MDU Exhibit 214

CASE NOS. PU-06-481 & PU-06-482

BEFORE THE NORTH DAKOTA PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE APPLICATION BY OTTER TAIL CORPORATION D/B/A

OTTER TAIL POWER COMPANY

AND

MONTANA-DAKOTA UTILITIES CO., A DIVISION OF MDU RESOURCES GROUP, INC.

FOR AN ADVANCED DETERMINATION OF PRUDENCE

For the Big Stone Unit II Generating Plant

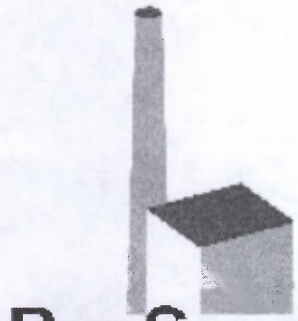
SUPPLEMENTAL PREFILED DIRECT TESTIMONY

OF

JAMES HEIDELL

PA CONSULTING GROUP

MARCH 10, 2008



SUPPLEMENTAL PREFILED DIRECT TESTIMONY OF JAMES HEIDELL

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BEFORE THE NORTH DAKOTA PUBLIC SERVICE COMMISSION

SUPPLEMENTAL PREFILED DIRECT TESTIMONY OF JAMES HEIDELL

I. INTRODUCTION

Q: Please state your name and business address.

A: James Heidell, 1700 Lincoln Street, Suite 4600, Denver, CO.

Q: Did you previously submit testimony in this proceeding?

A: Yes, I submitted MDU Exhibits 210-212.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q: What is the purpose of your supplemental testimony?

A: There are two purposes to my testimony. First, the testimony updates the previous analysis I presented to the Commission in June 2007. The updated analysis reflects both the proposed reconfiguration of the Big Stone Unit II power plant and other assumption modifications as a result of over a year of change in the dynamic power industry. Second, the testimony introduces two additional scenarios that evaluate the economics of both the wind and natural gas generation alternatives assuming key assumptions impacting the economics of wind made in the first two scenarios are incorrect and also quantifies the potential benefits of off-system sales.

Q: Is Big Stone Unit II identified as part of the least cost solution in your resource planning modeling for Montana-Dakota?

A: Yes, based upon my updated analysis using the Strategist® Resource Planning expansion software, the reconfigured Big Stone Unit II coal plant remains part of the lowest cost mix of resources for Montana-Dakota's resource expansion plan. The mix of new resources continues to include demand side resources, renewable resources, gas-fired peaking generation, and base-

load coal generation. This conclusion is based upon a review of four scenarios that tested a number of key assumptions including the continuation of the federal renewable energy production tax credit (PTC), the cost of natural gas, and the benefits of off-system, wholesale power sales. In all four scenarios the Big Stone Unit II resource is part of the least cost resource mix as a result of Montana-Dakota's need for new generation capacity and energy; a need in-part driven by the expiration of a long-term Basin Electric Power Cooperative power contract. A summary of the least cost resource expansion plan for each of the four scenarios is shown below:

EXPANSION PLAN SUMMARY

Scenario[1]	I	II	III	IV
KEY INPUTS				
BSPII Increment[2]	116 MW	116 MW with option for four additional five MW increments	25 MW with maximum of 125 MW	25 MW with maximum of 125 MW
PTC's	Expiration 1/1/2013	Expiration 1/1/2013	Expiration 1/1/2009	Expiration 1/1/2009
Wind Capacity Factor[3]	52%	52%	38%	38%
Off-System Sales	No	No	No	Yes
LEAST COST RESOURCE MIX (In addition to Diamond Willow and conservation)				
Year/MW/Resource	2010 / 31.5 MW / **Wind**		2012 / 43.5 MW / **CT**	
	2011 / 31.5 MW / **Wind**		2013 / 75 MW / **BSPII**	2013 / 125 MW / **BSPII**
	2013 / 116 MW / **BSPII**	2013 / 131 MW / **BSPII**	2016 / 50 MW / **BSPII**	2016 / 43.5 MW / **CT**
	2020 / 43.5 MW / **CT**	2020 / 43.5 MW / **CT**	2020 / 43.5 MW / **CT**	2020 / 43.5 MW / **CT**
Net Present Value - 2007 $(000)	2,203,347	2,183,038	2,124,493	2,051,745

NEXT COST RESOURCE MIX WITHOUT BSII (In addition to Diamond Willow and conservation)				
Year/MW/Resource	2010 / 31.5 MW / **Wind**	2010 / 31.5 MW / **Wind**	2013 / 130.5 MW / **CT**	2013 / 130.5 MW / **CT**
	2011 / 63 MW / **Wind**	2011 / 63 MW / **Wind**		
	2011 / 87 MW / **CT**	2011 / 87 MW / **CT**		
	2012 / 31.5 MW / **Wind**	2012 / 31.5 MW / **Wind**		
	2017 / 43.5 MW / **CT**	2017 / 43.5 MW / **CT**	2016 / 116 MW / **IGCC**	2016 / 116 MW / **IGCC**
	2024 / 43.5 MW / **CT**	2024 / 43.5 MW / **CT**		
Net Present Value - 2007 $(000)	2,215,660	2,215,660	2,363,530	2,312,366

1. Scenarios I & II were developed in Q3 of 2007. Scenarios III & IV were developed in the Q1 of 2008.
2. Big Stone Unit II modeled as a 500 MW unit in all scenarios.
3. There was no binding constraint on the amount of wind that Strategist® could add to the resource plan.

Q: Please summarize what the top two sections of the preceding table illustrate?

A: The top half of the table shows the least cost expansion plan identified by Strategist® in four scenarios prepared for this proceeding. The new resources added are detailed for each of the expansion plans where the year added is indicated and followed by the MW of nameplate capacity added and the type of resource. In all scenarios, the model selected all the available conservation resources and all the plans included Montana-Dakota's Diamond Willow wind project near Baker, Montana.

Q: Please describe what the last section of the preceding table illustrates?

A: The bottom half of the table shows the first resource plan for each scenario that did not include Big Stone Unit II. The model provides a summary of plans considered that have a higher cost than the least cost plan. For each scenario the incremental cost of not including Big Stone Unit II in Montana-Dakota's resource expansion plan is the difference between the net present value (NPV) for each scenario shown on the bottom and middle of the table.

Q: In summary, what was the result of your test of key assumptions regarding the economics of wind?

A: My analysis of the alternative plans evaluated by the Strategist® model indicates that without a production tax credit and with a realistic capacity factor for wind generators, the cost of a wind generation alternative is more than 10% higher than the optimal plan involving Big Stone Unit II.

Q: In summary, what was the result of your analysis of off-system sales?

A: My analysis indicates that on a net present value basis there are an additional approximate $72m of benefits from off-system sales with Big Stone Unit II in Montana-Dakota's resource mix.

Q: What risks do you see with a wind/combustion turbine alternative?

A: No. While Mr. Schlissel, on behalf of Mark Trechock and the Dakota Resource Council, has previously presented testimony in this proceeding regarding the risk of greenhouse gas regulation, there are also significant risks associated with the alternative wind/natural gas expansion plan. Even though the alternative plan has a net present value total cost within two percent of the Big Stone Unit II plan (comparing the top and bottom half of the preceding table under the column labeled "Scenario II"), there are risks associated with this alternative including: performance risk of the wind based upon the assumed capacity factor, fuel price risk associated with natural gas, the potential for significant capital costs associated with transmission and integration costs associated with large amounts of wind generation, and higher operating costs associated with the fossil fuel plants operating in a system with a large amount of wind generation.

As I will discuss later in this supplemental testimony, the previous assumptions used for wind included continuation of the PTC and high annual capacity factors. Both of those assumptions underlie the conclusion that the cost comparison is within two percent. If we were to use more realistic assumptions regarding the capacity factor of wind, the resulting costs of the scenarios will be further apart.

Q: Why was it necessary to update the input assumptions?

A: Resource planning is a dynamic process and a number of updates in assumptions were appropriate because a number of factors had changed since the analysis was completed and presented to this Commission almost one year ago. A key update was to modify the inputs to reflect material changes related to the down-sizing of the proposed Big Stone Unit II coal plant. Given the attention that wind generation has received in this proceeding, it was also critical that the analysis reflect the recent capital cost pressures on the construction of wind turbines. The updates also include changes made in conjunction with the development of Montana-Dakota's 2007 Integrated Resource Plan.

Q: Please summarize the organization of your supplemental testimony?

A: The first section of my testimony summarizes the key assumption updates to my previously filed analysis in this proceeding. The second part describes the sensitivities analysis I conducted. The final section summarizes the results.

Q: Please summarize the information contained in MDU Exhibit 215?

A: My exhibit summarizes the key input assumptions and results from the Strategist® analysis that I completed to support my supplemental testimony.

- Table 1: Fuel cost assumptions for Scenarios I & II
- Table 2: Natural gas cost assumptions (used for Scenarios III & IV)

- Table 3: Load Forecast used for all four scenarios (including a comparison with the load forecast previously used in this proceeding)
- Table 4: Assumptions for Resource Options
- Table 5: Demand Side Resource Options modeled
- Table 6: Scenario I Results Summary
- Table 7: Scenario II Results Summary
- Table 8: Scenario III Results Summary
- Table 9: Scenario IV Results Summary
- Table 10: Montana-Dakota's Least Cost Expansion Plan Summary

III. UPDATE OF ASSUMPTIONS

Q: What assumption updates were incorporated in your updated resource modeling results?

A: I will briefly list the key assumption updates and then provide additional detail on each of the updates. The updates include:

- Reflecting the proposed reconfiguration of the Big Stone Unit II coal plant as a 500 MW project;
- Allowing the Strategist® model to select up to 131 MW of Big Stone Unit II;
- Incorporating Montana-Dakota's revised energy and demand forecast;
- Incorporating Montana-Dakota's recent natural gas cost price forecast;
- Updating the cost of wind projects and testing scenarios with and without extension of the production tax credit (PTC);

- Updating the list of committed projects and contracts in the model to include the Diamond Willow wind project and removal of the South Dakota wind project;
- Incorporating additional demand-side management projects;
- Modeling the option to extend for an additional year Montana-Dakota's existing contract with Northern States Power for approximately 100 MW of capacity; and
- Analyzing constraints on how much wind is allowed to enter the model.

Q: What parameters for Big Stone Unit II did you adjust in your analysis?

A: The base case analysis reflects a resource option for a 116 MW share of the proposed Big Stone Unit II plant for Montana-Dakota. However, certain parameters relating to this resource were changed including extending the commercial on-line date one year to the summer of 2013, updating the capital cost of the project, updating the fuel and non-fuel operating cost assumptions, correcting a heat rate assumption, and incorporating interest during construction (IDC) into the capital cost assumption. The updated capital and O&M cost estimates incorporate the information provided by the Applicant's witness Mr. Mark Rolfes in the fall of 2007.

A second scenario, Scenario II, was also developed to determine whether it would be cost-effective for Montana-Dakota to increase its share of Big Stone Unit II from 116 to 131 MW. This scenario allowed the Strategist® model to select up to four incremental 5 MW shares of Big Stone Unit II if 116 MW share is cost effective.

Q: What capital costs for Big Stone Unit II did you assume in your analysis?

A: The capital cost for the 500 MW configuration of Big Stone Unit II power plant is $1.272B. My analysis in Strategist® involved converting the nominal construction costs in 2006 constant dollars and also incorporates the transmission line capital costs and interest during construction.

Q: Would you please summarize the load forecast update?

A: Yes. Montana-Dakota routinely updates its load forecast. In the process of preparing its 2007 Integrated Resource Plan, Montana-Dakota updated both its long-term forecast and its forecast methodology. Montana-Dakota recently decided to change its end-use forecasting methodology, which it used during the period 1988 – 2005, to an econometric approach. The end-use approach to developing load forecasts is based upon a process that characterizes electricity use by major users with fundamental equations that calculate electricity use as the product of electricity used per unit times the number of units. For example, electricity used per multi-family household times the forecast of the number of multifamily households. The econometric approach to forecast relies on statistical analysis of historical consumption to develop equations that are used to forecast future consumption. For example, residential sales are based upon changes in key explanatory variables such as population, income, and weather. Both approaches are valid load forecasting techniques. In the spring of 2007, Montana-Dakota prepared an econometric forecast of annual energy and peak demand in conjunction with the new Integrated Resource Plan.

Q: How did the long term energy and demand forecast change between the end-use and the econometric forecasts?

A: The new econometric forecast has slightly higher long-term demand and energy growth rates. The long-term average annual demand growth rate increased from 0.99 percent to 1.07 percent while the long-term average annual energy growth rate increased from 0.92 percent to 1.23 percent. Thus, Montana-Dakota is showing slightly more growth than previously forecast.

Q: Please summarize the update to the natural gas forecast.

A: The natural gas forecast consists of two components. The first part is a projection of natural gas prices at the CIG hub, and the second component incorporates the pipeline transportation delivery costs to the Ventura Hub and then through the South Dakota Intrastate Pipeline Company (SDIP) to a location near Mobridge, South Dakota.

The natural gas commodity forecast that I used in my capacity expansion modeling was prepared by Montana-Dakota and is based on the long-term DOE Energy Information Administration (EIA) natural gas forecast which was then adjusted based on Montana-Dakota's extensive in-house experience in procuring natural gas.

The natural gas transportation cost forecast is based upon the firm delivery of natural gas to a site at Mobridge, SD for a new gas turbine project. Delivery of gas to the site is relatively expensive until 2019 as a result of the SDIP tariff. The transportation cost to Mobridge is expected to decline commencing in 2019. Despite the near term high cost of transporting gas to South Dakota, this is nonetheless considered the preferred site for a new Montana-Dakota natural gas resource as a result of pipeline capacity and water constraints related to other potential sites.

Q: What updates were made regarding the assumed cost of wind projects?

A: The cost of wind was updated based upon a spreadsheet model used to calculate the levelized cost of wind over a twenty year period. This model incorporates the assumption that the capital cost of wind is $2,000 / kW (2006 $) rather than the $1,200 / kW that I used in previous modeling. This estimate better reflects the increased cost of wind projects and is also consistent with Montana-Dakota's experience with its 20 MW Diamond Willow project. This estimate also includes an assumed cost to connect the wind project to the transmission grid. However, it does not include the costs for any required transmission system upgrades.

The wind cost assumes two levels of integration costs. The first 156 MW of wind assumes a system integration cost of $4.6 / MWH (2006 $) and incremental wind beyond 156 MW has an integration costs of $6.6 / MWH (2006 $). As described further in my discussion of scenarios, wind was modeled under two assumptions regarding the PTC: first, assuming that the PTC would be extended thru 2012; and second, assuming the PTC is not extended beyond the end of 2008.

Q: What updates were made regarding Montana-Dakota's committed wind projects?

A: The analysis reflects the inclusion of Montana-Dakota's Diamond Willow wind project located near Baker, Montana. The updated analysis no longer includes capacity and energy associated with the 31.5 MW wind project that was slated to be installed near Java, South Dakota. That project was removed from the resource plan since the supplier defaulted on the contract in November, 2006.

Q: What updates in DSM assumptions were made?

A: As in the prior analysis, the impacts of conservation programs that Montana-Dakota is already implementing continue to be embedded in Montana-Dakota's long-term forecast. These programs include a residential high efficiency air conditioning program, a commercial high efficiency lighting program, and an interruptible load program. The least cost planning analysis in Strategist® is also allowed to select four proposed packages of conservation and DSM measures. All of these measures, outlined in MDU Exhibit 215 Table 5, are incorporated into the resource expansion plan developed in Strategist® and are based on Montana-Dakota's 2007 Integrated Resource Plan.

Q: Why was the option to extend the existing capacity contract between Montana-Dakota and NSP added to the resource plan?

A: The NSP contract, a four year contract for capacity starting in the summer of 2007, includes two options for renewal. The first option for renewal in 2011 is at a defined price and that option was incorporated into the Strategist® analysis previously presented to the Commission. In addition, the contract contains an option for a second annual extension, through the summer of 2012, at a price to be negotiated. While an extension of the contract requires that I make an assumption regarding the future contract price, I determined that it is better to include this option to provide a larger number of choices for the Montana-Dakota resource expansion plan. Extending the contract for modeling purposes creates more resource expansion options. Without the contract extension, the model is forced to select a long-term resource in 2012 due to the capacity deficit. The contract extension allows the model to select from long-term resources in 2012 and 2013 and thus creates more options.

Q: How did you determine the price for the contract extension in 2012?

A: I developed a proxy for a negotiated contract price based upon the levelized cost of a new General Electric 7FA combustion turbine. I also used Montana-Dakota's forecasted cost of natural gas.

Q: How much wind generation was incorporated into the resource optimization process?

A. In the case of wind generation, I limited the amount of wind to 219 MW of capacity which translates into approximately 40 percent of the utility's peak demand for 2015 and 25 percent to 35 percent of energy sales in 2015 (based upon a 38 percent or 52 percent capacity factor for the wind generation). These percentages are considered in excess of what could realistically be absorbed on the utility's system without incurring other costs, such as additional regulation up and down services, the need for more quick start capacity, potential loss of

efficiencies associated with backing down base-load coal plants, and potential increased maintenance costs associated with more cycling of fossil fuel generation units.

Q: Did your modeling of resource options create a bias against natural gas and wind options as a result of limiting choices associated with the wind / gas options?

A: No. The model could identify whether there was a lower cost combination of wind and natural-gas fired generation subject to the constraint of a realistic maximum amount of wind that Montana-Dakota could absorb on its system.

Q: Can you elaborate on why you chose to limit Strategist® to selecting an additional 189 MW of wind beyond Diamond Willow?

A: The amount of wind that can be assumed as part of the Montana-Dakota expansion plan cannot be completely divorced from the reality and context of its actual system and the limitations of that system. I limited wind in the model to 219 MW (the existing and planned 30 MW Diamond Willow project plus the potential of an additional 189 MW) based upon my review of a number of transmission integration and related studies, including the 2006 Minnesota Wind Integration Study and the Bonneville Power Administration (BPA) 2007 Northwest Wind Integration Plan. The Northwest study analyzed wind penetration on the order of 20 – 30 percent of system capacity. The Minnesota study stops at 25 percent penetration of energy. While neither study identifies a maximum amount of wind that can be absorbed by a utility system, both studies find that the cost of integrating wind into the system increases as more wind is added to the system.

The integration costs increase as a result of increased need for other resources (hydro or thermal) to maintain system reliability and stability. While the Northwest study estimated an integration cost of $4.60 / MWH at a 30 percent penetration of wind, the federal Bonneville

Power system has a large amount of hydropower to support wind integration. Alternatively, Idaho Power and Avista estimate that wind integration costs are respectively $8.84 and $16.16 / MWH at a 30 percent penetration.

The impact of more than 219 MW of wind energy on the Montana-Dakota system would depend, in part, on the ability of the MISO system to absorb some of that wind. On a stand-alone basis, this would inevitably require Montana-Dakota coal plants to reduce generation in some hours that would have negative cost implications. For example, 219 MW of assumed wind on the Montana-Dakota system creates the potential for wind production to exceed 75 percent of the Montana-Dakota's hourly demand in over 25 percent of the hours in 2015. This high level of wind penetration could lead to additional costs not modeled in Strategist® due to the complexity of the issue and the difficulty of capturing those complexities in Strategist®. These costs, including the cost of backing down coal plants to uneconomic levels of operation and the need for spinning reserves and regulation-up and regulation-down services, are not fully captured in the assumption regarding wind integration costs. The need for sufficient responsive thermal resources to maintain system reliability with large amounts of wind was recently demonstrated in Texas where emergency curtailments of interruptible load were required as a result of wind variations. In the February 27, 2008 event, wind output in Western Texas dropped from 1,700 MW to 300 MW during a time that load increased from 31,200 MW to 35,612 MW.

Q: Have there been any studies performed on wind integration for the Montana-Dakota system?

A: I am not aware of any studies related to Montana-Dakota's system with regard to the amount of wind capacity the system can absorb without incurring costs for additional generation resources to support the wind. However, based on the Minnesota and Pacific Northwest studies,

in order to be conservative (i.e., making an assumption in favor of wind energy), I increased the wind integration costs by only $2/MWH for capacity over 30 percent of the peak demand. Actual costs could be, if not likely will be, considerably greater.

In addition, it is important to also keep in mind that the total cost of adding a significant amount of wind is still understated since unlike the thermal resources analyzed in the expansion model, the costs for transmission that would actually be required to integrate significant additions of wind capacity into the grid were not included in the model.

Q: What was the result of the Strategist® modeling using the updated assumptions?

A: The results of my updated modeling continue to pick the Big Stone Unit II project as part of a least cost resource expansion plan. That plan also includes a new 43.5 MW gas peaking resource, a combination of energy-efficiency programs, and the Diamond Willow wind project.

Q: Did the Strategist® model identify a wind / CT alternative to the Big Stone Unit II alternative?

A: Yes, as shown on the Expansion Plan Summary, when the Big Stone Unit II resource is removed from the preferred resource mix, the next best resource mix under Scenarios I and II consists of four combustion turbines (174 MW) and four wind projects (126 MW in addition to the Diamond Willow project). However, there are some significant uncertainties associated with that plan. The plan assumes a wind capacity factor of over 50 percent which is a very questionable assumption. The cost of wind also assumes that Montana-Dakota would receive the benefit of the federal production tax credit for renewable resources and that no new transmission lines will be required. The assumption with the lack of transmission for wind resources is in contrast to the costs for new transmission facilities that were added to all the thermal options.

Q: Why were new transmission facility costs added to the thermal resources but not to the wind resources?

A: I did not have any studies regarding the costs to build transmission to the wind sites. The exclusion of the transmission cost is not meant to imply that a large penetration of wind energy will not require an associated transmission investment. However, leaving such costs out of the analysis favors the wind alternative.

IV. ADDITIONAL SCENARIOS

Q: Please summarize the additional scenarios that you analyzed?

A: I developed two additional scenarios that update the assumptions used in the third quarter of 2007 analysis. One scenario, Scenario III, is primarily designed to test some of the key assumptions regarding wind that resulted in wind / natural gas resources having a net present value cost within two percent of the least-cost scenario. The other scenario, Scenario IV, examines the potential benefits from off-system sales created by short-term excess capacity available to make such sales if Big Stone Unit II is built. The assumption updates in the additional scenarios include:

1. Testing the impact of the federal PTC not being extended;
2. Adjusting the capacity factor of the wind units to a more reasonable level;
3. Examining the impact of lower natural gas costs;
4. Allowing the resource expansion optimization to select Big Stone Unit II in 25 MW increments instead of as a single 116 MW unit;
5. Allowing the reduction of existing generation capacity that may be caused by regulation or obsolescence; and
6. Updating the cost-of-capital.

The first two assumptions in the list test the impact of two uncertain assumptions that I consider to be key drivers in the levelized cost of the wind. The third and fourth assumption updates were made to address concerns raised by others regarding the Montana-Dakota modeling.

Q: Why did you choose to analyze the impact of off-system sales?

A: The premise that the resource expansion plan should be based primarily on the retail load requirements of Montana-Dakota remains intact. However, a review of the model results indicates the Big Stone Unit II unit is not required to run at full capacity to meet Montana-Dakota's load requirements. In my testimony from last year, I pointed out there are potential benefits to off-system sales from the Big Stone Unit II unit, but those benefits were not included in the analysis. The purpose of the updated analysis is to identify the magnitude of those additional benefits.

Q: What is the impact of incorporating off-system sales into the resource planning optimization process?

A: The analysis identified an estimated additional $72m of benefits on a NPV basis. Importantly, the analysis also shows the selection of the resource expansion plan is not changed by the incorporation of off-system sales. In other words, the model does not rely on off-system sales as a basis for its selection of Big Stone Unit II for Montana-Dakota. Instead, it simply points to the fact that off-system sale opportunities provided by the plant provide additional benefits to Montana-Dakota's customers. These additional benefits diminish over time, however, as Montana-Dakota's retail load growth takes more and more of Montana-Dakota's participation in the project.

Q: Why did you test the impact of the expiration of the production tax credit?

A: The Energy Independence and Security Act of 2007, the major piece of federal energy legislation coming out of Congress last year, did not include an extension of the PTC. I anticipated extension of the PTC when I did my prior Strategist® modeling for Montana-Dakota. While the House of Representatives recently passed a bill to extend the PTC to the end of 2011 and it appears that some extension is likely, permanent extension remains uncertain. As a result, I simply wanted to test how important the federal PTC is to the selection of additional wind generation in any resource expansion modeling that we prepared for Montana-Dakota.

Q: What happens to the wind resource when the PTC is not extended in the model?

A: First, it is important to point out that Montana-Dakota's participation in Big Stone Unit II is identified as part of a least-cost resource plan even in scenarios which included the federal PTC. Even with the PTC extended (Scenarios I and II), the model did not select additional wind (i.e., beyond the 30 MW Diamond Willow) in the optimal expansion plan. The exclusion of the PTC obviously makes wind more expensive so it does not change the results of the model including Big Stone Unit II in the preferred plan. However, as I noted above, assuming no extension of the PTC causes the next best alternative resource plans – plans that substitute significant amounts of wind and natural gas generation in lieu of Big Stone Unit II – to become even more uneconomic, and in fact pushes these plans outside of 10 percent of the cost of the preferred plan.

Q: Why did you revise the assumption regarding the capacity factor of new wind units?

A: In the course of our review of certain of the modeling assumptions, we noted the model is still using a capacity factor for wind energy that is based on a single wind project that Montana-Dakota was considering in South Dakota. That project was cancelled after the developer defaulted. The capacity factor for the wind energy in that project was high, almost 52 percent,

based solely on the developer's representations. Thus, to model a more reasonable assumption, we reduced the capacity factor from 52 to 38 percent based on the statistics reported for wind projects recently undertaken by Minnkota Power Cooperative.

Q: Did you adjust the accredited capacity of the wind units in conjunction with reducing the capacity factor?

A: No. The accredited capacity for wind remains at 23 percent of nameplate capacity.

Q: What assumptions did you make to test the impact of lower gas costs?

A: I tested the impact of reducing the gas transportation costs. A natural gas plant located near Mobridge is likely the best location for Montana-Dakota because of the availability of water and gas pipeline capacity, even given the short-term high gas transportation costs. Therefore, the purpose of the analysis was to investigate whether a hypothetical reduction in gas transportation costs makes natural gas-fired generation significantly more attractive. The lower gas price does not change the results, the model still selected Big Stone Unit II as part of the least cost expansion option.

Q: Why did you test selection of Big Stone Unit II in increments of 25 MW?

A: In prior hearings, particularly in the recent Minnesota proceedings, Montana-Dakota has been criticized because it elected not to model increments of Big Stone Unit II to which it has no contractual opportunity to participate. In other words, Mr. Schlissel has argued that Montana-Dakota should allow the model to select the optimal amount of Big Stone Unit II, regardless of whether this amount was available to Montana-Dakota in the real world.

Our recent modeling simply was intended to test the theoretical question of whether a smaller increment of baseload coal would result in a lower cost expansion plan to Montana-Dakota. The Strategist® model still selected 125 MW of Big Stone Unit II as part of the least

cost expansion option. However, the model did identify higher cost expansion plans that incorporated smaller amounts of Big Stone Unit II in conjunction with building more combustion turbines.

Q: Why did you adjust the existing unit retirement assumptions?

A: Big Stone Unit II was already identified as part of the resource expansion plan assuming no other generating units are retired during the study period. The sensitivity was designed to identify whether there are additional savings associated with retiring smaller generating units that are relatively inefficient or have potentially high environmental retrofit costs.

Q: Why did you update the cost of capital?

A: The cost of capital was updated to make the analysis consistent with current utility financial assumptions.

Q: What other changes did you make to the modeling assumptions?

A: I corrected an error in modeling the energy profile associated with the possible NSP contract extension. The correction does not change the selection of new resources, but it corrected a problem with more energy being purchased under the short-term contract than what was needed given the availability of the existing coal plants.

V. UPDATED MODELING RESULTS SUMMARY

Q: What do the scenarios presented in your supplemental testimony conclude regarding the incorporation of Big Stone Unit II in Montana-Dakota's resource expansion plan?

A: The scenarios summarized below, and set forth in MDU Exhibit 215 , all indicate that the least cost expansion plan includes 116 to 131 MW of the proposed 500 MW Big Stone Unit II unit. The analysis also demonstrates that, while not a justification for its selection, there are

additional benefits to Montana-Dakota customers from off-system sales resulting from the short-term capacity that is available to Montana-Dakota from Big Stone Unit II, which benefits decrease over time as Montana-Dakota's load grows.

Cost / Resource	Scenario I: Update of 2006 Study (Q3 2007)	Scenario II: Update of 2006 Study with Potential for 131 MW of BSII (Q3 2007)	Scenario III: PTC not Extended (Q1 2008)	Scenario IV: PTC not Extended and Off-System Sales (Q1 2008)
Study Period NPV 2007 $(000)	$2,203,347	$2,183,038	$2,124,493	$2,051,745
Big Stone Unit II	116 MW	131 MW	125 MW (five 25 MW increments selected)	125 MW (five 25 MW increments selected)
Wind	93 MW (Diamond Willow and two additional projects)	30 MW (Diamond Willow)	30 MW (Diamond Willow)	30 MW (Diamond Willow)
Combustion Turbines: Natural Gas	43.5 MW (one project)	43.5 MW (one project)	87 MW (two projects)	87 MW (two projects)
Combined Cycle Turbine: Natural Gas	None selected	None selected	None selected	None selected
Conservation	All programs included	All programs included	All programs included	All programs included

Q: What does the Strategist® modeling conclude regarding the Big Stone Unit II alternative versus a hypothetical wind/gas alternative?

A: The modeling continues to show that Montana-Dakota's participation in Big Stone Unit II remains the lowest cost option. In scenarios where the federal PTC is extended, the comparative costs between Big Stone Unit II and a natural gas/wind option becomes very close, with the wind/gas option within two percent of the Big Stone Unit II scenario. These scenarios,

however, include use of a questionably high capacity factor for wind and wind would comprise nearly 30 percent of Montana-Dakota's total generating capacity. In cases assuming no PTC extension, a wind-gas option (that also excludes any portion of Big Stone Unit II) does not appear in plans that have a NPV within 10 percent of the least cost plan which includes Big Stone Unit II.

Q: Are there scenarios where the wind-gas option would displace Big Stone Unit II in the expansion plan?

A: Yes. One can change the input assumptions to construct scenarios where Big Stone Unit II would not be identified in the Strategist® model as a least cost expansion plan. Of course, scenarios can be constructed to achieve almost any result so the critical issue is the reasonableness of the collection of input assumptions that constitute the scenario. Those instances where a wind plus natural gas option is shown to be a lower cost option than is Montana-Dakota's participation in Big Stone Unit II would include a number of assumptions that, in my opinion, are unrealistic or undesirable or both. Montana-Dakota has stated, and with which I agree, the results of a particular model is an important consideration in the overall resource selection process. Modeling results, relying entirely on the assumptions upon which they are built, were never intended to be a substitute for experienced business judgment.

Q: Does this conclude your testimony?

A: Yes.