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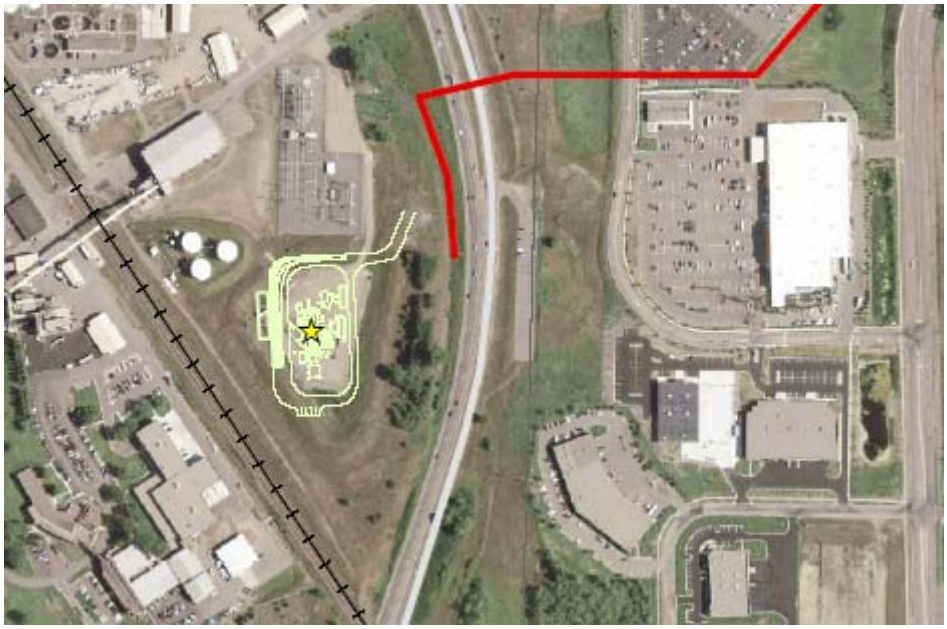
ENVIRONMENTAL IMPACT STATEMENT

ELK RIVER PEAKING STATION

PUC DOCKET NO. ET2/GS-07-715



Prepared by:

85 7th Place East
Suite 500
St. Paul, MN 55101

NOVEMBER 2007

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Responsible Governmental Unit

Minnesota Department of Commerce
85 7th Place East, Suite 500
St. Paul, MN 55101-2198

DOC Representative
William Cole Storm, Project Manager
Energy Facility Permitting
(651)-296-9535

Project Owner

Great River Energy
17845 Easy Highway 10; PO Box 800
Elk River, MN 55330

Project Representative
Mark Strohfus, Great River Energy
(763) 241-2272

Abstract

Great River Energy (GRE) has submitted a Large Electric Power Generating Plant (LEPGP) Site permit application for its proposed Elk River Peaking Station project pursuant to the provisions of the Power Plant Siting Act (Minnesota Statutes 116E). The proposed project consists of a single, simple-cycle combustion turbine generator (CT) with a nominal summer generating capacity of 175 MW and other associated facilities. The facility will use natural gas and ultra-low sulfur distillate fuel oil.

The addition of this generating unit at the Elk River site falls within the definition of a Large Electric Power Generating Plant in the Power Plant Siting Act and, thus, requires a Site Permit from the Commission prior to construction. Minnesota Rules 7849 provide for three different procedures for obtaining a site permit: full review, alternative review, and local review. GRE is applying for a site permit following the full review process. The project is not eligible for the alternative process because the proposed unit will be fueled by both natural gas and fuel oil.

The application will be reviewed under the Full Review Process (Minnesota Rules 7849.5200) of the Power Plant Siting Act (Minnesota Statutes 216E.001 to 216E.18). Under the Full Review Process, an applicant is required to propose an alternative site. The Department of Commerce Energy Facility Permitting Staff prepares a document called an Environmental Impact Statement, and a contested cased hearing is required. The PUC has one year to reach a decision under the Full Process from the time the application is accepted.

The preferred project site is on GRE's campus in Elk River, Sherburne County, Minnesota. The Elk River campus currently includes the Elk River Station, a Refuse-Derived-Fuel (RDF) combustor that co-produces electricity, and GRE's corporate offices. The preferred site is an area of approximately 11-acres in the northeast portion of the campus.

An existing 69-kilovolt (kV) transmission line segment extending 5.6 miles in length from the Elk River site will be upgraded with new conductors and new poles. No change in voltage of the existing lines is necessary; therefore, no PUC High Voltage Transmission Line Route Permit is required. No other lines will require upgrades due to the project. GRE will obtain natural gas for the project from Northern Natural Gas Company already serving the campus. Northern Natural Gas will construct and own a new one-half-mile, 12-inch lateral natural gas pipeline off of its existing 16-inch pipeline located northeast of the plant site.

ABSTRACT

The alternative site, required under the full review process, is located on GRE's property in the city of Rosemount in Dakota County, Minnesota. The site is bordered on the south by County Highway 42, on the east by Emery Avenue, on the north by Ehler's Path and 140th Street. The property is currently leased to a farmer for crop production.

The natural gas and electric transmission line interconnects and wastewater discharge lines at the alternative site would require short corridors for completion. The natural gas corridor would extend from the project property south along Emery Avenue for approximately 1000 feet to the existing 42-inch, high pressure pipeline owned by Northern Natural Gas. As with the preferred site, Northern Natural Gas would permit, own and operate the new lateral pipeline.

The plant would be interconnected to an existing transmission line that crosses the site. Water supply would likely be obtained from the existing or new onsite well. Wastewater would be discharged to an Metropolitan Council of Environmental Services (MCES) interceptor at the Rosemount WWTP through a new sewer line constructed along 140th street.

Persons interested in receiving additional information regarding this matter can register their names on the Project Docket webpage at:

http://energyfacilities.puc.state.mn.us/Docket.html?Id=19178

or by contacting Bill Storm, Energy Facilities Permitting, 85 7th Place East, Suite 500, St. Paul, Minnesota 55101, phone (651) 296-9535, e-mail: bill.storm@state.mn.us.

Many of the documents of interest regarding this matter, including this Environmental Impact Statement, are available online at the above webpage. The final LEPGP Site Permit issued to Great River Energy will also appear on this webpage.

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1.0 INTRODUCTION

Great River Energy (GRE) filed the Large Electric Power Generating Plant (LEPGP) site permit application on June 14, 2007. On August 1, 2007, the PUC issued an Order accepting the GRE Elk River Peaking Station LEPGP Site Permit Application as complete.

The Minnesota Department of Commerce (Department) is required to perform environmental review on applications for LEPGP Site Permits to inform the Minnesota Public Utilities Commission (Commission), which is the final decision making body in these matters. This Environmental Impact Statement (EIS) document covers the environmental review requirements for the LEPGP Site Permit.

Chapter 1 provides specific information about the proposed project. Chapter 2 provides information on the regulatory procedure for the LEPGP Site Permit processes. Chapter 3 provides information on the natural and built environment of the project area. Chapters 4 provides the analysis required for site permit applications under Minnesota Rule 4400.2750. Chapter 5 describes the additional permits that may be required for this project.

1.1 Project Description

The proposed project consists of a single natural gas-fired simple-cycle combustion turbine generator (CT) with a nominal summer generating capacity of 175 MW and other associated facilities. **Figure 1-1** is a general arrangement drawing illustrating the proposed plant's major features. **Figure 1-2** shows the locations for the preferred and alternative sites.

1.2 Project Location

Under the Full Review Process, an applicant is required to propose a preferred and an alternative site.

Preferred Site

The preferred site for the project is on GRE's campus in Elk River, Sherburne County, Minnesota. The Elk River campus currently includes Elk River Station, a Refuse-Derived-Fuel (RDF) combustor that co-produces electricity, and GRE's corporate offices. The preferred site is an area of approximately 11-acres in the northeast portion of the campus. **Figures 1-3 and 1-4** show the GRE Elk River campus property with the project general arrangement superimposed.

Alternative Site

The alternative site for the project is located on GRE's property in the city of Rosemount in Dakota County, Minnesota. The site is bordered on the south by County Highway 42, on the east by Emery Avenue, on the north by Ehler's Path and 140th Street. **Figures 1-5 and 1-6** show the boundaries of the alternative site property and the proposed interconnection corridors. The property is currently leased to a farmer for crop production.

1.3 Design

A simple cycle combustion turbine (CT) has three major components: (1) a compressor, (2) a combustion chamber, (3) and a turbine. Air is drawn into the compressor, compressed, and discharged to the combustion chamber, mixed with fuel and ignited. The resulting expanding hot gases are sent through the turbine blades, causing them to rotate. The rotating turbine blades turn a shaft connected to a generator that produces electricity. Exhaust gases are emitted to the atmosphere through a stack that is expected to be about 90 feet tall.

The combustion turbine generator for the project will be "F" class technology, such as a Siemens Model 5000F. The project will have a peak output of approximately 175 MW during Midwest Area Power Pool (MAPP) summer peaking conditions. When operating on distillate fuel oil during typical winter conditions, the unit has a nominal capacity of approximately 211 MW. The unit has a maximum capability of 224 MW. However, the Midwest Independent Transmission System Operator (MISO) transmission service request is limited to 200 MW.

The Midwest Independent System Operator (also known as MISO) monitors 920,000 miles of the high voltage transmission system throughout the Midwest. MISO operates one of the largest real time energy markets in the world. The main function of MISO is its reliability function. System operators known as Reliability Coordinators and Reliability Anaylst monitor the system 24/7. The RC/RA uses a model of the system and calculates power flows across the country.

The use of the power flow model gives the ability to calculate parallel flows caused by line outages and predict overloads before they occur. The MISO is an essential link in the safe, cost-effective delivery of electric power across much of North America. MISO is committed to reliability, the nondiscriminatory operation of the bulk power transmission system, and to working with all stakeholders to create cost-effective and innovative solutions for our changing industry.

As a fully integrated regional transmission organization, the non-profit Midwest ISO assures industry consumers of unbiased regional grid management and open access to the transmission facilities under Midwest ISO's functional supervision. MISO optimizes the efficiency of the interconnected system, provides regional solutions to regional planning needs and continually minimizes any risk to reliability.

The CT's primary fuel will be natural gas, chosen for its low air emissions and ready availability from a nearby pipeline. Dry low nitrogen oxides (NOx) combustion technology will be employed to minimize emissions when utilizing natural gas for fuel. Ultra-low sulfur diesel fuel will be used as a back-up fuel when natural gas is unavailable. Demineralized water injection will be employed to minimize NOx emissions when utilizing diesel fuel. In addition to the CT, new plant equipment will include:

- A generator step-up transformer.
- Less than 500 feet of transmission line from the transformers to the existing substation at the preferred site or less than 1,000 feet of transmission line from a new switchyard to the existing transmission line at the alternative site.

- A new lateral natural gas pipeline, town-border-station, and meter.
- An evaporative cooler.
- An exhaust stack with silencer.

1.4 Electrical Interconnection

Preferred Site

At the preferred site the project will include upgrades to the existing site substation and one of the 69-kV transmission lines originating from the substation. No change in the operating voltage and no significant realignment of this line are required for the project. The existing 69-kV and 230-kV substations will be modified to accommodate the electrical output from the project.

The Elk River site has two existing 230-kV outlets, seven existing 69-kV lines and an existing 33-MW RDF-fired generation plant.

Preliminary results from the MISO studies indicate that sections of 69-kV lines will need to be upgraded to accommodate the interconnection of the project . The locations of the transmission line segments that will require upgrades are shown on **Figure 1-7**. The project will include upgrading approximately 5.41 miles of 69-kV transmission line in Sherburne and Anoka counties as part of the Elk River Peaking Station transmission system. The project transmission line rebuilds may involve changing to taller poles (from approximately 40-55 feet to 60-65 feet above ground) and upgrading wire size. The upgrade of transmission capability will also entail improvements to a 0.19-mile section of 69-kV transmission line at the existing substation at County Road 78 (Hanson Blvd.) and Bunker Lake Blvd. Details of the interconnection will be finalized once the interconnection studies have been completed and a final interconnection recommendation is provided by the MISO (expected by mid-December 2007).

Alternative Site

At the alternative site a switchyard will be constructed next to the plant to convert the electricity voltage to 345 kV so that it can be sent to the grid through the existing 345-kV transmission line that crosses the site (**Figure 1-8**). An evaluation of the transmission system was conducted in 2003 as part of an earlier project, based on that evaluation, it is believed that no additional transmission system modifications would be necessary to interconnect the project at the alternative site.

1.5 Fuel Supply

The project will use natural gas as its primary fuel and ultra-low sulfur distillate fuel oil as its backup fuel. Natural gas would be transported to the project at either the preferred or alternative site by the Northern Natural Gas pipeline system.

Fuel oil would be delivered by truck, most likely from the oil terminal in Roseville, Minnesota. At either site, the tanks would be equipped with secondary containment structures in accordance with state and federal regulations.

At either the preferred or alternative site, Northern Natural Gas would construct and own the lateral pipeline from the interconnection at the existing high pressure pipeline to the new town-border station. Great River Energy will own a short segment of the interconnection that will extend from the town border station to the combustion turbine; the specific length and route is undetermined at this time. Northern Natural Gas would obtain any permits or approvals required for the Northern Natural Gas segment of the proposed gas interconnection.

Preferred Site

The Northern Natural Gas pipeline system can supply the proposed project during the period from April to November. Northern Natural Gas has indicated that winter natural gas deliverability will be curtailed from November to April due to high local home and commercial heating load. **Figure 1-9** depicts the existing pipelines and the preliminary route for the new lateral pipeline.

An existing 846,000-gallon above ground tank would be used to store fuel oil. Great River Energy would limit the amount of fuel stored in the tank to approximately 600,000 gallons to ensure that the volume of oil and oil products stored at the Elk River campus would be less than one million gallons.

The Elk River campus's Spill Prevention Control and Countermeasure (SPCC) Plan would be amended to address the new fuel storage.

Alternative Site

Northern Natural Gas has indicated that natural gas should be available year round to the alternative site. **Figure 1-10** depicts the existing pipelines and the preliminary route for the new lateral pipeline.

A new above ground tank with a capacity of approximately 900,000 gallons would be constructed. A new SPCC Plan would be prepared for the alternative site.

1.6 Water Supply

The largest source of operational water demand is for control of NOx emissions when the CT is operating on fuel oil. The water used for NOx control will require treatment with a de-mineralizer water treatment system. Source water will be treated in a rented trailer-mounted de-mineralizer system and pumped to an onsite storage tank. De-mineralized water demand by the CT when operating on fuel oil is approximately 100 to 120 gallons per minute (gpm) depending on the CT's operating load. Approximately 460,000 gallons of water would be used for NOx control if fuel oil were used for 76 hours in a year.

The second largest source of operational water demand is the CT evaporative cooler. The evaporative cooler is used on hot days to cool and increase the density of air being used by the CT, which increases the CT's power output and efficiency. When the evaporative cooler is in operation, approximately 60 to 85 gpm of water is required, depending on the ambient air temperature, the relative humidity, and the facility operating power level. Approximately 1,000,000 gallons of water would be used if the evaporative coolers were operated for 300 hours in a year.

Water needs are summarized in **Table 1-1**.

Untreated source water will also be used to supply fire suppression water. The maximum instantaneous use rate for fire suppression water is expected to be 1,500 gpm. Peak demand for drinking water, sanitary water, and other ancillary plant water uses is expected to be approximately 50 gpm.

Preferred Site

Water will be supplied by the Elk River Municipal Utilities (ERMU) at the preferred site.

The plant's water supply will come from ERMU, which operates 7 wells with a combined capacity of approximately 6,800 gpm. The project would have a peak water usage rate of 600 gpm for the demineralization process. This usage would occur over approximately 24 hours to fill an existing 846,000-gallon above ground storage tank on site, and GRE expects that the tank would require filling only once or twice per year. The Project could have a peak use of 85 gpm for evaporative cooling that could be coincidental with ERMU's summer peak demand.

Evaporative cooling is not critical for the plant's operation. In the event that ERMU could not operate a well due to maintenance or other reasons, GRE would be willing to coordinate with ERMU and not operate the evaporative coolers during their peak. Considering the flexibility GRE has in scheduling water usage, the project would not have a significant impact on the ERMU water supply system.

Alternative Site

A raw water holding tank may be necessary at the alternative site to provide sufficient instantaneous demand required for fire suppression.

Water supply at the Rosemount site would be from one of two existing onsite wells or a new well. The existing wells are used for irrigation and are permitted for 800 gpm each or annual maximum pumping of 39.1 and 52 million gallons per year (MGY) each. A dedicated pipeline would deliver the water to the plant pre-treatment system prior to use in the plant.

The project will require de-mineralized water for NOx controlling while firing fuel oil. A rented de-mineralizer would treat water to be stored in a tank on site.

1.7 Wastewater Management

The sources and types of water discharges include the evaporative cooler blow down, compressor section wash water, de-mineralizer concentrate, sanitary waste, and stormwater runoff from the site.

Sources of and estimated volumes of wastewater are identified in **Table 1-2**.

The main source of operations wastewater would be the evaporative cooler. The evaporative cooler is used on hot days to cool and increase the density of air being used by the CT, which increases the CT's power output and efficiency. When the evaporative cooler is in operation, approximately 30 to 60 gpm of blow down wastewater would be generated, depending on the ambient air temperature, the relative humidity, and the facility operating power level.

Compressor section wash water will be generated periodically during cleaning of the turbine compressor. This cleaning is necessary to promote efficient, reliable operation of the CT. Compressor wash water will be discharged to an onsite storage tank. The wash water will be analyzed and proper disposal options will be determined based on the analytical results.

Spill containment will be provided around oil-containing equipment. During rain events, rainwater can collect in the spill containment areas. The containment basins are visually inspected during routing site checks. If water is found within the containment and there is no visible oil sheen, the water would be discharged to the ground surface where it will infiltrate into the ground and possibly flow to the onsite stormwater pond. If there is a visible sheen, the water would be pumped to the plant's oil/water separators for treatment. The oil recovered in the separator will be reclaimed and processed offsite.

Preferred Site

At the preferred site, evaporative cooler wastewater stream would be piped to an onsite lift station that will discharge to the ERMU sewer system along U.S. Highway 169.

The wastewater discharge will not significantly impact the city wastewater treatment plant (WWTP). The city WWTP has an average discharge of 1.1 million gallons per day (MGD) and a maximum discharge of 1.2 MGD. ERPS would contribute up to 13 percent of the flow to the plant at its maximum discharge, but less than 0.3 percent on average. Discharge to the WWTP will require a pre-treatment permit that will include contaminant discharge limits.

Alternative Site

At the alternative site evaporative cooler waste stream would be discharged to a MCES sanitary sewer line that runs northwest of the site (**Figure 1-11**).

New sewer discharge lines approximately 0.75 miles long would be required to connect to MCES sewers. A pretreatment permit will likely be required from MCES for the waste water

discharge. Alternatively, an National Pollution Discharge Elimination System (NPDES) permit would be obtained to allow direct discharge to the Mississippi River. This permit could require additional onsite wastewater treatment. A pipeline similar to that required for an MCES discharge would be required to connect to the Empire WWTP outfall.

Some stormwater will also be discharged to the ERMU WWTP or the MCES system. The oil/water separator will discharge to the pumping station along with any evaporative cooler blow down and ultimately piped to the ERMU WWTP or the MWCC system. Some wastewater is also generated from sanitary waste. This wastewater will be discharged to the sanitary sewer system.

1.8 Air Pollution Control

The project will employ simple cycle combustion turbine technology using both natural gas and fuel oil as the fuel source. The CT will be equipped with Best Available Control Technology (BACT) for NOx emissions.

The CT air pollution controls are inherent to its design and so emission performance would not be different if the project were constructed at the preferred or the alternative site. Great River Energy will propose BACT as dry low-NOx combustors when firing natural gas and water injection for NOx control when firing fuel oil.

Preferred Site

For the preferred site BACT will ultimately be defined by the air emissions permitting process, which is administered by the Minnesota Pollution Control Agency (MPCA). The anticipated permitting approach will be to limit annual operation such that annual emissions of all Prevention of Significant Deterioration (PSD) pollutants except NOx will be less than the PSD significance threshold. Thus, NOx will be the only pollutant to require a BACT analysis. Siting the project at the preferred site will require a major amendment to the existing air permit to incorporate the PSD permit conditions.

Alternative Site

If the project were constructed at the alternative site, the CT would be the first emission unit for a new facility and would it be allowed a higher threshold before triggering the PSD permitting process. The permitting approach for the alternative site would be to accept a synthetic minor emissions limit with respect to the PSD review process, which would limit emissions to less than 250 tons per year for any PSD pollutant and a formal BACT review would not be required.

1.9 Construction

Mobilization at the site would be the first construction activity, with Great River Energy setting up field offices and the Contractor following with mobilization and setup of construction offices, security fencing, and entrances.

Upon issuance of the necessary permits, construction will begin. The area where the new turbine would be located will be excavated approximately 2-4 feet to prepare the area for pouring of concrete footings and foundations. For the preferred and the alternative sites, it is expected that pilings will not be required and that the surficial groundwater table is at a great enough depth that dewatering would not be necessary for construction of foundations.

Underground services will be installed. At the same time, the foundations for the generator step-up transformer and miscellaneous equipment will be formed. Extensive concrete work for all foundations will follow. Rough-ins for cable and pipe will be installed in the various foundations. Within two to three months of initial mobilization, deliveries will begin arriving at the site. These shipments will continue over a four to five month period. Shipments of the transformer, turbine and generator will likely be via rail, with other equipment likely being shipped by truck. The timing of these shipments will coincide with the completion and readiness of their respective foundations.

Rail shipments will be coordinated by the heavy haul subcontractor. This equipment will be lifted from the rail cars and loaded onto transport vehicles to be driven on site. A construction crane will be located on site to lift large equipment from transport vehicles onto foundations.
The combustion turbine, generator, and transformer for the new generating unit will be set first, followed by the remaining auxiliary equipment. Erection of the turbine's modular air inlet and the exhaust stack will take place next.

The greatest number of onsite workers will be present during the erection of the turbines, detailed wiring and piping, and while work is being performed in the substation. Gas pipeline work will occur while the site work is being completed.

Great River Energy will be constructing an overhead transmission line from the generator step-up transformers to the onsite substation or switchyard as plant work nears completion. Work will also be ongoing in the substation or switchyard to install breakers, a transformer, and additional protection devices. Final stages of construction activities will include installation of the inlet air filter and bird screen, completion of equipment platforms, insulation, and painting. Pre-operational testing will take place for one to two months in preparation for start-up of the new unit currently targeted for May 2009. The initial turbine start-up requires a two-week schedule.

The first days will fire gas in the unit and bring it up to full speed with no load on the turbine. Next, the turbine will be run and synchronized with the grid at a low load. Subsequently the unit's output will be slowly raised to its maximum capacity while testing the performance of various plant systems.

After the completion of testing, Great River Energy and the contractor will begin to demobilize the site. By early Fall 2009, trailers, construction equipment and temporary fencing are expected to be removed from the site.

1.10 Operation

The proposed project will operate as a peaking facility to provide electricity during times of peak demand, typically during very hot and very cold days. Great River Energy currently fulfills its peaking needs primarily with its Pleasant Valley Station (424 MW) and Lakefield Junction Station (515 MW). Pleasant Valley and Lakefield Junction are dual-fuel peaking plants that began commercial operation in May of 2001. Great River Energy's Cambridge Station Unit 2 (approximately 150 MW) is also a peaking facility, which recently began operation in June of 2007.

Typical full load heat rates (higher heating value) are 10,395 British Thermal Units per kilowatt-hour (Btu/kWh), while utilizing natural gas during the summer months, and 9,751 Btu/kWh, while utilizing ultra-low sulfur diesel during the winter months. These heat rates equate to an efficiency of approximately 33 percent and 35 percent, respectively.

Great River Energy anticipates the proposed project will have an annual capacity factor of approximately 5 to 10 percent. The plant will have a short start-up sequence, which is characteristic for an "F-Class" machine. When operating on natural gas, the start-up time would be approximately ten minutes, and the ramp rate would be approximately 30 MW per minute. When operating on distillate oil, the start-up time would be approximately 30 minutes, and the ramp rate is expected to be approximately 10 MW per minute.

Operational characteristics of the Project are summarized in **Table 1-3**.

1.11 Maintenance

Great River Energy has extensive experience operating and maintaining CTs including types such as the General Electric (GE) Frame 5, the Pratt & Whitney FT4, the GE 7EA, the Siemens V84.3A2, and the Westinghouse 501D5A. Great River Energy maintains those units using a combination of Great River Energy staff, the CT manufacturer staff through long-term service agreements, and subcontractors. Great River Energy is committed to providing its operations and maintenance (O&M) staff with the very best in continuing education and training to ensure a high level of reliability and availability of its generation assets.

Table 1-4 lists the chemicals anticipated to be used on-site for operation and maintenance activities.

1.12 Sources of Information

Much of the information contained within this document was provided by the applicant or the applicant's representatives in the form of the Application for a LEPGP Site Permit and correspondence.

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/)
- U. S. Environmental Protection Agency (http://www.epa.gov/)
- Electric Power Research Institute (http://www.epri.com/default.asp)
- U. S. Department of Agriculture Natural Resources Conservation (http://soils.usda.gov/about/)
- Minnesota Geological Survey (http://www.geo.umn.edu/mgs/)
- Department of Administration, State Demographic Center (http://www.demography.state.mn.us/)
- Federal Emergency Management Agency (http://www.fema.gov/)
- U. S. Department of Energy, Energy Information Administration (http://eia.doe.gov/)

2.0 REGULATORY PROCESS AND REQUIREMENTS

This project requires two distinct processes for the Commission: the first is determining the need for the project and the second is determining the LEPGP site to be selected.

2.1 Certification of Need Requirement

On May 18, 2007, Great River Energy made an application to the Minnesota Public Utilities Commission (PUC) for a Certificate of Need for the Elk River Peaking Station project pursuant to the provisions of Minnesota Statutes 216B.243 and Minnesota Rules, Chapter 7849. The PUC issued an Order finding the CON application to be substantially complete on June 19, 2007. The docket number for this filing is ET2/CN-07-678.

As part of the review of a Certificate of Need application the Department is required to prepare a document called an Environmental Report (ER). Minn. Rules 4410.7030. The Department Energy Facility Permitting (EFP) staff prepared an ER based on its analyses of the information and data supplied in the Certificate of Need application and several other relevant sources. In the ER the Department evaluated the general potential impacts from construction, operation, and maintenance of the proposed LEPGP and discussed ways to mitigate these potential impacts.

Two public information meetings were held, August 17, 2007 (Elk River) and August 18, 2007 (Rosemount); these meetings were held in conjunction with those required for the siting process and are discussed in subsection 2.2 below.

2.2 LEPGP Site Permit Requirement

On June 14, 2007, GRE submitted an application for a Site Permit for the proposed Elk River Peaking Station. The PUC issued an Order finding the Site Permit application to be complete on August 1, 2007, and authorized the Department to initiate the full review process under Minn. Rules 7845.5010 to .6500. The docket number for this filing is ET2/GS-07-715.

The addition of this generating unit at the Elk River site falls within the definition of a LEPGP in the Power Plant Siting Act and, thus, requires a Site Permit from the Commission prior to construction. Minnesota rules 7845.5010 to .6500 provide for three different procedures for obtaining a site permit: full review, alternative review, and local review. GRE is applying for a site permit following the full review process. The project is not eligible for the alternative process because the proposed unit will be fueled by both natural gas and fuel oil. In the full review process, the applicant must identify in the application the preferred site for the power plant and one alternative site, respectively Elk River and Rosemount.

The Department Energy Facility Permitting (EFP) staff prepares a document called an Environmental Impact Statement (EIS). An EIS is a written document that describes the human and environmental impacts of a proposed large electric power generating plant (and selected alternative sites) and methods to mitigate such impacts. The public has the opportunity to

comment on the scope of the EIS and the draft EIS through comment periods and at the Department sponsored information/scoping meetings.

As stated above, two public information/scoping meetings were held, August 17, 2007 (Elk River) and August 18, 2007 (Rosemount). Approximately 12 persons, excluding Department/PUC staff and the applicant's representatives, attended the meetings. The purpose of the public meetings was to provide the public with information about the project, afford the public an opportunity to ask questions and present comments, and to solicit input on the content of the ER and the scope of the EIS documents.

During the initial public information/scoping meetings concerns raised regarding need included fuel type, load service area, simple cycle versus combined cycle operation, and cost of electricity. On the siting application concerns raised included air emissions, water usage, potential for future expansion, future plans for the alternative site (i.e., Rosemount), and potential noise impacts.

The comment period was held open until 5:00 pm August 13, 2007.

One comment letter was received regarding GRE's proposed Elk River peaking station; a request that the use of utility scale batteries be considered in place of the natural gas facility. This issue, along with the typical LEPGP need and siting issues, have been incorporated into the proposed Orders on the Content of the Environmental Report and the Scope for the Environmental Impact Statement (**Appendix A**).

3.0 AFFECTED ENVIRONMENT

The ecological land classification system (ECS) is used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features. The ECS uses associations of biotic and environmental factors, including climate, geology, topography, soils, hydrology, and vegetation. ECS mapping enables resource managers to consider ecological patterns for areas as large as North America or as small as a single timber stand and identify areas with similar management opportunities or constraints relative to that scale. There are eight levels of ECS units in the United States. Map units for six of these levels occur in Minnesota: Provinces, Sections, Subsections, Land Type Associations, Land Types, and Land Type Phases.[1]

Provinces are units of land defined using major climate zones, native vegetation, and biomes such as prairies, deciduous forests, or boreal forests. There are 4 Provinces in Minnesota. Sections are units within Provinces that are defined by origin of glacial deposits, regional elevation, distribution of plants, and regional climate. Minnesota has 10 sections.

Both the preferred and alternative sites are located in the Eastern Broadleaf Forest Province and the Minnesota and Northeast Iowa Morinal Section.

Eastern Broadleaf Forest Province

The Eastern Broadleaf Forest (EBF) Province traverses Minnesota, Iowa, Wisconsin, Michigan, Ohio, New York, Illinois, Indiana, Kentucky, Tennessee, Missouri, and Arkansas. In Minnesota, the EBF Province covers nearly 12 million acres (4.9 million hectares) of the central and southeastern parts of the state and serves as a transition, or ecotone, between semiarid portions of the state that were historically prairie and semihumid mixed conifer-deciduous forests to the northeast. The western boundary of the province in Minnesota is sharply defined along much of its length as an abrupt transition from forest and woodland to open grassland. The northeastern boundary is more diffuse, with a gradual transition between eastern deciduous forests and the mixed conifer-hardwood forests of northern Minnesota.

The land surface of the province is largely the product of Pleistocene glacial processes. The northwestern and central portions of the province were covered by ice in the last glaciation and are characterized by thick (100–300 feet [30–90 meters]) deposits of glacial drift that is highly calcareous and of Wisconsin Age at its surface. Glacial lakes associated with the last glacial advance contributed large volumes of meltwater to rivers that cut deep valleys along the present course of the Minnesota, St. Croix, and lower Mississippi rivers. In the southeastern part of the province, which was not covered by ice in the last glaciation, headward erosion of streams draining into the deepening Mississippi valley dissected the flanking uplands, exposing Paleozoic bedrock and pre-Wisconsin drift. The waning stages of the glacial lakes contributed massive amounts of sediment to the river valleys and provided a source of silt that was redeposited by wind as a mantle of loess over the eroded lands in the southeastern part of the province.

[1] http://www.dnr.state.mn.us/ecs/index.html

The EBF Province coincides roughly with the part of Minnesota where precipitation approximately equals evapotranspiration; it seems likely that this aspect of climate has an important influence on plants, as many forest species reach their western range limits and several prairie species reach their eastern range limits within the province. Precipitation in the province increases from about 24 inches (60cm) annually in the northwestern portion to 35 inches (90cm) in the southeast, while normal annual temperatures range from 38°F (3°C) in the northwest to 46°F (8°C) in the southeast.[2]

Minnesota and Northeast Iowa Morinal Section

The Minnesota and Northeast Iowa Morainal Section (MIM) is a long band of deciduous forest, woodland, and prairie that stretches nearly 350 miles (560km) from Polk County in northwestern Minnesota to the Iowa border. Over half of this area consists of rugged to hummocky moraines deposited along the eastern margin of the Des Moines ice lobe during the last glaciation. Another quarter of the area consists of rolling till or basal till deposited as drumlins. Small sand plains occur locally within the moraines. A rather large sand plain, the Anoka Sand Plain, is present north of the Twin Cities metropolitan area. This level plain is formed from sand deposited by meltwater from the Grantsburg sublobe, a spur of ice emanating from the east flank of the Des Moines lobe.

The presettlement pattern of upland vegetation in the MIM reflects substrate texture and landform topography. These features affected plants directly through their influence on moisture and nutrient availability, insolation, and local temperature, and also indirectly through their influence on the frequency and severity of fires. Sandy flat areas were dominated by prairie, savanna, and oak and aspen woodlands. This is especially true of the Anoka Sand Plain and sandy terraces along the major rivers. In these areas, droughty soils and absence of impediments to the spread of fire promoted fire-dependent prairie and woodland vegetation. A large area of prairie, savanna, and oak woodland was also present on gently undulating glacial till in the southern part of the section, adjacent to the extensive prairie lands of western Minnesota. The low-relief landscape in this part of the section afforded few impediments to the spread of fire, including fires that spread into the section from the adjacent prairie region. Woodland and forest dominated sites in the section where fire was uncommon or rare. Fine-textured drift deposited in hummocky moraines supported mesic forests dominated by sugar maple, basswood, American elm, and northern red oak. Even small reductions in fire frequency afforded by streams, lakes, or topographic breaks permitted the formation of forest on finer-textured soils, and once formed these forests were highly resistant to burning.

Floodplain and terrace forests were present historically along the valleys of the major rivers, the Mississippi, Minnesota, and St. Croix, and are still prominent today along many stretches of these rivers. Forests of silver maple occupy the active floodplains, while forests of silver maple, cottonwood, box-elder, green ash, and elm occupy terraces that flood infrequently. These valleys are also characterized by herbaceous and shrubby river shore communities along shorelines and on sand bars, and in some areas by cliff communities on steep rocky river bluffs. Closed depressions that pond water in the spring provide habitat for open wetlands such as

[2] http://www.dnr.state.mn.us/ecs/222/index.html

marshes, wet meadows, shrub swamps, and wet prairies. Peatlands are uncommon in the section and usually develop following formation of sedge or moss mats over sediments in former lake basins.[3]

Preferred Site

The preferred site is an existing industrial site which incorporates the Elk River Station, a Refused Derived Fuel (RDF) combustion plant, and the GRE corporate offices. The plant site and immediate vicinity have an evident industrial/commercial aesthetic.

This facility sits within the Anoka Sand Plain Subsection of the ECS. Subsections are units within Sections that are defined using glacial deposition processes, surface bedrock formations, local climate, topographic relief, and the distribution of plants, especially trees. Minnesota has 26 subsections.

The Anoka Sand Plain Subsection encompasses the Anoka Sand Plain and sandy valley trains along the Mississippi River in Central Minnesota (Dept. of Soil Science, Univ. of Minn., 1980b). The Mississippi River and its valley form the western boundary. The boundary of the Anoka Sand Plain forms the eastern and northern edges.

This subsection consists of a flat, sandy lake plain and terraces along the Mississippi River. Recent mapping suggests that much of the sand plain, once thought to be fluvial, is probably lacustrine in origin (Lehr, in progress). Low moraines are locally exposed above the outwash and there are small dune features (Wright 1972). There are also ice block depressions and southwest trending tunnel valleys on the sand plain (Albert 1993).

The major landform is a broad sandy lake plain, which contains small dunes, kettle lakes, and tunnel valleys. Topography is level to gently rolling. There are small inclusions of ground moraine and end moraine (Wright 1972). The other important landform is a series of sandy terraces associated with historic levels of the Mississippi River. Terraces are also associated with major tributaries of the Mississippi.

Bedrock is locally exposed in the St. Cloud area. Surface glacial deposits are usually less than 200 feet thick (Olsen and Mossler 1982). The subsection is underlain by Cambrian and Ordovician dolomite, sandstone, and shale (Morey 1976).

Soils are derived primarily from fine the sands of the sandy plain. Most of these sandy soils are droughty, upland soils (Psamments), but there are organic soils (Hemists) in the ice block depressions and tunnel valleys, and poorly drained prairie soils (Aquolls) along the Mississippi River (Cummins and Grigal 1981). Seventy to e80 percent of the soils are excessively well drained sands and another 20 percent are very poorly drained (Dept. of Soil Science, Univ. of Minnesota 1980b).

[3] http://www.dnr.state.mn.us/ecs/222M/index.html

Total annual precipitation ranges from 27 inches in the west to 29 inches in the east, with growing-season precipitation ranging from 12 to 13 inches. The growing season length ranges from approximately 136 to 156 days, with the longest growing season in the south.

Terraces associated with the Mississippi River form part of the western boundary of the subsection. Most rivers and streams are tributaries of the Mississippi, although some flow east to the St. Croix River, which eventually flows into the Mississippi. Many rivers, streams, and lakes are located in old glacial tunnel valleys. There are 38 lakes larger than 160 acres in area; about 3 percent of the subsection's surface is covered by water. Peatlands occupy linear depressions of many tunnel valleys (Albert 1993).

The predominant vegetation on the droughty uplands was oak barrens and openings. Characteristic trees included small and misformed bur oak and northern pin oak (Kratz and Jensen 1983). Jack pine was present locally along the northern edge of the subsection. Brushland characterized large areas of the sandplain. Upland prairie formed a narrow band along the Mississippi River, as did areas of floodplain forest (Marschner 1974).

Sod and vegetable crops are extensively grown on drained peat and muck areas (Dept. of Soil Science, Univ. of Minnesota 1980). Urban development is rapidly expanding into the subsection. Wheeler et al. (1985) found species associated with oak openings and oak barrens to be abundant in the sandplain although large areas of opening and barrens are uncommon.

According to the 2000 U.S. Census, Sherburne County had a total population of 64,417.[4] The population grew by 53.6 percent between 1990 and 2000, and is continuing to grow at a similar pace.[5] The urban to rural population ratio is 28,087 to 36,330, respectively.

General demographics for Sherburne County show a 51.1 percent male and 48.9 percent female distribution of the predominantly (96.9 percent) white population. Approximately 7.1 percent of residents are 65 years old or older. The median age is 31.4. Median household income for the county ($57,014) is approximately 21 percent higher than the statewide average of $47,111. Unemployment in Sherburne County was 2.0 percent, slightly less than the statewide average (2.9 percent) for the year 2000.[6]

Alternative Site

The alternative site is located in the city of Rosemount in Dakota County, Minnesota. The site is bordered on the south by County Highway 42, on the east by Emery Avenue, on the south by Ehler's Path and 140th Street. The entire land use within the boundary of the Alternative site is currently agricultural crop land.

This site sits within the St. Paul-Baldwin Plains and Morianes Subsection of the ECS.[7]

[4] http://www.lmic.state.mn.us/datanetweb/php/census2000/2000Glance.php
[5] Ibid
[6] http://www.ers.usda.gov/Data/
[7] http://www.dnr.state.mn.us/ecs/222Md/index.html

The northern boundary of this subsection consists of a Superior Lobe end moraine complex (St. Croix Moraine). To the west, terraces associated with the Mississippi River separate the subsection from the Anoka Sand Plain subsection. The southern boundary coincides with the southern edge of the Rosemount Outwash Plain.

This subsection is small and continues into Wisconsin. Although it is topographically low in comparison to other areas in the state, the subsection is dominated by a large moraine and areas of outwash plain. The subsection encompasses part of the seven county metropolitan area and as a result is affected by urban development.

This subsection is dominated by a Superior lobe end moraine complex. South of this moraine is a series of outwash plains associated with the Superior lobe. There are some areas of loess plain over bedrock or till in the southeastern portion of the subsection. Topography is rolling to hummocky on the moraine (steep, short complex slopes) and level to rolling on the outwash.

Glacial drift is generally less than 100 feet thick within the subsection, with maximum thickness of about 200 feet (Olsen and Mossler 1982). Ordovician and Devonian dolomite (some limestone, sandstone, and shale) is locally exposed, especially in the dissected stream valleys at the eastern edge of the subsection (Morey 1976, Olsen and Mossler 1982). Precambrian bedrock is exposed along the St. Croix River.

Soils in this subsection are primarily Alfisols (soils formed under forested vegetation). Areas of Mollisols (soils formed under prairie vegetation) are present on the outwash plains. Parent materials are mixed on the moraines (mixtures of clay loams, loams, sandy loams, and loamy sands). The outwash plains have sandy parent materials (Cummins and Grigal 1981).

Climate

Annual normal precipitation ranges from 28 inches in the north to 31 inches in the south, and growing season precipitation ranges from 12.5 to 13 inches. The average growing season length ranges from 146 to 156 days.

The drainage network is poorly developed throughout most of the subsection. This is due to the nature of the landforms. The Mississippi River cuts through the center of the subsection. There is a well developed flood plain associated with the Mississippi. The end moraines in the northern third have an undeveloped drainage network. The St. Croix River forms the east boundary (as well as the boundary between Minnesota and Wisconsin). The river flows into the Mississippi southeast of the Twin Cities. There are many lakes in this subsection. Most are present on the moraines.

A mosaic of vegetation occurred in the subsection. Oak and aspen savanna were the primary communities, but areas of tallgrass prairie and maple-basswood forest were common. Tallgrass prairie was concentrated on level to gently rolling portions of the landscape. Bur oak savanna developed on rolling moraine ridges at the western edge of the subsection and in dissected ravines at the eastern edge. Maple-basswood forest was restricted to the portions of the landscape

with the greatest fire protection, either in steep, dissected ravines or where stream orientation reduced fire frequency or severity (Albert 1993).

Urban development is the primary land use. There are small areas of forest present in the eastern portion of the subsection, although these are becoming scarce as urban development continues. There is significant recreational activity along the Mississippi and St. Croix river corridors.

According to the 2000 U.S. Census, the Dakota County had a total population of 355,904.[8] The population grew by 29.3 percent between 1990 and 2000.[9] The urban to rural population ratio is 334,361 to 21,543, respectively.

General demographics for Dakota County show a 49.4 percent male and 50.6 percent female distribution of the predominantly (91.4 percent) white population. Approximately 7.4 percent of residents are 65 years old or older. The median age is 33.7. Median household income for the county ($61,863) is approximately 31.3 percent higher than the statewide average of $47,111. Unemployment in Dakota County was 2.1 percent, slightly less than the statewide average (2.9 percent) for the year 2000.[10]

[8] http://www.lmic.state.mn.us/datanetweb/php/census2000/2000Glance.php
[9] Ibid
[10] http://www.ers.usda.gov/Data/

4.0 ASSESSMENT OF IMPACTS AND MITIGATIVE MEASURES

4.1 Socioeconomic

The direct socioeconomic impacts of construction will generally coincide with the construction period. These direct impacts include the effects on demographics, employment, income, and community services and facilities.

Table 4-1 shows the estimated peak number of workers, by major discipline, required for construction and startup during each quarter of the construction period. The workforce is expected to peak during the third and fourth quarters of 2008, with an expected peak workforce of 183.[11]

Most of the construction workforce is expected to be hired from within the regional area. Given the close proximity to the Twin Cities metropolitan area, it is anticipated that most of the construction management (CM) and support category workers will be hired from the regional area.

The project will permanently employ approximately three full-time personnel to operate the plant and perform routine maintenance. The plant will share additional personnel with several other facilities. **Table 4-2** shows an estimated breakdown of operating staff during the three shifts.[12]

In addition to the direct employment and earnings impacts, indirect economic impacts would be generated from the construction and operation of the project through economic multiplier, or ripple effects. Generally, multiplier effects refer to the direct and indirect employment and earnings created in a region due to an increase in final demand such as a new investment.

Indirect employment impacts are those created when construction workers spend their income on goods and services and businesses hire more workers to meet this increased demand. Additional jobs will be created as industries producing the plant equipment for the project increase output and hire more workers.

Primary affected industries include the fabricated metal industry, which produces boilers, ductwork, valves, and pipe fittings; the non-electrical machinery industry, which produces turbines, generator sets, blowers, fans, pumps, and compressors; and the electrical and the electronic equipment industry, which produces electric motors, industrial controls, electric lighting, and wiring equipment. As these industries increase production, they will demand more inputs from their suppliers. Workers in these industries will also spend their income, further increasing the demand for goods and services. When the total economic repercussions created from the construction of the project have filtered through the economy, the total employment impact will be a multiple of the direct construction employment at the site.

[11] Correspondence with GRE, September 2007.
[12] Ibid.

The total cumulative economic statewide benefit is estimated to be $61 million, as shown in **Table 4-3**. These calculations assume a 30 year operating period.[13]

Demographic changes to the study area attributable to the construction of the project are expected to be minimal. Workers employed to construct the project, and who are currently living within the regional area, are not expected to relocate. These persons will commute to work at the Project site.

The Electric Power Research Institute ("EPRI") report, *Socioeconomics of Power Plants*, indicated that construction workers will travel an average of 73 miles one-way on a daily basis to a jobsite, even up to a maximum of 115 miles one way.[14] The study, which analyzed the commuting patterns of workers on several electric generating facility projects, concluded that the long commuting distances were acceptable to workers due to the temporary nature of construction employment at a electric generating facility site.

The operations personnel will not be required until the final months of construction. At approximately that time, it is expected that they would relocate on a permanent basis.

Given the temporary duration of employment, it is assumed that construction personnel who relocate will rent an apartment or home during employment. The operations personnel and families will most likely purchase living accommodations due to the lengthy expected plant life.

The supply of housing in the study area can easily accommodate the small number of relocating workers and families.

Since the population increase during the construction period is expected to be limited, the increased demand for school, hospital, fire and ambulance, police, and utility services will not be significant. Similarly, since the number of employees required after the construction period and during the facility's operational life is small, no significant impact will occur on the demand for other community facilities and services due to relocating personnel.

Socioeconomic impacts resulting from the project will be primarily positive, with increased tax revenue and an influx of wages and expenditures made at local businesses during construction.

4.2 Noise

Noise is comprised of a variety of sounds, of different intensities, across the entire frequency spectrum. Humans perceive sound when sound pressure waves encounter the auditory components in the ear. These components convert the pressure waves into perceivable sound. Noise is measured in decibels (dB).

[13] Ibid
[14] Socioeconomic Impacts of Power Plants, EPRI, Palo Alto, CA: EA-2228

Noise standards have been established by the MPCA, Minnesota Rules part 7030.0040, subp. 2. The MPCA is the regulatory agency responsible for the enforcement of these standards. The standards are consistent with speech (hearing and conversation), annoyance, and sleep requirements for receivers within areas classified according to land use activities.

The MPCA has established various noise area classifications (NAC) and has established noise standards for each classification. The NAC area classification is based on the land use activity at the location of the receiver, and the NAC determines the applicable noise standard. Lower noise levels are required in residential areas, for example, than in industrial zones.

The four noise area classifications are: NAC-1, NAC-2, NAC-3, and NAC-4. Some of the land use activities under NAC-1 include household units, hospitals, religious services, correctional institutions, and entertainment assemblies. NAC-2 land use activities include mass transit terminals, retail trade, and automobile parking. Some NAC-3 land uses include manufacturing facilities, utilities, and highway and street ROW. NAC-4, which has no noise limits, consists of undeveloped and under construction land use areas.[15]

Table 4-4 sets forth the Minnesota Noise Standards for the appropriate land use.

Distance is a main criterion for measuring the strength of noise. For every doubling of distance from the noise source, a decrease of 6dB occurs from isolated sources.

At both the preferred and alternative sites noise would be generated during the construction and operation of the project. Construction noise would be predominantly intermittent sources originating from diesel engine-driven construction equipment. Potential noise impacts would be mitigated by proper muffling equipment fitted to construction equipment and restricting activities conducted during nighttime hours.

Noise from the turbine operation is a result of air flow through the combustion air intake and from the exhaust gases discharging from the stack. The project air inlet will be appropriately sized and fitted with diffusers to minimize velocity and therefore the noise of air moving into the inlets. The stack will be fitted with silencers to reduce the noise of exhaust gases leaving the plant.

Preferred Site

Current ambient noise detectable on the preferred site consists of intermittent traffic along the local roads, traffic from US Highways 10 and 169, and operation of the existing facility. The project will not result in any violation of the Minnesota Noise Standards at residences located near the preferred site.
GRE, as part of a noise impact study, developed three noise data points for the Elk River Peaking project: 1) the near-field noise guarantee of 85 dBA, 2) the far-field noise guarantee of 63 dBA, and 3) actual far-field noise monitoring data for the Siemens V84 combustion turbines at

[15] http://www.pca.state.mn.us/programs/noise.html

Pleasant Valley Station (**Appendix B**). Using standard formulas for estimating sound attenuation from a point source, GRE estimated that the sound levels at the nearest residence, which is ~1,640 feet from the proposed combustion turbine, would range between 30 and 51 dBA for the three noise data points (**Figure 4-1**).

This analysis is conservative in that it does not take into consideration the noise attenuation that will be achieved by the barriers (topography, buildings, trees, etc) between the combustion turbine and the noise receptor. Based on the historic conservativeness of the guarantees relative to actual measurements and the conservativeness of the simple model, noise from the combustion turbine should not result in a violation of the Minnesota noise standard.

Alternation Site

Operation of the project at the Rosemount site would result in an increase in frequency of operational noises, but not a significant increase in maximum noise levels at nearby residences. Siting of the project at the Rosemount site will not result in any violation of Minnesota Noise Standards at the residences located near the facility.

Current ambient noise detectable on the alternative site consists of intermittent traffic along the local roads, traffic from US Highway 52 and Minnesota Highway 55, operation of agricultural equipment, small aircraft, and birds and insects.

Mitigative Measures

No mitigative measures are necessary.

4.3 Aesthetics

Preferred Site

Area aesthetics will not be significantly changed by the project. The plant site is on the existing Great River Energy campus, and has been previously used for various purposes related to utility operation and maintenance. The plant site and immediate vicinity have an evident industrial/commercial aesthetic. The proposed plant maintains this aesthetic.

The project transmission line upgrades will occur along an existing transmission line corridor. Upgrades to the project transmission lines may involve the use of poles that will be approximately 10-20 feet taller than the existing poles. However, taller poles would not appear significantly different than the existing transmission line configurations, and the current visual aesthetic would be maintained.

Alternative Site

The Rosemount site is visually dominated by lands used for row-crop agriculture to the south and east. Several local farmsteads exist nearby. A landfill is to the north, with mixed native/non-native vegetation around its perimeter. A golf course is to the west. Industrial properties dominate further north and northeast, including an oil refinery.

The GRE Peaking Station will provide a strong visual impression given the current landscape. The project site is not a heavily populated area. There are less than a dozen residences within a half-mile radius of the project site. However, the proposed facility will change the view of people living in or working around the farm houses nearest to the site or traveling along US Highway 52 and Minnesota Highway 55. These people will see a commercial/industrial looking building.

Mitigative Measures

No mitigation is necessary.

4.4 Recreation

Preferred Site

Area tourism and recreation will not be adversely impacted by the project.

Alternative Site

Currently, there are no public recreation areas in the project vicinity such as biking, hiking or horseback riding trails. In addition, there are no designated scenic vistas in the areas that will be impacted by the addition of the project. None of the local roadways has been given a scenic designation by any governmental jurisdiction.

Mitigative Measures

No mitigation is necessary.

4.5 Transportation

Traffic near the proposed facilities will increase during construction. Local motorists may be temporarily inconvenienced by the increase in large construction vehicles on the roadways and possible delays in traffic. Traffic due to the construction workers could be expected to produce local impacts over a 30-minute period at the beginning and end of the day and each time a change in shift occurs.

Mitigative Measures

Because traffic levels may only be slightly, but insignificantly, impacted during construction with no impacts anticipated during facility operation, no mitigation is necessary. The operation at either site will have no impact on traffic patterns or usage.

4.6 Land Use

Preferred Site

The plant site will be located on the existing Great River Energy Elk River campus. The campus includes offices, warehouses, pole yard and RDF Power Plant. Locating the new generating facility on the existing Great River Energy campus takes advantage of existing infrastructure, including roads, water, and sewer. Since the Project plant location has been previously used for utility purposes, as a Great River Energy pole yard, the new facility will not notably change the land use of the site. Land use in the vicinity of the project is diverse.

The proposed activities at the plant site meet the Sherburne County land use designation and city of Elk River zoning overlay for the site. Sherburne County Planning and Zoning Department lists the current land use of the project plant location as "Public Utility Land – Preferred" (Sherburne County 2007). The project falls within the approved uses for that designation. Adjacent land uses within one mile of the Project plant location include:

- Public Utility Land – Non-Preferred.
- Residential/Apartments Over 4 Units.
- State Public Property.
- Commercial.
- Industrial.
- Residential 2-3 Units.
- Residential Single Unit.
- Vacant Land.

According to the Elk River Department of Commercial Development, the Elk River Peaking Station site is zoned as Light Industrial/Solid Waste Facility (City of Elk River 2007). The project falls within the approved uses for that designation. Zoning for parcels immediately adjacent to the project plant site includes the following designations:

- Business Park.
- Planned Unit Development.
- Highway Commercial.
- Central Commercial.
- Townhouse/Multi-Family.

Land use and zoning maps of the project area are included as **Figures 4-2 and 4-3**, respectively.

The project will not require the displacement of any occupied residences or businesses. Area industries will not be adversely impacted by any component of the proposed project. Work on the project will not displace any other existing or planned land use, including residential land

uses. The proposed site for the new generating unit is located within a parcel currently owned by Great River Energy and used for power generation. The nearest residence is located approximately 1,200 feet north-northwest of the project location.

Land use in the vicinity of the project transmission line upgrades is diverse. The project transmission lines cross lands under the zoning authority of the Metropolitan Council, Sherburne County and the city of Elk River. The Metropolitan Council and the Sherburne County Planning and Zoning Department list the following current land uses along the project transmission line upgrade:

- Municipal Property.
- State Public Property.
- Agriculture.
- Residential Single Unit.

As noted previously, the project transmission line upgrades utilize an existing transmission corridor and the substation at County Road 78 and Bunker Lake Blvd. As a result, the project transmission line upgrade will not change current land use of the areas crossed.

According to the city of Elk River Department of Commercial Development, areas crossed by the project transmission line upgrade include the following zoning designations:

- Light Industrial.
- Business Park.
- Planned Unit Development.
- Single Family Residential.
- Agricultural Research.

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The project transmission line upgrade will not require the displacement of any occupied residences or businesses. Work on the upgrade will not displace any other existing or planned land use, including residential land uses.

Alternative Site

The entire land use within the boundary of the Rosemount site is currently agricultural crop land. The Rosemount site is about 320 acres, of which 215 acres, or 67 percent of the total area, is considered prime farmland. Minn. Rules 4400.3450 Subp. 4 prohibits use of more than 0.5 acres of prime farmland per megawatt of capacity for sites where large generating plants are located (unless no feasible alternative exists). Given the 175 MW capacity of the proposed facility, this rule would allow use of up to 87.5 acres of prime farmland for the Rosemount site. The proposed facility would utilize approximately 40 acres, or about 46 percent of the maximum allowable area. Therefore, construction of the project at the Rosemount site is consistent with Minn. Rules 4400.3450 regarding use of prime farmland.

The alternative site is located within the city of Rosemount corporate boundary, which encompasses approximately 36 square miles (city of Rosemount 2007). The city's zoning map

(**Figure 4-4)** shows the Rosemount parcel zoned as "Agricultural." Adjacent zoning includes "Waste Management" (a landfill) to the north and "Public/Institutional" (public golf course) to the west. Adjacent areas to the east and south are zoned agricultural.

No businesses or residences would be displaced by the project at the Rosemount site.

Mitigative Measures

Impacts to land use as a result of the project are expected to be minimal.

Forestry

Neither the proposed or alternative site contains any timber management activities.

Mining

Neither the proposed or alternative site contains any mining activities.

Prohibitive Sites

In accordance with Minn. Rule 4400.3450, no LEPGP may be located in sites deemed prohibitive. Neither the proposed nor the alternative site contains any of the prohibitive sites listed in the rule, including:

- National Parks;
- National historic sites and landmarks;
- National historic districts;
- National wildlife refuges;
- National monuments;
- National wild, scenic, and recreational river ways;
- State wild, scenic, and recreational rivers and their land use districts;
- State parks;
- Nature conservancy preserves;
- State Scientific and Natural Areas; and,
- State and national wilderness areas.

4.7 Topography, Soils and Geology

Preferred Site

The geology and soils at the plant site, along the transmission line upgrades and at the substation are structurally suitable for construction of the project components. The geology and soils do not present any special concerns related to water or wastewater management for the project. Surficial and bedrock geology for the preferred site are shown in **Figures 4-5 and 4-6**.

The entire project, including plant, transmission lines and substation, is located within the Anoka Sand Plain region and is underlain by approximately 150 feet of unconsolidated sediments, according to regional well logs. Pleistocene-aged trace deposits associated with mixed clasts of the Superior and Des Moines lobes are directly beneath the site. These deposits consist primarily of sand, gravelly sand, and cobbly gravel (Meyer et al 1993). Soils for the preferred site and associated facilities are shown in **Figure 4-7**.

The Soil Survey of Sherburne County, Minnesota (Grimes 1968) indicates soils found on the site are Hubbard loamy sands. Hubbard series soils are nearly level to gently sloping and formed in outwash sands. Soils are excessively drained. The preferred site has been utilized as a utility pole storage yard; thus the soils have been compacted and otherwise altered due to prior activities.

Hubbard series soils do not meet the productivity criteria for prime farmland. There are no prime farmland units associated with the site. The Soil Surveys of Sherburne County (Grimes 1968) and Anoka County (Chamberlain1977) indicate soils found along the transmission line upgrade are:

- Hubbard loamy sands.
- Isanti sandy loam.
- Nymore loamy coarse sand.
- Nymore loamy sand.

Soils at the existing substation were originally mapped as Sartell fine sand and Lino loamy fine sand. These soils types are all formed in outwash sands. The project transmission line upgrade utilizes an existing transmission corridor and substation; thus, the soils have likely been moderately compacted along the existing corridor and moderately to heavily compacted at the substation.

These soils do not meet the productivity criteria for prime farmland. There are no prime farmland units associated with the project transmission line or substation upgrades.

The facility will operate under an existing Minnesota General Industrial Stormwater Discharge Permit (Permit #MNG611000). In addition, the facility will be designed to avoid the discharge of stormwater off the site. In extreme precipitation events, stormwater would be directed to sand filters, and then discharged via the Minnesota DOT-controlled highway 169 drainage ditch to the Mississippi River.

There are no additional stormwater impacts associated with the Project transmission line or substation upgrades.

Alternative Site

The Rosemount site lies 3.25 miles west of the Mississippi River on level to gently rolling uplands at a mean elevation of approximately 840 feet above sea level. Construction and

operation of the proposed facility at the Rosemount site would not substantially alter the existing topography. Topography in the area is the result of a variety of geologic processes. Sedimentary rocks that were deposited 600-400 million years ago underlie all of Dakota County. The lower layers of rock consist of sandstone and shale. These are the older Paleozoic layers of Jordan sandstone, St. Lawrence and Franconia formations, Ironation and Galesville sandstones, Eau Claire formation and Mt. Simon sandstone (Balaban and Hobbs 1990). The upper layers were deposited later, and consist of sandstone, shale and limestone, and are at or near the surface across much of the county. This uppermost bedrock is Prairie du Chien group. These bedrock layers have been eroded by glaciers and by weathering.

The depth to bedrock is between 50-150 feet under the Rosemount site. The transmission corridors transverse areas of 0-50 feet depth to bedrock, 50- 150 feet depth to bedrock, and corridors that extend the furthest north are on areas with up to 500 feet depth to bedrock.

Glacial sediments were deposited directly by glaciers as loamy unsorted till. The Rosemount site is underlain by mixed outwash from the Des Moines lobe [Hobbs, 1990 #69]. This outwash generally consists of sand, loamy sand, and gravel. The project transmission corridors are primarily underlain by outwash from the Superior lobe deposits. The Superior lobe outwash consists of gravel and sand. Large rivers that formed when the glaciers melted deposited sandy outwash across much of the county. Since glaciation thick layers of loamy to silty alluvium have accumulated along major rivers and in side valley tributaries. The transmission corridors may also cross riparian terrace deposits, which consist of clean sand and gravel, with the lower terraces lying 5 to 70 feet, and the middle lying 70 to 130 feet above the present floodplain.

Soils in the area are Waukegan-Wadena-Hawick Associations, which are level to very steep, well drained and excessively drained soils formed in silty and loamy sediments over sandy outwash, on outwash plains and terraces (**Figure 4-8**). These soils formed mainly in glacial till, glacial outwash, loess, alluvium, and bedrock. Most of this soil map unit is used for cultivated crops and some areas are used for building sites. Waukegan soils are the most common soil type in the Rosemount site and corridor areas. Where drained, Waukegan soils are considered prime farmland.

Of the 320 acres of land at the Rosemount site, roughly 87 percent are deep and moderately deep, moderately well and well drained soils that have moderately coarse texture and moderate infiltration rates. Approximately 10 percent of the soils are deep, well drained to excessively well drained sands and gravels with high infiltration rates. The remaining 2 percent are soils that can be drained then classified. At the Rosemount site 66% of the area is prime farmland soils, and 1% are prime farmland soils if drained.

The facility would operate under a new Minnesota General Industrial Stormwater Discharge Permit. Stormwater collected from areas that may be contaminated by fuel or oil spills will flow through oil/water separators or containment systems that allow inspection prior to discharge to a stormwater pond.

Mitigative Measures

The project will not impact the geology at either the preferred or the alternative site. Potential impacts of construction are increased impervious surfaces, soil compaction and exposing the soils to wind and water erosion. Impacts to physiographic features should be controlled and minimal during and after construction activities; these impacts will be short term. There should be no long-term impacts resulting from the project at either site.

The Minnesota Pollution Control Agency's (MPCA) Stormwater Program is designed to reduce the pollution and damage caused by stormwater runoff. The MPCA has three stormwater programs for regulating stormwater runoff from three main sources: construction, industrial and municipal.

Areas of larger disturbance (one acre or more), will be addressed in the National Pollution Discharge Elimination System (NPDES) and Stormwater Pollution Prevention Plan (SWPPP) prepared for the project. Mitigation under the NPDES includes implementation of the SWPPP with the appropriate erosion control methods developed specifically for the site.

The MPCA issues combined NPDES/State Disposa System (SDS) permits for construction sites, industrial facilities and municipal separate storm sewer systems. Compliance with the MPCA stormwater program will be a condition of the LEPGP Site Permit.

4.8 Flora and Fauna

Preferred Site

According to the MDNR Ecological Classification System (MNDNR 2005), the plant site and its associated components are located along the southern edge of the Anoka Sandplain landform, in the Minnesota and Northeast Iowa Morainal Section of the Eastern Broadleaf Province. Pre-settlement vegetation was primarily composed of oak openings and barrens (savanna) on the upland areas and river bottom forest adjacent to the Mississippi River at lower elevations.

Most of the native vegetation was initially removed to allow the land to be converted first to lumber and then to agricultural uses. More recently, the project plant site has been part of Great River Energy's campus, and has had a number of uses including an ash storage and utility pole yard. These uses and the associated regarding of the land surface have left a mixture of primarily non-native grasses and forbs on the site, with a small stand of red pine (*Pinus resinosa*) to the east.

Any disturbance to vegetation due to the project transmission line upgrade will be minimal and limited to the areas immediately adjacent to pole placements. Remnants of native vegetation communities with pre-settlement characteristics remain in the vicinity of the project plant location. The nearest of these remnants is a series of five islands in the Mississippi River approximately one mile west of the project location. The Minnesota County Biological Survey

(MCBS) has mapped these islands as Silver maple – Virginia creeper floodplain forest (**Figure 4-9**). This floodplain forest features a canopy of well-spaced silver maple (*Acer saccharinum*), green ash (*Fraxinus pennsylvanica*) and American elm (Ulmus americana), with wood nettle (*Laportea canadensis*) and ostrich fern (*Matteuccia strutheopteris*) in the ground layer. This floodplain forest has reportedly never been grazed, although the northern island was used as a vegetable garden in the 1930s. The other area of native vegetation communities is approximately 1.25 miles southeast of the project plant location. MCBS mapped this area as a dry oak savanna/oak brushland complex. The area is dominated by a relatively open oak canopy, primarily bur oak (*Quercus macrocarpa*), with native prairie grasses and forbs in the ground layer.

The project is not expected to adversely impact area wildlife. The United States Fish and Wildlife Service (USFWS) lists the bald eagle (*Haliaeetus leucocephalus*) as the only Federally-listed species known to occur in Sherburne County. In order to evaluate the potential presence of State listed species, the MDNR Natural Heritage Program was contacted to review the Natural Heritage Information System (NHIS) database.

Results of the NHIS search identified only the bald eagle as being present in the vicinity of the project plant site. The NHIS records do not indicate that bald eagles nest on the Project plant site itself. Rather, the records show bald eagle nests approximately 3,600 feet to 3,800 feet west of the project plant location, nesting in the floodplain forest on a series of five islands in the Mississippi River. The nearest edge of the nearest island is 3,100 feet west of the Project plant location. If bald eagles were to nest on the mainland side of the river, across from the islands, they would still be over 2,800 feet west of the Project plant location. These distances are more than twice the 0.25-mile (1,320 feet) buffer that the USFWS normally considers to be necessary to avoid disturbance of an eagle nest. A project review request letter has also been sent to the USFWS to determine if the project will affect any threatened or endangered species.

The NHIS records indicate that no other State-listed species are known from the plant site.

The project transmission line and substation upgrades are also not expected to adversely impact area wildlife. The local presence of bald eagles is discussed above. No bald eagle nests are known along the Project transmission line upgrades. The MNDNR Natural Heritage Program was contacted to review the NHIS database for State-listed species. Results of the database search identified the following State-listed species occurring within one mile of the Project transmission line upgrades:

- Loggerhead shrike (*Lanius ludovicianus*), threatened, proposed endangered.
- Blanding's turtle (*Emydoidea blandingi*), threatened.
- Plains pocket mouse (*Perognathus flavescens*), special concern.

These species are all known to occur within Bunker Hills Regional Park, at the far eastern terminus of the project transmission line upgrade near the location of the substation improvements. The transmission line work at the eastern terminus would occur within the

existing Great River Energy substation, and would not involve activities that would remove or disturb these species or their habitats.

Alternative Site

The pre-settlement vegetation of the Rosemount site was upland oak woodland-brushland and prairie (Marschner 1930). There may have been patches of dry oak savanna, and mesic or dry subtype oak forest patches. Because of the fairly low groundwater table, the site was likely dominated by an assemblage of mesic to dry forest and prairie plants, such as bur and northern pin oaks, and big bluestem. Within the project transmission corridors native vegetation consisted of oak openings and barrens, which consist of scrubby forms of oak with some brush and thickets. Some areas of upland deciduous forest may have existed along the Mississippi River.

Since settlement, the site and its vicinity have been logged, ditched, tiled and tilled which has effectively removed all evidence of the pre-settlement vegetation. The native vegetation is almost entirely replaced with agricultural crops, dominated by corn and soybeans. The remaining nonagricultural areas were replaced by industrial development.

According to the Minnesota Land Cover Classification System (MLCCS), the entire Rosemount site consists of upland soils dominated by row crops. Plant communities were ranked by Dakota County based on MLCCS vegetation criteria. Minnesota County Biological Survey (CBS) natural communities were scored the highest. Natural communities are defined by the CBS as groups of native plants and animals that interact with each other, and their abiotic environment, in ways not greatly altered by modern human activity, or by introduced organisms. CBS natural communities did not occur within the Rosemount site, and are generally situated adjacent to the Mississippi River within transmission corridors in the floodplain.

No native plant communities exist at the Rosemount site.

The pre-settlement species of wildlife that resided in oak woodland-brushland and prairie included numerous large and small mammals and birds that are no longer present in the area. These species included the American bison, common elk, pronghorn antelope, black tailed prairie dog and the prairie chicken. The post-settlement conversion of the sites to agricultural crops and industrial areas has partly accounted for the complete removal of many wildlife species (agricultural crops do not provide suitable cover for most species of wildlife and do not support the diet that maintained these species prior to settlement).

At the Rosemount site, the loss of crops and herbaceous plants would displace the limited amount of wildlife that may utilize the area. However, an abundant amount of similar type habitat exists in the surrounding area, so it is not anticipated that the overall carrying capacity of the region would be significantly impacted.

Nearly all of the wildlife species will utilize the proposed site only as a food resource, with the exception of the small rodents, which may inhabit the bromegrass of the roadside ditches. These

species of wildlife will feed on grains and vegetable matter or they will feed on the insects and small mammals that are supported by these crops. Corn is one of the most highly utilized crops, and soybeans are one of the least utilized crops, as forage for wildlife. Therefore, the abundance and diversity of species found in the vicinity of the corn crop should be higher than found in the soybean crop. Most of the wildlife that would use this area is bird species which have an ability to travel some distance to and from suitable cover. The wetland complex at the north-west corner of the Rosemount site and on the adjacent property to the north provides important habitat for waterfowl and wetland species in the proximity.

Mitigative Measures

No mitigation is necessary.

4.9 Rare & Unique Natural Resources

Preferred Site

The project will not adversely impact Federally- or State-listed threatened or endangered species. The Natural Heritage Program of the MDNR was contacted and asked to review its database to determine if any rare plant or animal species or other significant natural features are known to occur within the project site. No plants or animals of concern were identified that would be adversely impacted by the project.

The MDNR also maps Sites of Biodiversity Significance, and rates them as Outstanding, High, Medium or Below. Sites rated "Below" are areas that have a degree of native community structure that is higher than disturbed or developed areas, but below the level of biodiversity significance for similar communities in the state.) The MDNR has mapped a total of six Sites of Biodiversity Significance (SBS) near the overall project (**Figure 4-9**). In the vicinity of the project plant site, SBS are mapped within 2600 feet to the southeast and 5600 feet to the northeast, respectively. Both are rated "Below". The project will have no impact on these sites.

The project transmission line upgrades cross two additional SBS. Both sites are mapped as Dry Sand-Gravel Oak Savanna (Southern Type). One of the sites is rated "Moderate" for biodiversity significance, and the other is rated "Below". Both are crossed along existing transmission line corridors; therefore, there is no additional impact to these sites.

Finally, near the site of the substation improvements, there are two additional SBS. One takes up most of Bunker Hills Regional Park, and is rated "Outstanding." The other is further southeast, and is rated "Below." The proposed activities at the existing substation will have no impact on these sites.

Alternative Site

The project will not adversely impact threatened or endangered species. The USFWS lists the following Federally-listed species as being potentially present in Dakota County:

- Higgins eye pearly-mussel (*Lampsilis higginsi*), endangered
- Minnesota dwarf trout lily (*Erythronium propullans*), endangered
- Bald eagle (*Haliaeetus leucocephalus*), threatened
- Prairie bush clover (*Lespedeza leptostachya*), threatened

The Rosemount site does not provide habitat for any of these species. There would be no discharge to potential Higgins eye pearly-mussel habitat. The intensive agricultural use of the property is incompatible with either of the plant species, as is the small wetland area (both are upland species).

Finally, the trees in the wetland are not large enough to support eagle nests. With regard to State-listed species, the MDNR Natural Heritage Inventory System (NHIS) was queried to determine if any rare plant or animal species or other significant natural features are known to occur within the Rosemount site. The NHIS database indicates that loggerhead shrikes (*Lanius ludovicianus*), a Minnesota threatened species, and bald eagles (*Haliaeetus leucocephalus*), a Federally threatened species, have been documented near the Rosemount site.

The MDNR does not know the size of the full extent of the loggerhead shrike population in the project vicinity, however breeding season observations and nesting sites have been located between Hwy 55 to the north, Hwy 52 to the west, Hwy 61 to the east, and Hwy 50 to the south. The MDNR has previously indicated in an earlier study of the Rosemount site that no further survey work is necessary to define the loggerhead shrike population, since the extent of the local population is fairly well known. Instead, in order for loggerhead shrikes to be able to continue to use the Rosemount site it would be imperative that some habitat be maintained or created within the Rosemount site buffer area.

Shrike habitat includes open country and dry upland prairie with hedgerows, shrubs, and small trees, as well as shelterbelts, old orchards, pastures, cemeteries, grassy roadsides, and farmsteads. The scattered trees, shrubs, and fencerows in these areas provide places shrikes need to hunt and nest. Shrikes feed by perching on trees, shrubs, fences or powerlines, and flying out to catch their prey (large insects, small mammals, birds, frogs etc.) in surrounding open grassy areas. Therefore, areas that are too open and have no trees or shrubs for nesting and perching are unsuitable, as are forested areas or dense brushland, which have no open areas in which to spot prey.

No plants or animals of concern were identified that would be adversely impacted by the utilization of the Rosemount site.

Mitigative Measures

No mitigation would be required at the Elk River location. At the Rosemount location consideration of maintaining or creating loggerhead shrike habitat within the facility/site buffer area should be given.

4.10 Archaeological and Historic Features

Preferred Site

The Minnesota State Historic Preservation Office (SHPO) was contacted to request a Historic, Archaeological and Architectural Inventory database search for the project plant site and for areas along and adjacent to the project transmission line upgrade. According to the SHPO database, there are 29 historic and/or architectural sites in Elk River. The closest to the project plant site are the twenty-two sites in the historic downtown area of Elk River, approximately 0.7 mile northwest of the site in the 300-block of Jackson Street, and on the 600- and 700-blocks of Main Street.

The SHPO database query also indicates that there are two known archaeological sites in the project plant vicinity. The nearest is a lithic scatter site approximately 2,300 feet northeast of the project plant site. The other archaeological database record in the vicinity is an artifact scatter approximately 3.8 miles southeast of the project plant site.

Further south and east of the generating facility, along the project transmission line upgrade, SHPO has no Architectural or Historic records. However, there are two archaeological lithic scatter records near the northwest shore of Lake Itasca in Sections 18 and 19 of Township 32 North, Range 25 East. The project transmission line upgrade passes within 2,000 feet of these areas at its closest.
There is an additional archaeological historic documentation record in the southwest quarter of Section 19, Township 32 North, Range 25 East. This record is south of the BNSF railroad line.

The project transmission line upgrade will have no impact on any of the SHPO sites.

Alternative Site

The Rosemount area was originally inhabited by the Lower Band Mdewanton of the Santee Sioux tribe. On August 5, 1851, Chief Little Crow, the leader of the New Ulm Indian uprising, signed a treaty at Pilot Knob, Mendota, turning the land over to the government.

Dakota County was established in 1849, one of the first counties in the new Territory of Minnesota.

The western boundary of the county was the Missouri River. The county was named for the people who inhabited it prior to white settlement, the Dakota people. Some of the earliest

immigrants to Dakota County were the French-Canadians who came to trade for furs with the Dakota people (Dakota County Historical Society, 2003).

In 1853, the first settlers, William and Walter Strathern and C. H. Carr came to the Rosemount area from Scotland. They were followed soon after by many immigrants, most of whom were Irish Catholics. On May 11, 1858, settlers met at the home of Thomas Dowd for the first township meeting. Coincidentally, this was the same day that Minnesota became a state. Because of strong Irish sentiments and the fact that there is a village in Ireland of the same name, Rosemount was chosen (City of Rosemount 2003).

The State Historical Preservation Office (SHPO) was contacted and asked to review their database. Based on the SHPO response, an archaeological survey was conducted in compliance with SHPO standards. Results of the survey were negative for significant archaeological findings

Mitigative Measures

No mitigation is necessary.

4.11 Air Quality

The proposed peaking station includes a new combustion source, which will emit products of combustion to the air. Estimated emissions are summarized in **Table 4-5**.

Another potential source of air emissions is fugitive dust from site preparation and construction activities. However, construction-related fugitive emissions will be of a short-term duration and will be controlled by watering or applying dust suppressants to exposed soil surfaces as necessary to reduce the impact on area residents.

Preferred Site

A preliminary analysis of the impacts of the estimated combustion emissions, summarized in **Table 4-6**, indicates the project will have no significant impact on area air quality. The potential to impact ambient air quality was modeled using AERMOD. The background concentrations plus modeled concentrations are well below the National Ambient Air Quality Standards and Minnesota Ambient Air Quality Standards for all pollutants, demonstrating that the project will have a minimal impact on area air quality for all pollutants modeled.

The project also triggers the MPCA's requirement to prepare an assessment of air emission risks to human health. The MPCA's "Air Emissions Risk Analysis (AERA) Guidelines" requires the establishment of a baseline risk for the existing site and an analysis of the impact of the new emissions from the turbine installation.[16]

[16] http://www.pca.state.mn.us/air/aera-guide.html

A preliminary air toxics review has been completed for the CT that indicates its incremental impacts are well below the MPCA's risk thresholds. Great River Energy will submit a completed AERA with the air permit application to the MPCA. The results for the CT are summarized in **Table 4-7**. Farmer cancer risks are the highest; however, the farmer scenario is not applicable at the worst-case receptors because these receptors are located on property that has been developed and is no longer suitable for farming.

While incremental impacts from the project are negligible, the MPCA has stressed that understanding the baseline risk is important to its risk decision. Great River Energy has developed the baseline risks associated with the existing operations at the Elk River campus and will work with the MPCA through the air permitting process to complete the baseline risk analysis. The complete AERA report is provided as **Appendix C**.

Alternative Site

The potential to impact ambient air quality was modeled using AERMOD. The results of the modeling, presented in **Table 4-8**, show that the project will have a minimal impact on area air quality for all pollutants modeled. The modeled concentrations are well below the National Ambient Air Quality Standards and Minnesota Ambient Air Quality Standards for all pollutants.

An analysis of the CT on the Rosemount site has not been completed; however, the analysis performed for the preferred site is a good indication that risks associated with the CT are negligible. A complete AERA would be conducted to confirm the impacts if the project was to be constructed at the alternative.

Mitigative Measures

As a condition of the LEPGP site permit, GRE would be required to comply, through the air permitting process, with conditions set by the MPCA. For the preferred site this would be accomplished by GRE submitting an application to amend the Elk River Station's air emission permit, Permit No. 1410003-003. The amendment will incorporate the project into the existing facility air operating permit.

4.12 Water Resources (groundwater, surface water, wetlands)

Preferred Site

The project will not significantly impact area water bodies. The project plant site is located within the Mississippi River (St. Cloud) watershed, USGS/MDNR major watershed #17. The nearest named stream is the Mississippi River, (**Figure 4-10**). The project plant site lies within the USGS/MDNR minor watershed #1700100, an area of approximately 16 square miles.

The project transmission line upgrade is located within portions of three major watersheds. For the overall project, the major and minor watersheds crossed and their drainage areas are summarized in **Table 4-9.**

The project transmission line upgrade will not significantly impact area water bodies. The project transmission line upgrade crosses Trott Brook twice, and an unnamed tributary to Trott Brook once. Trott Brook joins the Rum River approximately 5.5 miles east of the project transmission line upgrade's furthest downstream crossing. Streams will be crossed by spanning, with poles placed in locations that will avoid disturbance to the stream banks. As a result, the project transmission line upgrades will not introduce additional sediments into area streams.

No lakes or major rivers are crossed by the project transmission line upgrade. Letters have been sent to the MDNR and the U.S. Army Corps of Engineers requesting information on potential impacts of the project on area water resources.

The project will not impact area wetlands. No wetlands are located within the project plant site. However, several wetlands are found in the area surrounding the plant site, the nearest of which is an emergent wetland approximately 3 acres in area about 1000 feet north of the plant site. The only other wetlands located within 1,320 feet (0.25 mile) of the project plant site are east of Highway 169 and will not be affected by the project. **Figure 4-11** shows the wetlands in the vicinity of the project plant site and **Table 4-10** lists the Cowardin classification for all wetlands within approximately 1,320 feet of the project plant site.

The project transmission line upgrade will also not significantly impact area wetlands. However, several wetlands are crossed by the upgrade. **Figure 4-12** shows the wetlands in the vicinity of the transmission line upgrade and **Table 4-11** lists the Cowardin classification for all wetlands crossed by the transmission line upgrade.

The project transmission line upgrade follows an existing transmission corridor. Wetlands are primarily spanned to minimize disturbance. Wetlands that are too large to span have existing poles. In these situations, disturbances associated with the project transmission line upgrade will be minimal and limited to pole replacement as needed.

Alternative Site

The project will not significantly impact area water bodies. The project site is located within Mississippi River (Metro) watershed, USGS/MDNR major watershed #20. The nearest named stream is the Mississippi River, (**Figure 4-13**). Review request letters have been sent to the MDNR and the U.S. Army Corps of Engineers requesting information on potential impacts of the project on area water resources.

A wetland complex is located in the northwest corner within the Rosemount site (**Figure 4-14**). This wetland complex was delineated by Barr Engineering on April 28, 2003. The site was revisited in March 2007 to confirm the wetland boundaries. The wetland is a 16.0-acre

irregularly shaped basin comprising several wetland types. The western lobe of the wetland, approximately 40 percent of the overall area, is a Type 6 (palustrine scrub-shrub) wetland. The eastern lobe, approximately 40 percent of the total area, is a Type 4 (palustrine emergent, permanently flooded). The remainder of the wetland, primarily comprising the edges of the basin, is a combination of Type 1, 2 and 3 wetlands (palustrine emergent wetlands with water regimes ranging from semipermanently flooded to saturated).

Dominant plant species are narrowleaf and hybrid cattails (*Typha angustifolia* and *Typha* x *glauca*) in the emergent components of the wetland complex, and cottonwood (*Populus deltoides*) and willows (*Salix* sp.) in the scrub-shrub portion. Agricultural fields abut the wetland to the east and south. A golf course is to the west, and 140th Street East is to the north. The wetland is connected via a culvert under 140th Street East to an additional 10.5 acres of primarily Type 4 wetland. The project would be configured on the Rosemount site in such a way that it would have no direct impacts to the wetlands. There would be no discharge to the wetland.

An additional wetland was delineated in April 2003 on the golf course west of the alternative site. Also, the National Wetland Inventory maps for the area indicate seven smaller wetlands to the north and northeast of the alternative site. The acreages and Cowardin classifications of these wetlands are summarized in **Table 4-12**.

Construction of the project at the alternative site would have no impact, direct or indirect, on any of these wetlands.

Mitigative Measures

If dewatering is necessary, dewatered groundwater will be properly stored and sediments will be settled out and removed before the water is discharged.

As a condition of the LEPGP Site Permit, standard erosion control measures and best management practices (BMP) will be required to minimize potential impacts.[17]

Best Management Practices (BMPs) may include:

- Contain stockpiled material away from stream banks and lake shorelines.
- Stockpile and respread topsoil.
- Locate structures and disturbed areas away from rivers and lakes, whereprактical.
- Use turbidity control methods prior to discharging wastewater from concretebatching or other construction operations to streams or other surface waters. Wastewaters discharged will be free of settleable material.

[17] http://www.pca.state.mn.us/publications/wq-strm2-05.pdf

If it is determined that a Wetland Conservation Act (WCA) or Section 404 permit is necessary, the Applicants will work with the jurisdictional agencies (USACE, MDNR and/or BWSR) to determine the best ways to minimize the impacts and create appropriate mitigation measures.

Proposed construction activities at the sites would result in the disturbance of one acre or more of soils and a National Pollutant Discharge Elimination System (NPDES) stormwater permit would be required. A Stormwater Pollution Prevention Plan (SWPPP) would be prepared that would include erosion control plans and BMPs that would be implemented.

To minimize contamination of water due to accidental spilling of fuels or other hazardous substances, all construction equipment would be equipped with spill cleanup kits.

4.13 Human Health and Safety

Preferred Site

The project plant will be constructed on the existing Great River Energy campus. As a result, the project plant will utilize Great River Energy's existing framework for supporting public health and safety on the campus. This includes facilities and procedures for fire safety, emergency first aid capabilities, and general procedures and policies to ensure a safe operating environment. Fire alarms and emergency fire suppression equipment will be located throughout the facility to provide early detection of fire and enable initial response to reduce the risk and spread of fire. Emergency first aid equipment including eyewash stations and first aid kits will also be installed throughout the facility. Employees would have regular training in safety and first aid. Severe weather shelters will be designated and clearly identified.

Infrastructure on the Great River Energy campus includes water and sewer facilities. The project plant will utilize this existing infrastructure. In addition, the Great River Energy campus is served by Elk River fire and police.

Primary access to the Great River Energy campus is off of U.S. Highway 169 , U.S. Highway 10 or Main Street. Access to the Project plant location will primarily be off Highway 169. The current annual average traffic count on Highway 169 near the plant site is 52,000 vehicles per day with a heavy commercial vehicle count of 3,700 per day. Traffic on Highway 169 will increase slightly, but the increase will not be perceptible considering the existing traffic volumes.

Alternative Site

Security at the Rosemount site would be provided through the use of security gates and surveillance cameras. Fire alarms and emergency fire suppression equipment would be located throughout the facility to reduce the risk and spread of fire. Emergency first aid equipment, including eyewash stations and first aid kits would also be installed throughout the facility. Employees would have regular training in safety and first aid. Severe weather shelters would be designated and clearly posted.

The Rosemount site is agricultural land in the vicinity of an established industrial use area. There are basic public utility services of phone, sewer, water and electricity in the vicinity of the Rosemount site. The Rosemount site would utilize this existing infrastructure. The project would not be expected to greatly increase the demands on the local infrastructure.

A natural gas supply is required for firing the combustion turbine generators. A natural gas pipeline is about 8000 ft from the property boundary and only a short distribution line will be required to supply the plant with the required gas. A short transmission line will also be required to connect the plant to nearby transmission lines.

The site would be served by local fire and police. Major routes to and from the Rosemount site include a variety of highways. County Highway 42 is a local east-west route to the City of Rosemount 7 miles to the West. County Highway 42 is located directly adjacent to the site and connects to US Highway 52, 0.75 miles to the west side of the site. It is anticipated that any significant construction or supply access to the site would follow this route. The north side of the site is bounded by Ehler's Path and 140th St. East. Emery Ave East runs north-south along the east side of the Great River Energy site.

Mitigative Measures

There are no mitigative measures necessary to address human health and safety.

5.0 OTHER PERMITS AND APPROVALS REQUIRED

Table 5-1 contains a list of the anticipated permits and associated environmental approvals required for the Elk River Peaking Station LEPGP project. Compliance with the terms of all applicable and relevant regulatory permits and approvals would be a condition of any Site Permit issued by the PUC.

In any LEPGP Site Permit the PUC issues, the PUC will describe with specificity the approved site. The approved site may or may not be the site preferred by the applicant. The PUC may impose other conditions in a permit that the PUC determines are reasonable and appropriate (Minn. Rules part 4400.3650). Permit conditions typically relate to construction practices and administrative issues like transfer of the permit and permit amendments. As an example, a recently issued LEPGP Site Permit is contained in **Appendix D**.

6.0 ACRONYMS, ABBREVIATIONS and DEFINITIONS

ACRONYMS	
AC	Alternating Current
ACSR	Aluminum Conductor Steel Reinforced
APE	Area of Potential Effect
BMPs	Best Management Practices
BPA	Bonneville Power Administration
Commission	Minnesota Public Utilities Commission
CSAH	County State Aid Highway
dB(A)	Decibel (A-weighted)
EMF	Electromagnetic Fields
EPA	Environmental Protection Agency
EQB	Minnesota Environmental Quality Board
FAA	Federal Aviation Administration
FACW	Facultative Wet
FEMA	Federal Emergency Management Agency
FSI	Farmlands of Statewide Importance
GRE	Great River Energy
HVTL	High Voltage Transmission Line
ICD	Implantable Cardioverter/Defibrillator
kV	Kilovolt
kV/m	Kilovolt per meter
LEPGP	Large Electric Power Generating Plant
MBTA	Migratory Bird Treaty Act
MDNR	Minnesota Department of Natural Resources
MNDOT	Minnesota Department of Transportation
ma	Milliampere
mG	Milligauss
MHz	Megahertz
MISO	Midwest Independent Transmission System Operator
MP	Minnesota Power
MPCA	Minnesota Pollution Control Agency
MVA	Megavolt-ampere
MW	Megawatt
NAC	Noise Area Classifications
NESC	National Electric Safety Code
NIEHS	National Institute of Environmental Health Sciences
NHIS	Natural Heritage Information System
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Properties
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory

ACRONYMS	
OBL	Obligate
ppm	parts per million
RS	Route Segment
RUS	Rural Utilities Service
SHPO	Minnesota State Historic Preservation Office
SNAs	Scientific and Natural Areas
SNF	Superior National Forest
SSC	Species of Special Concern
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Officer
USACE	United States Army Corps of Engineers
USDOE	United States Department of Energy
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WMAs	Wildlife Management Areas
WPAs	Waterfowl Production Areas