
ENVIRONMENTAL ASSESSMENT



In the Matter of the Application for a Route Permit and Certificate of Need for the Mud Lake to Wilson Lake 115kV High Voltage Transmission Line Project

PUC Docket No. ET-2/TL-06-980

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List of Acronyms and Abbreviations Used in this Document

BMP	best management practice
CON	Certificate of Need
dB	Decibels
dBA	A-weighted sound level recorded in units of decibels
d/b/a	doing business as
DNR	Minnesota Department of Natural Resources
EA	Environmental Assessment
EMF	electromagnetic field
EFPP	Energy Facility Permitting
EQB	Minnesota Environmental Quality Board
FAA	Federal Aviation Administration
HVTL	high voltage transmission line
Hz	Hertz
kV	Kilovolt
MDH	Minnesota Department of Health
DOC	Minnesota Department of Commerce
MDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MW	megawatt
NAC	noise area classification
NESC	National Electrical Safety Code
NIEHS	National Institute of Environmental Health Sciences
NPDES	National Pollutant Discharge Elimination System
NWI	National Wetlands Inventory
ppm	parts per million
PUC	Minnesota Public Utilities Commission
ROW	Right-of-Way
SHPO	State Historic Preservation Office
SWPPP	Storm water pollution prevention plan
TH	Trunk Highway
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 Introduction

On July 28, 2006, Great River Energy (GRE) filed a route permit application under the alternative review process for the Mud Lake to Wilson Lake transmission line project (PUC docket: ET2/TL-06-980). On the same date, GRE filed an application for a Certificate of Need (CON) for the same transmission project (PUC docket: ET2/CN-06-367).

GRE is a not-for-profit generation and transmission cooperative based in Elk River, Minn. GRE provides electrical energy and related services to 28 member distribution cooperatives that, in turn, supply electricity and related services to more than 500,000 residential, commercial and industrial customers in Minnesota and Wisconsin.

The Minnesota Department of Commerce (DOC) is required to perform environmental review on CON and route permit applications to inform the final decisions made by the Minnesota Public Utilities Commission (PUC or Commission). The PUC directed the DOC to combine the environmental review into a single document to streamline the regulatory and public participation process. This Environmental Assessment (EA) document covers environmental review required for the CON and route permit applications.

Chapter 1 and 2 provide background on the proposed project and the regulatory process for both applications. Chapter 3 describes and analyzes alternatives to the proposed Mud Lake to Wilson Lake transmission line that attempt to reduce, mitigate or eliminate the need for the proposed transmission line. The analysis of alternatives is required by Minnesota Rule 7849.0230 and 4410.7035 for the CON application.

Chapters 4 through 6 provide the analysis required for transmission line route applications under Minnesota Rule 4400.2750, as well as, the analysis of impacts and mitigation measures required by Minnesota Rule 4400.7035 for the CON application. Chapter 4 addresses the human and environmental impacts of GRE's proposed transmission line and route, as well as, the alternative route proposed by members of the public. Chapter 5 addresses the feasibility, reliability, and unavoidable impacts of the proposed route and alternative route. Chapter 6 describes the additional permits required for the project.

1.1 Project Description & Right-of-Way Requirements

GRE proposes to build a new 115 kilovolt (kV) high voltage transmission line (HVTL) from the Mud Lake Substation owned by Minnesota Power to the Wilson Lake Substation owned by GRE's distribution customer Mille Lacs Energy Cooperative. The length of the proposed transmission line is approximately 12 miles. GRE also proposes a 4.55 acre expansion of the Wilson Lake Substation to accommodate new transmission and distribution infrastructure related to this project.

GRE's proposed transmission line route begins at the Mud Lake Substation and parallels existing 230 kV and 115 kV transmission lines north to the Oak Lawn Substation, a distance of about 1.5 miles. At the Oak Lawn Substation, the proposed line will run eastward and parallel to

Minnesota Trunk Highway 18 (TH 18 or Highway 18) to the Wilson Lake Substation, a distance of approximately 10.5 miles. GRE indicates that it would build the proposed transmission line approximately 5 to 10 feet outside of the TH 18 right-of-way (ROW) on easements to be acquired if a route permit is issued.

The EA analyzes an alternative route for the Mud Lake to Wilson Lake line using all or a portion of the existing Oak Lawn to Wilson Lake 69 kV transmission route owned by GRE. The Oak Lawn – Wilson Lake line is about 1 mile south of and generally parallel to Highway 18.

The ROW requirements for the proposed route and route alternative differ slightly. Along the Highway 18 route, and portions of the route alternative parallel to township or county roads, GRE requires a 70 foot wide (35 feet each side of the center line) ROW free of trees. If transmission line structures are placed within 10 feet of a road ROW, up to 45 feet of ROW clearing on private lands would be required. The remaining 25 feet of cleared space needed is typically found on the highway ROW, which are usually previously cleared of trees. This practice limits the amount tree clearing and easements required on private land easements.

Where the alternative route shares the existing 100 foot Oak Lawn – Wilson Lake ROW, 55 to 70 feet of additional ROW is needed to provide adequate spacing between the lines and between the line and the edge of the ROW. Only 35 – 50 feet of the existing ROW is currently cleared of trees meaning that a significant amount of tree clearing would be required. Much of the route alternative is located in thick forest.

Project Component	Length	Structure Type	Average Structure Height	Average Span Length	New ROW
GRE's Proposed Route along Highway 18	12 miles	Single Pole, Wood Horizontal Post Insulators, with distribution underbuild	60 - 75 ft.	250 - 300 ft.	70 ft.
Route Alternative primarily along Existing 69 kV ROW	11 – 13 miles	Single Pole, Wood Horizontal Post Insulators	60 - 75 ft.	300 – 400 ft.	55 – 70 ft. new, 100 ft. existing,

Table 1. Right-of-Way Requirements

1.2 Project Location

The GRE Mud Lake to Wilson Lake transmission line project is proposed in Crow Wing County, Minnesota. The project area is east of Brainerd and terminates a few miles west of Garrison near the shores of Lake Mille Lacs. The Highway 18 route proposed parallels existing transmission

lines and a state highway. The proposed route alternative parallels an existing transmission line, existing roads, and potentially involves new cross country ROW.

The project area is rural and is rich in lakes, wetlands, forest and agricultural areas. The area contains seasonal homes, permanent residences, and several commercial areas. Transmission and distribution lines are present along and near the proposed route and route alternative. The area contains several major state highways, and numerous county and township roads.

The proposed route and route alternative are displayed on the project location map in Figure 1.

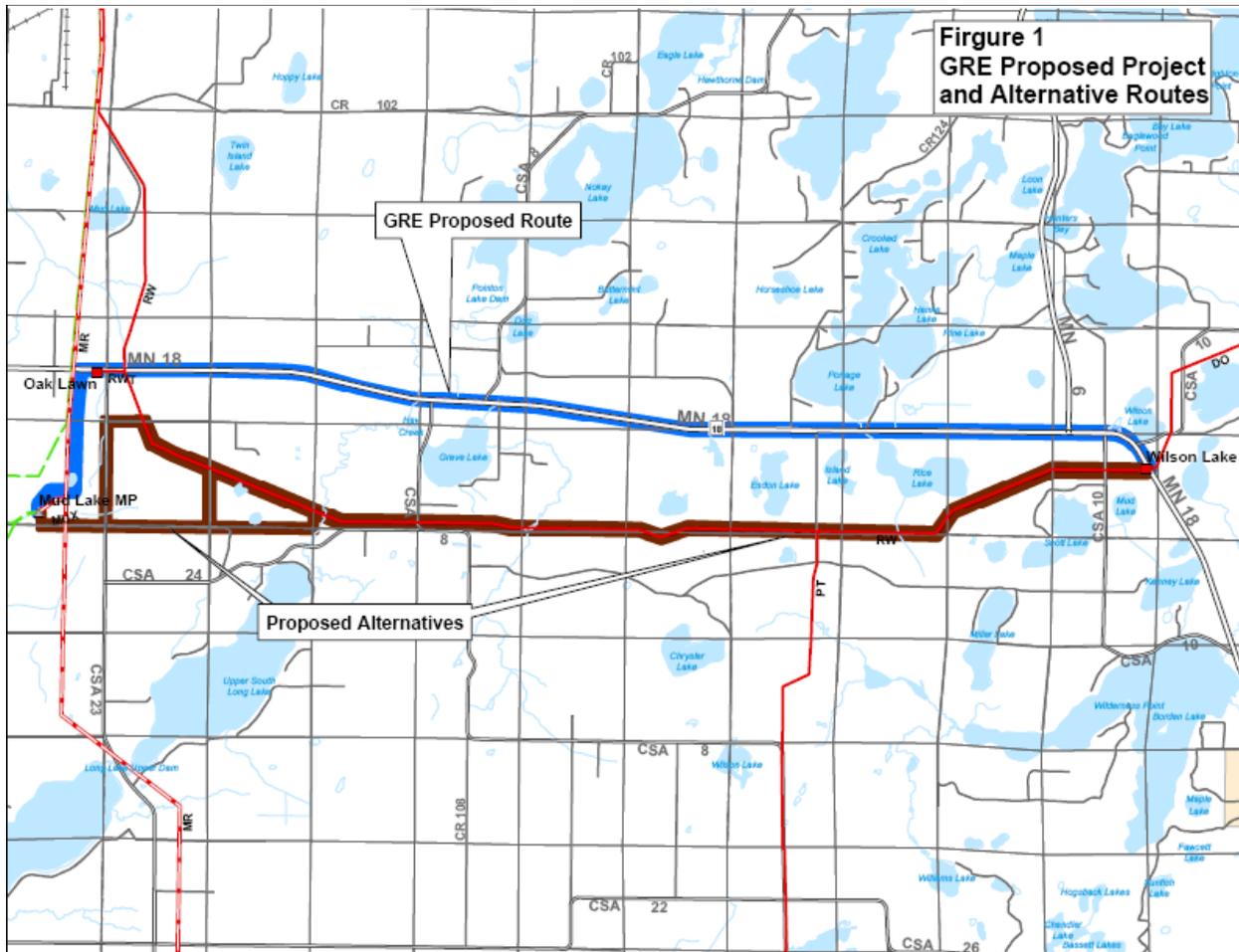


Figure 1. Project Route and Route Alternative Map

1.3 Project Purpose

The project is being proposed by GRE to improve electric system reliability in the Lake Mille Lacs area and to supply this rapidly growing area with electricity into the future.

Electric demand in the Lake Mille Lacs area is growing at a rapid rate. The peak electrical load in the area served by the Wilson Lake Substation, and in the Lake Mille Lacs area generally, exceeds the existing transmission system's capacity during peak load conditions. GRE indicates that the 2005 peak electrical load in the area was 52.4 MW, exceeding existing transmission capacity of 52 MW. As load increases over time the existing system will not be able to provide reliable electrical service and outages may increase in frequency and severity.

GRE indicates that a new 115 kV transmission line from the Mud Lake Substation to the Wilson Lake Substation and modifications at the Wilson Substation will solve reliability and voltage support issues for the next 10 - 15 years.

GRE's CON application requests certification of the need for this transmission line. GRE's route application requests a transmission line route for the proposed line along Highway 18.

1.4 Sources of Information

Much of the information contained within this document was provided by the applicant in the company's CON and route permit applications ("Application"). First hand information was gathered by site visits along the route and information requests to the company. Additional sources of information are listed below:

- Minnesota Pollution Control Agency (<http://www.pca.state.mn.us/>)
- Minnesota Department of Natural Resources (<http://www.dnr.state.mn.us/index.html>)
- Minnesota Department of Health (<http://www.health.state.mn.us/>)
- Minnesota Department of Administration, State Demographic Center (<http://www.demography.state.mn.us/>)
- United States Census Bureau, QuickFacts, (<http://quickfacts.census.gov/qfd/states/27000.html>)

2.0 Regulatory Framework

Authority for reviewing and permitting high voltage transmission lines is under the jurisdiction of the PUC. The proposed Mud Lake to Wilson Lake transmission line project requires two major decisions by the PUC. The DOC Energy Facilities Permitting (EFP) unit assists the Commission by implementing the environmental review and public participation process, and recommending a final course of action.

2.1 Certificate of Need Requirement

The proposed project is considered a large energy facility under Minnesota Statute 216B.2421 Subd. 2 (3), as it is between 100 kV and 200 kV, and exceeds 10 miles in length. A Certificate of Need from the PUC is required for the proposed project.

2.2 Route Permit Requirement

Minnesota Statute 216E.03 Subd. 2 (formerly 116C.57 Subd. 2), states that no person may construct a high voltage transmission line (HVTL) without a route permit from the PUC. A high voltage transmission line is defined by Minnesota Statute 216E.01, Subd. 4 (formerly 116C.52 Subd. 5), as any transmission line capable of operating at a voltage of 100 kV or more. The proposed project is eligible for the Alternative Permitting Process found in Minnesota Rule 4400.2000.

2.3 Scoping Environmental Impacts and Alternative Routes

The Department's EFP unit held a public information and EA scoping meeting on September 19, 2006, at the Garrison Township Hall to discuss the project with the public and to solicit input into the scope of the EA. Approximately 12 persons attended the public meeting. A public comment period on the scope of the EA closed on October 6, 2006. Two comment letters and one petition were received. One comment letter was signed by six landowners adjacent to the route. The petition was signed by 52 people owning land, businesses or residing near the proposed route. The comments and petition proposed a route alternative to be included in the EA. Commissioner Glenn Wilson of the Minnesota Department of Commerce issued the Scoping Order for the EA on October 19, 2006 (Appendix).

The route alternative calls for the construction of the new Mud Lake – Wilson Lake 115 kV line using all or a portion of the existing Oak Lawn to Wilson Lake 69 kV transmission route owned by GRE. The Oak Lawn – Wilson Lake line is about 1 mile south of and generally parallel to Highway 18. GRE considered this route as an alternative in its pre-application analysis, however GRE rejected it due to cost and reliability issues.

No additional alternatives were suggested by the applicant or any other party, except for expressing preferences for the route on a particular side of Highway 18. Those areas will be addressed as within the scope of the proposed line. The public comments can be reviewed at:

<http://energyfacilities.puc.state.mn.us/Docket.html?Id=18665>

2.4 Environmental Assessment and Environmental Report Requirements

The DOC is required to prepare an EA on the route permit application. The EA contains information on the human and environmental impacts of the proposed route and addresses mitigation measures. According to Minnesota Statutes 216E.04, Subd. 5 (formerly 116C.576 Subd. 5), the EA is the only state environmental review document required to be prepared on the project.

The DOC is also required to prepare an environmental report (ER) on the CON application for the proposed project. The ER contains information on the human and environmental impacts of the proposed project and analyzes alternatives. Requirements for the ER are found in Minnesota Statutes 216B.243, Subd. 4, and Minnesota Rule 4410.7035.

Pursuant to Minnesota Rule 4410.7060, the PUC has combined the CON and route permit processes for this line for purposes of process efficiency, environmental review, and to simplify public participation. This EA includes the ER conducted for CON applications, including an analysis of alternatives to the transmission line required by Minnesota Rule 4410.7035. The PUC authorized the DOC to follow environmental review and public participation procedures found in Minnesota Rule 4400.2000, the Alternative Permitting Process.

3.0 Analysis of Alternatives to the Proposed Project

Chapter 3 contains the analysis of alternatives to the proposed Mud Lake to Wilson Lake transmission line project normally found in a Certificate of Need Environmental Report. This chapter analyzes the general impacts of, mitigation measures for, and the feasibility of project alternatives.

Alternatives to the proposed transmission project evaluated in this chapter attempt to reduce, mitigate, delay or eliminate the need for the proposed transmission line, while delivering the proposed “needed” energy to the Wilson Lake Substation. The analysis in this chapter includes general impacts, mitigation, cost, and feasibility of the alternatives to the project. The description and analysis of general impacts associated with transmission lines typically in a route permit EA are included in Chapter 4.

Project Alternative	Length	Estimated Capital Cost	Reliability and Availability	Serves Underlying Need Long Term
GRE's Proposed Route along Highway 18	12 miles	\$15,872,000	Highest reliability, 99.9% availability	Yes
No Build Alternative	0	\$0	Lowest	No
Conservation Alternative	0	Cost of transmission line capacity	Low	No
Transmission Option 2	128 miles	\$137,300,000	Reliability concerns during construction, 99.9% availability	Yes
Transmission Option 2B	71 miles	\$84,500,000	Reliability concerns during construction, 99.9% availability	Yes
Transmission Option 3	13 miles	\$34,700,000	Moderate reliability, 99.9% availability	No
Generation Alternative	0	\$31,400,000	Lower reliability and 95% available	No

Table 2. Summary of Project Alternatives

3.1 No Build Alternative

As required by Minnesota Rule 4410.7035, Subp. 1B, a no build alternative to the proposed project is evaluated in the EA. This alternative assumes that the proposed Mud Lake to Wilson Lake Transmission line is not built.

The no build alternative avoids all human and environmental impacts associated with building the proposed transmission line, such as clearing trees, visual, construction, and noise impacts. However, socioeconomic impacts to the area's economy, public safety, and livability could be more frequent and potentially more severe due to reduced transmission reliability. These impacts could have varying economic and quality of life impacts for people affected.

GRE provides a detailed analysis of the impacts of delaying the proposed transmission line to future dates in Chapter 8 of its CON application. The no build alternative would have the same impacts as indefinitely delaying the proposed line. GRE's analysis shows that the longer the proposed line is delayed, the number of days, the amount of load needed to be shed (blacked out), and the number of customers at risk of being blacked out increases during times when demand exceeds transmission capacity. GRE concludes that:

“an indefinite delay would result in a blackout of the majority of the load in the region with the expected growth rate. If load is not shed, regional transmission may be impacted as failures may populate as facilities start to overload and fail, causing potential expansion of transmission failure beyond the local area” (page 8-3).

The no build alternative does not provide adequate electric delivery capacity, nor reliable electric service for customers in the immediate and long term future. The no build alternative would put the electrical system and customer equipment at risk of frequent, prolonged outages, damage and possible destruction.

GRE indicates that its distribution cooperative's customers in the area would bear most of the impacts of outages. Outages can have wide ranging local and regional economic impacts, especially when electric interruptions cause lost production, damage or destruction to customer equipment.

The impact of greatest concern under the no build alternative is a multiple day or longer transmission outage during severe winter weather conditions causing outages that prevent heating of area homes and businesses. Potential impacts include loss of business production, loss of life and damage to homes or business.

The no build alternative is feasible, but not viable. It does not achieve GRE's stated need to provide reliable electricity to the region. It places customers at significant risk of frequent, costly, and prolonged service disruptions and outages.

3.2 Conservation Alternative

Minnesota Rule 4410.7035, Subp. 1B, requires that an energy conservation alternative to the proposed project be evaluated in the EA. This alternative assumes that the proposed Mud Lake to Wilson Lake Transmission line is not built and energy conservation measures are implemented as an alternative.

Minnesota law requires most utilities to offer energy conservation and demand side management (DSM) programs to customers. These programs attempt to reduce both peak electricity demand and overall annual electricity use. Peak demand typically occurs on the hottest summer and winter coldest days when air conditioning or electric heat use is highest. Programs targeted at annual energy seek to reduce energy use by continuously operating customer equipment, such as refrigerators and lighting systems.

Energy conservation and DSM programs depend on voluntary customer participation. Even though conservation and DSM programs save customers money without sacrificing comfort, not all customers participate in the programs.

Conservation and DSM alternatives cost money, however when successful and structured properly the financial benefits of the programs outweigh the costs. These programs can improve environmental quality by reducing the amount of electricity generated, thus reducing air pollution. The programs also delay the need for new generation and transmission capacity.

GRE has indicated that the current electrical demand in the area exceeds the transmission system's rated capacity. GRE indicates that conservation and DSM programs may have already delayed the need for the proposed transmission line.

GRE provides data and analysis of its energy conservation and DSM programs in Chapter 7 of its CON application. GRE's analysis shows that future energy conservation programs would have to be very aggressive and results immediate to further delay the need for the proposed transmission line.

GRE reports the capacity cost of energy conservation program elements necessary to achieve savings sufficient to delay or avoid the proposed transmission line exceed the capacity cost of the proposed transmission line without providing the same level of benefits as the proposed transmission line.

In its November 1, 2006, comments the DOC analysis of GRE's forecasts and existing conservation programs conclude that "GRE's forecasted overload condition can not be avoided with existing conservation programs" and that "the Department agrees with GRE that the future conservation program would not be sufficient to avoid overload condition in Lake Mille Lacs region."

The conservation alternative is not a feasible alternative to the proposed transmission line project.

3.3 Existing Transmission Line or System Improvements

In Chapter 3 of its CON application, GRE analyzes two transmission line or transmission system options that would provide sufficient transmission capacity in the area to meet area load growth and enhance reliability. The two transmission options require rebuilding, reconductoring, or building new transmission lines along new ROW. GRE's transmission system options summarized below and in Table 2:

- Option 2 and 2B** Upgrade all or a portion of the existing 69 kV system to 115 kV
- Option 3** New 69 kV line Kimberly Sub to the Glen Substation

GRE's transmission Options 2 and Option 2B each upgrade all or a portion of the existing 69 kV transmission system to 115 kV. The 69 kV system encircles the entire area surrounding Lake Mille Lacs. Options 2 and 2B require upgrading 71 to 128 miles of transmission lines and new high voltage equipment at substations. The cost of Options 2 and 2B are estimated at \$84 to \$135 million, or approximately 5 to 9 times more expensive than the proposed Mud Lake – Wilson Lake transmission line.

Options 2 and 2B require significant portions of the existing transmission system be taken out of service to upgrade the 69 kV system to 115 kV. GRE believes that this could put the transmission system at risk if a contingency occurred during reconstruction triggering possible blackouts, voltage collapse, or overload of existing facilities.

GRE's transmission Option 3 requires building a new 69 kV transmission line from the Kimberly distribution substation to the Glen Substation, a distance of about 13 miles. Option 3 requires new high voltage transmission substation at the Kimberly site, located between Aitkin and McGregor. The Glen Substation is located near Highway 47 on the northeastern corner of Lake Mille Lacs. Option 3 is estimated at \$34.7 million, more than twice the cost of the proposed Mud Lake to Wilson Lake transmission line.

GRE concluded that Option 3 has several limitations affecting its viability. GRE's analysis found that the 115 kV transmission line at Kimberly cannot handle the addition of large loads. Thus, Option 3 is too weak to supply the northwest Lake Mille Lacs area with electricity over the long term. GRE concluded that Option 3 will require the Mud Lake – Wilson Lake transmission line to be built in approximately 10 years.

The human and environmental impacts of Options 2, 2B, and 3 are similar to the proposed Mud Lake – Wilson Lake line on a per transmission line mile basis. Options 2 and 2B affect substantially greater amounts of ROW requiring tree clearing, therefore the cumulative impacts would likely greater than the proposed Mud Lake – Wilson Lake line. Option 3, the Kimberly to Glen line, would have impacts and mitigation measures very similar to the proposed Mud Lake to Wilson Lake transmission line.

In its November 1, 2006, comments, the DOC concurs with GRE's conclusion that Options 2, 2B and 3 are not prudent alternatives to the proposed Mud Lake – Wilson Lake project due to the significantly higher costs of the alternatives.

The transmission alternatives examined in the EA are feasible, but significantly exceed the cost of the proposed Mud Lake – Wilson Lake transmission project. Options 2 and 2B may have greater total environmental impacts due to their significantly greater project size. Option 3 provides a shorter term, higher cost solution with expected human and environmental impacts similar to the Mud Lake – Wilson Lake project.

3.4 Generation Alternative

As required by Minnesota Rules 4410.7035, Subp. 1B, a generation alternative to the proposed transmission project is evaluated in the EA. This alternative assumes that a generation facility at the Wilson Lake Substation is built instead of the proposed Mud Lake to Wilson Lake Transmission line.

General description and location

The EA expands on the generation alternative proposed in the GRE CON application, which analyzed building initially a 5 MW, scaleable, generation system using diesel fueled generator sets each 1.5 MW – 2.0 MW in size. The EA assumes that the generation system is built on the site of or adjacent to the Wilson Lake Substation. To accommodate continued electric growth in the area, a scaleable generation system is required to accommodate additional generation units up to 20 MW total system capacity by 2020.

GRE reports that natural gas service capable of supplying a generating unit of this scale is not available at the Wilson Lake Substation, nor in the surrounding area. The most likely fuel used would be diesel fuel. Building a natural gas pipeline to accommodate the generation project would substantially add to the generation alternative capital cost.

GRE indicates that renewable resources such as wind energy, currently the lowest cost renewable energy option, are not available in the general area. Wind resources in the area and current wind energy technology together are not capable of avoiding or serving the underlying need of the proposed transmission project.

Human and environmental impacts

A 5 – 20 MW diesel generation system will require several acres of land for the generator sets, fuel storage tanks, electrical switch gear, an operating and maintenance building, and associated infrastructure. Up to 10 acres of land would be needed for the diesel generating facility.

Diesel generation systems emit a variety of air pollutants, noise, and have a visual impact. Additionally, there is a risk of fuel or hazardous materials spills from storage of large quantities of fuel and hazardous materials associated with ongoing maintenance of diesel generators.

Air Impacts

Diesel generators produce air emissions greater than, and not associated with, the proposed transmission line. Diesel generator emissions include carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO₂), volatile organic compounds (VOC), and particulate matter (PM). Each of these are regulated pollutants.

In particular, emissions of NO_x, PM, and VOC are concern to pollution control agencies. These pollutants mix under certain conditions creating high levels of haze and ground level ozone. Haze and ground level ozone can contribute to respiratory cardiac problems, especially the young, the elderly, and those with preexisting conditions. These chemicals (and their precursors) can be transported in the air for hundreds of miles. When haze and ground level ozone levels exceed health risk thresholds, air quality advisories are issued to inform the public of the potential for respiratory and cardiac problems.

Total air pollution generated by a diesel generation system is dependent on facility configuration, operating characteristics, fuel, and the duration of operation. The EA assumes the generation system is used only in contingency or peak demand situations to avoid running diesel generation for extended periods of time. Extended operation of diesel generators can contribute to higher air pollution and noise emissions and increase the system's capital and fuel costs.

Mitigation measures for human and environmental impacts

There are two methods to mitigate air pollution impacts from a diesel generation alternative. First is to choose generation equipment with the lowest emissions. Second is to minimize the use of diesel generation to emergency, peak load, and contingency situations, which limits emissions. However, even with these measures in place, a diesel generation system alternative would emit more pollution to the air in the area than the proposed transmission line.

To reduce noise impacts, the diesel generation system could utilize noise mitigation measures such as mufflers and sound baffles to ensure compliance with the Minnesota Pollution Control Agency rules limiting noise levels at the nearest residential homes. These measures are standard and are generally available from generator manufacturers.

Feasibility and Availability

The diesel generation alternative is feasible and the technology is widely available in Minnesota. However, a diesel generation alternative is less reliable, has greater environmental impact and costs significantly more than the proposed transmission line. The DOC November 1, 2006 comments on the CON application indicate that the diesel generation alternative is not a reasonable alternative to the proposed Mud Lake – Wilson Lake transmission line due to significantly higher cost and lower reliability.

Generator sets have a lower availability rating than transmission lines, meaning that generators may not be able to operate when needed by the utility. GRE reports that transmission lines are available 99.9 percent of the year and generator sets 95 percent.

Operating diesel generation only at peak demand conditions reduces operational cost and environmental impact, but reduces the generation system's ability to immediately pick up load under transmission emergency conditions, such as an unexpected line outage.

Based on cost estimates provided by GRE in its CON application, the diesel generation alternative is more than three times more expensive than the proposed transmission line while providing somewhat less reliability.

4.0 Impacts of the Proposed Route and Route Alternative: Assessment of Impacts and Mitigation Measures

There are a number of potential impacts associated with an HVTL that must be taken into account on any project. Minnesota Rule 4400.3150 designates certain factors that must always be considered when examining a high voltage transmission line route application. These and other factors relevant to the proposed transmission line, proposed route and the proposed route alternative are addressed in Chapter 4.

4.1 Description of Environmental Setting

The project area is east of Brainerd and terminates a few miles west of Garrison near the shores of Lake Mille Lacs. The project as proposed would parallel an existing transmission line and an existing state highway. The route alternative would parallel existing township or county roads, travel cross country through forested areas, and parallel an existing transmission line ROW.

The project area is rural and is rich in lakes, wetlands, forest and agricultural areas. The area contains seasonal homes, permanent residences, farms and commercial areas. Several transmission and distribution lines are present along the proposed route and route alternative.

4.2 Impacts on Human Settlement

The proposed route and route alternative will have minimal impacts on human settlement. The line along either route will emit noise and will be visible to people. The Highway 18 route will pass within 250 feet of more homes and businesses than the alternative route. The route alternative will pass very close to several homes, possibly requiring a reroute.

4.2.1 Socioeconomic

According to the 2000 U.S. Census demographics, Crow Wing County is approximately 97.5 percent white. Minority groups in the area constitute a very small percentage of the total population. No impacts are anticipated to minority or low-income populations.

Location	Population	Per Household Income	Percentage of Population Below Poverty Level
Crow Wing County (2000)	55,099	\$37,589	9.8

Table 3. Population and Income

Census data also show that Crow Wing County's population is rapidly growing. U.S. Census data show that between 2000 and 2005, the county's population grew 8.7 percent, twice the statewide growth over the same period. From 1990 – 2000, Census data show Crow Wing County's population grew 24.5 percent.

Electric load growth can be expected when human population grows. As discussed in Chapter 3, GRE indicates that electrical load growth is growing at a rapid rate in the project area. GRE indicates that electrical loads in the area are growing at over 4 percent annually and are expected to continue to grow at similar rates.

GRE estimates that approximately 15 – 20 skilled workers will be required to build the transmission line and substation. During construction, there will be a small positive impact on the community due to the expenditures of the construction crews in the local community. GRE does not anticipate the creation of permanent jobs resulting from this project.

Reliable and adequate electric service can benefit local economic conditions. Frequent electrical outages or low voltage conditions can cause damage to customer equipment and cause economic losses to businesses. These are negative socioeconomic impacts.

4.2.2 Displacement

There are several areas of concentrated residential and commercial development immediately adjacent or close to the proposed route and the route alternative. Many homes and businesses are located along the proposed Highway 18 route. The route alternative avoids the development along Highway 18; however the alternative passes very close to several homes and farmsteads. In general, the route alternative would have fewer homes, farms and businesses within 250 feet of the line.

The proposed Highway 18 route will not displace residential homes or businesses. GRE conducted a survey to determine the distance of homes, farms and businesses are from the centerline of Highway 18. The survey found that 87 homes, farms and businesses are within 250 feet of the centerline of Highway 18. GRE indicates that it can meet National Electric Safety Code (NESC) transmission line setback requirements from structures along Highway 18.

GRE indicates that the route alternative may not provide an adequate transmission line set back from several homes required by the NESC. The area of concern is located near the intersection of Pine Center Road and County Road 24. This area contains several homes near and on both sides of the existing 69 kV transmission ROW. GRE indicates that the 115 kV transmission line would need to be routed along a separate ROW in this area. The most likely reroute would place the 115 kV line along portions of County Road 24 and Pine Center Road. While this routing option would avoid displacing homes, the 115 kV line would be within 250 feet of at least 6 homes or farms in this section.

4.2.3 Noise

Transmission lines and substation transformers produce audible noise under certain conditions. The level of noise or its loudness depends on line conditions, voltage level, and weather conditions. In foggy, damp, or rainy weather conditions, transmission lines can create an audible crackling sound due to small amounts of electricity ionizing moist air near the wires. During heavy rain the general background noise level is usually greater than the noise from a transmission line. During light rain, dense fog, snow, and other times when there is moisture in the air, the proposed transmission line will produce audible noise higher than rural background levels but similar to household background levels. During dry weather, audible noise from transmission lines is a nearly imperceptible and sporadic crackling sound.

The Minnesota Pollution Control Agency noise regulations (Minnesota Rule 7030.0050) list various activity categories by Noise Area Classification. The table below identifies the established noise standards for daytime and nighttime by NAC. The standards are expressed as a range of dB(A) (a measure of sound) within a one hour period; L₅₀ is the dB(A) that is exceeded 50 percent of the time within an hour, while L₁₀ is the dB(A) that is exceeded ten percent of the time within the hour.

Noise Area Classification	Daytime		Nighttime	
	L ₅₀	L ₁₀	L ₅₀	L ₁₀
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Table 4. MPCA Noise Standards

GRE estimates that the proposed line, under worst case conditions of heavy rain, will emit approximately 15.3 dB(A) of sound directly under the line and 14.2 dB(A) at the edge of the ROW 35 feet away from the line. According to the Minnesota Pollution Control Agency's "Guide to Noise Control in Minnesota," a 15 dB(A) sound level is equivalent to the sound of a whisper (MPCA, 1999).

Residences fall within NAC 1. While the nearest noise receptors are potentially within approximately 50 feet from the proposed 115 kV transmission line along both route options, the audible noise generated from the transmission line is not expected to exceed the Minnesota noise standards.

Substation transformers also produce noise under certain conditions. The proposed changes at the Mud Lake and Wilson Lake substations are not expected to impact area noise levels. The substations are shielded from homes and businesses by distance, forested and agricultural areas. There are no known reports of noise complaints at either of the existing substation sites.

Another source of noise associated with transmission lines is an inaudible electromagnetic generated noise termed Corona. Corona on transmission line conductors can cause interference with radio waves, primarily with AM radio stations and the video portion of television signals, depending on the frequency and strength of the radio and television signal. Although radio and television interference sometimes occurs GRE will investigate all reported problems and will correct problems caused by GRE facilities. GRE does not expect that there will be any impacts from the operation of the new line.

4.2.4 Aesthetics

GRE proposes to use 70 foot wood transmission line poles with horizontal post insulators for the line 115 kV. This type of transmission structure has a narrow profile as compared with other types of 115 kV transmission structures. GRE intends to place existing overhead distribution lines along Highway 18 on the 115 kV structures. This practice is called an underbuild. Examples of the types of structures proposed for the project are found in Figure 2 and Figure 3 below.

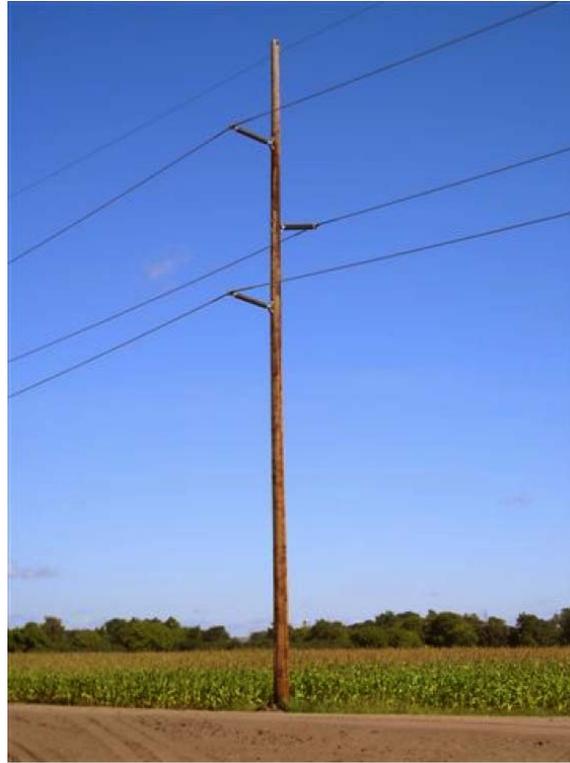


Figure 2. 115 kV Horizontal Post Structure



Figure 3. 115 kV Horizontal Post Structure w/ Distribution Underbuild

The 115 kV transmission line may stand out against other land uses along the route. The area along the Highway 18 route is rapidly developing and includes a mixture of residential, commercial, light manufacturing, and agricultural land uses. Overhead distribution lines are present along portions of Highway 18. The transmission line poles may be in contrast to the existing land uses in some cases.

The visual impact of the new line may be less noticeable or incremental in the western portion of the proposed route and route alternative. The western portion of the project area contains several existing transmission lines. A new line on either route will likely be an incremental visual impact rather than a completely new visual intrusion in this area.

If the route alternative is selected, the visual impact of the new line will be incremental in along the existing Oak Lawn – Wilson Lake ROW. The ROW will become wider, however much of it is cross county and away from public road corridors.

Although the transmission line and structures may contrast with surrounding land uses, the proposed route and route alternative utilize existing corridors and will avoid homes to the greatest extent practicable. GRE will work with landowners to identify concerns related to the transmission line, tree clearing and aesthetics. The final alignment of the transmission line, if routed along Highway 18, could cross the highway several times in order to avoid homes and businesses. If routed along the alternative route, the line will cross several township and county roads.

4.2.5 Human Health and Safety

The proposed transmission line will be designed in compliance with local, state, NESC, Rural Utilities Service (RUS), and GRE standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and ROW widths. GRE construction crews and/or contract crews will comply with local, state, NESC, and GRE standards regarding installation of facilities and standard construction practices. Established GRE and industry safety procedures will be followed during and after installation of the transmission line. This will include clear signage during all construction activities.

The proposed transmission line will be equipped with protective devices to safeguard the public from the transmission line if an accident occurs, such as if a structure or conductor falls to the ground. The protective equipment will de-energize the line should such an event occur. The substation facility will be fenced and access limited to authorized personnel. Proper signage will be posted warning the public of the risk of coming into contact with the energized equipment.

4.2.6 Electric and Magnetic Fields

Electric and magnetic fields (EMF) arise from the flow of electricity and the voltage of an electrical line. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors.

Many years of research on the biological effects of electromagnetic fields have been conducted on animals and humans, and no association has been found between exposure to EMF and human disease. While the consensus is that EMF poses no risk to humans, the question of whether exposure to EMF can cause biological responses or even health effects continues to be the subject of medical research and public debate.

In 2002, Minnesota formed an Interagency Working Group to evaluate the body of research and develop policy recommendations to protect the public health from any potential problems resulting from HVTL EMF effects. The Working Group consisted of staff from the Minnesota Department of Health (MDH), the Minnesota Department of Commerce, the Minnesota Public Utilities Commission, the Minnesota Pollution Control Agency, and the Minnesota Environmental Quality Board. The MDH coordinated the activities of the Working Group.

In September 2002, the Working Group published its findings in a White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options (hereinafter “White Paper”). The Minnesota Department of Health made the following statement in the White Paper:

“The Minnesota Department of Health concludes that the current body of evidence is insufficient to establish a cause and effect relationship between EMF and adverse health effects. However, as with many other environmental health issues, the possibility of a health risk from EMF cannot be completely dismissed. The uncertainty surrounding EMF health effects presents a difficult context in which to make regulatory decisions. This approach suggests that one should avoid any activity or exposure about which there are questions of safety or health, at least to the extent that an activity can be avoided easily or cheaply.”

Additional discussion of EMF can be found in the MDH White Paper and in other environmental reviews prepared by the EQB on proposed transmission lines. See the PUC Energy Facilities website.

There are no state or federal standards for transmission line electric fields. However, in previous transmission line permits, the EQB and PUC have imposed a maximum electric field limit of eight kV per meter measured one meter above the ground. The standard is designed to prevent serious hazard from shocks when touching large objects like a bus or farm equipment parked under high voltage transmission lines.

Minnesota does not have a standard for magnetic fields. The PUC and EQB have recognized in other transmission line proceedings that other states have established standards for magnetic fields, e.g., Florida (150 milligauss limit) and New York (200 milligauss limit).

GRE has modeled the electric and magnetic fields that might be found with the proposed 115 kV transmission line along the proposed route and route alternative. The results of this modeling are shown below. The maximum electric field expected immediately below the line is 0.5 kV per meter, well below the eight kV per meter allowance. The maximum magnetic field immediately beneath the line during contingency conditions is 43.1 milligauss.

Type	Voltage	Distance to Proposed Centerline (Miligauss)				
		-100'	-50'	0'	50'	100'
115 kV single-circuit Horizontal Pole w/ distribution underbuild, normal maximum conditions	115 kV	2	4.5	17.6	4.5	2
115 kV single-circuit Horizontal Pole w/ distribution underbuild, maximum contingency conditions	115 kV	22	15	43.1	15	22
115 kV single-circuit and 69 kV common corridor route alternative	115 kV and 69 kV	1.8	6.0	21.6	6.0	1.8

Table 5. Maximum Calculated Magnetic Fields (milligauss) at One Meter above Ground

4.3 Impacts on Land-based Economics

The proposed route and route alternative will have no or minimal impact on land-based economics. A small amount of farmland may be impacted due to the placement of transmission structures. The route alternative will have a minor impact on the Hesitation Wildlife Management Area. Additional archeological studies will be conducted to prevent disturbance of undocumented archeological sites.

4.3.1 Recreation

The general area near the proposed route and route alternative has many recreational opportunities. These include several wildlife management areas, numerous lakes and streams, multiple use trails. Paul Bunyan Land, a local tourist attraction, is located on the south side of Highway 18 along the proposed route.

Construction and operation of the route and route alternative will not directly impact these resources, with the possible exception of the Hesitation Wildlife Management Area (WMA), discussed below. The new transmission line structures along Highway 18 or the alternative route may contrast with the surrounding landscape; however, there will be no loss of recreational resources in the area. Both routes are located primarily along existing transmission and transportation corridors. This will minimize the visual impact to the surrounding recreational areas.

The alternative route crosses a portion of the Hesitation Wildlife Management Area. Routing a second line through this WMA may incrementally impact recreational resources. The EA assumes that the new line will pass through this WMA, which may have a minor effect on the use and enjoyment of the WMA for recreational purposes.

4.3.2 Prime Farmland

Farmlands designated as “prime farmland” are present in the project area. The Natural Resources Conservation Service (NRCS) is unable to determine the potential impacts of the transmission project until specific transmission pole locations are determined. This evaluation is expected to occur after a route is designated.

A small amount of farmland will be permanently impacted by the proposed project and route alternative. Permanent impacts will occur due to the placement of the transmission line poles. Temporary impacts may include soil compaction and crop damages within the ROW.

To minimize loss of farmland and to ensure reasonable access to the land near the poles, GRE intends to place transmission structures within 10 feet of the highway ROW along Highway 18 or within the same distance along township and county roads in the route alternative. When possible, GRE will attempt to construct the transmission line before crops are planted or following harvest. GRE will compensate landowners for crop damage and soil compaction that occurs as a result of the project. Soil compaction will be addressed by compensating the farmer to repair the ground or by using contractors to chisel plow the site.

4.3.3 Transportation

The Brainerd Regional Airport is located approximately five miles north of the western extent of the proposed Highway 18 route. GRE has consulted with the airport engineer to assure there are no conflicts with the airport’s approaches.

A Federal Aviation Administration (FAA) VOR navigation transmitting site is located approximately one-quarter of a mile south of Highway 18. GRE is conducting studies to determine if the proposed line could have any impact on this facility, however no impacts are expected. Similar FAA VOR sites are located in similar proximity to transmission lines in Minnesota with no known negative impacts. The FAA will study the proposed alignment of the line to determine if mitigation is required or if the proposed line will create a hazard to air travel.

The major roads in the area, including Highway 18, Highway 6 and Highway 169, are heavily used regional transportation corridors.

The Highway 18 route parallels existing roadways and transmission ROW for its entire length. The route alternative parallels existing road and transmission ROW for 90 – 100 percent of the route, depending on route selected from the Mud Lake Substation to the 69 kV ROW. About 1 mile of new, cross county ROW is required between Townline Road and the existing ROW if the most direct route alternative is selected.

The Minnesota Department of Transportation (MDOT) is planning an expansion of the interchange of Highway 18 and Minnesota Highway 6 in its long range plans. However, the transmission line is not expected to impact MDOT's expansion plans, which are uncertain and are not scheduled until 2020 or later. GRE has and will continue to consult with MDOT about future transportation planning issues.

The transmission line under either routing scenario will not affect transportation systems except for minor impacts during construction.

4.3.4 Mining and Forestry

The project area does not have any mining operations and will not impact any active mining operations. There are several areas where forestry is or could be practiced; however, the proposed line will not impact these operations with the exception of possible ROW clearing. For potential vegetation impacts, see 4.4.5 below.

4.3.5 Economic Development

The project area and Crow Wing County are rapidly developing into a regional economic center. The area is the center for tourism, recreational homes, local and regional governmental facilities, public services, and a wide variety of businesses.

Neither route will have negative impact on the region's economic development. However, the proposed route and route alternative may place the proposed line close to area homes and businesses. As discussed in Chapter 3, the transmission line may enhance economic development in the area by providing more reliable electric supplies with fewer outages as electric load grows into the future.

4.3.6 Archeological and Historic Resources

The State Historical Preservation Office (SHPO) informed GRE that there are a number of known archeological sites and a high degree of archeological potential in and near the proposed route and the route alternative. There are no properties listed on the National or State Registers of Historic Places along the route and route alternative.

GRE contracted a professional archeologist to conduct a cultural resources study to determine if project would impact any known archeological sites. GRE will perform a more detailed archeological study of the route if a permit is issued. The study will include extensive soil sampling along the final route to determine if archeological evidence is present and if so, recommend mitigation measures and documentation of sites pursuant to state and federal laws.

4.4 Impacts on Natural Environment

The proposed route and route alternative will have no or a minimal impact on the natural environment. A small impact to air quality can be expected during construction of both routes. Trees will be cut down along both routes. The Highway 18 route may require trees currently screening homes and businesses to be removed. The route alternative requires a greater quantity of tree removal. Transmission structures may be placed in wetland areas along both routes.

4.4.1 Air Quality

During project construction, there will be emissions from vehicles and construction equipment and fugitive dust from ROW clearing. Temporary air quality impacts caused by the proposed construction-related emissions are expected to occur. The magnitude of these emissions is influenced heavily by weather conditions, the specific construction activity taking place and equipment condition. Exhaust emissions from diesel equipment will vary during construction, but will be minimal and temporary.

The only potential air emissions directly emitting from a 115 kV transmission line result from corona. Corona can produce very small amounts of ozone and oxides of nitrogen in the air surrounding the conductor, especially in humid conditions. Corona consists of the ionization of air within a few centimeters immediately surrounding conductors. Ozone is a very reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short-lived and weather related. The project area will meet all federal and state air quality standards.

4.4.2 Water Quality, Soils and Geology

During construction there is the possibility of sediment reaching surface waters when land is disturbed by excavation, grading, and construction traffic. There are many surface water resources including streams, wetlands and riparian areas along both the proposed Highway 18 route and the proposed route alternative.

GRE will follow standard erosion control measures identified in the Minnesota Pollution Control Agency's (MPCA) Stormwater Best Management Practices Manual, such as using silt fencing to prevent impacts to adjacent water resources. A National Pollutant Discharge Elimination System (NPDES) permit is required for storm-water discharges associated with construction activities disturbing soil equal to or greater than one acre in area. GRE will limit ground disturbance in riparian areas to areas disturbed by ROW clearing and pole placement. GRE will obtain Work Permit for Public Waters licenses to cross public waters from the DNR and follow mitigation measures recommended to minimize impacts. Permits are discussed further in Chapter 6.

Once the project is complete it will have no impact on surface water quality, soil, and geology.

4.4.3 Groundwater and Wetlands

The proposed Highway 18 route will cross approximately 167 acres of wetlands, representing about 23 percent of the 12 mile route. Wetlands comprise approximately 40 percent of the 11 mile route alternative. In both cases, wetlands are concentrated primarily in the eastern half of the area.

If placement of transmission poles or construction in wetlands is necessary, GRE will minimize impacts by using special construction mats designed to limit disturbance and compaction. If areas of the wetland are disturbed, GRE will restore the area to preconstruction contours and will allow the existing seed bank to revegetate the area. Any soil removed from the wetlands will not be placed back into the wetland.

4.4.4 Fish and Wildlife Resources

There is a potential for temporary displacement of wildlife during construction and loss of small amounts of habitat from the proposed transmission line project. Wildlife that inhabits the trees

that will be removed for the transmission lines will likely be displaced. Comparable habitat is adjacent to the route, and it is likely that these organisms would only be displaced a short distance.

Raptors, waterfowl and other bird species may also be affected by the construction and placement of the transmission lines. Avian collisions are a possibility after the completion of the transmission line. Waterfowl are typically more susceptible to transmission line collision, especially if the line is placed between agricultural fields that serve as feeding areas, or between wetlands and open water, which serve as resting areas.

The area along the route and route alternative includes bald eagles and osprey nesting and feeding sites. However, the presence of several transmission lines in the general area has not negatively affected these birds. DNR staff indicate that transmission line structures have had positive impacts on ospreys by providing nesting sites and open areas to feed. Utility companies have worked with the DNR staff to remove or relocate raptor nests built on transmission line structures in the project area that pose a threat to transmission line safety or the birds themselves.

Electrocution of large birds is a concern related to lower voltage distribution lines. Electrocution occurs when birds with large wingspans come in contact with either two conductors or a conductor and a grounding device. GRE transmission line design standards provide adequate spacing to eliminate the risk of raptor electrocution. As such, electrocution should not be a concern related to the proposed transmission line. Additional mitigation measures addressing distribution level lines can be found in the Avian Power Line Interaction Committee's recommendations.

4.4.5 Vegetation

Trees are present along much of the route and route alternative, with exception of agricultural lands, wetlands, and along some developed areas. In general, the proposed Highway 18 route requires fewer trees to be removed than the route alternative. Trees within the permitted route will be removed to provide a tree-free ROW for the line.

As discussed in Chapter 1.1, the proposed route and route alternative require differing ROW widths. Most of the proposed Highway 18 route requires a 70 foot ROW to be acquired. Most of the route alternative requires at least an additional 55feet of ROW be added to the existing 100 foot ROW. However, only 35 -50 feet is currently clear of trees, meaning that up to 105 feet of tree clearing would be required.

To minimize impacts to trees in the project corridor, GRE will minimize tree removal and only remove trees located in the transmission ROW or trees which would threaten the safe operation of the line. GRE will work with landowners to discuss tree removal, trimming and ongoing vegetation management on transmission ROW if a permit is issued.

The one area where impacts may occur is where trees provide a buffer between a road or highway and a residence or business. In these cases, the homeowner or business owner may see a visual or notice a noise impact. Mitigation measures vary from case to case and may include the utility and

landowner agreeing to replace trees with shorter growing trees or vegetation within the ROW, or planting new vegetation outside the ROW. This may provide visual and noise screening while ensuring that trees do not grow into or endanger the safe operation of the transmission line.

The loss of trees due to the proposed project and route alternative are not expected to have significant impact.

4.5 Rare and Unique Natural Resources

Thirty two known occurrences of rare, endangered, threatened or species of special concern have been identified in the general vicinity of the proposed route and route alternative, according to the DNR Natural Heritage Database. Species identified are: bald eagles, red shouldered hawks, lake sturgeon, and a variety of native plants. However, based on the nature and location of the proposed project, the DNR did not believe any of these known occurrences of rare and unique resources would be affected by the proposed project along the Highway 18 route. The US Fish and Wildlife Service (FWS) also concluded that the project would not impact federally listed species.

GRE will not place transmission line structures on or clear ROW where identified threatened or endangered plant species are present. To the extent practicable, GRE will avoid placing transmission line structures near known nests of threatened or endangered animals and will consult with wildlife management agencies if such nests are discovered.

5.0 Feasibility of Alternatives

Feasibility of the proposed route and route alternative was evaluated based on reliability, cost and unavoidable of human and environmental impacts.

The proposed route and the route alternative are feasible, either could be built. Because the Mud Lake to Wilson Lake line and the Oak Lawn to Wilson Lake line are redundant to each other, the reliability of a common corridor route is an important routing consideration. The Highway 18 route provides a higher level of reliability compared to the route alternative due to significantly easier access.

5.1 Reliability of the Route Alternative

The North American Electric Reliability Council (NERC) establishes and maintains transmission line reliability standards applicable to GRE. NERC is authorized by the Federal Energy Regulatory Commission (FERC) as the standards issuing organization for transmission reliability standards. NERC's goal is to ensure the bulk electric system is planned, designed, operated and maintained ensuring electrical reliability and security. GRE is a member of the Midwest Reliability Organization (MRO), a regional reliability entity affiliated with NERC, and must comply with NERC standards. FERC is currently considering making NERC standards mandatory for all transmission lines in the United States.

While both the proposed Highway 18 route and the common corridor route alternative using the existing Oak Lawn – Wilson Lake ROW meet NERC reliability requirements, GRE indicates that the route alternative provides somewhat less reliability and will be more difficult to access and repair than the Highway 18 route.

Both the existing Oak Lawn – Wilson Lake and the proposed Mud Lake – Wilson Lake lines are redundant; they provide transmission service to the Wilson Lake Substation and surrounding customers. The Oak Lawn – Wilson Lake line is considered a “critical element” meaning that if it is lost at times when electric demand exceeds transmission capacity, controlled rotating blackouts may be required to avoid damaging the transmission system or customer equipment.

The Mud Lake – Wilson Lake line is being proposed to address this weakness in the transmission system. However, if both lines are placed in a common corridor, a number of possible emergencies could cause an outage of both the Oak Lawn – Wilson and Mud Lake – Wilson lines. If both lines were taken out of service, controlled blackouts in the project area would be implemented.

If both lines are placed in a common corridor, a number of possible emergencies could cause an outage of both lines. These are similar to failures which occur on separate lines sharing the same transmission structures, called “double circuit” lines. Failures on double circuit lines which have occurred in the region include:

- Lightning strike causing outages on both lines,

- High winds blowing debris into both lines causing outages,
- A transmission structure failure or conductor failure resulting in short circuiting if equipment on one line contacts conductor or shield wires on the other line,
- Outages due to human interference such as vehicle accidents, construction equipment and aircraft flying into the lines, and;
- Outages due to grass, brush or forest fires.

Increasing the separation of the lines reduces and in some cases eliminates the risk that a single emergency causes outages on both lines. However, there remains a risk that an ice storm, tornado or other natural disaster could cause both lines to be lost at the same time.

GRE indicates the Highway 18 route provides enhanced reliability in a natural disaster or severe weather caused outage because utility maintenance vehicles will have faster access to the proposed transmission line directly from Highway 18, even in the most severe winter conditions. If both lines were lost, the Highway 18 route allows GRE to quickly restore the 115 kV line from Highway 18 corridor first, then restore the Oak Lawn – Wilson Lake line.

By comparison, the Oak Lawn – Wilson Lake ROW is significantly more difficult to access with heavy maintenance equipment, especially when deep snow or wet ground conditions are present, increasing the risk of longer outages and repair times.

Finally, GRE's proposed Highway 18 route will allow distribution cooperatives in the area to upgrade distribution lines and place them onto the new 115 kV structures. This will enhance reliability to customers by improving the electrical infrastructure by connecting distribution lines in the area to both the Oak Lawn and the Wilson Lake substations. This allows area customers to be supplied electricity from either substation in the event one substation or distribution feeder was out of service.

5.2 Cost & Construction

The proposed route alternative has a higher cost and may be more difficult to construct and maintain due to greater ROW clearing and specialty construction equipment to access rough and wet terrain. However, GRE has indicated that it has not conducted a full comparative cost analysis of the common corridor route alternative.

Route	Capital Cost	Est. Total Line Miles	Est. Homes, Businesses, Farms w/ in 250 feet	New ROW Width Needed
Proposed Highway 18 Route	\$15,872,000	12 miles	88	70 feet
Proposed Route Alternative Option 1 (Mud Lake Sub to Townline Rd. then cross country to 69 kV ROW)	More than \$15,872,000	11 miles	14	70 feet along roads 55 feet in existing ROW
Proposed Route Alternative Option 2 (Mud Lake Sub to Townline Rd, north on County Rd. 23 to Timber La, then east to 69 kV ROW)	More than \$15,872,000	13.25 miles	17	70 feet along roads 55 feet in existing ROW
Proposed Route Alternative Option 3 (Mud Lake Sub to Townline Rd, north on Burgwald Rd to to 69 kV ROW)	More than \$15,872,000	11.5 miles	17	70 feet along roads 55 feet in existing ROW

5.3 Unavoidable Human and Environmental Impacts

The Highway 18 route and the proposed route alternative have similar human and environmental impacts. A number of these impacts are unavoidable.

5.3.1 Highway 18 Route

The Highway 18 route has more homes, farms or businesses within 250 feet of the road centerline and will require trees to be cleared in some areas. The Highway 18 route will be visible to more people than the alternative route. Tree removal will not have a significant ecological impact, but it may reduce visual and noise screening at homes and businesses along the route. Wetlands are present and transmission structures may need to be placed in wetlands along Highway 18. The Highway 18 route exclusively uses existing transmission or road corridors. The route may offer more flexible route options by allowing GRE to cross from the north side to the south side of the highway to avoid impacts to human or natural resources.

5.3.2 Alternative Route

The route alternative has fewer homes within 250 feet. It will require more trees removed to widen the existing Oak Lawn – Wilson Lake ROW to accommodate both lines. The alternative route will pass through more wetlands and the Hesitation Wildlife Management Area. The alternative route passes fewer human developments and utilizes existing road and transmission ROW for 90 – 100 percent of its length. The alternative shares 8 to 9 miles of the Oak Lawn to Wilson Lake transmission ROW, which is predominantly comprised of forested areas and

wetlands. The alternative may have fewer options to avoid sensitive human or natural resources. Finally, the proposed transmission line may be more difficult to repair if placed in the alternative route, which may increase repair time during emergencies.

Neither route is expected to cause irreversible or irretrievable commitment of resources. The transmission line could be removed sometime in the future allowing the landscape, natural resources, and human resources to revert to previous uses.

6.0 Permits and Approvals Required

Permit	Jurisdiction
State of Minnesota Approvals	
Route Permit (Alternative Process)	PUC
Certificate of Need	PUC
NPDES Permit	MPCA
Road Crossing Permits	MDOT
Licence to Cross Public Waters	DNR
Federal Approvals	
Form 7460-1, Notice of Proposed Construction	FAA
Form 7460-2, Part 1, Notice of Actual Construction or Alteration	FAA
Rural Utilities Service Approval	RUS

Table 6. Federal and State Permit Requirements

Local approval for this proposed route and route alternative are limited to permits to cross county and township roads.

6.1 State Permits Required

The proposed project requires a Certificate of Need from the PUC. The project is considered a large energy facility as defined in Minnesota Statutes 216B.2421, which requires utilities to obtain a CON for such facilities.

The proposed project requires a Route Permit (Alternative Process), from the Public Utilities Commission. A HVTL cannot be constructed in Minnesota without a route permit approved by the PUC. A route permit under the Alternative Process requires the applicant to be eligible as outlined in Minnesota Rule 4400.2000.

A National Pollutant Discharge Elimination System (NPDES) permit from the MPCA is required for storm-water runoff associated with construction activities disturbing soil equal to or greater than one acre in area. A requirement of the permit is to develop and implement a Storm-Water Pollution Prevention Plan (SWPPP), which includes Best Management Practices (BMP) to

minimize discharge of pollutants from the site. This permit will be required since the project work impacts more than one acre.

A Work Permit for Public Waters is required from the DNR utility crossings of public waterways above the ordinary high water line.

A Utility Permit on Trunk Highway Right-Of-Way is required from MDOT for transmission line crossings of state roads.

6.2 Federal Approval Required

A Notice of Proposed Construction and Notice of Actual Construction or Alteration, using Forms 7460-1 and 7460-2, must be submitted to the Federal Aviation Administration since the proposed structures are within 20,000 feet of an airport with a runway greater than 3,200 feet in length, and the object exceeds a slope of 100:1 horizontally.

GRE has requested financing from the Rural Utilities Service (RUS) and must demonstrate that environmental review was conducted on the project and that the project will comply with environmental requirements.

Appendix: Scoping Decision



In the Matter of the Application for a Route Permit and Certificate of Need for a the Mud Lake to Wilson Lake 115kV High Voltage Transmission Line Project

**ENVIRONMENTAL ASSESSMENT
SCOPING DECISION**

**PUC Docket No. ET-2/TL-06-980
PUC Docket No. ET-2/CN-06-367**

The above matter has come before the Commissioner of the Department of Commerce (the Department) for a decision on the scope of the Environmental Assessment (EA) to be prepared on the proposed Great River Energy (GRE) Mud Lake to Wilson Lake 115kV High Voltage Transmission Line (HVTL) Project in Crow Wing County, Minnesota.

GRE has filed applications with the Public Utilities Commission (PUC) for the Certificate of Need and the Route Permit for the proposed facilities. The PUC has combined the Certificate of Need and Route Permit processes, and authorized the Department to prepare a single EA in order to streamline the processes. The Department will include in the EA the analysis of alternatives required in rules guiding environmental review in Certificate of Need cases (Minnesota Rule 4410.7035).

The Department's Energy Facilities Permitting (EFP) Unit held a public information and EA scoping meeting on September 19, 2006, at the Garrison Township Hall to discuss the project with the public and to solicit input into the scope of the EA to be prepared. Approximately 12 persons attended the public meeting. A public comment period on the scope of the EA closed on October 6, 2006. Two comment letters and one petition were received. One comment letter was signed by six landowners adjacent to the route. The petition was signed by 52 people owning land, businesses or residing near the proposed route. The comment letters and petition request that the DOC consider a route alternative in the EA using an existing 69 kV ROW between the Oak Lawn Substation and the Wilson Lake Substation.

Having reviewed the matter, consulted with the EFP staff, and in accordance with Minnesota Rule 4400.2750, I hereby make the following Scoping Decision:

MATTERS TO BE ADDRESSED

The Environmental Assessment will address the following matters:

For the purposes of clarity and completeness, the EA will be divided into two major parts. Part 1 will include a description and analysis of human and environmental impacts of the proposed project and alternatives that is required by Minnesota Rule 4410.7035 under an Environmental Report for the Certificate of Need. Part 1 will evaluate the matters of size, type and timing that

would not normally be included in an EA for a route permit application. Part 2 will address the human and environmental impacts of the proposed route and a route alternative.

INTRODUCTION

1.0 SUMMARY OF THE MUD LAKE TO WILSON LAKE TRANSMISSION PROJECT

- 1.1 Project Description
- 1.2 Project Location
- 1.3 Project Purpose
- 1.4 Project Alternatives
- 1.5 Sources of Information

2.0 REGULATORY FRAMEWORK

- 2.1 PUC Certificate of Need
- 2.2 PUC Route Permit
- 2.3 Scoping of Environmental Impacts and Alternative Routes
- 2.4 Environmental Assessment Requirement

PART 1: ALTERNATIVES TO THE TRANSMISSION PROJECT

In Part 1, the EA will consider only alternatives that have an impact on the proposed transmission project. The Department will evaluate alternatives that deliver an equal amount of energy and capacity to the Wilson Substation as proposed by GRE. Such alternatives may attempt to reduce, mitigate or eliminate the need for the proposed transmission line, while delivering the proposed “needed” energy. Any analysis of the alleged need will be conducted through the CON testimony and public hearing(s) generally and not specifically in this EA. The EA will focus on the environmental, social, economic and cultural impacts of the proposed project and alternatives.

This analysis will review feasibility, general impacts and mitigation measures for the following alternatives required in Certificate of Need Environmental Reports, Minnesota Rule 4410.7030:

- No-build Alternative
- Conservation Alternative
- Existing Line/System Improvements
- Generation Alternative
- Alternatives Approved by the Commissioner of the Department

3.0 POTENTIAL HUMAN AND ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND FEASIBILITY

- 3.1 Right-of-Way Requirements
- 3.2 Anticipated Size and Type of Structures
- 3.3 Electric and Magnetic Fields
- 3.4 Anticipated Noise Impacts
- 3.5 Anticipated Visual Impacts

- 3.6 Anticipated Emissions of any Hazardous Air Pollutants and VOCs
- 3.7 Anticipated Impacts on Water Quality
- 3.8 Anticipated Impacts on Natural and Wildlife Resources
- 3.9 Anticipated Social and Economic Impacts

PART 2: IMPACTS OF THE PROPOSED ROUTE AND ROUTE ALTERNATIVE

In Part 2, the EA will review impacts and mitigation measures for the proposed Highway 18 route as described in the GRE Mud Lake to Wilson Lake Project route permit application. The EA will also analyze a route alternative utilizing all or a portion of the existing 69 kV Oak Lawn to Wilson Lake transmission line right-of-way, and three route segments linking the Mud Lake Substation and the existing 69 kV transmission right-of-way. The segments are:

- A route segment paralleling Butternut Road, Townline Road, and approximately 1 mile cross country from the Mud Lake Substation east approximately 3 miles to the existing Oak Lawn to Wilson Lake 69 kV transmission right-of-way.
- A route segment paralleling County Highway 23 from Townline Road north to Highway 18 or Timber Lane then east to the existing right-of-way.
- A route segment paralleling Burgwald Road from Townline Road north approximately .5 miles to the existing right-of-way.

4.0 ASSESSMENT OF IMPACTS AND MITIGATION MEASURES

- 4.1 Description of Environmental Setting
- 4.2 Impacts on Human Settlement
 - 4.2.1 Socioeconomic
 - 4.2.2 Displacement
 - 4.2.3 Noise
 - 4.2.4 Aesthetics
 - 4.2.5 Human Health and Safety
- 4.3 Impacts on Land-based Economics
 - 4.3.1 Recreation
 - 4.3.2 Prime Farmland
 - 4.3.3 Transportation
 - 4.3.4 Mining and Forestry
 - 4.3.5 Economic Development
 - 4.3.5 Archeological and Historic Resources
- 4.4 Impacts on Natural Environment
 - 4.4.1 Air Quality
 - 4.4.2 Water Quality, Soils and Geology
 - 4.4.3 Groundwater and Wetlands
 - 4.4.4 Fish and Wildlife Resources
 - 4.4.5 Vegetation
- 4.5 Rare and Unique Natural Resources

5.0 OTHER CONSIDERATIONS

- 5.1 Significant Unavoidable Adverse Impacts
- 5.2 Irreversible/Irretrievable Commitment of Resources

6.0 PERMITS AND APPROVALS REQUIRED

- 6.1 Federal
- 6.2 State
- 6.3 Local

ISSUES OUTSIDE THE SCOPE OF THE EA

The Environmental Assessment will not consider the following matters:

1. The manner in which land owners are paid for transmission ROW easements, as that is outside the PUC jurisdiction.
2. Any alternatives not described specifically in this Scoping Decision.

SCHEDULE

The EA shall be completed and available by November 22, 2006. A public hearing will be held in Crow Wing County before an Administrative Law Judge after the EA has been issued and notice served.

Signed this ____ day of _____, 2006

STATE OF MINNESOTA
DEPARTMENT OF COMMERCE

Glenn Wilson, Commissioner