

May 8, 2009

Bill Storm, Project Manager
Minnesota Department of Commerce
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Re: Public Comments on Draft Environmental Impact Statement for Prairie Island Nuclear Generating Plant, Extended Power Uprate, PUC Docket Nos. E002/CN-08-509 and E002/GS-08-690; Request for Additional Dry Cask Storage, PUC Docket No. E002/CN-08-510.

Dear Mr. Storm:

Please accept the Sierra Club North Star Chapter's comments on the Draft Environmental Impact Statement (DEIS) for the Prairie Island Nuclear Generating Plant (PINGP). The North Star Chapter represents 17,000 members in the state of Minnesota who share concerns about the environmental, public health, and economic impacts of Xcel's proposal to increase and extend electricity production for at least 20 years at the Prairie Island Nuclear Generating Plant and the associated on-site nuclear waste dry cask storage. The Chapter echoes the concerns of those who spoke at the Public Hearing in Red Wing on April 21, none of whom supported the extended power uprate or the expansion of the waste storage installation.¹

In our review of the DEIS, we have identified several important elements of analysis that were incomplete. The following is a summary of the additional analysis requested in the final EIS which is described in more detail in the text of our comments:

Chapter 1

Section 3.2: Demand Side Management

- Updated demand forecasts (page 24)
- Analysis of 1.5 percent annual conservation (24)

Section 3.4.2: Renewable-Fuel Technologies

- Assessment of wind integration (31)
- Total lifecycle greenhouse gas emissions, not just operating emissions (31)
- Alternatives to the EPU utilizing combinations of renewable resources (31)

Section 3.4.3: Developing Technologies

- Updated assessment of renewable power storage technology (38)

Section 4.2: Biological Resources

- Assessment of potential cumulative effects on invasive species (50)

Section 4.13: Radiological

- Lifecycle health costs for nuclear power, not just operating costs (74)

¹ Stephanie Hemphill, "Neighbors share concerns about Prairie Island nuclear plant," Minnesota Public Radio, available at http://minnesota.publicradio.org/display/web/2009/04/22/red_wing_nuclear/.

Chapter 2

Section 5.2: Radiological Impacts

- Total health risks (page 25)

Section 5.3: Radiological Impacts – Potential Incidents

- Assessment of potential changes in river flow over the cumulative impact period (28)
- Potential flood risks to the ISFSI given changes in river flow (28)
- Potential harm to workers from cask failure (33)

Section 5.4: Cumulative Impacts

- Forecasts of effects assuming increases in local population (35)

Section 6.1: Off-site Storage Alternatives

- Cumulative impacts of storage beyond 200 years (41)

Not addressed in the EIS:

- Discussion of environmental justice issues related to increasing risk to the Prairie Island Indian Community
- Difficulties in transporting spent fuel
- Reconciling comments by the Federal Energy Regulatory Commission Chair

Extended Power Uprate

The Sierra Club chapter has concerns about the environmental and health impacts that the Extended Power Uprate (EPU) may have and requests that the final EIS consider additional alternatives.

I. The DEIS inadequately addresses alternatives.

The Sierra Club requests analysis of Xcel Energy achieving the additional .4% conservation goal of the Next Generation Act as an alternative to the EPU. In addition, we request a more comprehensive analysis of mixed source alternatives, including conservation, renewables, and distributed generation for the proposed 164 MW EPU.

Considered Alternatives

The DEIS addresses the tax implications of selecting the no-build alternative.² It notes that the tax loss from a no-build alternative are high and emphasizes the benefits from the EPU and continuing to operate the facility. None of the other alternative evaluations addresses the tax benefits from new or expanded facilities constructed in Minnesota. As a result, the DEIS overlooks potential benefits from the alternatives for the uprate and the alternatives to continuing operation of Prairie Island.

² DEIS Chapter 1, §3.1, page 23.

The DEIS did not address the discrepancy between the Next Generation Energy Act goal of 1.5 percent conservation and Xcel's projected demand-side reductions of 1.1 percent.³ While Xcel's Conservation Improvement Programs will meet the mandatory minimum goal of 1.1 percent, Xcel's projections fail to include the additional overall reduction that the Act targets.

Conservation improvement programs, like demand side management and energy efficiency, provide a clean and cost-effective way to ensure that Xcel is able to provide reliable power to its customers. Conservation provides an alternative to increased power and generates neither excess emissions nor solid waste while providing additional benefits; such as lower utility bills to consumers. The DEIS does not adequately address implementation of additional conservation to further reduce the need for the uprate with less environmental impact.

The no-build option discusses the PUC's role in the certificate of need process; however, the final EIS should provide the PUC with the most up-to-date information on demand to inform that decision. In September 2008, Xcel revised its demand estimates because of economic downturn,⁴ and reduced the expected demand forecast by 300 MW over the next five years.⁵ Since this revised forecast, the economy has continued to slow and the PUC has approved several proposed projects. The accompanying changes in demand projections coupled with implementation of the conservation goals of the Next Generation Energy Act may significantly decrease the need for the EPU and make the no-build alternative a viable option.

The possibility of reduced demand is reinforced by the decrease in Xcel's peak demand from 2006 to 2007 and 2008. The DEIS relies on forecasts provided in Xcel's Certificate of Need, filed May 16, 2008.⁶ That forecast anticipated consistent growth in demand through 2020.⁷ As provided on Xcel's 10-K tax form for 2008, Xcel's peak demand fell from 9,859 MW in 2006 to 8,697 MW in 2008.⁸ This decrease of nearly 12 percent contradicts the assumptions of Xcel's demand forecast and does not justify the EPU. The six percent decrease from 2007 to 2008 and a potential decrease in 2009 seem to counter the argument for rejecting demand-side management.

Moreover, the Advisory Task Force requested updated demand forecasts from Xcel. The OES responded that it would seek "updated demand forecast information to be included in the EIS."⁹ The DEIS contains no evidence of an updated forecast and only refers to the filing on May 16, 2008.¹⁰ The final EIS should contain updated forecasts.

³ The Draft Environmental Impact Statement notes that the statute provides the overall conservation goal of 1.5 percent, but does not address the potential demand decrease caused by that reduction. Instead, the DEIS only addresses the 1.1 percent reduction currently planned by Xcel. See DEIS at Chapter 1, page 24.

⁴ Resource Plan Reply Comments, Docket No. E002/RP-07-1572, Sept. 5, 2008, at 2. Xcel noted that increased fuel prices and slowing economic indicators forced it to reconsider its demand forecast nine months after it was made.

⁵ *Id.* at 3.

⁶ DEIS Chapter 1, §3.2, page 25.

⁷ *Id.*

⁸ See Form 10-K, filed Feb. 27, 2009. Available as attachment to "EXHIBITS--AFFIDAVIT OF PAULA G. MACCABEE WITH ATTACHMENTS," Mar. 16, 2009, on PUC Docket No. CN-06-1115.

⁹ "EIS Scoping Worksheets with OES Treatment," Office of Energy Security, Nov. 3, 2008, at 3. Available at <http://energyfacilities.puc.state.mn.us/documents/19602/ATF-Summary-Appendix-E.pdf>.

¹⁰ DEIS Chapter 1, §3.2, page 25.

The DEIS considers the emissions of some alternatives, but fails to consider the environmental costs and emissions of the total life cycle.¹¹ While nuclear power does not generate carbon dioxide emissions during operation, mining and transportation of fuel do produce environmental costs. The mining, processing, and subsequent waste generate both carbon dioxide emissions and radioactive waste. Moreover, mining uranium requires processing significant quantities to achieve sufficiently enriched uranium for power generation.¹² Some of this excess waste requires special care and handling, increasing the total environmental cost of operating the facility.

In combination, renewable resources could provide sufficient power and present a feasible alternative to the EPU. The DEIS argues that wind energy cannot provide sufficient power at needed times to provide intermediate and peak load needs.¹³ The 2006 Minnesota Wind Integration Study found that wind could account for twenty percent of total generation with sufficient transmission upgrades.¹⁴ Using wind power with geographic variation will “smooth out” the variations in power generation.¹⁵ An increase of 164 MW would be a step toward the integration of wind power that the Wind Integration Study deemed possible.

Integrating wind power does require increases in transmission capacity.¹⁶ The DEIS’s feasibility section notes that integrating wind requires building transmission infrastructure from areas that lack transmission capacity at present.¹⁷ The combination of lower demand forecasts and the PUC’s approval of CapX 2020 (with wind transmission requirements)¹⁸ ensure the time to build infrastructure to transport renewable energy from distributed generation points.

The potential integration of wind matches current national expectations. According to the Federal Energy Regulatory Commission Chair, Jon Wellinghoff, the United States does not need additional nuclear power (or coal power for that matter).¹⁹ Chairman Wellinghoff further stated that renewables will provide enough energy to meet baseload capacity and demand.²⁰ He noted that scattered wind farms can provide the kind of smooth power production that baseload capacity demands.²¹ Given Xcel’s decreased demand forecast and decreasing peak demands, wind power could provide a feasible alternative to the EPU. The final EIS should reconcile its analysis with Chairman Wellinghoff’s statements.

¹¹ See, e.g., Table 3-2, which lists all emissions for Prairie Island Uprate Project as zero.

¹² U.S. Geological Survey estimates approximately three billion metric tons of solid waste result from uranium mining. “Uranium Mining Wastes,” U.S. E.P.A., available at <http://www.epa.gov/rpdweb00/tenorm/uranium.html>.

¹³ DEIS Chapter 1, §3.4.2, page 34.

¹⁴ “Final Report – 2006 Minnesota Wind Integration Study Volume I,” EnerNex Corporation for the Minnesota Public Utilities Commission, Nov. 30, 2006, at 76. Available at http://www.puc.state.mn.us/portal/groups/public/documents/pdf_files/000666.pdf.

¹⁵ *Id.* at 2.

¹⁶ *Id.* at 76.

¹⁷ DEIS Chapter 1, §3.4.2, page 35.

¹⁸ Sea Stachura, “State approves massive powerline project,” Minnesota Public Radio, April 16, 2009, available at http://minnesota.publicradio.org/display/web/2009/04/16/state_approves_capx_power_line_project.

¹⁹ Noel Straub and Peter Behr, “Energy Regulatory Chief Says New Coal, Nuclear Plants May Be Unnecessary,” The New York Times, Apr. 22, 2009, available at <http://www.nytimes.com/gwire/2009/04/22/22greenwire-no-need-to-build-new-us-coal-or-nuclear-plants-10630.html>.

²⁰ *Id.*

²¹ *Id.*

Additional alternatives

The DEIS considered the option of combining natural gas and wind power to create a diversified replacement power, but failed to consider other combinations of power sources. Combining natural gas with additional small sources may provide a more suitable alternative. This approach increases diversity of sources while relying on renewable energy that meets the state's energy portfolio goals. Using wind, solar, and biomass can provide consistent power while reducing the waste impacts of a pure biomass alternative.

New storage technologies to capture renewable energy make renewables feasible. The development of energy storage in batteries and other forms (such as compressed air) can allow baseload power from wind and solar power sources. An additional alternative is using wind power to convert carbon dioxide emissions into methane for natural gas facilities.²² These new technologies allow for greater reliance on wind and lower base load requirements from non-renewable sources. Wind may also be a more viable consideration because of the decision of the Public Utilities Commission to require the CapX 2020 transmission lines to carry 700 MW of wind power to the metro area.²³ This line is expected to be open by 2013, allowing increased transmission at a time when Xcel expects demand may increase.

The development of a new hydrokinetic power source provides an alternative that the DEIS identifies but does not assess.²⁴ In sufficient numbers, these in-stream uses of water could provide baseload power to offset the need for the EPU. The Federal Energy Regulatory Commission licensing of a hydrokinetic project in Minnesota²⁵ shows that the opportunity to implement and expand hydrokinetic power may be possible by the time demand rises.

II. The environmental impacts of the EPU are understated.

The EPU may have several negative impacts on aquatic life. The final EIS should address these concerns fully to ensure that the project does not undermine federal environmental protection with the increased power generation.

The DEIS states that the increased water flow will have no effect on the entrainment or impingement of aquatic life. However, the EPU will require an increased water intake of approximately ten percent. This increased intake will likely cause an increase in entrainment through either a higher rate of flow or a larger area of intake. The DEIS only makes a conclusory statement that the increased intake will have no significant effect on aquatic impingement or entrainment because no physical changes will be made.²⁶ For endangered

²² For additional information, see "(WO/2008/100659) RELIABLE CARBON-NEUTRAL POWER GENERATION SYSTEM", World Intellectual Property Organization, available at <http://www.wipo.int/pctdb/en/wo.jsp?WO=2008100659>.

²³ Sea Stachura, "State approves massive powerline project," Minnesota Public Radio, April 16, 2009, available at http://minnesota.publicradio.org/display/web/2009/04/16/state_approves_capx_power_line_project.

²⁴ DEIS Chapter 1, §3.4.2 at 37.

²⁵ "Hydrokinetic Projects – Issued and Pending Licenses," Federal Energy Regulatory Commission, Dec. 13, 2008, available at <http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics/licences.asp>.

²⁶ DEIS, Chapter 1, at 48.

species like the Higgins Eye Pearlymussel, increased intake could lead to higher larvae mortality rates.²⁷

The increased heat of the reactor triggers the increased need for cooling water. The DEIS concedes that the thermal plume near the water outlet may allow the growth of thermophilic organisms such as parasitic bacteria, but assesses the likelihood as “small.” With increased water discharge and potentially increased temperature, the final EIS should address this issue more thoroughly.

The Higgins Eye Pearlymussel, a federally endangered species found near the facility,²⁸ has suffered from significant habitat loss including changes in river flows.²⁹ Further altering the river flow could harm the reproductive process. The Higgins Eye has also suffered from the invasion of zebra mussels, with a population particularly affected near Prairie du Chien, Wisconsin.³⁰ Increased water temperature in the winter may encourage the growth of Zebra mussels by increasing the thawed water in which the mussels may survive.³¹ This would further harm the Higgins Eye’s chances of survival.

The increased likelihood of significant drought events increases potential negative effects from water withdrawal. The effects of climate change may increase the incidence of heat waves and droughts in the region.³² While the water withdrawal may constitute a small portion of the river under normal circumstances, with decreased water flow the withdrawal and heated effluent increase the impacts on aquatic life.

III. The DEIS insufficiently addresses health risks.

Health impacts of the EPU are addressed briefly in the DEIS, but the document provides little explanation for the conclusions it reaches. The EPU will require additional radioactive waste to be stored on-site and will increase the radiation levels at the facility. To demonstrate the full effects of the increased radiation levels, the FEIS should directly address and distinguish studies indicating an increased risk of cancer near nuclear facilities.³³

The DEIS also fails to consider the broader health costs of operating a nuclear facility. Mining uranium ore may have additional health effects if workers are exposed to the ore, increasing the

²⁷ The Higgins Eye Pearlymussel larvae are sent with the river current to attach to fish. Increasing the intake would increase the larvae entrained by the screens. U.S. Forest Service, “Higgins eye pearlymussel fact sheet,” available at http://www.fws.gov/Midwest/endangered/clams/higginseye/higgins_fs.html.

²⁸ DEIS Chapter 1, § 4.2, at 50.

²⁹ *Id.*

³⁰ *Id.*

³¹ “Water Temperature,” Zebra Mussel Information System of the U.S. Army Corps of Engineers, available at <http://el.ercd.usace.army.mil/zebra/zmis/>.

³² UN News Centre, “Heat waves and extreme drought will increase with climate change, UN agency says,” Feb. 19, 2009, available at www.un.org/apps/news/story.asp?NewsID=29957&Cr=climate+change&Cr1. For an example, see Moises Velasquez-Manoff, “Heat sends Southwest climate back in time,” *Christian Science Monitor*, available at <http://features.csmonitor.com/environment/2009/01/08/dry-us-southwest-is-growing-drier/>.

³³ DEIS Chapter 2, § 4.13, at 85. The DEIS does not address why these studies would not have significance for PINGP.

potential health risks.³⁴ The health impacts of the facility's total lifecycle exceed the localized cancer risks cited in the DEIS.

Increased Dry Cask Storage

The North Star Chapter has several concerns for the increased storage requested by Xcel Energy. The most significant concern is for the long-term solution for waste storage. In the shorter term, the Chapter has additional concerns for the potential health impacts and the scope of alternatives the DEIS considered.

I. The DEIS failed to consider cumulative impacts of storage.

The DEIS considers the effects of storage for the next 200 years.³⁵ There is no guarantee that the federal government will provide an alternative storage site within that time. The only planned federal facility at Yucca Mountain has stalled.³⁶ As the DEIS notes, the amount of nuclear waste will exceed the capacity of the Yucca Mountain facility before the facility would even open.³⁷ The final EIS should consider the possibility of longer-term storage on site in the absence of a permanent storage solution in a federal repository.

Potential changes to the flow of the Mississippi River may also present a risk for the ongoing storage of waste even within the 200-year period. Lengthy on-site storage increases the potential for significant flood events. Given that the facility is less than half a mile from the river and is directly next to Sturgeon Lake, major flood events might flood the facility and the independent spent fuel storage installation (ISFSI). While the earthen berm is 17 feet high,³⁸ the entrance to the ISFSI is at equal height with the surrounding land and provides no flood protection. The DEIS notes that in extreme flood conditions, water would reach more than halfway up the casks.³⁹ The DEIS states that the casks would be able to withstand the water height and flow, but provides no explanation.

The proximity of the Prairie Island Indian Community (PIIC) presents a further consideration for the ISFSI expansion. Any accident in an expanded ISFSI may have a greater impact because of the corresponding increase in radiation. The nearby residents would suffer greater effects because of the ISFSI expansion. The disparate effects on the Prairie Island Indian Community also raise issues of environmental justice. Environmental justice holds that no group "should bear a disproportionate share of the negative environmental consequences."⁴⁰ The radiation effects from the facility have a significantly greater effect on the PIIC than on others, given the Community's proximity.

³⁴ See L.S. Gottlieb and L.A. Husen, "Lung Cancer Among Navajo Uranium Miners," *Chest* 81 (4): 449-452, Apr. 1982, available at <http://www.chestjournal.org/content/81/4/449.full.pdf+html>

³⁵ DEIS Chapter 2, §4.10, at 23.

³⁶ See, e.g., "Yucca Mountain Plan for Nuclear Waste Dies," The Caucus Blog on The New York Times, Mar. 31, 2009, available at <http://thecaucus.blogs.nytimes.com/2009/03/31/yucca-mountain-plan-for-nuclear-waste-dies/>

³⁷ DEIS Chapter 2, §6.1, page 41.

³⁸ DEIS Chapter 2, §3.1, page 9.

³⁹ DEIS Chapter 2, § 5.3, page 28-29.

⁴⁰ "MPCA and Environmental Justice," Minnesota Pollution Control Agency, available at <http://www.pca.state.mn.us/assistance/ej.html>.

The DEIS overlooks transportation issues that will arise if a federal location can take the casks. The PUC's scoping decision excludes transport to Yucca Mountain, but does not explicitly exclude all transportation considerations.⁴¹ As Andrew Peters noted at the public hearing in Red Wing on April 21, the DEIS does not address how Xcel intends to remove the waste from the ISFSI. Increasing the number of casks that have to be move compounds the problem. The DEIS does note that it will not address movement of material to Yucca Mountain, which is appropriate given Yucca Mountain's current status; however, failing to address the movement of waste undercuts the assumption that the storage is only temporary. The inability to move the casks could render the ISFSI more permanent than Xcel intends.

II. The DEIS gave insufficient consideration of health impacts from storage.

No exposure to radiation is considered entirely safe. The increased storage of waste at the facility will increase the risk of cancer to facility workers and nearby residents. The Sierra Club supports additional analysis of health impacts based on the comments in section nine of the PINGP Study Group's DEIS comments written by Paula Maccabee. In addition, we have additional concerns about workers and growing populations.

The impacts will be greatest on the plant personnel, who will be exposed to increased skyshine radiation and handling radiation. The combination of uprate and ISFSI expansion combines these negative impacts. Allowing these combined increases exposes the plant personnel to unacceptably high levels of radiation.

The DEIS notes that 450 residents live close enough to the facility to have potential exposure to radiation. The city of Red Wing has grown from less than 10,000 residents to more than 15,000 in the last forty years. The DEIS should consider the impacts on additional nearby residents resulting from the growing population base in the 200-year period of analysis. An increase in nearby residents – and the additional waste at the ISFSI – would increase the risk of cancer beyond the presently projected risks.

In considering the scope of the effects, the DEIS does not sufficiently address the potential impacts beyond the Red Wing area. With the increased level of skyshine radiation, the significantly larger population within 50 miles would make one-in-two million probabilities lead to cancer cases and deaths. If an incident occurred at the ISFSI that led to greater exposure, such as mishandling of a cask or failure of a cask seal, the effects could be significantly greater.

The final EIS should address the potential harm to workers following the failure of casks in the ISFSI. The DEIS notes that recovery workers “would experience relatively greater health impacts” and fails to assess what those impacts because of substantial uncertainties in projections.⁴² At a minimum, the final EIS should provide possible effects based on reasonable ranges of assumptions. To understand the full impacts of the facility, these costs must be assessed and considered.

⁴¹ William Glahn, “Environmental Impact Scoping Decision,” State of Minnesota Office of Energy Security, Docket Nos. E002/CN-08-501, E002/GS-08-690, E002/CN-08-509, Nov. 13, 2008, at 6.

⁴² DEIS Chapter 2, §5.3, page 33.

Conclusion

The DEIS should consider a broader range of alternatives, additional environmental impacts, and cumulative effects of the proposed changes to Prairie Island. As Red Wing's city council and the public hearing in Red Wing showed, residents have significant concerns about the effects of the proposed changes. The Sierra Club North Star Chapter appreciates the effort that OES staff have made in the DEIS, and respectfully request the above-mentioned additions to the final EIS to provide a more thorough analysis of this proposal which will have a significant impact on Minnesotans long into the future.

Sincerely,

Co-Chair, Clean Air and Renewable Energy Committee
Sierra Club North Star Chapter