

MONTANA-DAKOTA UTILITIES CO.
BEFORE THE NORTH DAKOTA PUBLIC SERVICE COMMISSION
CASE NO. PU-22-____
PREPARED DIRECT TESTIMONY OF
LARRY E. KENNEDY

1 **Q1. Please state your name and business address.**

2 A1. My name is Larry E. Kennedy. My business address is 200 Rivercrest Drive
3 SE, Suite 277, Calgary, Alberta, T2C 2X5.

4 **Q2. By whom are you employed?**

5 A2. I am employed by Concentric Advisors, ULC

6 **Q3. What is your position with Concentric Advisors, ULC. (“Concentric”)?**

7 A3. I am employed by Concentric as a Senior Vice President.

8 **Q4. On whose behalf are you submitting this Direct Testimony?**

9 A4. I am submitting this Direct Testimony before the North Dakota Public
10 Service Commission (“Commission”) on behalf of Montana-Dakota Utilities Co.
11 (“Montana-Dakota” or the “Company”).

12 **Q5. Please describe your education and experience.**

13 A5. I am a Certified Depreciation Professional, with over 40 years of regulatory
14 plant accounting and depreciation experience, and 22 years of depreciation and plant
15 accounting consulting to the regulated utility industry. I have advised numerous

1 energy and utility clients on a wide range of accounting, property tax and utility
2 depreciation matters. Many of these assignments have included the determination
3 of the cost of appropriate annual depreciation accrual rates. I have included my
4 resume and a summary of testimony that I have filed in other proceedings as Exhibit
5 No. (LEK-2), Schedule 1.

6 **Q6. Please describe Concentric's activities in energy and utility engagements.**

7 A6. Concentric provides financial and economic advisory services to many and
8 various energy and utility clients across North America. Our regulatory, economic,
9 and market analysis services include utility ratemaking and regulatory advisory
10 services; energy market assessments; market entry and exit analysis; corporate and
11 business unit strategy development; demand forecasting; resource planning; and
12 energy contract negotiations. Our financial advisory activities include buy and sell-
13 side merger, acquisition and divestiture assignments; due diligence and valuation
14 assignments; project and corporate finance services; and transaction support
15 services. In addition, we provide litigation support services on a wide range of
16 financial and economic issues on behalf of clients throughout North America.

17 **Q7. Have you testified before any regulatory authorities?**

18 A7. Yes. A list of proceedings in which I have provided testimony is provided
19 in Exhibit No. LEK-2

20 **I. PURPOSE AND OVERVIEW OF DIRECT TESTIMONY**

21 **Q8. What is the purpose of your Direct Testimony?**

1 A8. The purpose of my Direct Testimony is to set forth the results of my full
2 and comprehensive depreciation study of the plant in service of the Montana-Dakota
3 – Electric Division (“MDU” or the “Company”), as of December 31, 2020. My
4 detailed report, including my analyses and recommendations, is provided in Exhibit
5 No. LEK-3, titled “Calculated Annual Depreciation Rates Applicable to Plant in
6 Service as of December 31, 2020”. The detailed depreciation study report was
7 prepared by me or under my direction.

8 **Q9. Please provide a brief overview of the analyses that led to your depreciation**
9 **recommendations.**

10 A9. In preparing the depreciation study report, I analyzed the historic plant
11 account data of MDU to prepare an analysis of the Company’s past retirement
12 experience. I met (virtually) with the Company’s management and operations
13 representatives to determine the extent to which the historic indications would be
14 reflective of the future retirement patterns. In addition, as the study was completed
15 over the period in which COVID protocols were in place, I relied on my notes from
16 my operational site tours from the 2018 Depreciation Study completed by
17 Concentric. The completion of the 2018 depreciation study included tours of three
18 Company substations and switch yards, a coal fired thermal generation plant, gas
19 turbine generation facility, the Company service building and yard, and the MDU
20 electric control room. Lastly, I also reviewed the average service life and net salvage
21 indications of many North American based electric utilities to test the results of my
22 analysis against the electric industry peers.

23 **Q10. How is the remainder of your Direct Testimony organized?**

1 A10. Section II provides the scope of my study and a summary of my analyses
2 and conclusions. This section also includes a discussion of the major causes of
3 changes in the depreciation accrual rate and amounts as compared to the last study.
4 Section III provides a background on utility depreciation, depreciation methods and
5 procedures. Section IV provides concluding comments.

6 **II. SCOPE OF THE DEPRECIATION STUDY**

7 **Q11. Please outline the Scope of the Depreciation Study.**

8 A11. My depreciation study report sets forth the results of the depreciation study
9 for the electric generation, transmission, distribution and general plant assets of the
10 MDU Electric Division, to determine the annual depreciation accrual rates and
11 amounts for book purposes applicable to the original cost of investment, as of
12 December 31, 2020. The rates and amounts are based on the Straight-Line Method,
13 incorporating the Average Life Group Procedure applied on a Remaining Life Basis.
14 This study also describes the concepts, methods and judgments which underlie the
15 recommended annual depreciation accrual rates related to the MDU electric assets
16 in service, as of December 31, 2020.

17 **Q12. Please outline the information included in your depreciation study report.**

18 A12. The depreciation study report is presented in nine (9) sections outlined as
19 follows:

- 20 • Section 1 Study Highlights, presents a summary of the depreciation
21 study and results.
- 22 • Section 2 Introduction, contains statements with respect to the plan
23 and the basis of the study.

- 1 • Section 3 Development of Depreciation Parameters, presents
2 descriptions of the methods used and factors considered in the service life
3 study.
- 4 • Section 4 Calculation of Annual and Accrued Depreciation, presents
5 the methods and procedures used in the calculation of depreciation.
- 6 • Section 5 Result of Study, presents summaries by depreciable group of
7 annual and accrued depreciation in Tables 1, 2, 3, 4, 5, and 6.
- 8 • Section 6 Retirement Rate Analysis
- 9 • Section 7 Net Salvage Calculations
- 10 • Section 8 Detailed Depreciation Calculations
- 11 • Section 9 Estimation of Survivor Curves, is an overview of Iowa
12 curves and the Retirement Rate Analysis.

13

14 **Q13. Was the depreciation study prepared using generally accepted standard**
15 **methods and practices?**

16 A13. Yes. Previous depreciation studies completed for MDU utilized a widely
17 accepted method for the study of the Company's historic data, known as the
18 Retirement Rate Analysis Method. The Retirement Rate Analysis Method is
19 generally accepted as the correct method to use when aged data is available for
20 review. The aged data used in the last study, through December 31, 2017, was
21 available to be incorporated into our database. Additional reliable aged data, for the
22 period January 1, 2018 through to December 31, 2020, was provided by the
23 Company and incorporated in our database. Given the availability of reliable aged
24 data, I prepared the historic study of mortality history using the retirement rate
25 method. A detailed discussion of the retirement rate analysis is presented in
26 Section 9 of my depreciation study report.

1 Additionally, the service life study included:

- 2 • a review of MDU company practice and outlook, as they relate to plant
3 operation and retirement;
- 4 • consideration of current practice in the electric system industry, including
5 knowledge of service life estimates used for other electric system
6 companies; and
- 7 • informed professional judgment which incorporated analyses of all of the
8 above factors.

9 My study of the net salvage percentages was based on detailed study prepared under
10 the standard approach, which has commonly become known as the “Traditional
11 method”. Within this method, the net salvage transactions (gross salvage proceeds,
12 re-use salvage and costs of removal or retirement) are compared to the original cost
13 of the item being retired. The analysis is prepared on an actual transaction year
14 basis, for as many years as reliable data is available. The analysis then includes a
15 series of 3-year rolling average bands, 5-year rolling average bands, and life to date
16 bands covering all years of transactional data.

17 As described in later sections of this evidence, the depreciation accrual rates
18 presented herein are based on generally-accepted methods and procedures for
19 calculating depreciation.

20 The methods described above are generally accepted for use in the development of
21 depreciation rates for regulated utilities.

22 **Q14. Please provide a summary of the results of the depreciation study.**

23 A14. The study results in an annual depreciation expense accrual related to the
24 recovery of original cost (i.e. excluding net salvage requirement) of \$56.8 million,

1 when applied to depreciable plant balances, as of December 31, 2020. The study
 2 results are summarized at an aggregate functional group level as follows:

3 **Summary of Original Cost, Accrual Percentages and Amounts**

| Plant Group | Original Cost | Annual Accrual | |
|------------------------|----------------------|-----------------------|--------------|
| Steam Plant | \$372,470,891 | 2.45% | \$9,115,697 |
| Other Production Plant | \$537,757,981 | 3.98% | \$21,377,839 |
| Transmission Plant | \$522,283,617 | 1.70% | \$8,889,889 |
| Distribution Plant | \$461,078,839 | 3.25% | \$15,005,624 |
| General Plant | \$33,261,966 | 7.34% | \$2,443,013 |
| Total Plant in Service | \$1,926,853,295 | 2.95% | \$56,832,062 |

4
 5 **Q15. How do the above depreciation rates compare to the currently approved**
 6 **depreciation rates?**

7 A15. The following chart summarizes the proposed composite depreciation rates
 8 as compared to the currently approved composite depreciation rates.

| Plant Group | Proposed Depreciation Rate | Currently Approved Depreciation Rate |
|------------------------|-----------------------------------|---|
| Steam Plant | 2.45% | 1.93% |
| Other Production Plant | 3.98% | 3.76% |
| Transmission Plant | 1.70% | 1.61% |
| Distribution Plant | 3.25% | 2.40% |
| General Plant | 7.34% | 5.84% |
| Total Plant in Service | 2.95% | 2.54% |

1 **Q16. Please describe the reasons for the increase in the depreciation rates related to**
2 **electric production plant.**

3 A16. The largest influence in electric production depreciation rates results from
4 the continued use of a Life Span approach applied to each generation unit. The
5 impact of using the Life Span approach has been more dramatic in recent years
6 because of the large capital spending primarily related to environmental
7 requirements at several of the units.

8 The use of the Life Span Method is a continuation of the method that was
9 incorporated into the production accounts in the last depreciation study, wherein
10 the depreciation rates for each of the location specific generation accounts were
11 developed from the continued use of a Life Span Method. With the use of a Life
12 Span Method, an interim retirement curve is identified for each property group,
13 based on the analysis as described within Section 3.6 of my depreciation study
14 report. The probable retirement dates for each of the generation plants were,
15 provided to me by MDU, based on an internal MDU analysis of the factors
16 impacting the terminal life of each plant. The life span date is incorporated into the
17 interim survivor curve to develop an average service life and average remaining
18 life, via the Life Span Method, for each of the generation accounts. A comparison
19 of the life span dates used for each the generation facilities from the depreciation
20 study completed in 2015 based on 2014 data and the life span dates used in my
21 current depreciation study are provided below.

| Generation Station | Proposed | Currently Used |
|---|-----------------|-----------------------|
| Heskett Generating Stations (Common Plant) | N/A | 2028 |
| Lewis & Clark Generating Station (Common Plant) | N/A | 2025 |
| Coyote Generating Station | 2041 | 2041 |
| Big Stone Generating Station | 2046 | 2046 |
| Wygen III Generating Station | 2060 | 2060 |
| Glendive Turbine – Unit 1 | 2033 | 2022 |
| Glendive Turbine – Unit 2 | 2046 | 2046 |
| Miles City Turbine | 2033 | 2019 |
| Portable Generators | 2047 | 2047 |
| Heskett Turbine | 2057 | 2057 |
| Diamond Willow Wind Farm | 2035 | 2027 |
| Cedar Hills Wind Farm | 2035 | 2030 |
| Lewis & Clark Turbine - RICE | 2045 | 2045 |
| Ormat Generation Facility | 2034 | 2029 |
| Thunder Spirit Wind Farm I | 2040 | N/A |
| Thunder Spirit Wind Farm II | 2043 | N/A |

1
2 These life span dates, used in my study for the MDU steam generation plants,
3 related to several stations, are the same dates used in the last depreciation study.
4 However, the steam generation assets at Heskett Stations I and II have been retired
5 since the last depreciation rates were approved, leaving the common plant assets
6 required for the support of the Turbine unit left to be depreciated. Similarly, the
7 steam generation units at Lewis and Clark Generating Station have also retired
8 since the last depreciation study, and again leaving the Common Assets required
9 for the recently installed turbine unit. The use of a life span approach for these
10 common assets at the Heskett and Lewis and Clark generating sites has been

1 discontinued in the current depreciation study. In the Other Production category,
2 the life span date for the Glendive Turbine - Unit 1 has been extended from
3 December 31, 2022 to December 31, 2033, the Miles City Turbine has been
4 extended from December 31, 2019 to December 31, 2033, the Ormat Generation
5 Facility has been extended from December 31, 2029 to December 31, 2034, the
6 Diamond Willow Wind Farm has been extended from December 31, 2027 to
7 December 31, 2035, and the Cedar Hill Wind Farm has been extended from 2030
8 to December 31 2035 . Additionally, new life span dates have been introduced for
9 both Thunder Spirit Wind Farm units. As such, the increase in the generation
10 depreciation rate is not significantly caused by changes in the life span dates, but
11 rather by the large amount of capital spending that is required for the generation
12 plants to continue to operate through to the life span date.

13 Over the period since the 2014 depreciation study, the gross depreciable cost related
14 to electric generation plants that incorporate the use of a life span has increased
15 by approximately \$297 million (an increase of 48 within the steam generation
16 capital additions, the removal of a life span from the depreciation rate calculations
17 for the Common assets at the Heskett and Lewis and Clark generations stations
18 has also contributed to the decrease in the depreciation rate for this
19 segment of the generation plant.

20 The original cost of depreciable plant within the Other Production accounts, has
21 increased by \$331 million since 2014. This additional investment has been made
22 in the gas turbine and renewable energy generation, representing an increase in
23 these Other Production accounts of 160% since December 31, 2014. This

1 investment was largely in the new Thunder Spirt Wind Farm facility - and the Lewis
 2 & Clark RICE turbine unit which account for approximately \$250 million of the
 3 total \$331 million of new capital investment. This new investment is subject to life
 4 span dates that are similar to the life span dates used for Other Production assets in
 5 the 2014 depreciation study, and therefore has a large impact on the depreciation
 6 rate in the Other Production category.

7 **Q17. Please outline the reasons for the increase in the composite depreciation rate for**
 8 **electric transmission plant.**

9 A17. Within the electric transmission group of assets, extensions to the average
 10 service life estimates have a decreasing impact on the transmission system
 11 depreciation rates. However, cost of removal estimates have become more negative
 12 which has an offsetting impact resulting in a small overall increase to the
 13 transmission system depreciation rates.

14 **Q18. Please provide a summary of the current and proposed average service life**
 15 **estimates for transmission plant.**

16 A18. The following is a summary of the proposed average service life estimates
 17 compared to the currently used estimates, demonstrating the lengthening of the
 18 average service lives in all but two accounts.

| Account | Description | Proposed Iowa Curves | Current Iowa Curves |
|---------|-----------------------------|----------------------|---------------------|
| 350.20 | Land Rights | 70-R4 | 50-R3 |
| 352.00 | Structures and Improvements | 50-R2 | 45-R2 |
| 353.00 | Station Equipment | 65-R2.5 | 60-R3 |
| 354.00 | Towers and Fixtures | 60-R4 | 55-R5 |

| Account | Description | Proposed Iowa Curves | Current Iowa Curves |
|---------|------------------------------------|----------------------|---------------------|
| 355.00 | Poles and Fixtures | 63-R2.5 | 50-R3 |
| 356.00 | Overhead Conductors and Devices | 70-R3 | 65-R3 |
| 357.00 | Underground Conduit | 50-R3 | 50-R3 |
| 358.00 | Underground Conductors and Devices | 50-R3 | 50-R3 |

1
2 The specific reasons for the average service life extensions for each of the large
3 transmission accounts are discussed in Section 3.6 of my report. Additionally, the
4 results of the statistical mortality study are presented for each account in Section 6
5 of my report.

6 **Q19. Are the average service life extensions, as noted above, typical for electric**
7 **transmission assets?**

8 A19. Yes. In a number of recent depreciation studies that I have completed, I
9 have noted that the average service life of electric transmission assets is lengthening
10 throughout North America. While there are a number of factors causing this
11 lengthening of life estimates, the most prevalent reason is the increased focus of
12 utilities in maintaining and life extending the transmission infrastructure. For
13 example, in recent years electric transmission utilities have been pro-active in pole
14 and tower structure management and adding enhanced protection and control
15 equipment within the substations. The specific life expectation of the digital
16 protection and control systems is shorter than the previous electro-mechanical
17 protection and control system, however, the enhanced protection provided within
18 the substation of the new technology has had a life extension influence for
19 transforming and switching equipment.

1 Likewise, I have noted that the life of transmission line assets has also benefited
2 from enhanced technology and the pro-active maintenance programs undertaken by
3 electric transmission utilities. The introduction of pole and tower testing and
4 treatments for wood structures combined with the observation of longer than
5 previously expected life indications for steel structures throughout the industry,
6 have provided electric transmission utilities with the ability to recognize longer
7 lives on these transmission assets. As such, the average service life extensions as
8 observed in this study are consistent with my observations in a number of other
9 electric utilities.

10 **Q20. Please provide a summary of the current and proposed net salvage percentages**
11 **for transmission plant.**

12 A20. The following is a summary of the proposed net salvage percentages used
13 in the depreciation rate calculations. I note that the currently approved rates differ
14 in many accounts from those proposed in the 2015 depreciation study. It is my
15 understanding that the currently approved depreciation rates related to cost of
16 removal were ultimately negotiated. Therefore, the net salvage percentage
17 comparisons as noted below are based on the percentages as recommended in the
18 2015 depreciation study. However, the following also provides a comparison of the
19 recommended net salvage depreciation rate to the currently approved net salvage
20 depreciation rate.

21

| Account | Description | Proposed | | Last Depn Study (*) | |
|---------|------------------------------------|---------------|-----------|---------------------|----------------|
| | | Net Salvage % | Depn Rate | Net Salvage % | Depn Rate |
| 350.20 | Land Rights | 0 | 0.00 | 0.00 | 0.00% |
| 352.00 | Structures and Improvements | 0 | 0.00 | 0.00 | -2.00% |
| 353.00 | Station Equipment | -10 | 0.10 | -10 | 0.15% |
| 354.00 | Towers and Fixtures | -20 | 0.77 | -5 | 0.15% |
| 355.00 | Poles and Fixtures | -35 | 0.59 | -50 | 1.18% 0.60% |
| 356.00 | Overhead Conductors and Devices | -20 | 0.46 | -15 | 0.51% |
| 357.00 | Underground Conduit | 0 | 0.00 | 0.0 | 0.00% |
| 358.00 | Underground Conductors and Devices | 0 | 0.00 | 0.0 | 0.00% |

(*)Rate identified in yellow represents the depreciation rate after negotiated settlement.

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The specific reasons for the net salvage percentages for each of the large transmission accounts are discussed in Section 3.6 of my report. Additionally, the results of the statistical net salvage study are presented for each account, in Section 7 of my report.

8 **Q21. Please outline the reasons for the increased composite depreciation rate for the**
9 **electric distribution assets.**

10 A21. The average service life estimates for the electric distribution assets have
11 extended in a similar fashion as described for the average service life extensions of
12 the electric transmission assets. However, in the circumstances of the distribution
13 assets, the need for more negative net salvage percentages has had a depreciation

1 rate increase impact that out-weighed the influence of a decrease due to the life. The
 2 following is a summary of the proposed average service life estimates compared to
 3 the currently used estimates, demonstrating the lengthening of the average service
 4 lives in all but four accounts.

| Account | Description | Proposed Iowa Curves | Current Iowa Curves |
|---------|------------------------------------|----------------------|---------------------|
| 360.2 | Rights of Way | 62-R3 | 50-R2 |
| 362.00 | Station Equipment | 53-R2 | 50-R2.5 |
| 364.00 | Poles, Towers & Fixtures | 60-R1.5 | 50-R1 |
| 365.00 | Overhead Conductor & Devices | 65-R2 | 55-R1 |
| 366.00 | Underground Conduit | 50-R3 | 50-R3 |
| 367.00 | Underground Conductors and Devices | 42-R2.5 | 40-R2 |
| 368.00 | Line Transformers | 55-R3 | 55-R3 |
| 369.10 | Services | 50-R3 | 45-R3 (*) |
| 370.00 | Meters | 20-L3 | 20-L3 |
| 371.00 | Installation on Customer Premises | 20-R0.5 | 22-R0.5 |
| 373.00 | Street Lighting System | 43-R1 | 43-R1 |

5 (*) For comparison purposes, the underground Iowa curve has been used as it
 6 accounts for the majority of the investment. The current study proposes to
 7 aggregate the overhead and underground into one depreciation rate.

8
 9 The specific reasons for the average service life extensions for each of the large
 10 distribution accounts are discussed in Section 3.6 of my report. Additionally, the
 11 results of the statistical mortality study are presented for each account, in Section 6
 12 of my report.

13 **Q22. Are the average service life extensions, as noted above, typical for electric**
 14 **distribution assets?**

1 A22. Yes. In a number of recent depreciation studies that I have completed, I
2 have noted that the average service life of electric distribution assets is lengthening
3 throughout North America. While there are a number of factors causing this
4 lengthening of life estimates, the most prevalent reason is the increased focus of
5 utilities in maintaining and life extending the distribution infrastructure. For
6 example, in recent years electric distribution utilities have been pro-active in pole
7 structure management and adding enhanced protection and control equipment within
8 the substations. The specific life expectation of the digital protection and control
9 systems is shorter than the previous electro-mechanical protection and control
10 system, however, the enhanced protection provided within the substation of the new
11 technology has had a life extension influence for transforming and switching
12 equipment.

13 Likewise, I have noted that the life of distribution line assets has also benefited
14 from enhanced technology and the pro-active maintenance programs undertaken by
15 electric distribution utilities. The introduction of pole testing and treatments for
16 wood structures have provided electric distribution utilities with the ability to
17 recognize longer lives. As such, the average service life extensions as observed in
18 this study are consistent with my observations in a number of other electric utilities.

19 **Q23. Please provide a summary of the current and proposed net salvage percentages**
20 **for distribution plant.**

21 The following is a summary of the proposed net salvage percentages used in the
22 depreciation rate calculations. I note that the current rates differ in many accounts
23 from those proposed in the 2015 depreciation study. It is my understanding that

1 the currently approved depreciation rates related to cost of removal were ultimately
 2 negotiated. Therefore, the net salvage percentage comparisons as noted below are
 3 based on the percentages as recommended in the 2015 depreciation study.
 4 However, a comparison of the recommended net salvage depreciation rates to the
 5 currently approved net salvage depreciation rate is also provided.

| Account | Description | Proposed | | Last Depn Study (*) | |
|---------|------------------------------------|---------------|-----------|---------------------|----------------|
| | | Net Salvage % | Depn Rate | Net Salvage % | Depn Rate |
| 360.20 | Rights of Ways | 0% | 0.00% | 0% | 0.00% |
| 362.00 | Station Equipment | (15)% | 0.27% | (5)% | 0.13% |
| 364.00 | Poles, Towers & Fixtures | (120)% | 2.50% | (95)% | 2.17% 1.50% |
| 365.00 | Overhead Conductor & Devices | (110)% | 1.98% | (85)% | 1.62% 1.26% |
| 366.00 | Underground Conduit | 0% | -.06% | 0% | -0.05% |
| 367.00 | Underground Conductor & Devices | (50)% | 1.84% | (25)% | 0.73% 0.33% |
| 368.00 | Line Transformers | (20)% | 0.58% | (20)% | 0.50% 0.25% |
| 369.10 | Services | (50)% | 0.84% | (50)% | 0.90% 0.23% |
| 370.00 | Meters | (5)% | 0.57% | (5)% | 0.46% |
| 371.00 | Installation on Customers Premises | (15)% | 1.93% | (15)% | 1.51% |
| 373.00 | Street Lighting System | (45)% | 1.16% | (40)% | 0.97% |

6 (*)Rates identified in yellow represent the depreciation rate after negotiated
 7 settlement.
 8

9 As noted above, the depreciation rates related to cost of removal and salvage
 10 currently used were changed significantly from the depreciation rates as proposed
 11 in the 2015 depreciation study. The current study has noted the continued trend to

1 increased levels of recovery for cost of removal. Five of the nine distribution
2 accounts that had proposed cost of removal recovery in the 2015 study, now
3 indicate the need for increased levels from the level witnessed in the 2015 study.
4 Given the period from 2015 through 2020 has incorporated a lower than
5 recommended rate for a number of the Depreciation accounts, this current
6 depreciation study is proposing a significant increase in the depreciation for the
7 company's distribution assets.

8 The detailed analysis of the net salvage estimates is provided in Section 7 of my
9 MDU report.

10 **Q23. Is the trend for more negative net salvage percentage, as noted above, typical**
11 **for electric distribution assets?**

12 A23. Yes. The increased amount of cost of removal expenditures is a common
13 trend throughout North American utilities. In fact, this trend has been the most
14 significant change noted in depreciation studies over the past five years.
15 Accordingly, it has become the most debated topic of depreciation studies filed
16 throughout North America, as well as being a significant topic of discussion at
17 depreciation conferences. At the 2018 Society of Depreciation Professionals
18 conference held in September, there were four presentations regarding the large
19 increase in cost of removal expenditures. This trend has been witnessed over
20 virtually all electric, gas and pipeline utilities. As such, the trend witnessed in my
21 MDU study is consistent with depreciation studies conducted across North America.

22 **Q24. What is causing this trend to increased cost of removal of utility assets?**

1 A24. It is generally accepted that there exist three main causes of increases.

2 Firstly, as the average age of utility assets continue to be extended, the impact of
3 inflation becomes more pronounced. For example, in the MDU Account 364 –
4 Distribution Poles and Fixtures, the average service life has been extended in this
5 study from 50 years to 60 years. Also, the last depreciation study increased the
6 average life from 38 years to 50 years for this same account. As such, over the
7 course of two depreciation studies, the indications of average service life have
8 increased from 38 years to 60 years (a 58% increase). As the average service life
9 has increased, the length of time between the original installation of the assets in
10 this account and the estimated average time of retirement of the asset is 58% longer.
11 The net salvage percentage is calculated by dividing the costs to remove the asset
12 in dollars of the time when the asset is removed by the original cost dollar of the
13 time of installation. Given that the major component of cost of removal is labor,
14 this 58% increase in the life expectation, also results in an increased length of time
15 that the labor associated with the removal is 58% longer. When it is considered
16 that in this account, the impacts of inflation of an additional 22 years are recognized
17 in the cost of removal included in my study as compared to the study completed
18 two studies ago, and an additional 10 years when compared to the last depreciation
19 study, it is expected and reasonable to see the increases in cost of removal. To the
20 extent that the average service lives for distribution assets have extended, the
21 impact as described above (for Account 364) applies to a number of the MDU
22 electric distribution accounts.

23 Secondly, the costs associated with the removal (or retirement) of utility assets must

1 deal with increased environmental and regulatory requirements. For example, the
2 costs related to the safe removal of asbestos and PCB contaminants at substations
3 have greatly increased since the assets were originally installed. Additionally, the
4 utilities are required to deal with the increased level of regulations within areas that
5 are much more densely populated at the time of removal of the assets as compared
6 to when the assets were originally placed into service. As distribution assets are
7 often removed in municipal areas, the need to effectively deal with urban growth
8 and density within the areas adds a significant cost to the removal of the assets that
9 did not exist at the time of the original installation of the assets. When the assets
10 were originally installed, the distribution assets were largely within greenfield
11 developments, whereas now, when the assets are removed, the utility must deal
12 with (for example) applications for road closures and re-routing, noise bylaws, and
13 performing work within and around developed and landscaped yards.

14 Lastly, as utilities have implemented new and enhanced accounting systems, the
15 ability to better track capital projects has improved the processes to track capital
16 project costs more accurately. This provides the ability for direct charging labor
17 associated to costs of removal specifically to cost of removal. Likewise, in
18 circumstances where the utility uses an allocation of the total project costs to
19 recognize that a portion of the capital project relates to the removal of assets, the
20 advancements in the work order and plant accounting systems provide better
21 information to allow the utility to better develop proper allocation factors.

1 **III. DEPRECIATION METHODS AND PROCEDURES**

2 **Q25. How is depreciation defined for a rate regulated utility?**

3 A25. Depreciation defined – “Depreciation, as applied to depreciable electric
4 plant, means the loss in service value not restored by current maintenance, incurred
5 in connection with the consumption or prospective retirement of electric plant in the
6 course of service from causes which are known to be in current operation and against
7 which the utility is not protected by insurance. Among the causes to be given
8 consideration are wear and tear, decay, action of the elements, inadequacy,
9 obsolescence, changes in the art, changes in demand and requirements of public
10 authorities”.¹ When considering the action of the elements, my average service life
11 recommendations have considered large catastrophic events that have occurred and
12 impacted the life estimates of utility assets across North America through our use of
13 peer analysis. The average service life of utilities has been influenced by events
14 including forest fires, earthquakes, tornadoes, ice storms, wind storms, large scale
15 flooding, fires, actions of third parties and other natural forces of nature, and these
16 forces of retirement should be included in the determination of the average service
17 life.

18 Depreciation, as used in accounting, is a method of distributing fixed capital costs,
19 less net salvage, over a period of time by allocating annual amounts to expense.
20 Each annual amount of such depreciation expense is part of that year's total cost of
21 providing electric system utility service. Normally, the period of time over which

1 Federal Energy Regulatory Commission, Part 101, Uniform System of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act, Definitions

1 the fixed capital cost is allocated to the cost of service is equal to the period of time
2 over which an item renders service, that is, the item's service life. The most
3 prevalent method of allocation is to distribute an equal amount of cost to each year
4 of service life. This method is known as the Straight-Line Method of depreciation,
5 which was adopted for use in my study.

6 **Q26. Please outline the depreciation methods and procedures used in your**
7 **depreciation study.**

8 A26. The calculation of annual and accrued depreciation, based on the Straight-
9 Line Method, requires the estimation of survivor curves and the selection of group
10 depreciation procedures, as discussed below.

11 Depreciation Grouping Procedures - When more than a single item of property is
12 under consideration, a group procedure for depreciation is appropriate because
13 normally all of the items within a group do not have identical service lives but have
14 lives that are dispersed over a range of time. There are two primary group
15 procedures, namely, the Average Life Group and Equal Life Group procedures.

16 In the Average Life Group Procedure, the rate of annual depreciation is based on
17 the average service life of the group. This rate is applied to the surviving balances
18 of the group's cost. A characteristic of this procedure is that the cost of plant retired
19 prior to average life is not fully recouped at the time of retirement, whereas the cost
20 of plant retired subsequent to the average life is more than fully recouped. Over
21 the entire life cycle, the portion of cost not recouped prior to average life is balanced
22 by the cost recouped subsequent to average life.

1 In the Equal Life Group Procedure, also known as the Unit Summation Procedure,
2 the property group is subdivided according to service life. That is, each equal life
3 group includes that portion of the property which experiences the life of that
4 specific group. The relative size of each equal life group is determined from the
5 property's life dispersion curve. The calculated depreciation for the property group
6 is the summation of the calculated depreciation based on the service life of each
7 equal life unit. In the determination of the depreciation rates in this study, the use
8 of the Average Service Life Procedure has been continued.

9 Amortization accounting is used for certain general plant accounts because of the
10 disproportionate plant accounting effort required in these accounts. Many
11 regulated utilities in North America have received approval to adopt amortization
12 accounting for these accounts. This study calculates the annual and accrued
13 depreciation using the Straight-Line Method and Average Life Group Procedure
14 for most accounts. For certain general plant accounts, the annual and accrued
15 depreciation are based on amortization accounting. Both types of calculations were
16 based on original cost, attained ages and estimates of service lives. Variances
17 between the calculated accrued depreciation and the book accumulated
18 depreciation are amortized over the composite remaining life of each account
19 within the remaining life calculations. Amortization accounting has been continued
20 in this study in a manner largely consistent with the prior study.

21 A detailed account by account analysis of the factors considered in the selection of
22 my recommended average service life estimates is provided in Section 3.6 of my
23 depreciation study report.

1 **Q27. Please outline any changes that you made in the depreciation method, grouping**
2 **procedures or remaining life calculations as compared to previous depreciation**
3 **studies.**

4 A27. The depreciation rates calculated in this study were calculated on the same
5 manner as used in the prior full depreciation study – i.e. using the Straight-Line
6 Method, the Average Life Group Procedure was applied on a remaining life basis.
7 However, I note that in the application of the remaining life basis, the prior study
8 calculated the remaining life on a broad average basis, whereas Concentric
9 incorporates a refinement into the remaining life calculations based on a weighted
10 investment by vintage approach. The vintage approach weighs the calculations of
11 remaining life on an allocation of the actual book accumulated depreciation account
12 by the Calculated Accumulated Depreciation (CAD) factor determined for each
13 vintage of plant in service. This method is described as a Calculated Accumulated
14 Depreciation (“CAD”) weighted calculation in the textbook *Depreciation Systems*,
15 by Frank K. Wolf and W. Chester Fitch, published by the Iowa State University in
16 1994, under the title “Adjustments” within the Broad Group Model.

17 In contrast, the remaining life calculations in prior studies was based on a broad
18 averaging of the composite remaining life. This method is also discussed as the
19 Amortization Method in *Depreciation Systems* under the title “Adjustments” within
20 the Broad Group Model.

21 In the manner in which I developed the remaining life calculations, the depreciation
22 rate is established by dividing the undepreciated value of each group of assets (after
23 consideration to the net salvage requirements) by the composite remaining life of

1 the group of assets. Specifically, my calculations are made for each vintage
2 surviving investment as of the date of the study (December 31, 2020), and then
3 composited into a calculation for the account or group as a whole as compared to
4 applying one overall composite life to all vintages as done in prior studies. My
5 calculation requires two estimates:

6 1. The actual booked accumulated depreciation for each vintage within each
7 account. Consistent with the plant accounting systems of most utilities, MDU does
8 not track the booked accumulated depreciation reserve by vintage within each
9 account. Rather the depreciation expense is calculated at an account level and
10 booked to accumulated depreciation at the same account level. As such, the
11 accumulated depreciation by account is allocated within the account to each
12 vintage, on the basis of the calculated accumulated depreciation by vintage. The
13 calculated accumulated depreciation is a function of the estimated survivor curve,
14 the average service life estimate, the net salvage estimates and the achieved age of
15 each vintage.

16 2. The estimated remaining life of each vintage within each account. The
17 estimated remaining life of each vintage is a direct function of the achieved age of
18 each vintage, the estimated survivor curve and the average service life estimate.

19 Once the above two estimates are determined (the allocated booked reserve by
20 vintage and the average remaining life of each vintage), an annual accrual
21 requirement for each vintage is determined by dividing the net book value for each
22 vintage (considering the estimated future salvage requirements) by the average

1 remaining life of the vintage. The annual requirement for each vintage is summed
2 at the account level and divided into the sum of the accounts original cost surviving,
3 as of December 31, 2020.

4 This process results in each vintage's calculated net book value to be depreciated
5 over an appropriate remaining life. This vintage weighting on a CAD approach to
6 the remaining life calculations is widely considered to be the most accurate. I agree
7 and view this methodology as the correct and most appropriate calculation.

8 **IV. CONCLUDING REMARKS**

9 **Q28. What is your conclusion with respect to Montana-Dakota's proposed**
10 **Depreciation expense?**

11 A28. My conclusion is that Montana-Dakota's requested depreciation rates,
12 resulting in a composite depreciation rate of 2.95%, reasonably reflects the annual
13 consumption of the undepreciated service value of the utility plant in service.
14 Therefore, the use of the depreciation rates as presented in my report, by account,
15 will provide for an appropriate amount of depreciation expense in the Company's
16 revenue requirement. Therefore, I recommend that the proposed depreciation rates
17 set forth in the depreciation study, that I prepared for this proceeding, be adopted by
18 the Commission for regulatory purposes as well as by the Company for financial
19 reporting purposes.

20 **Q29. Does this conclude your Direct Testimony?**

21 A29. Yes, it does.

LARRY E. KENNEDY, CDP

Senior Vice President

Mr. Kennedy has been in the pipeline, electric, gas utility and municipal infrastructure business for 40 years. As Senior Vice President, Concentric Advisors, ULC, Mr. Kennedy has provided professional consulting services to gas and electric utilities including generation facilities (including nuclear facilities), and high voltage transmission lines, large diameter transmission pipelines, railway systems and municipally owned utility systems. Previously, Mr. Kennedy was with Gannett Fleming Canada ULC, for over 17 years, where he was responsible for completing depreciation studies and provided advice related to large capital program spending and controls for many regulated North American utilities. Mr. Kennedy was also employed by Interprovincial Pipelines Limited (now Enbridge Pipelines) for 15 years in several plant accounting and regulatory positions and with Nova Gas Transmission Pipelines (now TC Energy) for three years as a Depreciation Specialist.

Mr. Kennedy has provided expert witness testimony related to depreciation, stranded costs, capital accounting issues, utility valuation, and property tax issues before several North American regulatory bodies. Mr. Kennedy has completed numerous seminars and all courses offered by Depreciation Programs, Inc. Mr. Kennedy is a member of the teaching faculty of the Society of Depreciation Professionals ("SDP") and has presented depreciation, stranded cost, and capital accounting related topics to the SDP, Canadian Electric Association, Canadian Gas Association, Canadian Property Taxpayers Association, Alberta Utilities Commission, British Columbia Utilities Commission and the Canadian Energy Pipeline Association. Mr. Kennedy is a past Society of Depreciation Professionals President.

PERSONAL INFORMATION

- Diploma, Applied Arts - Business Administration, Northern Alberta Institute of Technology, 1978
- Member, Society of Depreciation Professionals
- Certified Depreciation Professional

EXPERIENCE

Representative Project Experience

- Consolidated Edison Company of New York, Inc.: Mr. Kennedy co-authored a study and report which presented the results of research focusing on prior periods of transformative change and more recent discussions of policy tools that could address the impacts of climate change on the Company's electric, steam, and natural gas businesses.
- Montana-Dakota Utilities Co.: A study was developed to determine the appropriate depreciation parameters for all electric generation, transmission and distribution assets. The study and associated expert testimony were submitted to the Montana Public Service Commission in 2018. Elements of the study included a field review of electric generation and transmission plant, the service life analysis for all accounts using the retirement rate analysis, discussion with management regarding outlook and the



estimation of the retirement of generation facilities due to environmental legislation and estimation of net salvage requirements.

- Commonwealth Edison Company: Mr. Kennedy sponsored extensive Rebuttal Testimony related to the average service life, net salvage estimations, and appropriate depreciation practices in a 2020 rate proceeding.
- Great Plains Natural Gas Co.: Annual updates of depreciation rates and net salvage requirements were calculated and submitted to the Minnesota Department of Commerce annually since 2017.
- Midwestern Gas Transmission Company: The assignment included development of a detailed depreciation study and Testimony to develop the appropriate depreciation policy to align with the organization's overall goals and objectives. The resulting depreciation study, which was submitted to the Federal Energy and Regulatory Commission, incorporated the concepts of time-based depreciation for gas transmission accounts and development of Economic Planning Horizons. The Direct Testimony included significant discussion related to the topics of Decarbonization and changing political climate towards removal of fossil fuel demand forecasts.
- National Grid USA Service Company Limited: A depreciation study was completed in 2020 for the National Grid High Voltage Direct Current (HVDC) electric interstate transmission line. The study included consideration of the average service life of the system components, the level of components of the system and the compliance of the recommended componentization to the FERC Uniform System of Accounts. The resultant study was used by the company in filings with the Federal Energy and Regulatory Commission (FERC)
- Viking Gas Transmission Company - The assignment included working with the company to develop the appropriate depreciation policy to align with the organization's overall goals and objectives. The resulting depreciation study, which was submitted to the Federal Energy and Regulatory Commission, incorporated the concepts of time-based depreciation for gas transmission accounts and development of Economic Planning Horizons, including discussion related to the long demand of natural gas.
- Society of Depreciation Professionals (SDP): Mr. Kennedy has presented at the annual conferences on the topic of the erosion of the regulatory compact throughout North America, the Future of Energy transition and its impacts on recovery of investment. Additionally, Mr. Kennedy is a member of the SDP teaching faculty and has lead a number of workshops on various aspects of decarbonization and has co-instructed on the topic of the future of energy.

Other Representative Project Experience

- Alberta Departments of Energy and Forestry and Agriculture: Detailed toll comparison and valuation models were developed to provide a comparison of the toll fairness of each of the Provinces Rural Electrification Associations (“REA”) to the comparable Investor Owned Utilities (“IOU”) for the 32 REA’s currently operating in Alberta. In addition to providing a toll comparison of the REA and IOU, a fair market valuation for each of the REA’s was also prepared. The final report of the toll compatibility and specific valuations



were submitted to the Alberta Department of Energy and the Alberta Department of Forestry and Agriculture. Mr. Kennedy was the Responsible Officer on this project.

- Alliance Pipeline L.P. A number of depreciation studies have been completed by Mr. Kennedy for both the Canadian and US assets of Alliance Pipelines. The most recent studies completed in 2012 for Submission to the National Energy Board of Canada and to the Federal Energy Regulatory included operational discussions related to the gas transmission plant, the service life analysis for all accounts using the retirement rate analysis, discussion with management regarding outlook, and the inclusion of an Economic Planning Horizon.
- AltaGas Utilities Inc.: A number of depreciation studies have been completed, which included the assembly of basic data from the Company's accounting systems, statistical analysis of retirements for service life and net salvage indications, discussions with management regarding the outlook for property, and the calculations of annual and accrued depreciation. The studies were prepared for submission to the Alberta Energy and Utilities Board ("Board"). Mr. Kennedy has appeared before the Alberta Utilities Commission on behalf of AltaGas on a number of occasions.
- AltaLink LP: An initial study was developed for submission to the Alberta Utilities Commission ("AUC") in 2002. The study included the estimation of service life characteristics, and the estimation of net salvage requirements for all electric transmission assets. A net salvage study and technical update was also filed with the Board in 2004. Since 2004, additional depreciation studies were filed in 2005, 2010 and 2012, 2016 and 2018. The 2010, 2012, 2016 and 2018 studies included a number of provisions in order to ensure compliance to Alberta's Minimum Filing Requirements for depreciation studies and for compliance to the International Financial Reporting Standards. These studies also specifically analyzed the pace of technical change in the Alberta Electric system, and recently have specifically considered the impacts of early retirements caused by storms and forest fires.
- ATCO Electric: Studies have included the development of annual and accrued depreciation rates for the electric transmission and distribution systems for the Alberta assets of ATCO Electric, in addition to the generation, transmission, and distribution assets of Northland Utilities Inc. (NWT) and the distribution assets of Northland Utilities (Yellowknife) Inc. The ATCO Electric studies were submitted to the AUC for review, while the NWT and Northland Utilities (Yellowknife) Inc. studies were submitted to the Northwest Territories Utilities Board and Yukon Electric Company Limited (YECL) was submitted to the Yukon Public Utilities Board. These studies also specifically analyzed the pace of technical and recently have specifically considered the impacts of early retirements caused by storms and forest fires.
- ATCO Gas: Studies were prepared in 2010 and 2018 which were the subject of a review by the AUC. Elements of all of the studies included the service life analysis for all accounts using the retirement rate analysis, discussion with management regarding outlook, and the estimation of net salvage requirements. These studies also specifically analyzed the



pace of technical change in the Alberta Gas system, and recently have specifically considered the impacts of early retirements caused by storms and forest fires.

- Centra Gas Manitoba, Inc.: The study included development of annual and accrued depreciation rates for all gas plant in service. Elements of the study included a field inspection of metering and compression facilities, service buildings and other gas plant; service life analysis for all accounts using the retirement rate analysis on a combined database developed from actuarial data and data developed through the computed method; discussions with management regarding outlook; and the estimation of net salvage requirements. A similar study was completed in 2006, 2011, and 2015. The 2011 and 2015 studies were the subject of a review by the Manitoba Public Utilities Board in 2012 and 2016. Mr. Kennedy has also consulted on issues regarding International Financial Reporting Standards (“IFRS”) compliance and required componentization.
- Enbridge Gas Distribution Inc.: Full and comprehensive depreciation studies have been completed in 2009 and 2011. The 2009 study also included review of the company's gas storage operations. Both studies included the development of annual and accrued depreciation rates for all depreciable natural gas distribution, transmission and general plant assets. Elements of the studies included the service life analysis for all accounts using the computed mortality method of analysis, discussion with management regarding outlook and the estimation of net salvage requirements. Studies were prepared for submission to the Ontario Energy Board.
- Mr. Kennedy has also completed an allocation of the accumulated depreciation accounts into the amounts related to the recovery of original cost and the amounts recovered in tolls for the future removal of assets currently in service. The allocations were determined as of December 31, 2009 and were deemed by the company's external auditors to be in conformance with proper accounting standards and procedures. In 2013, a review of the reserve required for the future removal of assets currently in service was undertaken by Mr. Kennedy. The results of the review were summarized in evidence presented by Mr. Kennedy to the Ontario Energy Board.
- ENMAX Power Corporation: Studies have included the development of annual and accrued depreciation rates for all depreciable electric transmission assets. Elements of the studies included the service life analysis for all accounts using the retirement rate analysis, discussion with management regarding outlook, and the estimation of net salvage requirements. Studies were prepared for submission to the Alberta Department of Energy and more recently for submission to the Alberta Energy and Utilities Board. Similar studies have also been completed for submission for the ENMAX Electric Distribution assets for submission to the AUC. The ENMAX distribution asset assignments also included an extensive asset verification project where the plant accounting and operational asset records were verified to the field assets actually in service.
- Fortis Group of Companies: Studies have included the development of annual and accrued depreciation rates for the electric distribution assets in Alberta and for the



generation, transmission, and distribution assets in British Columbia. The FortisBC Inc. studies were completed and filed with the British Columbia Utilities Commission (“BCUC”) in 2005, 2010, 2011 and 2018 encompassing both the FortisBC electric and natural gas companies. FortisAlberta Inc. studies were completed in 2004 (updated in 2005), 2009 and 2010. Elements of the studies included the development of average service lives using the retirement rate method of analysis, development of net salvage estimates, compliance with IFRS, and the determination of appropriate annual accrual and accrued depreciation rates. The most recent studies also specifically analyzed the pace of technical change in the Electric systems, and specifically considered the impacts of retirements, system modernization and technical enhancements to the assets.

- International Financial Reporting Standards (“IFRS”): Mr. Kennedy has been retained by numerous clients encompassing most Canadian Provinces and Territories. The assignments included the review of company's assets and depreciation practices to provide opinion on the compliance to the IFRS. The assignments have also included the issuance of opinion to the External Auditors of Utilities to comment on the manner in which the Utilities can minimize differences in the regulatory ledgers and the accounting records used for financial disclosure purposes. Mr. Kennedy has also presented to the Canadian Electric Association, the Society of Depreciation Professionals, the Canadian Energy Pipeline Association and to the BCUC on this topic.
- Mackenzie Valley Pipeline Project: This assignment included the review of the proposed depreciation schedule for the proposed Mackenzie Valley Pipeline. The review included a discussion of the policies used by the company and the depreciation concepts to be included in a depreciation schedule for a Greenfield pipeline. The review was supported through appearance at the oral public hearings before the National Energy Board of Canada (“NEB”).
- Manitoba Hydro: A study was developed to determine the appropriate depreciation parameters for all electric generation, transmission and distribution assets. The study was submitted to the Manitoba Public Utilities Board. Elements of the study included a field review of electric generation and transmission plant, the service life analysis for all accounts using the retirement rate analysis, discussion with management regarding outlook and the estimation of net salvage requirements. A similar study was also completed in 2006 and in 2011. The 2011 depreciation study was the subject of a review by the Manitoba Public Utilities Board in 2012. Mr. Kennedy has also consulted with Manitoba Hydro on issues regarding IFRS compliance and required componentization.
- New Brunswick Power: Mr. Kennedy completed a comprehensive depreciation review of the electric generation (including the nuclear facilities), transmission, distribution and general plant assets. The review, which was prepared for submission to the New Brunswick Public Utilities Board, included a significant amount of discussion regarding the development of depreciation policy for the company. The study also included development of procedures to extract data from the company databases, tours of the company facilities, interviews with operational and management representatives,



development of appropriate net salvage rates, development of average service life estimates, and the compilation of the report.

- Newfoundland and Labrador Hydro (NALCOR): Mr. Kennedy developed comprehensive depreciation studies that included the development of depreciation policy and rates for NALCOR. The studies provided a significant review of the previous depreciation policy, which included use of a sinking fund depreciation method and provided justification for the conversation to the straight-line depreciation method. The study, which was prepared for submission to the Newfoundland and Labrador Utilities Commission, included a significant amount of discussion regarding the development of depreciation policy for the company. The study also included development of procedures to extract data from the company databases, tours of the company facilities, interviews with operational and management representatives, development of appropriate net salvage rates, development of average service life estimates, and the compilation of the report for submission in a General Tariff Application. Additional studies were also completed in 2008 and 2010. The 2010 and 2017 studies were the subject of Regulatory Review in 2012 and 2019.
- Ontario Power Generation: Assignments have included a review of the Depreciation Review Committee process completed in 2007. This review provided recommendations for enhanced internal processes and controls in order to ensure that the depreciation expense reflects the annual consumption of service value. Additionally, full assessments of the lives of the regulated assets of the company's electric generation hydro and nuclear plants were completed in 2011 and 2013 and were submitted to the Ontario Energy Board for review.
- TransCanada Pipelines Limited - Alberta Facilities: The assignment included working with the company to develop the appropriate depreciation policy to align with the organization's overall goals and objectives. The resulting depreciation study, which was submitted to the Alberta Energy and Utilities Board, incorporated the concepts of time-based depreciation for gas transmission accounts and unit-based depreciation for gathering facilities. The data was assembled from two different accounting systems and statistical analysis of service life and net salvage were performed. For gathering accounts, the assignment included the oversight of the development of appropriate gas production and ultimate gas potential studies for specific areas of gas supply. Field inspections of gas compression, metering and regulating, and service operations were conducted. Studies were completed in 2002 and 2004, 2007, 2009 and 2012, 2015, and 2018.
- TransCanada Pipelines Limited - Mainline Facilities: The study prepared for submission to the NEB included the development of annual and accrued depreciation rates for gas transmission plant east of the Alberta - Saskatchewan border. Elements of the study included a field inspection of compression and metering facilities, service life and net salvage analysis for all accounts. The study was completed in 2002 and was supported through an appearance before the NEB. Study updates have been completed in 2005, 2007, 2009 and an additional full and comprehensive study was completed in 2011, and



2017. The 2011 study was fully supported through an appearance before the NEB in 2012.

Designations and Professional Affiliations

- Society of Depreciation Professionals -Certified Depreciation Professional
- Society of Depreciation Professionals (former President)



EVIDENCE ENTERED INTO PROCEEDINGS IN THE UNITED STATES

| YEAR | CLIENT | APPLICANT | REGULATORY BOARD | PROCEEDING NUMBER |
|-------------|---|---|--|-----------------------------|
| 2015 | Alliance Pipeline LP | Alliance Pipeline LP | Federal Energy and Regulatory Commission | Docket No. RP15-1022 |
| 2019 | Viking Gas Transmission Company | Viking Gas Transmission Company | Federal Energy Regulatory Commission | RP19-1340 |
| 2020 | National Grid USA Service Company Limited | National Grid USA Service Company Limited | Federal Energy Regulatory Commission | Settled through Negotiation |
| 2018 | Great Plains Natural Gas Co. | Great Plains Natural Gas Co. | Minnesota Department of Commerce | Annual Depreciation Filing |
| 2018 | Montana-Dakota Utilities | Montana-Dakota Utilities | Montana Public Service Commission | Docket D2019.9 |
| 2019 | Great Plains Natural Gas Co | Great Plains Natural Gas Co | Minnesota Department of Commerce | Annual Depreciation Filing |
| 2020 | Cascade Natural Gas Corporation | Cascade Natural Gas Corporation | Oregon Public Utility Commission | UM - 2073 |
| 2020 | Missouri-American Water Company | Missouri-American Water Company | Missouri Public Service Commission | WR-2020-0344 |
| 2020 | Great Plains Natural Gas Co | Great Plains Natural Gas Co | Minnesota Department of Commerce | Annual Depreciation Filing |
| 2020 | Commonwealth Edison Company | Commonwealth Edison Company | State of Illinois - Illinois Commerce Commission | Docket 20-0393 |
| 2021 | Intermountain Gas Company | Intermountain Gas Company | Idaho Public Utilities Commission | Case No. INT-21-01 |
| 2021 | Midwestern Gas Transmission Company | Midwestern Gas Transmission Company | Federal Energy Regulatory Commission | RP21-525-000 |
| 2021 | Consolidated Edison of New York | Consolidated Edison of New York | New York State Public Service Commission | 19-G-0066 |



EVIDENCE ENTERED INTO PROCEEDINGS IN CANADA

| YEAR | CLIENT | APPLICANT | REGULATORY BOARD | PROCEEDING NUMBER |
|-------------|-------------------------------|--------------------------------------|---------------------------------------|--------------------------|
| 1999 | ENMAX Power Corporation | Edmonton Power Corporation | Alberta Energy and Utilities Board | 980550 |
| 2000 | AltaGas Utilities Inc. | AltaGas Utilities Inc. | Alberta Energy and Utilities Board | Decision 2002-43 |
| 2001 | City of Calgary | ATCO Pipelines South | Alberta Energy and Utilities Board | 2000-365 |
| 2001 | City of Calgary | ATCO Gas South | Alberta Energy and Utilities Board | 2000-350 |
| 2001 | City of Calgary | ATCO Affiliate Proceeding | Alberta Energy and Utilities Board | 1237673 |
| 2001 | ENMAX Power Corporation | ENMAX Power Corporation Transmission | Alberta Department of Energy | N/A |
| 2002 | Centra Gas British Columbia | Centra Gas British Columbia | British Columbia Utilities Commission | N/A |
| 2002 | ENMAX Power Corporation | ENMAX Power Corporation Transmission | Alberta Department of Energy | N/A |
| 2003 | AltaLink LP | AltaLink LP | Alberta Energy and Utilities Board | 1279345 |
| 2003 | Centra Gas Manitoba | Centra Gas Manitoba | Manitoba Public Utilities Board | N/A |
| 2003 | City of Calgary | ATCO Pipelines | Alberta Energy and Utilities Board | 1292783 |
| 2003 | City of Calgary | ATCO Electric-ISO Issues | Alberta Energy and Utilities Board | N/A |
| 2003 | City of Calgary | ATCO Gas | Alberta Energy and Utilities Board | 1275466 |
| 2003 | City of Calgary | ATCO Electric | Alberta Energy and Utilities Board | 1275494 |
| 2003 | Manitoba Hydro | Manitoba Hydro | Manitoba Public Utilities Board | N/A |
| 2003 | TransCanada Pipelines Limited | TransCanada Pipelines Limited | National Energy Board of Canada | RH-1-2002 |
| 2004 | AltaGas Utilities Inc. | AltaGas Utilities Inc. | Alberta Energy and Utilities Board | 1305995 |
| 2004 | AltaLink LP | AltaLink LP | Alberta Energy and Utilities Board | 1336421 |
| 2004 | Central Alberta Midstream | Central Alberta Midstream | Municipal Government Board of Alberta | N/A |
| 2004 | Central Alberta Midstream | Central Alberta Midstream | Municipal Government Board of Alberta | N/A |
| 2004 | ENMAX Power Corporation | ENMAX Power Corporation | Alberta Energy and Utilities Board | 1306819 |



| YEAR | CLIENT | APPLICANT | REGULATORY BOARD | PROCEEDING NUMBER |
|------|--|---|--|-------------------|
| 2004 | Heritage Gas Ltd. | Heritage Gas Ltd. | Nova Scotia Utility and Review Board | N/A |
| 2004 | NOVA Gas Transmission Limited | NOVA Gas Transmission Limited | Alberta Energy and Utilities Board | 1315423 |
| 2004 | Westridge Utilities Inc. | Westridge Utilities Inc. | Alberta Energy and Utilities Board | 1279926 |
| 2005 | AltaGas Utilities Inc. | AltaGas Utilities Inc. | Alberta Energy and Utilities Board | 1378000 |
| 2005 | ATCO Electric | ATCO Electric | Alberta Energy and Utilities Board | 1399997 |
| 2005 | ATCO Power | ATCO Power | Municipal Government Board of Alberta | N/A |
| 2005 | British Columbia Transmission Corporation | British Columbia Transmission Corporation | British Columbia Utilities Commission | N/A |
| 2005 | Centra Gas Manitoba | Centra Gas Manitoba | Manitoba Public Utilities Board | N/A |
| 2005 | ENMAX Power Corporation | ENMAX Power Corporation - Transmission | Alberta Energy and Utilities Board | N/A |
| 2005 | ENMAX Power Corporation | ENMAX Power Corporation - Distribution Assets | Alberta Energy and Utilities Board | 1380613 |
| 2005 | FortisAlberta Inc. | FortisAlberta Inc. | Alberta Energy and Utilities Board | 1371998 |
| 2005 | FortisAlberta Inc. | FortisAlberta Inc. | Alberta Energy and Utilities Board | N/A |
| 2005 | FortisBC, Inc. | FortisBC, Inc. | British Columbia Utilities Commission | N/A |
| 2005 | Manitoba Hydro | Manitoba Hydro | Manitoba Public Utilities Board | N/A |
| 2005 | New Brunswick Board of Commissioners of Public Utilities | New Brunswick Power Distribution and Customer Service Company | New Brunswick Board of Commissioners of Public Utilities | N/A |
| 2005 | Northland Utilities (NWT) Inc. | Northland Utilities (NWT) Inc. | Northwest Territories Utilities Board | N/A |
| 2005 | Northland Utilities (Yellowknife) Inc. | Northland Utilities (Yellowknife) Inc. | Northwest Territories Utilities Board | N/A |
| 2005 | NOVA Gas Transmission Ltd. | NOVA Gas Transmission Ltd. | Alberta Energy and Utilities Board | 1375375 |
| 2005 | City of Red Deer | City of Red Deer Electric System | Alberta Energy and Utilities Board | 1402729 |
| 2005 | Yukon Energy Corporation | Yukon Energy Corporation | Yukon Utilities Board | N/A |



| YEAR | CLIENT | APPLICANT | REGULATORY BOARD | PROCEEDING NUMBER |
|------|---|-------------------------------------|---------------------------------------|-------------------|
| 2006 | AltaLink LP | AltaLink LP | Alberta Energy and Utilities Board | 1456797 |
| 2006 | BC Hydro | BC Hydro | British Columbia Utilities Commission | N/A |
| 2006 | Imperial Oil Resources Ventures Limited | McKenzie Valley Pipeline Project | National Energy Board of Canada | GH-1-2004 |
| 2007 | Enbridge Pipelines Limited | Enbridge Pipelines Limited | National Energy Board of Canada | RH-2-2007 |
| 2007 | FortisAlberta Inc. | Fortis Alberta Inc. | Alberta Energy and Utilities Board | 1514140 |
| 2007 | Kinder Morgan | Terasen (Jet fuel) Pipeline Limited | British Columbia Utilities Commission | N/A |
| 2008 | ATCO Electric | Yukon Electrical Company Limited | Yukon Utilities Board | N/A |
| 2008 | ATCO Gas | ATCO Gas | Alberta Utilities Commission | 1553052 |
| 2008 | City of Lethbridge Electric System | City of Lethbridge | Alberta Utilities Commission | N/A |
| 2008 | ENMAX Power Corporation | ENMAX Power Corporation | Alberta Utilities Commission | 1512089 |
| 2008 | Heritage Gas Ltd. | Heritage Gas Ltd. | Nova Scotia Utility and Review Board | N/A |
| 2009 | AltaGas Utilities Inc. | AltaGas Utilities Inc. | Alberta Utilities Commission | N/A |
| 2009 | Fortis Alberta Inc. | Fortis Alberta, Inc. | Alberta Utilities Commission | 1605170 |
| 2010 | ATCO Electric | ATCO Electric | Alberta Utilities Commission | 1606228 |
| 2010 | Enbridge Pipelines Limited - Line 9 | Enbridge Pipelines Limited - Line 9 | National Energy Board of Canada | N/A |
| 2010 | Gazifere | Gazifere | La Regie de L'Energie | R-3724-2010 |
| 2010 | Kinder Morgan | Kinder Morgan | National Energy Board of Canada | N/A |
| 2010 | Pacific Northern Gas | Pacific Northern Gas | British Columbia Utilities Commission | N/A |
| 2011 | AltaGas Utilities Inc. | AltaGas Utilities Inc. | Alberta Utilities Commission | 1606694 |
| 2011 | AltaLink LP | AltaLink LP | Alberta Utilities Commission | 1606895 |
| 2011 | ATCO Electric | Northland Utilities (NWT) Inc. | Northwest Territories Utility Board | N/A |
| 2011 | ATCO Gas | ATCO Gas | Alberta Utilities Commission | 1606822 |
| 2011 | FortisAlberta Inc. | Fortis Alberta Inc. | Alberta Utilities Commission | 1607159 |
| 2011 | FortisBC Energy, Inc. | FortisBC Energy, Inc. | British Columbia Utilities Commission | 3698627 |



| YEAR | CLIENT | APPLICANT | REGULATORY BOARD | PROCEEDING NUMBER |
|------|---|---|--|-------------------|
| 2011 | GazMetro | GazMetro | La Regie de L'Energie | R-3752-2011 |
| 2011 | Heritage Gas Ltd. | Heritage Gas Ltd. | Nova Scotia Utility and Review Board | N/A |
| 2011 | Qulliq | Qulliq | Utilities Rates Review Council | N/A |
| 2011 | SaskPower | SaskPower | Internal Review Committee | N/A |
| 2011 | TransAlta Utilities Corporation | TransAlta Utilities Corporation | Municipal Government Board of Alberta | N/A |
| 2012 | City of Red Deer | City of Red Deer | Alberta Utilities Commission | 1608641 |
| 2012 | Enbridge Gas Distribution Inc. | Enbridge Gas Distribution Inc. | Ontario Energy Board | EB 2011-0345 |
| 2012 | FortisBC, Inc. | FortisBC, Inc. | British Columbia Utilities Commission | 3698620 |
| 2012 | Manitoba Hydro | Manitoba Hydro | Manitoba Public Utilities Board | 2013/2013 GRA |
| 2012 | Newfoundland and Labrador Hydro | Newfoundland and Labrador Hydro | Newfoundland and Labrador Board of Commissioners of Public Utilities | N/A |
| 2012 | Northwest Territories Power Corporation | Northwest Territories Power Corporation | Northwest Territories Public Utilities Board | N/A |
| 2012 | TransCanada Pipelines Limited | TransCanada Pipelines Limited | National Energy Board of Canada | RH-003 -2011 |
| 2013 | AltaLink LP | AltaLink LP | Alberta Utilities Commission | 1608711 |
| 2013 | IntraGaz Incorporated | IntraGaz Incorporated | La Regie de L'Energie | R-3807-2012 |
| 2013 | Yukon Electrical Company Limited (YECL) | Yukon Electrical Company Limited (YECL) | Yukon Utilities Board | 2013-2015 GRA |
| 2014 | Enbridge Gas Distribution | Enbridge Gas Distribution | Ontario Energy Board | EB-2012-0459 |
| 2014 | ENMAX Power Corporation | ENMAX Power Corporation | Alberta Utilities Commission | 1609674 |
| 2015 | AltaLink LP | AltaLink LP | Alberta Utilities Commission | Proceeding 3524 |
| 2015 | EPCOR Distribution & Transmission | EPCOR Distribution & Transmission | Alberta Utilities Commission | Proceeding 20407 |
| 2015 | FortisBC Energy, Inc. | FortisBC Energy, Inc. | British Columbia Utilities Commission | N/A |
| 2015 | FortisBC, Inc. | FortisBC, Inc. | British Columbia Utilities Commission | N/A |
| 2015 | GazMetro | GazMetro | La Regie de L'Energie | N/A |



| YEAR | CLIENT | APPLICANT | REGULATORY BOARD | PROCEEDING NUMBER |
|------|---|---|--|-----------------------|
| 2015 | Manitoba Hydro | Manitoba Hydro | Manitoba Public Utilities Board | 2014/15 & 2015/16 GRA |
| 2015 | Newfoundland and Labrador Hydro | Newfoundland and Labrador Hydro | Newfoundland and Labrador Board of Commissioners of Public Utilities | N/A |
| 2016 | ATCO Electric | ATCO Electric | Alberta Utilities Commission | Proceeding 20272 |
| 2017 | NALCOR | NALCOR | Newfoundland Public Utilities Board | Settled |
| 2017 | TransCanada Pipelines Limited - Mainline Facilities | TransCanada Pipelines Limited - Mainline Facilities | National Energy Board of Canada | RH-1-2018 |
| 2017 | TransCanada Pipelines Limited - NGTL Facilities | TransCanada Pipelines Limited - NGTL Facilities | National Energy Board of Canada | RH-001-2019 |
| 2018 | WestCoast Transmission System | WestCoast Transmission System | National Energy Board of Canada | Settled |
| 2018 | ATCO Electric | ATCO Electric | Alberta Utilities Commission | Proceeding 24195 |
| 2018 | ATCO Gas | ATCO Gas | Alberta Utilities Commission | Proceeding 24188 |
| 2018 | SaskEnergy Inc. | SaskEnergy Inc. | Saskatchewan Review Board | N/A |
| 2018 | SaskPower | SaskPower | Saskatchewan Review Board | N/A |
| 2018 | AltaGas Utilities Inc. | AltaGas Utilities Inc. | Alberta Utilities Commission | Proceeding 24161 |
| 2018 | AltaLink LP | AltaLink LP | Alberta Utilities Commission | Proceeding 23848 |
| 2018 | FortisBC Energy Inc. | FortisBC Energy Inc. | British Columbia Utilities Commission | N/A |
| 2018 | FortisBC Inc. | FortisBC Inc. | British Columbia Utilities Commission | N/A |
| 2019 | Capital Power Corporation | Capital Power Corporation | Municipal Government Board of Alberta | N/A |
| 2019 | TransAlta Corporation | TransAlta Corporation | Municipal Government Board of Alberta | N/A |
| 2019 | Trans Mountain Pipeline ULC | Trans Mountain Pipeline ULC | Canadian Energy Regulator | T260-2019-04-01 |
| 2019 | NB Power | NB Power | New Brunswick Energy Utility Regulator | Pending |
| 2019 | ATCO Electric | ATCO Electric Transmission | Alberta Utilities Commission | Proceeding 24964 |



| YEAR | CLIENT | APPLICANT | REGULATORY BOARD | PROCEEDING NUMBER |
|-------------|-----------------------------|-----------------------------|--|--------------------------|
| 2020 | Enbridge Pipelines Inc. | Enbridge Pipelines Inc. | Canada Energy Regulator (CER) | RH-001-2020 |
| 2020 | Commonwealth Edison Company | Commonwealth Edison Company | State of Illinois - Illinois Commerce Commission | Docket 20-0393 |
| 2021 | Ontario Power Generation | Ontario Power Generation | Ontario Energy Board | N/A |
| 2021 | AltaLink L.P | AltaLink L.P | Alberta Utilities Commission | Proceeding 26059 |