	453	-	251	1,272	1,272	-	-	-	1,081	-	-	-	64,837	211	-
2b.3.2	Process decommissioning chemical flush waste	3	-	114	431	-	858	-	292	1,700	1,700	-	-	-	1,154	-	-	-	122,948	216	-
2b.3.3	Small tool allowance	-	414	-	-	-	-	-	62	476	476	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	9,529	1,429	10,958	-	10,958	-	-	-	-	-	-	-	-	-
2b.3.5	Retention and Severance	-	-	-	-	-	-	4,127	619	4,746	4,746	-	-	-	-	-	-	-	-	-	-
2b.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,517	-	1,517	-	1,517	-	-	-	-	-	-	-	-	-
2b.3.7	On-site survey and release of 0.437 tons clean metallic waste	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	170	414	226	721	-	1,311	15,174	2,654	20,670	8,195	12,475	-	-	2,234	-	-	-	187,785	427	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table G-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed Volume Cu. Feet	Burial Volumes				Burial /	Craft Manhours	Utility and
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs		Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.		Contractor Manhours
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,135	-	-	-	-	-	-	284	1,419	1,419	-	-	-	-	-	-	-	-	-	
2b.4.2	Insurance	-	-	-	-	-	-	620	62	682	682	-	-	-	-	-	-	-	-	-	
2b.4.3	Property taxes	-	-	-	-	-	-	2,983	298	3,281	3,281	-	-	-	-	-	-	-	-	-	
2b.4.4	Health physics supplies	-	2,580	-	-	-	-	-	645	3,225	3,225	-	-	-	-	-	-	-	-	-	
2b.4.5	Heavy equipment rental	-	2,740	-	-	-	-	-	411	3,151	3,151	-	-	-	-	-	-	-	-	-	
2b.4.6	Disposal of DAW generated	-	-	115	34	-	431	-	124	704	704	-	-	-	5,291	-	-	-	105,826	173	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,379	207	1,586	1,586	-	-	-	-	-	-	-	-	-	
2b.4.8	NRC Fees	-	-	-	-	-	-	481	48	529	529	-	-	-	-	-	-	-	-	-	
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,558	156	1,714	-	1,714	-	-	-	-	-	-	-	-	
2b.4.10	Fixed Overhead	-	-	-	-	-	-	1,503	225	1,728	1,728	-	-	-	-	-	-	-	-	-	
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	487	73	560	-	560	-	-	-	-	-	-	-	-	
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	246	37	282	282	-	-	-	-	-	-	-	-	-	
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	63	9	72	-	72	-	-	-	-	-	-	-	-	
2b.4.14	Railroad Track Maintenance	-	-	-	-	-	-	70	10	80	80	-	-	-	-	-	-	-	-	-	
2b.4.15	Security Staff Cost	-	-	-	-	-	-	8,243	1,236	9,479	9,479	-	-	-	-	-	-	-	-	136,323	
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	16,150	2,422	18,572	18,572	-	-	-	-	-	-	-	-	184,288	
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	21,222	3,183	24,405	24,405	-	-	-	-	-	-	-	-	342,069	
2b.4	Subtotal Period 2b Period-Dependent Costs	1,135	5,320	115	34	-	431	55,004	9,432	71,472	69,125	2,346	-	-	5,291	-	-	-	105,826	173	662,680
2b.0	TOTAL PERIOD 2b COST	7,270	28,099	1,095	2,520	8,602	18,050	72,314	26,716	164,664	146,833	14,822	3,010	101,555	85,217	-	-	-	9,235,236	408,286	664,431
PERIOD 2c - Spent fuel delay prior to SFP decon																					
Period 2c Direct Decommissioning Activities																					
Period 2c Additional Costs																					
2c.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	
Period 2c Collateral Costs																					
2c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	66,610	9,992	76,602	-	76,602	-	-	-	-	-	-	-	-	
2c.3.2	Retention and Severance	-	-	-	-	-	-	2,034	305	2,339	2,339	-	-	-	-	-	-	-	-	-	
2c.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	1,630	-	1,630	-	1,630	-	-	-	-	-	-	-	-	
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	70,274	10,297	80,571	2,339	78,232	-	-	-	-	-	-	-	-	
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	666	67	733	733	-	-	-	-	-	-	-	-	-	
2c.4.2	Property taxes	-	-	-	-	-	-	3,060	306	3,366	3,366	-	-	-	-	-	-	-	-	-	
2c.4.3	Health physics supplies	-	270	-	-	-	-	-	67	337	337	-	-	-	-	-	-	-	-	-	
2c.4.4	Disposal of DAW generated	-	-	12	3	-	44	-	13	72	72	-	-	-	538	-	-	-	10,761	18	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	395	59	454	454	-	-	-	-	-	-	-	-	-	
2c.4.6	NRC Fees	-	-	-	-	-	-	305	31	336	336	-	-	-	-	-	-	-	-	-	
2c.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,674	167	1,842	-	1,842	-	-	-	-	-	-	-	-	
2c.4.8	Fixed Overhead	-	-	-	-	-	-	1,615	242	1,857	1,857	-	-	-	-	-	-	-	-	-	
2c.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	
2c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	67	10	77	-	77	-	-	-	-	-	-	-	-	
2c.4.11	Railroad Track Maintenance	-	-	-	-	-	-	75	11	86	86	-	-	-	-	-	-	-	-	-	
2c.4.12	Security Staff Cost	-	-	-	-	-	-	8,857	1,329	10,185	10,185	-	-	-	-	-	-	-	-	146,478	
2c.4.13	Utility Staff Cost	-	-	-	-	-	-	6,575	986	7,561	7,561	-	-	-	-	-	-	-	-	107,146	
2c.4	Subtotal Period 2c Period-Dependent Costs	-	270	12	3	-	44	23,343	3,296	26,968	25,049	1,919	-	-	538	-	-	-	10,761	18	253,623
2c.0	TOTAL PERIOD 2c COST	-	270	12	3	-	44	97,965	14,245	112,539	32,387	80,151	-	-	538	-	-	-	10,761	18	253,623
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	328	32	94	32	-	595	-	335	1,416	1,416	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical - Contaminated - Fuel Pool	-	197	2	6	75	9	-	64	353	353	-	-	864	33	-	-	-	37,250	2,783	-
2d.1.2.2	Electrical - Decontaminated - Fuel Pool	-	1,230	14	47	698	-	-	421	2,410	2,410	-	-	8,069	-	-	-	-	327,668	16,495	-
2d.1.2.3	Fire Protection & Detection - RCA Fuel P	-	36	1	2	25	-	-	13	76	76	-	-	286	-	-	-	-	11,622	476	-
2d.1.2.4	HVAC - Contaminated - Fuel Pool	-	549	12	31	418	52	-	219	1,280	1,280	-	-	4,828	182	-	-	-	208,080	7,448	-
2d.1.2.5	Safeguards Chilled Water - RCA	-	4	0	0	2	-	-	1	8	8	-	-	26	-	-	-	-	1,045	51	-
2d.1.2.6	Spent Fuel Pool Cooling	31	35	3	2	3	30	-	33	137	137	-	-	39	107	-	-	-	8,635	882	-
2d.1.2.7	Spent Fuel Pool Normal Ventilation	-	26	1	2	23	3	-	11	66	66	-	-	265	12	-	-	-	11,532	394	-
2d.1.2	Totals	31	2,077	32	89	1,244	95	-	761	4,328	4,328	-	-	14,376	333	-	-	-	605,832	28,530	-

Table G-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
						Processing Costs	Disposal Costs				Lic. Term. Costs				Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Handling of Aux Building	975	1,082	9	32	209	173	-	838	3,319	3,319	-	-	2,417	944	-	-	-	177,818	30,401	-
2d.1.3	Totals	975	1,082	9	32	209	173	-	838	3,319	3,319	-	-	2,417	944	-	-	-	177,818	30,401	-
2d.1.4	Scaffolding in support of decommissioning	-	708	6	2	24	6	-	183	930	930	-	-	253	22	-	-	-	12,861	6,567	-
2d.1	Subtotal Period 2d Activity Costs	1,334	3,900	142	155	1,477	868	-	2,118	9,994	9,994	-	-	17,046	3,391	-	-	-	934,809	66,074	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	16,173	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	2,082	625	2,706	2,706	-	-	-	-	-	-	-	-	16,173	6,240
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	39	-	27	70	-	109	-	60	306	306	-	-	-	261	-	-	-	15,670	51	-
2d.3.2	Process decommissioning chemical flush waste	0	-	1	5	-	10	-	3	20	20	-	-	-	13	-	-	-	1,422	2	-
2d.3.3	Small tool allowance	-	79	-	-	-	-	-	12	91	91	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13,144	1,972	15,115	-	15,115	-	-	-	-	-	-	-	-	-
2d.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	971	-	971	-	971	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	39	79	172	130	575	270	14,114	2,194	17,573	1,488	16,086	-	6,000	804	-	-	-	322,060	142	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	218	-	-	-	-	-	-	54	272	272	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	398	40	437	437	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,740	174	1,914	1,914	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	742	-	-	-	-	-	186	928	928	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,757	-	-	-	-	-	264	2,020	2,020	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	44	13	-	163	-	47	266	266	-	-	-	2,000	-	-	-	40,003	65	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	471	71	542	542	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	256	26	282	282	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	999	100	1,099	-	1,099	-	-	-	-	-	-	-	-	-
2d.4.10	Fixed Overhead	-	-	-	-	-	-	963	144	1,108	1,108	-	-	-	-	-	-	-	-	-	-
2d.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	315	47	362	362	-	-	-	-	-	-	-	-	-	-
2d.4.12	ISFSI Operating Costs	-	-	-	-	-	-	40	6	46	-	46	-	-	-	-	-	-	-	-	-
2d.4.13	Railroad Track Maintenance	-	-	-	-	-	-	45	7	52	52	-	-	-	-	-	-	-	-	-	-
2d.4.14	Security Staff Cost	-	-	-	-	-	-	5,123	768	5,891	5,891	-	-	-	-	-	-	-	-	-	84,157
2d.4.15	DOC Staff Cost	-	-	-	-	-	-	6,065	910	6,975	6,975	-	-	-	-	-	-	-	-	-	69,996
2d.4.16	Utility Staff Cost	-	-	-	-	-	-	7,796	1,169	8,966	8,527	439	-	-	-	-	-	-	-	-	126,236
2d.4	Subtotal Period 2d Period-Dependent Costs	218	2,499	44	13	-	163	24,212	4,013	31,160	29,576	1,584	-	-	2,000	-	-	-	40,003	65	280,390
2d.0	TOTAL PERIOD 2d COST	1,591	6,478	357	298	2,052	1,301	40,408	8,949	61,434	43,764	17,670	-	23,046	6,195	-	-	-	1,296,872	82,455	286,630
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
2f.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	934	-	934	-	934	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,122	178	2,300	1,367	934	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,626	163	1,789	1,789	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	602	-	-	-	-	-	150	752	752	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	334	-	-	-	6,685	11	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	272	27	299	299	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	51	5	56	-	56	-	-	-	-	-	-	-	-	-
2f.4.8	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
2f.4.9	ISFSI Operating Costs	-	-	-	-	-	-	39	6	44	-	44	-	-	-	-	-	-	-	-	-

Table G-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed Volume Cu. Feet	Burial Volumes				Burial /	Craft Manhours	Utility and
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs		Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.		Contractor Manhours
Period 2f Period-Dependent Costs (continued)																					
2f.4.10	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
2f.4.11	Security Staff Cost	-	-	-	-	-	-	4,924	739	5,663	5,663	-	-	-	-	-	-	-	-	-	80,898
2f.4.12	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
2f.4.13	Utility Staff Cost	-	-	-	-	-	-	3,854	578	4,433	4,007	426	-	-	-	-	-	-	-	-	59,507
2f.4	Subtotal Period 2f Period-Dependent Costs	-	602	7	2	-	27	16,445	2,508	19,592	19,066	526	-	-	334	-	-	-	6,685	11	186,687
2f.0	TOTAL PERIOD 2f COST	-	602	7	2	-	27	26,150	4,962	31,750	30,290	1,460	-	-	334	-	-	-	6,685	102,653	189,807
PERIOD 2 TOTALS		9,835	63,787	29,263	6,901	13,758	38,202	294,441	90,987	547,174	421,894	119,682	5,598	163,227	129,602	250	673	-	15,079,400	824,945	1,954,541
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	4,256	-	-	-	-	-	638	4,895	-	-	4,895	-	-	-	-	-	-	44,679	-
3b.1.1.2	Auxiliary	-	1,897	-	-	-	-	-	285	2,182	-	-	2,182	-	-	-	-	-	-	11,902	-
3b.1.1.3	Condensate Storage Tank Foundation	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	33	-
3b.1.1.4	Construction Warehouse & Fab Shop	-	118	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	1,405	-
3b.1.1.5	D3/D4 Emergency Generator	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	84	-
3b.1.1.6	Drum Transfer & Truck Loading Enclosure	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	221	-
3b.1.1.7	Hydrogen House	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	47	-
3b.1.1.8	LLRW Storage Enclosure	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	853	-
3b.1.1.9	Misc Structures 2017	-	1,391	-	-	-	-	-	209	1,599	-	-	1,599	-	-	-	-	-	-	12,939	-
3b.1.1.10	Radwaste	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	1,400	-
3b.1.1.11	Resin Disposal	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	120	-
3b.1.1.12	Structures below 3' below grade	-	1,713	-	-	-	-	-	257	1,969	-	-	1,969	-	-	-	-	-	-	9,238	-
3b.1.1.13	Sulfuric Acid Tank Enclosure	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	35	-
3b.1.1.14	Turbine	-	1,983	-	-	-	-	-	298	2,281	-	-	2,281	-	-	-	-	-	-	22,052	-
3b.1.1.15	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
3b.1.1.16	Warehouse #2	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	213	-
3b.1.1.17	Waste Neutralizing Tank House	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	56	-
3b.1.1.18	Waste Oil Storage	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	70	-
3b.1.1.19	Water Treatment	-	303	-	-	-	-	-	46	349	-	-	349	-	-	-	-	-	-	2,690	-
3b.1.1.20	Fuel Handling of Aux Building	-	1,032	-	-	-	-	-	155	1,186	-	-	1,186	-	-	-	-	-	-	8,240	-
3b.1.1	Totals	-	13,424	-	-	-	-	-	2,014	15,438	-	-	15,438	-	-	-	-	-	-	118,134	-
Site Closeout Activities																					
3b.1.2	Remove Rubble	-	1,308	-	-	-	-	-	196	1,505	-	-	1,505	-	-	-	-	-	-	6,495	-
3b.1.3	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	78	12	90	90	-	-	-	-	-	-	-	-	-	667
3b.1	Subtotal Period 3b Activity Costs	-	15,163	-	-	-	-	78	2,286	17,528	90	-	17,438	-	-	-	-	-	-	125,549	667
Period 3b Additional Costs																					
3b.2.1	Clean Concrete Disposal	-	3,313	-	-	-	-	8	498	3,818	-	-	3,818	-	-	-	-	-	-	12,824	-
3b.2.2	Underground Services Excavations	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
3b.2.3	Intake Structure Cofferdam	-	423	-	-	-	-	-	63	486	-	-	486	-	-	-	-	-	-	3,552	-
3b.2.4	Construction Debris	-	-	-	-	-	-	463	69	532	-	-	532	-	-	-	-	-	-	-	-
3b.2.5	Backfill	-	8,465	-	-	-	-	-	1,270	9,735	-	-	9,735	-	-	-	-	-	-	9,327	-
3b.2	Subtotal Period 3b Additional Costs	-	13,012	-	-	-	-	991	2,100	16,103	-	-	16,103	-	-	-	-	-	-	33,110	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	172	-	-	-	-	-	26	198	-	-	198	-	-	-	-	-	-	-	-
3b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,651	-	2,651	-	2,651	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	172	-	-	-	-	2,651	26	2,848	-	2,651	198	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	542	54	596	-	596	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	4,334	433	4,767	-	4,767	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	236	24	259	-	259	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	145	14	159	-	159	-	-	-	-	-	-	-	-	-
3b.4.7	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-
3b.4.9	Railroad Track Maintenance	-	-	-	-	-	-	331	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	4,245	637	4,882	-	4,882	-	-	-	-	-	-	-	-	57,340
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885

Table G-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs (continued)																					
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	4,813	722	5,535	(0)	1,207	4,329	-	-	-	-	-	-	-	74,431
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,670	-	-	-	-	26,534	4,718	37,921	(0)	11,997	25,924	-	-	-	-	-	-	-	248,656
3b.0	TOTAL PERIOD 3b COST	-	35,017	-	-	-	-	30,253	9,130	74,401	90	14,648	59,663	-	-	-	-	-	-	158,659	249,323
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	84,962	12,744	97,707	-	97,707	-	-	-	-	-	-	-	-	-
3c.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	43,116	-	43,116	-	43,116	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	128,079	12,744	140,823	-	140,823	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	8,818	882	9,700	-	9,700	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	39,829	3,983	43,812	-	43,812	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	5,648	565	6,213	-	6,213	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	2,360	236	2,596	-	2,596	-	-	-	-	-	-	-	-	-
3c.4.6	Fixed Overhead	-	-	-	-	-	-	5,267	790	6,057	-	6,057	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	1,782	267	2,049	-	2,049	-	-	-	-	-	-	-	-	-
3c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,991	299	2,289	-	2,289	-	-	-	-	-	-	-	-	-
3c.4.9	Security Staff Cost	-	-	-	-	-	-	69,105	10,366	79,471	-	79,471	-	-	-	-	-	-	-	-	933,362
3c.4.10	Utility Staff Cost	-	-	-	-	-	-	17,069	2,560	19,629	-	19,629	-	-	-	-	-	-	-	-	242,315
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	151,870	19,948	171,817	-	171,817	-	-	-	-	-	-	-	-	1,175,677
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	279,948	32,692	312,640	-	312,640	-	-	-	-	-	-	-	-	1,175,677
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1.1	Totals	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,331	-	-	8,689	-	1,636	11,656	11,656	-	-	-	-	-	-	3,746	837,596	-	-
Period 3d Collateral Costs																					
3d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	26	4	29	-	29	-	-	-	-	-	-	-	-	-
3d.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	48	-	48	-	48	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	73	4	77	-	77	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	10	1	11	11	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	39	4	43	43	-	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4	0	5	-	5	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	3	0	3	-	3	-	-	-	-	-	-	-	-	-
3d.4.6	Fixed Overhead	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d.4.8	Railroad Track Maintenance	-	-	-	-	-	-	2	0	3	3	-	-	-	-	-	-	-	-	-	-
3d.4.9	Security Staff Cost	-	-	-	-	-	-	77	12	88	88	-	-	-	-	-	-	-	-	-	1,037
3d.4.10	Utility Staff Cost	-	-	-	-	-	-	19	3	22	22	-	-	-	-	-	-	-	-	-	269
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	162	21	183	173	10	-	-	-	-	-	-	-	-	1,306
3d.0	TOTAL PERIOD 3d COST	-	-	1,331	-	-	8,689	235	1,661	11,916	11,829	87	-	-	-	-	-	3,746	837,596	-	1,306
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	15	48	2	214	-	2,289	867	859	4,293	4,293	-	-	-	8,229	-	-	-	1,119,503	5,267	924
3e.2	Subtotal Period 3e Additional Costs	15	48	2	214	-	2,289	867	859	4,293	4,293	-	-	-	8,229	-	-	-	1,119,503	5,267	924
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	96	24	121	121	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	26	6	32	32	-	-	-	-	-	-	-	-	-	-
3e.4.4	Fixed Overhead	-	-	-	-	-	-	51	13	63	63	-	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table G-2
Prairie Island Nuclear Generating Plant, Unit 2
DECON Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage and Periodic TN-40 Replacement
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3e Period-Dependent Costs (continued)																					
3e.4.5	Railroad Track Maintenance	-	-	-	-	-	-	19	5	24	24	-	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	154	38	192	192	-	-	-	-	-	-	-	-	-	2,500
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	130	33	163	163	-	-	-	-	-	-	-	-	-	1,896
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	476	119	595	595	-	-	-	-	-	-	-	-	-	4,396
3e.0	TOTAL PERIOD 3e COST	15	48	2	214	-	2,289	1,343	978	4,888	4,888	-	-	-	8,229	-	-	-	1,119,503	5,267	5,320
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Demolition and Site Restoration of ISFSI	-	715	-	-	-	-	109	124	948	-	-	948	-	-	-	-	-	-	3,748	160
3f.2	Subtotal Period 3f Additional Costs	-	715	-	-	-	-	109	124	948	-	-	948	-	-	-	-	-	-	3,748	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.2	Property taxes	-	-	-	-	-	-	13	1	14	-	-	14	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	13	2	15	-	-	15	-	-	-	-	-	-	-	-
3f.4.5	Fixed Overhead	-	-	-	-	-	-	25	4	29	-	-	29	-	-	-	-	-	-	-	-
3f.4.6	Railroad Track Maintenance	-	-	-	-	-	-	10	1	11	-	-	11	-	-	-	-	-	-	-	-
3f.4.7	Security Staff Cost	-	-	-	-	-	-	78	12	89	-	-	89	-	-	-	-	-	-	-	1,260
3f.4.8	Utility Staff Cost	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	782
3f.4	Subtotal Period 3f Period-Dependent Costs	-	62	-	-	-	-	190	37	289	-	-	289	-	-	-	-	-	-	-	2,042
3f.0	TOTAL PERIOD 3f COST	-	782	-	-	-	-	300	162	1,243	-	-	1,243	-	-	-	-	-	-	3,748	2,202
PERIOD 3 TOTALS		15	35,847	1,333	214	-	10,978	312,079	44,623	405,089	16,808	327,375	60,906	-	8,229	-	-	3,746	1,957,099	167,675	1,433,828
TOTAL COST TO DECOMMISSION		13,423	104,950	31,018	7,565	13,927	53,146	707,463	153,040	1,084,531	562,164	455,241	67,126	169,551	151,717	839	673	3,746	17,656,020	1,026,161	4,190,673

TOTAL COST TO DECOMMISSION WITH 16.43% CONTINGENCY:	\$1,084,531	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 51.83% OR:	\$562,164	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 41.98% OR:	\$455,241	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 6.19% OR:	\$67,126	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	153,229	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	41,515	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,026,161	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

***Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis***

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APPENDIX H

DETAILED COST ANALYSIS

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Prairie Island Nuclear Generating Plant, Unit 2	H-11

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table H-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	571	171	742	742	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	176	26	202	202	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.16	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.17	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.18.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	578	87	664	664	-	-	-	-	-	-	-	-	-	4,920
1a.1.18.2	Plant systems	-	-	-	-	-	-	489	73	562	562	-	-	-	-	-	-	-	-	-	4,167
1a.1.18.3	Plant structures and buildings	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
1a.1.18.4	Waste management	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.18.5	Facility and site dormancy	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.18	Total	-	-	-	-	-	-	1,902	285	2,188	2,188	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.19.1	Plant systems	-	-	-	-	-	-	139	21	160	160	-	-	-	-	-	-	-	-	-	1,183
1a.1.19.2	Facility closeout & dormancy	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1a.1.19	Total	-	-	-	-	-	-	280	42	322	322	-	-	-	-	-	-	-	-	-	2,383
1a.1.20	Procure vacuum drying system	-	-	-	-	-	-	12	2	13	13	-	-	-	-	-	-	-	-	-	100
1a.1.21	Drain/de-energize non-cont. systems									a											
1a.1.22	Drain & dry NSSS									a											
1a.1.23	Drain/de-energize contaminated systems									a											
1a.1.24	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	5,781	953	6,734	6,734	-	-	-	-	-	-	-	-	-	44,390
Period 1a Collateral Costs																					
1a.3.1	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,682	268	2,950	2,950	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	43,802	6,442	51,394	49,108	2,286	-	-	610	-	-	-	12,190	20	544,960
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	51,587	7,395	60,131	55,842	4,289	-	-	610	-	-	-	12,190	20	589,350

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	1,135	-	-	-	-	-	-	568	1,703	1,703	-	-	-	-	-	-	-	-	17,003	-
1b.1.1	Totals	1,135	-	-	-	-	-	-	568	1,703	1,703	-	-	-	-	-	-	-	-	17,003	-
1b.1	Subtotal Period 1b Activity Costs	1,135	-	-	-	-	-	-	568	1,703	1,703	-	-	-	-	-	-	-	-	17,003	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	77	-	50	130	-	204	-	114	575	575	-	-	-	486	-	-	-	29,184	95	-
1b.3.4	Small tool allowance	-	19	-	-	-	-	-	3	22	22	-	-	-	-	-	-	-	-	-	-
1b.3.5	Prairie Island Indian Community Payments	-	-	-	-	-	-	315	-	315	-	315	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,050	19	50	130	-	204	315	263	2,031	1,716	315	-	-	486	-	-	-	29,184	95	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	415	-	-	-	-	-	-	104	518	518	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	436	44	480	480	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	676	68	744	744	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	212	-	-	-	-	-	53	264	264	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	143	-	-	-	-	-	21	164	164	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	2	-	27	-	8	43	43	-	-	-	326	-	-	-	6,519	11	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	382	57	439	439	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	161	16	178	178	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	404	40	445	-	445	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	370	56	426	426	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	101	15	116	-	116	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	13	2	15	-	15	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	1,863	279	2,142	2,142	-	-	-	-	-	-	-	-	-	30,932
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	6,501	975	7,476	7,476	-	-	-	-	-	-	-	-	-	106,428
1b.4	Subtotal Period 1b Period-Dependent Costs	415	355	7	2	-	27	10,922	1,740	13,467	12,891	576	-	-	326	-	-	-	6,519	11	137,360
1b.0	TOTAL PERIOD 1b COST	2,600	373	57	132	-	230	22,929	4,324	30,645	29,754	891	-	-	812	-	-	-	35,703	17,108	137,360
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	486	-	-	-	-	-	73	559	559	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	9,017	-
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	68	10	79	79	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	534	-	-	-	-	801	310	1,646	1,646	-	-	-	-	-	-	-	-	12,717	583
Period 1c Collateral Costs																					
1c.3.1	Process decommissioning water waste	88	-	58	150	-	234	-	131	661	661	-	-	-	560	-	-	-	33,579	109	-
1c.3.3	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	230	35	265	-	265	-	-	-	-	-	-	-	-	-
1c.3.5	Retention and Severance	-	-	-	-	-	-	1,088	163	1,251	1,251	-	-	-	-	-	-	-	-	-	-
1c.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	315	-	315	-	315	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	88	4	58	150	-	234	1,633	329	2,497	1,917	580	-	-	560	-	-	-	33,579	109	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	436	44	480	480	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	676	68	744	744	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	191	-	-	-	-	-	48	239	239	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	143	-	-	-	-	-	21	164	164	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	1	-	13	-	4	20	20	-	-	-	154	-	-	-	3,073	5	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	382	57	439	439	-	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1c Period-Dependent Costs (continued)																					
1c.4.7	NRC Fees	-	-	-	-	-	-	161	16	178	178	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	404	40	445	-	445	-	-	-	-	-	-	-	-	-
1c.4.9	Fixed Overhead	-	-	-	-	-	-	370	56	426	426	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	101	15	116	-	116	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	13	2	15	-	15	-	-	-	-	-	-	-	-	-
1c.4.12	Railroad Track Maintenance	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-
1c.4.13	Security Staff Cost	-	-	-	-	-	-	1,863	279	2,142	2,142	-	-	-	-	-	-	-	-	-	30,932
1c.4.14	Utility Staff Cost	-	-	-	-	-	-	6,501	975	7,476	7,476	-	-	-	-	-	-	-	-	-	106,428
1c.4	Subtotal Period 1c Period-Dependent Costs	-	334	3	1	-	13	10,922	1,627	12,900	12,324	576	-	-	154	-	-	-	3,073	5	137,360
1c.0	TOTAL PERIOD 1c COST	88	873	61	151	-	247	13,356	2,267	17,043	15,887	1,156	-	-	713	-	-	-	36,652	12,832	137,943
PERIOD 1 TOTALS		2,688	2,329	132	287	-	527	87,872	13,986	107,820	101,484	6,336	-	-	2,135	-	-	-	84,545	29,960	864,653
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	68	10	78	78	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	643	161	804	804	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	711	171	882	882	-	-	-	-	-	-	-	-	-	-
Period 2a Additional Costs																					
2a.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	65,860	9,879	75,739	-	75,739	-	-	-	-	-	-	-	-	-
2a.3.2	Retention and Severance	-	-	-	-	-	-	23,628	3,544	27,172	27,172	-	-	-	-	-	-	-	-	-	-
2a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	5,897	-	5,897	-	5,897	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	95,385	13,423	108,808	27,172	81,636	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	2,412	241	2,653	2,653	-	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	12,654	1,265	13,919	13,919	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	898	-	-	-	-	-	224	1,122	1,122	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	21	6	-	79	-	23	129	129	-	-	-	972	-	-	-	19,431	32	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,430	214	1,644	1,644	-	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	1,211	121	1,332	1,332	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	6,061	606	6,667	-	6,667	-	-	-	-	-	-	-	-	-
2a.4.8	Fixed Overhead	-	-	-	-	-	-	6,938	1,041	7,979	7,979	-	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	1,894	284	2,178	-	2,178	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	244	37	280	-	280	-	-	-	-	-	-	-	-	-
2a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	-
2a.4.12	Security Staff Cost	-	-	-	-	-	-	32,791	4,919	37,709	26,849	10,860	-	-	-	-	-	-	-	-	542,920
2a.4.13	Utility Staff Cost	-	-	-	-	-	-	11,657	1,748	13,405	9,531	3,874	-	-	-	-	-	-	-	-	190,075
2a.4	Subtotal Period 2a Period-Dependent Costs	-	898	21	6	-	79	77,772	10,796	89,573	65,713	23,860	-	-	972	-	-	-	19,431	32	732,995
2a.0	TOTAL PERIOD 2a COST	-	898	21	6	-	79	178,216	25,043	204,263	98,767	105,496	-	-	972	-	-	-	19,431	32	732,995
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection									a											
2b.1.2	Semi-annual environmental survey									a											
2b.1.3	Prepare reports									a											
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	362	54	416	416	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	3,433	858	4,291	4,291	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	3,795	913	4,707	4,707	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	20,705	3,106	23,811	-	23,811	-	-	-	-	-	-	-	-	-
2b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	31,469	-	31,469	-	31,469	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	52,174	3,106	55,280	-	55,280	-	-	-	-	-	-	-	-	-

Table H-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	12,873	1,287	14,160	14,160	-	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	65,863	6,586	72,449	72,449	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	2,403	-	-	-	-	-	601	3,003	3,003	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	57	17	-	212	-	61	346	346	-	-	-	2,602	-	-	-	52,049	85	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	3,816	572	4,388	4,388	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	6,141	614	6,756	6,756	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,723	172	1,895	-	1,895	-	-	-	-	-	-	-	-	-
2b.4.8	Fixed Overhead	-	-	-	-	-	-	3,844	577	4,421	4,421	-	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	1,301	195	1,496	-	1,496	-	-	-	-	-	-	-	-	-
2b.4.10	Railroad Track Maintenance	-	-	-	-	-	-	1,453	218	1,671	1,671	-	-	-	-	-	-	-	-	-	-
2b.4.11	Security Staff Cost	-	-	-	-	-	-	63,533	9,530	73,063	15,051	58,012	-	-	-	-	-	-	-	-	943,283
2b.4.12	Utility Staff Cost	-	-	-	-	-	-	32,977	4,946	37,923	23,588	14,335	-	-	-	-	-	-	-	-	524,046
2b.4	Subtotal Period 2b Period-Dependent Costs	-	2,403	57	17	-	212	193,523	25,360	221,571	145,834	75,737	-	-	2,602	-	-	-	52,049	85	1,467,329
2b.0	TOTAL PERIOD 2b COST	-	2,403	57	17	-	212	249,492	29,379	281,559	150,541	131,017	-	-	2,602	-	-	-	52,049	85	1,467,329
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.3	Prepare reports	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	325	49	374	374	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	3,085	771	3,857	3,857	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	3,410	820	4,230	4,230	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	11,351	1,135	12,487	12,487	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	49,013	4,901	53,914	53,914	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	2,136	-	-	-	-	-	534	2,670	2,670	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	50	15	-	188	-	54	307	307	-	-	-	2,305	-	-	-	46,092	75	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	3,429	514	3,944	3,944	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	5,036	504	5,539	5,539	-	-	-	-	-	-	-	-	-	-
2c.4.7	Fixed Overhead	-	-	-	-	-	-	3,454	518	3,973	3,973	-	-	-	-	-	-	-	-	-	-
2c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,306	196	1,502	1,502	-	-	-	-	-	-	-	-	-	-
2c.4.9	Security Staff Cost	-	-	-	-	-	-	48,790	7,318	56,108	56,108	-	-	-	-	-	-	-	-	-	706,402
2c.4.10	Utility Staff Cost	-	-	-	-	-	-	25,156	3,773	28,930	28,930	-	-	-	-	-	-	-	-	-	412,068
2c.4	Subtotal Period 2c Period-Dependent Costs	-	2,136	50	15	-	188	147,535	19,448	169,372	169,372	-	-	-	2,305	-	-	-	46,092	75	1,118,470
2c.0	TOTAL PERIOD 2c COST	-	2,136	50	15	-	188	150,946	20,268	173,602	173,602	-	-	-	2,305	-	-	-	46,092	75	1,118,470
PERIOD 2 TOTALS		-	5,436	128	37	-	479	578,654	74,690	659,424	422,910	236,514	-	-	5,879	-	-	-	117,573	192	3,318,794
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
3a.1.4	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
3a.1.9.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	865	130	995	895	-	99	-	-	-	-	-	-	-	7,370
3a.1.9.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
3a.1.9.3	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
3a.1.9.4	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
3a.1.9.5	Biological shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
3a.1.9.6	Steam generators	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
3a.1.9.7	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
3a.1.9.8	Main Turbine	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
3a.1.9.9	Main Condensers	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
3a.1.9.10	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
3a.1.9.11	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours		
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet					
Activity Specifications (continued)																							
3a.1.9.12	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900		
3a.1.9	Total	-	-	-	-	-	-	4,669	700	5,369	4,726	-	643	-	-	-	-	-	-	-	39,777		
Planning & Site Preparations																							
3a.1.10	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400		
3a.1.11	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-		
3a.1.12	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400		
3a.1.13	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-		
3a.1.14	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230		
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	13,653	2,048	15,701	15,058	-	643	-	-	-	-	-	-	-	68,607		
Period 3a Additional Costs																							
3a.2.1	Site Characterization	-	-	-	-	-	-	3,700	1,110	4,810	4,810	-	-	-	-	-	-	-	-	21,020	8,332		
3a.2.2	Mixed/Hazardous Waste	-	-	318	75	164	-	-	68	624	624	-	-	6,133	-	-	-	-	351,986	2,361	-		
3a.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-		
3a.2	Subtotal Period 3a Additional Costs	-	2,364	320	185	164	1,359	3,700	2,125	10,216	10,216	-	-	6,133	12,843	-	-	-	518,945	44,288	8,332		
Period 3a Collateral Costs																							
3a.3.1	Small tool allowance	-	32	-	-	-	-	-	5	37	37	-	-	-	-	-	-	-	-	-	-		
3a.3	Subtotal Period 3a Collateral Costs	-	32	-	-	-	-	-	5	37	37	-	-	-	-	-	-	-	-	-	-		
Period 3a Period-Dependent Costs																							
3a.4.1	Insurance	-	-	-	-	-	-	501	50	552	552	-	-	-	-	-	-	-	-	-	-		
3a.4.2	Property taxes	-	-	-	-	-	-	1,737	174	1,910	1,910	-	-	-	-	-	-	-	-	-	-		
3a.4.3	Health physics supplies	-	562	-	-	-	-	-	140	702	702	-	-	-	-	-	-	-	-	-	-		
3a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-		
3a.4.5	Disposal of DAW generated	-	-	11	3	-	42	-	12	68	68	-	-	-	514	-	-	-	10,287	17	-		
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-		
3a.4.7	NRC Fees	-	-	-	-	-	-	341	34	376	376	-	-	-	-	-	-	-	-	-	-		
3a.4.8	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-		
3a.4.9	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-		
3a.4.10	Security Staff Cost	-	-	-	-	-	-	3,843	576	4,419	4,419	-	-	-	-	-	-	-	-	-	65,000		
3a.4.11	Utility Staff Cost	-	-	-	-	-	-	15,819	2,373	18,191	18,191	-	-	-	-	-	-	-	-	-	257,920		
3a.4	Subtotal Period 3a Period-Dependent Costs	-	1,129	11	3	-	42	25,283	3,901	30,369	30,369	-	-	-	514	-	-	-	10,287	17	322,920		
3a.0	TOTAL PERIOD 3a COST	-	3,524	331	188	164	1,401	42,636	8,079	56,322	55,679	-	643	6,133	13,357	-	-	-	529,232	44,305	399,859		
PERIOD 3b - Decommissioning Preparations																							
Period 3b Direct Decommissioning Activities																							
Detailed Work Procedures																							
3b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733		
3b.1.1.2	Reactor internals	-	-	-	-	-	-	293	44	337	337	-	-	-	-	-	-	-	-	-	2,500		
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350		
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000		
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000		
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000		
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630		
3b.1.1.8	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200		
3b.1.1.9	Missile shields	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	450		
3b.1.1.10	Biological shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200		
3b.1.1.11	Steam generators	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600		
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000		
3b.1.1.13	Main Turbine	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560		
3b.1.1.14	Main Condensers	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560		
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730		
3b.1.1.16	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730		
3b.1.1	Total	-	-	-	-	-	-	3,785	568	4,352	3,508	-	844	-	-	-	-	-	-	-	32,243		
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,785	568	4,352	3,508	-	844	-	-	-	-	-	-	-	32,243		
Period 3b Collateral Costs																							
3b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-		
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-		
3b.3.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-		
3b.3	Subtotal Period 3b Collateral Costs	973	1,200	-	-	-	-	1,189	504	3,866	3,866	-	-	-	-	-	-	-	-	-	-		

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Decommissioning Cost Analysis

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(thousands of 2017 dollars)

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															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	35	-	-	-	-	-	-	9	43	43	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	255	25	280	280	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	840	84	924	924	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	248	-	-	-	-	-	62	309	309	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	283	-	-	-	-	-	42	325	325	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	6	2	-	24	-	7	39	39	-	-	-	290	-	-	-	5,802	9	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	755	113	869	869	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	170	17	187	187	-	-	-	-	-	-	-	-	-	-
3b.4.9	Fixed Overhead	-	-	-	-	-	-	733	110	843	843	-	-	-	-	-	-	-	-	-	-
3b.4.10	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
3b.4.11	Security Staff Cost	-	-	-	-	-	-	1,916	287	2,204	2,204	-	-	-	-	-	-	-	-	-	32,411
3b.4.12	DOC Staff Cost	-	-	-	-	-	-	5,123	769	5,892	5,892	-	-	-	-	-	-	-	-	-	58,080
3b.4.13	Utility Staff Cost	-	-	-	-	-	-	7,888	1,183	9,071	9,071	-	-	-	-	-	-	-	-	-	128,607
3b.4	Subtotal Period 3b Period-Dependent Costs	35	530	6	2	-	24	17,709	2,713	21,019	21,019	-	-	-	290	-	-	-	5,802	9	219,098
3b.0	TOTAL PERIOD 3b COST	1,008	1,730	6	2	-	24	22,682	3,785	29,237	28,393	-	844	-	290	-	-	-	5,802	9	251,341
PERIOD 3 TOTALS		1,008	5,254	338	190	164	1,425	65,318	11,863	85,559	84,072	-	1,487	6,133	13,647	-	-	-	535,034	44,314	651,200
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	11	40	6	5	34	75	-	41	212	212	-	-	144	152	-	-	-	33,380	771	-
4a.1.1.2	Pressurizer Relief Tank	5	18	4	3	23	50	-	24	126	126	-	-	96	101	-	-	-	22,241	347	-
4a.1.1.3	Reactor Coolant Pumps & Motors	13	56	43	76	-	736	-	220	1,143	1,143	-	-	-	2,332	-	-	-	295,800	1,226	80
4a.1.1.4	Pressurizer	10	68	359	82	-	693	-	244	1,456	1,456	-	-	-	2,196	-	-	-	158,199	1,499	750
4a.1.1.5	Steam Generators	47	2,943	1,576	1,614	1,246	3,467	-	2,212	13,104	13,104	-	-	18,672	10,990	-	-	-	1,560,086	10,964	2,250
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	60	243	199	32	169	369	-	233	1,305	1,305	-	-	2,138	2,146	-	-	-	165,025	4,449	-
4a.1.1.7	Reactor Vessel Internals	61	4,189	21,537	971	-	7,954	239	12,812	47,763	47,763	-	-	-	757	-	742	-	166,435	19,373	933
4a.1.1.8	Vessel & Internals GTCC Disposal	-	-	-	-	-	8,689	-	1,303	9,992	9,992	-	-	-	-	-	-	3,746	837,596	-	-
4a.1.1.9	Reactor Vessel	-	5,439	1,328	198	-	1,804	239	5,398	14,406	14,406	-	-	-	5,719	-	-	-	569,974	19,373	933
4a.1.1	Totals	206	12,996	25,052	2,982	1,471	23,836	478	22,487	89,506	89,506	-	-	21,050	24,393	-	742	3,746	3,808,735	58,003	4,947
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	269	128	27	287	-	-	127	838	838	-	-	2,243	-	-	-	-	134,601	4,116	-
4a.1.3	Main Condensers	-	2,269	87	26	383	-	-	637	3,403	3,403	-	-	4,000	-	-	-	-	180,000	34,978	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
4a.1.4	Totals	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
Disposal of Plant Systems																					
4a.1.5.1	Air Removal	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	452	-
4a.1.5.2	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	670	-
4a.1.5.3	Auxiliary Feedwater - RCA	-	45	0	1	19	-	-	14	79	79	-	-	215	-	-	-	-	8,722	601	-
4a.1.5.4	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,335	-
4a.1.5.5	Caustic Addition - RCA	-	36	0	1	20	-	-	12	71	71	-	-	233	-	-	-	-	9,453	444	-
4a.1.5.6	Chemical Feed	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	304	-
4a.1.5.7	Chemical Feed - RCA	-	1	0	0	1	-	-	0	2	2	-	-	6	-	-	-	-	243	12	-
4a.1.5.8	Circulating Water	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	619	-
4a.1.5.9	Condensate	-	414	-	-	-	-	-	62	476	-	-	476	-	-	-	-	-	-	6,837	-
4a.1.5.10	Condensate Polishing	-	205	-	-	-	-	-	31	236	-	-	236	-	-	-	-	-	-	3,420	-
4a.1.5.11	Condensate Polishing - RCA	-	176	4	12	180	-	-	73	444	444	-	-	2,078	-	-	-	-	84,395	2,329	-
4a.1.5.12	Electro-hydraulic	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	127	-
4a.1.5.13	Feedwater	-	133	-	-	-	-	-	20	153	-	-	153	-	-	-	-	-	-	2,215	-
4a.1.5.14	Feedwater - RCA	-	186	6	19	278	-	-	91	579	579	-	-	3,208	-	-	-	-	130,294	2,651	-
4a.1.5.15	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	505	-
4a.1.5.16	Heater Drain	-	349	-	-	-	-	-	52	401	-	-	401	-	-	-	-	-	-	5,881	-
4a.1.5.17	Internal Circ Water & CDSR	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	389	-
4a.1.5.18	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
4a.1.5.19	Main Steam	-	101	-	-	-	-	-	15	116	-	-	116	-	-	-	-	-	-	1,690	-
4a.1.5.20	Main Steam - RCA	-	350	9	29	436	-	-	158	983	983	-	-	5,044	-	-	-	-	204,825	4,956	-
4a.1.5.21	Steam Generator Blowdown	-	416	21	22	176	195	-	185	1,014	1,014	-	-	2,031	686	-	-	-	127,773	5,974	-
4a.1.5.22	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
4a.1.5.23	Turbine & Moisture Separators	-	337	-	-	-	-	-	51	388	-	-	388	-	-	-	-	-	-	5,609	-

Table H-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4a.1.5.24	Turbine Oil Purification	-	61	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	1,003	-
4a.1.5	Totals	-	3,075	40	85	1,108	195	-	814	5,317	3,172	-	2,145	12,815	686	-	-	-	565,705	48,101	-
4a.1.6	Scaffolding in support of decommissioning	-	833	3	1	13	3	-	212	1,066	1,066	-	-	138	12	-	-	-	7,016	6,020	-
4a.1	Subtotal Period 4a Activity Costs	206	20,170	25,310	3,121	3,263	24,034	478	24,386	100,967	98,823	-	2,145	40,246	25,091	-	742	3,746	4,696,057	158,807	4,947
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,865	559	2,424	2,424	-	-	-	-	-	-	-	24,374	-	
4a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
4a.2	Subtotal Period 4a Additional Costs	1	659	785	107	-	1,439	1,865	1,996	6,851	6,851	-	-	-	2,097	125	-	-	205,890	26,549	87
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	2	-	4	10	-	16	-	7	40	40	-	-	-	39	-	-	-	2,331	8	-
4a.3.3	Small tool allowance	-	195	-	-	-	-	-	29	224	201	-	22	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	2	195	4	10	-	16	-	36	264	242	-	22	-	39	-	-	-	2,331	8	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	84	-	-	-	-	-	-	21	105	105	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	617	62	679	679	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	1,841	184	2,025	2,025	-	-	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,494	-	-	-	-	-	374	1,868	1,868	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,653	-	-	-	-	-	398	3,051	3,051	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	62	18	-	230	-	66	376	376	-	-	-	2,823	-	-	-	56,462	92	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,738	261	1,999	1,999	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	673	67	741	741	-	-	-	-	-	-	-	-	-	-
4a.4.9	Fixed Overhead	-	-	-	-	-	-	1,496	224	1,720	1,720	-	-	-	-	-	-	-	-	-	-
4a.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	489	73	562	562	-	-	-	-	-	-	-	-	-	-
4a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	70	10	80	80	-	-	-	-	-	-	-	-	-	-
4a.4.12	Security Staff Cost	-	-	-	-	-	-	3,379	507	3,886	3,886	-	-	-	-	-	-	-	-	-	57,844
4a.4.13	DOC Staff Cost	-	-	-	-	-	-	14,773	2,216	16,989	16,989	-	-	-	-	-	-	-	-	-	171,797
4a.4.14	Utility Staff Cost	-	-	-	-	-	-	18,389	2,758	21,147	21,147	-	-	-	-	-	-	-	-	-	303,691
4a.4	Subtotal Period 4a Period-Dependent Costs	84	4,147	62	18	-	230	43,466	7,222	55,228	55,228	-	-	-	2,823	-	-	-	56,462	92	533,332
4a.0	TOTAL PERIOD 4a COST	293	25,171	26,160	3,256	3,263	25,719	45,808	33,641	163,310	161,143	-	2,167	40,246	30,050	125	742	3,746	4,960,740	185,455	538,365
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	297	32	94	32	-	595	-	319	1,369	1,369	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
4b.1.2.1	Aux Bldg Normal Ventilation	-	2	0	0	0	-	-	0	3	3	-	-	3	-	-	-	-	140	26	-
4b.1.2.2	Battery Rm Special Ventilation	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
4b.1.2.3	Buildings Maintenance	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	65	-
4b.1.2.4	Chemical & Volume Control	-	1,210	83	69	389	802	-	580	3,134	3,134	-	-	4,498	2,846	-	-	-	369,246	17,235	-
4b.1.2.5	Component Cooling - RCA	-	821	22	72	1,075	-	-	379	2,369	2,369	-	-	12,427	-	-	-	-	504,675	11,242	-
4b.1.2.6	Containment Cooling	-	65	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	1,086	-
4b.1.2.7	Containment Cooling - RCA	-	290	6	20	294	-	-	120	730	730	-	-	3,400	-	-	-	-	138,090	3,971	-
4b.1.2.8	Containment Hydrogen Control - RCA	-	29	0	1	9	-	-	9	48	48	-	-	105	-	-	-	-	4,278	401	-
4b.1.2.9	Containment Spray - RCA	-	90	2	5	75	-	-	35	206	206	-	-	868	-	-	-	-	35,249	1,217	-
4b.1.2.10	Containment Ventilation	-	219	24	40	428	209	-	180	1,100	1,100	-	-	4,951	737	-	-	-	249,786	3,278	-
4b.1.2.11	Cooling Water	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	2,396	-
4b.1.2.12	Cooling Water - RCA	-	629	14	45	668	-	-	266	1,622	1,622	-	-	7,728	-	-	-	-	313,832	8,594	-
4b.1.2.13	D1 Emergency Diesel	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	730	-
4b.1.2.14	D2 Emergency Diesel	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	522	-
4b.1.2.15	Diesel Rooms Ventilation	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	135	-
4b.1.2.16	Electrical - Clean	-	1,669	-	-	-	-	-	250	1,919	-	-	1,919	-	-	-	-	-	-	26,981	-
4b.1.2.17	Electrical - Contaminated	-	536	6	16	219	27	-	177	980	980	-	-	2,527	95	-	-	-	108,935	7,488	-
4b.1.2.18	Electrical - Contaminated - Fuel Pool	-	133	2	4	53	7	-	44	242	242	-	-	615	23	-	-	-	26,508	1,857	-
4b.1.2.19	Electrical - Decontaminated	-	3,674	41	137	2,037	-	-	1,249	7,138	7,138	-	-	23,551	-	-	-	-	956,401	49,378	-
4b.1.2.20	Electrical - Decontaminated - Fuel Pool	-	918	10	34	510	-	-	312	1,785	1,785	-	-	5,893	-	-	-	-	239,327	12,340	-
4b.1.2.21	Fuel Handling	-	104	6	9	79	62	-	55	314	314	-	-	908	218	-	-	-	51,280	1,595	-
4b.1.2.22	Fuel Oil	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	1,697	-
4b.1.2.23	HVAC - Clean	-	105	-	-	-	-	-	16	121	-	-	121	-	-	-	-	-	-	1,891	-
4b.1.2.24	HVAC - Contaminated	-	335	8	21	282	35	-	139	819	819	-	-	3,261	123	-	-	-	140,573	4,335	-
4b.1.2.25	HVAC - Contaminated - Fuel Pool	-	143	3	9	121	15	-	59	351	351	-	-	1,398	53	-	-	-	60,246	1,858	-

Table H-1
Prairie Island Nuclear Generating Plant, Unit 1
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(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours		
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours			
Disposal of Plant Systems (continued)																							
4b.1.2.26	Incore Instrumentation	-	24	1	1	5	16	-	11	59	59	-	-	60	57	-	-	-	6,177	382	-		
4b.1.2.27	Misc Drains & Vents	-	203	14	10	34	146	-	95	503	503	-	-	390	514	-	-	-	49,900	2,764	-		
4b.1.2.28	Reactor Coolant	-	271	21	14	30	221	-	132	689	689	-	-	344	777	-	-	-	65,413	3,865	-		
4b.1.2.29	Reactor Hot Sampling	-	120	11	6	6	98	-	57	297	297	-	-	66	342	-	-	-	25,347	1,611	-		
4b.1.2.30	Reactor Makeup	-	64	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	1,042	-		
4b.1.2.31	Reactor Vessel	-	18	1	0	2	4	-	6	31	31	-	-	26	14	-	-	-	2,011	260	-		
4b.1.2.32	Residual Heat Removal	-	360	85	66	250	926	-	377	2,065	2,065	-	-	2,895	3,252	-	-	-	332,849	5,374	-		
4b.1.2.33	Safeguards Chilled Water	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	259	-		
4b.1.2.34	Safeguards Chilled Water - RCA	-	82	1	3	43	-	-	27	155	155	-	-	495	-	-	-	-	20,100	1,019	-		
4b.1.2.35	Safety Injection	-	774	40	57	587	327	-	376	2,161	2,161	-	-	6,788	1,156	-	-	-	351,793	11,276	-		
4b.1.2.36	Sampling	-	53	4	2	5	31	-	22	116	116	-	-	59	107	-	-	-	9,505	731	-		
4b.1.2.37	Shield Bldg Ventilation	-	120	14	20	186	139	-	97	576	576	-	-	2,152	491	-	-	-	119,838	1,811	-		
4b.1.2.38	Spent Fuel Pool Cooling	-	311	34	25	70	377	-	190	1,006	1,006	-	-	806	1,325	-	-	-	120,439	4,400	-		
4b.1.2.39	Station & Instrument Air	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	300	-		
4b.1.2.40	Station & Instrument Air - RCA	-	79	1	2	29	-	-	24	135	135	-	-	332	-	-	-	-	13,496	1,053	-		
4b.1.2.41	Station & Instrument Air - RCA Fuel Pool	-	20	0	0	7	-	-	6	34	34	-	-	83	-	-	-	-	3,374	263	-		
4b.1.2.42	Turbine Bldg Traps & Drains	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	767	-		
4b.1.2.43	Unit Coolers	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	611	-		
4b.1.2.44	Unit Coolers - RCA	-	53	0	1	20	-	-	16	91	91	-	-	230	-	-	-	-	9,348	683	-		
4b.1.2	Totals	-	13,970	453	689	7,514	3,443	-	5,394	31,463	28,759	-	2,704	86,861	12,129	-	-	-	4,328,159	198,796	-		
4b.1.3	Scaffolding in support of decommissioning	-	1,250	5	2	20	5	-	317	1,599	1,599	-	-	207	18	-	-	-	10,524	9,030	-		
Decontamination of Site Buildings																							
4b.1.4.1	Reactor	1,037	2,360	118	833	193	6,372	-	2,868	13,781	13,781	-	-	2,230	36,899	-	-	-	3,286,398	45,584	-		
4b.1.4.2	Backwash Waste Receiving Tank	-	24	1	11	-	87	-	30	154	154	-	-	-	507	-	-	-	43,896	264	-		
4b.1.4	Totals	1,037	2,385	119	845	193	6,460	-	2,897	13,936	13,936	-	-	2,230	37,406	-	-	-	3,330,294	45,848	-		
4b.1.5	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096		
4b.1.6	Receive NRC approval of termination plan									a													
4b.1	Subtotal Period 4b Activity Costs	1,334	17,637	671	1,567	7,726	10,503	481	9,000	48,919	46,215	-	2,704	89,298	51,645	-	-	-	7,807,274	254,251	4,096		
Period 4b Additional Costs																							
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240		
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,832	849	3,681	3,681	-	-	-	-	-	-	-	-	37,017	-		
4b.2.3	Excavation of Underground Services	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-		
4b.2.4	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-		
4b.2.5	License Termination ISFSI	-	37	2	211	-	2,157	1,158	891	4,456	4,456	-	-	-	7,458	-	-	-	1,071,985	3,403	5,284		
4b.2.6	Demolition and Site Restoration ISFSI	-	399	-	-	-	-	87	73	558	-	-	558	-	-	-	-	-	-	1,900	160		
4b.2	Subtotal Period 4b Additional Costs	-	1,246	11	240	312	2,157	5,441	2,319	11,726	9,637	-	2,089	5,855	7,458	-	-	-	1,218,360	49,742	11,684		
Period 4b Collateral Costs																							
4b.3.1	Process decommissioning water waste	5	-	9	23	-	36	-	16	88	88	-	-	-	85	-	-	-	5,091	17	-		
4b.3.3	Small tool allowance	-	288	-	-	-	-	-	43	331	331	-	-	-	-	-	-	-	-	-	-		
4b.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-		
4b.3	Subtotal Period 4b Collateral Costs	5	288	152	78	575	186	-	205	1,489	1,489	-	-	6,000	614	-	-	-	310,059	105	-		
Period 4b Period-Dependent Costs																							
4b.4.1	Decon supplies	521	-	-	-	-	-	-	130	651	651	-	-	-	-	-	-	-	-	-	-		
4b.4.2	Insurance	-	-	-	-	-	-	910	91	1,001	1,001	-	-	-	-	-	-	-	-	-	-		
4b.4.3	Property taxes	-	-	-	-	-	-	2,625	262	2,887	2,887	-	-	-	-	-	-	-	-	-	-		
4b.4.4	Health physics supplies	-	2,245	-	-	-	-	-	561	2,806	2,806	-	-	-	-	-	-	-	-	-	-		
4b.4.5	Heavy equipment rental	-	4,021	-	-	-	-	-	603	4,624	4,624	-	-	-	-	-	-	-	-	-	-		
4b.4.6	Disposal of DAW generated	-	-	85	25	-	318	-	92	520	520	-	-	-	3,905	-	-	-	78,097	127	-		
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,023	303	2,326	2,326	-	-	-	-	-	-	-	-	-	-		
4b.4.8	NRC Fees	-	-	-	-	-	-	992	99	1,092	1,092	-	-	-	-	-	-	-	-	-	-		
4b.4.9	Fixed Overhead	-	-	-	-	-	-	2,205	331	2,535	2,535	-	-	-	-	-	-	-	-	-	-		
4b.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	721	108	829	829	-	-	-	-	-	-	-	-	-	-		
4b.4.11	Railroad Track Maintenance	-	-	-	-	-	-	103	15	118	118	-	-	-	-	-	-	-	-	-	-		
4b.4.12	Security Staff Cost	-	-	-	-	-	-	1,017	153	1,170	1,170	-	-	-	-	-	-	-	-	-	20,373		
4b.4.13	DOC Staff Cost	-	-	-	-	-	-	14,220	2,133	16,353	16,353	-	-	-	-	-	-	-	-	-	174,093		
4b.4.14	Utility Staff Cost	-	-	-	-	-	-	18,286	2,743	21,029	21,029	-	-	-	-	-	-	-	-	-	311,145		
4b.4	Subtotal Period 4b Period-Dependent Costs	521	6,266	85	25	-	318	43,101	7,625	57,941	57,941	-	-	-	3,905	-	-	-	78,097	127	505,611		
4b.0	TOTAL PERIOD 4b COST	1,860	25,436	919	1,910	8,613	13,164	49,023	19,149	120,075	115,282	-	4,793	101,153	63,622	-	-	-	9,413,790	304,226	521,391		

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Decommissioning Cost Analysis

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Table H-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 4e - Delay before License Termination																					
Period 4e Period-Dependent Costs																					
4e.4.1	Insurance	-	-	-	-	-	-	381	38	419	419	-	-	-	-	-	-	-	-	-	-
4e.4.2	Property taxes	-	-	-	-	-	-	1,046	105	1,150	1,150	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	69	-	-	-	-	-	17	87	87	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	2	0	-	6	-	2	10	10	-	-	-	74	-	-	-	1,486	2	-
4e.4.6	NRC Fees	-	-	-	-	-	-	166	17	182	182	-	-	-	-	-	-	-	-	-	-
4e.4.7	Fixed Overhead	-	-	-	-	-	-	923	138	1,061	1,061	-	-	-	-	-	-	-	-	-	-
4e.4.8	Railroad Track Maintenance	-	-	-	-	-	-	43	6	49	49	-	-	-	-	-	-	-	-	-	-
4e.4.9	Utility Staff Cost	-	-	-	-	-	-	662	99	761	761	-	-	-	-	-	-	-	-	-	10,850
4e.4	Subtotal Period 4e Period-Dependent Costs	-	69	2	0	-	6	3,220	422	3,720	3,720	-	-	-	74	-	-	-	1,486	2	10,850
4e.0	TOTAL PERIOD 4e COST	-	69	2	0	-	6	3,220	422	3,720	3,720	-	-	-	74	-	-	-	1,486	2	10,850
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
Period 4f Collateral Costs																					
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
4f.4.2	Property taxes	-	-	-	-	-	-	1,002	100	1,102	1,102	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	418	-	-	-	-	-	105	523	523	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	332	-	-	-	6,649	11	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	417	42	459	459	-	-	-	-	-	-	-	-	-	-
4f.4.7	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
4f.4.8	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
4f.4.9	Security Staff Cost	-	-	-	-	-	-	707	106	813	813	-	-	-	-	-	-	-	-	-	11,668
4f.4.10	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
4f.4.11	Utility Staff Cost	-	-	-	-	-	-	3,630	544	4,174	4,174	-	-	-	-	-	-	-	-	-	56,395
4f.4	Subtotal Period 4f Period-Dependent Costs	-	418	7	2	-	27	11,435	1,738	13,627	13,627	-	-	-	332	-	-	-	6,649	11	114,346
4f.0	TOTAL PERIOD 4f COST	-	418	7	2	-	27	16,016	2,934	19,405	19,405	-	-	-	332	-	-	-	6,649	40,183	117,466
PERIOD 4 TOTALS		2,153	51,095	27,089	5,168	11,876	38,916	114,068	56,146	306,510	299,549	-	6,960	141,399	94,078	125	742	3,746	14,382,660	529,866	1,188,072
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	4,255	-	-	-	-	-	638	4,894	-	-	4,894	-	-	-	-	-	-	44,669	-
5b.1.1.2	Condensate Storage Tank Foundation	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	16	-
5b.1.1.3	Structures below 3' below grade	-	1,713	-	-	-	-	-	257	1,969	-	-	1,969	-	-	-	-	-	-	9,238	-
5b.1.1.4	Turbine	-	1,983	-	-	-	-	-	297	2,280	-	-	2,280	-	-	-	-	-	-	22,040	-
5b.1.1.5	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
5b.1.1	Totals	-	8,303	-	-	-	-	-	1,245	9,548	-	-	9,548	-	-	-	-	-	-	77,820	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	8,733	-	-	-	-	183	1,337	10,254	211	-	10,044	-	-	-	-	-	-	78,740	1,560
Period 5b Additional Costs																					
5b.2.1	Clean Concrete Disposal	-	2,213	-	-	-	-	3	332	2,549	-	-	2,549	-	-	-	-	-	-	8,386	-
5b.2.2	Intake Structure Cofferdam	-	596	-	-	-	-	-	89	686	-	-	686	-	-	-	-	-	-	5,168	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 5b Additional Costs (continued)																					
5b.2.3	Construction Debris	-	-	-	-	-	-	10	2	12	-	-	12	-	-	-	-	-	-	-	-
5b.2.4	Backfill	-	2,751	-	-	-	-	-	413	3,164	-	-	3,164	-	-	-	-	-	-	2,904	-
5b.2	Subtotal Period 5b Additional Costs	-	5,560	-	-	-	-	13	836	6,410	-	-	6,410	-	-	-	-	-	-	16,458	-
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.2	Property taxes	-	-	-	-	-	-	1,712	171	1,883	-	-	1,883	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
5b.4.5	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
5b.4.6	Railroad Track Maintenance	-	-	-	-	-	-	122	18	141	-	-	141	-	-	-	-	-	-	-	-
5b.4.7	Security Staff Cost	-	-	-	-	-	-	1,812	272	2,084	-	-	2,084	-	-	-	-	-	-	-	29,221
5b.4.8	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885
5b.4.9	Utility Staff Cost	-	-	-	-	-	-	3,673	551	4,224	-	-	4,224	-	-	-	-	-	-	-	57,340
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,670	-	-	-	-	19,097	3,779	29,546	-	-	29,546	-	-	-	-	-	-	-	203,445
5b.0	TOTAL PERIOD 5b COST	-	21,070	-	-	-	-	19,294	5,969	46,333	211	-	46,122	-	-	-	-	-	-	95,198	205,005
PERIOD 5 TOTALS		-	21,070	-	-	-	-	19,294	5,969	46,333	211	-	46,122	-	-	-	-	-	-	95,198	205,005
TOTAL COST TO DECOMMISSION		5,848	85,184	27,686	5,682	12,040	41,346	865,206	162,654	1,205,645	908,226	242,850	54,569	147,532	115,740	125	742	3,746	15,119,820	699,530	6,227,724

TOTAL COST TO DECOMMISSION WITH 15.59% CONTINGENCY:	\$1,205,645	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 75.33% OR:	\$908,226	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 20.14% OR:	\$242,850	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 4.53% OR:	\$54,569	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	116,607	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	33,003	tons
TOTAL CRAFT LABOR REQUIREMENTS:	699,530	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	571	171	742	742	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.11	End product description	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	75	11	87	87	-	-	-	-	-	-	-	-	-	641
1a.1.13	Define major work sequence	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.14	Perform SER and EA	-	-	-	-	-	-	156	23	179	179	-	-	-	-	-	-	-	-	-	1,326
1a.1.15	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.16	Perform Site-Specific Cost Study	-	-	-	-	-	-	251	38	289	289	-	-	-	-	-	-	-	-	-	2,138
1a.1.17	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
Activity Specifications																					
1a.1.18.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	247	37	284	284	-	-	-	-	-	-	-	-	-	2,104
1a.1.18.2	Plant systems	-	-	-	-	-	-	209	31	241	241	-	-	-	-	-	-	-	-	-	1,782
1a.1.18.3	Plant structures and buildings	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,334
1a.1.18.4	Waste management	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.18.5	Facility and site dormancy	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.18	Total	-	-	-	-	-	-	813	122	935	935	-	-	-	-	-	-	-	-	-	6,930
Detailed Work Procedures																					
1a.1.19.1	Plant systems	-	-	-	-	-	-	59	9	68	68	-	-	-	-	-	-	-	-	-	506
1a.1.19.2	Facility closeout & dormancy	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	513
1a.1.19	Total	-	-	-	-	-	-	120	18	138	138	-	-	-	-	-	-	-	-	-	1,019
1a.1.20	Procure vacuum drying system	-	-	-	-	-	-	5	1	6	6	-	-	-	-	-	-	-	-	-	43
1a.1.21	Drain/de-energize non-cont. systems									a											
1a.1.22	Drain & dry NSSS									a											
1a.1.23	Drain/de-energize contaminated systems									a											
1a.1.24	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	2,799	505	3,304	3,304	-	-	-	-	-	-	-	-	-	18,981
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,776	266	2,042	-	2,042	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	8,394	1,259	9,653	9,653	-	-	-	-	-	-	-	-	-	-
1a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,281	-	2,281	-	2,281	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	12,450	1,525	13,976	9,653	4,323	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,682	268	2,950	2,950	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	507	-	-	-	-	-	127	633	633	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	49	-	14	79	79	-	-	-	597	-	-	-	11,939	19	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	778	78	855	855	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	24,344	3,652	27,995	27,995	-	-	-	-	-	-	-	-	-	400,523
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,074	13	4	-	49	42,022	6,189	49,351	47,066	2,286	-	-	597	-	-	-	11,939	19	523,243
1a.0	TOTAL PERIOD 1a COST	-	1,074	13	4	-	49	57,272	8,220	66,631	60,023	6,608	-	-	597	-	-	-	11,939	19	542,224

Table H-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	1,135	-	-	-	-	-	-	568	1,703	1,703	-	-	-	-	-	-	-	-	17,003	-
1b.1.1.2	Auxiliary	1,177	-	-	-	-	-	-	589	1,766	1,766	-	-	-	-	-	-	-	-	17,950	-
1b.1.1.3	Drum Transfer & Truck Loading Enclosure	16	-	-	-	-	-	-	8	24	24	-	-	-	-	-	-	-	-	244	-
1b.1.1.4	LLRW Storage Enclosure	99	-	-	-	-	-	-	50	149	149	-	-	-	-	-	-	-	-	1,487	-
1b.1.1.5	Radwaste	44	-	-	-	-	-	-	22	66	66	-	-	-	-	-	-	-	-	669	-
1b.1.1.6	Resin Disposal	13	-	-	-	-	-	-	7	20	20	-	-	-	-	-	-	-	-	198	-
1b.1.1.7	Fuel Handling of Aux Building	863	-	-	-	-	-	-	431	1,294	1,294	-	-	-	-	-	-	-	-	12,414	-
1b.1.1	Totals	3,348	-	-	-	-	-	-	1,674	5,022	5,022	-	-	-	-	-	-	-	-	49,966	-
1b.1	Subtotal Period 1b Activity Costs	3,348	-	-	-	-	-	-	1,674	5,022	5,022	-	-	-	-	-	-	-	-	49,966	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	105	-	68	177	-	277	-	155	781	781	-	-	-	660	-	-	-	39,628	129	-
1b.3.4	Small tool allowance	-	56	-	-	-	-	-	8	64	64	-	-	-	-	-	-	-	-	-	-
1b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	454	68	522	-	522	-	-	-	-	-	-	-	-	-
1b.3.6	Retention and Severance	-	-	-	-	-	-	2,315	347	2,662	2,662	-	-	-	-	-	-	-	-	-	-
1b.3.7	Prairie Island Indian Community Payments	-	-	-	-	-	-	315	-	315	-	315	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,078	56	68	177	-	277	3,083	724	5,462	4,625	837	-	-	660	-	-	-	39,628	129	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	1,232	-	-	-	-	-	-	308	1,540	1,540	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	436	44	480	480	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	675	68	743	743	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	369	-	-	-	-	-	92	461	461	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	143	-	-	-	-	-	21	164	164	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	14	4	-	52	-	15	85	85	-	-	-	636	-	-	-	12,711	21	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	382	57	439	439	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	107	11	118	118	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	404	40	445	-	445	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	370	56	426	426	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	101	15	116	-	116	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	13	2	15	-	15	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	1,863	279	2,142	2,142	-	-	-	-	-	-	-	-	-	30,932
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	6,501	975	7,476	7,476	-	-	-	-	-	-	-	-	-	106,428
1b.4	Subtotal Period 1b Period-Dependent Costs	1,232	512	14	4	-	52	10,867	1,986	14,667	14,090	576	-	-	636	-	-	-	12,711	21	137,360
1b.0	TOTAL PERIOD 1b COST	5,657	568	82	181	-	328	21,745	5,553	34,114	32,701	1,413	-	-	1,296	-	-	-	52,338	50,116	137,360
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	486	-	-	-	-	-	73	559	559	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	9,017	-
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	29	4	34	34	-	-	-	-	-	-	-	-	-	249
1c.1	Subtotal Period 1c Activity Costs	-	534	-	-	-	-	762	304	1,601	1,601	-	-	-	-	-	-	-	-	12,717	249
Period 1c Collateral Costs																					
1c.3.1	Process decommissioning water waste	88	-	58	150	-	234	-	131	661	661	-	-	-	560	-	-	-	33,579	109	-
1c.3.3	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	251	38	289	-	289	-	-	-	-	-	-	-	-	-
1c.3.5	Retention and Severance	-	-	-	-	-	-	1,741	261	2,002	2,002	-	-	-	-	-	-	-	-	-	-
1c.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	314	-	314	-	314	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	88	4	58	150	-	234	2,306	430	3,271	2,668	603	-	-	560	-	-	-	33,579	109	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table H-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	436	44	480	480	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	674	67	742	742	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	191	-	-	-	-	-	48	239	239	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	143	-	-	-	-	-	21	164	164	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	1	-	13	-	4	20	20	-	-	-	154	-	-	-	3,073	5	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	382	57	439	439	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	107	11	118	118	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	404	40	445	-	445	-	-	-	-	-	-	-	-	-
1c.4.9	Fixed Overhead	-	-	-	-	-	-	370	56	426	426	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	101	15	116	-	116	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	13	2	15	-	15	-	-	-	-	-	-	-	-	-
1c.4.12	Railroad Track Maintenance	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-
1c.4.13	Security Staff Cost	-	-	-	-	-	-	1,863	279	2,142	2,142	-	-	-	-	-	-	-	-	-	30,932
1c.4.14	Utility Staff Cost	-	-	-	-	-	-	6,501	975	7,476	7,476	-	-	-	-	-	-	-	-	-	106,428
1c.4	Subtotal Period 1c Period-Dependent Costs	-	334	3	1	-	13	10,866	1,622	12,839	12,263	576	-	-	154	-	-	-	3,073	5	137,360
1c.0	TOTAL PERIOD 1c COST	88	873	61	151	-	247	13,934	2,357	17,711	16,532	1,179	-	-	713	-	-	-	36,652	12,832	137,609
PERIOD 1 TOTALS		5,746	2,514	156	335	-	624	92,951	16,130	118,456	109,256	9,200	-	-	2,606	-	-	-	100,929	62,967	817,193
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	309	46	356	356	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	477	119	596	596	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	786	166	951	951	-	-	-	-	-	-	-	-	-	-
Period 2a Additional Costs																					
2a.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	63,609	9,541	73,151	-	73,151	-	-	-	-	-	-	-	-	-
2a.3.2	Retention and Severance	-	-	-	-	-	-	12,266	1,840	14,106	14,106	-	-	-	-	-	-	-	-	-	-
2a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	4,371	-	4,371	-	4,371	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	80,246	11,381	91,628	14,106	77,522	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	1,788	179	1,966	1,966	-	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	9,379	938	10,317	10,317	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	631	-	-	-	-	-	158	789	789	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	15	4	-	55	-	16	89	89	-	-	-	670	-	-	-	13,402	22	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,060	159	1,219	1,219	-	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	819	82	901	901	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	4,492	449	4,941	-	4,941	-	-	-	-	-	-	-	-	-
2a.4.8	Fixed Overhead	-	-	-	-	-	-	5,142	771	5,913	5,913	-	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	1,404	211	1,615	-	1,615	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	181	27	208	-	208	-	-	-	-	-	-	-	-	-
2a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	410	62	472	472	-	-	-	-	-	-	-	-	-	-
2a.4.12	Security Staff Cost	-	-	-	-	-	-	23,761	3,564	27,325	19,456	7,870	-	-	-	-	-	-	-	-	392,966
2a.4.13	Utility Staff Cost	-	-	-	-	-	-	3,341	501	3,842	2,732	1,110	-	-	-	-	-	-	-	-	54,579
2a.4	Subtotal Period 2a Period-Dependent Costs	-	631	15	4	-	55	51,776	7,116	59,597	43,854	15,744	-	-	670	-	-	-	13,402	22	447,545
2a.0	TOTAL PERIOD 2a COST	-	631	15	4	-	55	137,156	19,315	157,176	63,911	93,265	-	-	670	-	-	-	13,402	22	447,545
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection									a											
2b.1.2	Semi-annual environmental survey									a											
2b.1.3	Prepare reports									a											
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	2,226	334	2,560	2,560	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	3,433	858	4,291	4,291	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	5,659	1,192	6,852	6,852	-	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	20,705	3,106	23,811	-	23,811	-	-	-	-	-	-	-	-	-
2b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	31,469	-	31,469	-	31,469	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	52,174	3,106	55,280	-	55,280	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	12,873	1,287	14,160	14,160	-	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	67,525	6,753	74,278	74,278	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	2,403	-	-	-	-	-	601	3,003	3,003	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	57	17	-	212	-	61	346	346	-	-	-	2,602	-	-	-	52,049	85	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	3,816	572	4,388	4,388	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	5,654	565	6,219	6,219	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,723	172	1,895	-	1,895	-	-	-	-	-	-	-	-	-
2b.4.8	Fixed Overhead	-	-	-	-	-	-	3,844	577	4,421	4,421	-	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	1,301	195	1,496	-	1,496	-	-	-	-	-	-	-	-	-
2b.4.10	Railroad Track Maintenance	-	-	-	-	-	-	1,453	218	1,671	1,671	-	-	-	-	-	-	-	-	-	-
2b.4.11	Security Staff Cost	-	-	-	-	-	-	63,533	9,530	73,063	15,051	58,012	-	-	-	-	-	-	-	-	943,283
2b.4.12	Utility Staff Cost	-	-	-	-	-	-	32,977	4,946	37,923	23,588	14,335	-	-	-	-	-	-	-	-	524,046
2b.4	Subtotal Period 2b Period-Dependent Costs	-	2,403	57	17	-	212	194,698	25,478	222,863	147,126	75,737	-	-	2,602	-	-	-	52,049	85	1,467,329
2b.0	TOTAL PERIOD 2b COST	-	2,403	57	17	-	212	252,531	29,776	284,995	153,978	131,017	-	-	2,602	-	-	-	52,049	85	1,467,329
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.3	Prepare reports	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	2,073	311	2,384	2,384	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	3,197	799	3,997	3,997	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	5,270	1,110	6,381	6,381	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	11,764	1,176	12,940	12,940	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	53,045	5,305	58,350	58,350	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	2,122	-	-	-	-	-	530	2,652	2,652	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	49	14	-	183	-	53	300	300	-	-	-	2,254	-	-	-	45,081	74	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	3,554	533	4,087	4,087	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	5,051	505	5,556	5,556	-	-	-	-	-	-	-	-	-	-
2c.4.7	Fixed Overhead	-	-	-	-	-	-	3,580	537	4,117	4,117	-	-	-	-	-	-	-	-	-	-
2c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	1,353	203	1,556	1,556	-	-	-	-	-	-	-	-	-	-
2c.4.9	Utility Staff Cost	-	-	-	-	-	-	11,863	1,779	13,642	13,642	-	-	-	-	-	-	-	-	-	195,212
2c.4	Subtotal Period 2c Period-Dependent Costs	-	2,122	49	14	-	183	90,209	10,622	103,200	103,200	-	-	-	2,254	-	-	-	45,081	74	195,212
2c.0	TOTAL PERIOD 2c COST	-	2,122	49	14	-	183	95,480	11,732	109,580	109,580	-	-	-	2,254	-	-	-	45,081	74	195,212
PERIOD 2 TOTALS		-	5,156	120	35	-	450	485,167	60,823	551,751	327,469	224,283	-	-	5,527	-	-	-	110,532	180	2,110,086
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
3a.1.3	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
3a.1.4	End product description	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
3a.1.6	Define major work sequence	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
3a.1.7	Perform SER and EA	-	-	-	-	-	-	156	23	179	179	-	-	-	-	-	-	-	-	-	1,326
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	251	38	289	289	-	-	-	-	-	-	-	-	-	2,138
Activity Specifications																					
3a.1.9.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	370	55	425	383	-	43	-	-	-	-	-	-	-	3,151
3a.1.9.2	Plant systems	-	-	-	-	-	-	209	31	241	216	-	24	-	-	-	-	-	-	-	1,782
3a.1.9.3	Reactor internals	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,036
3a.1.9.4	Reactor vessel	-	-	-	-	-	-	326	49	375	375	-	-	-	-	-	-	-	-	-	2,779
3a.1.9.5	Biological shield	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
3a.1.9.6	Steam generators	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,334
3a.1.9.7	Reinforced concrete	-	-	-	-	-	-	80	12	92	46	-	46	-	-	-	-	-	-	-	684

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Table H-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Activity Specifications (continued)																					
3a.1.9.8	Main Turbine	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
3a.1.9.9	Main Condensers	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
3a.1.9.10	Plant structures & buildings	-	-	-	-	-	-	157	23	180	90	-	90	-	-	-	-	-	-	-	1,334
3a.1.9.11	Waste management	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
3a.1.9.12	Facility & site closeout	-	-	-	-	-	-	45	7	52	26	-	26	-	-	-	-	-	-	-	385
3a.1.9	Total	-	-	-	-	-	-	1,996	299	2,296	2,021	-	275	-	-	-	-	-	-	-	17,009
Planning & Site Preparations																					
3a.1.10	Prepare dismantling sequence	-	-	-	-	-	-	120	18	139	139	-	-	-	-	-	-	-	-	-	1,026
3a.1.11	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
3a.1.12	Design water clean-up system	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	-	599
3a.1.13	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
3a.1.14	Procure casks/liners & containers	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	526
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	9,043	1,357	10,400	10,125	-	275	-	-	-	-	-	-	-	29,336
Period 3a Additional Costs																					
3a.2.1	Site Characterization	-	-	-	-	-	-	1,582	475	2,057	2,057	-	-	-	-	-	-	-	-	8,988	3,563
3a.2.2	Mixed/Hazardous Waste	-	-	326	75	169	-	-	69	639	639	-	-	6,324	-	-	-	-	362,914	2,410	-
3a.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
3a.2	Subtotal Period 3a Additional Costs	-	2,364	328	185	169	1,359	1,582	1,491	7,478	7,478	-	-	6,324	12,843	-	-	-	529,873	32,305	3,563
Period 3a Collateral Costs																					
3a.3.1	Small tool allowance	-	32	-	-	-	-	-	5	37	37	-	-	-	-	-	-	-	-	-	-
3a.3	Subtotal Period 3a Collateral Costs	-	32	-	-	-	-	-	5	37	37	-	-	-	-	-	-	-	-	-	-
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	501	50	552	552	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	1,644	164	1,809	1,809	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	539	-	-	-	-	-	135	673	673	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	10	3	-	39	-	11	64	64	-	-	-	481	-	-	-	9,613	16	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	298	30	327	327	-	-	-	-	-	-	-	-	-	-
3a.4.8	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
3a.4.9	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
3a.4.10	Security Staff Cost	-	-	-	-	-	-	312	47	358	358	-	-	-	-	-	-	-	-	-	6,240
3a.4.11	Utility Staff Cost	-	-	-	-	-	-	11,597	1,740	13,336	13,336	-	-	-	-	-	-	-	-	-	199,680
3a.4	Subtotal Period 3a Period-Dependent Costs	-	1,106	10	3	-	39	17,394	2,718	21,270	21,270	-	-	-	481	-	-	-	9,613	16	205,920
3a.0	TOTAL PERIOD 3a COST	-	3,501	339	188	169	1,398	28,019	5,570	39,184	38,909	-	275	6,324	13,324	-	-	-	539,486	32,320	238,819
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	238	36	273	246	-	27	-	-	-	-	-	-	-	2,024
3b.1.1.2	Reactor internals	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	1,069
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	68	10	78	19	-	58	-	-	-	-	-	-	-	577
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	182	27	210	210	-	-	-	-	-	-	-	-	-	1,552
3b.1.1.8	Facility closeout	-	-	-	-	-	-	60	9	69	35	-	35	-	-	-	-	-	-	-	513
3b.1.1.9	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	192
3b.1.1.10	Biological shield	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	513
3b.1.1.11	Steam generators	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	50	8	58	29	-	29	-	-	-	-	-	-	-	428
3b.1.1.13	Main Turbine	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
3b.1.1.14	Main Condensers	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	-	667
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
3b.1.1.16	Reactor building	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	-	1,167
3b.1.1	Total	-	-	-	-	-	-	1,618	243	1,861	1,500	-	361	-	-	-	-	-	-	-	13,787
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	1,618	243	1,861	1,500	-	361	-	-	-	-	-	-	-	13,787

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Table H-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	973	1,200	-	-	-	-	1,189	504	3,866	3,866	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	35	-	-	-	-	-	-	9	43	43	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	255	25	280	280	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	764	76	840	840	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	230	-	-	-	-	-	57	287	287	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	283	-	-	-	-	-	42	325	325	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	6	2	-	22	-	6	35	35	-	-	-	264	-	-	-	5,286	9	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	755	113	869	869	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	148	15	163	163	-	-	-	-	-	-	-	-	-	-
3b.4.9	Fixed Overhead	-	-	-	-	-	-	733	110	843	843	-	-	-	-	-	-	-	-	-	-
3b.4.10	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
3b.4.11	Security Staff Cost	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	-	3,111
3b.4.12	DOC Staff Cost	-	-	-	-	-	-	3,539	531	4,070	4,070	-	-	-	-	-	-	-	-	-	42,523
3b.4.13	Utility Staff Cost	-	-	-	-	-	-	5,782	867	6,650	6,650	-	-	-	-	-	-	-	-	-	99,566
3b.4	Subtotal Period 3b Period-Dependent Costs	35	513	6	2	-	22	12,161	1,881	14,618	14,618	-	-	-	264	-	-	-	5,286	9	145,201
3b.0	TOTAL PERIOD 3b COST	1,008	1,713	6	2	-	22	14,968	2,628	20,345	19,984	-	361	-	264	-	-	-	5,286	9	158,988
PERIOD 3 TOTALS		1,008	5,214	345	189	169	1,420	42,987	8,198	59,529	58,893	-	636	6,324	13,588	-	-	-	544,771	32,329	397,807
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	11	40	6	5	34	75	-	41	212	212	-	-	144	152	-	-	-	33,380	771	-
4a.1.1.2	Pressurizer Relief Tank	5	18	4	3	23	50	-	24	126	126	-	-	96	101	-	-	-	22,241	347	-
4a.1.1.3	Reactor Coolant Pumps & Motors	13	56	43	76	-	736	-	220	1,143	1,143	-	-	-	2,332	-	-	-	295,800	1,226	80
4a.1.1.4	Pressurizer	10	68	359	82	-	693	-	244	1,456	1,456	-	-	-	2,196	-	-	-	158,199	1,499	750
4a.1.1.5	Steam Generators	47	2,943	1,576	1,614	1,246	3,467	-	2,212	13,104	13,104	-	-	18,672	10,990	-	-	-	1,560,086	10,964	2,250
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	60	243	199	32	169	369	-	233	1,305	1,305	-	-	2,138	2,146	-	-	-	165,025	4,449	-
4a.1.1.7	Reactor Vessel Internals	59	4,189	21,552	1,011	-	7,239	239	12,467	46,756	46,756	-	-	-	757	-	673	-	166,167	19,373	933
4a.1.1.8	Vessel & Internals GTCC Disposal	-	-	-	-	-	8,689	-	1,303	9,992	9,992	-	-	-	-	-	3,746	-	837,596	-	-
4a.1.1.9	Reactor Vessel	-	5,439	1,328	198	-	1,804	239	5,398	14,406	14,406	-	-	-	5,719	-	-	-	569,974	19,373	933
4a.1.1	Totals	204	12,996	25,067	3,022	1,471	23,120	478	22,142	88,499	88,499	-	-	21,050	24,393	-	673	3,746	3,808,467	58,003	4,947
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	269	128	27	287	-	-	127	838	838	-	-	2,243	-	-	-	-	134,601	4,116	-
4a.1.3	Main Condensers	-	2,269	87	26	383	-	-	637	3,403	3,403	-	-	4,000	-	-	-	-	180,000	34,978	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
4a.1.4.2	Auxiliary	-	210	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	1,309	-
4a.1.4.3	Radwaste	-	8	-	-	-	-	-	1	9	9	-	-	-	-	-	-	-	-	65	-
4a.1.4	Totals	-	946	-	-	-	-	-	142	1,088	1,088	-	-	-	-	-	-	-	-	8,963	-
Disposal of Plant Systems																					
4a.1.5.1	Admin Bldg Ventilation	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	90	-
4a.1.5.2	Air Removal	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	422	-
4a.1.5.3	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	676	-
4a.1.5.4	Auxiliary Feedwater - RCA	-	36	0	1	15	-	-	12	65	65	-	-	178	-	-	-	-	7,214	486	-
4a.1.5.5	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,331	-
4a.1.5.6	Caustic Addition - RCA	-	38	0	1	21	-	-	13	74	74	-	-	240	-	-	-	-	9,761	468	-
4a.1.5.7	Chemical Feed	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	261	-
4a.1.5.8	Chemical Feed - RCA	-	3	0	0	1	-	-	1	5	5	-	-	16	-	-	-	-	634	31	-
4a.1.5.9	Circulating Water	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	401	-
4a.1.5.10	Condensate	-	459	-	-	-	-	-	69	527	-	-	527	-	-	-	-	-	-	7,537	-
4a.1.5.11	Condensate Polishing	-	181	-	-	-	-	-	27	209	-	-	209	-	-	-	-	-	-	2,987	-
4a.1.5.12	Condensate Polishing - RCA	-	36	1	3	42	-	-	16	98	98	-	-	483	-	-	-	-	19,616	493	-
4a.1.5.13	Electro-Hydraulic	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	143	-
4a.1.5.14	External Circulating Water	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	385	-
4a.1.5.15	External Circulating Water - RCA	-	70	1	4	62	-	-	28	165	165	-	-	721	-	-	-	-	29,284	938	-

Table H-2
Prairie Island Nuclear Generating Plant, Unit 2
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(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4a.1.5.16	Feedwater	-	111	-	-	-	-	-	17	128	-	-	128	-	-	-	-	-	-	1,840	-
4a.1.5.17	Feedwater - RCA	-	236	7	24	359	-	-	117	744	744	-	-	4,147	-	-	-	-	168,414	3,377	-
4a.1.5.18	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	504	-
4a.1.5.19	Heater Drain	-	334	-	-	-	-	-	50	384	-	-	384	-	-	-	-	-	-	5,638	-
4a.1.5.20	Hypobromous Acid Feed	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	86	-
4a.1.5.21	Hypobromous Acid Feed - RCA	-	1	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	100	12	-
4a.1.5.22	Internal Circ Water & CDSR	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	366	-
4a.1.5.23	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
4a.1.5.24	Main Steam	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	1,482	-
4a.1.5.25	Main Steam - RCA	-	364	9	30	447	-	-	163	1,013	1,013	-	-	5,166	-	-	-	-	209,799	5,146	-
4a.1.5.26	Repairable Spare Snubbers	-	6	0	0	1	-	-	2	8	8	-	-	12	-	-	-	-	490	82	-
4a.1.5.27	Steam Exclusion	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	32	-
4a.1.5.28	Steam Exclusion - RCA	-	4	0	0	2	-	-	1	8	8	-	-	24	-	-	-	-	966	47	-
4a.1.5.29	Steam Generator Blowdown	-	362	20	21	165	179	-	165	911	911	-	-	1,906	631	-	-	-	119,126	5,179	-
4a.1.5.30	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
4a.1.5.31	Turbine & Moisture Separators	-	329	-	-	-	-	-	49	379	-	-	379	-	-	-	-	-	-	5,472	-
4a.1.5.32	Turbine Oil Purification	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	757	-
4a.1.5.33	Water Treatment	-	394	-	-	-	-	-	59	453	-	-	453	-	-	-	-	-	-	6,677	-
4a.1.5.34	Water Treatment - RCA	-	19	0	1	10	-	-	6	37	37	-	-	115	-	-	-	-	4,652	252	-
4a.1.5	Totals	-	3,400	39	85	1,125	179	-	858	5,687	3,128	-	2,559	13,010	631	-	-	-	570,056	53,681	-
4a.1.6	Scaffolding in support of decommissioning	-	2,682	24	8	97	25	-	695	3,532	3,532	-	-	1,012	89	-	-	-	51,445	23,719	-
4a.1	Subtotal Period 4a Activity Costs	204	22,563	25,345	3,168	3,363	23,325	478	24,601	103,048	100,489	-	2,559	41,316	25,114	-	673	3,746	4,744,569	183,459	4,947
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,516	455	1,971	1,971	-	-	-	-	-	-	-	-	19,818	-
4a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
4a.2	Subtotal Period 4a Additional Costs	1	659	785	107	-	1,439	1,516	1,892	6,398	6,398	-	-	-	2,097	125	-	-	205,890	21,993	87
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	2	-	4	11	-	17	-	7	42	42	-	-	-	40	-	-	-	2,403	8	-
4a.3.3	Small tool allowance	-	220	-	-	-	-	-	33	254	228	-	25	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	2	220	4	11	-	17	-	41	295	270	-	25	-	40	-	-	-	2,403	8	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	79	-	-	-	-	-	-	20	98	98	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	578	58	636	636	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	1,698	170	1,868	1,868	-	-	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,556	-	-	-	-	-	389	1,945	1,945	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,484	-	-	-	-	-	373	2,857	2,857	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	73	21	-	274	-	79	449	449	-	-	-	3,371	-	-	-	67,420	110	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,628	244	1,872	1,872	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	430	43	473	473	-	-	-	-	-	-	-	-	-	-
4a.4.9	Fixed Overhead	-	-	-	-	-	-	1,401	210	1,611	1,611	-	-	-	-	-	-	-	-	-	-
4a.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	458	69	527	527	-	-	-	-	-	-	-	-	-	-
4a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	-
4a.4.12	Security Staff Cost	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	73,548
4a.4.13	DOC Staff Cost	-	-	-	-	-	-	13,997	2,100	16,097	16,097	-	-	-	-	-	-	-	-	-	162,394
4a.4.14	Utility Staff Cost	-	-	-	-	-	-	18,027	2,704	20,731	20,731	-	-	-	-	-	-	-	-	-	294,192
4a.4	Subtotal Period 4a Period-Dependent Costs	79	4,040	73	21	-	274	42,631	7,120	54,239	54,239	-	-	-	3,371	-	-	-	67,420	110	530,134
4a.0	TOTAL PERIOD 4a COST	286	27,483	26,207	3,307	3,363	25,055	44,625	33,653	163,980	161,395	-	2,585	41,316	30,622	125	673	3,746	5,020,282	205,570	535,167
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	297	32	94	32	-	595	-	319	1,369	1,369	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
4b.1.2.1	ADT & Misc Ventilation	-	21	0	1	13	3	-	8	47	47	-	-	153	9	-	-	-	6,814	325	-
4b.1.2.2	Aux Bldg Normal Ventilation	-	60	2	5	60	11	-	28	165	165	-	-	692	39	-	-	-	30,671	906	-
4b.1.2.3	Aux Bldg Special Ventilation	-	12	0	0	6	2	-	4	25	25	-	-	70	6	-	-	-	3,243	176	-
4b.1.2.4	Battery Rm Special Ventilation	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	24	-
4b.1.2.5	Boron Recycle	-	3	0	0	0	3	-	2	8	8	-	-	3	9	-	-	-	709	45	-
4b.1.2.6	Chemical & Volume Control	-	822	59	44	204	560	-	388	2,075	2,075	-	-	2,356	1,977	-	-	-	225,854	11,575	-
4b.1.2.7	Cold Chemical Lab Ventilation	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-

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(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4b.1.2.8	Component Cooling - RCA	-	617	21	70	1,038	-	-	322	2,068	2,068	-	-	11,996	-	-	-	-	487,169	8,583	-
4b.1.2.9	Containment Cooling	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	502	-
4b.1.2.10	Containment Cooling - RCA	-	288	5	16	237	-	-	110	656	656	-	-	2,743	-	-	-	-	111,390	3,949	-
4b.1.2.11	Containment Hydrogen Control - RCA	-	35	0	1	12	-	-	11	60	60	-	-	141	-	-	-	-	5,742	494	-
4b.1.2.12	Containment Spray - RCA	-	186	3	8	126	-	-	67	389	389	-	-	1,453	-	-	-	-	59,019	2,617	-
4b.1.2.13	Containment Ventilation	-	201	23	38	408	205	-	171	1,047	1,047	-	-	4,721	722	-	-	-	239,450	3,016	-
4b.1.2.14	Control/Relay/Cmptr Rm Vent	-	27	1	2	23	6	-	12	70	70	-	-	260	20	-	-	-	11,915	406	-
4b.1.2.15	Cooling Water	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	2,344	-
4b.1.2.16	Cooling Water - RCA	-	456	15	49	730	-	-	232	1,482	1,482	-	-	8,442	-	-	-	-	342,822	6,311	-
4b.1.2.17	Cranes/Hoists/Elevators - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
4b.1.2.18	D3 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
4b.1.2.19	D4 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
4b.1.2.20	D5 Emergency Diesel	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
4b.1.2.21	Electrical - Clean	-	1,502	-	-	-	-	-	225	1,727	-	-	1,727	-	-	-	-	-	-	24,276	-
4b.1.2.22	Electrical - Contaminated	-	417	5	13	173	21	-	138	767	767	-	-	1,997	75	-	-	-	86,080	5,813	-
4b.1.2.23	Electrical - Contaminated - Fuel Pool	-	178	2	6	75	9	-	59	329	329	-	-	864	33	-	-	-	37,250	2,488	-
4b.1.2.24	Electrical - Decontaminated	-	2,866	33	109	1,622	-	-	980	5,610	5,610	-	-	18,753	-	-	-	-	761,569	38,423	-
4b.1.2.25	Electrical - Decontaminated - Fuel Pool	-	1,230	14	47	698	-	-	421	2,410	2,410	-	-	8,069	-	-	-	-	327,668	16,495	-
4b.1.2.26	Filter Rm Ventilation	-	4	0	0	2	0	-	1	8	8	-	-	24	1	-	-	-	1,020	61	-
4b.1.2.27	Fire Protection & Detection	-	178	-	-	-	-	-	27	205	-	-	205	-	-	-	-	-	-	3,009	-
4b.1.2.28	Fire Protection & Detection - RCA	-	236	3	11	158	-	-	85	492	492	-	-	1,828	-	-	-	-	74,245	3,134	-
4b.1.2.29	Fire Protection & Detection - RCA Fuel P	-	36	1	2	25	-	-	13	76	76	-	-	286	-	-	-	-	11,622	476	-
4b.1.2.30	Fuel Handling	-	64	1	2	17	14	-	22	121	121	-	-	200	49	-	-	-	11,396	983	-
4b.1.2.31	Fuel Oil	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
4b.1.2.32	HVAC - Clean	-	132	-	-	-	-	-	20	151	-	-	151	-	-	-	-	-	-	2,373	-
4b.1.2.33	HVAC - Contaminated	-	1,102	26	69	929	115	-	457	2,699	2,699	-	-	10,745	405	-	-	-	463,144	14,282	-
4b.1.2.34	HVAC - Contaminated - Fuel Pool	-	495	12	31	418	52	-	205	1,212	1,212	-	-	4,828	182	-	-	-	208,080	6,417	-
4b.1.2.35	Heating	-	279	-	-	-	-	-	42	321	-	-	321	-	-	-	-	-	-	4,804	-
4b.1.2.36	Heating - RCA	-	323	3	11	165	-	-	107	609	609	-	-	1,907	-	-	-	-	77,458	4,086	-
4b.1.2.37	Hot Lab & Sample Rm Ventilation	-	17	0	1	9	1	-	6	34	34	-	-	107	4	-	-	-	4,632	255	-
4b.1.2.38	Incore Instrumentation	-	26	1	1	5	16	-	12	62	62	-	-	60	58	-	-	-	6,264	412	-
4b.1.2.39	Misc Drains & Vents	-	203	12	9	40	121	-	90	475	475	-	-	458	426	-	-	-	46,850	2,841	-
4b.1.2.40	Misc Lab & Service Areas Vent	-	113	8	6	32	70	-	52	280	280	-	-	370	244	-	-	-	31,186	1,537	-
4b.1.2.41	Miscellaneous Gas	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	1,073	-
4b.1.2.42	Miscellaneous Gas - RCA	-	129	1	3	52	-	-	41	226	226	-	-	600	-	-	-	-	24,378	1,636	-
4b.1.2.43	Radiation Monitoring	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	111	-
4b.1.2.44	Radiation Monitoring - RCA	-	62	1	2	27	-	-	20	112	112	-	-	316	-	-	-	-	12,826	782	-
4b.1.2.45	Reactor Coolant	-	207	20	12	20	208	-	110	577	577	-	-	229	730	-	-	-	57,672	2,891	-
4b.1.2.46	Reactor Hot Sampling	-	112	10	5	5	89	-	53	273	273	-	-	54	312	-	-	-	22,919	1,499	-
4b.1.2.47	Reactor Makeup	-	36	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	583	-
4b.1.2.48	Reactor Makeup - RCA	-	4	0	0	2	-	-	1	8	8	-	-	28	-	-	-	-	1,148	47	-
4b.1.2.49	Reactor Vessel	-	16	0	0	2	4	-	5	28	28	-	-	22	14	-	-	-	1,826	225	-
4b.1.2.50	Residual Heat Removal	-	338	84	66	247	924	-	371	2,029	2,029	-	-	2,853	3,244	-	-	-	330,651	5,039	-
4b.1.2.51	Safeguards Chilled Water	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
4b.1.2.52	Safeguards Chilled Water - RCA	-	4	0	0	2	-	-	1	8	8	-	-	26	-	-	-	-	1,045	51	-
4b.1.2.53	Safety Injection	-	758	40	56	577	329	-	371	2,131	2,131	-	-	6,676	1,161	-	-	-	347,600	11,029	-
4b.1.2.54	Sampling	-	46	3	2	3	27	-	19	100	100	-	-	37	93	-	-	-	7,697	645	-
4b.1.2.55	Service Bldg & New Cmptr Vent	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
4b.1.2.56	Shield Bldg Ventilation	-	103	13	19	175	138	-	91	539	539	-	-	2,028	484	-	-	-	114,378	1,555	-
4b.1.2.57	Spent Fuel Pool Cooling	-	32	3	2	3	30	-	17	87	87	-	-	39	107	-	-	-	8,635	427	-
4b.1.2.58	Spent Fuel Pool Normal Ventilation	-	23	1	2	23	3	-	10	62	62	-	-	265	12	-	-	-	11,532	352	-
4b.1.2.59	Station & Instrument Air	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	2,424	-
4b.1.2.60	Station & Instrument Air - RCA	-	288	3	9	141	-	-	95	535	535	-	-	1,625	-	-	-	-	65,986	3,638	-
4b.1.2.61	Turbine Bldg Traps & Drains	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	462	-
4b.1.2.62	Turbine Bldg Traps & Drains - RCA	-	28	0	1	16	-	-	10	55	55	-	-	180	-	-	-	-	7,321	344	-
4b.1.2.63	Turbine Bldg Ventilation	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	655	-
4b.1.2.64	Unit Coolers	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	332	-
4b.1.2.65	Unit Coolers - RCA	-	54	0	1	20	-	-	17	93	93	-	-	232	-	-	-	-	9,413	690	-
4b.1.2.66	Waste Gas Disposal	-	417	40	35	212	381	-	241	1,327	1,327	-	-	2,453	1,358	-	-	-	188,334	5,879	-
4b.1.2.67	Waste Liquid Disposal	-	1,581	108	76	316	1,019	-	720	3,819	3,819	-	-	3,655	3,594	-	-	-	385,370	22,011	-
4b.1.2.68	Waste Solid Disposal	-	127	11	8	34	112	-	67	358	358	-	-	389	393	-	-	-	41,732	1,781	-
4b.1.2	Totals	-	16,987	591	852	9,112	4,472	-	6,657	38,670	35,660	-	3,010	105,339	15,761	-	-	-	5,317,908	240,033	-
4b.1.3	Scaffolding in support of decommissioning	-	4,024	36	12	146	38	-	1,043	5,298	5,298	-	-	1,518	134	-	-	-	77,168	35,578	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	1,037	2,361	118	833	193	6,373	-	2,868	13,784	13,784	-	-	2,230	36,903	-	-	-	3,286,751	45,596	-
4b.1.4.2	Auxiliary	1,105	356	12	80	92	582	-	814	3,040	3,040	-	-	1,060	3,355	-	-	-	332,498	21,222	-
4b.1.4.3	Backwash Waste Receiving Tank	-	24	1	11	-	87	-	30	154	154	-	-	-	507	-	-	-	43,896	264	-
4b.1.4.4	Drum Transfer & Truck Loading Enclosure	15	7	0	2	2	13	-	13	52	52	-	-	19	74	-	-	-	7,118	328	-
4b.1.4.5	LLRW Storage Enclosure	105	45	1	11	3	87	-	88	341	341	-	-	38	502	-	-	-	44,971	2,149	-
4b.1.4.6	Radwaste	47	20	1	5	4	39	-	40	155	155	-	-	42	225	-	-	-	21,136	963	-
4b.1.4.7	Resin Disposal	14	10	0	2	7	12	-	14	60	60	-	-	83	69	-	-	-	9,271	340	-
4b.1.4.8	Fuel Handling of Aux Building	875	966	9	32	209	173	-	759	3,024	3,024	-	-	2,417	944	-	-	-	177,818	27,141	-
4b.1.4	Totals	3,199	3,791	143	977	509	7,366	-	4,626	20,611	20,611	-	-	5,889	42,580	-	-	-	3,923,460	98,004	-
4b.1.5	Prepare/submit License Termination Plan	-	-	-	-	-	-	206	31	236	236	-	-	-	-	-	-	-	-	-	1,751
4b.1.6	Receive NRC approval of termination plan									a											
4b.1	Subtotal Period 4b Activity Costs	3,496	24,833	864	1,872	9,767	12,471	206	12,675	66,184	63,174	-	3,010	112,746	60,568	-	-	-	9,456,834	374,192	1,751
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,832	849	3,681	3,681	-	-	-	-	-	-	-	-	37,017	-
4b.2.3	Excavation of Underground Services	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
4b.2.4	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
4b.2.5	License Termination ISFSI	-	37	2	211	-	2,157	1,158	891	4,456	4,456	-	-	-	7,458	-	-	-	1,071,985	3,403	5,284
4b.2.6	Demolition and Site Restoration ISFSI	-	399	-	-	-	-	87	73	558	-	-	558	-	-	-	-	-	-	1,900	160
4b.2	Subtotal Period 4b Additional Costs	-	1,246	11	240	312	2,157	5,441	2,319	11,726	9,637	-	2,089	5,855	7,458	-	-	-	1,218,360	49,742	11,684
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	7	-	11	29	-	46	-	20	113	113	-	-	-	109	-	-	-	6,546	21	-
4b.3.3	Small tool allowance	-	417	-	-	-	-	-	63	480	480	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
4b.3.5	On-site survey and release of 0.437 tons clean metallic waste	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
4b.3	Subtotal Period 4b Collateral Costs	7	417	155	84	575	196	1	229	1,664	1,664	-	-	6,000	638	-	-	-	311,514	109	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	1,338	-	-	-	-	-	-	335	1,673	1,673	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	910	91	1,001	1,001	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	2,554	255	2,809	2,809	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	2,897	-	-	-	-	-	724	3,621	3,621	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	4,021	-	-	-	-	-	603	4,624	4,624	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	128	37	-	476	-	137	778	778	-	-	-	5,849	-	-	-	116,984	191	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,023	303	2,326	2,326	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	677	68	745	745	-	-	-	-	-	-	-	-	-	-
4b.4.9	Fixed Overhead	-	-	-	-	-	-	2,205	331	2,535	2,535	-	-	-	-	-	-	-	-	-	-
4b.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	721	108	829	829	-	-	-	-	-	-	-	-	-	-
4b.4.11	Railroad Track Maintenance	-	-	-	-	-	-	103	15	118	118	-	-	-	-	-	-	-	-	-	-
4b.4.12	Security Staff Cost	-	-	-	-	-	-	6,843	1,026	7,870	7,870	-	-	-	-	-	-	-	-	-	115,753
4b.4.13	DOC Staff Cost	-	-	-	-	-	-	21,571	3,236	24,806	24,806	-	-	-	-	-	-	-	-	-	248,175
4b.4.14	Utility Staff Cost	-	-	-	-	-	-	26,893	4,034	30,927	30,927	-	-	-	-	-	-	-	-	-	437,085
4b.4	Subtotal Period 4b Period-Dependent Costs	1,338	6,917	128	37	-	476	64,499	11,267	84,662	84,662	-	-	-	5,849	-	-	-	116,984	191	801,014
4b.0	TOTAL PERIOD 4b COST	4,841	33,414	1,158	2,234	10,654	15,300	70,147	26,490	164,237	159,138	-	5,099	124,601	74,513	-	-	-	11,103,690	424,234	814,449
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license									a											
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
Period 4f Collateral Costs																					
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table H-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 4f Period-Dependent Costs																					
4f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
4f.4.2	Property taxes	-	-	-	-	-	-	1,002	100	1,102	1,102	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	600	-	-	-	-	-	150	750	750	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	332	-	-	-	6,649	11	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	272	27	299	299	-	-	-	-	-	-	-	-	-	-
4f.4.7	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
4f.4.8	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
4f.4.9	Security Staff Cost	-	-	-	-	-	-	707	106	813	813	-	-	-	-	-	-	-	-	-	11,668
4f.4.10	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
4f.4.11	Utility Staff Cost	-	-	-	-	-	-	3,630	544	4,174	4,174	-	-	-	-	-	-	-	-	-	56,395
4f.4	Subtotal Period 4f Period-Dependent Costs	-	600	7	2	-	27	11,289	1,768	13,695	13,695	-	-	-	332	-	-	-	6,649	11	114,346
4f.0	TOTAL PERIOD 4f COST	-	600	7	2	-	27	20,061	4,222	24,919	24,919	-	-	-	332	-	-	-	6,649	102,652	117,466
PERIOD 4 TOTALS		5,126	61,497	27,372	5,543	14,017	40,383	134,832	64,365	353,136	345,452	-	7,684	165,917	105,467	125	673	3,746	16,130,620	732,456	1,467,082
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	4,256	-	-	-	-	-	638	4,895	-	-	4,895	-	-	-	-	-	-	44,679	-
5b.1.1.2	Auxiliary	-	1,897	-	-	-	-	-	285	2,182	-	-	2,182	-	-	-	-	-	-	11,902	-
5b.1.1.3	Condensate Storage Tank Foundation	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	33	-
5b.1.1.4	Construction Warehouse & Fab Shop	-	118	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	1,405	-
5b.1.1.5	D3/D4 Emergency Generator	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	84	-
5b.1.1.6	Drum Transfer & Truck Loading Enclosure	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	221	-
5b.1.1.7	Hydrogen House	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	47	-
5b.1.1.8	LLRW Storage Enclosure	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	853	-
5b.1.1.9	Misc Structures 2017	-	1,391	-	-	-	-	-	209	1,599	-	-	1,599	-	-	-	-	-	-	12,939	-
5b.1.1.10	Radwaste	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	1,400	-
5b.1.1.11	Resin Disposal	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	120	-
5b.1.1.12	Structures below 3' below grade	-	1,713	-	-	-	-	-	257	1,969	-	-	1,969	-	-	-	-	-	-	9,238	-
5b.1.1.13	Sulfuric Acid Tank Enclosure	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	35	-
5b.1.1.14	Turbine	-	1,983	-	-	-	-	-	298	2,281	-	-	2,281	-	-	-	-	-	-	22,052	-
5b.1.1.15	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
5b.1.1.16	Warehouse #2	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	213	-
5b.1.1.17	Waste Neutralizing Tank House	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	56	-
5b.1.1.18	Waste Oil Storage	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	70	-
5b.1.1.19	Water Treatment	-	303	-	-	-	-	-	46	349	-	-	349	-	-	-	-	-	-	2,690	-
5b.1.1.20	Fuel Handling of Aux Building	-	1,032	-	-	-	-	-	155	1,186	-	-	1,186	-	-	-	-	-	-	8,240	-
5b.1.1	Totals	-	13,424	-	-	-	-	-	2,014	15,438	-	-	15,438	-	-	-	-	-	-	118,134	-
Site Closeout Activities																					
5b.1.2	Remove Rubble	-	1,492	-	-	-	-	-	224	1,716	-	-	1,716	-	-	-	-	-	-	7,408	-
5b.1.3	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	78	12	90	90	-	-	-	-	-	-	-	-	-	667
5b.1	Subtotal Period 5b Activity Costs	-	15,347	-	-	-	-	78	2,314	17,740	90	-	17,650	-	-	-	-	-	-	126,463	667
Period 5b Additional Costs																					
5b.2.1	Clean Concrete Disposal	-	3,313	-	-	-	-	8	498	3,818	-	-	3,818	-	-	-	-	-	-	12,824	-
5b.2.2	Intake Structure Cofferdam	-	423	-	-	-	-	-	63	486	-	-	486	-	-	-	-	-	-	3,552	-
5b.2.3	Construction Debris	-	-	-	-	-	-	463	69	532	-	-	532	-	-	-	-	-	-	-	-
5b.2.4	Backfill	-	8,465	-	-	-	-	-	1,270	9,735	-	-	9,735	-	-	-	-	-	-	9,327	-
5b.2	Subtotal Period 5b Additional Costs	-	12,201	-	-	-	-	471	1,901	14,572	-	-	14,572	-	-	-	-	-	-	25,703	-
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	169	-	-	-	-	-	25	194	-	-	194	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	169	-	-	-	-	-	25	194	-	-	194	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.2	Property taxes	-	-	-	-	-	-	526	53	579	-	-	579	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
5b.4.5	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
5b.4.6	Railroad Track Maintenance	-	-	-	-	-	-	122	18	141	-	-	141	-	-	-	-	-	-	-	-

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Decommissioning Cost Analysis

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Table H-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with DOE Pickup of Industry Spent Fuel Starting in 2025
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 5b Period-Dependent Costs (continued)																					
5b.4.7	Security Staff Cost	-	-	-	-	-	-	1,812	272	2,084	-	-	2,084	-	-	-	-	-	-	29,221	
5b.4.8	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	116,885	
5b.4.9	Utility Staff Cost	-	-	-	-	-	-	3,673	551	4,224	-	-	4,224	-	-	-	-	-	-	57,340	
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,670	-	-	-	-	17,912	3,661	28,242	-	-	28,242	-	-	-	-	-	-	203,445	
5b.0	TOTAL PERIOD 5b COST	-	34,387	-	-	-	-	18,461	7,901	60,748	90	-	60,658	-	-	-	-	-	152,166	204,112	
PERIOD 5 TOTALS		-	34,387	-	-	-	-	18,461	7,901	60,748	90	-	60,658	-	-	-	-	-	152,166	204,112	
TOTAL COST TO DECOMMISSION		11,879	108,769	27,994	6,103	14,186	42,876	774,398	157,417	1,143,621	841,160	233,483	68,978	172,241	127,188	125	673	3,746	16,886,860	980,098	4,996,280

TOTAL COST TO DECOMMISSION WITH 15.96% CONTINGENCY:	\$1,143,621	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 73.55% OR:	\$841,160	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 20.42% OR:	\$233,483	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 6.03% OR:	\$68,978	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	127,986	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	41,593	tons
TOTAL CRAFT LABOR REQUIREMENTS:	980,098	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

***Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis***

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APPENDIX I

DETAILED COST ANALYSIS

SCENARIO 7: SAFSTOR with 60 Year DFS

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Prairie Island Nuclear Generating Plant, Unit 2	I-11

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table I-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	571	171	742	742	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	176	26	202	202	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
1a.1.16	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
1a.1.17	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.18.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	578	87	664	664	-	-	-	-	-	-	-	-	-	4,920
1a.1.18.2	Plant systems	-	-	-	-	-	-	489	73	562	562	-	-	-	-	-	-	-	-	-	4,167
1a.1.18.3	Plant structures and buildings	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
1a.1.18.4	Waste management	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.18.5	Facility and site dormancy	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	2,000
1a.1.18	Total	-	-	-	-	-	-	1,902	285	2,188	2,188	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.19.1	Plant systems	-	-	-	-	-	-	139	21	160	160	-	-	-	-	-	-	-	-	-	1,183
1a.1.19.2	Facility closeout & dormancy	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
1a.1.19	Total	-	-	-	-	-	-	280	42	322	322	-	-	-	-	-	-	-	-	-	2,383
1a.1.20	Procure vacuum drying system	-	-	-	-	-	-	12	2	13	13	-	-	-	-	-	-	-	-	-	100
1a.1.21	Drain/de-energize non-cont. systems									a											
1a.1.22	Drain & dry NSSS									a											
1a.1.23	Drain/de-energize contaminated systems									a											
1a.1.24	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	5,781	953	6,734	6,734	-	-	-	-	-	-	-	-	-	44,390
Period 1a Collateral Costs																					
1a.3.1	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	2,003	-	2,003	-	2,003	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,682	268	2,950	2,950	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	515	-	-	-	-	-	129	644	644	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	50	-	14	81	81	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,110	111	1,221	1,221	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	25,791	3,869	29,660	29,660	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,083	13	4	-	50	43,802	6,442	51,394	49,108	2,286	-	-	610	-	-	-	12,190	20	544,960
1a.0	TOTAL PERIOD 1a COST	-	1,083	13	4	-	50	51,587	7,395	60,131	55,842	4,289	-	-	610	-	-	-	12,190	20	589,350

Table I-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	1,135	-	-	-	-	-	-	568	1,703	1,703	-	-	-	-	-	-	-	-	17,003	-
1b.1.1	Totals	1,135	-	-	-	-	-	-	568	1,703	1,703	-	-	-	-	-	-	-	-	17,003	-
1b.1	Subtotal Period 1b Activity Costs	1,135	-	-	-	-	-	-	568	1,703	1,703	-	-	-	-	-	-	-	-	17,003	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	11,691	1,754	13,445	13,445	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	77	-	50	130	-	204	-	114	575	575	-	-	-	486	-	-	-	29,184	95	-
1b.3.4	Small tool allowance	-	19	-	-	-	-	-	3	22	22	-	-	-	-	-	-	-	-	-	-
1b.3.5	Prairie Island Indian Community Payments	-	-	-	-	-	-	315	-	315	-	315	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,050	19	50	130	-	204	315	263	2,031	1,716	315	-	-	486	-	-	-	29,184	95	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	415	-	-	-	-	-	-	104	518	518	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	436	44	480	480	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	676	68	744	744	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	212	-	-	-	-	-	53	264	264	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	143	-	-	-	-	-	21	164	164	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	2	-	27	-	8	43	43	-	-	-	326	-	-	-	6,519	11	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	382	57	439	439	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	161	16	178	178	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	404	40	445	-	445	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	370	56	426	426	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	101	15	116	-	116	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	13	2	15	-	15	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	1,863	279	2,142	2,142	-	-	-	-	-	-	-	-	-	30,932
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	6,501	975	7,476	7,476	-	-	-	-	-	-	-	-	-	106,428
1b.4	Subtotal Period 1b Period-Dependent Costs	415	355	7	2	-	27	10,922	1,740	13,467	12,891	576	-	-	326	-	-	-	6,519	11	137,360
1b.0	TOTAL PERIOD 1b COST	2,600	373	57	132	-	230	22,929	4,324	30,645	29,754	891	-	-	812	-	-	-	35,703	17,108	137,360
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	486	-	-	-	-	-	73	559	559	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	9,017	-
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	68	10	79	79	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	534	-	-	-	-	801	310	1,646	1,646	-	-	-	-	-	-	-	-	12,717	583
Period 1c Collateral Costs																					
1c.3.1	Process decommissioning water waste	88	-	58	150	-	234	-	131	661	661	-	-	-	560	-	-	-	33,579	109	-
1c.3.3	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	159	24	183	-	183	-	-	-	-	-	-	-	-	-
1c.3.5	Retention and Severance	-	-	-	-	-	-	1,088	163	1,251	1,251	-	-	-	-	-	-	-	-	-	-
1c.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	315	-	315	-	315	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	88	4	58	150	-	234	1,562	319	2,415	1,917	498	-	-	560	-	-	-	33,579	109	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	436	44	480	480	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	676	68	744	744	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	191	-	-	-	-	-	48	239	239	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	143	-	-	-	-	-	21	164	164	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	1	-	13	-	4	20	20	-	-	-	154	-	-	-	3,073	5	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	382	57	439	439	-	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table I-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1c Period-Dependent Costs (continued)																					
1c.4.7	NRC Fees	-	-	-	-	-	-	161	16	178	178	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	404	40	445	-	445	-	-	-	-	-	-	-	-	-
1c.4.9	Fixed Overhead	-	-	-	-	-	-	370	56	426	426	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	101	15	116	-	116	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	13	2	15	-	15	-	-	-	-	-	-	-	-	-
1c.4.12	Railroad Track Maintenance	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-
1c.4.13	Security Staff Cost	-	-	-	-	-	-	1,863	279	2,142	2,142	-	-	-	-	-	-	-	-	-	30,932
1c.4.14	Utility Staff Cost	-	-	-	-	-	-	6,501	975	7,476	7,476	-	-	-	-	-	-	-	-	-	106,428
1c.4	Subtotal Period 1c Period-Dependent Costs	-	334	3	1	-	13	10,922	1,627	12,900	12,324	576	-	-	154	-	-	-	3,073	5	137,360
1c.0	TOTAL PERIOD 1c COST	88	873	61	151	-	247	13,285	2,256	16,961	15,887	1,074	-	-	713	-	-	-	36,652	12,832	137,943
PERIOD 1 TOTALS		2,688	2,329	132	287	-	527	87,801	13,975	107,738	101,484	6,254	-	-	2,135	-	-	-	84,545	29,960	864,653
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	68	10	78	78	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	643	161	804	804	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	711	171	882	882	-	-	-	-	-	-	-	-	-	-
Period 2a Additional Costs																					
2a.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	73,811	11,072	84,883	-	84,883	-	-	-	-	-	-	-	-	-
2a.3.2	Retention and Severance	-	-	-	-	-	-	23,628	3,544	27,172	27,172	-	-	-	-	-	-	-	-	-	-
2a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	5,897	-	5,897	-	5,897	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	103,336	14,616	117,952	27,172	90,780	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	2,412	241	2,653	2,653	-	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	12,654	1,265	13,919	13,919	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	898	-	-	-	-	-	224	1,122	1,122	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	21	6	-	79	-	23	129	129	-	-	-	972	-	-	-	19,431	32	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,430	214	1,644	1,644	-	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	1,211	121	1,332	1,332	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	6,061	606	6,667	-	6,667	-	-	-	-	-	-	-	-	-
2a.4.8	Fixed Overhead	-	-	-	-	-	-	6,938	1,041	7,979	7,979	-	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	1,894	284	2,178	-	2,178	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	244	37	280	-	280	-	-	-	-	-	-	-	-	-
2a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	-
2a.4.12	Security Staff Cost	-	-	-	-	-	-	32,791	4,919	37,709	26,849	10,860	-	-	-	-	-	-	-	-	542,920
2a.4.13	Utility Staff Cost	-	-	-	-	-	-	11,657	1,748	13,405	9,531	3,874	-	-	-	-	-	-	-	-	190,075
2a.4	Subtotal Period 2a Period-Dependent Costs	-	898	21	6	-	79	77,772	10,796	89,573	65,713	23,860	-	-	972	-	-	-	19,431	32	732,995
2a.0	TOTAL PERIOD 2a COST	-	898	21	6	-	79	186,168	26,235	213,407	98,767	114,640	-	-	972	-	-	-	19,431	32	732,995
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection									a											
2b.1.2	Semi-annual environmental survey									a											
2b.1.3	Prepare reports									a											
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	549	82	631	631	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	5,206	1,301	6,507	6,507	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	5,754	1,384	7,138	7,138	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	29,940	4,491	34,431	-	34,431	-	-	-	-	-	-	-	-	-
2b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	47,719	-	47,719	-	47,719	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	77,660	4,491	82,151	-	82,151	-	-	-	-	-	-	-	-	-

Table I-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	19,520	1,952	21,472	21,472	-	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	102,394	10,239	112,633	112,633	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	3,643	-	-	-	-	-	911	4,554	4,554	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	86	25	-	321	-	93	525	525	-	-	-	3,946	-	-	-	78,923	129	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	5,786	868	6,654	6,654	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	9,312	931	10,244	10,244	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	2,612	261	2,873	-	2,873	-	-	-	-	-	-	-	-	-
2b.4.8	Fixed Overhead	-	-	-	-	-	-	5,829	874	6,703	6,703	-	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	1,972	296	2,268	-	2,268	-	-	-	-	-	-	-	-	-
2b.4.10	Railroad Track Maintenance	-	-	-	-	-	-	2,203	330	2,534	2,534	-	-	-	-	-	-	-	-	-	-
2b.4.11	Security Staff Cost	-	-	-	-	-	-	96,335	14,450	110,786	22,822	87,964	-	-	-	-	-	-	-	-	1,430,311
2b.4.12	Utility Staff Cost	-	-	-	-	-	-	50,003	7,500	57,503	35,767	21,736	-	-	-	-	-	-	-	-	794,617
2b.4	Subtotal Period 2b Period-Dependent Costs	-	3,643	86	25	-	321	295,966	38,707	338,748	223,907	114,842	-	-	3,946	-	-	-	78,923	129	2,224,928
2b.0	TOTAL PERIOD 2b COST	-	3,643	86	25	-	321	379,380	44,581	428,037	231,045	196,992	-	-	3,946	-	-	-	78,923	129	2,224,928
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection									a											
2c.1.2	Semi-annual environmental survey									a											
2c.1.3	Prepare reports									a											
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	1,337	334	1,671	1,671	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	1,478	355	1,833	1,833	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	4,919	492	5,411	5,411	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	17,059	1,706	18,764	18,764	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	925	-	-	-	-	-	231	1,157	1,157	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	22	6	-	81	-	23	133	133	-	-	-	999	-	-	-	19,973	33	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	2,182	218	2,400	2,400	-	-	-	-	-	-	-	-	-	-
2c.4.7	Fixed Overhead	-	-	-	-	-	-	1,497	225	1,721	1,721	-	-	-	-	-	-	-	-	-	-
2c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	566	85	651	651	-	-	-	-	-	-	-	-	-	-
2c.4.9	Security Staff Cost	-	-	-	-	-	-	21,142	3,171	24,313	24,313	-	-	-	-	-	-	-	-	-	306,102
2c.4.10	Utility Staff Cost	-	-	-	-	-	-	10,901	1,635	12,536	12,536	-	-	-	-	-	-	-	-	-	178,560
2c.4	Subtotal Period 2c Period-Dependent Costs	-	925	22	6	-	81	59,751	8,009	68,795	68,795	-	-	-	999	-	-	-	19,973	33	484,661
2c.0	TOTAL PERIOD 2c COST	-	925	22	6	-	81	61,229	8,365	70,628	70,628	-	-	-	999	-	-	-	19,973	33	484,661
PERIOD 2 TOTALS		-	5,466	129	38	-	482	626,776	79,181	712,072	400,440	311,632	-	-	5,916	-	-	-	118,328	193	3,442,584
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	153	23	175	175	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	880	132	1,012	1,012	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	587	88	675	675	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
3a.1.9.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	865	130	995	895	-	99	-	-	-	-	-	-	-	7,370
3a.1.9.2	Plant systems	-	-	-	-	-	-	489	73	562	506	-	56	-	-	-	-	-	-	-	4,167
3a.1.9.3	Reactor internals	-	-	-	-	-	-	833	125	958	958	-	-	-	-	-	-	-	-	-	7,100
3a.1.9.4	Reactor vessel	-	-	-	-	-	-	763	114	877	877	-	-	-	-	-	-	-	-	-	6,500
3a.1.9.5	Biological shield	-	-	-	-	-	-	59	9	67	67	-	-	-	-	-	-	-	-	-	500
3a.1.9.6	Steam generators	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,120
3a.1.9.7	Reinforced concrete	-	-	-	-	-	-	188	28	216	108	-	108	-	-	-	-	-	-	-	1,600
3a.1.9.8	Main Turbine	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
3a.1.9.9	Main Condensers	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
3a.1.9.10	Plant structures & buildings	-	-	-	-	-	-	366	55	421	211	-	211	-	-	-	-	-	-	-	3,120
3a.1.9.11	Waste management	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table I-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Activity Specifications (continued)																					
3a.1.9.12	Facility & site closeout	-	-	-	-	-	-	106	16	121	61	-	61	-	-	-	-	-	-	-	900
3a.1.9	Total	-	-	-	-	-	-	4,669	700	5,369	4,726	-	643	-	-	-	-	-	-	-	39,777
Planning & Site Preparations																					
3a.1.10	Prepare dismantling sequence	-	-	-	-	-	-	282	42	324	324	-	-	-	-	-	-	-	-	-	2,400
3a.1.11	Plant prep. & temp. svces	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	-
3a.1.12	Design water clean-up system	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,400
3a.1.13	Rigging/Cont. Cntrl Envlp/ tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
3a.1.14	Procure casks/liners & containers	-	-	-	-	-	-	144	22	166	166	-	-	-	-	-	-	-	-	-	1,230
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	13,653	2,048	15,701	15,058	-	643	-	-	-	-	-	-	-	68,607
Period 3a Additional Costs																					
3a.2.1	Site Characterization	-	-	-	-	-	-	3,700	1,110	4,810	4,810	-	-	-	-	-	-	-	-	21,020	8,332
3a.2.2	Mixed/Hazardous Waste	-	-	318	75	164	-	-	68	624	624	-	-	6,133	-	-	-	-	351,986	2,361	-
3a.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	947	4,782	4,782	-	-	-	12,843	-	-	-	166,959	20,907	-
3a.2	Subtotal Period 3a Additional Costs	-	2,364	320	185	164	1,359	3,700	2,125	10,216	10,216	-	-	6,133	12,843	-	-	-	518,945	44,288	8,332
Period 3a Collateral Costs																					
3a.3.1	Small tool allowance	-	32	-	-	-	-	-	5	37	37	-	-	-	-	-	-	-	-	-	-
3a.3	Subtotal Period 3a Collateral Costs	-	32	-	-	-	-	-	5	37	37	-	-	-	-	-	-	-	-	-	-
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	501	50	552	552	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	1,736	174	1,909	1,909	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	562	-	-	-	-	-	140	702	702	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	11	3	-	42	-	12	68	68	-	-	-	514	-	-	-	10,287	17	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	341	34	376	376	-	-	-	-	-	-	-	-	-	-
3a.4.8	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
3a.4.9	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
3a.4.10	Security Staff Cost	-	-	-	-	-	-	3,843	576	4,419	4,419	-	-	-	-	-	-	-	-	-	65,000
3a.4.11	Utility Staff Cost	-	-	-	-	-	-	15,819	2,373	18,191	18,191	-	-	-	-	-	-	-	-	-	257,920
3a.4	Subtotal Period 3a Period-Dependent Costs	-	1,129	11	3	-	42	25,282	3,901	30,368	30,368	-	-	-	514	-	-	-	10,287	17	322,920
3a.0	TOTAL PERIOD 3a COST	-	3,524	331	188	164	1,401	42,635	8,078	56,321	55,678	-	643	6,133	13,357	-	-	-	529,232	44,305	399,859
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	556	83	639	575	-	64	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor internals	-	-	-	-	-	-	293	44	337	337	-	-	-	-	-	-	-	-	-	2,500
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	158	24	182	46	-	137	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	117	18	135	135	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	426	64	490	490	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	141	21	162	81	-	81	-	-	-	-	-	-	-	1,200
3b.1.1.9	Missile shields	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	450
3b.1.1.10	Biological shield	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.11	Steam generators	-	-	-	-	-	-	540	81	621	621	-	-	-	-	-	-	-	-	-	4,600
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	117	18	135	67	-	67	-	-	-	-	-	-	-	1,000
3b.1.1.13	Main Turbine	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
3b.1.1.14	Main Condensers	-	-	-	-	-	-	183	27	211	-	-	211	-	-	-	-	-	-	-	1,560
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
3b.1.1.16	Reactor building	-	-	-	-	-	-	320	48	369	332	-	37	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	3,785	568	4,352	3,508	-	844	-	-	-	-	-	-	-	32,243
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,785	568	4,352	3,508	-	844	-	-	-	-	-	-	-	32,243
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	973	1,200	-	-	-	-	1,189	504	3,866	3,866	-	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table I-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	35	-	-	-	-	-	-	9	43	43	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	255	25	280	280	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	804	80	884	884	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	248	-	-	-	-	-	62	309	309	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	283	-	-	-	-	-	42	325	325	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	6	2	-	24	-	7	39	39	-	-	-	290	-	-	-	5,802	9	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	755	113	869	869	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	170	17	187	187	-	-	-	-	-	-	-	-	-	-
3b.4.9	Fixed Overhead	-	-	-	-	-	-	733	110	843	843	-	-	-	-	-	-	-	-	-	-
3b.4.10	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
3b.4.11	Security Staff Cost	-	-	-	-	-	-	1,916	287	2,204	2,204	-	-	-	-	-	-	-	-	-	32,411
3b.4.12	DOC Staff Cost	-	-	-	-	-	-	5,123	769	5,892	5,892	-	-	-	-	-	-	-	-	-	58,080
3b.4.13	Utility Staff Cost	-	-	-	-	-	-	7,888	1,183	9,071	9,071	-	-	-	-	-	-	-	-	-	128,607
3b.4	Subtotal Period 3b Period-Dependent Costs	35	530	6	2	-	24	17,673	2,709	20,979	20,979	-	-	-	290	-	-	-	5,802	9	219,098
3b.0	TOTAL PERIOD 3b COST	1,008	1,730	6	2	-	24	22,646	3,781	29,197	28,353	-	844	-	290	-	-	-	5,802	9	251,341
PERIOD 3 TOTALS		1,008	5,254	338	190	164	1,425	65,281	11,860	85,519	84,032	-	1,487	6,133	13,647	-	-	-	535,034	44,314	651,200
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	11	40	6	5	34	75	-	41	212	212	-	-	144	152	-	-	-	33,380	771	-
4a.1.1.2	Pressurizer Relief Tank	5	18	4	3	23	50	-	24	126	126	-	-	96	101	-	-	-	22,241	347	-
4a.1.1.3	Reactor Coolant Pumps & Motors	13	56	43	76	-	736	-	220	1,143	1,143	-	-	-	2,332	-	-	-	295,800	1,226	80
4a.1.1.4	Pressurizer	10	68	359	82	-	693	-	244	1,456	1,456	-	-	-	2,196	-	-	-	158,199	1,499	750
4a.1.1.5	Steam Generators	47	2,943	1,576	1,614	1,246	3,467	-	2,212	13,104	13,104	-	-	18,672	10,990	-	-	-	1,560,086	10,964	2,250
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	60	243	199	32	169	369	-	233	1,305	1,305	-	-	2,138	2,146	-	-	-	165,025	4,449	-
4a.1.1.7	Reactor Vessel Internals	61	4,189	21,537	971	-	7,954	239	12,812	47,763	47,763	-	-	-	757	-	742	-	166,435	19,373	933
4a.1.1.8	Vessel & Internals GTCC Disposal	-	-	-	-	-	8,689	-	1,303	9,992	9,992	-	-	-	-	-	-	3,746	837,596	-	-
4a.1.1.9	Reactor Vessel	-	5,439	1,328	198	-	1,804	239	5,398	14,406	14,406	-	-	-	5,719	-	-	-	569,974	19,373	933
4a.1.1	Totals	206	12,996	25,052	2,982	1,471	23,836	478	22,487	89,506	89,506	-	-	21,050	24,393	-	742	3,746	3,808,735	58,003	4,947
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	269	128	27	287	-	-	127	838	838	-	-	2,243	-	-	-	-	134,601	4,116	-
4a.1.3	Main Condensers	-	2,269	87	26	383	-	-	637	3,403	3,403	-	-	4,000	-	-	-	-	180,000	34,978	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
4a.1.4	Totals	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
Disposal of Plant Systems																					
4a.1.5.1	Air Removal	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	452	-
4a.1.5.2	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	670	-
4a.1.5.3	Auxiliary Feedwater - RCA	-	45	0	1	19	-	-	14	79	79	-	-	215	-	-	-	-	8,722	601	-
4a.1.5.4	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,335	-
4a.1.5.5	Caustic Addition - RCA	-	36	0	1	20	-	-	12	71	71	-	-	233	-	-	-	-	9,453	444	-
4a.1.5.6	Chemical Feed	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	304	-
4a.1.5.7	Chemical Feed - RCA	-	1	0	0	1	-	-	0	2	2	-	-	6	-	-	-	-	243	12	-
4a.1.5.8	Circulating Water	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	619	-
4a.1.5.9	Condensate	-	414	-	-	-	-	-	62	476	-	-	476	-	-	-	-	-	-	6,837	-
4a.1.5.10	Condensate Polishing	-	205	-	-	-	-	-	31	236	-	-	236	-	-	-	-	-	-	3,420	-
4a.1.5.11	Condensate Polishing - RCA	-	176	4	12	180	-	-	73	444	444	-	-	2,078	-	-	-	-	84,395	2,329	-
4a.1.5.12	Electro-hydraulic	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	127	-
4a.1.5.13	Feedwater	-	133	-	-	-	-	-	20	153	-	-	153	-	-	-	-	-	-	2,215	-
4a.1.5.14	Feedwater - RCA	-	186	6	19	278	-	-	91	579	579	-	-	3,208	-	-	-	-	130,294	2,651	-
4a.1.5.15	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	505	-
4a.1.5.16	Heater Drain	-	349	-	-	-	-	-	52	401	-	-	401	-	-	-	-	-	-	5,881	-
4a.1.5.17	Internal Circ Water & CDSR	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	389	-
4a.1.5.18	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
4a.1.5.19	Main Steam	-	101	-	-	-	-	-	15	116	-	-	116	-	-	-	-	-	-	1,690	-
4a.1.5.20	Main Steam - RCA	-	350	9	29	436	-	-	158	983	983	-	-	5,044	-	-	-	-	204,825	4,956	-
4a.1.5.21	Steam Generator Blowdown	-	416	21	22	176	195	-	185	1,014	1,014	-	-	2,031	686	-	-	-	127,773	5,974	-
4a.1.5.22	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
4a.1.5.23	Turbine & Moisture Separators	-	337	-	-	-	-	-	51	388	-	-	388	-	-	-	-	-	-	5,609	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table I-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	
Disposal of Plant Systems (continued)																					
4a.1.5.24	Turbine Oil Purification	-	61	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	1,003	-
4a.1.5	Totals	-	3,075	40	85	1,108	195	-	814	5,317	3,172	-	2,145	12,815	686	-	-	-	565,705	48,101	-
4a.1.6	Scaffolding in support of decommissioning	-	833	3	1	13	3	-	212	1,066	1,066	-	-	138	12	-	-	-	7,016	6,020	-
4a.1	Subtotal Period 4a Activity Costs	206	20,170	25,310	3,121	3,263	24,034	478	24,386	100,967	98,823	-	2,145	40,246	25,091	-	742	3,746	4,696,057	158,807	4,947
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,865	559	2,424	2,424	-	-	-	-	-	-	-	24,374	-	
4a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
4a.2	Subtotal Period 4a Additional Costs	1	659	785	107	-	1,439	1,865	1,996	6,851	6,851	-	-	-	2,097	125	-	-	205,890	26,549	87
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	2	-	4	10	-	16	-	7	40	40	-	-	-	39	-	-	-	2,329	8	-
4a.3.3	Small tool allowance	-	195	-	-	-	-	-	29	224	201	-	22	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	2	195	4	10	-	16	-	36	264	242	-	22	-	39	-	-	-	2,329	8	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	82	-	-	-	-	-	-	20	102	102	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	599	60	659	659	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	1,782	178	1,960	1,960	-	-	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,476	-	-	-	-	-	369	1,846	1,846	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,575	-	-	-	-	-	386	2,961	2,961	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	61	18	-	228	-	66	373	373	-	-	-	2,802	-	-	-	56,048	91	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,687	253	1,940	1,940	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	653	65	719	719	-	-	-	-	-	-	-	-	-	-
4a.4.9	Fixed Overhead	-	-	-	-	-	-	1,452	218	1,670	1,670	-	-	-	-	-	-	-	-	-	-
4a.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	475	71	546	546	-	-	-	-	-	-	-	-	-	-
4a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	68	10	78	78	-	-	-	-	-	-	-	-	-	-
4a.4.12	Security Staff Cost	-	-	-	-	-	-	3,359	504	3,863	3,863	-	-	-	-	-	-	-	-	-	57,436
4a.4.13	DOC Staff Cost	-	-	-	-	-	-	14,349	2,152	16,501	16,501	-	-	-	-	-	-	-	-	-	166,833
4a.4.14	Utility Staff Cost	-	-	-	-	-	-	17,900	2,685	20,586	20,586	-	-	-	-	-	-	-	-	-	295,394
4a.4	Subtotal Period 4a Period-Dependent Costs	82	4,051	61	18	-	228	42,324	7,038	53,802	53,802	-	-	-	2,802	-	-	-	56,048	91	519,664
4a.0	TOTAL PERIOD 4a COST	290	25,075	26,160	3,256	3,263	25,717	44,667	33,457	161,884	159,717	-	2,167	40,246	30,029	125	742	3,746	4,960,324	185,455	524,697
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	297	32	94	32	-	595	-	319	1,369	1,369	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
4b.1.2.1	Aux Bldg Normal Ventilation	-	2	0	0	0	-	-	0	3	3	-	-	3	-	-	-	-	140	26	-
4b.1.2.2	Battery Rm Special Ventilation	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
4b.1.2.3	Buildings Maintenance	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	65	-
4b.1.2.4	Chemical & Volume Control	-	1,210	83	69	389	802	-	580	3,134	3,134	-	-	4,498	2,846	-	-	-	369,246	17,235	-
4b.1.2.5	Component Cooling - RCA	-	821	22	72	1,075	-	-	379	2,369	2,369	-	-	12,427	-	-	-	-	504,675	11,242	-
4b.1.2.6	Containment Cooling	-	65	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	1,086	-
4b.1.2.7	Containment Cooling - RCA	-	290	6	20	294	-	-	120	730	730	-	-	3,400	-	-	-	-	138,090	3,971	-
4b.1.2.8	Containment Hydrogen Control - RCA	-	29	0	1	9	-	-	9	48	48	-	-	105	-	-	-	-	4,278	401	-
4b.1.2.9	Containment Spray - RCA	-	90	2	5	75	-	-	35	206	206	-	-	868	-	-	-	-	35,249	1,217	-
4b.1.2.10	Containment Ventilation	-	219	24	40	428	209	-	180	1,100	1,100	-	-	4,951	737	-	-	-	249,786	3,278	-
4b.1.2.11	Cooling Water	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	2,396	-
4b.1.2.12	Cooling Water - RCA	-	629	14	45	668	-	-	266	1,622	1,622	-	-	7,728	-	-	-	-	313,832	8,594	-
4b.1.2.13	D1 Emergency Diesel	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	730	-
4b.1.2.14	D2 Emergency Diesel	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	522	-
4b.1.2.15	Diesel Rooms Ventilation	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	135	-
4b.1.2.16	Electrical - Clean	-	1,669	-	-	-	-	-	250	1,919	-	-	1,919	-	-	-	-	-	-	26,981	-
4b.1.2.17	Electrical - Contaminated	-	536	6	16	219	27	-	177	980	980	-	-	2,527	95	-	-	-	108,935	7,488	-
4b.1.2.18	Electrical - Contaminated - Fuel Pool	-	133	2	4	53	7	-	44	242	242	-	-	615	23	-	-	-	26,508	1,857	-
4b.1.2.19	Electrical - Decontaminated	-	3,674	41	137	2,037	-	-	1,249	7,138	7,138	-	-	23,551	-	-	-	-	956,401	49,378	-
4b.1.2.20	Electrical - Decontaminated - Fuel Pool	-	918	10	34	510	-	-	312	1,785	1,785	-	-	5,893	-	-	-	-	239,327	12,340	-
4b.1.2.21	Fuel Handling	-	104	6	9	79	62	-	55	314	314	-	-	908	218	-	-	-	51,280	1,595	-
4b.1.2.22	Fuel Oil	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	1,697	-
4b.1.2.23	HVAC - Clean	-	105	-	-	-	-	-	16	121	-	-	121	-	-	-	-	-	-	1,891	-
4b.1.2.24	HVAC - Contaminated	-	335	8	21	282	35	-	139	819	819	-	-	3,261	123	-	-	-	140,573	4,335	-
4b.1.2.25	HVAC - Contaminated - Fuel Pool	-	143	3	9	121	15	-	59	351	351	-	-	1,398	53	-	-	-	60,246	1,858	-

Table I-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed Volume Cu. Feet	Burial Volumes				Burial /		Utility and	
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs		Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.	Craft Manhours	Contractor Manhours	
Disposal of Plant Systems (continued)																						
4b.1.2.26	Incore Instrumentation	-	24	1	1	5	16	-	11	59	59	-	-	60	57	-	-	-	6,177	382	-	
4b.1.2.27	Misc Drains & Vents	-	203	14	10	34	146	-	95	503	503	-	-	390	514	-	-	-	49,900	2,764	-	
4b.1.2.28	Reactor Coolant	-	271	21	14	30	221	-	132	689	689	-	-	344	777	-	-	-	65,413	3,865	-	
4b.1.2.29	Reactor Hot Sampling	-	120	11	6	6	98	-	57	297	297	-	-	66	342	-	-	-	25,347	1,611	-	
4b.1.2.30	Reactor Makeup	-	64	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	1,042	-	
4b.1.2.31	Reactor Vessel	-	18	1	0	2	4	-	6	31	31	-	-	26	14	-	-	-	2,011	260	-	
4b.1.2.32	Residual Heat Removal	-	360	85	66	250	926	-	377	2,065	2,065	-	-	2,895	3,252	-	-	-	332,849	5,374	-	
4b.1.2.33	Safeguards Chilled Water	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	259	-	
4b.1.2.34	Safeguards Chilled Water - RCA	-	82	1	3	43	-	-	27	155	155	-	-	495	-	-	-	-	20,100	1,019	-	
4b.1.2.35	Safety Injection	-	774	40	57	587	327	-	376	2,161	2,161	-	-	6,788	1,156	-	-	-	351,793	11,276	-	
4b.1.2.36	Sampling	-	53	4	2	5	31	-	22	116	116	-	-	59	107	-	-	-	9,505	731	-	
4b.1.2.37	Shield Bldg Ventilation	-	120	14	20	186	139	-	97	576	576	-	-	2,152	491	-	-	-	119,838	1,811	-	
4b.1.2.38	Spent Fuel Pool Cooling	-	311	34	25	70	377	-	190	1,006	1,006	-	-	806	1,325	-	-	-	120,439	4,400	-	
4b.1.2.39	Station & Instrument Air	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	300	-	
4b.1.2.40	Station & Instrument Air - RCA	-	79	1	2	29	-	-	24	135	135	-	-	332	-	-	-	-	13,496	1,053	-	
4b.1.2.41	Station & Instrument Air - RCA Fuel Pool	-	20	0	0	7	-	-	6	34	34	-	-	83	-	-	-	-	3,374	263	-	
4b.1.2.42	Turbine Bldg Traps & Drains	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	767	-	
4b.1.2.43	Unit Coolers	-	37	-	-	-	-	-	6	42	-	-	42	-	-	-	-	-	-	611	-	
4b.1.2.44	Unit Coolers - RCA	-	53	0	1	20	-	-	16	91	91	-	-	230	-	-	-	-	9,348	683	-	
4b.1.2	Totals	-	13,970	453	689	7,514	3,443	-	5,394	31,463	28,759	-	2,704	86,861	12,129	-	-	-	4,328,159	198,796	-	
4b.1.3	Scaffolding in support of decommissioning	-	1,250	5	2	20	5	-	317	1,599	1,599	-	-	207	18	-	-	-	10,524	9,030	-	
Decontamination of Site Buildings																						
4b.1.4.1	Reactor	1,037	2,360	118	833	193	6,372	-	2,868	13,781	13,781	-	-	2,230	36,899	-	-	-	3,286,398	45,584	-	
4b.1.4.2	Backwash Waste Receiving Tank	-	24	1	11	-	87	-	30	154	154	-	-	-	507	-	-	-	43,896	264	-	
4b.1.4	Totals	1,037	2,385	119	845	193	6,460	-	2,897	13,936	13,936	-	-	2,230	37,406	-	-	-	3,330,294	45,848	-	
4b.1.5	Prepare/submit License Termination Plan	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	4,096	
4b.1.6	Receive NRC approval of termination plan									a												
4b.1	Subtotal Period 4b Activity Costs	1,334	17,637	671	1,567	7,726	10,503	481	9,000	48,919	46,215	-	2,704	89,298	51,645	-	-	-	7,807,274	254,251	4,096	
Period 4b Additional Costs																						
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240	
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,832	849	3,681	3,681	-	-	-	-	-	-	-	-	37,017	-	
4b.2.3	Excavation of Underground Services	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-	
4b.2.4	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-	
4b.2.5	License Termination ISFSI	-	37	2	211	-	2,157	1,186	898	4,491	4,491	-	-	-	7,458	-	-	-	1,071,985	3,670	5,284	
4b.2.6	Demolition and Site Restoration ISFSI	-	495	-	-	-	-	87	87	669	-	-	669	-	-	-	-	-	-	2,308	160	
4b.2	Subtotal Period 4b Additional Costs	-	1,342	11	240	312	2,157	5,469	2,340	11,872	9,672	-	2,200	5,855	7,458	-	-	-	1,218,360	50,417	11,684	
Period 4b Collateral Costs																						
4b.3.1	Process decommissioning water waste	5	-	9	23	-	36	-	16	88	88	-	-	-	85	-	-	-	5,086	17	-	
4b.3.3	Small tool allowance	-	288	-	-	-	-	-	43	331	331	-	-	-	-	-	-	-	-	-	-	
4b.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-	
4b.3	Subtotal Period 4b Collateral Costs	5	288	152	78	575	186	-	205	1,490	1,490	-	-	6,000	614	-	-	-	310,054	105	-	
Period 4b Period-Dependent Costs																						
4b.4.1	Decon supplies	521	-	-	-	-	-	-	130	651	651	-	-	-	-	-	-	-	-	-	-	
4b.4.2	Insurance	-	-	-	-	-	-	910	91	1,001	1,001	-	-	-	-	-	-	-	-	-	-	
4b.4.3	Property taxes	-	-	-	-	-	-	2,610	261	2,872	2,872	-	-	-	-	-	-	-	-	-	-	
4b.4.4	Health physics supplies	-	2,248	-	-	-	-	-	562	2,810	2,810	-	-	-	-	-	-	-	-	-	-	
4b.4.5	Heavy equipment rental	-	4,021	-	-	-	-	-	603	4,624	4,624	-	-	-	-	-	-	-	-	-	-	
4b.4.6	Disposal of DAW generated	-	-	85	25	-	318	-	92	520	520	-	-	-	3,905	-	-	-	78,097	127	-	
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,023	303	2,326	2,326	-	-	-	-	-	-	-	-	-	-	
4b.4.8	NRC Fees	-	-	-	-	-	-	992	99	1,092	1,092	-	-	-	-	-	-	-	-	-	-	
4b.4.9	Fixed Overhead	-	-	-	-	-	-	2,205	331	2,535	2,535	-	-	-	-	-	-	-	-	-	-	
4b.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	721	108	829	829	-	-	-	-	-	-	-	-	-	-	
4b.4.11	Railroad Track Maintenance	-	-	-	-	-	-	103	15	118	118	-	-	-	-	-	-	-	-	-	-	
4b.4.12	Security Staff Cost	-	-	-	-	-	-	1,017	153	1,170	1,170	-	-	-	-	-	-	-	-	-	20,373	
4b.4.13	DOC Staff Cost	-	-	-	-	-	-	14,220	2,133	16,353	16,353	-	-	-	-	-	-	-	-	-	174,093	
4b.4.14	Utility Staff Cost	-	-	-	-	-	-	18,286	2,743	21,029	21,029	-	-	-	-	-	-	-	-	-	311,145	
4b.4	Subtotal Period 4b Period-Dependent Costs	521	6,269	85	25	-	318	43,087	7,625	57,929	57,929	-	-	-	3,905	-	-	-	78,097	127	505,611	
4b.0	TOTAL PERIOD 4b COST	1,860	25,537	919	1,910	8,613	13,164	49,037	19,170	120,210	115,306	-	4,904	101,153	63,622	-	-	-	9,413,785	304,901	521,391	

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table I-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 4e - Delay before License Termination																					
Period 4e Period-Dependent Costs																					
4e.4.1	Insurance	-	-	-	-	-	-	308	31	339	339	-	-	-	-	-	-	-	-	-	-
4e.4.2	Property taxes	-	-	-	-	-	-	846	85	930	930	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	56	-	-	-	-	-	14	70	70	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	1	0	-	5	-	1	8	8	-	-	-	60	-	-	-	1,202	2	-
4e.4.6	NRC Fees	-	-	-	-	-	-	134	13	147	147	-	-	-	-	-	-	-	-	-	-
4e.4.7	Fixed Overhead	-	-	-	-	-	-	746	112	858	858	-	-	-	-	-	-	-	-	-	-
4e.4.8	Railroad Track Maintenance	-	-	-	-	-	-	35	5	40	40	-	-	-	-	-	-	-	-	-	-
4e.4.9	Utility Staff Cost	-	-	-	-	-	-	536	80	616	616	-	-	-	-	-	-	-	-	-	8,776
4e.4	Subtotal Period 4e Period-Dependent Costs	-	56	1	0	-	5	2,604	342	3,009	3,009	-	-	-	60	-	-	-	1,202	2	8,776
4e.0	TOTAL PERIOD 4e COST	-	56	1	0	-	5	2,604	342	3,009	3,009	-	-	-	60	-	-	-	1,202	2	8,776
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	3,217	965	4,182	4,182	-	-	-	-	-	-	-	-	40,172	3,120
Period 4f Collateral Costs																					
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
4f.4.2	Property taxes	-	-	-	-	-	-	1,002	100	1,102	1,102	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	418	-	-	-	-	-	105	523	523	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	332	-	-	-	6,649	11	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	417	42	459	459	-	-	-	-	-	-	-	-	-	-
4f.4.7	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
4f.4.8	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
4f.4.9	Security Staff Cost	-	-	-	-	-	-	707	106	813	813	-	-	-	-	-	-	-	-	-	11,668
4f.4.10	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
4f.4.11	Utility Staff Cost	-	-	-	-	-	-	3,630	544	4,174	4,174	-	-	-	-	-	-	-	-	-	56,395
4f.4	Subtotal Period 4f Period-Dependent Costs	-	418	7	2	-	27	11,435	1,738	13,627	13,627	-	-	-	332	-	-	-	6,649	11	114,346
4f.0	TOTAL PERIOD 4f COST	-	418	7	2	-	27	16,016	2,934	19,405	19,405	-	-	-	332	-	-	-	6,649	40,183	117,466
PERIOD 4 TOTALS		2,150	51,086	27,088	5,168	11,876	38,913	112,324	55,902	304,508	297,436	-	7,071	141,399	94,043	125	742	3,746	14,381,960	530,540	1,172,330
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	4,255	-	-	-	-	-	638	4,894	-	-	4,894	-	-	-	-	-	-	44,669	-
5b.1.1.2	Condensate Storage Tank Foundation	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	16	-
5b.1.1.3	Structures below 3' below grade	-	1,713	-	-	-	-	-	257	1,969	-	-	1,969	-	-	-	-	-	-	9,238	-
5b.1.1.4	Turbine	-	1,983	-	-	-	-	-	297	2,280	-	-	2,280	-	-	-	-	-	-	22,040	-
5b.1.1.5	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
5b.1.1	Totals	-	8,303	-	-	-	-	-	1,245	9,548	-	-	9,548	-	-	-	-	-	-	77,820	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	8,733	-	-	-	-	183	1,337	10,254	211	-	10,044	-	-	-	-	-	-	78,740	1,560
Period 5b Additional Costs																					
5b.2.1	Clean Concrete Disposal	-	2,213	-	-	-	-	3	332	2,549	-	-	2,549	-	-	-	-	-	-	8,386	-
5b.2.2	Intake Structure Cofferdam	-	596	-	-	-	-	-	89	686	-	-	686	-	-	-	-	-	-	5,168	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table I-1
Prairie Island Nuclear Generating Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 5b Additional Costs (continued)																					
5b.2.3	Construction Debris	-	-	-	-	-	-	10	2	12	-	-	12	-	-	-	-	-	-	-	-
5b.2.4	Backfill	-	2,751	-	-	-	-	-	413	3,164	-	-	3,164	-	-	-	-	-	-	2,904	-
5b.2	Subtotal Period 5b Additional Costs	-	5,560	-	-	-	-	13	836	6,410	-	-	6,410	-	-	-	-	-	-	16,458	-
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.2	Property taxes	-	-	-	-	-	-	1,712	171	1,883	-	-	1,883	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
5b.4.5	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
5b.4.6	Railroad Track Maintenance	-	-	-	-	-	-	122	18	141	-	-	141	-	-	-	-	-	-	-	-
5b.4.7	Security Staff Cost	-	-	-	-	-	-	1,812	272	2,084	-	-	2,084	-	-	-	-	-	-	-	29,221
5b.4.8	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885
5b.4.9	Utility Staff Cost	-	-	-	-	-	-	3,673	551	4,224	-	-	4,224	-	-	-	-	-	-	-	57,340
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,670	-	-	-	-	19,097	3,779	29,546	-	-	29,546	-	-	-	-	-	-	-	203,445
5b.0	TOTAL PERIOD 5b COST	-	21,070	-	-	-	-	19,294	5,969	46,333	211	-	46,122	-	-	-	-	-	-	95,198	205,005
PERIOD 5 TOTALS		-	21,070	-	-	-	-	19,294	5,969	46,333	211	-	46,122	-	-	-	-	-	-	95,198	205,005
TOTAL COST TO DECOMMISSION		5,846	85,205	27,686	5,682	12,040	41,346	911,476	166,888	1,256,169	883,602	317,887	54,680	147,532	115,742	125	742	3,746	15,119,870	700,205	6,335,772

TOTAL COST TO DECOMMISSION WITH 15.32% CONTINGENCY:	\$1,256,169	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 70.34% OR:	\$883,602	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 25.31% OR:	\$317,887	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 4.35% OR:	\$54,680	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	116,610	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	33,003	tons
TOTAL CRAFT LABOR REQUIREMENTS:	700,205	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table I-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	571	171	742	742	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.11	End product description	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	75	11	87	87	-	-	-	-	-	-	-	-	-	641
1a.1.13	Define major work sequence	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.14	Perform SER and EA	-	-	-	-	-	-	156	23	179	179	-	-	-	-	-	-	-	-	-	1,326
1a.1.15	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
1a.1.16	Perform Site-Specific Cost Study	-	-	-	-	-	-	251	38	289	289	-	-	-	-	-	-	-	-	-	2,138
1a.1.17	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
Activity Specifications																					
1a.1.18.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	247	37	284	284	-	-	-	-	-	-	-	-	-	2,104
1a.1.18.2	Plant systems	-	-	-	-	-	-	209	31	241	241	-	-	-	-	-	-	-	-	-	1,782
1a.1.18.3	Plant structures and buildings	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,334
1a.1.18.4	Waste management	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.18.5	Facility and site dormancy	-	-	-	-	-	-	100	15	115	115	-	-	-	-	-	-	-	-	-	855
1a.1.18	Total	-	-	-	-	-	-	813	122	935	935	-	-	-	-	-	-	-	-	-	6,930
Detailed Work Procedures																					
1a.1.19.1	Plant systems	-	-	-	-	-	-	59	9	68	68	-	-	-	-	-	-	-	-	-	506
1a.1.19.2	Facility closeout & dormancy	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	513
1a.1.19	Total	-	-	-	-	-	-	120	18	138	138	-	-	-	-	-	-	-	-	-	1,019
1a.1.20	Procure vacuum drying system	-	-	-	-	-	-	5	1	6	6	-	-	-	-	-	-	-	-	-	43
1a.1.21	Drain/de-energize non-cont. systems									a											
1a.1.22	Drain & dry NSSS									a											
1a.1.23	Drain/de-energize contaminated systems									a											
1a.1.24	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	2,799	505	3,304	3,304	-	-	-	-	-	-	-	-	-	18,981
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,227	184	1,411	-	1,411	-	-	-	-	-	-	-	-	-
1a.3.2	Retention and Severance	-	-	-	-	-	-	8,394	1,259	9,653	9,653	-	-	-	-	-	-	-	-	-	-
1a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	2,281	-	2,281	-	2,281	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,902	1,443	13,345	9,653	3,692	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,730	173	1,903	1,903	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	2,682	268	2,950	2,950	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	507	-	-	-	-	-	127	633	633	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	4	-	49	-	14	79	79	-	-	-	597	-	-	-	11,939	19	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	778	78	855	855	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,604	160	1,765	-	1,765	-	-	-	-	-	-	-	-	-
1a.4.9	Fixed Overhead	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	401	60	461	-	461	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	52	8	59	-	59	-	-	-	-	-	-	-	-	-
1a.4.12	Railroad Track Maintenance	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,390	1,108	8,498	8,498	-	-	-	-	-	-	-	-	-	122,720
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	24,344	3,652	27,995	27,995	-	-	-	-	-	-	-	-	-	400,523
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,074	13	4	-	49	42,022	6,189	49,351	47,066	2,286	-	-	597	-	-	-	11,939	19	523,243
1a.0	TOTAL PERIOD 1a COST	-	1,074	13	4	-	49	56,723	8,138	66,000	60,023	5,977	-	-	597	-	-	-	11,939	19	542,224

Table I-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	1,135	-	-	-	-	-	-	568	1,703	1,703	-	-	-	-	-	-	-	-	17,003	-
1b.1.1.2	Auxiliary	1,177	-	-	-	-	-	-	589	1,766	1,766	-	-	-	-	-	-	-	-	17,950	-
1b.1.1.3	Drum Transfer & Truck Loading Enclosure	16	-	-	-	-	-	-	8	24	24	-	-	-	-	-	-	-	-	244	-
1b.1.1.4	LLRW Storage Enclosure	99	-	-	-	-	-	-	50	149	149	-	-	-	-	-	-	-	-	1,487	-
1b.1.1.5	Radwaste	44	-	-	-	-	-	-	22	66	66	-	-	-	-	-	-	-	-	669	-
1b.1.1.6	Resin Disposal	13	-	-	-	-	-	-	7	20	20	-	-	-	-	-	-	-	-	198	-
1b.1.1.7	Fuel Handling of Aux Building	863	-	-	-	-	-	-	431	1,294	1,294	-	-	-	-	-	-	-	-	12,414	-
1b.1.1	Totals	3,348	-	-	-	-	-	-	1,674	5,022	5,022	-	-	-	-	-	-	-	-	49,966	-
1b.1	Subtotal Period 1b Activity Costs	3,348	-	-	-	-	-	-	1,674	5,022	5,022	-	-	-	-	-	-	-	-	49,966	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	7,794	1,169	8,963	8,963	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	105	-	68	177	-	277	-	155	781	781	-	-	-	-	660	-	-	-	39,628	129
1b.3.4	Small tool allowance	-	56	-	-	-	-	-	8	64	64	-	-	-	-	-	-	-	-	-	-
1b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	286	43	329	-	329	-	-	-	-	-	-	-	-	-
1b.3.6	Retention and Severance	-	-	-	-	-	-	2,315	347	2,662	2,662	-	-	-	-	-	-	-	-	-	-
1b.3.7	Prairie Island Indian Community Payments	-	-	-	-	-	-	315	-	315	-	315	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,078	56	68	177	-	277	2,916	699	5,269	4,625	644	-	-	-	660	-	-	-	39,628	129
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	1,232	-	-	-	-	-	-	308	1,540	1,540	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	436	44	480	480	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	675	68	743	743	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	369	-	-	-	-	-	92	461	461	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	143	-	-	-	-	-	21	164	164	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	14	4	-	52	-	15	85	85	-	-	-	-	636	-	-	-	12,711	21
1b.4.7	Plant energy budget	-	-	-	-	-	-	382	57	439	439	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	107	11	118	118	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	404	40	445	-	445	-	-	-	-	-	-	-	-	-
1b.4.10	Fixed Overhead	-	-	-	-	-	-	370	56	426	426	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	101	15	116	-	116	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	13	2	15	-	15	-	-	-	-	-	-	-	-	-
1b.4.13	Railroad Track Maintenance	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	1,863	279	2,142	2,142	-	-	-	-	-	-	-	-	-	30,932
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	6,501	975	7,476	7,476	-	-	-	-	-	-	-	-	-	106,428
1b.4	Subtotal Period 1b Period-Dependent Costs	1,232	512	14	4	-	52	10,867	1,986	14,667	14,090	576	-	-	-	636	-	-	-	12,711	21
1b.0	TOTAL PERIOD 1b COST	5,657	568	82	181	-	328	21,577	5,528	33,921	32,701	1,220	-	-	-	1,296	-	-	-	52,338	50,116
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	486	-	-	-	-	-	73	559	559	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	9,017	-
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	29	4	34	34	-	-	-	-	-	-	-	-	-	249
1c.1	Subtotal Period 1c Activity Costs	-	534	-	-	-	-	762	304	1,601	1,601	-	-	-	-	-	-	-	-	12,717	249
Period 1c Collateral Costs																					
1c.3.1	Process decommissioning water waste	88	-	58	150	-	234	-	131	661	661	-	-	-	-	560	-	-	-	33,579	109
1c.3.3	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	84	13	96	-	96	-	-	-	-	-	-	-	-	-
1c.3.5	Retention and Severance	-	-	-	-	-	-	1,741	261	2,002	2,002	-	-	-	-	-	-	-	-	-	-
1c.3.6	Prairie Island Indian Community Payments	-	-	-	-	-	-	314	-	314	-	314	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	88	4	58	150	-	234	2,139	405	3,079	2,668	411	-	-	-	560	-	-	-	33,579	109

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

Table I-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	436	44	480	480	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	674	67	742	742	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	191	-	-	-	-	-	48	239	239	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	143	-	-	-	-	-	21	164	164	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	1	-	13	-	4	20	20	-	-	-	154	-	-	-	3,073	5	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	382	57	439	439	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	107	11	118	118	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	404	40	445	-	445	-	-	-	-	-	-	-	-	-
1c.4.9	Fixed Overhead	-	-	-	-	-	-	370	56	426	426	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	101	15	116	-	116	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	13	2	15	-	15	-	-	-	-	-	-	-	-	-
1c.4.12	Railroad Track Maintenance	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	-
1c.4.13	Security Staff Cost	-	-	-	-	-	-	1,863	279	2,142	2,142	-	-	-	-	-	-	-	-	-	30,932
1c.4.14	Utility Staff Cost	-	-	-	-	-	-	6,501	975	7,476	7,476	-	-	-	-	-	-	-	-	-	106,428
1c.4	Subtotal Period 1c Period-Dependent Costs	-	334	3	1	-	13	10,866	1,622	12,839	12,263	576	-	-	154	-	-	-	3,073	5	137,360
1c.0	TOTAL PERIOD 1c COST	88	873	61	151	-	247	13,767	2,331	17,518	16,532	987	-	-	713	-	-	-	36,652	12,832	137,609
PERIOD 1 TOTALS		5,746	2,514	156	335	-	624	92,067	15,997	117,440	109,256	8,184	-	-	2,606	-	-	-	100,929	62,967	817,193
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	309	46	356	356	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	477	119	596	596	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	786	166	951	951	-	-	-	-	-	-	-	-	-	-
Period 2a Additional Costs																					
2a.2.1	Security Modifications	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	4,348	652	5,000	5,000	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	72,373	10,856	83,229	-	83,229	-	-	-	-	-	-	-	-	-
2a.3.2	Retention and Severance	-	-	-	-	-	-	12,266	1,840	14,106	14,106	-	-	-	-	-	-	-	-	-	-
2a.3.3	Prairie Island Indian Community Payments	-	-	-	-	-	-	4,371	-	4,371	-	4,371	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	89,010	12,696	101,706	14,106	87,600	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	1,788	179	1,966	1,966	-	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	9,379	938	10,317	10,317	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	631	-	-	-	-	-	158	789	789	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	15	4	-	55	-	16	89	89	-	-	-	670	-	-	-	13,402	22	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,060	159	1,219	1,219	-	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	819	82	901	901	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	4,492	449	4,941	-	4,941	-	-	-	-	-	-	-	-	-
2a.4.8	Fixed Overhead	-	-	-	-	-	-	5,142	771	5,913	5,913	-	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	1,404	211	1,615	-	1,615	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	181	27	208	-	208	-	-	-	-	-	-	-	-	-
2a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	410	62	472	472	-	-	-	-	-	-	-	-	-	-
2a.4.12	Security Staff Cost	-	-	-	-	-	-	23,761	3,564	27,325	19,456	7,870	-	-	-	-	-	-	-	-	392,966
2a.4.13	Utility Staff Cost	-	-	-	-	-	-	3,341	501	3,842	2,732	1,110	-	-	-	-	-	-	-	-	54,579
2a.4	Subtotal Period 2a Period-Dependent Costs	-	631	15	4	-	55	51,776	7,116	59,597	43,854	15,744	-	-	670	-	-	-	13,402	22	447,545
2a.0	TOTAL PERIOD 2a COST	-	631	15	4	-	55	145,920	20,630	167,255	63,911	103,344	-	-	670	-	-	-	13,402	22	447,545
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection									a											
2b.1.2	Semi-annual environmental survey									a											
2b.1.3	Prepare reports									a											
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	3,376	506	3,882	3,882	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	5,206	1,301	6,507	6,507	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	8,581	1,808	10,389	10,389	-	-	-	-	-	-	-	-	-	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table I-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	29,940	4,491	34,431	-	34,431	-	-	-	-	-	-	-	-	-
2b.3.2	Prairie Island Indian Community Payments	-	-	-	-	-	-	47,719	-	47,719	-	47,719	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	77,660	4,491	82,151	-	82,151	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	19,520	1,952	21,472	21,472	-	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	102,394	10,239	112,633	112,633	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	3,643	-	-	-	-	-	911	4,554	4,554	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	86	25	-	321	-	93	525	525	-	-	-	3,946	-	-	-	78,923	129	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	5,786	868	6,654	6,654	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	8,573	857	9,430	9,430	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	2,612	261	2,873	-	2,873	-	-	-	-	-	-	-	-	-
2b.4.8	Fixed Overhead	-	-	-	-	-	-	5,829	874	6,703	6,703	-	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	1,972	296	2,268	-	2,268	-	-	-	-	-	-	-	-	-
2b.4.10	Railroad Track Maintenance	-	-	-	-	-	-	2,203	330	2,534	2,534	-	-	-	-	-	-	-	-	-	-
2b.4.11	Security Staff Cost	-	-	-	-	-	-	96,335	14,450	110,786	22,822	87,964	-	-	-	-	-	-	-	-	1,430,311
2b.4.12	Utility Staff Cost	-	-	-	-	-	-	50,003	7,500	57,503	35,767	21,736	-	-	-	-	-	-	-	-	794,617
2b.4	Subtotal Period 2b Period-Dependent Costs	-	3,643	86	25	-	321	295,227	38,633	337,935	223,094	114,842	-	-	3,946	-	-	-	78,923	129	2,224,928
2b.0	TOTAL PERIOD 2b COST	-	3,643	86	25	-	321	381,468	44,931	430,475	233,483	196,992	-	-	3,946	-	-	-	78,923	129	2,224,928
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.3	Prepare reports	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	940	141	1,080	1,080	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	1,449	362	1,811	1,811	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	2,388	503	2,892	2,892	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	5,331	533	5,864	5,864	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	18,485	1,849	20,334	20,334	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	962	-	-	-	-	-	240	1,202	1,202	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	22	7	-	83	-	24	136	136	-	-	-	1,021	-	-	-	20,430	33	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	1,610	242	1,852	1,852	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	2,289	229	2,518	2,518	-	-	-	-	-	-	-	-	-	-
2c.4.7	Fixed Overhead	-	-	-	-	-	-	1,622	243	1,866	1,866	-	-	-	-	-	-	-	-	-	-
2c.4.8	Railroad Track Maintenance	-	-	-	-	-	-	613	92	705	705	-	-	-	-	-	-	-	-	-	-
2c.4.9	Utility Staff Cost	-	-	-	-	-	-	5,376	806	6,182	6,182	-	-	-	-	-	-	-	-	-	88,466
2c.4	Subtotal Period 2c Period-Dependent Costs	-	962	22	7	-	83	35,327	4,258	40,659	40,659	-	-	-	1,021	-	-	-	20,430	33	88,466
2c.0	TOTAL PERIOD 2c COST	-	962	22	7	-	83	37,716	4,761	43,551	43,551	-	-	-	1,021	-	-	-	20,430	33	88,466
PERIOD 2 TOTALS		-	5,236	123	36	-	459	565,104	70,323	641,280	340,944	300,336	-	-	5,638	-	-	-	112,755	184	2,760,938
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	-	1,967
3a.1.3	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
3a.1.4	End product description	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	-	428
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	556
3a.1.6	Define major work sequence	-	-	-	-	-	-	376	56	433	433	-	-	-	-	-	-	-	-	-	3,207
3a.1.7	Perform SER and EA	-	-	-	-	-	-	156	23	179	179	-	-	-	-	-	-	-	-	-	1,326
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	251	38	289	289	-	-	-	-	-	-	-	-	-	2,138
Activity Specifications																					
3a.1.9.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	370	55	425	383	-	43	-	-	-	-	-	-	-	3,151
3a.1.9.2	Plant systems	-	-	-	-	-	-	209	31	241	216	-	24	-	-	-	-	-	-	-	1,782
3a.1.9.3	Reactor internals	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,036
3a.1.9.4	Reactor vessel	-	-	-	-	-	-	326	49	375	375	-	-	-	-	-	-	-	-	-	2,779
3a.1.9.5	Biological shield	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
3a.1.9.6	Steam generators	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,334
3a.1.9.7	Reinforced concrete	-	-	-	-	-	-	80	12	92	46	-	46	-	-	-	-	-	-	-	684

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table I-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index		Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
																Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Activity Specifications (continued)																						
3a.1.9.8	Main Turbine	-	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	171	
3a.1.9.9	Main Condensers	-	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	171	
3a.1.9.10	Plant structures & buildings	-	-	-	-	-	-	-	157	23	180	90	-	90	-	-	-	-	-	-	1,334	
3a.1.9.11	Waste management	-	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	1,967	
3a.1.9.12	Facility & site closeout	-	-	-	-	-	-	-	45	7	52	26	-	26	-	-	-	-	-	-	385	
3a.1.9	Total	-	-	-	-	-	-	-	1,996	299	2,296	2,021	-	275	-	-	-	-	-	-	17,009	
Planning & Site Preparations																						
3a.1.10	Prepare dismantling sequence	-	-	-	-	-	-	-	120	18	139	139	-	-	-	-	-	-	-	-	1,026	
3a.1.11	Plant prep. & temp. svces	-	-	-	-	-	-	-	3,300	495	3,795	3,795	-	-	-	-	-	-	-	-	-	
3a.1.12	Design water clean-up system	-	-	-	-	-	-	-	70	11	81	81	-	-	-	-	-	-	-	-	599	
3a.1.13	Rigging/Cont. Cntrl Envlp/s/tooling/etc.	-	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	
3a.1.14	Procure casks/liners & containers	-	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	526	
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	-	9,043	1,357	10,400	10,125	-	275	-	-	-	-	-	-	29,336	
Period 3a Additional Costs																						
3a.2.1	Site Characterization	-	-	-	-	-	-	-	1,582	475	2,057	2,057	-	-	-	-	-	-	-	8,988	3,563	
3a.2.2	Mixed/Hazardous Waste	-	-	326	75	169	-	-	-	69	639	639	-	-	6,324	-	-	-	362,914	2,410	-	
3a.2.3	Asbestos Abatement	-	2,364	2	110	-	1,359	-	-	947	4,782	4,782	-	-	-	12,843	-	-	166,959	20,907	-	
3a.2	Subtotal Period 3a Additional Costs	-	2,364	328	185	169	1,359	1,582	-	1,491	7,478	7,478	-	-	6,324	12,843	-	-	529,873	32,305	3,563	
Period 3a Collateral Costs																						
3a.3.1	Small tool allowance	-	32	-	-	-	-	-	-	5	37	37	-	-	-	-	-	-	-	-	-	
3a.3	Subtotal Period 3a Collateral Costs	-	32	-	-	-	-	-	-	5	37	37	-	-	-	-	-	-	-	-	-	
Period 3a Period-Dependent Costs																						
3a.4.1	Insurance	-	-	-	-	-	-	-	501	50	552	552	-	-	-	-	-	-	-	-	-	
3a.4.2	Property taxes	-	-	-	-	-	-	-	1,608	161	1,769	1,769	-	-	-	-	-	-	-	-	-	
3a.4.3	Health physics supplies	-	539	-	-	-	-	-	-	135	673	673	-	-	-	-	-	-	-	-	-	
3a.4.4	Heavy equipment rental	-	567	-	-	-	-	-	-	85	652	652	-	-	-	-	-	-	-	-	-	
3a.4.5	Disposal of DAW generated	-	-	10	3	-	39	-	-	11	64	64	-	-	-	481	-	-	9,613	16	-	
3a.4.6	Plant energy budget	-	-	-	-	-	-	-	1,515	227	1,742	1,742	-	-	-	-	-	-	-	-	-	
3a.4.7	NRC Fees	-	-	-	-	-	-	-	298	30	327	327	-	-	-	-	-	-	-	-	-	
3a.4.8	Fixed Overhead	-	-	-	-	-	-	-	1,470	220	1,690	1,690	-	-	-	-	-	-	-	-	-	
3a.4.9	Railroad Track Maintenance	-	-	-	-	-	-	-	58	9	66	66	-	-	-	-	-	-	-	-	-	
3a.4.10	Security Staff Cost	-	-	-	-	-	-	-	312	47	358	358	-	-	-	-	-	-	-	-	6,240	
3a.4.11	Utility Staff Cost	-	-	-	-	-	-	-	11,597	1,740	13,336	13,336	-	-	-	-	-	-	-	-	199,680	
3a.4	Subtotal Period 3a Period-Dependent Costs	-	1,106	10	3	-	39	17,358	-	2,714	21,230	21,230	-	-	-	481	-	-	9,613	16	205,920	
3a.0	TOTAL PERIOD 3a COST	-	3,501	339	188	169	1,398	27,983	-	5,567	39,145	38,870	-	275	6,324	13,324	-	-	539,486	32,320	238,819	
PERIOD 3b - Decommissioning Preparations																						
Period 3b Direct Decommissioning Activities																						
Detailed Work Procedures																						
3b.1.1.1	Plant systems	-	-	-	-	-	-	-	238	36	273	246	-	27	-	-	-	-	-	-	2,024	
3b.1.1.2	Reactor internals	-	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	1,069	
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	-	68	10	78	19	-	58	-	-	-	-	-	-	577	
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	428	
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	428	
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	-	50	8	58	58	-	-	-	-	-	-	-	-	428	
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	-	182	27	210	210	-	-	-	-	-	-	-	-	1,552	
3b.1.1.8	Facility closeout	-	-	-	-	-	-	-	60	9	69	35	-	35	-	-	-	-	-	-	513	
3b.1.1.9	Missile shields	-	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	192	
3b.1.1.10	Biological shield	-	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	513	
3b.1.1.11	Steam generators	-	-	-	-	-	-	-	231	35	266	266	-	-	-	-	-	-	-	-	1,967	
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	-	50	8	58	29	-	29	-	-	-	-	-	-	428	
3b.1.1.13	Main Turbine	-	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	667	
3b.1.1.14	Main Condensers	-	-	-	-	-	-	-	78	12	90	-	-	90	-	-	-	-	-	-	667	
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	1,167	
3b.1.1.16	Reactor building	-	-	-	-	-	-	-	137	21	158	142	-	16	-	-	-	-	-	-	1,167	
3b.1.1	Total	-	-	-	-	-	-	-	1,618	243	1,861	1,500	-	361	-	-	-	-	-	-	13,787	
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	-	1,618	243	1,861	1,500	-	361	-	-	-	-	-	-	13,787	

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table I-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	973	-	-	-	-	-	-	146	1,119	1,119	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	973	1,200	-	-	-	-	1,189	504	3,866	3,866	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	35	-	-	-	-	-	-	9	43	43	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	255	25	280	280	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	760	76	836	836	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	230	-	-	-	-	-	57	287	287	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	283	-	-	-	-	-	42	325	325	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	6	2	-	22	-	6	35	35	-	-	-	264	-	-	-	5,286	9	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	755	113	869	869	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	148	15	163	163	-	-	-	-	-	-	-	-	-	-
3b.4.9	Fixed Overhead	-	-	-	-	-	-	733	110	843	843	-	-	-	-	-	-	-	-	-	-
3b.4.10	Railroad Track Maintenance	-	-	-	-	-	-	29	4	33	33	-	-	-	-	-	-	-	-	-	-
3b.4.11	Security Staff Cost	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	-	3,111
3b.4.12	DOC Staff Cost	-	-	-	-	-	-	3,539	531	4,070	4,070	-	-	-	-	-	-	-	-	-	42,523
3b.4.13	Utility Staff Cost	-	-	-	-	-	-	5,782	867	6,650	6,650	-	-	-	-	-	-	-	-	-	99,566
3b.4	Subtotal Period 3b Period-Dependent Costs	35	513	6	2	-	22	12,157	1,880	14,614	14,614	-	-	-	264	-	-	-	5,286	9	145,201
3b.0	TOTAL PERIOD 3b COST	1,008	1,713	6	2	-	22	14,964	2,627	20,341	19,980	-	361	-	264	-	-	-	5,286	9	158,988
PERIOD 3 TOTALS		1,008	5,214	345	189	169	1,420	42,947	8,194	59,485	58,850	-	636	6,324	13,588	-	-	-	544,771	32,329	397,807
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	11	40	6	5	34	75	-	41	212	212	-	-	144	152	-	-	-	33,380	771	-
4a.1.1.2	Pressurizer Relief Tank	5	18	4	3	23	50	-	24	126	126	-	-	96	101	-	-	-	22,241	347	-
4a.1.1.3	Reactor Coolant Pumps & Motors	13	56	43	76	-	736	-	220	1,143	1,143	-	-	-	2,332	-	-	-	295,800	1,226	80
4a.1.1.4	Pressurizer	10	68	359	82	-	693	-	244	1,456	1,456	-	-	-	2,196	-	-	-	158,199	1,499	750
4a.1.1.5	Steam Generators	47	2,943	1,576	1,614	1,246	3,467	-	2,212	13,104	13,104	-	-	18,672	10,990	-	-	-	1,560,086	10,964	2,250
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	60	243	199	32	169	369	-	233	1,305	1,305	-	-	2,138	2,146	-	-	-	165,025	4,449	-
4a.1.1.7	Reactor Vessel Internals	59	4,189	21,552	1,011	-	7,239	239	12,467	46,756	46,756	-	-	-	757	-	673	-	166,167	19,373	933
4a.1.1.8	Vessel & Internals GTCC Disposal	-	-	-	-	-	8,689	-	1,303	9,992	9,992	-	-	-	-	-	3,746	-	837,596	-	-
4a.1.1.9	Reactor Vessel	-	5,439	1,328	198	-	1,804	239	5,398	14,406	14,406	-	-	-	5,719	-	-	-	569,974	19,373	933
4a.1.1	Totals	204	12,996	25,067	3,022	1,471	23,120	478	22,142	88,499	88,499	-	-	21,050	24,393	-	673	3,746	3,808,467	58,003	4,947
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	269	128	27	287	-	-	127	838	838	-	-	2,243	-	-	-	-	134,601	4,116	-
4a.1.3	Main Condensers	-	2,269	87	26	383	-	-	637	3,403	3,403	-	-	4,000	-	-	-	-	180,000	34,978	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	728	-	-	-	-	-	109	837	837	-	-	-	-	-	-	-	-	7,589	-
4a.1.4.2	Auxiliary	-	210	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	1,309	-
4a.1.4.3	Radwaste	-	8	-	-	-	-	-	1	9	9	-	-	-	-	-	-	-	-	65	-
4a.1.4	Totals	-	946	-	-	-	-	-	142	1,088	1,088	-	-	-	-	-	-	-	-	8,963	-
Disposal of Plant Systems																					
4a.1.5.1	Admin Bldg Ventilation	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	90	-
4a.1.5.2	Air Removal	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	422	-
4a.1.5.3	Auxiliary Feedwater	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	676	-
4a.1.5.4	Auxiliary Feedwater - RCA	-	36	0	1	15	-	-	12	65	65	-	-	178	-	-	-	-	7,214	486	-
4a.1.5.5	Bleed Steam	-	78	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,331	-
4a.1.5.6	Caustic Addition - RCA	-	38	0	1	21	-	-	13	74	74	-	-	240	-	-	-	-	9,761	468	-
4a.1.5.7	Chemical Feed	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	261	-
4a.1.5.8	Chemical Feed - RCA	-	3	0	0	1	-	-	1	5	5	-	-	16	-	-	-	-	634	31	-
4a.1.5.9	Circulating Water	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	401	-
4a.1.5.10	Condensate	-	459	-	-	-	-	-	69	527	-	-	527	-	-	-	-	-	-	7,537	-
4a.1.5.11	Condensate Polishing	-	181	-	-	-	-	-	27	209	-	-	209	-	-	-	-	-	-	2,987	-
4a.1.5.12	Condensate Polishing - RCA	-	36	1	3	42	-	-	16	98	98	-	-	483	-	-	-	-	19,616	493	-
4a.1.5.13	Electro-Hydraulic	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	143	-
4a.1.5.14	External Circulating Water	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	385	-
4a.1.5.15	External Circulating Water - RCA	-	70	1	4	62	-	-	28	165	165	-	-	721	-	-	-	-	29,284	938	-

Table I-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4a.1.5.16	Feedwater	-	111	-	-	-	-	-	17	128	-	-	128	-	-	-	-	-	-	1,840	-
4a.1.5.17	Feedwater - RCA	-	236	7	24	359	-	-	117	744	744	-	-	4,147	-	-	-	-	168,414	3,377	-
4a.1.5.18	Gland Seal	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	504	-
4a.1.5.19	Heater Drain	-	334	-	-	-	-	-	50	384	-	-	384	-	-	-	-	-	-	5,638	-
4a.1.5.20	Hypobromous Acid Feed	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	86	-
4a.1.5.21	Hypobromous Acid Feed - RCA	-	1	0	0	0	-	-	0	1	1	-	-	2	-	-	-	-	100	12	-
4a.1.5.22	Internal Circ Water & CDSR	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	366	-
4a.1.5.23	Main Gen/Exciter/Transformer	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
4a.1.5.24	Main Steam	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	1,482	-
4a.1.5.25	Main Steam - RCA	-	364	9	30	447	-	-	163	1,013	1,013	-	-	5,166	-	-	-	-	209,799	5,146	-
4a.1.5.26	Repairable Spare Snubbers	-	6	0	0	1	-	-	2	8	8	-	-	12	-	-	-	-	490	82	-
4a.1.5.27	Steam Exclusion	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	32	-
4a.1.5.28	Steam Exclusion - RCA	-	4	0	0	2	-	-	1	8	8	-	-	24	-	-	-	-	966	47	-
4a.1.5.29	Steam Generator Blowdown	-	362	20	21	165	179	-	165	911	911	-	-	1,906	631	-	-	-	119,126	5,179	-
4a.1.5.30	Steam Generators	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
4a.1.5.31	Turbine & Moisture Separators	-	329	-	-	-	-	-	49	379	-	-	379	-	-	-	-	-	-	5,472	-
4a.1.5.32	Turbine Oil Purification	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	757	-
4a.1.5.33	Water Treatment	-	394	-	-	-	-	-	59	453	-	-	453	-	-	-	-	-	-	6,677	-
4a.1.5.34	Water Treatment - RCA	-	19	0	1	10	-	-	6	37	37	-	-	115	-	-	-	-	4,652	252	-
4a.1.5	Totals	-	3,400	39	85	1,125	179	-	858	5,687	3,128	-	2,559	13,010	631	-	-	-	570,056	53,681	-
4a.1.6	Scaffolding in support of decommissioning	-	2,682	24	8	97	25	-	695	3,532	3,532	-	-	1,012	89	-	-	-	51,445	23,719	-
4a.1	Subtotal Period 4a Activity Costs	204	22,563	25,345	3,168	3,363	23,325	478	24,601	103,048	100,489	-	2,559	41,316	25,114	-	673	3,746	4,744,569	183,459	4,947
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,516	455	1,971	1,971	-	-	-	-	-	-	-	-	19,818	-
4a.2.2	Retired RPV upper internals package	1	659	785	107	-	1,439	-	1,437	4,427	4,427	-	-	-	2,097	125	-	-	205,890	2,175	87
4a.2	Subtotal Period 4a Additional Costs	1	659	785	107	-	1,439	1,516	1,892	6,398	6,398	-	-	-	2,097	125	-	-	205,890	21,993	87
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	2	-	4	11	-	17	-	7	42	42	-	-	-	40	-	-	-	2,403	8	-
4a.3.3	Small tool allowance	-	220	-	-	-	-	-	33	254	228	-	25	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	2	220	4	11	-	17	-	41	295	270	-	25	-	40	-	-	-	2,403	8	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	66	-	-	-	-	-	-	17	83	83	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	487	49	536	536	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	1,429	143	1,572	1,572	-	-	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,465	-	-	-	-	-	366	1,832	1,832	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,093	-	-	-	-	-	314	2,407	2,407	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	71	21	-	266	-	77	434	434	-	-	-	3,264	-	-	-	65,288	106	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,372	206	1,578	1,578	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	363	36	399	399	-	-	-	-	-	-	-	-	-	-
4a.4.9	Fixed Overhead	-	-	-	-	-	-	1,180	177	1,357	1,357	-	-	-	-	-	-	-	-	-	-
4a.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	386	58	444	444	-	-	-	-	-	-	-	-	-	-
4a.4.11	Railroad Track Maintenance	-	-	-	-	-	-	55	8	63	63	-	-	-	-	-	-	-	-	-	-
4a.4.12	Security Staff Cost	-	-	-	-	-	-	3,664	550	4,213	4,213	-	-	-	-	-	-	-	-	-	61,973
4a.4.13	DOC Staff Cost	-	-	-	-	-	-	11,794	1,769	13,563	13,563	-	-	-	-	-	-	-	-	-	136,836
4a.4.14	Utility Staff Cost	-	-	-	-	-	-	15,190	2,278	17,468	17,468	-	-	-	-	-	-	-	-	-	247,890
4a.4	Subtotal Period 4a Period-Dependent Costs	66	3,559	71	21	-	266	35,920	6,048	45,950	45,950	-	-	-	3,264	-	-	-	65,288	106	446,699
4a.0	TOTAL PERIOD 4a COST	273	27,002	26,205	3,306	3,363	25,047	37,914	32,581	155,691	153,106	-	2,585	41,316	30,515	125	673	3,746	5,018,150	205,566	451,732
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	297	32	94	32	-	595	-	319	1,369	1,369	-	-	-	2,092	-	-	-	138,298	576	-
Disposal of Plant Systems																					
4b.1.2.1	ADT & Misc Ventilation	-	21	0	1	13	3	-	8	47	47	-	-	153	9	-	-	-	6,814	325	-
4b.1.2.2	Aux Bldg Normal Ventilation	-	60	2	5	60	11	-	28	165	165	-	-	692	39	-	-	-	30,671	906	-
4b.1.2.3	Aux Bldg Special Ventilation	-	12	0	0	6	2	-	4	25	25	-	-	70	6	-	-	-	3,243	176	-
4b.1.2.4	Battery Rm Special Ventilation	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	24	-
4b.1.2.5	Boron Recycle	-	3	0	0	0	3	-	2	8	8	-	-	3	9	-	-	-	709	45	-
4b.1.2.6	Chemical & Volume Control	-	822	59	44	204	560	-	388	2,075	2,075	-	-	2,356	1,977	-	-	-	225,854	11,575	-
4b.1.2.7	Cold Chemical Lab Ventilation	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table I-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4b.1.2.8	Component Cooling - RCA	-	617	21	70	1,038	-	-	322	2,068	2,068	-	-	11,996	-	-	-	-	487,169	8,583	-
4b.1.2.9	Containment Cooling	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	502	-
4b.1.2.10	Containment Cooling - RCA	-	288	5	16	237	-	-	110	656	656	-	-	2,743	-	-	-	-	111,390	3,949	-
4b.1.2.11	Containment Hydrogen Control - RCA	-	35	0	1	12	-	-	11	60	60	-	-	141	-	-	-	-	5,742	494	-
4b.1.2.12	Containment Spray - RCA	-	186	3	8	126	-	-	67	389	389	-	-	1,453	-	-	-	-	59,019	2,617	-
4b.1.2.13	Containment Ventilation	-	201	23	38	408	205	-	171	1,047	1,047	-	-	4,721	722	-	-	-	239,450	3,016	-
4b.1.2.14	Control/Relay/Cmptr Rm Vent	-	27	1	2	23	6	-	12	70	70	-	-	260	20	-	-	-	11,915	406	-
4b.1.2.15	Cooling Water	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	2,344	-
4b.1.2.16	Cooling Water - RCA	-	456	15	49	730	-	-	232	1,482	1,482	-	-	8,442	-	-	-	-	342,822	6,311	-
4b.1.2.17	Cranes/Hoists/Elevators - RCA	-	3	0	1	9	-	-	2	15	15	-	-	103	-	-	-	-	4,184	48	-
4b.1.2.18	D3 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
4b.1.2.19	D4 Emergency Diesel	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	141	-
4b.1.2.20	D5 Emergency Diesel	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	5	-
4b.1.2.21	Electrical - Clean	-	1,502	-	-	-	-	-	225	1,727	-	-	1,727	-	-	-	-	-	-	24,276	-
4b.1.2.22	Electrical - Contaminated	-	417	5	13	173	21	-	138	767	767	-	-	1,997	75	-	-	-	86,080	5,813	-
4b.1.2.23	Electrical - Contaminated - Fuel Pool	-	178	2	6	75	9	-	59	329	329	-	-	864	33	-	-	-	37,250	2,488	-
4b.1.2.24	Electrical - Decontaminated	-	2,866	33	109	1,622	-	-	980	5,610	5,610	-	-	18,753	-	-	-	-	761,569	38,423	-
4b.1.2.25	Electrical - Decontaminated - Fuel Pool	-	1,230	14	47	698	-	-	421	2,410	2,410	-	-	8,069	-	-	-	-	327,668	16,495	-
4b.1.2.26	Filter Rm Ventilation	-	4	0	0	2	0	-	1	8	8	-	-	24	1	-	-	-	1,020	61	-
4b.1.2.27	Fire Protection & Detection	-	178	-	-	-	-	-	27	205	-	-	205	-	-	-	-	-	-	3,009	-
4b.1.2.28	Fire Protection & Detection - RCA	-	236	3	11	158	-	-	85	492	492	-	-	1,828	-	-	-	-	74,245	3,134	-
4b.1.2.29	Fire Protection & Detection - RCA Fuel P	-	36	1	2	25	-	-	13	76	76	-	-	286	-	-	-	-	11,622	476	-
4b.1.2.30	Fuel Handling	-	64	1	2	17	14	-	22	121	121	-	-	200	49	-	-	-	11,396	983	-
4b.1.2.31	Fuel Oil	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	9	-
4b.1.2.32	HVAC - Clean	-	132	-	-	-	-	-	20	151	-	-	151	-	-	-	-	-	-	2,373	-
4b.1.2.33	HVAC - Contaminated	-	1,102	26	69	929	115	-	457	2,699	2,699	-	-	10,745	405	-	-	-	463,144	14,282	-
4b.1.2.34	HVAC - Contaminated - Fuel Pool	-	495	12	31	418	52	-	205	1,212	1,212	-	-	4,828	182	-	-	-	208,080	6,417	-
4b.1.2.35	Heating	-	279	-	-	-	-	-	42	321	-	-	321	-	-	-	-	-	-	4,804	-
4b.1.2.36	Heating - RCA	-	323	3	11	165	-	-	107	609	609	-	-	1,907	-	-	-	-	77,458	4,086	-
4b.1.2.37	Hot Lab & Sample Rm Ventilation	-	17	0	1	9	1	-	6	34	34	-	-	107	4	-	-	-	4,632	255	-
4b.1.2.38	Incore Instrumentation	-	26	1	1	5	16	-	12	62	62	-	-	60	58	-	-	-	6,264	412	-
4b.1.2.39	Misc Drains & Vents	-	203	12	9	40	121	-	90	475	475	-	-	458	426	-	-	-	46,850	2,841	-
4b.1.2.40	Misc Lab & Service Areas Vent	-	113	8	6	32	70	-	52	280	280	-	-	370	244	-	-	-	31,186	1,537	-
4b.1.2.41	Miscellaneous Gas	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	1,073	-
4b.1.2.42	Miscellaneous Gas - RCA	-	129	1	3	52	-	-	41	226	226	-	-	600	-	-	-	-	24,378	1,636	-
4b.1.2.43	Radiation Monitoring	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	111	-
4b.1.2.44	Radiation Monitoring - RCA	-	62	1	2	27	-	-	20	112	112	-	-	316	-	-	-	-	12,826	782	-
4b.1.2.45	Reactor Coolant	-	207	20	12	20	208	-	110	577	577	-	-	229	730	-	-	-	57,672	2,891	-
4b.1.2.46	Reactor Hot Sampling	-	112	10	5	5	89	-	53	273	273	-	-	54	312	-	-	-	22,919	1,499	-
4b.1.2.47	Reactor Makeup	-	36	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	583	-
4b.1.2.48	Reactor Makeup - RCA	-	4	0	0	2	-	-	1	8	8	-	-	28	-	-	-	-	1,148	47	-
4b.1.2.49	Reactor Vessel	-	16	0	0	2	4	-	5	28	28	-	-	22	14	-	-	-	1,826	225	-
4b.1.2.50	Residual Heat Removal	-	338	84	66	247	924	-	371	2,029	2,029	-	-	2,853	3,244	-	-	-	330,651	5,039	-
4b.1.2.51	Safeguards Chilled Water	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	75	-
4b.1.2.52	Safeguards Chilled Water - RCA	-	4	0	0	2	-	-	1	8	8	-	-	26	-	-	-	-	1,045	51	-
4b.1.2.53	Safety Injection	-	758	40	56	577	329	-	371	2,131	2,131	-	-	6,676	1,161	-	-	-	347,600	11,029	-
4b.1.2.54	Sampling	-	46	3	2	3	27	-	19	100	100	-	-	37	93	-	-	-	7,697	645	-
4b.1.2.55	Service Bldg & New Cmptr Vent	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	6	-
4b.1.2.56	Shield Bldg Ventilation	-	103	13	19	175	138	-	91	539	539	-	-	2,028	484	-	-	-	114,378	1,555	-
4b.1.2.57	Spent Fuel Pool Cooling	-	32	3	2	3	30	-	17	87	87	-	-	39	107	-	-	-	8,635	427	-
4b.1.2.58	Spent Fuel Pool Normal Ventilation	-	23	1	2	23	3	-	10	62	62	-	-	265	12	-	-	-	11,532	352	-
4b.1.2.59	Station & Instrument Air	-	140	-	-	-	-	-	21	161	-	-	161	-	-	-	-	-	-	2,424	-
4b.1.2.60	Station & Instrument Air - RCA	-	288	3	9	141	-	-	95	535	535	-	-	1,625	-	-	-	-	65,986	3,638	-
4b.1.2.61	Turbine Bldg Traps & Drains	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	462	-
4b.1.2.62	Turbine Bldg Traps & Drains - RCA	-	28	0	1	16	-	-	10	55	55	-	-	180	-	-	-	-	7,321	344	-
4b.1.2.63	Turbine Bldg Ventilation	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	655	-
4b.1.2.64	Unit Coolers	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	332	-
4b.1.2.65	Unit Coolers - RCA	-	54	0	1	20	-	-	17	93	93	-	-	232	-	-	-	-	9,413	690	-
4b.1.2.66	Waste Gas Disposal	-	417	40	35	212	381	-	241	1,327	1,327	-	-	2,453	1,358	-	-	-	188,334	5,879	-
4b.1.2.67	Waste Liquid Disposal	-	1,581	108	76	316	1,019	-	720	3,819	3,819	-	-	3,655	3,594	-	-	-	385,370	22,011	-
4b.1.2.68	Waste Solid Disposal	-	127	11	8	34	112	-	67	358	358	-	-	389	393	-	-	-	41,732	1,781	-
4b.1.2	Totals	-	16,987	591	852	9,112	4,472	-	6,657	38,670	35,660	-	3,010	105,339	15,761	-	-	-	5,317,908	240,033	-
4b.1.3	Scaffolding in support of decommissioning	-	4,024	36	12	146	38	-	1,043	5,298	5,298	-	-	1,518	134	-	-	-	77,168	35,578	-

Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis

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Table I-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	1,037	2,361	118	833	193	6,373	-	2,868	13,784	13,784	-	-	2,230	36,903	-	-	-	3,286,751	45,596	-
4b.1.4.2	Auxiliary	1,105	356	12	80	92	582	-	814	3,040	3,040	-	-	1,060	3,355	-	-	-	332,498	21,222	-
4b.1.4.3	Backwash Waste Receiving Tank	-	24	1	11	-	87	-	30	154	154	-	-	-	507	-	-	-	43,896	264	-
4b.1.4.4	Drum Transfer & Truck Loading Enclosure	15	7	0	2	2	13	-	13	52	52	-	-	19	74	-	-	-	7,118	328	-
4b.1.4.5	LLRW Storage Enclosure	105	45	1	11	3	87	-	88	341	341	-	-	38	502	-	-	-	44,971	2,149	-
4b.1.4.6	Radwaste	47	20	1	5	4	39	-	40	155	155	-	-	42	225	-	-	-	21,136	963	-
4b.1.4.7	Resin Disposal	14	10	0	2	7	12	-	14	60	60	-	-	83	69	-	-	-	9,271	340	-
4b.1.4.8	Fuel Handling of Aux Building	875	966	9	32	209	173	-	759	3,024	3,024	-	-	2,417	944	-	-	-	177,818	27,141	-
4b.1.4	Totals	3,199	3,791	143	977	509	7,366	-	4,626	20,611	20,611	-	-	5,889	42,580	-	-	-	3,923,460	98,004	-
4b.1.5	Prepare/submit License Termination Plan	-	-	-	-	-	-	206	31	236	236	-	-	-	-	-	-	-	-	-	1,751
4b.1.6	Receive NRC approval of termination plan									a											
4b.1	Subtotal Period 4b Activity Costs	3,496	24,833	864	1,872	9,767	12,471	206	12,675	66,184	63,174	-	3,010	112,746	60,568	-	-	-	9,456,834	374,192	1,751
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	845	253	1,098	1,098	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,832	849	3,681	3,681	-	-	-	-	-	-	-	-	37,017	-
4b.2.3	Excavation of Underground Services	-	811	-	-	-	-	520	200	1,531	-	-	1,531	-	-	-	-	-	-	7,407	-
4b.2.4	Operational Equipment	-	-	9	29	312	-	-	52	402	402	-	-	5,855	-	-	-	-	146,375	16	-
4b.2.5	License Termination ISFSI	-	37	2	211	-	2,157	1,186	898	4,491	4,491	-	-	-	7,458	-	-	-	1,071,985	3,670	5,284
4b.2.6	Demolition and Site Restoration ISFSI	-	495	-	-	-	-	87	87	669	-	-	669	-	-	-	-	-	-	2,308	160
4b.2	Subtotal Period 4b Additional Costs	-	1,342	11	240	312	2,157	5,469	2,340	11,872	9,672	-	2,200	5,855	7,458	-	-	-	1,218,360	50,417	11,684
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	7	-	11	29	-	46	-	20	113	113	-	-	-	109	-	-	-	6,546	21	-
4b.3.3	Small tool allowance	-	418	-	-	-	-	-	63	481	481	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	144	55	575	150	-	147	1,071	1,071	-	-	6,000	529	-	-	-	304,968	88	-
4b.3.5	On-site survey and release of 0.437 tons clean metallic waste	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
4b.3	Subtotal Period 4b Collateral Costs	7	418	155	84	575	196	1	229	1,665	1,665	-	-	6,000	638	-	-	-	311,514	109	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	1,338	-	-	-	-	-	-	335	1,673	1,673	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	910	91	1,001	1,001	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	2,554	255	2,809	2,809	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	2,900	-	-	-	-	-	725	3,625	3,625	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	4,021	-	-	-	-	-	603	4,624	4,624	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	128	37	-	476	-	137	778	778	-	-	-	5,849	-	-	-	116,984	191	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,023	303	2,326	2,326	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	677	68	745	745	-	-	-	-	-	-	-	-	-	-
4b.4.9	Fixed Overhead	-	-	-	-	-	-	2,205	331	2,535	2,535	-	-	-	-	-	-	-	-	-	-
4b.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	721	108	829	829	-	-	-	-	-	-	-	-	-	-
4b.4.11	Railroad Track Maintenance	-	-	-	-	-	-	103	15	118	118	-	-	-	-	-	-	-	-	-	-
4b.4.12	Security Staff Cost	-	-	-	-	-	-	6,843	1,026	7,870	7,870	-	-	-	-	-	-	-	-	-	115,753
4b.4.13	DOC Staff Cost	-	-	-	-	-	-	21,571	3,236	24,806	24,806	-	-	-	-	-	-	-	-	-	248,175
4b.4.14	Utility Staff Cost	-	-	-	-	-	-	26,893	4,034	30,927	30,927	-	-	-	-	-	-	-	-	-	437,085
4b.4	Subtotal Period 4b Period-Dependent Costs	1,338	6,921	128	37	-	476	64,499	11,268	84,667	84,667	-	-	-	5,849	-	-	-	116,984	191	801,014
4b.0	TOTAL PERIOD 4b COST	4,841	33,514	1,158	2,234	10,654	15,300	70,175	26,513	164,387	159,178	-	5,210	124,601	74,513	-	-	-	11,103,690	424,909	814,449
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license									a											
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	176	53	229	229	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	7,406	2,222	9,628	9,628	-	-	-	-	-	-	-	-	102,642	3,120
Period 4f Collateral Costs																					
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-

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Decommissioning Cost Analysis

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Table I-2
Prairie Island Nuclear Generating Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate with 60 Years of Spent Fuel Storage
(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 4f Period-Dependent Costs																					
4f.4.1	Insurance	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
4f.4.2	Property taxes	-	-	-	-	-	-	1,002	100	1,102	1,102	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	600	-	-	-	-	-	150	750	750	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	7	2	-	27	-	8	44	44	-	-	-	332	-	-	-	6,649	11	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	272	27	299	299	-	-	-	-	-	-	-	-	-	-
4f.4.7	Fixed Overhead	-	-	-	-	-	-	926	139	1,065	1,065	-	-	-	-	-	-	-	-	-	-
4f.4.8	Railroad Track Maintenance	-	-	-	-	-	-	43	6	50	50	-	-	-	-	-	-	-	-	-	-
4f.4.9	Security Staff Cost	-	-	-	-	-	-	707	106	813	813	-	-	-	-	-	-	-	-	-	11,668
4f.4.10	DOC Staff Cost	-	-	-	-	-	-	4,101	615	4,716	4,716	-	-	-	-	-	-	-	-	-	46,283
4f.4.11	Utility Staff Cost	-	-	-	-	-	-	3,630	544	4,174	4,174	-	-	-	-	-	-	-	-	-	56,395
4f.4.11	Subtotal Period 4f Period-Dependent Costs	-	600	7	2	-	27	11,289	1,768	13,695	13,695	-	-	-	332	-	-	-	6,649	11	114,346
4f.0	TOTAL PERIOD 4f COST	-	600	7	2	-	27	20,061	4,222	24,919	24,919	-	-	-	332	-	-	-	6,649	102,652	117,466
PERIOD 4 TOTALS		5,114	61,116	27,370	5,542	14,017	40,374	128,149	63,315	344,997	337,203	-	7,794	165,917	105,360	125	673	3,746	16,128,490	733,128	1,383,647
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	4,256	-	-	-	-	-	638	4,895	-	-	4,895	-	-	-	-	-	-	44,679	-
5b.1.1.2	Auxiliary	-	1,897	-	-	-	-	-	285	2,182	-	-	2,182	-	-	-	-	-	-	11,902	-
5b.1.1.3	Condensate Storage Tank Foundation	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	33	-
5b.1.1.4	Construction Warehouse & Fab Shop	-	118	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	1,405	-
5b.1.1.5	D3/D4 Emergency Generator	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	84	-
5b.1.1.6	Drum Transfer & Truck Loading Enclosure	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	221	-
5b.1.1.7	Hydrogen House	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	47	-
5b.1.1.8	LLRW Storage Enclosure	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	853	-
5b.1.1.9	Misc Structures 2017	-	1,391	-	-	-	-	-	209	1,599	-	-	1,599	-	-	-	-	-	-	12,939	-
5b.1.1.10	Radwaste	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	1,400	-
5b.1.1.11	Resin Disposal	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	120	-
5b.1.1.12	Structures below 3' below grade	-	1,713	-	-	-	-	-	257	1,969	-	-	1,969	-	-	-	-	-	-	9,238	-
5b.1.1.13	Sulfuric Acid Tank Enclosure	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	35	-
5b.1.1.14	Turbine	-	1,983	-	-	-	-	-	298	2,281	-	-	2,281	-	-	-	-	-	-	22,052	-
5b.1.1.15	Turbine Pedestal	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	1,857	-
5b.1.1.16	Warehouse #2	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	213	-
5b.1.1.17	Waste Neutralizing Tank House	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	56	-
5b.1.1.18	Waste Oil Storage	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	70	-
5b.1.1.19	Water Treatment	-	303	-	-	-	-	-	46	349	-	-	349	-	-	-	-	-	-	2,690	-
5b.1.1.20	Fuel Handling of Aux Building	-	1,032	-	-	-	-	-	155	1,186	-	-	1,186	-	-	-	-	-	-	8,240	-
5b.1.1	Totals	-	13,424	-	-	-	-	-	2,014	15,438	-	-	15,438	-	-	-	-	-	-	118,134	-
Site Closeout Activities																					
5b.1.2	Remove Rubble	-	1,492	-	-	-	-	-	224	1,716	-	-	1,716	-	-	-	-	-	-	7,408	-
5b.1.3	Grade & landscape site	-	431	-	-	-	-	-	65	495	-	-	495	-	-	-	-	-	-	921	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	78	12	90	90	-	-	-	-	-	-	-	-	-	667
5b.1	Subtotal Period 5b Activity Costs	-	15,347	-	-	-	-	78	2,314	17,740	90	-	17,650	-	-	-	-	-	-	126,463	667
Period 5b Additional Costs																					
5b.2.1	Clean Concrete Disposal	-	3,313	-	-	-	-	8	498	3,818	-	-	3,818	-	-	-	-	-	-	12,824	-
5b.2.2	Intake Structure Cofferdam	-	423	-	-	-	-	-	63	486	-	-	486	-	-	-	-	-	-	3,552	-
5b.2.3	Construction Debris	-	-	-	-	-	-	463	69	532	-	-	532	-	-	-	-	-	-	-	-
5b.2.4	Backfill	-	8,465	-	-	-	-	-	1,270	9,735	-	-	9,735	-	-	-	-	-	-	9,327	-
5b.2	Subtotal Period 5b Additional Costs	-	12,201	-	-	-	-	471	1,901	14,572	-	-	14,572	-	-	-	-	-	-	25,703	-
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	169	-	-	-	-	-	25	194	-	-	194	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	169	-	-	-	-	-	25	194	-	-	194	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.2	Property taxes	-	-	-	-	-	-	526	53	579	-	-	579	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,670	-	-	-	-	-	1,000	7,670	-	-	7,670	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	321	48	369	-	-	369	-	-	-	-	-	-	-	-
5b.4.5	Fixed Overhead	-	-	-	-	-	-	990	148	1,138	-	-	1,138	-	-	-	-	-	-	-	-
5b.4.6	Railroad Track Maintenance	-	-	-	-	-	-	122	18	141	-	-	141	-	-	-	-	-	-	-	-

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Table I-2
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(thousands of 2017 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 5b Period-Dependent Costs (continued)																					
5b.4.7	Security Staff Cost	-	-	-	-	-	-	1,812	272	2,084	-	-	2,084	-	-	-	-	-	-	-	29,221
5b.4.8	DOC Staff Cost	-	-	-	-	-	-	10,467	1,570	12,038	-	-	12,038	-	-	-	-	-	-	-	116,885
5b.4.9	Utility Staff Cost	-	-	-	-	-	-	3,673	551	4,224	-	-	4,224	-	-	-	-	-	-	-	57,340
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,670	-	-	-	-	17,912	3,661	28,242	-	-	28,242	-	-	-	-	-	-	-	203,445
5b.0	TOTAL PERIOD 5b COST	-	34,387	-	-	-	-	18,461	7,901	60,748	90	-	60,658	-	-	-	-	-	-	152,166	204,112
PERIOD 5 TOTALS		-	34,387	-	-	-	-	18,461	7,901	60,748	90	-	60,658	-	-	-	-	-	-	152,166	204,112
TOTAL COST TO DECOMMISSION		11,867	108,467	27,994	6,103	14,186	42,876	846,728	165,730	1,223,951	846,342	308,520	69,089	172,241	127,192	125	673	3,746	16,886,950	980,773	5,563,697

TOTAL COST TO DECOMMISSION WITH 15.66% CONTINGENCY:	\$1,223,951	thousands of 2017 dollars
TOTAL NRC LICENSE TERMINATION COST IS 69.15% OR:	\$846,342	thousands of 2017 dollars
SPENT FUEL MANAGEMENT COST IS 25.21% OR:	\$308,520	thousands of 2017 dollars
NON-NUCLEAR DEMOLITION COST IS 5.64% OR:	\$69,089	thousands of 2017 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	127,991	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	3,746	cubic feet
TOTAL SCRAP METAL REMOVED:	41,593	tons
TOTAL CRAFT LABOR REQUIREMENTS:	980,773	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

***Prairie Island Nuclear Generating Plant
Decommissioning Cost Analysis***

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**APPENDIX J
ISFSI DECOMMISSIONING**

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Table J-1
Prairie Island Nuclear Generating Plant
Scenarios 1 & 6
ISFSI Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Description	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor									
Planning (characterization, specs and procedures)	-	-	-	-	200	200	-	-	1,000
Decontamination (activated disposition)	73	3	422	4,315	-	4,813	14,916	526	-
License Termination (radiological surveys)	-	-	-	-	808	808	-	6,279	-
Subtotal	73	3	422	4,315	1,008	5,821	14,916	6,805	1,000
Supporting Costs									
NRC and NRC Contractor Fees and Costs					357	357	-	-	776
Insurance					193	193	-	-	-
Property taxes					51	51	-	-	-
Site O&M Cost					101	101	-	-	-
Railroad Track Maintenance					38	38	-	-	-
Security Staff Cost					308	308	-	-	4,999
Oversight Staff Cost					260	260	-	-	3,792
Subtotal	-	-	-	-	1,308	1,308	-	-	9,568
Total (w/o contingency)	73	3	422	4,315	2,316	7,129	14,916	6,805	10,568
Total (w/25% contingency)						8,912			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

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Table J-2
Prairie Island Nuclear Generating Plant
Scenarios 2 & 7
ISFSI Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Description	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor									
Planning (characterization, specs and procedures)	-	-	-	-	200	200	-	-	1,000
Decontamination (activated disposition)	73	3	422	4,315	-	4,813	14,916	526	-
License Termination (radiological surveys)	-	-	-	-	865	865	-	6,813	-
Subtotal	73	3	422	4,315	1,065	5,878	14,916	7,339	1,000
Supporting Costs									
NRC and NRC Contractor Fees and Costs					356	356	-	-	776
Insurance					193	193	-	-	-
Property taxes					51	51	-	-	-
Site O&M Cost					101	101	-	-	-
Railroad Track Maintenance					38	38	-	-	-
Security Staff Cost					308	308	-	-	4,999
Oversight Staff Cost					260	260	-	-	3,792
Subtotal	-	-	-	-	1,307	1,307	-	-	9,568
Total (w/o contingency)	73	3	422	4,315	2,372	7,185	14,916	7,339	10,568
Total (w/25% contingency)						8,982			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

Table J-3
Prairie Island Nuclear Generating Plant
Scenario 3 & 4
ISFSI Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Description	Decon Costs	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor										
Planning (characterization, specs and procedures)	-	-	-	-	-	296	296	-	-	1,168
Decontamination (activated disposition)	30	2	1	5	38	-	76	254	365	-
License Termination (radiological surveys)	-	-	-	-	-	1,288	1,288	-	10,842	-
Subtotal	30	2	1	5	38	1,584	1,660	254	11,207	1,168
Supporting Costs										
NRC and NRC Contractor Fees and Costs						357	357	-	-	776
Insurance						193	193	-	-	-
Property taxes						51	51	-	-	-
Site O&M Cost						101	101	-	-	-
Railroad Track Maintenance						38	38	-	-	-
Security Staff Cost						308	308	-	-	4,999
Oversight Staff Cost						260	260	-	-	3,792
Subtotal	-	-	-	-	-	1,308	1,308	-	-	4,396
Total (w/o contingency)	30	2	1	5	38	2,892	2,968	254	11,207	5,564
Total (w/25% contingency)							3,711			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

Table J-4
Prairie Island Nuclear Generating Plant
Scenario 5
ISFSI Decommissioning Cost Estimate
(thousands of 2017 dollars)

Activity Description	Decon Costs	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor										
Planning (characterization, specs and procedures)	-	-	-	-	-	241	241	-	-	1,072
Decontamination (activated disposition)	30	96	4	427	4,579	-	5,136	16,457	1,123	-
License Termination (radiological surveys)	-	-	-	-	-	1,136	1,136	-	9,412	-
Subtotal	30	96	4	427	4,579	1,377	6,513	16,457	10,535	1,072
Supporting Costs										
NRC and NRC Contractor Fees and Costs						357	357	-	-	776
Insurance						193	193	-	-	-
Property taxes						51	51	-	-	-
Fixed Overhead						101	101	-	-	-
Railroad Track Maintenance						38	38	-	-	-
Security Staff Cost						308	308	-	-	4,999
Oversight Staff Cost						260	260	-	-	3,792
Subtotal	-	-	-	-	-	476	1,308	-	-	8,792
Total (w/o contingency)	30	96	4	427	4,579	1,853	7,821	16,457	10,535	9,864
Total (w/25% contingency)							9,777			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)