# ATTACHMENT D

**ROBERT MCLENNAN**
**DECLARATION OF HARM IN SUPPORT OF MOTION FOR A STAY PENDING REVIEW**

1. My name is Robert McLennan. I am the President and Chief Executive Officer at Minnkota Power Cooperative, Inc. (Minnkota). I am over the age of 18 years, and I am competent to testify concerning the matters in this declaration. I have personal knowledge of the facts set forth in this declaration, and if called and sworn as a witness, could and would competently testify to them.

2. I have more than 29 years of experience in electricity generation. I have been employed at Minnkota since 2011. I hold dual bachelor's degrees in history and political science, and psychology from the University of Jamestown. As President and CEO at Minnkota, my responsibilities include ensuring access to safe, reliable, affordable and sustainable electricity for 11 member-owner cooperatives in eastern North Dakota and northwestern Minnesota. This includes oversight of more the 400 employees and a budget of more than $450 million annually.

3. I am providing this Declaration in support of the motions to stay challenging the U.S. Environmental Protection Agency's (EPA) National Emission Standards for Hazardous Air Pollutants: Coal and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review, 89 Fed. Reg. 38508 (May 7, 2024), known as the Mercury and Air Toxics Standards Risk and Technology Review (the Final Rule or the MATS RTR).

4. Minnkota is a not-for-profit electric generation and transmission cooperative headquartered in Grand Forks, North Dakota. Minnkota provides wholesale electric energy to 11 member-owner distribution cooperatives located in eastern North Dakota and northwestern Minnesota. Minnkota also serves as the operating agent for the Northern Municipal Power Agency (NMPA), headquartered in Thief River Falls, MN.

5. Electricity generated by Minnkota is distributed through the Midcontinent Independent System Operator (MISO) regional transmission organization (RTO). MISO "operates the transmission system and centrally dispatched market" in fifteen states ranging from Canada down to the Gulf

Coast. Across those states, it serves more than 42 million customers[1]. Minnkota and its system partners (Northern Municipal Power Agency and Square Butte Cooperative) have the capability of generating 1,425 MWs, which may be provided to MISO for scheduling and reliability purposes. Over half of the electricity generated by Minnkota is dispatchable power from coal sources, meaning it is available on demand, unlike power from wind and solar resources, which do not have on-demand capabilities. Dispatchable power is critical for MISO because MISO has small reserve margins, which is the amount of power needed to ensure demand is met and avoid failure of the grid.

6. Minnkota is a member of the Lignite Energy Council (LEC). LEC represents the regional lignite industry in North Dakota, an $18 billion industry critical to the economy of the Upper Midwest and the reliability of its electrical grid. The primary objective of LEC is to maintain a viable lignite coal industry and enhance development of the region's lignite

[1] FERC, MISO, https://www.ferc.gov/industries-data/electric/electric-power-markets/miso.

resources. Members of LEC include mining companies, utilities that use lignite to generate electricity, synthetic natural gas and other valuable byproducts, and businesses that provide goods and services to the lignite industry. LEC has advocated for its members since 1974 to protect, maintain, and enhance development of our region's abundant lignite resources. LEC is committed to environmental stewardship and understands the importance of protecting North Dakota's natural beauty.

7. Minnkota is a member of the National Rural Electric Cooperative Association (NRECA). NRECA represents the interests of rural electric cooperatives across the country.

8. Minnkota is a member of America's Power (AP). AP is a national trade organization that advocates at the federal and state levels on behalf of the U.S. coal fleet and its supply chain.

9. North Dakota contains the world's largest known deposit of lignite and is the fifth-largest coal producing state, accounting for 5% of total U.S. coal production. Most of that lignite is utilized at mine-mouth power generation facilities, which are coal-fired power plants built near a

coal mine that use coal from that mine as fuel. As a result of this plentiful natural resource, coal provides the majority of the electric power generated and consumed in North Dakota.

10. The MATS RTR threatens the viability of North Dakota's lignite-powered plants. It also threatens the reliability of the entire grid across the region, places burdens on the power sector as a whole, and causes harm to industries dependent on a reliable electric grid.

**MILTON R. YOUNG STATION**

11. Minnkota is the operator and a partial owner of the Milton R. Young Station (the Young Station or MRY), a two-unit (the Units or MRY 1 and MRY 2), cyclone lignite coal-fired power plant located near the town of Center, North Dakota.

12. MRY 1 and 2 are well-controlled electric generating units (EGUs), which provide energy to the MISO system. MRY Units 1 and 2 have substantially reduced NOx and SO2 emissions, which have been documented in the context of the Regional Haze program. MRY 1 has reduced $SO_2$ emissions by 96% since 2002, and MRY 2 has reduced $SO_2$ by

75% since 2002. Both Units have reduced NOx emissions approximately 60% since 2002.

13. MRY 1 is a cyclone lignite-fired unit with a 235 MW nominal net rating. The Unit controls NOx with advanced separated over-fire air (ASOFA) and selective non-catalytic reduction (SNCR). A wet scrubber controls $SO_2$. An electrostatic precipitator (ESP) controls particulate matter (PM).

14. MRY Unit 2 is also a cyclone lignite-fired unit, with a larger capacity (440 MW nominal net rating). It also is equipped with a SNCR, wet scrubber, and an ESP.

15. The MRY Units have different configurations. Although Minnkota uses the same control devices for the Units, operation and emissions output differs based on a number of factors. The Units vary in capacity and control device design. MRY 2 has a different ductwork configuration between the air heater and the electrostatic precipitator than MRY 1. MRY 1 has shorter ductwork and a smaller outlet for measurement of mercury emissions. The ductwork configuration affects the amount of

residence time for the flue gas to be exposed to the injection of powder activated carbon (PAC), also known as activated carbon injection(ACI) in the Final Rule.

16. Minnkota uses the same mercury control strategies for both Units. Minnkota currently uses a fuel additive system to apply a Potassium Iodide fuel additive sorbent known as M-Prove procured from ARQ (formerly ADA). Minnkota injects non-halogenated PAC post-combustion. The fuel additive system was designed to meet the original 2012 MATS limitation for lignite units of 4.0 lb/TBtu, with a margin for compliance due to the variability of lignite coals.

17. MRY 1 and 2 at the Young Station combust lignite coal. The Young Station's lignite supply comes exclusively from BNI Coal Inc. (BNI), which is in close proximity to the plant.The lignite supplied by BNI is run-of-mine (ROM) coal that contains impurities and does not conform to a single mineral content or heat value specification. For this reason, the ROM supply currently varies in mercury content from 4.9 lb/TBtu to 18.6 lb/TBtu, based on recent mercury content testing. *See* Sargent & Lundy, "Mercury

Testing Results for the MATS Residual Risk and Technology Review," at Table 2-5 (May 22, 2024) [hereinafter Mercury Testing 2024 Report], **Attachment A**. The broad range of variability is projected to continue into the future. *See id.* at Table 2-4.

## MATS RTR RULE REVISIONS

18. The MATS RTR eliminates the low rank coal subcategory for lignite-powered facilities and changes the limit for mercury from lignite-fired power plants from 4.0 lb/TBtu to 1.2 lb/TBtu (the New Mercury Limitation). EPA assumes this limit can be met using brominated ACI to achieve greater than 90% mercury removal by lignite-burning units. 89 Fed. Reg. 38508, 38547 (May 7, 2024).

19. The MATS RTR decreases the limit for filterable particulate matter (fPM) to 0.010 lbs/MMBtu (the New fPM Limitation).

20. Compliance with the New Mercury and fPM Limitations is required on or before three years after the effective date of the Final Rule.

21. The MATS RTR provides that Continuous Emission Monitoring Systems (CEMS) are the only method to demonstrate compliance with the fPM limit.

## LIGNITE COMBUSTION

22. Lignite varies in composition and the distribution of mercury within individual coal samples is not uniform, unlike other types of coals. The amount of mercury within one seam of coal can vary drastically, not to mention mercury content fluctuations between seams at the same mine.[2] Minnkota's units see this large degree of variability within a 24hour operating period. *See* **Attachment A**, at Tables 2-4, 2-5.

23. An important difference between mine-mouth coal plants and typical coal-fired power plants is the control over fuel composition. Non-mine-mouth facilities purchase coal of a specified quality to be delivered to the facility. Unlike other types of facilities that may be able to blend coals to achieve greater consistency in the character of their fuel, many North

[2] LEC Comments filed June 23, 2024, https://downloads.regulations.gov/EPA-HQ-OAR-2018-0794-5957/attachment_1.pdf

Dakota lignite units are located at mine-mouth facilities without access to other coal types. MRY does not have access to alternate coal supplies. It has no rail spur or barge access to transport the coal to the facility. Therefore, MRY depends entirely on the fuel extracted from the neighboring BNI mine, and without incurring substantial economic cost and significant waste of resources, MRY has no means to control coal quality.

24. When high mercury batches of coal are combusted, the original 2012 MATS mercury emission limitation provided lignite power plants enough margin in their percentage of mercury removal to account for higher mercury emissions due to the mercury content in the coal. 77 Fed. Reg. 9304, 9490 (Feb. 16, 2012).

25. It is well-known and consistent with Minnkota's experience that lignite deposits vary significantly in quality, including fuel combustion performance and mineral content. Mercury content in the lignite varies because different seams within the mine yield lignite with diverse attributes (including mercury) on a day-to-day basis. Minnkota currently

maintains continuous emission controls to accommodate for the changing lignite quality to assure compliance with existing MATS mercury limitations. The variability of the lignite results in a much broader design range of controls and the equipment operation must account for the maximum mercury ROM and in turn must have a greater performance design standard for removal percentage removal. A compliance margin in the performance design standard for percentage removal is critical to allow for controls to adjust in response to changing lignite content, assuring continuous compliance with the MATS RTR Rule. *See* **Attachment A**, at Table 2-4.

## ELIMINATION OF THE MERCURY SUBCATEGORY FOR LIGNITE CAUSES IMMEDIATE AND IRREPARABLE HARM TO THE NORTH DAKOTA LIGNITE INDUSTRY AND TO MINNKOTA

26. EPA established the lignite subcategory for mercury because lignite units have different characteristics than units designed to combust bituminous and subbituminous coals. 77 Fed. Reg. at 9378. Lignite has a higher mercury content in many instances and presents greater variability than other coals. *See* E.J. Cichanowicz, "Technical Comments on MATS

RTR," EPA-HQ-OAR-2018-0794-5956, at Section 6.3.1 EIA Hg-Sulfur Relationship (June 19, 2024) [hereinafter Cichanowicz Technical Report], **Attachment B**. The higher sulfur content found in lignite fuels inhibits the ability of injected sorbents to reduce mercury emissions at lignite plants. The mercury content also results in higher levels of $SO_3$ formed, which significantly limits the mercury emission reduction potential of emission controls at lignite plants. *Id.*

27. Minnkota has used the same technology (combination of sorbent injection plus a chemical additive (oxidizing agent)) as its primary mercury control strategy since the MATS rule came into effect. While there are many variations of PAC on the market, in Minnkota's experience with these products, no PAC product has been identified as more successful than the others at MRY. Therefore, Minnkota has continued to use activated carbon injection as its primary mercury control system. Minnkota is not aware of any new developments in practices, processes, and control technologies in mercury control since the original MATS rule's technology evaluation.

28. Minnkota is unaware of any verified testing or evidence that demonstrates that lignite units can meet the New Mercury Limitation of 1.2 lb/TBtu at full load. EPA finds that by using brominated activated carbon, without regard for equipment performance design, "greater than 90 percent Hg control can be achieved at lignite-fired units," 89 Fed. Reg. at 38547, and cites for support a beyond-the-floor memorandum from the 2012 MATS rule, Kevin Culligan, SPPD/OAQPS to EPA-HQ-OAR-2009-0234, "Emission Reduction Costs for Beyond-the-floor Mercury Rate for Existing Units Designed to Burn Low Rank Virgin Coal" (Dec.16, 2011) [hereinafter Beyond-the-Floor Memorandum], **Attachment C.** EPA concludes that "units could meet the final, more stringent, emission standard of 1.2 lb/TBtu by utilizing brominated activated carbon at the injection rates suggested in the beyond-the-floor memorandum from the 2012 MATS Final Rule." 89 Fed. Reg. at 38547. To support this removal rate, the Beyond-the-Floor Memorandum cites a technical publication: Sjostrom, "Activated carbon injection for mercury control: Overview," Fuel Vol. 89, Issue 6, at 1320-22 (June 2010) [hereinafter ACI Fuel 2010 Article], **Attachment D.**

The ACI Fuel 2010 Article presents a chart that compiles mercury removal test results from Department of Energy (DOE) mercury control systems. The ACI Fuel 2010 Article scatterplot presents a variety of results under different conditions and equipment configurations. The ACI Fuel 2010 Article dataset contains only one lignite datapoint, which is a unit equipped with a fabric filter. Fabric filters aid in mercury removal because of increasing resonance time and temperature differential. The raw testing data from the ACI Fuel 2010 Article is not available in the docket. Given that the dataset (1) uses a single lignite data point (containing Fabric Filter controls), (2) fails to include the backup testing data, and (3) lacks data from ESP-equipped units like the MRY Units, the scatterplot in the ACI Fuel 2010 Article does not support the conclusion that a emissions standard based on 90% mercury removal can be achieved across the lignite industry, particularly with respect to lignite-fired units that are not equipped with a fabric filter.

29. Concluding that mercury removal over 90% is possible and equates to meeting the New Mercury Limitation, EPA calculates the removal

percentages for various lignite units across the country. EPA reports that lignite plants would need to remove up to 95% of mercury in the flue gas to meet the new limit based on 2022 data. 89 Fed. Reg. at 38547.

30. After the release of the proposed MATS RTR, Minnkota performed testing to evaluate the capability of its current mercury reduction system at MRY 1 and to examine the feasibility of EPA's mercury removal assumptions as applied to MRY 1. *See* **Attachment A**. Minnkota used its existing mercury control system to apply PAC and M-Prove sorbent, both of which MRY uses routinely for mercury control. Minnkota added as much PAC and Potassium Iodide sorbent as the MRY conveyors, injection lances, and associated components would allow, based on their maximum performance design capabilities and consistent with good engineering practices. As described in more detail in the Mercury Testing 2024 Report (**Attachment A)** the test results showed:

| MRY Unit | Average Hourly Mercury Emissions Value Achieved at Full Load (Sorbent Trap Data) 18 ppm MProve and Non-Brominated PAC |
|---|---|
| Unit 1 | 2.17 |
| Unit 2 | 1.61 |

31. The Final Rule solely relies on the conclusion that brominated PAC improves mercury removal. 89 Fed. Reg. at 38547 (citing the Beyond-the-Floor Memorandum). Consequently, MRY purchased brominated PAC for the purpose of determining if that product would achieve improved mercury removal as compared to non-brominated PAC. Minnkota selected MRY 1 for this trial because its mercury emissions baseline rate was higher than MRY 2 in the results identified above. As shown below, the MRY 1 average mercury emissions rate was higher when injecting brominated PAC as compared with non-brominated PAC.

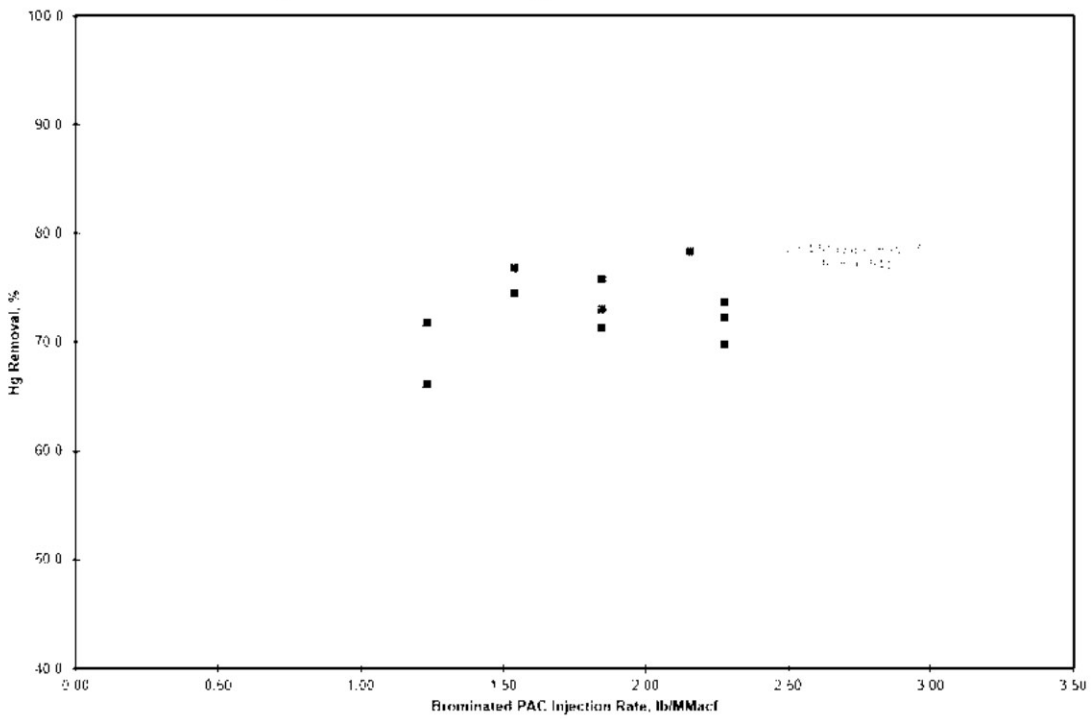
| MRY Unit | Average Hourly Hg Emissions Value Achieved at Full Load (Sorbent Trap) Brominated PAC | Average Hourly Hg Emissions Value Achieved at Full Load (Sorbent Trap) Non-Brominated PAC |
|---|---|---|
| Unit 1 | 2.57 | 2.17 |

32. With existing equipment, the recent testing results demonstrate that MRY is unable to achieve the New Mercury Limitation on an hourly basis at full load. Further, Minnkota has no information or data supporting the conclusion that MRY 1 or MRY 2 could achieve the New Mercury Limitation on a 30-day rolling basis while operating at full load. The short-term testing data suggest that even a longer-term averaging period would not result in compliance.

33. In fact, Minnkota plotted the recent test results to project the removal rate at a brominated PAC injection rate of 3.0 lb/MMacf, which is a higher injection rate than the existing MRY equipment can achieve, but is consistent with EPA's achievability conclusion in the Beyond-the-Floor Memorandum and Final Rule. The trend line shows an estimated maximum mercury removal rate of less than 80%. The plotted trend line, based on the test values, is far below EPA's conclusion (consistent with the ACI Fuel 2010 Article) that injection of brominated PAC at the rate of 3.0 lb/MMacf will result in a 90% removal rate. Rather, the trend line levels off, demonstrating that increasing the amount of brominated PAC injected

into MRY Unit 1 is not an adequate control strategy to achieve the New Mercury Limitation and that EPA ignored and erroneously omitted limitations of ACI in its achievability conclusion . **Attachment A**, at Figure 2-1. The scatterplot from the Report is presented below.

**Figure 2-1 — MRY Unit 1 Existing System Mercury Removal Performance Capabilities using Brominated PAC**




34. Mercury testing and analysis of data at MRY confirms and supports Minnkota's belief that numerous variables affect its mercury emissions rate. Specifically, Minnkota observed mercury emissions rate fluctuations based on unit load, mercury content in lignite, and normal variability in unit operation and control equipment function. Some hourly

mercury emissions increases were not directly traceable to a cause, even upon data analysis.

35. One of Minnkota's conclusions, based on recent testing experience, is that known and unknown variables cause mercury emissions fluctuation, such that a standard for mercury must include a minimum compliance margin of 25%.

36. Minnkota is irreparably harmed by the final MATS RTR because MRY's existing mercury controls cannot achieve the New Mercury Limitation of 1.2 lb/TBtu on an hourly or sustained basis at full load. In fact, the MRY testing data predicts that increased injection of brominated PAC beyond the capabilities of the existing mercury control system will not achieve the New Mercury Limitation due to the leveling off of mercury removal at less than an 80% removal rate.

37. The Final Rule places Minnkota in an urgent and untenable position, given the Rule's impending compliance date. Noncompliance with the Clean Air Act is not an option. Therefore, prior to making a shutdown decision regarding critical assets, Minnkota would determine

what mercury emission rate the MRY units can achieve. That would require significant additional investment in testing that, along with existing testing costs, will exceed $600,000.00.

38. To achieve lower mercury emissions, MRY must install and operate advanced pollution control equipment to replace its existing equipment, such as an ACI system with a higher injection rate. Even though the New Mercury Limitation is not shown to be feasible, Minnkota must complete this installation project to improve the emission rate and avoid the only other option of derating the units for compliance. The installation costs and ongoing operation expenses are significant. Specifically, these technologies will require an estimated minimum of $5,000,000.00 capital expenditure upfront, as well as increased labor costs for installation, operation, and maintenance of the technology, and equipment and associated training, and will result in increased operating costs over the long term. This expenditure must take place expeditiously and certainly before the resolution of this case.

39. Without the ability to meet the New Mercury Limitation, the Final Rule provides no other option but to force Minnkota to ultimately shut down MRY Unit 1 and Unit 2. Shutting down MRY substantially harms Minnkota by entirely eliminating its ability to generate dispatchable electricity for its cooperative members and end users.

40. EPA failed to take into consideration the actual costs of compliance and had a significantly flawed calculation. *See* **Attachment A**, at Section 3 EPA Cost Validity.

41. Further, EPA underestimates the cost of the Final Rule to Minnkota by using incorrect fuel additive costs for MRY 1 and for MRY 2. EPA's underestimate results in $487,747 and $1,347,383 that should have been included in the cost analysis for MRY Units 1 and 2, respectively.

42. The magnitude of EPA's underestimation of cost is apparent when actual compliance costs are used to calculate cost effectiveness. Compared to EPA's hypothetical 800 MW unit, the cost for just one 250 MW lignite unit is nearly 80% EPA's estimate—and this fails to include equipment upgrades necessary to achieve an injection rate unproven to

meet a 90% removal rate on lignite. Note the table does not include or account for any costs associated with MRY 1 mercury system upgrades.

**Example MRY Unit 2 Cost Underestimations Summary Table 3-1**

| Parameter | EPA Example Hypothetical 800 MW | EPA Assumed MRY U2 Costs 447 MW | Est. Actual MRY U2 Costs 447 MW |
|---|---|---|---|
| Current Hg Compliance (4.0 lb/TBtu) Cost [1] | $2.6 M | $0.3 M | $1.9 M |
| Current Hg Removed | 1,295 lb | 77 lb | 149 lb |
| Current C/E ($ per lb Hg Removed) | 2,004 | 3,845 | 12,754 |
| Hg Control System Annualized Capital Cost | Not included | Not included | $472k [2] |
| BPAC Cost @ 5 lb/MMacf | $7.5 M | $0.6 M | $1.3 M [3] |
| M-Prove Cost | Not included | $0.2 M | $1.6 M [4] |
| Future Hg Compliance (@ 5 lb/MMacf) Cost | $7.5 M | $0.8 M | $3.4 M |
| Future Hg Removed (EPA Assumed @ 1.2 lb/TBtu) | 1,447 lb [5] | 110 lb | 216 lb |
| Future C/E ($ per lb Hg Removed) | 5,083 | 7,040 | 15,678 |
| Incremental C/E ($ per lb Hg Removed) | 28,176 | 14,360 | 22,217 |

Note 1 – EPA example only based on sorbent. EPA assumed current compliance cost includes sorbent and chemical fuel additive. Est. actual cost based on 2023 MRY Unit 2 usage rate & pricing for both sorbent and chemical additive.

Note 2 Cost of $5.0 million dollars from S&L project database was annualized using a capital recovery factor calculated based on annual interest rate of 7% (pre-tax marginal rate of return on private investment, EPA Cost Manual Section 5)and 20 year evaluation period (EPA Cost Manual Section 6).

Note 3 – Cost based on EPA assumed rate but using 2023 MRY BPAC pricing.

Note 4 – Cost based on 2023 MRY Unit 2 usage rate & pricing instead of assuming same as sorbent costs.

Note 5 Based on calculated value for EPA example inlet Hg of 1,542 lbs (current H g coal content) 95 lbs (future emitted amount). However, the EPA example identifies 1,468 lb for the incremental cost effectiveness calculation.

43. Costs to comply with the New Mercury Limitation are exorbitant and damage Minnkota. Many costs may be passed along to its member cooperatives and end users who are harmed via higher electricity

prices. The capital and operational costs to Minnkota, its member cooperatives, and end users cannot be recouped.

44. At a minimum, compliance with the new standard for mercury is estimated to cost $22,217 per pound of incremental emission removed for Unit 2. The significant cost of reducing mercury emissions is overly burdensome for Minnkota as a small entity and as a not-for-profit electric cooperative.

45. Minnkota's harm due to the New Mercury Limitation is immediate. Minnkota must immediately begin mercury testing to determine maximum mercury removal rates and capabilities.

46. The MATS RTR sets a mercury limitation for lignite units without any technical basis or data demonstrating its achievability. In summary, the New Mercury Limitation is defective due to the following flawed assumptions:

a. EPA assumes that greater than 90% mercury control can be achieved at lignite-fired units at a < 2.0 lb/MACF injection rate for units with installed fabric filter and using brominated PAC

and greater than 90% mercury control can be achieved at lignite-fired units at < 3.0 lb/MACF injection rate for units with installed ESPs and using brominated PAC. Yet, MRY's testing data demonstrates that EPA's assumptions that greater than 90% mercury control can be achieved is in error. EPA's Beyond-the-Floor Memorandum and its supporting data also demonstrates that EPA's achievability conclusions around application of ACI are clearly erroneous.

b. EPA finds that no lignite units will need to achieve a removal rate higher than 95% mercury control to meet the New Mercury Limitation of 1.2 lb/TBtu, based on EPA's unit-by-unit calculations, and finds MRY would need 87% removal in the Final Rule. Yet, Minnkota's calculations for MRY show that greater than 90% removal would be required when combusting high mercury content lignite based on test results at the mercury inlet.

47. Minnkota is harmed by having to comply with a New Mercury Limitation that is not achievable and is based on flawed and unsupported technical conclusions.

## THE NEW fPM LIMITATION WILL CAUSE IMMEDIATE AND IRREPARABLE HARM TO THE NORTH DAKOTA UTILITIES AND TO MINNKOTA

48. EPA's new fPM limit of 0.010 lb/MMBtu will require either the installation of a baghouse (fabric filter technology) or complete retrofit of electrostatic precipitators at MRY. *See* Sargent & Lundy, "Particulate & Mercury Control Technology Evaluation & Risk Assessment for Proposed MATS Rule Report," EPA-HQ-OAR-2018-0794-5978 (June 2023) [hereinafter MATS 2023 Study], **Attachment E**.

49. ESP improvements may result in fPM reductions. These upgrades would require substantial modifications, including structural support modification, and would represent substantial expenditures in cost per ton removed. **Attachment E**, at Section 2.3.

50. Minnkota's harm is immediate. Minnkota would need to begin constructing an ESP upgrade as soon as possible to have any opportunity to meet the new compliance date for the MATS RTR.

51. For MRY 2, an ESP upgrade may achieve the New fPM Limitation with adequate margin. However, the MATS 2023 Study finds that vendors would have to complete a more detailed qualitative study and baseline testing to determine whether an ESP rebuild can achieve a low enough fPM rate based on ESP inlet and outlet emissions. **Attachment E**, at Section 2.1.6. Otherwise, a baghouse would be required. MRY would need 48 months to convert to baghouse technology. *Id.* at Table 2-2.

52. ESP upgrades take 36 months to complete. There are 26 units in the country that would need ESP upgrades for a new limitation of 0.010 lb/mmBtu. *Id.* Only 4 vendors in the United States can undertake these projects. It is likely that the 36-month estimate will be further protracted due to the dearth of contractors available to perform the work.

53. Costs of compliance with the New fPM Limitation are overly burdensome, for the following reasons.

54. Baghouse installation is extremely costly. It is estimated to cost $282,715 per fPM ton removed. *See* **Attachment B**.

55. ESP retrofits are expensive. NRECA's technical consultant estimates $67,262 per fPM ton removed. *See* **Attachment B**.

56. Electric cooperatives have limited financial resources to undertake projects of this magnitude in general and especially when coincident with other environmental compliance projects.

57. Minnkota is harmed by having to comply with a New fPM Limitation that may not be achievable prior to the compliance deadline, is based on flawed and unsupported technical conclusions, and is very costly.

58. To comply with the MATS RTR, Minnkota is forced to take measures that immediately increase compliance and operational costs. The MATS RTR impacts Minnkota's ability to supply affordable, reliable energy to its customers. Added costs will place upward pressure on rates for rural customers, particularly when combined with the effects of EPA's other recent electric utility sector-focused rules.

## THE MATS RTR CREATES GRID RELIABILITY CONCERNS DUE TO EARLY RETIREMENTS OF COAL-FIRED UNITS

59. Lignite coal provides the majority of the electric power generated and consumed in North Dakota. Lignite power plants play a significant role in the regional economy.

60. Thus, this rule, with its reversal of EPA's position on lignite-fired sources, impacts North Dakota more profoundly than other areas of the country. These concentrated impacts affect the ability of the North Dakota utilities to maintain adequate generation resources.

61. Most (if not all) of the lignite plants in North Dakota must make some changes as result of this rule. There will be a marked impact on grid stability and reliability. In addition, increased maintenance needs of new pollution control technology will continue to affect reliability in the longer term.

62. Units will retire due to the inability to meet the New Mercury or fPM Limitations.

63. Existing generation resources are unlikely to be adequate in North Dakota to sustain the grid with multiple unit retirements in a short

time frame. Multiple environmental regulations that EPA promulgated this month directly and profoundly impact generation resources in North Dakota.[3] This Final Rule is part of those cumulative reliability and cost impacts on coal-fired generation.

64. The North American Electric Reliability Corporation (NERC) has predicted continued future shortfalls in North Dakota.[4] The MATS RTR intensifies an already tenuous, overburdened grid in transition.

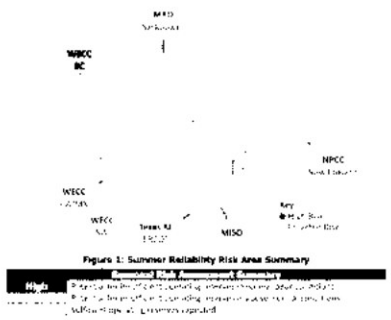



Figure 1: Summer Reliability Risk Area Summary

[3] New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule, 89 Fed. Reg. 39798 (May 9, 2024); Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments, 89 Fed. Reg. 38950 (May 8, 2024); Supplemental Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, 89 Fed. Reg. 40198 (May 9, 2024); National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review, 89 Fed. Reg. 38508 (May 7, 2024).

[4] NERC, 2024 Summer Reliability Assessment (May 2024), https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2024.pdf.

65. Dramatic repercussions would flow from the loss of North Dakota generation units due to the Final Rule. North Dakota Transmission Authority (NDTA), "Analysis of Proposed EPA MATS Residual Risk and Technology Review and Potential Effects on Grid Reliability in North Dakota" (Apr. 3, 2024) [hereinafter NDTA Analysis], **Attachment F.**

66. The MATS RTR will cause the loss of tax revenue and a decrease in economic activity for the region if units must shut down. Retirements not only economically impact local communities, jobs, and industries, but put more strain on existing resources to provide reliable and affordable energy.

67. The interruption of power delivery from a grid failure would cause damage to public health. North Dakotans rely on electricity to heat their homes during the extreme winter temperatures of the long winter season. Affordable and consistent power allows for medical providers to provide essential services to the elderly, infirm, and to vulnerable individuals with chronic health conditions. Evidence from grid failures in other areas of the country in winter storms Uri and Elliott show the

documented health impacts and morbidity caused by those events.[5] The MATS RTR places the portion of the grid serving North Dakota in jeopardy of failure and resulting consequences.

68. With respect to MRY, Minnkota would anticipate a loss of jobs. Minnkota employs approximately 200 people in the vicinity of Center, North Dakota. In addition, subcontractors provide services to the plant on a regular basis. The nearby BNI Coal mine would be impacted or possibly close because it sells lignite to MRY. On information and belief, BNI employs approximately 178 persons at the mine. In total, the direct cost to the community from the loss of employment would be staggering. Impacts from the loss of jobs in the area would have a ripple effect on ancillary industries, such as nearby service stations, reduced demand for customer services, and the social and psychological impacts of job loss on the affected individuals and their families. Premature retirement of units

[5] *See, e.g.*, Hanchey, "Mortality Surveillance During Winter Storm Uri, United States – 2021," Disaster Med Public Health Prep (Dec. 2023), https://pubmed.ncbi.nlm.nih.gov/37974501/; Sharma, "Winter Storm Elliott death toll climbs to 56 as thousands still without power in -40 temperatures," Yahoo News (Dec. 26, 2022), https://www.yahoo.com/news/winter-storm-elliot-power-outages-154557710.html.

results in irreversible harm that economically damages Minnkota and impacts the entire region.

69. EPA failed to account for the costs due to a grid failure in the rulemaking. In its service area, Minnkota would anticipate that grid failures would cause end users to suffer economic damages such as food spoilage, property damage, lost labor productivity, and loss of life. The NDTA Analysis discusses these damages in more detail in Section D (Modeling Results).

**SUMMARY OF HARM TO MINNKOTA**

70. With respect to the New Mercury Limitation, MRY is unable to meet the new limit with its existing technology at full load. Recent test data suggest that Minnkota will not be able to meet the New Mercury Limitation even at the higher PAC injection rates that EPA assumed to be sufficient to meet the New Mercury Limitation. Further testing and analysis would need to be performed to identify MRY's emission reduction rate. If either no feasible technology exists, or if a technology cannot be installed to meet the compliance deadline, the MRY units will be forced to

ultimately cease operation immediately upon the Final Rule compliance date.

71. With respect to the fPM limitation, Minnkota is unable to meet the New fPM Limitation with its existing technology at full capacity at MRY Unit 2.

72. An ESP rebuild project must take placeat a minimum. If further study indicates that an ESP upgrade is not sufficient, Minnkota must install a baghouse. If Minnkota cannot commence these projects – either due to cost or timing – then MRY would be forced to cease operation beginning on the MATS compliance date.

73. Minnkota is immediately harmed becauseit must expend financial resources to commence testing and project development to lower its fPM and mercury emissions and even have an opportunity to meet the MATS RTR compliance deadline.

74. In summary, the Rule may force MRY off-line due to control infeasibility, cost, or project timing. The Rule would cause this dispatchable,

reliable generating resource to operate differently at a substantial cost and permanent loss to Minnkota.

75. Minnkota's member cooperatives and end userswill also be economically impacted. If MRY must prematurely retire, Minnkota would not have time to construct replacement generationprior to the compliance date for the Final Rule in 2027. Minnkota would be faced with increased exposure and reliance on an often volatile and constrained MISO market. Past market pricing demonstrates the extraordinary costs to purchase power from the market. The costs of purchasing power off the MISO market may expose Minnkota's membership to a current cap of $3,500 per MWh. A four-day exposure to the MISO market cap (half of the total days of the market conditions resulting from Winter Storm Uri) would result in a total exposure of $236,888,000 to replace the megawatts that MRY 1 and MRY 2 generate (705 MWns cumulatively), thereby eliminating the entire annual operating revenues of MRY. In fact, these staggering costs have bankrupted a small utility recently (Brazos Electric Power

Cooperative) due to power purchases during Winter Storm Uri from the ERCOT market.

76. The following Tables compile of all of the harms identified herein that Minnkota will suffer due to the Final Rule.

**Table A: MRY 1 and 2 Mercury Compliance Costs**

| Activity | Cost | Notes |
|---|---|---|
| **MRY Unit 2 Capital Costs:** | | |
| Future mercury testing to determine lowest achievable rate | $600,000 | This is a minimum value. |
| Inlet Hg Monitor | $150,000 | To track coal quality |
| WFGD Additive Dosing System | $750,000 | To attempt to reduce mercury emissions further |
| WFGD Oxidizing Reduction Potential (ORP) Monitoring System | $7,500 | For WFGD dosing system feedback |
| Mercury New PAC Silo and injection equipment capital cost to reach the lowest achievable rate | $5,000,000 | Based on industry data from similar projects; This is the total project cost without financing costs. |
| **MRY Unit 2 Operating & Maintenance (O&M) Costs:** | | |
| WFGD Additive costs (based on annual operation) | $1,412,000 | Based on MRY usage rate and supplier pricing |
| Mercury control additional PAC costs (based on annual operation) | $1,300,000 | Based on EPA hypothetical 5.0 lb/MMacf injection rate for 800 MW unit |

| Activity | Cost | Notes |
|---|---|---|
| Mercury control additional Potassium Iodide costs (based on annual operation) | $1,600,000 | Cost based on 2023 MRY Unit 2 usage rate & pricing instead of assuming same as sorbent costs. Cost is $1.4 million more than estimated by EPA. |
| Incremental Mercury Control O&M cost | $2,412,000 | This is the cost in excess of the current O&M costs. This estimate is based on current compliance of approximately $1.9 million. |
| **Capital & O&M Costs:** | | |
| **Total MRY 2 Costs** | **$8,919,500** | Per MW (440MW) = $18,978 |
| **MRY 1 Projected Costs** | **$4,880,000** | MRY has 235 MW. Based on the cost per MW from itemized costs for MRY 2 |
| **Total for MRY 1 and MRY 2** | **$13,799,500** | |

**Table B: MRY 2 fPM Compliance Costs**

| Activity | Cost | Notes |
|---|---|---|
| fPM Feasibility Study | $175,000 | Based on roughly budgetary estimates from Southern Environmental , Inc. |
| Low cost: MRY 2 ESP Rebuild Capital Cost | $36,326,000 | Based on S&L's conceptual cost estimates and inputs from Southern Environmental, Inc. |

| Activity | Cost | Notes |
|---|---|---|
| Low cost: MRY 2 ESP Rebuild Incremental O&M Cost | $530,000 | Incremental costs accounts for costs incurred above what is currently paid for by station for existing PM compliance (i.e. ESP power consumption, fly ash disposal, etc.) |
| Low cost: MRY 2 ESP Rebuild Outage Cost | $1,421,000 | |
| High cost: New MRY 2 Baghouse | $242,083,000 | Based on S&L's conceptual cost estimating |
| Low cost: MRY 2 Baghouse Incremental O&M Cost | $4,047,000 | Incremental costs accounts for costs incurred above what is currently paid for by station for existing PM compliance (i.e. ESP power consumption, fly ash disposal, etc.) |
| Low cost: MRY 2 Baghouse Outage Cost | $507,000 | |
| Total fPM Cost Range: | High – $246,812,000<br>Low – $38,452,000 | |

**Table C: Minnkota's Total MRY Mercury and fPM Compliance Costs**

| Activity | Cost | Notes |
|---|---|---|
| MRY Total Mercury Costs for MRY 1 and MRY 2 | $13,799,500 | From Table above, O&M based on 1 year |
| MRY Total fPM Costs for MRY 2 | High – $246,812,000<br>Low – $38,452,000 | From Table above, O&M based on 1 year |

| Activity | Cost | Notes |
|---|---|---|
| Total Compliance Cost to MRY | High – $260,611,500<br>Low – $52,251,500 | |

77. The compliance cost estimates for MRY to comply with the MATS RTR (assuming its possible for the New Mercury Limit), presented in the above Tables A, B, and C, equate to between 15% (low fPM compliance option) to 60% (high fPM compliance option) of Minnkota's total annual operating revenue. Such expenditures will severely and permanently harm Minnkota's membership.

78. Even if the MATS RTR is overturned, the direct costs to Minnkota, its member cooperatives, and end users cannot be recouped once spent. These damages are permanent.

* * * *

[Signature Follows on Next Page]

*  *  *

I declare under penalty of perjury under the laws of the United States of America, pursuant to 28 U.S.C. § 1746, that the foregoing is true and correct to the best of my knowledge.

Executed on this 9 day of June, 2024, in Grand Forks ND

Robert McLennan