APPLICATION TO THE MINNESOTA ENVIRONMENTAL QUALITY BOARD

FOR A

GENERATING PLANT SITE PERMIT AND A TRANSMISSION LINE ROUTE PERMIT

BLUE LAKE GENERATING PLANT EXPANSION PROJECT

EQB DOCKET NO. _____

FEBRUARY 10, 2004

Application for a Generating Plant Site Permit and a Transmission Line Route Permit

Blue Lake Generating Plant Expansion Project

Table of Contents

List of Tables

List of Figures

Appendices

Application Content Requirements Cross Reference

Project Permit Application Requirements (Minn. Rules 4400.1150, Subp. 1)	**Application Section**
A. a statement of proposed ownership of the facility as of the day of filing and after commercial operation;	1.3
B. the precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated;	1.3
C. at least two proposed sites for the proposed large electric power generating plant and identification of the applicant's preferred site and the reasons for preferring the site;	Not required under alternative process
D. a description of the proposed large electric power generating plant and all associated facilities, including the size and type of the facility;	2.1
E. the environmental information required under subpart 3;	See Environmental Information below
F. the names of the owners of the property for each proposed site;	2.1
G. the engineering and operational design for the large electric power generating plant at each of the proposed sites;	3.1
H. a cost analysis of the large electric power generating plant at each proposed site, including the costs of constructing and operating the facility that are dependent on design and site;	2.4
I. an engineering analysis of each of the proposed sites, including how each site could accommodate expansion of generating capacity in the future;	Section 4, 3.1, 2.5
J. identification of transportation, pipeline, and electrical transmission systems that will be required to construct, maintain, and operate the facility;	Section 2, 4.5.2
K. a listing and brief description of federal, state, and local permits that may be required for the project at each proposed site; and	1.5.2
L. a copy of the Certificate of Need for the project from the Public Utilities Commission or documentation that an application for a Certificate of Need has been submitted or is not required.	1.5.1
HVTL Route Permit Application Requirements (Minn. Rules 4400.1150, Subp. 2)	**Application Section**
A. a statement of proposed ownership of the facility at the time of filing the application and after commercial operation;	1.3
B. the precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated;	1.3
C. at least two proposed routes for the proposed high voltage transmission line and identification of the applicant's preferred route and the reasons for the preference;	Not required under alternative process
D. a description of the proposed high voltage transmission line and all associated facilities including the size and type of the high voltage transmission line;	2.2
E. the environmental information required under subpart 3;	See Environmental Information below
F. identification of land uses and environmental conditions along the proposed routes;	2.2, Section 4

G. the names of each owner whose property is within any of the proposed routes for the high voltage transmission line;	2.2, Appendix A
H. United States Geological Survey topographical maps or other maps acceptable to the chair showing the entire length of the high voltage transmission line on all proposed routes;	Figure 2-1
I. identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share the right-of-way with the proposed line;	2.2, 3.2.2
J. the engineering and operational design concepts for the proposed high voltage transmission line, including information on the electric and magnetic fields of the transmission line;	3.2, 4.5.1
K. cost analysis of each route, including the costs of constructing, operating, and maintaining the high voltage transmission line that are dependent on design and route;	2.4
L. a description of possible design options to accommodate expansion of the high voltage transmission line in the future;	2.5
M. the procedures and practices proposed for the acquisition and restoration of the right-of-way, construction, and maintenance of the high voltage transmission line;	3.2.2, 3.2.3, 3.2.4
N. a listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line; and	1.5.2
O. a copy of the Certificate of Need or the certified HVTL list containing the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not required.	1.5.1
Environmental Information Requirements for both Site and Route Permit Applications (Minn. Rules 4400.1150, Subp. 3)	**Application Section**
A. a description of the environmental setting for each site or route;	Section 4
B. a description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services;	4.3, 4.4, 4.5
C. a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;	4.4.3
D. a description of the effects of the facility on archaeological and historic resources;	4.5.3
E. a description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna;	4.1, 4.2, 4.6
F. a description of the effects of the facility on rare and unique natural resources;	4.6.6
G. identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route; and	Section 4
H. a description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigative measures.	Section 4, 2.4

1 Introduction

1.1 Overview

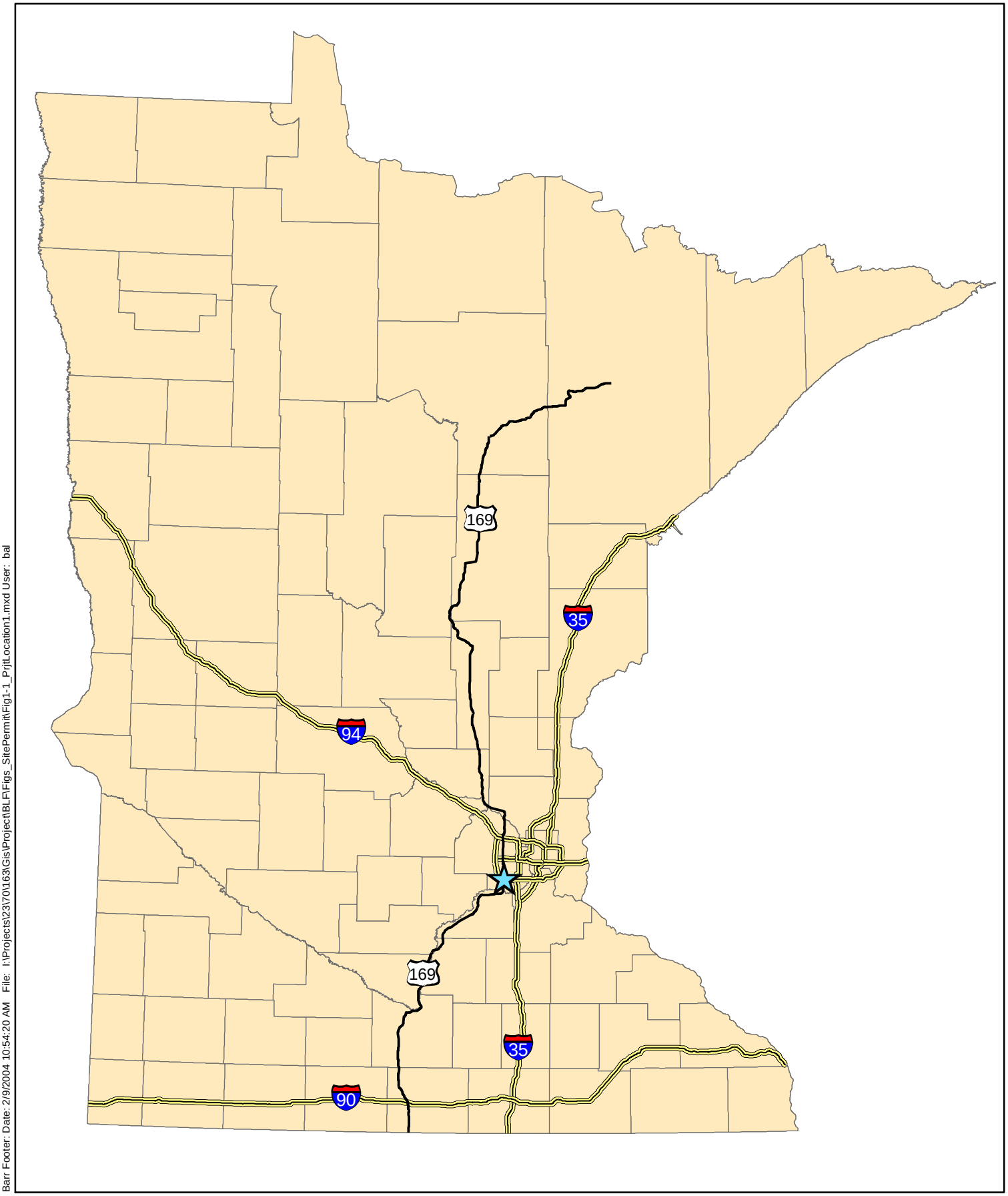
Northern States Power Company, doing business as Xcel Energy ("Xcel Energy"), hereby applies to the Minnesota Environmental Quality Board ("MEQB") for a Site Permit and for a Route Permit pursuant to the Minnesota Power Plant Siting Act (Minnesota Statutes 116C.51 through 116C.69) and Minnesota Rules Chapter 4400.

Xcel Energy proposes to add two, 162 megawatt, natural gas fueled, combustion turbine generating units ("CTGs" or "Units") to the Blue Lake Electric Generating Plant to be placed in service in the spring of 2005. The addition of these generating units at the Blue Lake Generating Plant site falls within the definition of a Large Electric Power Generating Plant ("LEPGP") in the Act and, thus, requires a Site Permit from the MEQB prior to construction.

The addition of generating capacity at the Blue Lake Generating Plant (the "Plant") site requires some transmission system improvements so that power output can be reliably delivered. Xcel Energy proposes to construct a double circuit 115/230 kilovolt (kV) high voltage transmission line approximately 4000 feet long as part of the project. The new line would connect the existing Blue Lake Substation to an existing 230 kV transmission line that passes the Plant site to the south. Part of the existing 230 kV circuit will be converted to 115 kV operation. The remainder will continue to be operated at 230 kV. The proposed transmission line addition falls within the definition of a High Voltage Transmission Line ("HVTL") in the Act and, thus, requires a Route Permit from the MEQB.

The proposed power plant and transmission line additions and associated facilities (collectively the "Project") are described in more detail throughout this Application. The location of the Project and the Plant vicinity are shown in Figures 1-1 and 1-2, respectively. The Project will be completely within the City of Shakopee.

Xcel Energy has prepared this joint application for the Site Permit and the Route Permit and requests that the Application be processed in a joint proceeding in accordance with Minnesota Rules 4400.0675. Xcel Energy informed the MEQB by its January 16, 2004 letter that we are electing to make application and have our



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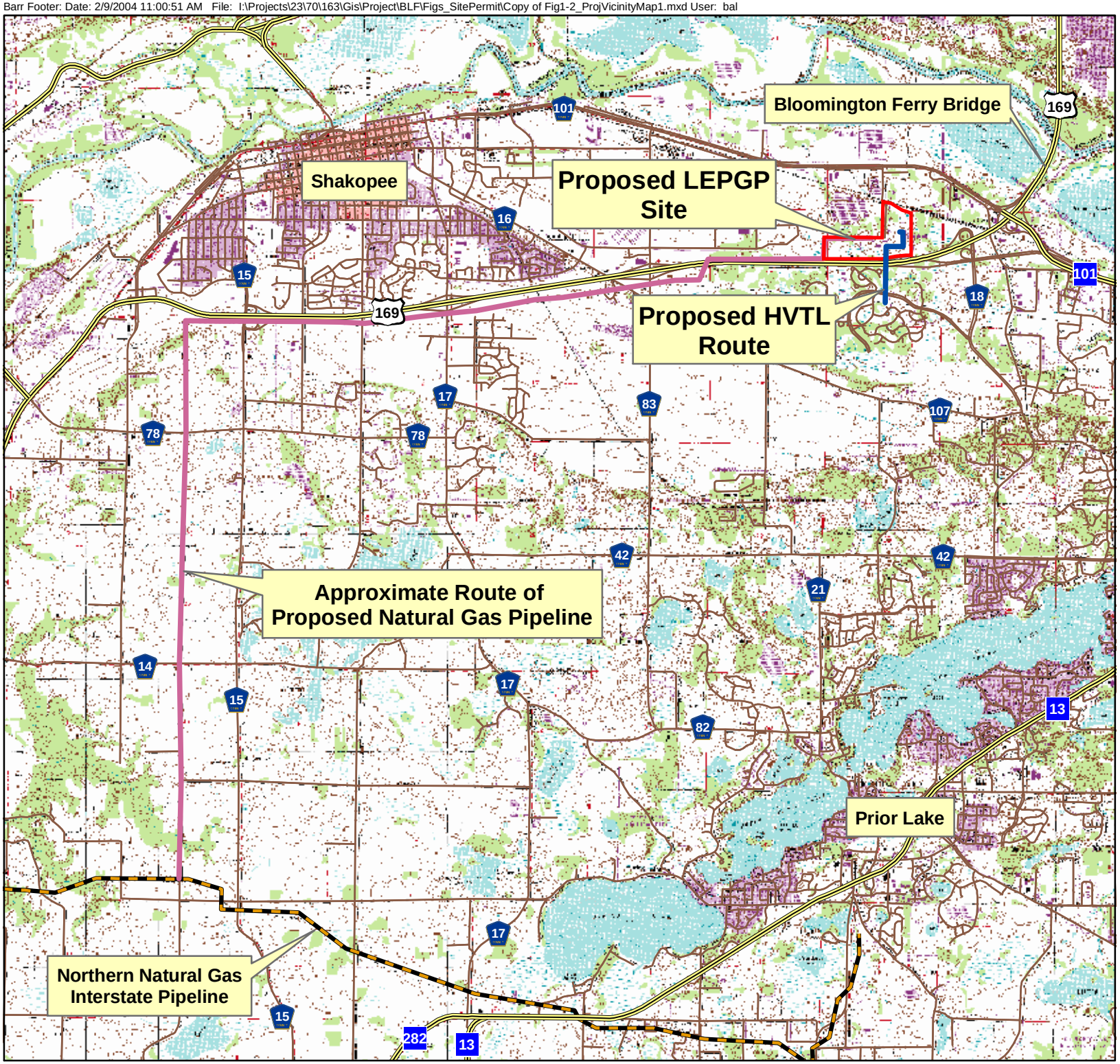
Project Location

N
W
E
S

Miles

0 25 50 100 150

Figure 1-1
PROJECT LOCATION MAP
Xcel Energy
Blue Lake Generating Plant
Expansion Project



Feet
0 3,000 6,000 9,000

Figure 1-2
PROJECT VICINITY MAP
Xcel Energy
Blue Lake Generating Plant
Expansion Project

proposal reviewed using the procedures of Minnesota Rules 4400.2000 through 4400.2950, referred to as the Alternative Permitting Process, for both permits. The Project generating addition and transmission line are both eligible for the Alternative Permitting Process because the proposed units will be fueled by natural gas (Minnesota Rules 4400.2000, Subp. 1, B) and the proposed transmission line is less than five miles long (Minnesota Rules 4400.2000, Subp. 1, D).

Xcel Energy filed an application for a Certificate of Need with the Minnesota Public Utilities Commission for the Project on January 16, 2004 in accordance with Minnesota Rules Chapter 7829 and 7849. Minnesota Rules 4410.7060 provide for the consolidation of environmental review procedures and Minnesota Statutes § 216B.243, Subd. 4 provides for joint hearing procedures for the Certificate of Need and Site and Route Permits when feasible. Xcel Energy respectfully requests the MEQB and the MPUC consider consolidating environmental review and hearings in this case.

The Project will require a new, 16-inch, natural gas pipeline approximately 11 miles long to bring natural gas to the Plant site. The general location of the proposed pipeline is shown on Figure 1-2. The proposed pipeline meets the thresholds of Minnesota Statutes 116I and thus requires a Pipeline Routing Permit from the MEQB. We intend to file our application for the pipeline routing permit shortly.

1.2 Purpose

Xcel Energy has encountered significant challenges as we attempt to make the power supply purchases necessary to meet the anticipated peak demand for electricity from our customers in 2005.

Recently encountered limitations and constraints on the regional transmission system have created considerable uncertainty in our ability to make sufficient short term power supply purchases that we have traditionally relied on to reliably meet peak electrical demand.

Regional transmission constraints and other issues have also presented difficulties in our longer-term power supply purchasing program. As a result, resources originally anticipated to be available in 2005 will be delayed and may need to be replaced.

This proposed project, along with another combustion turbine generator we have proposed at the Angus Anson Generating Plant near Sioux Falls, are necessary to ensure that Xcel Energy has adequate generating capacity in 2005 and beyond to reliably meet customer demand for electricity. The need for the addition of peaking units at the Blue Lake Power Plant is described in more detail in our application for a Certificate of Need before the Public Utilities Commission. We have posted the CON Application at our Web site, http:// www.xcelenergy.com, in the "Environment & Community" section.

1.3 Applicant Information

The Project will be constructed, owned and operated by Northern States Power Company d/b/a Xcel Energy. Xcel Energy, headquartered in Minneapolis, Minnesota, is the fourth-largest combination electricity and natural gas energy company in the United States. Northern States Power Company is a wholly owned subsidiary of Xcel Energy, Inc..

Northern States Power Company d/b/a Xcel Energy will be the permittee. The contact person at Xcel Energy regarding this Project is:

Jim Alders
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Minneapolis, MN 55401
(612) 330-6732
james.r.alders@xcelenergy.com

1.4 Project Schedule

In order to meet the anticipated need for additional peaking duty generating capacity in the summer of 2005 construction must begin in the late summer 2004.

We anticipate that plant, transmission line, and pipeline construction will proceed in parallel through the fall and winter, start up and testing activities will occur in the spring of 2005, and the plant will be placed in service in May or June 2005.

1.5 Other Project Permits

1.5.1 Certificate of Need

Xcel Energy has filed an application for a Certificate of Need from the Minnesota Public Utilities Commission for the Project in accordance with Minnesota Rules Chapter 7849. The PUC Docket No. for that proceeding is E-002/CN-04-76.

The 230/115 kV transmission line portion of the Project does not require a Certificate of Need because, although it meets the definition of a Large Energy Facility, it qualifies as an exempted project as defined in Minnesota Statutes 216B.243, Subd. 8. Paragraph (4): *"a high-voltage transmission line of one mile or less required to connect a new or upgraded substation to an existing, new, or upgraded high-voltage transmission line"*.

1.5.2 Other Project Permits

1.5.2.1 Air Quality Permit

Xcel Energy submitted an application for an amendment to the Blue Lake Generating Plant air emission permit, Permit No. 13900010-002, to accommodate the Project to the Minnesota Pollution Control Agency on January 19, 2004.

1.5.2.2 Water Appropriations Permits

Xcel Energy will request an amendment to its existing groundwater appropriation permit (No. 731114) for the Plant to meet the water needs of the Plant resulting from the Project.

1.5.2.3 Wastewater Discharge Permit

Xcel Energy plans to dispose of Project wastewater at a Publicly-Owned Treatment Works, so its discharges would be covered under the treatment plant's National Pollutant Discharge Elimination System discharge permit. Xcel Energy will comply with any requirements of the Publicly-Owned Treatment Works for accepting Project wastewater.

1.5.2.4 National Pollutant Discharge Elimination System Stormwater Program

The Project will disturb over one acre of land and therefore triggers the requirement to apply for coverage under the Minnesota Pollution Control Agency's (MPCA) National Pollutant Discharge Elimination System Stormwater

Permit Program for Construction Activities. Xcel Energy will require its contractor to apply for and comply with the construction storm water permit.

1.5.2.5 Gas Pipeline Route Permit

Xcel Energy will apply for a gas pipeline routing permit in accordance with the requirements of Minnesota Statutes 116I.015 and Minnesota Rules 4415 to construct a natural gas pipeline to furnish natural gas for the Project. We will also apply for other necessary permits for the gas pipeline, which may include:

- MPCA NPDES General Stormwater Permit for Construction Activity,
- MDNR License to Cross Public Lands and Waters,
- MDNR Wetland Replacement Plan Application, and
- U.S. Army Corps of Engineers Section 404 Wetland Permit.

1.5.2.6 Other Permits

The Project may require permits, approvals or notifications under the following programs:

- Exemption to allow burning of natural gas for power production (DOE, 10 CFR 503)
- Road Crossing Permits (Mn/DOT, Minn. Rules Chpt. 8810)
- Miscellaneous State Building and Construction Permits and Inspections
- Miscellaneous Local Building and Construction Permits and Inspection

2 Project Description

2.1 Generating Plant

Xcel Energy proposes to add two General Electric 7FA dry low NOx gas-fired combustion turbine generators to the Blue Lake Generating Plant, each with a nominal capacity of 162 MW. The Blue Lake Generating Plant address is 1200 70th Street South, Shakopee, Minnesota 55379. The Project property is located approximately 15 miles southwest of Minneapolis in Township 115N, Range 22W, Section 11 in Scott County.

The Blue Lake Generating Plant property is owned by Xcel Energy, is located between MN Highway 101 to the north and US Highway 169 to the south, and covers about 127 acres. The site boundaries are shown in Figure 2-1. The area immediately to the north, west and east of the Plant site is industrial in use. US Highway 169 borders the Plant to the south. Across US 169 from the site is single family residential housing.

The Project will be constructed on the existing Blue Lake Plant site between existing fuel tanks and four existing oil-fired peaking units on an area previously graded and surfaced with gravel. The layout of the two units and associated facilities on the plant site is shown in Figure 2-1. No expansion of the Plant footprint will be required by the project.

The new generating units will be supplied with high pressure natural gas via a new 16-inch diameter high pressure natural gas pipeline connecting to the existing Northern Natural Gas interstate pipeline which runs east-west approximately 10 miles south of the Project.

2.2 Transmission Line

The addition of generating capacity at the Blue Lake Power Plant requires some improvements to the transmission system to ensure power can be reliably delivered. As part of the Project, Xcel Energy proposes to connect the Blue Lake Substation to an existing 230 kV transmission line that passes south of the Plant site. A new segment of double circuit 115/230 kV transmission line approximately 4000 feet long would be built to connect the existing line to the Blue Lake Substation. That portion of the circuit between Blue Lake Substation and Black

LEPGP Site

Approximate Alignment of New Transmission

N

W E

S

Feet

0 300 600 1,200

Figure 2-1
PROJECT LAYOUT
Xcel Energy
Blue Lake Generating Plant
Expansion Project

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Dog Substation would receive new conductors and be converted to 115 kV operation. That portion between Blue Lake Substation and McLeod Substation would continue to operate at 230 kV.

The proposed route of the 230/115 kV double-circuit transmission line is shown on Figure 2-1. The proposed line would be constructed 90 feet (centerline-to-centerline) east of and parallel to an existing 345 kV transmission line. The proposed route is primarily on property owned by Xcel Energy and the Minnesota Department of Transportation. Appendix A provides a list of landowners within the proposed route as required by the Board's application content requirements. The line would be supported by single steel pole structures approximately 110 feet tall. Modification to the Blue Lake Substation will consist of the addition of a transformer and switching equipment, but no expansion of the substation footprint will be necessary.

2.3 Rejected Sites and Routes

Xcel Energy considered other existing peaking plant and substation sites for the Project and is proposing a similar expansion project at its Angus Anson Generating Plant near Sioux Falls, South Dakota. These two sites were chosen because of the existing infrastructure at the existing plants, suitability for expansion, and the availability of transmission capacity.

Greenfield sites and sites that would require major transmission system upgrades were not considered because of the long lead time necessary to site a new power plant and transmission line.

Xcel Energy did not consider other routes for the transmission line because of the proximity of the existing Blue Lake Substation and the McLeod to Black Dog 230 kV transmission line to each other and the Project. Choosing a route parallel to the existing 345 kV transmission line is consistent with the State's nonproliferation policy for selecting transmission line routes[1].

[1] People for Environmental Enlightenment and Responsibility (PEER) v. Minnesota Environmental Quality Council, 266NW2d858 (Minn. 1978)

2.4 Cost Analysis

Total construction costs for the addition of the two new generating units are estimated to be about $100 million.

Transmission line construction costs are estimated to be approximately $1.5 million. Blue Lake Substation modifications and additions are estimated to cost $4.5 million.

2.5 Future Expansion

Minnesota Rules 4400.1150, Subp. 1, I. and 4400.1150, Subp. 2, L. ask an applicant to describe the extent to which a proposed generating plant site and transmission line route, can accommodate future expansion. In this case, we have chosen a site that was previously designed to accommodate expansion and a route that uses fewer resources by taking advantage of an existing right of way. Thus the potential for land use and environmental impact is minimized.

The proposed transmission line cannot accommodate future expansion in the number of circuits because of the physical limitations of support structures and the right-of-way width.

3 Engineering and Operational Design

3.1 Generating Plant Engineering and Operational Design

The section describes the design of the proposed generating additions and their operation. The proposed plant additions will consist of two simple cycle gas-fired combustion turbine generators (CTGs) and associated equipment that will be operated for peaking service.

The most fundamental Project design consideration is the selection of the generation technology. A simple cycle CTG is the most appropriate generation technology for the peaking service need the Project is intended to address. Overall power supply costs are kept lower when a low capital cost resource like combustion turbines are used in peaking service. Peaking service also requires flexibility in operation, particularly rapid and frequent startups and short-duration runs. The selection of natural gas-fired simple cycle technology results in several other environmental benefits as discussed further in Section 4. The Minnesota Public Utility Commission will determine if our simple cycle combustion turbine proposal is appropriate by granting or denying a Certificate of Need for the project.

3.1.1 Combustion Turbines and Balance of Plant Equipment

A simple cycle combustion turbine 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, causing them to rotate. The rotating turbine blades turn a shaft connected to a generator that produces electricity. Exhaust gasses are emitted to the atmosphere through a stack approximately 50 feet tall. This process is shown schematically in Figure 3-1.

The Project will use two General Electric 7FA units, each with a nominal capacity of 162 MW.

In addition to the CTGs, new Plant equipment will include:

- two generator step-up transformers,

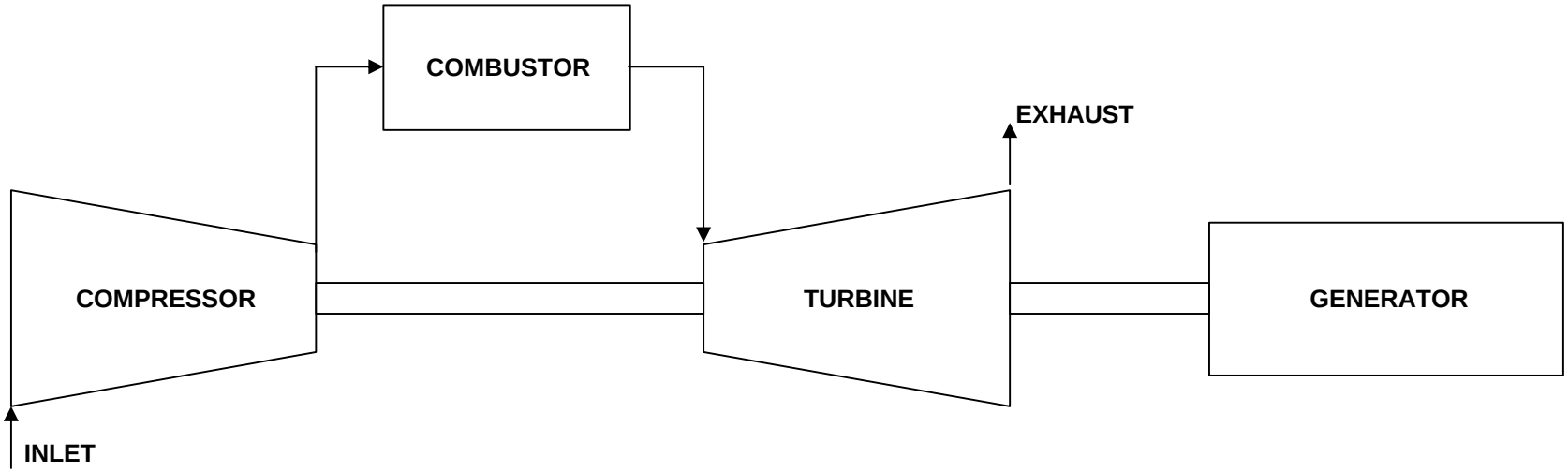


Figure 3-1
SIMPLE CYCLE TECHNOLOGY SCHEMATIC
Xcel Energy
Blue Lake Generating Plant
Expansion Project

- a transmission line from the transformers to the existing Blue Lake Substation,
- a gas metering station,
- an evaporative cooler,
- an exhaust stack with silencer.

These items comprise the largest components of the major plant systems discussed further below. The generating plant layout is shown in Figure 2-1.

3.1.2 Major Systems

3.1.2.1 Electrical Interconnection

The two units will generate electricity at a voltage of 18 kV. Two generator step up transformers will increase the voltage to 115 kV. A 115 kV transmission line approximately 1000 feet long will connect the transformers to the existing 115 kV bus in the Blue Lake Substation located on the Project site, east of the generating Plant. The transmission interconnection will require at least two tubular steel structures, one adjacent to the Plant and the other just outside the substation.

3.1.2.2 Fuel Supply

Natural gas will be the only fuel used to generate electricity in the two new units. An 11 mile long pipeline with a diameter of 16 inches will be constructed to supply natural gas from the Northern Natural Gas Interstate gas pipeline to the south (see Figure 1-2). After metering, the natural gas will pass through a moisture separator and fine dust filter. The natural gas may require preheating prior to entering the combustion turbines. Preheating the gas prevents moisture in the fuel gas stream from damaging combustion turbine parts. Fuel use at the facility is a function of temperature and operating characteristics of the unit. It is anticipated at full capacity during summer months, each combustion turbine unit will use approximately 1.5 million cubic feet of natural gas per hour.

The Project use of fuel is not expected to impact the ability of the Northern Natural Gas interstate pipeline to supply natural gas for winter heating needs. The Project will have firm natural gas delivery contracts only for summer gas supply, when the Project is expected to operate. When natural gas demand for heating is

at its peak, the Project will have an interruptible supply contract, giving heating uses higher priority to the available gas supply.

3.1.2.3 Water Supply/Wastewater Management

Simple cycle combustion turbine technology can operate without the need for water. However, in this case we propose to include evaporative inlet air cooling to enhance operating efficiency of the units during the warmest days of the year. It is estimated that over 80 percent of the time the proposed units will operate without using any water. Up to about 20 percent of the time, it is anticipated evaporative cooling may be used to cool the air entering the units. Air is cooled through humidification by allowing water to flow over a fabric or cellular media at the inlet to each combustion turbine. The evaporative cooling process consumes a small amount of water, but increases output about 3 to 5 percent depending on the ambient relative humidity.

Water quality information indicates groundwater may contain high levels of minerals and other undesirable constituents. Therefore pH adjustment and filtration will be required prior to use of the water in the evaporative coolers.

A water balance diagram that summarizes water use and wastewater generation from the operation of the new units is shown in Figure 3-2. Each unit will use about 60 gpm of treated makeup water during peak load operation. Based on operating the two CTGs for just over 1300 unit-hours per year combined, and assuming the evaporative coolers are used for about 20 percent of the time, the total annual evaporative cooler water requirement will be about 840 thousand gallons of treated water. A reverse osmosis water treatment system would require about 1 million gallons of raw water to produce 840 thousand gallons of treated water of adequate quality for the evaporative coolers. Approximately 140 thousand gallons of water with concentrated minerals is discharged during the water treatment process and half of the evaporative cooler feed water, 420 thousand gallons annually, remains after the cooling process and is discharged. The remainder is lost by evaporation.

These two wastewater sources plus an estimated 50 thousand gallons generated from water treatment filter backwashing, results in a total annual wastewater volume of about 600 thousand gallons. This process wastewater will be trucked to a regional wastewater treatment plant.

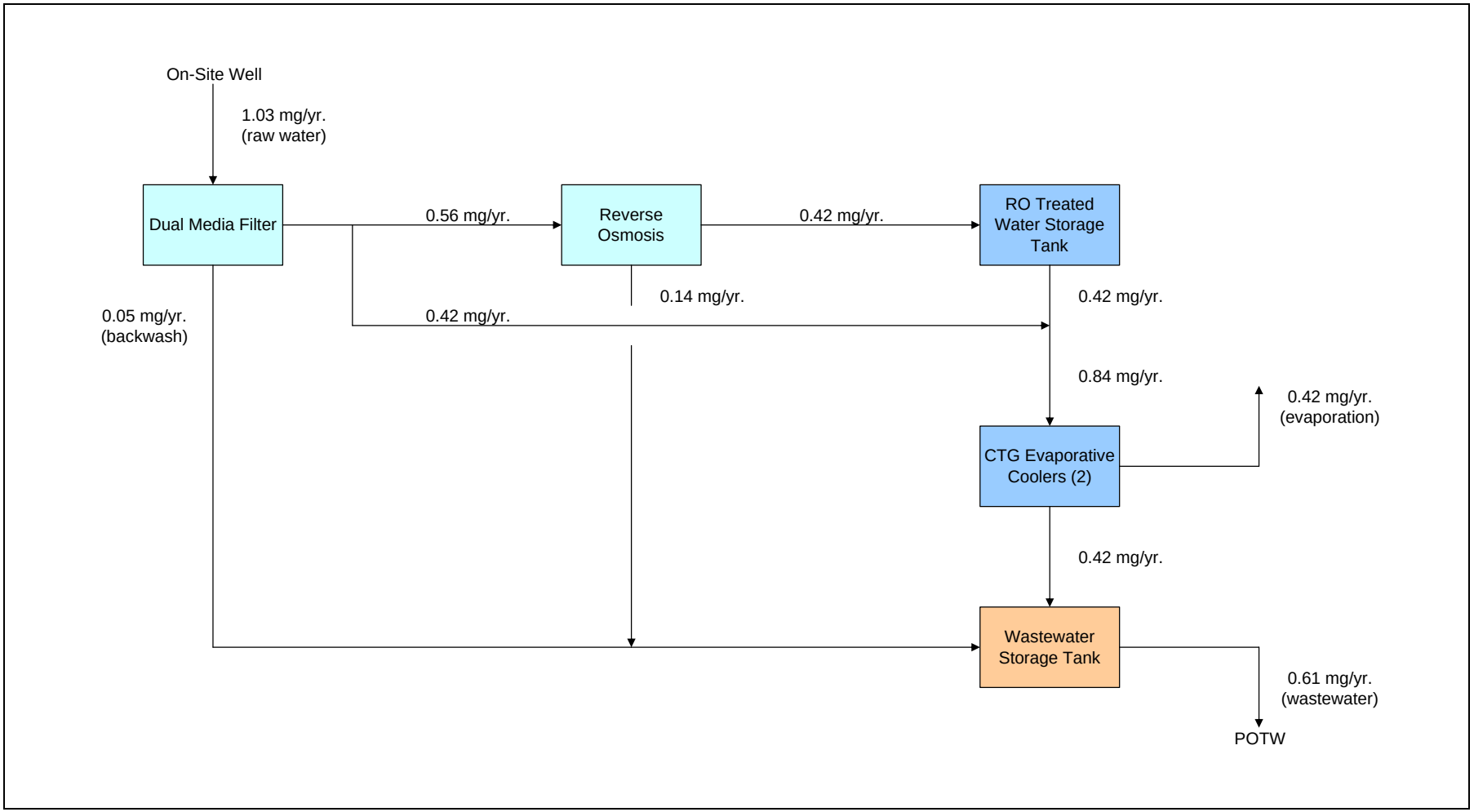


Figure 3-2
GENERATING UNIT WATER BALANCE
Xcel Energy
Blue Lake Generating Plant
Expansion Project

The Plant currently holds a water appropriations permit (No. 731114) for an existing well. The permit allows an annual appropriation of up to 5 million gallons for fire protection purposes. Xcel Energy will apply for an amendment to that permit to allow for an appropriation of groundwater for evaporative cooling and other minor uses such as equipment washing without increasing the total authorized annual appropriation.

3.1.2.4 Air Pollution Control

Simple cycle plants are based on the use of combustion turbine technology, where natural gas is burned in the combustion chamber to spin a turbine and a coupled generator produces electricity. Natural gas combustion generates significantly less particulate matter than oil or coal, and very little sulfur dioxide or other trace air emissions. Uncontrolled natural gas combustion does produce nitrogen oxides and carbon monoxide.

The Project will employ dry low NO_X technology to control nitrous oxides emissions. Combustion turbine dry-low NO_X burners reduce peak flame temperature and the chemical reaction time available to form nitrous oxides (NO_X). Emissions of nitrous oxides from the two new units combined will be kept at or below 39.5 tons annually.

3.1.3 Construction

Mobilization at the site will be the first construction activity with Xcel Energy setting up its' field offices and the Contractor following with mobilization and set up of construction offices, security fencing and entrances.

Next, the site will be leveled near the plant entrance to allow for construction parking of up to 70 vehicles. The gravel area where the new turbines will be located will be excavated approximately 2-4 feet to prepare the area for pile driving. A pile-driving rig will be set up on the site just prior to the expected start of permanent construction.

Upon approval of the necessary permits, construction will begin. Piles will be driven over a 15-day period. Following the setting of pilings, turbine foundation forms will be constructed and underground services will be installed. At the same time, the foundations for the generator step-up transformers 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, including the auxiliary equipment shipped by truck and the transformers shipped by rail. These shipments will continue over a four to five month period. Shipments of the transformers, turbines and generators will be via rail. The timing of these shipments will coincide with the completion and readiness of their respective foundations. Shipments at the rail siding and the plant entrance road will be coordinated by the Contractor's 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 turbines, generators, and transformers for the new generating units will be set first, followed by the remaining auxiliary equipment. Erection of the turbine modular air inlets and the exhaust stacks will take place next.

The greatest number of on-site workers will be present during the erection of the turbines, detailed wiring and piping, and while work is being performed in the Blue Lake Substation.

Xcel Energy will be constructing the gas pipeline to the Project while the site work is being completed. The 16-inch pipeline is planned to enter the northwest corner of the Plant underground to a gas metering and regulating building. A contractor will take the pipeline from this point and run underground to the turbines.

The Company will be constructing an overhead 115 KV line from the generator step-up transformers to the Blue Lake Substation as plant work nears completion. Work will also be ongoing in the substation to install breakers, transformer and additional protection devices. The number of construction personnel will be down to 30-40 during final stages of construction such as installation of inlet air filters and bird screens, completion of equipment platforms, insulation and painting.

Pre-operational testing will then take place for one to two months in preparation for start-up of the first new unit targeted for May 2005 and the second new unit targeted for June 2005. The initial turbine start-up requires a two-week schedule. The first two days will be to fire gas in the unit and bring it up to full speed with no load on the turbine. On days three and four, 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, Xcel Energy and the Contractor will begin to demobilize the site. By late Fall 2005, trailers, construction equipment and temporary fencing is expected to be removed from the site.

3.1.4 Operation and Maintenance

Xcel Energy will use the Project's capability for peak demand periods. The new units will be operated from the Company's central control center. Each new unit will be able to start up and be at full load within about 40 minutes of initiating the startup sequence. The second unit must lag the first unit in start up initiation by about 20 minutes because of shared startup equipment, so the two units can be at full combined load within one hour.

The new units will be limited to a total 1,300 unit-hours per year of operation combined, corresponding to an annual capacity factor of less than 8 percent, because of air permitting constraints. Xcel Energy anticipates the units will have at least a 30-year operating life. The new CTGs are expected to be in the range of 36 percent efficient, depending on operating conditions.

Maintenance activities for the Plant's CTGs and balance of plant equipment will be based on power industry practices and the equipment manufacturer's recommendations. The frequency of CTG maintenance activities typically include inspections of the combustor every 400 starts, hot gas path every 800 starts, and all major components every 1200 starts.

3.2 Transmission Line Engineering and Operational Design

The section describes the design of the proposed transmission line and its operation. The transmission line will consist of a 230/115kV double circuit transmission line and associated equipment that will provide an outlet from the Blue Lake Substation for the energy generated by the proposed generating units.

3.2.1 Design

The proposed conductor for the transmission line is 795-kcmil 26/7 aluminum core steel supported (ACSS). For lightning protection, Xcel Energy will use 3/8-inch shield wire.

Xcel Energy is proposing to use single pole, galvanized steel, davit arm structures designed to accommodate 230/115 kV double circuit for the transmission line. Figure 3-3 depicts the double circuit structures that will be used. The steel

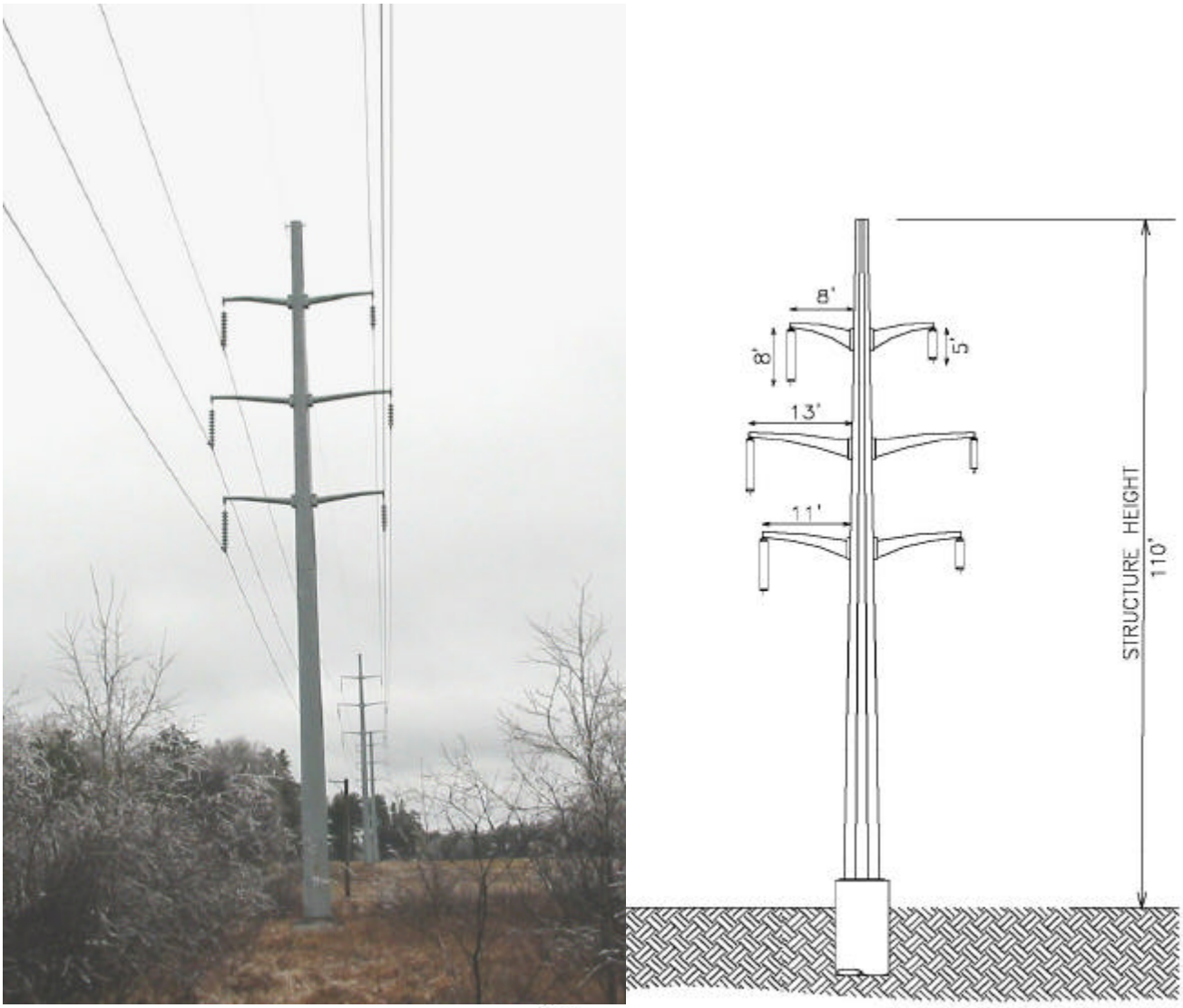


Figure 3-3
TRANSMISSION LINE STRUCTURE
Xcel Energy
Blue Lake Generating Plant
Expansion Project

structures will allow for longer spans. We propose to locate structures adjacent to the structures of the 345 kV transmission lines.

The structures will be erected on concrete foundations and will be approximately 110 feet tall. Blue Lake Substation was previously designed and laid out to accommodate improvements like that proposed here and thus does not require physical expansion. Equipment will be added inside the existing fenced area of the substation and will include additional buswork, breakers and switches, communications equipment, and a new 230 kV transformer.

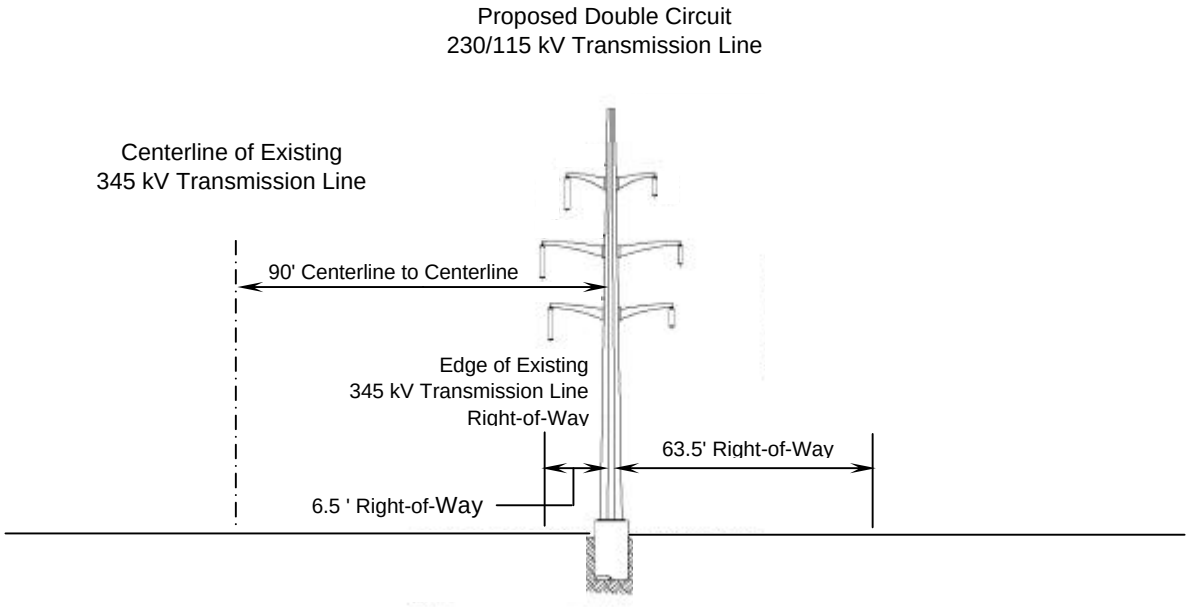
3.2.2 Right-of-Way Requirements and Acquisition

The proposed transmission line will run parallel to an existing 345 kV transmission line along its entire route, except immediately adjacent to the existing Blue Lake Substation (see Figure 2-1). The additional required right-of-way width is 6.5 feet on the existing transmission line side of the proposed line, and 63.5 feet on the opposite side, as illustrated in Figure 3-4.

As approvals to construct the Project are secured, Xcel Energy will initiate contact with landowners. We will consult with the landowners to discuss the Project in detail prior to conducting any necessary surveys and soil investigations. As the design detail for the line is developed, contacts with the owners of affected properties will continue and the negotiation and acquisition phase will begin to obtain the necessary land or easement rights for the facilities.

During the acquisition phase, individual property owners will be advised of construction schedules, needed access to the site and any vegetation clearing required for the Project. The right-of-way will be cleared of the amount of vegetation necessary to construct, operate and maintain the proposed transmission line. It is standard practice to remove any vegetation that at a mature height would be a danger to the line. Also, any vegetation that is in the way of construction equipment may have to be removed. Wood from the clearing operation will be offered to the landowner or removed from the site. Brush will be chipped and disposed of on the right-of-way.

Some structure locations may require soil analysis to assist with the design of the line's support structures. Xcel Energy will inform the landowners at the initial survey consultation that these borings may occur. An independent geotechnical testing company will take and analyze borings.



Not to Scale

Figure 3-4
TRANSMISSION LINE
RIGHT-OF-WAY REQUIREMENTS
Xcel Energy
Blue Lake Generating Plant
Expansion Project

Where possible, staging and lay down areas will be located within the right-of-way and limited to previously disturbed or developed areas. When additional property is temporarily required for construction, temporary limited easements may be obtained from landowners. Temporary limited easements will be limited to special construction access needs or additional staging or lay down areas required outside of the proposed transmission line right-of-way.

3.2.3 Construction

The steel structures will be supported by a drilled concrete pier foundation that will require an excavation 15 to 20 feet deep and four to six feet in diameter. Any excess soil will be removed from the site unless otherwise requested by the landowner. Erosion control measures will be implemented to minimize erosion during construction.

Xcel Energy construction crews or an Xcel Energy contractor will comply with local, state, National Electric Safety Code (NESC) and Xcel Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, right-of-way widths, erection of power poles and stringing of transmission line conductors.

Poles will be delivered to the structure locations and placed on the right-of-way out of the clear zone of any adjacent roadways or designated pathways. Insulators and other hardware will be attached while the pole is on the ground. The pole will then be lifted, placed and secured on the foundation by a crane or similar heavy equipment.

Once the structures have been erected, conductors will be installed by establishing a stringing setup area on the portion of the right-of-way on Xcel Energy property. Conductor stringing operations will also require brief access to each structure to secure the conductor cable to the insulators or to install shield wire clamps once final tensioning is completed. Temporary guard or clearance poles will be installed as needed over existing distribution or communication lines, streets, roads, highways, railways or other obstructions after any necessary notifications are made and permits obtained. This ensures that conductors will not obstruct traffic or contact existing energized conductors or other cables.

During construction, crews will attempt to limit ground disturbance wherever possible. Upon completion of construction activities, landowners will be contacted to determine if any additional restoration due to construction is

necessary. Disturbed areas will be restored to their original condition to the extent practicable and as negotiated with the landowner. Post-construction reclamation activities include the removing and disposing of debris, dismantling all temporary facilities (including staging and lay down areas), leveling or filling tire ruts, employing appropriate erosion control measures and reseeding areas disturbed by construction activities with vegetation similar to that which was removed.

3.2.4 Operation and Maintenance

Xcel Energy will periodically perform inspections, maintain equipment and make repairs over the life of the line. Xcel Energy will also conduct routine maintenance approximately every five years to remove undesired vegetation that may interfere with the safe and reliable operation of the transmission line.

4 Environmental Information

The Project's proposed generation addition will be made at a site that has previously been developed for power production, and as a result, will not have significant effects on human settlement, environmental resources, recreation areas, wetlands, threatened or endangered species or archaeological/historical sites. The Project transmission line will parallel a pre-existing transmission line, so will not alter land use of the area. The transmission line will traverse an area of wetlands, and a Minnesota Department of Natural Resources (MDNR) Area of Significant Biological Diversity. Wetlands will be avoided during placement of tower foundations. The transmission line route was selected because it follows an existing transmission line and thus minimizes any clearing necessary for the new line. The transmission line will not impact threatened or endangered species, recreation areas, cultural values or archaeological historical sites. The potential effects of the Project in each of these environmental categories are described further below.

This section also presents an analysis and discussion of the engineering design and operational features of the Project that enhance the Project's compatibility with its surrounding environment. The Project as proposed will have very little adverse effect on the environment. The Project has been conceived and will be designed and operated with the objective of avoiding adverse environmental effects. The engineering of several Project features has included consideration of the setting of the generating units site and transmission line route described in Section 3. Incremental impacts will be minimized by locating the generating units and transmission line immediately adjacent to existing generation and transmission facilities. The Project will employ state-of-the-art equipment to minimize air emissions and solid and liquid waste generation, and control noise.

4.1 Air Impacts

The new generating units, because of the employment of clean burning natural gas combustion turbine technology, the use of dry low NO_X pollution control technology, and limits on the hours of operation will have no significant impact on area air quality.

Air quality in the Blue Lake Area is similar to that of the Twin Cities in general. Air quality meets or is better than National Ambient Air Quality Standards and Minnesota Air Quality Standards for all pollutants for which there are promulgated standards, including sulfur dioxide, nitrogen oxide, carbon monoxide, ozone, and particulate matter. The Twin Cities is under a maintenance plan for carbon monoxide and sulfur dioxide, and the US EPA recently agreed with the MPCA that the entire state, including the Twin Cities and Shakopee area, should be classified as meeting the new 8-hour ozone standard.

Xcel Energy submitted an application for an amendment to the Blue Lake Generating Plant air emission permit, Permit No. 13900010-002, to the Minnesota Pollution Control Agency on January 19, 2004to accommodate the Project. The permit application requests that emissions from the Plant after Project construction be limited to 39.5 tons per year (tpy) NOx, 99.5 tpy CO, 39 tpy SO_2, and 14 tpy PM_{10}. This will effectively limit operation of the Project to just over 1,300 unit-hours per year. The estimated air emissions from the new units, based on the conditions outlined in the air permit application are presented in Table 4-1.

Table 4-1 Estimated Project Air Emissions

General		
Pollutant	**Emission Factor**[1] at Rated Project Capacity (average ambient conditions, base load) (lbs/hour per CTG)	**Emissions**[2] (tons/year)
SO_2	5.5	3.7
NO_X	59	39.5
PM_{10}	9.0	6.0
CO	30	20
VOCs	2.8	1.9

Hazardous Air Pollutants (HAPS) (selected list from EPA's AP-42 emission factor database)			
Pollutant	**Emissions**[2] (tons/year)	**Pollutant**	**Emissions**[2] (tons/year)
1,3-Butadiene[3]	0.0005	Naphthalene (POM)	0.0014
Acetaldehyde	0.043	PAHs[4] (also POM)	0.0024
Acrolein	0.007	Propylene Oxide[2]	0.031
Benzene	0.013	Toluene	0.14
Ethylbenzene	0.036	Xylene	0.069
Formaldehyde	0.77		

[1]Emission factors for the general pollutants from manufacturer data.
[2]Based on 1339 combined operating hours
[3]Emission factor is based on one-half the detection limits. Expected emissions are lower than the presented numbers.
[4]PAH is polycyclic aromatic hydrocarbon. POM is polycyclic organic matter.

Modeling completed in support of the air permit application demonstrates that ambient air quality around the Blue Lake Generating Plant are currently well within ambient air quality limits and will remain well within ambient air quality standards with the proposed expansion. The estimated maximum emission contributions to ambient air quality and the applicable standards are presented in Table 4-2.

Table 4-2 Estimated Maximum Contributions to Ambient Air Quality

Pollutant	**Existing Plant Contribution to Ground-level Concentrations** ($\mu g/m^3$)	**Future Plant Contribution to Ground-level Concentrations** ($\mu g/m^3$)	**Ambient Standards** ($\mu g/m^3$)
SO_2 (Annual)	0.010	0.010	80
SO_2 (24-hour)	63	63	365
SO_2 (3-hour)	138	138	1,300
SO_2 (1-hour)	174	174	1,300
NO_2 (Annual)	0.20	0.20	100
PM_{10} (Annual)	0.006	0.006	50
PM_{10} (24-hour)	19	19	150
CO (1-hour)	202	202	40,000
CO (8-hour)	84	84	10,000

Note: Modeling was conducted to demonstrate potential ambient air impacts associated with the Project. Modeling is not required by air quality regulations. Short-term (1-24 hour) concentrations based on hourly maximum emission rates. Annual modeled impacts from the existing plant based on 2000 actual emissions. Annual modeled impacts from the future plant based on 2000 actual emissions from the existing plant plus emissions based on 1,339 operating hours from each new CTG.

Another potential source of air emissions is fugitive dust from site preparation and construction activities. Fugitive emissions will be controlled to reduce their impact on area residents by watering or applying dust suppressants to exposed soil surfaces as necessary.

4.2 Water Use and Wastewater Generation

The Plant currently obtains water from two on-site wells. The Project will not require any additional water supply source.

The Plant currently discharges sanitary wastewater to an on-site drain field. The additional water treatment process wastewater generated by the Project, estimated to be approximately 600 thousand gallons annually will be discharged at a regional publicly-owned treatment works. The quantity and quality of the wastewater will not significantly impact the operation of the accepting facility.

4.2.1 Water

Simple cycle gas-fired CTGs can operate with minimal need for water—just that needed for periodic maintenance washing. The Project as designed will require additional water to utilize evaporative cooling to increase the power output of the units. The evaporative cooling purpose and process is described more fully in Section 3.1. The new units are estimated to require about 1.0 million gallons of water annually, assuming 125 unit-hours of evaporative cooling operation annually.

The Plant has an existing water appropriations permit allowing the Plant to appropriate up to 5.0 million gallons per year, with the primary use being for fire protection. Xcel Energy plans to apply for a modification of the Plant water appropriations permit requesting the additional use of water for evaporative cooling and other needs associated with the Plant expansion, but an increase in annual appropriation volume in not necessary.

In contrast to other high volume users in the area, including the cities of Shakopee and Savage, industries and golf courses, the 1 million gallons of estimated ground water appropriation for the project is small.

While ground water is available from the alluvial outwash, most municipal, industrial and private wells in the Project vicinity are finished in the Prairie du-Chien/Jordan (PdC/J) bedrock aquifers. Other, deeper bedrock aquifers are also available for such uses. Water from the PdC/J aquifer is of high quality, suitable for drinking water without pretreatment (except for the addition of chlorine and

fluoride). Large quantities are available. As examples, the city of Shakopee has eight municipal water supply wells, six of which are located in the PdC/J aquifer. Each well is permitted to withdraw up to 2.150 billion gallons per year, and the city routinely withdraws 100 millions gallons or more from each well each year. The nearby city of Savage also has 4 municipal wells, 3 in the PdC/J formation, each of which is permitted to withdraw 1 billion gallons per year. The city of Savage routinely withdraws over 100 million gallons from the 4 wells in a single year. Other industrial users in the area also have high volume PdC/J wells, as do golf courses, mobile home parks and private wells.

4.2.2 Wastewater

The primary waste water streams generated by the Project will be those associated with the treatment of the groundwater prior to its use for evaporative cooling. Evaporative cooling water must be very clean in order to minimize fouling of the evaporative cooling equipment and the combustion turbines. The water treatment process including the Project water balance is described in Section 3.1. Approximately 60 percent of the Project water appropriation becomes wastewater, with the remaining 40 percent evaporating during the evaporative cooling process. The characteristics of the wastewater will be very similar to the source groundwater, except that the water treatment processes will concentrate the constituents in the waste water about 1 and 2/3 times the concentration present in the source water.

The wastewater from the Project will be temporarily stored on site and then trucked to a regional publicly-owned treatment works for disposal. About 100 truckloads of wastewater will require transport off-site, based on current Project operating expectations.

Domestic waste water generated from employees working at the Plant will continue to be discharged to an existing on-site drain field.

4.3 Noise

Operation of the new generation units and the transmission line will result in no perceptible increase in noise levels in nearby residential areas. The Project will not result in any violation of Minnesota Noise Standards in the residential Waybridge Subdivision located across U.S. Highway 169, or at nearby industrial facilities to the north and east of the Plant.

4.3.1 Project Noise

Noise will be generated by the construction and operation of the Project. Construction noise will be predominantly intermittent sources originating from diesel engine driven construction equipment. Potential noise impacts will be mitigated by proper muffling equipment fitted to construction equipment and restricting activities conducted during nighttime hours.

Noise from the operation of the new CTGs is expected to be predominantly low frequency noise, as is noise from traffic. Noise from Project operation will not significantly impact the acoustical environment given the high background noise levels (particularly in low frequencies), from nearby U.S. Highway 169 and MN Highway 101, the distance of the CTGs from adjacent properties and the noise control technology that will be employed by the new generating units.

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

Transmission conductors and transformers at substations produce noise under certain conditions. The level of noise or its loudness depends on conductor conditions, voltage level and weather conditions. Noise emission from a transmission line occurs during heavy rain and wet conductor conditions. In foggy, damp, or rainy weather conditions, power lines can create a crackling sound due to the small amount of the electricity ionizing the moist air near the wires. During heavy rain the general background noise level is usually greater than the noise from a transmission line. In addition, very few people are out near the transmission line. For these reasons audible noise is not noticeable during heavy rain. During light rain, dense fog, snow and other times when there is moisture in the air, the proposed transmission lines will produce audible noise higher than rural background levels but similar to household background levels. During dry weather, audible noise from transmission lines is an imperceptible, sporadic crackling sound.

4.3.2 Noise Standards

Noise is defined as unwanted sound. Sound is transmitted as waves of pressure fluctuations through the air. The intensity of the sound is called the sound pressure level and is expressed using a logarithmic scale called the decibel (dB)

scale. In this logarithmic scale a 3 dB increase corresponds to a doubling in the actual sound pressure level.

Minnesota Rule 7030.0040 establishes standards to regulate noise levels by land use types. Land uses such as picnic areas, churches or commercial land are assigned to a category based on the activities occurring in each respective land use. The Noise Area Classification (NAC) is listed in the Minnesota Pollution Control Agency (MPCA) noise regulations (Minnesota Rule 7030.0050) to define the categories. Residences are included in NAC 1, most commercial facilities are included in NAC 2, and most industrial facilities are included in NAC 3. The Minnesota Noise Standards are given in Table 4-3.

Table 4-3 Minnesota Noise Standards by Noise Area Classification

Noise Area Classification	Daytime (dBA)		Nighttime (dBA)	
	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

L_{50} – The sound level that is exceeded 50% of the time
L_{10} – The sound level that is exceeded 10% of the time

The Minnesota Noise standards are expressed in dBA and are based on a statistical analysis of hour-long measurements of noise levels. The L_{50} is the sound level that must not be exceeded for more than 50% of any given hour (30 minutes), while the L_{10} is the sound level which must not be exceeded for more than 10% of any given hour (six-minutes). The daytime noise standards apply from 7 a.m. through 10 p.m. From 10 p.m. through 7 a.m. the nighttime standards apply. Noise standards apply at the point of the receiver, not at the boundary of the noise source. For a residential area, the standard applies at the nearest home, not at the property line of the residential property or the property line of the noise source.

4.3.3 Current Noise Environment

The Plant site is located in an industrial area. The nearest residences are in the Classics at Waybridge Subdivision approximately 800 feet south of the Plant's south fence line and approximately 1,000 feet south of the proposed CTG locations. South and adjacent to the Plant, and between the Plant and the nearest residence, is U.S. Highway 169, a well-traveled four-lane freeway (see Figure 1-2).

Noise levels were measured between 7 a.m. and 7 p.m., on November 11, 2003, to the east of the Classics of Waybridge Subdivision in an existing transmission line right-of-way, and at two locations within the subdivision, Eddington Circle and the north end of Hartley Boulevard. In addition, noise monitoring was completed during the same period at two locations east and west of the Plant site and north of U.S. Highway 169. Noise monitoring locations are shown in Figure 4-1. The existing Plant generating units did not run during the monitoring period.

Highway noise dominated the acoustic environment in the subdivision. Measured noise levels are shown in Table 4-4. Sound levels were measured in individual octave bands at the two locations within the subdivision (see Figure 4-1). Low frequency noise (below 1,000 Hz) accounts for most of the noise within the subdivision.

Table 4-4 Ambient Noise Level Monitoring Results (November 11, 2003)

Location	Time	Measured Sound Levels (dBA)[1]			
		L_{eq}[2]	L_{90}[3]	L_{50}[4]	L_{10}[5]
Transmission Line Easement (east of Classics at Waybridge sub-division)	08:30 – 09:29	56.8	54.9	56.6	57.7
	11:30 – 12:29	57.6	55.2	56.4	59.8
	16:00 – 17:00	62.9	60.4	62.9	63.9
North End of Hartley Drive (within Classics at Waybridge sub-division)	11:08 – 12:07	64.4	62.1	64.1	65.8
	12:50 – 13:49	65.1	61.0	64.0	68.0
	15:08 – 16:07	68.1	67.0	68.0	69.0
	16:24 – 17:23	69.0	67.6	68.9	70.4
Eddington Circle (within Classics at Waybridge sub-division)	08:30 – 08:29	58.2	54.0	57.0	61.0
	14:52 – 15:51	59.5	55.0	58.0	60.0
200 feet east of Plant (north of U.S. Highway 169)	09:53 – 10:52	62.8	60.2	62.7	64.7
	11:53 – 12:52	61.7	59.7	60.3	63.1
	13:53 – 14:52	61.2	58.7	60.4	63.3
Gateway Drive (approx. 1000 feet west of Plant and north of U.S. Highway 169)	10:09 – 11:08	57.3	53.9	56.9	59.2
	12:09 – 13:08	56.7	51.4	55.9	59.9
	14:09 – 15:08	53.6	50.4	52.4	56.0

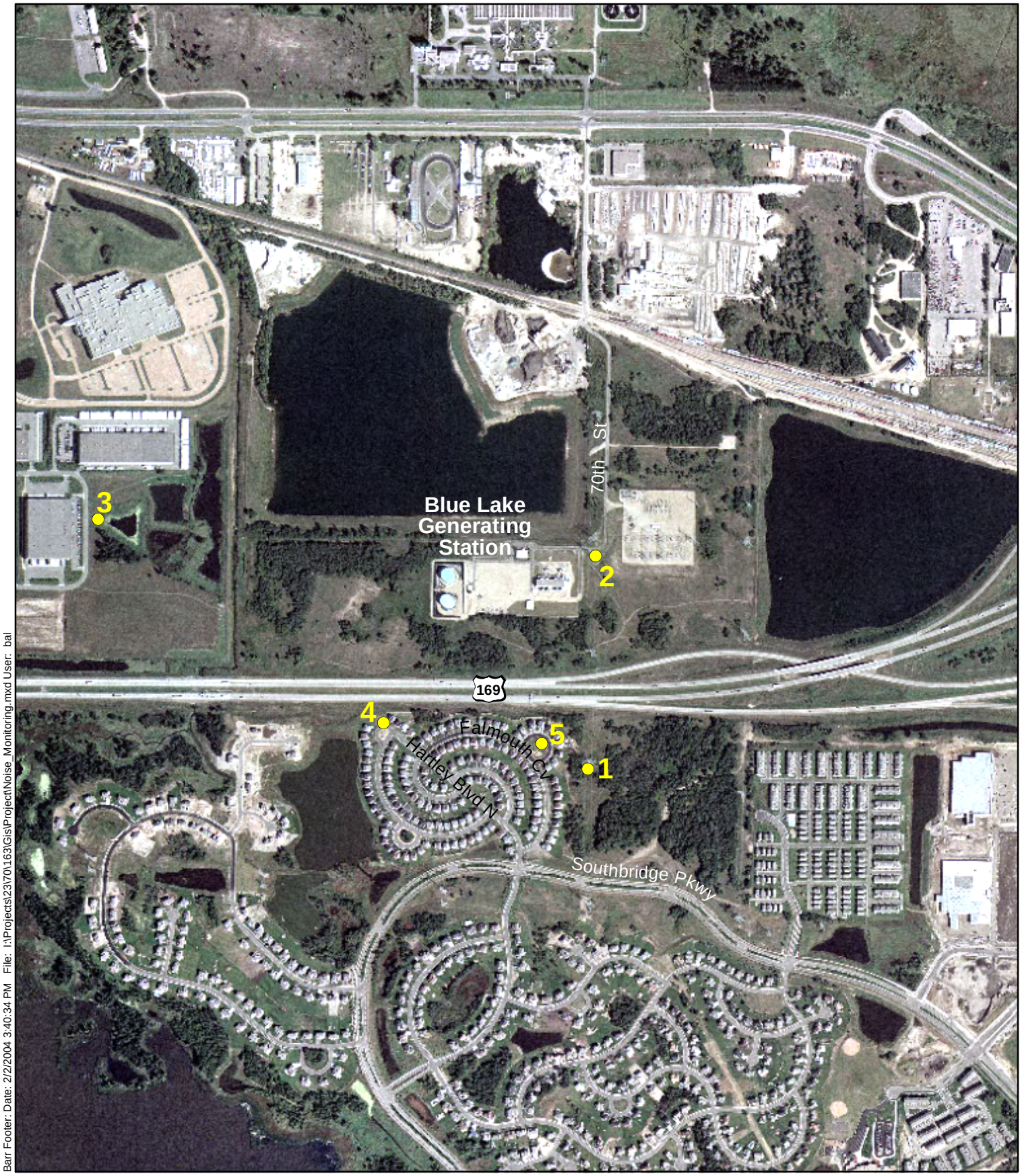
[1] dBA – Decibels A-weighted

[2] L_{eq} – Equivalent sound level. This is the average sound level over the sample period.

[3] L_{90} – The sound level that was exceeded 90% of the time during the sample period.

[4] L_{50} – The sound level that was exceeded 50% of the time during the sample period.

[5] L_{10} – The sound level that was exceeded 10% of the time during the sample period.



① Transmission Line Right-of-Way
② Blue Lake Generating Station
③ Gateway Drive
④ 6527 Hartley Blvd.
⑤ 6997 Edington Circle

Feet
1,000 0 1,000

Figure 4-1
NOISE MONITORING LOCATIONS
Blue Lake Generating Station
Shakopee, Minnesota
November 11, 2003

4.4 Land Use Impacts

The Project location takes advantage of existing generating station, substation and transmission infrastructure. The additional generating units will be located within the footprint of an existing peaking plant in an industrial-zoned area, so will not change the land use of the area. Similarly, the proposed transmission line will be located between two existing transmission lines on right-of-way immediately adjacent to existing transmission right-of-way.

4.4.1 Zoning and Displacement

The area surrounding the Blue Lake Generating Plant is zoned by the City of Shakopee as an I-1 Light Industry Zone. A zoning map of the Project area is included as Figure 4-2.

The Project will not require the displacement of any occupied residences or businesses. Work on the Project will not displace any other existing or planned land use, including residential land uses. The proposed site for the additional generating units is located within a 127-acre parcel owned by Xcel Energy (see Figure 2-1). The nearest residential area lies approximately 1000 feet south of the new units and about 200 feet west of the proposed transmission line.

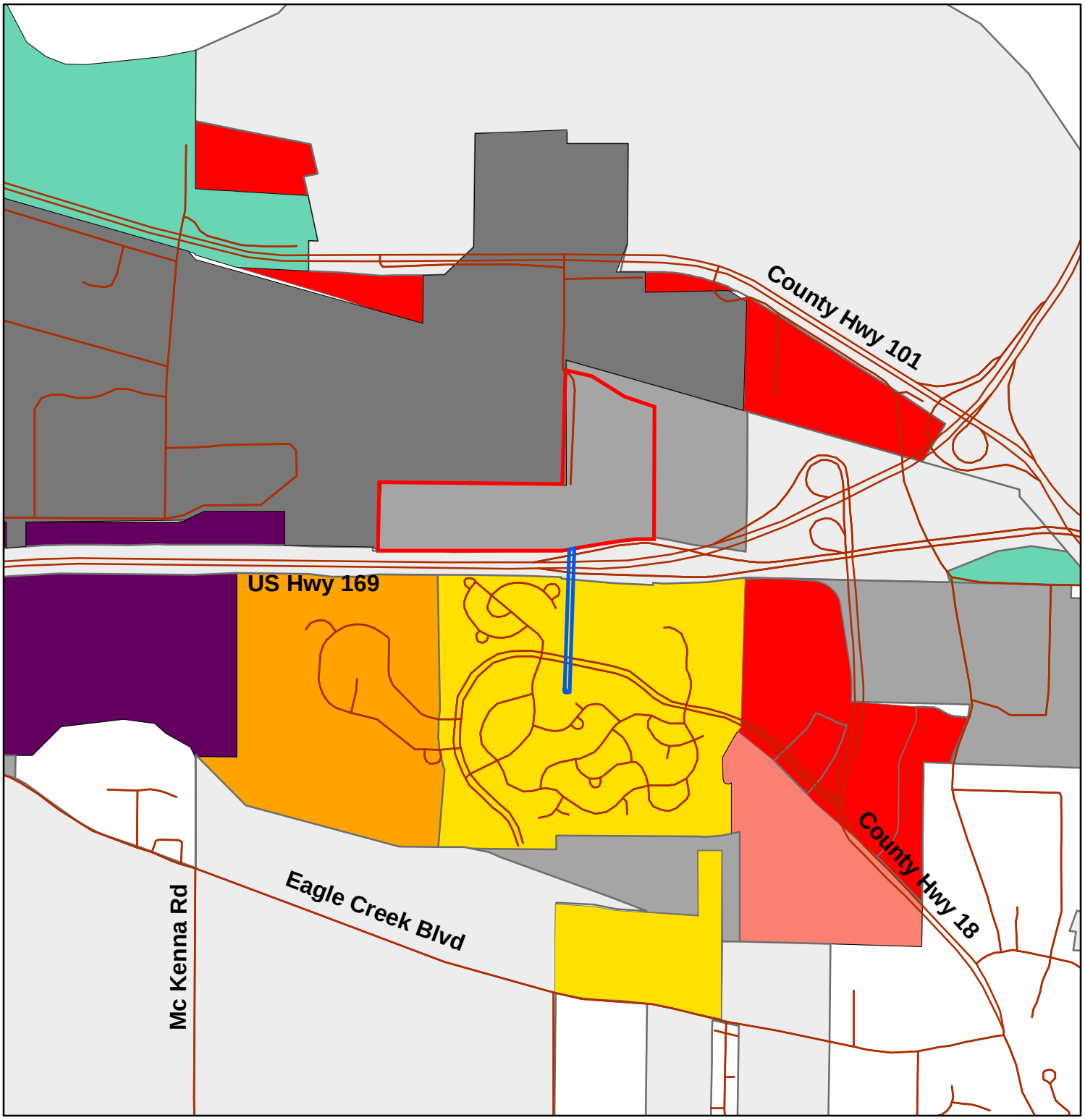
4.4.2 Aesthetics

Area aesthetics will not be significantly changed by the Project. The proposed generating addition site is already developed, housing the existing Blue Lake Generating Plant and its four oil-fired CTGs. The Project will not impact the scenic areas to the north of the Plant, along the Minnesota River National Wildlife Refuge because the Project will be within the existing Plant site and immediately adjacent to existing transmission lines. The existing stacks at the Project are about 50 feet tall, as will the new stacks. The transmission line will utilize single steel poles spaced approximately 600 feet apart and 110 feet high located adjacent to existing structures. Since no discernable land use change will occur no change in cultural values will result.

4.4.3 Impacts to Industries

Area industries will not be adversely impacted by the Project.

No agricultural land will be used for the Project. No prime farmland will be taken out of production. No forestry-related industry will be adversely impacted by the



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- LEPGP Site
- HVTL Route
- AG - Agriculture
- RR - Rural Residential
- R1A - Low Density Residential
- R1B - Urban Residential
- R2 - Medium Density Residential
- R3 - Multiple Family Residential
- R1C - Old Shakopee Residential
- PRD - Planned Residential District
- NC - Neighborhood Commercial
- CC - Community Commercial
- B1 - Highway Business
- B2 - Office Business
- B3 - Central Business
- BP - Business Park
- L1 - Light Industrial
- L2 - Heavy Industrial
- MR - Major Recreation

Data Source: Scott County

Feet
2,000 1,000 0 2,000

Figure 4-2
ZONING MAP
Xcel Energy
Blue Lake Generating Plant
Expansion Project

Project. There is a gravel quarry immediately north of the Project, owned by JL Shiely Company. The Project will not impact this gravel quarry. Area tourism and recreation areas (see Figure 4-3) will not be adversely impacted by the Project.

4.5 Social, Cultural and Economic Impacts

4.5.1 Public Health and Safety

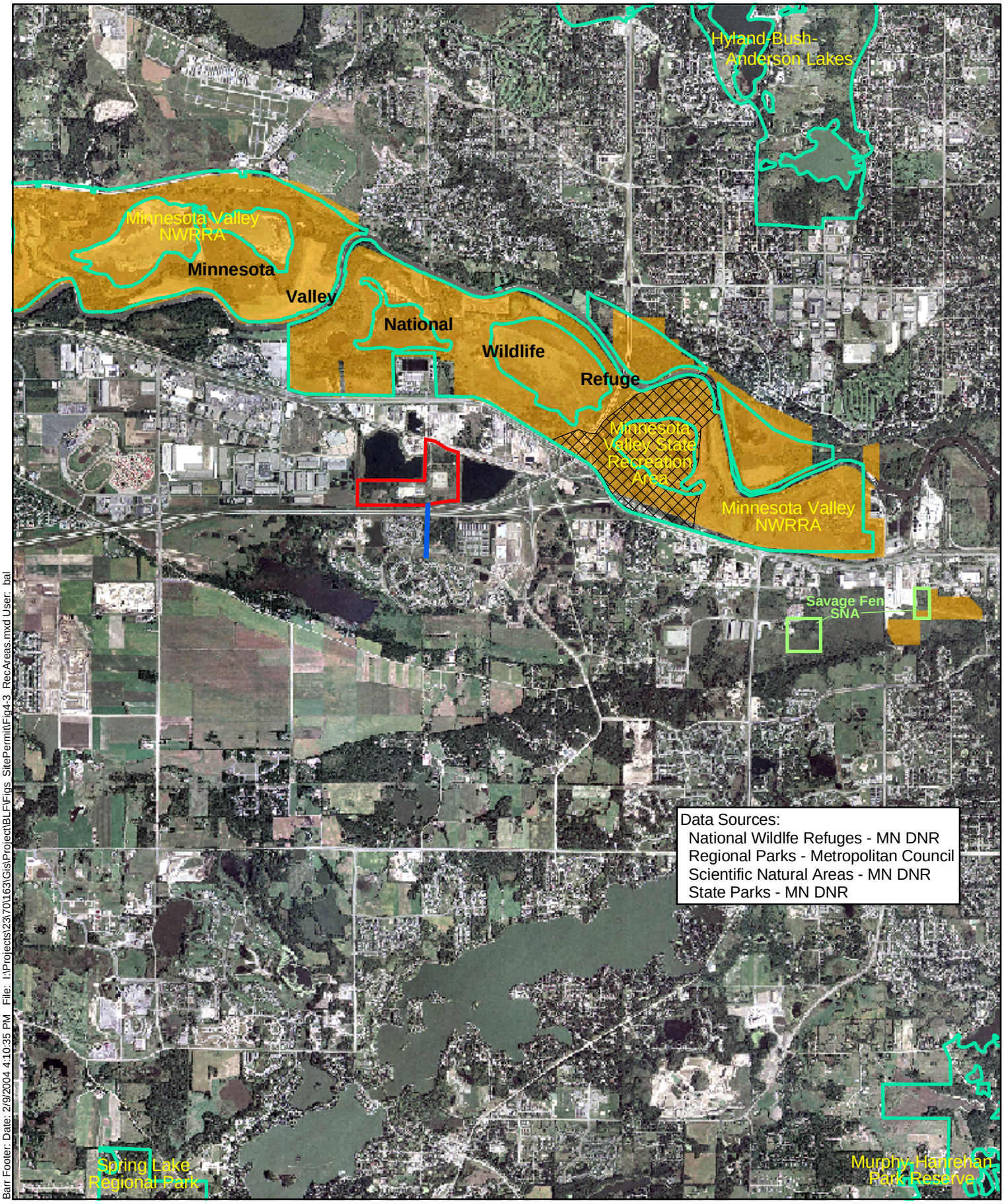
Typical health and safety concerns associated with electricity generation are related to air emissions, noise, security and emergency preparedness and electric and magnetic fields (EMF). Air and noise impacts from the Project are addressed in Sections 4.1 and 4.3, respectively. Plant security and emergency preparedness and EMF are discussed below.

4.5.1.1 Plant Security and Emergency Preparedness

During construction of the Project, Xcel will employ a security service to guard equipment and prevent vandalism at the Project during the day. The Plant has a six-foot high chain link fence around the property to prevent vandalism and to secure operations on site.

The Shakopee Police provide law enforcement services in the area. The Shakopee Police Station is located in the residential downtown part of the City of Shakopee, approximately 4.5 miles from the Plant. The Shakopee Police department has 35 sworn officers and two community officers. Three to four officers are on duty during day time shifts, along with a sergeant, the Chief of Police and the Deputy Chief of Police. Night shifts have roughly three officers available. The local Shakopee police force currently does, and in the future will be able to, accommodate any law enforcement needs at the Plant.

The Plant is equipped with a complete fire protection system consisting of a two wells on site, one for potable water and one for fire protection. An electric fire pump supplies water from the dedicated fire well to hydrants situated around the site. The oil storage tanks at the Plant are equipped with a foam fire suppression system. The new generating units as well as the existing units will employ a carbon dioxide fire protection system. This existing equipment is designed in accordance with National Fire Protection Association (NFPA) requirements, and the new plant will meet the same NFPA requirements.



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LEPGP Site
HVTL Route
Regional Parks
State Parks
National Wildlife Refuge
Scientific & Natural Areas

Feet
5,000 2,500 0 5,000

Figure 4-3
RECREATION AREAS
Xcel Energy
Blue Lake Generating Plant
Expansion Project

4.5.1.2 Electric and Magnetic Fields and Stray Voltage

The term EMF refers to electric and magnetic fields that are present around any electrical device. Electric and magnetic fields arise from the flow of electricity and the voltage of a line. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors.

Electric Fields

Voltage on any wire (conductor) produces an electric field in the area surrounding the wire. The electric field associated with a high voltage transmission line extends from the energized conductors to other nearby objects such as the ground, towers, vegetation, buildings and vehicles. The electric field from a power line gets weaker as one moves away from the line. Nearby trees and building material also greatly reduce the strength of power line electric fields.

The intensity of electric fields is measured in kilovolts per meter (kV/M). Table 4-5 provides the electric fields at maximum conductor voltage for the proposed 230/115 kV transmission line.

Table 4-5 Calculated Electric Fields (kV/m) for Proposed 230/115 kV Transmission Line (1 meter Above Ground)

		Distances shown are from centerline of proposed transmission line														
Line	**Voltage**	**(300')**	**(250')**	**(200')**	**(150')**	**(100')**	**(50')**	**(25')**	**0**	**25**	**50**	**100**	**150**	**200'**	**250'**	**300'**
Existing 345/115kV double circuit	345/115 kv	0.17	0.35	0.91	1.85	1.69	0.74	0.55	0.40	0.27	0.18	0.10	0.06	0.04	0.03	0.03
Existing 345/115kV and proposed 230/115kV	345/115 and 230/115 kv	0.18	0.39	1.00	2.04	1.91	1.37	1.72	0.98	0.42	0.23	0.04	0.02	0.01	0.01	0.01

The existing line and the proposed line would create maximum electric field of approximately 2.04 kV per meter centered beneath the existing line. This is significantly less than the limit of 8 kV per meter that has been a permit condition previously imposed by the MEQB. The MEQB permit condition was designed to

prevent serious hazard from shocks when touching large objects, such as semi tractor trailers or large farm equipment, parked under extra high voltage transmission lines of 500 kV or greater.

Magnetic Fields

Current passing through any conductor, including a wire, produces a magnetic field in the area around the wire. The magnetic field associated with a high voltage transmission line surrounds the conductor and decreases rapidly with increasing distance from the conductor. The magnetic field is expressed in units of magnetic flux density, gauss (G).

Table 4-6 provides the existing and estimated magnetic fields based on the proposed line and structure design. The estimated magnetic field for the existing 345/115 transmission line and the proposed transmission line has been calculated at various distances from the center of the proposed transmission line.

Table 4-6 Calculated Magnetic Flux Density (milligauss) for Proposed 230/115/kV Transmission Line (1 meter Above Ground)

			Distances shown are from centerline of proposed transmission line														
Line	**Condi-tion**	**Amps**	**(300')**	**(250')**	**(200')**	**(150')**	**(100')**	**(50')**	**(25')**	**0**	**25**	**50**	**100**	**150**	**200'**	**250'**	**300'**
Existing 345/115kV double circuit	2005 Peak	164/500	1.8	3.0	6.0	13.2	20.5	27.1	22.3	15.6	10.5	7.2	3.9	2.4	1.6	1.1	0.9
	Average	98/300	1.1	1.8	3.6	7.9	12.3	16.2	13.4	9.4	6.3	4.3	2.3	1.4	0.9	0.7	0.5
Existing 345/115kV and proposed 230/115kV	2005 Peak w/ 175MW output	154/412 85/281	1.5	2.6	5.0	10.7	18.5	22.2	21.7	25.1	20.7	12.1	4.4	2.2	1.4	0.9	0.7
	2005 Peak w/ 515 MW output	154/643 158/643	2.2	3.4	6.4	12.9	27.0	36.3	41.2	52.8	46.9	28.4	9.8	4.4	2.5	1.6	1.1

The question of whether exposure to power-frequency (60 Hz) magnetic fields can cause biological responses or health effects has been the subject of considerable research for the past three decades. There is presently no Minnesota statute or rule that pertains to magnetic field exposure. The most recent and exhaustive reviews of the health effects from power-frequency fields conclude that the evidence of health risk is weak. The National Institute of Environmental Health Sciences (NIEHS) issued its final report, "NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields" on June 15, 1999, following six years of intensive research. NIEHS concluded that there is little scientific evidence correlating EMF exposures with health risk.

The Minnesota State Interagency Working Group on EMF Issues, consisting of members from the Minnesota Department of Health, Department of Commerce, PUC, Pollution Control Agency and EQB conducted research related to EMF, which resulted in similar findings to the NIEHS report. The group issued "A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options" in September of 2002 wherein it stated:

> *"Research on the health effects of EMF has been carried out since the 1970s. Epidemiological studies have mixed results – some have shown no statistically significant association between exposure to EMF and health effects, and some have shown a weak association. More recently, laboratory studies have failed to show such an association, or to establish a biological mechanism for how magnetic fields may cause cancer."*

The group concluded:

> *"The Minnesota Department of Health (MDH) concludes that the current body of evidence is insufficient to establish a cause and effect relationship between EMF and adverse health effects. However, as with many other environmental health issues, the possibility of health risk from EMF cannot be dismissed."*

The conclusions of the Minnesota State Interagency Working Group are also consistent with those reached by the Minnesota Department of Health in 2000.

While the general consensus is that electric and magnetic fields pose no discernibly elevated risk to humans, the question of whether exposure to magnetic fields potentially can cause biological responses or health effects continues to be the

subject of research and debate. In addressing this issue, Xcel Energy provides information to the public, interested customers and employees for them to make an informed decision about EMF. Xcel Energy will provide measurements for landowners, customers and employees who request them. In addition, Xcel Energy has followed "prudent avoidance" guidance suggested by most public agencies. This includes using structure designs that minimize magnetic field levels and siting facilities in locations with fewer people living nearby.

Stray Voltage

Stray voltage is defined as a small electric current that can be found between two contact points in an animal confinement area where electricity is used. Electrical systems, including farm systems and utility distribution systems, must be grounded to the earth by code to ensure continuous safety and reliability. Inevitably, some current flows through the earth at each point where the electrical system is grounded and a small voltage develops. This voltage is called neutral-to-earth voltage (NEV). When a NEV is measured between two objects that may be simultaneously touched by an animal, it is frequently called stray voltage. Stray voltage is not electrocution, ground currents, EMF or earth currents.

Stray voltage can be a concern on some dairy farms because it can impact milk production. Problems are usually related to the distribution and service lines directly serving the farm or the wiring on a farm. In those instances when transmission lines have been shown to contribute to stray voltage, the electric distribution system directly serving the farm or the wiring on a farm was directly under and parallel to the transmission line. These circumstances are considered in installing transmission lines and the potential for a stray voltage problem can be readily eliminated. The proposed transmission line will not run parallel to any existing distribution line for long distances. Therefore, no stray voltage issues are anticipated with this transmission line.

4.5.2 Public Services and Infrastructure

The Project will not require extraordinary public services nor strain the public infrastructure. Construction and operating simplicity associated with simple cycle technology result in minimal burden on roadways and public services.

The Project will not require additional electric service from the Shakopee Municipal Electric Utility. The Project will utilize its own generating capacity to provide on-going operational electrical needs.

The Plant does not currently have natural gas utility service. The Project natural gas fuel supply will be furnished through a new natural gas transmission pipeline that will be constructed in association with the Project. The natural gas transmission pipeline is described in Section 3.1.2 and will be the subject of a separate application to the Environmental Quality Board for a Pipeline Route Permit.

The major traffic route in the area is US Highway 169, which runs East-West along the southern boundary of the Plant site. The proposed transmission line route crosses US Hwy 169, which runs north to Minneapolis and south to Mankato (Figure 4-4). Other major traffic routes in the Project area include County Highway 101 and County Hwy 83 (see Figure 4-5).

The Union Pacific Railroad track passes directly adjacent to the northeast portion of the Plant property. The closest airport to the Project is the Minneapolis Flying Cloud Airport, approximately 2.75 miles to the north (Figure 4-4).

Additional traffic generated by the Project is limited to the truck traffic associated with the transporting of wastewater to a regional publicly-owned treatment works. The estimated 100 additional truck trips annually will not significantly affect area transportation services.

4.5.3 Archaeological and Historical Resources

The Project will be on a previously graded site or will be adjacent to established transmission right of ways, thus there will be no impacts to any buildings, including historic structures.

The Minnesota State Historic Preservation Office (SHPO) was asked to review their records to determine whether there are any reported historic or archaeological resources at the generating units site and along the HTVL route. Their November 3, 2003 response indicated that the closest archaeological site is approximately 900 feet north of the Project (Appendix B). SHPO also indicated that additional sites may be present, but not yet included in the SHPO inventory. Xcel will submit the final Project plans to the SHPO office for review.

4.5.4 Economic Benefits

The local community will benefit from the generating units and transmission line construction. Plant and transmission line construction will require an estimated 90-120 construction workers over the 12-month Plant construction period. These

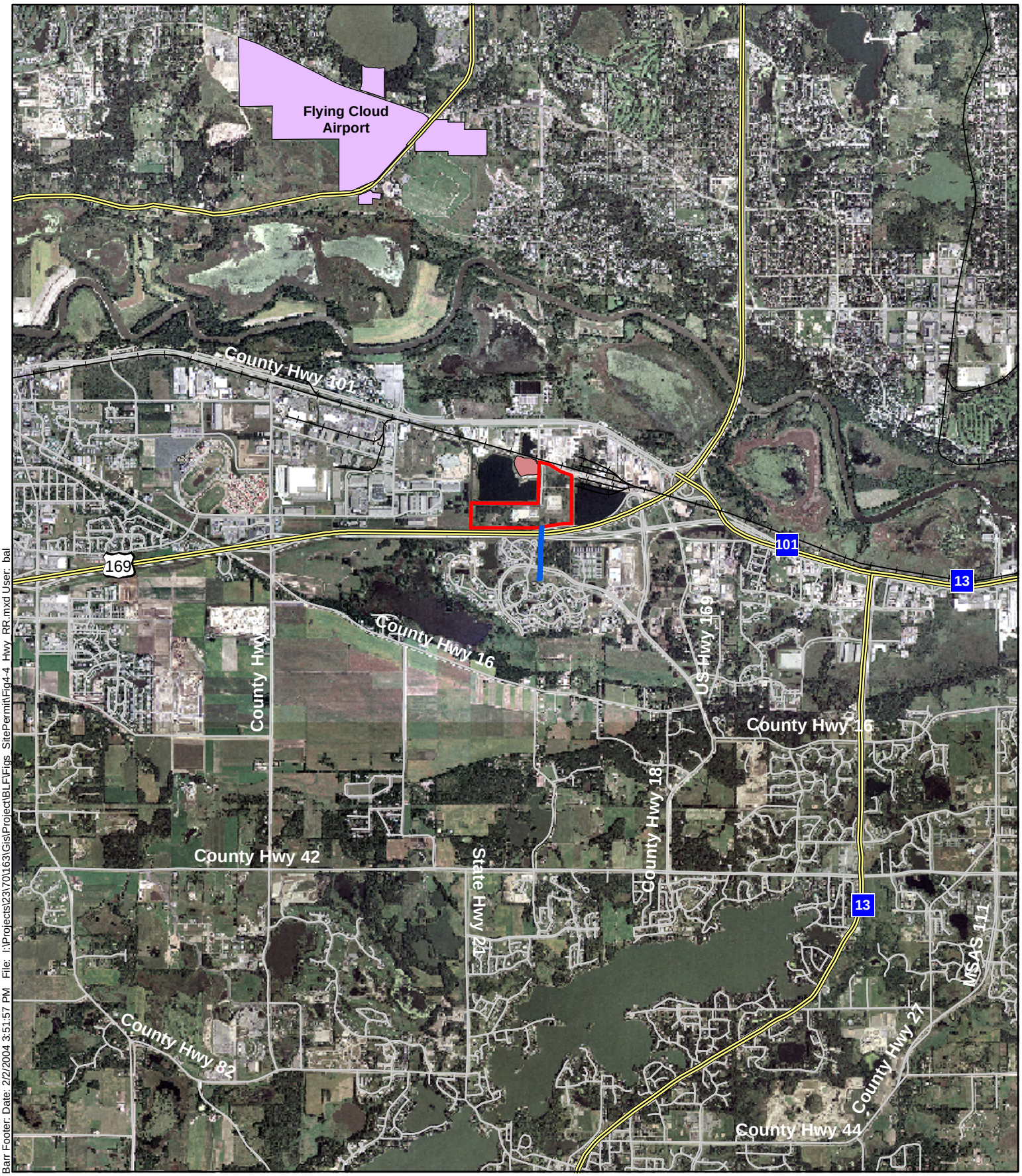

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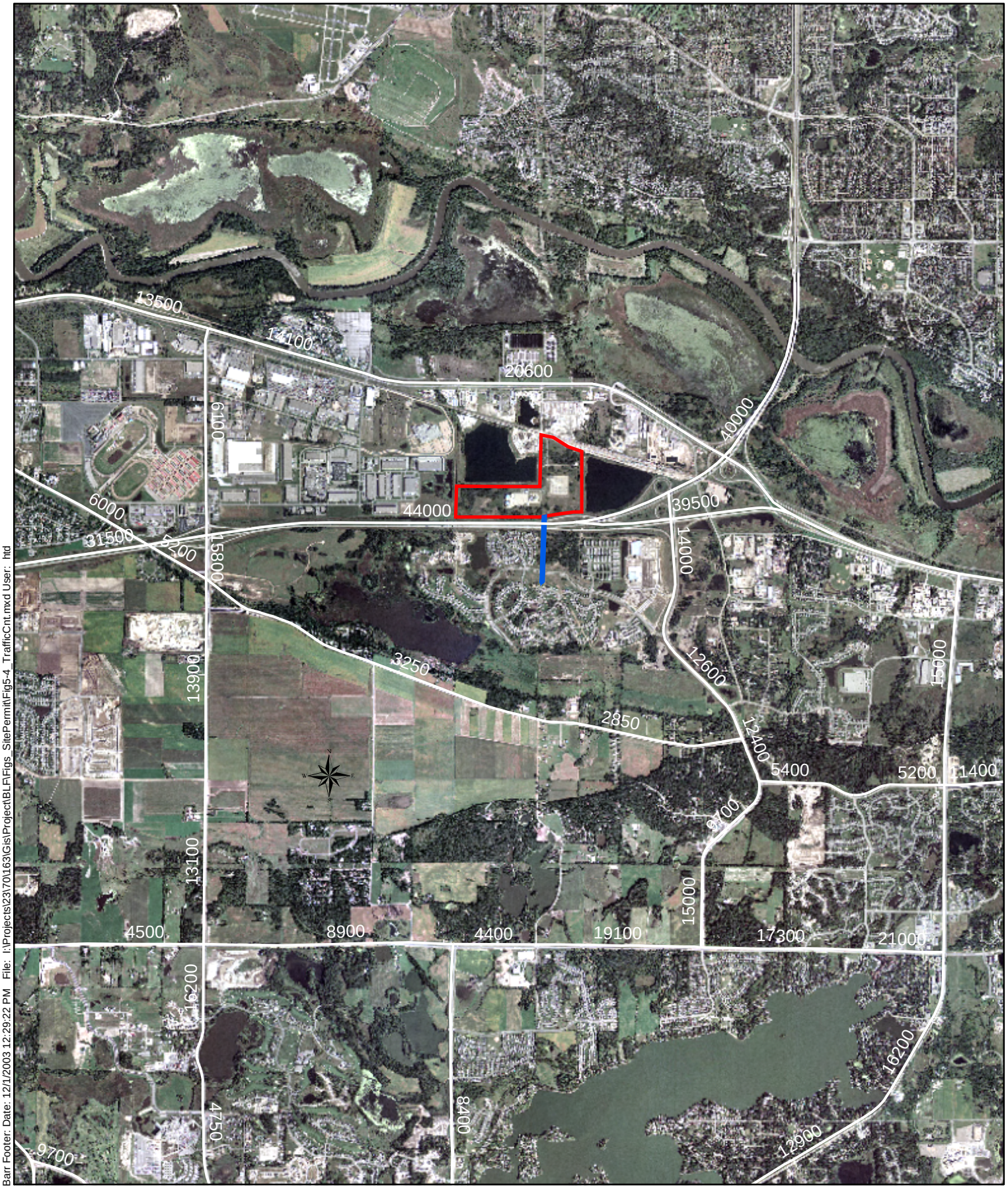
Figure 4-4
HIGHWAYS, RAILROADS, AIRPORTS
Xcel Energy
Blue Lake Generating Plant
Expansion Project



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LEPGP Site

HVTL Route

40000 Average Daily Traffic Count (2002)

Source: Scott County & MnDOT

Feet

4,000 2,000 0 4,000

Figure 4-5
TRAFFIC COUNTS
Xcel Energy
Blue Lake Generating Plant
Expansion Project

high-skill, high paying positions, including pipe fitters, iron workers, millwrights, boilermakers, carpenters, electricians, and other trades, are estimated to add over $8 million of payroll into the regional economy. Operation of the new units after construction will require approximately 2 to 3 additional full-time positions. Periodic major maintenance will also create local jobs

The Project and existing Blue Lake Generating Plant facilities will contribute property taxes for the City of Shakopee, Scott County and the Shakopee School District. The state and Scott County will also benefit from income and sales taxes paid as a result of the construction of the Project. The operating staff associated with the Project will continue to pay payroll taxes.

4.6 Effects on the Natural Environment

4.6.1 Geology and Soils

The geologic setting and soils at the Plant site make the location ideally suited for the additional generating units. The soil conditions along the proposed transmission line are also suitable for the transmission tower foundations.

The Project is located on a broad flat flood terrace along the Minnesota River Valley that is approximately 800 feet above mean sea level (MSL). The surficial geology at the proposed turbine location consists of about 20 feet of alluvial sands over dolomite bedrock of the Prairie du Chien group. Geologic conditions along the transmission line route are similar except that depth to bedrock is up to 80 feet or more.

Area soil resources will not be significantly impacted by the Project. Most of the area disturbed for construction of the generating units has already been graded and covered with gravel. Excavation of soils for the transmission line will be limited to structure locations for placement of foundations. No areas containing "prime farmland" soils, as defined by Minnesota Rules 4400.3450, Subp.4, are present at the Plant site or along the transmission line route.

Figure 4-6 illustrates the soil series in the Project area. Soils are primarily Zimmerman fine sand, 6 to 12 percent slopes (ZaC2). There is an area of Zimmerman fine sand, 0 to 2 percent slope (ZaA) at the generating units site and of Zimmerman fine sand, 2 to 6 percent slope (ZaB2) along the transmission line route. The Zimmerman fine sands soils are light-colored, windblown sands on the

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Soils Series Symbol & Name

Dg, Dune Land
Ia, Isanti fine sandy loam
Ma, Marsh
PaA, Palms Muck
ZaA, Zimmerman fine sand, 0 to 2 percent slope
ZaB2, Zimmerman fine sand, 2 to 6 percent slope
ZaC2, Zimmerman fine sand, 6 to 12 percent slopes

LEPGP Site
HVTL Route

Feet
0 500 1,000 2,000

Soils Data Source:
NRCS Scott County Class 3 Soils Survey

Figure 4-6
SOIL SERIES
Xcel Energy
Blue Lake Generating Plant
Expansion Project

terraces between Shakopee and Savage. Zimmerman soils are subject to severe drought, as they have little moisture-holding capacity, and wind erosion is active.

4.6.2 Rivers, Streams and Lakes

The Project will not significantly impact area water bodies. Surface water runoff from the Project will follow existing drainage patterns. Currently Plant surface water runoff generally drains to the south where it enters a drainageway paralleling US Hwy 169. The drainage discharges to the west and then north into an intermittent stream that drains into the Minnesota River (see Figure 4-7).

4.6.3 Vegetation

The site of the new generating units is already free of vegetation. Plant species along the proposed transmission line route include: bur oak (*Quercus macrocarpa*), northern pin oak (*Quercus ellipsoidalis*), quaking aspen (*Populus tremuloides*), black cherry (*Prunus serotina*), red cedar (*Juniperus virginiana*), honeysuckle (*Lonicera* sp.), buckthorn (*Rhamnus cathartica*), leadplant (*Amorpha canescens*), switchgrass (*Panicum virgatum*). Some clearing of the trees along the transmission route may be necessary. Approximately one to two acres of sparsely wooded land will be converted to lower growing vegetation.

The pre-settlement nature in the vicinity of the Project was oak openings and barrens. Since settlement, the Project vicinity has been developed, which has effectively removed most evidence of the pre-settlement vegetation. The native oak woods were almost entirely replaced with industrial and residential land uses. There are some remnants of pre-settlement vegetation indicated by the Minnesota County Biological Survey in the area (Figure 4-8). Plant species that could potentially be found in the remnants are listed in Table 4-7.

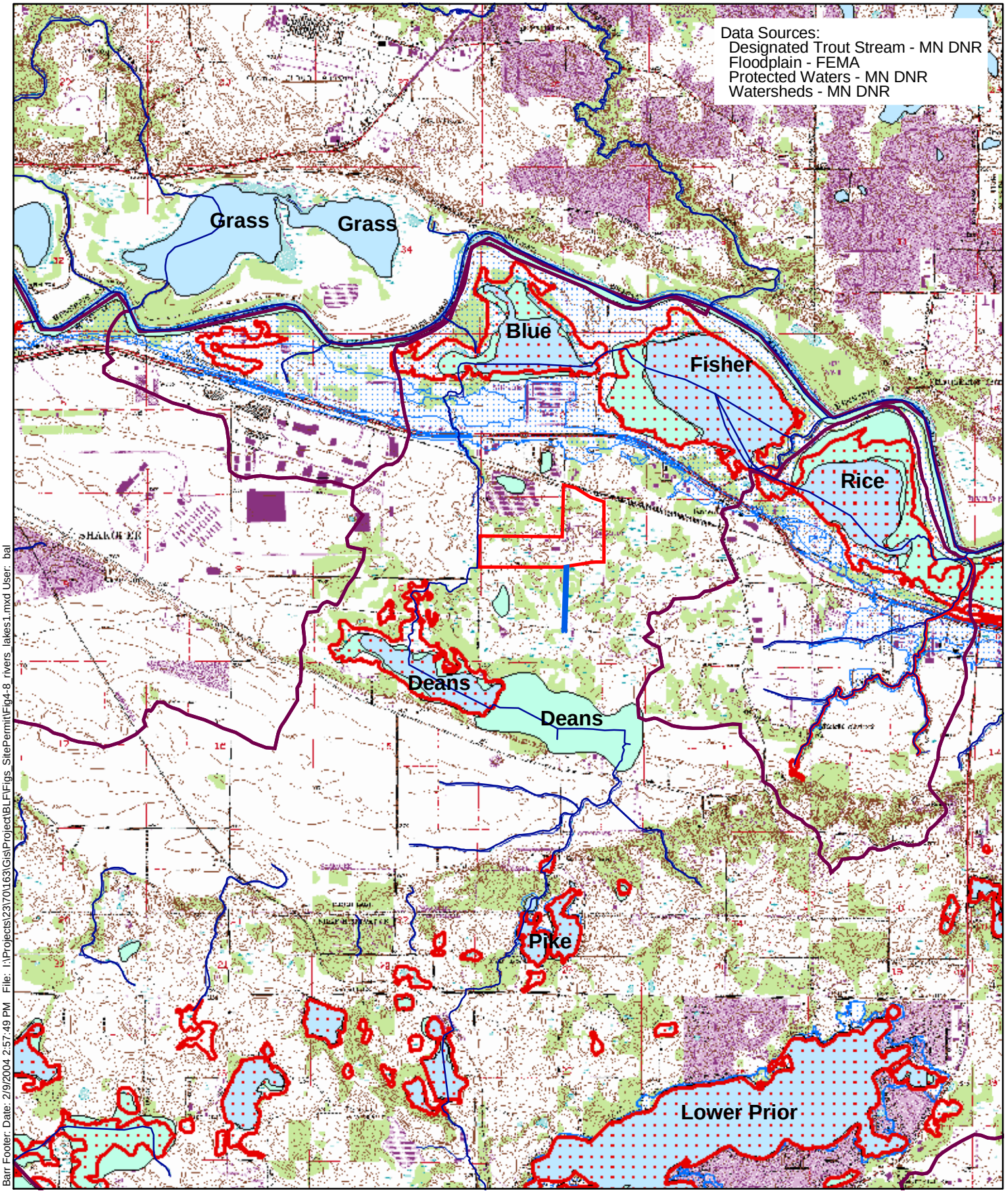
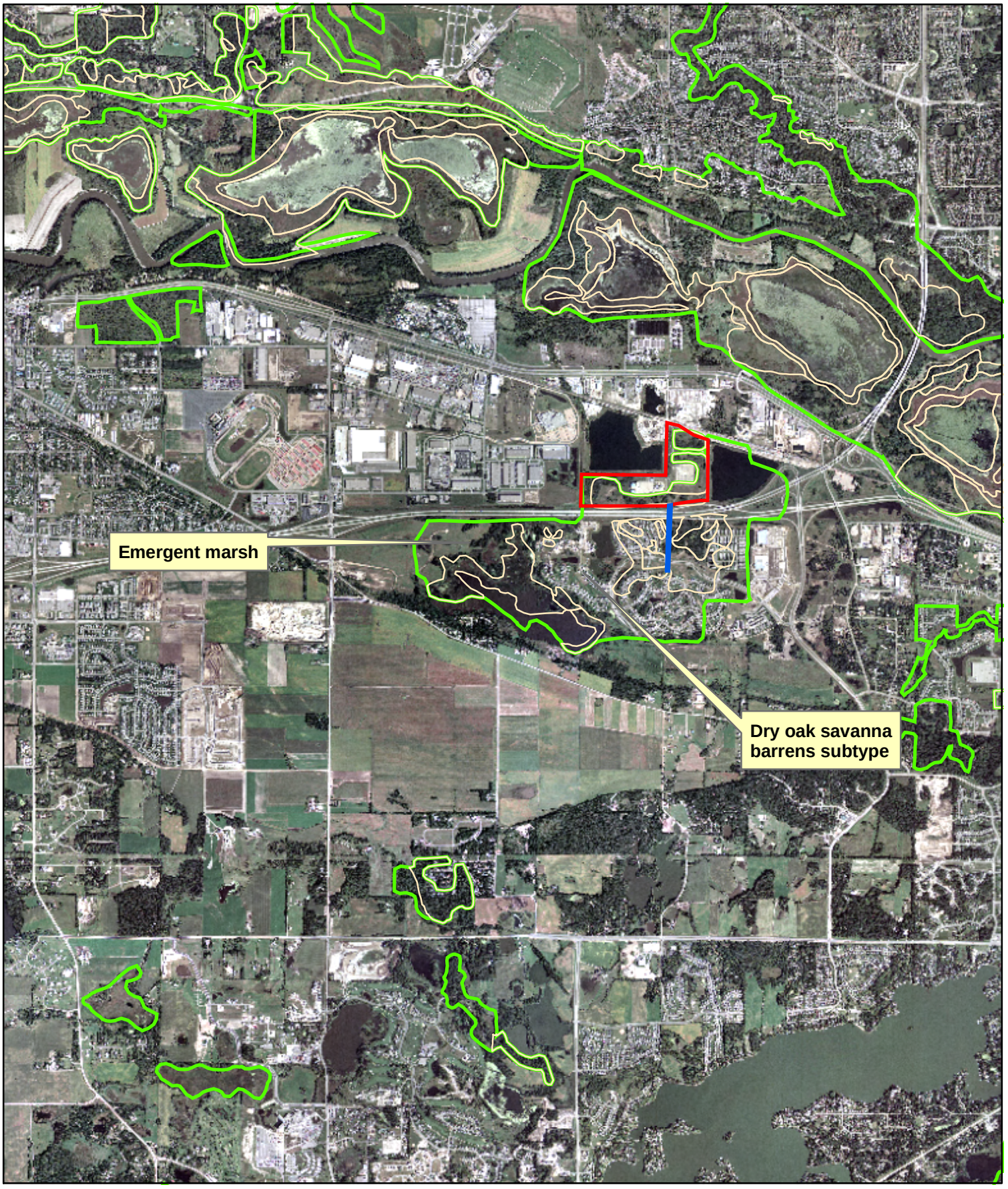


Figure 4-7
RIVERS, LAKES, WATERSHEDS
Xcel Energy
Blue Lake Generating Plant
Expansion Project



LEPGP Site
HVTL Route
Native Plant Community
Significant Biological Diversity

Data Source: MN DNR

Feet
0 2,000 4,000 8,000

Figure 4-8
COMMUNITIES OF SIGNIFICANT BIOLOGICAL DIVERSITY
Xcel Energy
Blue Lake Generating Plant Expansion Project

Table 4-7 Plant Species found in Native Vegetation Remnants

Plant Community Name	Common Name	Latin Name
Dry Oak Savanna (Southeast) Barrens Subtype		
	bur oak	*Quercus macrocarpa*
	northern pin oak	*Quercus ellipsoidalis*
	leadplant	*Amorpha canescens*
	prairie willow	*Salix humilis*
	prairie rose	*Rosa arkansana*
Emergent Marsh		
	river bulrush	*Scirpus fluviatilis*
	cattails	*Typha spp.*
	lake sedge	*Carex lacustris*
	wild rice	*Zizania aquatica*
	bur reed	*Sparganium eurycarpum*
	bluejoint grass	*Calamagrostic canadensis*
	rice cut grass	*Leersia oryzoides*
	broad-leaved arrowhead	*Sagittaria latifolia*
	water plantain	*Alisma subcordatum*
	sweetflag	*Acorus calamus*
	water parsnip	*Sium suave*
	wild mint	*Mentha arvensis*
	American water-horehound	*Lycopus americanus*
Lowland Hardwood Forest		
	basswood	*Tilia americana*
	black ash	*Fraxinus nigra*
	green ash	*Fraxinus pennsylvanica*
	American elm	*Ulmus americana*
	hacberry	*Celtis occidentalis*
	bur oak	*Quercus macrocarpa*
	sugar maple	*Acer saccharum*
	cleavers	*Galium spp.*
	Virginia waterleaf	*Hydrophyllum virginainum*
	wood nettle	*Laportea canadensis*
	eastern narrowleaf sedge	*Dcarex amphibola*
Oak Forest (Big Woods) Mesic Subtype		
	red oak	*Quercus rubra*
	white oak	*Quercus alba*
	northern pin oak	*Quercus ellipsoidalis*
	bur oak	*Quercus macrocarpa*
	basswood	*Tilia americana*
	sugar maple	*Acer saccharum*
	ironwood	*Ostrya virginiana*
	bitternut hickory	*Carya coridformis*
	black cherry	*Prunus serotina*

	big-toothed aspen	*Populus grandidentata*
	gooseberries	*Ribes spp.*
	honewort	*Cryptotaenia canadensis*
	lopseed	*Phryma leptostachya*
	sweet cicely	*Osmorhiza claytonii*
	white snakeroot	*Eupatorium rugosum*
Oak Woodland-Brushland (Big Woods)		
	pin oak	*Quercus ellipsoidalis*
	bur oak	*Quercus macrocarpa*
	white oak	*Quercus alba*
	paper birch	*Betula papyrifera*
	eastern red cedar	*Juniperus visginaian*
	quaking aspen	*Populus tremuloides*
	basswood	*Tilia americana*
	big-toothed aspen	*Populus grandidentata*
	American hazel	*Corylus americana*
	chokecherry	*Prunus virginiana*
	prickly ash	*Zanthoxylum americanum*
	smooth sumac	*Rhus glabra*
	gray dogwood	*Cornus racemosa*
	hog-peanut	*Amphicarpaea bracteata*
	chining bedstraw	*Galium concinnum*
	Pennsylvania sedge	*Carex pensylvanica*
Wet Meadow		
	lake sedge	*Carex lacustris*
	tussock sedge	*Carex stricta*
	bluejoint grass	*Calamagrostic canadensis*
	bur reed	*Sparganium eurycarpum*
	cattails	*Typha spp.*
	hardstem bulrush	*Scirpus acutus*
	aquatic sedge	*Carex aquatilis*
	red-osier dogwood	*Cornus stolonifera*
	pussy willow	*Salix discolor*
	swamp-loosestrife	*Lysimachia thrysiflora*
	spotted joe-pye weed	*Eupatorium maculatum*
	northern marsh fern	*Thelypteris palustris*
	American water-horehound	*Lycopus americanus*

4.6.4 Fauna

The Minnesota National Wildlife Refuge is approximately one mile from the Project (Figure 4-3). Work at the Plant site is not expected to impact the Refuge, or any wildlife species in the area. A list of potential wildlife species was generated

from data for the Minnesota Valley Wildlife Refuge (Table 4-8). These wildlife species may also inhabit areas in the vicinity of the Project.

Table 4-8 Wildlife Species found along Minnesota River Valley[1]

Common Name	Latin Name	Oak savanna and dry praire uplands[2]	Floodplain forest and low prairie or meadow[2]	Marsh and open water[2]
Oposum, Shrews, Moles				
Virginia oposum	*Didelphis virginiana*	r	r	
masked shrew	*Sorex cinereus*		u	
arctic shrew	*Sorex arcticus*		r	
pigmy shrew	*Microsorex hoyi*		r	
shorttail shrew	*Blarina brevicauda*	r	c	u
eastern mole	*scalopus aquaticus*	u	u	
starnose mole	*Condylura cristata*		r	
Bats				
little brown myotis	*Myotis lucifugus*		c	
keen myotix	*Myotis keenii*		r	
silver-haried bat	*Lasionycteris noctivagagns*		r	
eastern pipistrel	*Pipistrellus subflavus*		r	
big brown bat	*Eptesicus fuscus*		c	
red bat	*Lasiurus borealis*		c	c
hoary bat	*Lasiurus cinereus*		c	
Rabbits, Rodents				
eastern cottontail	*Sylvilagus floridanus*	c	a	u
whitetail jackrabbit	*Lepus townsendii*	u		
woodchuck	*Marmota monax*	a	c	
richardson ground squirrel	*Citellus richardsoni*		u	
thirteen-lined ground squirrel	*Citellus tridecemlineatus*	c	u	
Franklin ground squirrel	*Citellus franklinii*	u	u	
eastern chipmunk	*Tamias striatus*	a	c	
eastern gray squirrel	*sciurus carolinensis*	c	c	
eastern fox squirrel	*Sciurus carolinensis*		c	
red squirrel	*Tamiasciurus hudsonicus*		c	
southern flying squirrel	*Glaucomys volns*		u	
plains pocket gopher	*Geomys bursarius*	a		
plains pocket mouse	*Perognoathus flavescens*	u		
beaver	*Castor canadensis*			c
western harvest mouse	*Reithrodontomys megalotis*	r		
deer mouse	*Peromyscus maniculatus*	u		
white-footed mouse	*Peromyscus leucopus*	c	c	
Gapper's red-backed vole	*Clethrionomys gapperi*		u	

meadow vole			u	
muskrat	*Ondatra zibethica*			a
Norway rat	*Rattus norvegicus*	u		
house mouse	*Mus musculus*	u		
meadow jumping mouse	*Zapus hudsonicus*	r	c	
Coyote/Fox				
coyote	*Canis latrans*	r		
red fox	*Vulpes fulva*	c	u	
gray fox	*Urocyon cinereoargenteus*	u		
Raccoon, Weasel, Skunk, Otter				
Raccoon	*Procyon lotor*		c	c
ermine/shorttail weasel	*Mustela ermina*		u	
least weasel	*Mustela rixosa*	u		
longtail weasel	*Mustela frenata*		u	
mink	*Mustela vision*			u
badger	*Taxidea taxus*	r		
spotted skunk	*Spilogale putoris*	u	u	
striped skunk	*Mephitis mephitis*	c	c	
river otter	*Lutra canadensis*			r
Deer				
whitetail deer	*Odocoileus virginianus*	c	a	c
Reptiles and Amphibians				
Turtles				
snapping turtle	*Chelydra serpentina*		c	
map turtle	*Graptemys geographica*			r
false map turtle	*Graptemys pseudogeographics*			c
painted turtle	*Chrysemys picta*	u	c	c
Blanding's turtle	*Emydoidea blandingi*		r	r
smooth softshell	*Trionys muticus*			c
spiny softwhell	*Trionys spiniferus*			u
Lizards and Snakes				
prairie skink	*Eumeces septentrionalis*		u	
northern water snake	*Nerodia sipedon*		c	c
brown (DeKay's) snake	*Storeria occiptomaculata*		u	u
redbelly snake	*Storeria occiptomaculata*		u	
common garter snake	*Thamnophis sirtalis*	c	a	a
plains garter snake	*Thamnophis radix*	c	c	c
western hognose snake	*Heterodon nasicus*	c	u	
racer	*Coluber constrictor*	u		
smooth green snake	*Opheodrys vernalis*		u	
fox snake	*Elaphe vulpina*	u	c	c
gopher snake	*Pituophis melanoleucus*	c	u	
milk snake	*Lamproperltis triangulum*		u	

Salamanders				
mudpuppy	*Necturus maculosus*			u
eastern newt	*Notophthalmus viridescens*		u	u
blue-spotted salamander	*Ambystoma laterale*		r	
tiger salamander	*Ambystoma trigrinum*		c	
Toads and Frogs				
American toad	*Bufo americanus*	c	c	c
spring peeper	*Hyla crucifer*		c	c
gray tree frog	*Hyla versicolor*		c	
striped chorus frog	*Pseudacris triseriata*		c	c
green frog	*Rana clamitans*			c
wood frog	*Rana sylvatica*		c	
northern leopard frog	*Rana pipiens*	u	a	a
Birds				
American crow	*Corvus brachyrhynchos*	unspecified		
American goldfinch	*Carduelis tristis*	unspecified		
American kestrel	*Falco sparverius*	unspecified		
American robin	*Turdus migratorius*	unspecified		
Bald eagle	*Haliaeetus leucocephalus*	unspecified		
Barn swallow	*Hirundo rustica*	unspecified		
Belted kingfisher	*Megaceryle alcyon*	unspecified		
Black-capped chickadee	*Poecile atricapilla*	unspecified		
Blue jay	*Cyanocitta cristata*	unspecified		
Brown-headed cowbird	*Molothrus ater*	unspecified		
Canada goose	*Branta canadensis*	unspecified		
Common nighthawk	*Chordeiles minor*	unspecified		
Cooper's hawk	*Accipitier cooperii*	unspecified		
Downy woodpecker	*Picoides pubescens*	unspecified		
Eastern bluebird	*Sialia sialis*	unspecified		
Eastern phoebe	*Sayornis phoebe*	unspecified		
European starling	*Sturnus vulgaris*	unspecified		
Great blue-heron	*Ardea herodias*	unspecified		
Great egret	*Casmerodius albus*	unspecified		
Hairy woodpecker	*Picoides villosus*	unspecified		
Hermit thrush	*Catharus guttatus*	unspecified		
House sparrow	*Passer domesticus*	unspecified		
House wren	*Troglodytes aedon*	unspecified		
Killdeer	*Charadrius vociferus*	unspecified		
Marsh wren	*Cistothorus palustris*	unspecified		
Mourning dove	*Zenaida macroura*	unspecified		
Northern Cardinal	*Cardinalis cardinalis*	unspecified		
Northern flicker	*Colaptes auratus*	unspecified		
Northern Parula	*Parula americana*	unspecified		
Purple finch	*Carpodacus purpureus*	unspecified		
Purple martin	*Progne subis*	unspecified		

Red-headed woodpecker	*Melanerpes erythrocephalua*	unspecified
Red-tailed hawk	*Buteo jamaicensis*	unspecified
Red-winged blackbird	*Agelaius phoeniceus*	unspecified
Ring-billed gull	*Larus delawarensis*	unspecified
Rock dove	*Columba livia*	unspecified
Savannah sparrow	*Passerculus sandwichensis*	unspecified
Song sparrow	*Melospiza melodia*	unspecified
Turkey Vulture	*Coragyps atratus*	unspecified
White-breated nuthatch	*Sitta carolinensis*	unspecified
Wild turkey	*Meleagris gallopavo*	unspecified
Yellow warbler	*Dendroica petechia*	unspecified
Yellow-bellied sapsucker	*Sphyrapicus varius*	unspecified

[1] From MN Valley National Wildlife Refuge data, bird data from Barr Engineering Co.

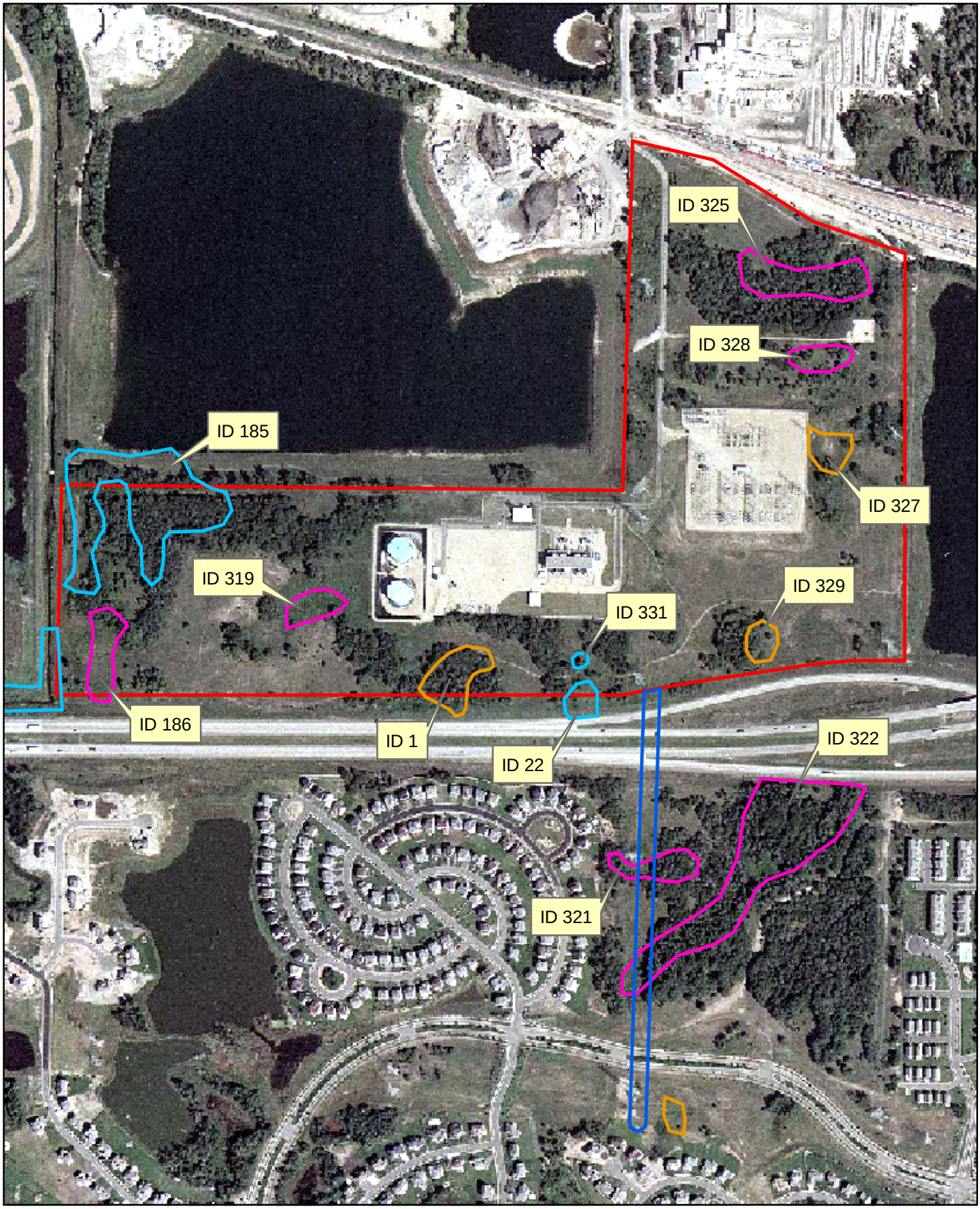
[2] a = abundant, c = common, u = uncommon, r = rare

4.6.5 Wetlands

There are no wetlands at the location of the proposed generating units, and wetlands near the Plant will not be impacted by the Project. The location of foundation structures of the transmission line will be determined considering the wetland review work. Once the transmission line structure locations are finalized, potential wetland sites will be precisely delineated and applications for the wetland permits will be submitted, if necessary.

Potential wetland sites identified in the vicinity of the Project are shown on Figure 4-9. Maps of potential wetlands were created using off-site pre-field work, and then were verified in the field. The off-site data collection included mapping Natural Resource Conservation Service wetland determinations, hydric soils, topography, and National Wetland Inventory data.

The historic color aerial photographs from the Scott County Farm Service Agency were reviewed off-site for wetland signatures within the Project area to determine areas of potential wetland hydrology. The slide review focused on three years, 1990, 1993 and 1997 based on precipitation data from the closest WETS station at Jordan. According to the Jordan precipitation data, the water year (Oct. 1 – Sept 30) was above normal in 1990 and 1993, and below normal in 1997. The FSA slides are typically taken in July and August, and precipitation was generally above normal in Jordan during the summer months of these years, making wet areas more clearly visible on the aerial photographs.



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Barr Wetland Classification
- Wetland (NRCS Determined)
- Probable Wetland
- Unknown

- LEPGP Site
- HVTL Route

Feet
0 300 600 1,200

Figure 4-9
POTENTIAL WETLANDS
Xcel Energy
Blue Lake Generating Plant
Expansion Project

Barr Engineering Co. reviewed 12 potential wetlands areas. Of these, three areas are wetland, six areas are probable wetland and three areas will need more detailed study to confirm if they are wetlands. All of these wetlands within the Project area are Palustrine wetlands and are listed in Table 4-9. The Palustrine wetland classification includes:

> *"all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and all such wetlands that occur in tidal areas where salinity stemming from ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation but with all of the following characteristics: (1) area less than 8 ha.; (2) lack of active wave-formed or bedrock shoreline features; (3) water depth in the deepest pat of the basin of less than 2 m at low water; and (4) salinity stemming from ocean-derived salts of less than 0.5 ppt.."* (Mitsch and Gosselink, 2000)

There are no DNR Public Waters, as defined by Minnesota Statutes, Section 103G.005, subd 15., within the Project area.

Table 4-9 Potential Wetlands Summary

Barr Identification No.	Approximate Cowardin Classification [1]	Field Determination [2]	Acres
322	PFOB	PW	7.0
185	PEMB	W	6.1
325	PFOB/7	PW	2.1
1	PEM/FOB	UNK	1.4
186	PFOBd	PW	1.2
321	PEM/FOB	PW	0.9
328	PSSB	PW	0.7
327	PEMB	UNK	0.7
319	PEMB	PW	0.7
22	PEMB	W	0.5
329	PFOB	UNK	0.5
331	PEMB	W	0.1

[1] Cowardin et al., 1979. Classifications of Wetlands and Deepwater Habitats of the United States

[2] W = Wetland, PW = Probable wetland, UNK = Unknown

4.6.6 Rare and Unique Natural Resources

The Project will not adversely impact threatened or endangered species. The Natural Heritage Program of the MN DNR was contacted and asked to review their database to determine if any rare plant or animal species or other significant natural features are know to occur within the Plant site or along the transmission line route.

The area within the northern part of T115, R22W, Section 11 is listed by the Minnesota County Biological Survey as a "Site of High Biodiversity Significance" (Figure 4-8). This listing allows the county to track information, and designates this site as a priority for preservation. This area lies directly south of the proposed generating units and transmission line. It is a Dry Oak Savanna, barrens subtype, which indicates a dry savanna on an excessively drained soil on wind blown sand dunes located on terraces along the Minnesota River. The tree canopy is open (10-50% cover) and dominated by bur oak (*Quercus macrocarpa*) and northern pin oak (*Quercus ellipsoidalis*). Common shrubs include leadplant (*Amorpha canescens*), prairie willow (*Salix humilis*) and prairie rose (*Rosa arkansana*) with the ground layer dominated by forbs and graminoids typical of dry prairie – barrens subtype.

There are several special concern species located in the southern part of T115N, R22W, Section 11 (Appendix C). Impacts to the Species of Special Concern will be minimized by limiting the extent of disturbance within this specially designated area. These species are typically found within Dry Oak Savanna and Oak woodland-brushland native plant communities, which are located in the southern half of Section 11. Work at the Project is not expected to have any adverse effects on these species.

Appendices

Appendix A
Property Ownership Information

Plat ID	Plat Contact	# Owners
A	J L SHIELY CO	1
B	J L SHIELY CO	1
C	J L SHIELY CO	1
D	STATE OF MINN DEPT OF TRANSP	1
E	SCOTT COUNTY HWY ENGINEER	1
F	WILLIAM G PEARSON,JR	1
G	UNION PACIFIC RR COMPANY	1
H	UNION PACIFIC RR COMPANY	1
I	GLENN D ZACHARIAS	1
J	RICHARD MARZAN	1
27073	CRETEX INDUSTRIAL PARK 1ST ADD	1
27095	ZIEGLER	1
27148	RLS # 134	1
27151	CONDOMINIUM 1015	1
27219	VALLEY PARK 13TH ADDN	2
27227	STONE MEADOW 1ST CIC 1043	1
27250	SOUTHBRIDGE 1ST ADDN	46
27251	EAGLE CREEK PRESERVE	2
27271	SOUTHBRIDGE 3RD ADDN	25
27277	SOUTHBRIDGE COVE	2
27279	CIC 1073 VILLAGE/SOUTHBRIDGE	24
27281	CLASSICS AT SOUTHBRIDGE	33
27284	SOUTHBRIDGE 4TH ADDN	1
27296	SOUTHBRIDGE COVE 2ND ADDN	9
27302	SAVANNA OAKS @ SOUTHBRIDGE 2ND	1
27305	CLASSICS @ SOUTHBRIDGE 2ND ADD	39
27308	SOUTHBRIDGE 5TH ADDN	14
27315	CLASSICS @ SOUTHBRIDGE 3RD ADD	35
27331	SAVANNA OAKS @ SOUTHBRIDGE 4TH	2

Parcel Data Source:
Scott County Assessors Office

LEPGP Site
HVTL Route
Parcels

Feet
0 750 1,500 3,000

Figure A-1
PROPERTY OWNERSHIP MAP
Xcel Energy
Blue Lake Generating Plant
Expansion Project

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Appendix B
Response from Minnesota State Historical Society

MINNESOTA HISTORICAL SOCIETY
STATE HISTORIC PRESERVATION OFFICE

November 3, 2003

Helen Dijkstra
Barr Engineering Company
4700 West 77th Street
Minneapolis MN 55435-4803

RE: Potential Utility Corridor Along County Highway 15, 17, 83 or 42
Scott County
SHPO Number: 2004-0206

Dear Ms. Dijkstra:

Based on the Section-Township-Range project location information included in your letter of 1 October 2003, I have completed data searches of the MN State Historic Preservation Office databases of recorded archaeological sites and history/architecture sites. Enclosed are printouts from these searches, each printout page is for an individual township. Please be aware that the archaeological site location information is confidential and should not be published in any public documents.

Additional historic properties and archaeological sites may be present, but not yet included in the SHPO inventory. Submittal of your project to our office for review, including photographs of any affected buildings/structures built before 1950 and detailed maps of the project's area of impact, will insure that potential historic sites and the probability of archaeological sites are evaluated.

Please also note that this comment letter **does not** address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36CFR800, Procedures of the Advisory Council on Historic Preservation for the protection of historic properties. If this project is considered for federal assistance, or requires a federal permit or license, it should be submitted to our office with reference to the assisting federal agency.

If any further information is needed, please feel free to contact me at (651) 296-5462, or by email at sarah.jordan-beimers@mnhs.org.

Sincerely,

Sarah Jordan Beimers

Sarah Jordan Beimers
Review and Compliance Associate

Enclosures

Appendix C
Response from Minnesota Department of Natural Resources Natural Heritage Database Search

Minnesota Department of Natural Resources

Natural Heritage and Nongame Research Program, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-40__

Phone: (651) 296-7863 Fax: (651) 296-1811 E-mail: sarah.hoffmann@dnr.state.mn.us

October 13, 2003

Helen T. Dijkstra
Barr Engineering Company
4700 W. 77th Street
Minneapolis, MN 55435

Re: Request for Natural Heritage information for vicinity of proposed Scott County Utility Corridor
NHNRP Contact #: ERDB 20040253

County	Township (N)	Range (W)	Sections
Scott	114	22	5,7,8
Scott	114	23	1,2,11,12
Scott	115	22	7-11,16,18-21,28-30,32
Scott	115	23	12-14,23-26,35,36

Dear Ms. Dijkstra,

The Minnesota Natural Heritage database has been reviewed to determine if any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius of the area indicated on the map enclosed with your information request. Based on this review, there are 30 known occurrences of rare species or natural communities in the area searched (for details, see enclosed database printout and explanation of selected fields). Following are specific comments for **only those elements that *may* be impacted** by the proposed project. Rare feature occurrences not listed below are not anticipated to be affected by the proposed project.

- The portion of the utility corridor within T115N R22W Sections 10 & 11 is within an area that has been identified by the Minnesota County Biological Survey as a "Site of High Biodiversity Significance". "Sites of Biodiversity Significance" are areas with varying levels of native biodiversity that may contain high quality native plant communities, rare plants, rare animals, and/or animal aggregations. Biodiversity significance is evaluated on the basis of the number of rare species, the quality of the native plant communities, size of site, and context within the landscape. This particular site contains Dry Prairie, Dry Oak Savanna, Oak Woodland-Brushland, and Emergent Marsh native plant communities and several special concern species including Rhombic-Petaled Evening Primrose (*Oenothera rhombipetala*), Plains Pocket Mouse (*Perognathus flavescens*), and Gopher Snake (*Pituophis catenifer*) have been documented within the site (see the enclosed maps for details). We recommend that in project development, alternatives be sought which will avoid impacts to this ecologically significant site.

The Natural Heritage database is maintained by the Natural Heritage and Nongame Research Program, a unit within the Division of Ecological Services, Department of Natural Resources. It is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, natural communities, and other natural features. Its purpose is to foster better understanding and protection of these features.

Because our information is not based on a comprehensive inventory, there may be rare or otherwise significant natural features in the state that are not represented in the database. A county-by-county survey of rare natural features is now underway, and has been completed for Scott County. Our information about natural communities is, therefore, quite thorough for that county. However, because survey work for rare plants and animals is less exhaustive, and because there has not been an on-site survey of all areas of the county, ecologically significant features for which we have no records may exist on the project area.

The enclosed results of the database search are provided in two formats: index and full record. To control the release of locational information which might result in the damage or destruction of a rare element, both printout formats are copyrighted.

The index provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an Environmental Assessment Worksheet, municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the index for any other purpose, please contact me to request written permission. Copyright notice for the index should include the following disclaimer:

> "Copyright (year) State of Minnesota, Department of Natural Resources. This index may be reprinted, unaltered, in Environmental Assessment Worksheets, municipal natural resource plans, and internal reports. For any other use, written permission is required."

The full-record printout includes more detailed locational information, and is for your personal use only. **If you wish to reprint the full-record printouts for any purpose, please contact me to request written permission.**

Please be aware that review by the Natural Heritage and Nongame Research Program focuses only on *rare natural features*. It does not constitute review or approval by the Department of Natural Resources as a whole. If you require further information on the environmental review process for other wildlife-related issues, you may contact your Regional Environmental Assessment Ecologist, Wayne Barstad, at (651) 772-7940.

An invoice for the work completed is enclosed. You are being billed for map and database search and staff scientist review. Please forward this invoice to your Accounts Payable Department. Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

Sincerely,

Sarah Hoffmann

Sarah D. Hoffmann
Endangered Species Environmental Review Coordinator

encl: Database search results
Rare Feature Database Print-Outs: An Explanation of Fields
Natural Communities and Rare Species Map: Scott County
Invoice

cc: Wayne Barstad