



ENVIRONMENTAL ASSESSMENT

**GREAT RIVER ENERGY/XCEL ENERGY AIR LAKE-EMPIRE
115 kV TRANSMISSION LINE AND NEW SUBSTATION**

EQB DOCKET No. 04-81-TR-AIR LAKE-EMPIRE

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SCOPING DECISION

1.0 Introduction

Great River Energy (GRE) and Xcel Energy have made a joint application to the Minnesota Environmental Quality Board (EQB) for a Route Permit authorizing construction of a High Voltage Transmission Line (HVTL) and Substation pursuant to the provisions of the Power Plant Siting Act (Minnesota Statutes, Sections 116C.51 to 116C.69). Throughout this document, the applicants will be referred to as “applicants” unless specifically referred to as GRE or Xcel Energy.

1.1 Description

The proposed HVTL will be an 115 kilovolt (115 kV) alternating current transmission line. The permit application is for the construction, operation, and maintenance of a new 115 kV transmission line circuit approximately 9.25 miles in length, depending on the route, connecting the Air Lake Substation in Lakeville to the Empire Substation in Empire Township, through Farmington in Dakota County. The project includes a new substation in Farmington called the Vermillion River Substation.

The first portion of the project adds 2.75 miles of 115 kV line to the existing Xcel Energy 69 kV line from the Air Lake Substation to the proposed new Vermillion River Substation. The second portion of the project is approximately 6.5 miles of new 115 kV transmission line between the Vermillion River Substation and the Empire Substation that will require new right-of-way.

1.2 Purpose

The proposed 115 kV HVTL is intended to provide more reliable electric service to the residents of southern Dakota County. Most of the existing transmission system in this area was designed and built prior to 1970. Growth in the electric load in this area can no longer be supported by the existing transmission system. The major benefit of the project is that it will put transmission infrastructure in place that will enable GRE and Xcel Energy to provide more reliable energy service to customers in the Farmington and Empire Township area. This new HVTL will increase electrical system reliability in Dakota County sufficiently to allow for projected regional growth over the next twenty years.

1.3 Sources of Information

Much of the information used in this Environmental Assessment (EA) is derived from documents prepared by GRE and Xcel Energy. These include the Route Permit Application, April 30, 2004, hereinafter referred to as the “Permit Application.” Discussion of Electromagnetic Field (EMF) issues came primarily from the white paper developed by the Interagency Task Force led by the Minnesota Health Department, hereinafter known as “EMF White Paper.” Additional information comes from earlier EQB Environmental Assessments, in particular EQB Docket No. 03-64-TR-XCEL, a new 161 kV Line between Lakefield Junction and Fox Lake Substations in Southwest Minnesota, and EQB Docket No. 03-65-TR-GRE PMG, a new 115 kV transmission line between the Parkers Lake and Elm Creek Substations in Plymouth and Maple Grove, both available for review on the EQB website. First hand information was gathered by site visits on the proposed line and along the alternative route segments.

2.0 Regulatory Framework

In Minnesota, most of the larger HVTL projects go through a two stage regulatory process. First, application is made to the Minnesota Public Utilities Commission (PUC) for a Certificate of Need (CON). If a CON is granted, the utility must then obtain a Route Permit from the Environmental Quality Board (EQB) that designates a route for the HVTL.

2.1 Certificate of Need Requirement

The new line is approximately 9.25 miles long as proposed. Because a 115 kV line must be more than ten miles in length to trigger a certificate of need, according to Minnesota Statutes § 216B.2421, subd 2 (3), the applicants have not applied to the Public Utilities Commission for a CON. However, it should be noted that several of the alternatives discussed later in this assessment do exceed that ten mile limit. Whether or not approval of one of these longer route alternatives would require a certificate of need would be determined by the PUC.

2.2 Route Permit Requirement

Minnesota Statutes § 116C.57 subd 2a states, “Any person seeking to construct a large electric power generating plant or a high voltage transmission line must apply to the board for a site permit or a route permit.” “High voltage transmission line means a conductor of electric energy and associated facilities designed for and capable of operation at a nominal voltage of 100 kilovolts or more,” according to Minnesota Statutes § 116C.52 subd 4. The proposed 115 kV transmission line in Lakeville, Farmington and Empire Township meets this definition, and the applicants are required to obtain a route permit from the EQB for the line.

EQB’s obligation is to choose routes that minimize adverse human and environmental impact while insuring continuing electric power system reliability and integrity, and also while insuring that electric energy needs are met and fulfilled in an orderly and timely fashion. The route permit will contain conditions specifying construction and system operation standards.

In April 2004, the applicants applied to EQB for a route permit for the proposed new power line. They identified a preferred route for the new line in their application, shown in Figures 1 and 2 attached to this document.

2.2.1 Environmental Assessment

For this project, and all other projects using the alternative route permitting process in Minnesota Rules, parts 4400.2000 to 4400.2900, the EQB prepares an Environmental Assessment (EA). The EA shall contain information on the human and environmental impacts of the proposed project. It shall address required methods to mitigate such impacts for all of the routes considered. The EA shall be the only state environmental review document required to be prepared on the project by the EQB.

The Environmental Quality Board held a public meeting on this project, as required by Minnesota Rules part 4400.2500, in Farmington on June 24, 2004. This meeting was intended to provide the public with

an opportunity to learn about the proposed project, to suggest other route alternatives, and to identify concerns that should be considered by the EQB in preparing the EA. The EA will assist the board in making its decision on exactly what route to approve and what construction and operation conditions to attach to the final permit. Public comments on the scope of the EA were accepted until July 9, 2004. Copies of the comment letters received regarding this project and alternative routes can be found on the EQB website at www.eqb.state.mn.us/Docket.html?Id=6237.

After consideration of the public comments, the Chair of the EQB issued a Scoping Order on July 23, 2004. A copy of this order is attached hereto. The major concerns expressed by citizens about this project are the potential impact of the new line on property values, health concerns from the potential effects of electromagnetic fields (EMF) on nearby residents, aesthetic concerns about vegetation removal, and negative visual impacts of HVTL structures.

All alternative route options identified during the public meetings and EA scoping process were included in the Scoping Order. These include:

- A. Rother Bypass #1, using abandoned RR right-of-way
- B. Rother Bypass #2, using School District property
- C. Empire Citizens #1, retired railway route
- D. Empire Citizens #2, State Highway 50 route
- E. Empire Citizens #3, modified County Road 66 route
- D. Empire Citizens #4, 210th Street diversion
- E. Empire Citizens #5, Met Council sewer corridor
- F. Farmington City, using RR right-of-way to Highway 3

In this Environmental Assessment, the EQB addresses the major social, environmental and economic concerns associated with the new HVTL and the different route options described above.

2.2.2 Public Hearing

The EQB is required by Minnesota Statutes § 116C.57 subd 2d to hold a public hearing once the EA has been completed. This hearing will be held in Farmington on October 11, 2004, and will be conducted by Administrative Law Judge (ALJ) Allan W. Klein. Details about the place and time of the hearing can be found online at <http://www.eqb.state.mn.us/Docket.html?Id=6237>. Interested persons may comment on the environmental assessment at the public hearing. Persons may testify at the hearing without being first sworn under oath. The ALJ shall ensure that the record created at the hearing is preserved and transmitted to the board. The ALJ will prepare a report that will include findings of fact and conclusions and a recommendation on a route.

Comments received on the Environmental Assessment shall become part of the record in the proceeding but the board shall not be required to revise or supplement the EA document. A final decision on a route permit will be made by the EQB Board at an open meeting within a couple of months after the public hearing, depending on scheduling opportunities.

2.3 Other Permits

The EQB route permit is the only State permit required for routing of high voltage transmission lines, but other permits may be required for certain construction activities, such as river crossings. This EA

includes a list of supplementary permits that will be required for the project proposers to complete this project. This listing of supplementary permits required is also found in the Permit Application. The applicant must apply for and obtain all permits required for project completion. The following local and specialized county or state permits have been identified as potential requirements for this project:

- A. City Road Crossing Permits (Farmington and Empire Township)
- B. County Road Crossing Permits (Dakota County)
- C. Land Use Permits for Public Lands (Farmington, Empire Township and Dakota County)
- D. Building Permits for substations (Lakeville, Farmington, Empire Township)
- E. Licenses to Cross Public Waters (DNR)
- F. Road Crossing Permits (DOT)
- G. State Lands Permits (DNR)
- H. Rural Utilities Service Approval (RUS)

2.4 Applicable Codes

The transmission line, regardless of route location, must meet all requirements of the National Electrical Safety Code (NESC) and the Rural Utilities Service (RUS) Design Manual for High Voltage Transmission Lines. These standards are designed to protect human health and the environment. They also ensure that the transmission line and all associated structures are built from high quality materials that will withstand the operational stresses placed upon them over the expected lifespan of the equipment provided normal routine operational and maintenance is performed.

Utilities must comply with the most recent edition of the National Electric Safety Code, as published by the Institute of Electrical and Electronics Engineers, Inc., and approved by the American National Standards Institute, when constructing new facilities or reinvesting capital in existing facilities. See Minnesota Statute § 326.243 and Minnesota Rules 7826.0300 subp 1.

The NESC is a voluntary utility developed set of standards intended to ensure that the public is protected. The NESC covers electric supply stations and overhead and underground electric supply and communication lines, and is applicable only to systems and equipment operated by utilities or similar systems on industrial premises. For more information, go to standards.ieee.org/faqs/NESCFAQ.html#q1. The RUS provides leadership and capital to “upgrade, expand, maintain, and replace America's vast rural electric infrastructure.” For more information, go to <http://www.usda.gov/rus/electric/index.htm>

2.5 Issues outside EQB Authority

The EQB will not, as part of this environmental review, consider whether a different size or different type of transmission line should be built instead of that which the applicants have proposed. The EQB will not consider other endpoints. The EQB will not consider the no-build option.

3.0 Proposed Project

The applicants propose to build a 115 kV transmission line between Air Lake Substation in Lakeville and the Empire Substation in Empire Township. The planned line as proposed is 9.25 miles long. As proposed, the project would require 5.8 miles of new right-of-way. The new line will connect with the proposed Vermillion River Substation in Farmington. The entire permit application, maps, appendices and other documents may be viewed at www.eqb.state.mn.us/Docket.html?Id=6237. The proposed route is shown in Figures 1 and 2.

3.1 Route Segments

The first half mile of transmission line exiting the Air Lake Substation to the east is already designed, and is capable of operating as a triple circuit 115 kV line and is not part of the permit application. The proposed route is described by the following route segments:

3.1.1 Cedar Avenue to Vermillion River Substation (Xcel Energy)

The first section of the route is being constructed by Xcel Energy. The route begins at County Road 50 and Cedar Avenue and continues to the Vermillion River Substation. See Figure 1. The route heads east along the north side of CR 50 for approximately 2.5 miles. A new double circuit 115/69 kV line with distribution underbuild will replace the existing 69 kV line along this route. The line will then turn north approximately ¼ mile. The 115 kV line will leave the existing 69 kV alignment and extend approximately 300 feet north into the new Vermillion River Substation.

3.1.2 Vermillion River Substation (Xcel Energy)

The new Vermillion River Substation is proposed to be located on 11.4 acres in an industrial-zoned portion of the City of Farmington near the intersection of CR 50 and Akin Road. The fenced-in area will use 2.5 acres of the site and be laid out to accommodate the installation of future feeders and transformers should significant load growth occur in the area. Xcel Energy will own the new installation, and Dakota Electric Association (DEA) will have a permanent easement for its facilities on the western ¼ portion of the area.

The applicants proposed only this location for the new Vermillion River Substation. No alternative proposals were recommended by any other person.

3.1.3 Vermillion River Substation to Empire Substation (GRE)

GRE plans to construct approximately 6.5 miles of new 115 kV line connecting the proposed Vermillion River Substation and the existing Empire Substation in Empire Township. See Figure 2. The 115 kV line exits the Vermillion River Substation, connects with the Xcel Energy 69 kV line, proceeds east 1/3 mile as a 69/115 kV double circuit line to Akin Road. Then it moves north along the east side of Akin road another 1/3 mile crossing the west branch of the Vermillion River. At this point the proposed 115 kV single circuit will split off and head east along a city-planned 208th Street route, again crossing the west branch of the Vermillion River and the main channel of the Vermillion River to the northeast corner of

CR 66 and Hwy 3. The line turns south about 1/3 mile along the east side of Highway 3 to the south property line of the American Legion, where it turns easterly about ½ mile and proceeds east along the north side of 210th Street for 4 miles to the Empire Substation. Approximately 3.5 of the 4 miles along 210th Street follow existing Xcel Energy and Dakota Electric Association distribution lines.

3.2 Substation Modifications

The new 115 kV line from the Vermillion River Substation will enter the Air Lake Substation from the south, and a new 115 kV termination will be built there to accommodate the new line. The layout will be developed to accommodate additional substation expansion plans, but no additional fence or control house expansion is planned at this time.

No major modifications are anticipated at the Empire Substation. The only equipment additions necessary at this time include the installation of control and protection equipment within the control house, installation of underground control wires, and the connection of the 115 kV transmission line to the existing breaker and a half bus.

3.3 Design Features

The design voltage of the proposed project is 115 kilovolts. Structure heights and spans will vary depending on topography and environmental constraints, such as highway crossings, stream crossings and required angle structures. If the existing Xcel Energy 69 kV line corridor is utilized as proposed, the project would require 5.8 miles of new right-of-way.

Both transmission line segments would utilize 795 aluminum conductor steel-supported (ACSS) conductors. These provide greater load capacity with less sag than other traditional conductors, including 795 aluminum conductor steel reinforced (ACSR). ACSS provides more current carrying capability than ACSR with comparable structures, poles and appearance. The conductor has an overall diameter of 1.108 inches and weighs 1.094 pounds per lineal foot. The line uses three single conductors.

The proposal uses single shaft wooden poles for the majority of the project. Galvanized or weathering steel single shaft poles will be used in a few places where longer spans are required. Horizontal post insulators are planned unless design requires longer spans beyond the capability of the insulators. The longest spans will utilize a braced post design to accommodate the increased loadings. Schematic diagrams showing typical pole structure are shown in Figures 3 and 4.

3.4 Right-of-Way

Xcel Energy will use its existing easements where the 69kV transmission line will be replaced by 115/69kV double circuits. GRE is seeking 70 feet of right-of-way along the route. EQB could designate a wider corridor within which this right-of-way can be located. This would give the utility leeway to mitigate environmental effects and landowner concerns by routing along either the north or south side of 210th Street in Empire Township, for example. Permit conditions may be applied by the EQB to specify where the route corridor width allowance may be restricted or expanded. Permit conditions may also be specific for sections of the route as to which side of the road the line may utilize.

4.0 Route Segment Alternatives

In the public meetings and throughout the EQB's EA scoping process, a number of citizens and groups suggested alternative segments to portions of the proposed route. The Chair did include these suggestions in his Scoping Decision as alternatives to be evaluated. These alternative route segments are identified here.

4.1 Route Segment Alternative Descriptions

4.1.1 Rother Bypass #1

Jerry Rother is the owner of property along the proposed route where the proposed route follows the to-be-built 208th Street between Akin Road and Minnesota State Highway 3. Mr. Rother has proposed two alternative routes that would avoid following the proposed 208th Street. Both of these alternatives involve about one mile of line between the new Vermillion River Substation and Highway 3.

The first alternative suggested by Mr. Rother would run south about 1/3 of a mile on Akin Road rather than north as GRE has proposed and then turn east at the existing Xcel Energy and Dakota Electric Farmington Substations at the intersection of CR 50 and Akin Road in the City of Farmington. The route would then run north – northeast until it intersected with 210th Street, where it would then follow the proposed GRE route along 210th Street to the Empire Substation.

The Rother Bypass # 1 Alternative is shown in Figure 5.

The Rother Bypass #1 route alternative would have to cross the Vermillion River in Rambling River Park in the City of Farmington. There are two existing distribution lines that cross the river in this area, and either corridor could be used for the new 115 kV line. The northern most distribution corridor passes by three houses; the southernmost corridor does not pass by any houses. The Rother Bypass #1 Alternative also avoids a short stretch along Highway 3 between Willow Street and County Road 66.

4.1.2 Rother Bypass #2

The second Rother Alternative differs from #1 in that the second option continues due east from the new Vermillion River Substation across Akin Road. About ½ mile east of Akin Road, it turns south and follows the existing railway corridor for a short distance until it connects with Rother Bypass #1. This route alternative is shown in Figure 6.

Rother Bypass #2 crosses over playing fields, tennis courts, and other school facilities to the south of Farmington Middle School. This alternative also requires one crossing of the Vermillion River in Rambling River Park.

4.1.3 City of Farmington Alternative

The City of Farmington has proposed an alternative route for a short section of the line near the intersection of Willow Street and State Highway 3. The City would prefer that GRE avoid certain parcels

of property near the American Legion Hall that the City and the Legion are hoping to develop. The American Legion and a nearby homeowner would also like to see GRE avoid this area.

The alternative proposed by the City of Farmington would follow an existing abandoned railroad right-of-way, which is also the planned extension of 210th Street just east of Highway 3 (called the “Willow Extension”). This segment passes between two homes on the north and industrial buildings on the south. Significant clearing of trees will be necessary for the city to construct the street.

The City of Farmington alternative is shown in Figure 7.

This alternative could follow the route proposed by GRE at Highway 3 or could connect with either of the Rother Alternatives.

4.1.4 Empire Citizens #1

This is the first of five route alternatives presented by a citizens group called “Save the 210th Street Residents Group.” Members of this group for the most part live or own land along 210th Street, which is the route proposed by GRE.

Alternative # 1 begins on the west end south of 210th Street. Instead of running due east as GRE has proposed, this alternative runs diagonally to the north – northeast through agricultural land essentially along an abandoned railroad right-of-way. The railroad right-of-way was abandoned years ago, is not visually apparent, and the land is currently under cultivation by a number of landowners.

Empire Citizens #1 is shown in Figure 8.

This route alternative could be combined with either of the Rother alternatives or with the City of Farmington preferred route alternative.

4.1.5 Empire Citizens #2

The alternative continues south on State Highway 3 to State Highway 50 rather than turning east at Willow Street as GRE has proposed. This alternative runs due east on Highway 50 to a point due south of the Empire Substation, where it intersects an existing Xcel Energy 115 kV line. This alternative would then involve double-circuiting with the Xcel Energy line for approximately one mile and entering the substation from the south.

This Alternative is shown in Figure 9.

The citizens’ route segment alternative passes 40 homes, two apartments, 11 businesses and one temple. GRE evaluated a MN 50 route alternative. It passed 95 houses, nine town homes, three apartments, 11 businesses, the County Fairgrounds entrance and numerous road, river and railroad crossings. The discrepancy lies in the citizens’ count of housing only up to Highway 3, where their alternative segment turns north. GRE’s proposal continued west past the fairgrounds and turned north up Akin Road, counting all residences along the route.

This routing alternate along Hwy 50 brings the total project distance above ten miles.

4.1.6 Empire Citizens #3

Alternative segment #3 routes from 210th Street at Biscayne Avenue, cutting behind a farmstead and moving through farm fields behind ten residences on Route 66. The proposed alternate then turns back north to run along Route 66. The proposal crosses Route 66 side-to-side two times to avoid seven homes along the remainder of the route. The citizens' proposal does not state where these road crossings would occur. At the eastern edge, the line intersects with the existing north-south 115 kV line east of County 79 (Blaine Avenue) and would double-circuit to the Empire Substation.

This Alternative is shown in Figure 10.

As in the citizens' alternative #1, this line crosses tilled farmland. This routing alternate along Route 66 also brings the total project distance above ten miles.

4.1.7 Empire Citizens #4

The fourth citizens' alternate segment uses the GRE proposed route along 210th Street from the east until just west of the Baker property. It would veer north and run east above the properties of interest to the citizens' group. This would put the line directly behind a new development of homes north of the properties fronting 210th Street. Alternatively, the line could follow an irrigation ravine further north, cutting across a sod farm. The ravine does not continue through Blaine Avenue. The proposal continues going cross country, bisecting another sod farm. The line would then double-circuit the short distance south to the Empire Substation.

This Alternative is shown in Figure 11.

4.1.8 Empire Citizens #5

Citizens' alternate #5 runs along Highway 50 as does Empire Citizens alternate #2. The variation exists where the segment enters the City of Farmington. With alternative #5, the route would turn south at Biscayne Avenue in Empire Township, and the line would run south to 225th Street and share a corridor with a proposed Metropolitan Council Interceptor line. That Interceptor is part of a planned sewer connection from Elko-New Market to the Empire Waste Water Treatment Plant. The alternate segment would shadow that corridor along 225th Street and turn north up Denmark Avenue, eventually branching off on Xcel Energy's existing 69 kV line leading to the new substation.

This Alternative is shown in Figure 12.

5.0 Potential Impacts of the Project

Regardless of the route that is ultimately selected, there are a number of potential impacts associated with HVTLs that must be taken into account on any project. Minnesota Rules part 4400.3150 designates certain factors that must always be considered when examining a high voltage transmission line. During the public meetings and hearings on the scope of the environmental assessment, citizens raised additional issues of concern specific to the particular project. These factors are discussed in the following sections.

5.1 Property Values

One of the first concerns of many residents near existing or proposed transmission lines is how that proximity could affect the value of their property. The responses to those concerns in this case are addressed below by comparing a similar transmission line in another Twin Cities community.

The Shenhon Company of Minneapolis, a business and real estate valuation company, performed a study on property values in the Maple Grove area relative to proximity to transmission lines. Their conclusions were included in the GRE application for a permit for a 115 kV line in Plymouth and Maple Grove in Hennepin County, EQB Docket No. 03-65-TR-GRE PMG. According to the report, “it is our opinion that single source power lines do not cause a measurable and significant diminution in value to typical single-family homes in Maple Grove...Homes defined as larger “family” homes exhibit a slightly larger incremental decrease in selling price. However, given the inexact nature of real estate markets in general, we cannot conclude that the entire difference is attributed to proximity to the power line, or that the difference is considered significant.” (p. 14)

The following discussion of property value impacts was prepared for the Environmental Report for EQB Docket No. 03-65-TR-GRE PMG, released February 29, 2004. It has been reproduced herein below in whole:

This issue of the impact of a new transmission line on property values arises in nearly every public discussion of transmission line permits. Landowners in the vicinity of this proposed transmission line have raised such a concern. It is impossible to know what the impact of a particular transmission line on a particular piece of property will be, and there are no studies of such impacts anywhere in Minnesota.

There are studies available from other parts of the country. Craig L. Solum and Associates, a firm of Wisconsin Certified Real Estate Appraisers, was hired by Northern States Power (now d.b.a. Xcel Energy) to collect market substantiated information on the impact attributable to the imposition of transmission line easements on residential property values in suburban and undeveloped areas near Eau Claire and La Crosse, Wisconsin. The Solum group examined 200 residential property transactions adjacent to or in close proximity to high voltage electric transmission lines in urban, suburban and rural areas of western Wisconsin during the mid 1990's¹. The selection process used in his study concentrated primarily on upper price level residences and vacant lots ready for

¹ Transmission Line Impact Study Based on Paired Sale Comparisons of Residential Properties Located within Northwest and West Central Wisconsin, Craig Solum & Associates, 329 South River Street, Suite 100, P.O. Box 280, Spooner, Wisconsin 54801

construction on the assumption that these properties would be most sensitive to potential negative influences. In the report, Mr. Solum asserted that the very minor positive and negative impact results he observed indicate that there is virtually no impact present that is attributable to the presence of a transmission line encumbrance on residential properties. He stated,

“It is typical for sale prices to vary from market values in ordinary transactions by several percentage points. Each purchaser of a residence has different motives and expectations that result in varying reasons for the reconciliation of the final price paid. The transmission line presence has no real impact on the price paid for residential property.”²

Cowger and his associates looked at a number of property transactions in the vicinity of Portland, Oregon, Seattle, Washington, and Vancouver, British Columbia impacted by transmission lines of the Bonneville Power Administration (BPA)³. As an introduction to the article, Cowger reviewed generalized findings from several studies done between 1975 and 1995. He extracted the following six key points from these studies:⁴

1. “Overhead transmission lines can reduce the value of residential and agricultural property. The impact is usually small (0 – 10 per cent) for single family residential properties.”
2. “Other factors such as location, improvements and lot size are more likely to be major determinants of sale price.”
3. “Impacts on sales are most likely to occur on property crossed or immediately adjacent to the lines.”
4. “In areas where the right-of-way has been landscaped or developed for recreational use, positive impacts have been measured.”
5. “Impacts may be greater on small properties than for larger properties.”
6. “Impacts are more pronounced immediately after construction of a new line and diminish over time.”

Cowger et al⁵ examined 296 subject sales in four counties, each one paired with a comparable property transaction that occurred in the same year, where the comparable property was not influenced by an adjacent HVTL.

“Analysis of this data show overhead HVTLs had minimal impacts on residential property values in these metropolitan areas. Seattle and Vancouver subjects averaged small decreases in property values (-1.00 percent and -1.05 percent respectively). Portland subjects were on average, worth slightly more (+1.46 percent) than the matched

² Ibid, pg 13

³ Transmission Line Impact on Residential Property Values, Jr. Cowger et al, “Right-of-way” September 1996 pg 13

⁴ Ibid, pg .14

⁵ Ibid, pgs 13-17

comparable properties. None of the difference was statistically different from zero at the 95 per cent probability level.”⁶

In the Final Environmental Impact Statement on the Arrowhead-Weston Electric Transmission Line Project, the Wisconsin Public Service Commission addressed the issue of property value changes associated with HVTL⁷. This document looked at approximately 30 papers, articles and court cases covering the period from 1987 through 1999.

“In general there are two types of property value impacts that can be experienced by property owners affected by a new transmission line. The first is a potential economic impact associated with the amount paid by a utility for a right-of-way (ROW) easement. The second is the potential economic impact involving the future marketability of the property.”⁸

However, substantial differences may exist between people’s perceptions about how they would behave and their actual behavior when confronted with the purchase of property supporting a power line.”⁹

“The presence of a power line may not affect some individual’s perceptions of a property’s value at all. These people tend to view power lines as necessary infrastructure on the landscape, similar to roads, water towers and antenna. They generally do not notice the lines nor do they have strong feelings about them.”¹⁰

The Final EIS provides six general observations among all the studies it evaluated. These are:¹¹

1. “The potential reduction in sale price for single family homes may range from 0 to 14 per cent.
2. “Adverse effects on the sale price of smaller properties could be greater than effects on the sale price of larger properties”.
3. “Other amenities, such as proximity to schools or jobs, lot size, square footage of a house and neighborhood characteristics, tend to have a much greater effect on sale price than the presence of a power line.”
4. “The adverse effects appear to diminish over time.”
5. “Effects on sale price are most often observed for property crossed by or immediately adjacent to a power line, but effects have also been observed for properties farther away from the line.”

⁶ Ibid, pg 16

⁷ Final Environmental Impact Statement , Arrowhead –Weston Electric Transmission Line Project, Volume I, Public Service Commission of Wisconsin Docket 05-CE-113, October 2000, pg 212-215

⁸ Final Environmental Impact Statement , Arrowhead –Weston, pg 215

⁹ Ibid, pg 213

¹⁰ Ibid, pg 215

¹¹ Ibid, pg 215

6. “The value of agricultural property is likely to decrease if the power line poles are placed in an area that inhibits farm operations.”

Later on the same page, the Final EIS stated,

“In coastal states, such as California and Florida, the decrease in property values can be quite dramatic; in states within the Midwest (Minnesota, Wisconsin and the Upper Peninsula of Michigan), the average decrease appears to be between 4 and 7 per cent .”¹²

The Final EIS succinctly summarizes the dilemma in its closing paragraph which stated,

“It is very difficult to make predictions about how a specific transmission line will affect the value of specific properties.”¹³

In 1995, two university professors named Stanley Hamilton and Gregory Schwann published a highly empirical study of residential home prices in Vancouver, British Columbia¹⁴. The study contrasted sales in four separate Vancouver neighborhoods of residences adjacent to power lines of 60 kV or greater from 1985 to 1991. The sample size was 12,097 transactions in the four study areas. The authors stated,

“We find that properties adjacent to a line lose 6.3 per cent of their value due to proximity and the visual impact.” “The statistical findings presented in this article lead one to conclude that the depressing effect power lines have on property value is not merely an American phenomenon.”¹⁵

Haider and Haroun did a quantification of property value impacts of high voltage transmission lines examining 27,400 freehold residential properties sold in the Toronto area during 1995¹⁶. This research presents summary statistics, uses several econometric models and spatial autoregressive techniques to analyze the data. This research offers strong evidence to the claim that proximity to HVTL lowers property values. Results suggest that properties within one kilometer lose between 4 to 6.2 per cent of their total value strictly due to power line effects. The loss in value decreases with distance from the power lines. The authors chose to use actual transaction prices and not assessed property values. They assert that only market prices can reflect the true perceptions of consumers of the impact of HVTLs on residential real estate values. They also discovered that the relationship between proximity to power lines and price reduction is not uniform throughout the Greater Toronto area. The study concludes with an analysis of its own limitations.

¹² Ibid, pg 215

¹³ Ibid pg 215

¹⁴ Stanley Hamilton and Gregory Schwan, “Electric Transmission Lines and Property Value,” Land Economics, Vol 71, No. 4, p 436 (1995).

¹⁵ Ibid pg 436

¹⁶ Murtaza Haider & Antoine Haroun, “Impact of Power Lines on Freehold Residential Property Values in the Greater Toronto Area,” Master’s Thesis, Department of Civil Engineering, University of Toronto, 2000.

5.2 Electromagnetic Fields

In the Lakefield-Fox Lake 161 kV transmission line matter (EQB Docket No. 03-64-TR-XCEL), Judge Klein found that there was “insufficient evidence to demonstrate a cause and effect relationship between EMF exposure and any adverse health effects.” (“Report and Recommendations,” July 1, 2004, p.17) For further findings, see the report at www.eqb.state.mn.us/Docket.html?Id=3843.

The EQB Board adopted this finding in its final action. (“Findings of Fact, Conclusions and Order,” September 19, 2004, p.1)

The discussion below of EMF impacts was prepared for the Environmental Assessment for EQB Docket No. 03-65-TR-GRE PMG (Plymouth-Maple Grove) released February 29, 2004. This line was also a 115 kV transmission line. The discussion has been reproduced herein below in whole:

What is EMF

EMF stands for electric and magnetic fields. The Minnesota Department of Health maintains a webpage with information about electric and magnetic fields. The following statements are found at <http://www.health.state.mn.us/divs/eh/radiation/emf/index.html>.

“EMF refers to electric and magnetic fields which are invisible lines of force that surround any electrical device, such as a power line, electrical wiring, or an appliance. Electric fields are produced by voltage and these fields are easily shielded by objects (e.g., trees, buildings, and skin). In contrast, magnetic fields are produced by current and these fields pass through most materials. Both electric and magnetic fields weaken with increasing distance from the source.”

“Even though electric and magnetic fields are present around appliances and power lines, more recent interest has focused on the potential health effects of magnetic fields. This is because some epidemiological studies have suggested that there may be an association between increased cancer risks and magnetic fields.”

Interagency White Paper on EMF

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

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

“Research on the health effects of EMF has been carried out since the 1970’s. Epidemiological studies have mixed results – some have shown no statistically significant association between exposure to EMF and health effects, 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. A number of scientific panels convened by national and international health agencies and the United States Congress have reviewed the research carried out to date. Most concluded that there is insufficient evidence to prove an association between EMF and health effects; however many of them also concluded that there is insufficient evidence to prove that EMF exposure is safe.”

Given the questions and controversy surrounding this issue, several Minnesota agencies that regularly deal with electric generation and transmission formed an Interagency workgroup to provide information and options to policy-makers. Based on its review the Work Group believes the most appropriate public health policy is to take a prudent avoidance approach to regulating EMF. Policy recommendations of the Work-Group include:

- apply low-cost EMF mitigation options in electric infrastructure construction projects,
- encourage energy conservation,
- encourage distributed generation,
- continue to monitor EMF research,
- encourage utilities to work with customers on household EMF issues and
- provide public education on EMF issues.

The Minnesota Department of Health made the following statement in the “White Paper”:

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

Other EMF Studies

Recent studies of potential human health effects from transmission line EMF done in California and for the Arrowhead line EIS in Wisconsin have shown the same conclusions of no discernible health impacts from power lines. Both of these studies recommend the general precaution of minimizing unnecessary contact and advise prudent avoidance to EMF exposure.

The 1999 National Academy of Science report from its National Research Council found,

“No clear, convincing evidence exists to show that residential exposures to electric and magnetic fields (EMFs) are a threat to human health. After examining more than 500 studies spanning 17 years of research, the committee said there is no conclusive evidence that electromagnetic fields play a role in the development of cancer, reproductive and developmental abnormalities, or learning and behavioral problems. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and

magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects. Committee chair Charles F. Stevens, investigator, Howard Hughes Medical Institute, and professor, Salk Institute, La Jolla, Calif. said, Research has not shown in any convincing way that electromagnetic fields common in homes can cause health problems, and extensive laboratory tests have not shown that EMFs can damage the cell in a way that is harmful to human health.” (National Academy of Science, National Research Council, Stevens, et al, 1999, Possible Exposure to Residential Electric and Magnetic Fields p.132)

EMF Standards

“Electric utilities have a variety of methods for reducing EMF exposures when they upgrade or install transmission and distribution lines. The main methods for mitigating EMF include increasing distance from the line, using phase cancellation, shielding, and limiting voltage and current flow levels.” (White Paper, p.2)

In the Route Permit application when discussing HVTL line clearance from nearby receptors, GRE stated,

“The proposed HVTL will be constructed to comply with Rural Utilities Service (RUS) standards as well as all applicable provisions of the National Electric Safety Code (NESC).”

These standards are designed to minimize human exposure from electric and magnetic fields.

“The proposed 115 kV line will have a maximum magnitude of electric field density of approximately 1.1 kV per meter directly underneath the conductors one meter above ground level. Research on the biological effects from electric fields on animals and humans has shown no significant association with negative health effects in humans.”

“Although there is no state or federal standard for transmission line electric field exposures, the EQB has imposed standard of a maximum electric field limit of eight kV per meter at one meter above ground. That standard was implemented to mitigate serious hazard from shocks when touching large objects parked under transmission lines with voltage of 500 kV or greater.”

EMF field strength decreases with increasing distance from the line. This design standard provides significant protection from electric fields for every homeowner adjacent to the proposed transmission line, even those within 30 to 40 feet of the line or right-of-way. This electric field density charge limit standard is more than sufficiently protective of human health impacts from EMF for the lower voltage 115 kV line proposed for this project.

“Currently there are no federal or state *health-based* exposure standards for magnetic fields. This is due to the fact that there is inadequate scientific evidence to develop a health-based standard. References to safe/unsafe magnetic field levels in studies are not health-based standards; they are arbitrary exposure cut off points used by researchers, and they provide no scientific basis to evaluate or estimate potential health risks.” (MDH, website)

On the basis of the most current information available and the expert advice of the Interagency workgroup on EMF lead by the Minnesota Department of Health, the EQB has not established any standard or regulatory limit on magnetic fields from HVTLs.

5.3 Impacts of Poles

5.3.1 Visual

The primary visual impact associated with transmission lines is from the pole structures that must be constructed at various intervals along the route. (Schematics of typical structures planned for this project are shown in Figures 3 and 4.) The wires themselves (the conductor) are much less of a visual impact.

The western portion of the proposed route is double-circuited with an Xcel Energy line and will use single pole steel structures with davit arms and distribution lines attached. The average height will be 90-95 feet above ground, with an average span of 350 to 400 feet. This portion replaces an existing 69 kV line with distribution underbuild. The local area is developed, and the line parallels CR 50, a major road. No significant impacts to the visual character of this area are anticipated.

New ROW would be required for the route between Highway 3 and the Empire Substation along all proposed routes. The GRE 115 kV single-circuit line will use single pole wood structures with horizontal post insulators. The average height will be approximately 60-75 feet, with an average span of 350 to 400 feet (275 to 300 feet in portions where distribution lines are attached). The structures will have a narrow profile designed to be less intrusive than older installations.

5.3.2 Vegetation

It helps to mitigate the visual impact of transmission line poles if there is vegetation near the right-of-way. Nearby residents have inquired about the removal or trimming of trees to construct and maintain the line. GRE has indicated that it will work with residents to minimize the need to remove or trim nearby vegetation, although the company will have to do what is necessary to safely construct and maintain the line regardless of route selected.

For example, residents are concerned about a loss of trees and vegetation along 210th Street, especially just west of Blaine Avenue. GRE has proposed to cross the street diagonally from the northeast corner of the intersection to the southwest corner to avoid as much clearing as possible along this route. The line could cross 210th Street to the north again avoiding trees and buildings surrounding the dog kennels at the corner. In other places, other vegetation may be planted to alleviate some of the loss of mature tree growth.

5.4 Human settlement patterns

Since 1970, around when the existing transmission network was installed, the population of the City of Farmington and Empire Township has increased more than three-fold. Forecasts by the Metropolitan Council are for Farmington and Empire Township to double in population again by 2030 (Estimates and projections are available online at <http://www.metrocouncil.org/metroarea/stats.htm>). As the population of this area has increased, the electric demand has increased dramatically. The construction of this new

transmission line will not lead to development that would not otherwise occur. Nor will it interfere with future development.

The location of the transmission line and new poles will be done in a manner such that no person will be displaced from his or her residence or business. This project should have no significant direct impact on human settlement patterns in the Farmington area.

5.5 Socioeconomics

The project will result in a short-term infusion of capital and employment in the local area from construction jobs, material purchases and minor purchases by workers at establishments near the proposed corridor. GRE and Xcel Energy both expect between 15 and 25 additional temporary jobs to be created during construction, and that no permanent jobs would be created by the transmission options. Workers may make minor purchases from the area during construction. By providing local customers with a reliable and efficient future energy supply, the anticipated long-term impacts are positive for future growth in the project area.

Impacts to agriculture may occur from pole placement in currently farmed areas. The proposed route parallels existing roads, minimizing the impact to agricultural land. Mitigation measures are anticipated for the land-based economies along some alternate route segments, especially to determine how to accommodate pivot irrigation systems potentially affected by poles and lines. The area designated for the new substation is already zoned “light-industrial.”

5.6 Archaeological and historic resources

There are no properties listed on the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project. The proposed route was reviewed pursuant to the responsibilities given the Minnesota Historical Society by the Minnesota Historic Sites Act and the Minnesota Field Archaeology Act.

It was also reviewed pursuant to the responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the Advisory Council on Historic Preservation (36 Code of Federal Regulations (CFR, chapter 800). If any archeological artifacts or sites are identified during placement of the poles along the selected route, work will cease immediately at the site and the Minnesota Historical Society contacted for further instructions.

5.7 Environmental Impacts

This project is located in an area ranging from urban to pastoral. Hydrologic features include creeks, ditches, wetlands and riparian areas. A mix of groundcover is present, and wildlife habitat exists in pockets along the proposed route. There are no threatened or endangered species or state listed species identified or any sites that are classified as rare or unique habitat. Mitigation measures will be required during construction to protect all natural areas from impact.

5.7.1 Wetlands and Waters

The HVTL route preferred by GRE would cross the Vermillion River and two public ditches along 210th Street. Rother #1 and #2 alternatives cross the Vermillion River in Farmington. GRE will have to apply to the DNR Division of Lands and Minerals for a license to cross these waters and wetlands. Impacts will be short-term and limited to placement of poles. This same Rother #1 alternative also avoids a DNR-identified wetland (19-355) east of Akin Road along the GRE proposed route. In any case, typical impacts are temporary and limited to the placement of poles, placement that should be flexible enough to avoid sensitive areas.

5.7.2 Topography, Geology & Soils

The topography of the project area is the result of glacial deposition. It is characterized by nearly level to gently rolling areas with a small number of localized depressions. The elevation ranges from approximately 940 to 880 feet mean sea level. There are no significant topographical changes to distinguish one route segment from another.

The majority of the corridor soils were formed on the Grantsburg sub lobe of the Late Wisconsinian glaciation period. The most recent glaciation period began approximately 70,000 years ago and ended 10,000 years ago. The Grantsburg Loamy Till Plain varies in thickness but is generally over forty feet in thickness. The northeast area of the proposed route consists of fluvial sediment, or outwash, deposited by water running out of a glacier. Transmission line structure construction will result in no disturbances to the bedrock geology in the area regardless of route, and mitigative measures are not required.

In general, prime farmland soils have an adequate and dependable water supply from precipitation or irrigation. They have a favorable temperature and growing season with acceptable levels of acidity or alkalinity, content of salt or sodium and few or no rocks. They are permeable to water and air and not excessively susceptible to erosion. According to the Minnesota NRCS, approximately 90% of the project corridor is considered prime farmland. The proposed route mitigates disturbing this land by locating along existing roadways. Empire Citizens #1 and #3 cross diagonally across areas currently in farm production.

5.7.3 Air Quality

During construction of the project, there will be emissions from vehicles and other construction equipment and fugitive dust from right-of-way clearing. Temporary air quality impacts caused by the proposed construction-related emissions are expected to occur during this phase of activity. Fugitive dust may result from replacing the existing structures and from any additional ROW clearing that may be required. The magnitude of these emissions is influenced heavily by weather conditions and the specific construction activity taking place. Exhaust emissions from primarily diesel equipment will vary according to the phase of construction but will be minimal and temporary.

There will be no impact on air quality during operation of the lines. There will be no significant adverse impacts to the surrounding environment because of the short and intermittent nature of the emission and dust-producing construction phases. No mitigation measures for air quality are necessary for the construction of the transmission lines.

5.7.4 Noise

During Construction. Normal construction noise can be expected during the installation of transmission line structures. These operations will be of short duration and conducted during daylight hours to minimize any residential impact. The noise impacts are the same regardless of which route is selected.

During Operation. Audible noise is due to point source corona (minor breakdown of air insulating a conductor) and is a function of conductor voltage gradient, which is increased by irregularities on the conductor surface and hardware due to burrs on the material when new, and rain droplets on the surface. The major causes of these irregularities are rain droplets or droplets from heavy fog that form underneath the conductor. In foggy, damp, or rainy weather conditions, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires.

Audible noise is generally measured by the decibel (dB(A)) scale (the “A” suffix refers to the weighting network used for measurement), which is used for general noise ordinances. A 115 kV line operating normally should not exceed approximately 12 dB(A) at the edge of the right-of-way during fair weather conditions, according to the Permit Application, p.32. For comparison, the maximum noise level permitted under standards established by the Minnesota Pollution Control Agency is 55 dB(A) during the nighttime. (Minn. Rules part 7030.0040.) That implies that line noise should be essentially imperceptible at the nearest household. During a heavy rain (1 inch per hour) the noise level may approach 18 dB(A) at the right-of-way edge. However, background noise levels will also be greatly increased by the rainfall itself, thereby minimizing the additional power line noise.

5.8 Land Use Impacts

Land use along the proposed route consists of roadways and streets, residential, commercial, industrial, railroad and utility property, public and institutional property, parks and open space and agricultural. A map showing land use along the proposed route is provided in Figure 13. Industrial land uses include manufacturing and warehouses. Commercial uses include retail and service businesses. The residential areas along the proposed route range from single-family homes to mixed high-density dwellings.

Parks and open space include community and school playfields and neighborhood and regional parks. Agricultural lands along the proposed route are quite extensive and are generally under cultivation. The nature of urban expansion in the Twin Cities area for the last twenty years make it quite likely that much of the undeveloped land in the project area which is not already protected will be occupied by business or residential development in the next twenty years.

It is anticipated that the new transmission line will not have any long term impact on existing land uses along the proposed corridor. There may be temporary disruption to right-of-way property while new transmission poles are installed and wires strung. There are some limitations on the types of vegetation that can be planted under and immediately adjacent to the power lines.

5.9 Economics

Great River Energy and Xcel Energy have provided estimates of the costs of construction along the companies’ preferred route, and GRE has provided estimates of costs associated with the various alternative route segments under review. Table 1 below compares the estimated costs of implementing

each route segment against the cost of implementing the originally proposed route. GRE did not submit estimates for Empire Citizens #2 or #5.

Table 1. Comparison of Costs

	Air Lake & Empire Substation Modifications, Xcel Energy & GRE	Vermillion River Substation, Xcel Energy & DEA	Cedar Av to Vermillion River 115/115 kV Line, Xcel Energy	Vermillion River to Empire Substation 115 kV Line, GRE	Total Estimated Cost of Project
Proposed Route	\$800,000	\$6,200,000	\$1,500,000	\$2,604,000	\$11,104,000
Rother Bypass #1				+276,000	\$11,380,000
Rother Bypass #2				+254,000	\$11,358,000
City of Farmington				-7,000	\$11,097,000
Empire Citizens #1				+848,000	\$11,952,000
Empire Citizens #3				+1,599,000	\$12,703,000
Empire Citizens #4				+688,000	\$11,792,000

5.10 Radio, Television, and Cell Phone Interference

GRE reports that interference with existing television or radio is typically not a problem with transmission lines designed and operated at 115 kilovolts. The proposed transmission facilities will be designed to industry standards to avoid interference with reception. If due to some unique circumstance this new transmission line causes some localized effect outside the right-of-way that was not previously experienced, the applicants will be responsible to rectify the situation.

While transmission lines are designed so no interference occurs, in areas where radio, television, or cell phone signals are weak, the presence of a structure (transmission structure, tree, building, etc.) may cause interference. Interference caused by electrical noise is very uncommon and is typically the result of loose hardware. This can be easily corrected. It is very common for cell phone providers to install their antennas on transmission structures.

5.11 Condemnation of Property

The applicants currently hold easements where transmission lines are presently located. Approximately 5.8 miles of new right-of-way will be required. The new right of way will be obtained by direct easement negotiations or by exercising the power of eminent domain. Public utilities like Great River Energy and Xcel Energy have been granted the right of eminent domain and may take private property, upon payment of just compensation, for construction of HVTLs. See Minnesota Statutes § 116C.63.

6.0 Summary of Mitigative Measures

6.1.1 General Mitigation Issues

The applicants have indicated that the proposed transmission line will be designed to meet or exceed all relevant State codes and those of the National Electrical Safety Code. GRE also adheres to RUS standards regarding clearances to ground, clearances to crossing utilities, clearance to buildings, right-of-way widths erecting power poles, and stringing transmission lines. Appropriate standards will be met for construction and installation, and all applicable safety procedures will be followed after installation. The proposed transmission lines will be equipped with protective devices to safeguard the public from the transmission lines if an accident occurs and a structure or conductor falls to the ground. The protective equipment would de-energize the line when an event occurred. In addition, the substation facilities will be fenced and access restricted.

Environmental effects that cannot be avoided are generally short-term during the construction of the line. According to the applicants, if any archeological sites are identified during placement of the poles along the proposed route, or an alternative segment if selected, the particular site will be avoided and the poles placed outside the specified buffer zone. Native vegetation that is compatible with the operation and maintenance of the transmission line will be maintained within any route. If necessary, native species will be planted or seeded in areas that are devoid of native species. Soils will be re-vegetated as soon as possible to minimize erosion or some other method will be used during construction to prevent soil erosion. During construction, temporary guard or clearance poles are installed at crossings to provide adequate clearance over other utilities, streets, roads, highways, railroads, or other obstructions after any necessary notifications are made or permit requirements met to mitigate any concerns with traffic flow or operations of other utilities.

Along areas of new corridors, such as those suggested by some of the alternate segments, mitigation would require engineering around irrigation systems. It would also require development of maintenance access that would need to be designed to minimize loss of prime farmland areas.

6.1.2 Adaptation of the Proposed Route through Farmington

The City of Farmington and GRE have had discussions about refining the Rother Bypass #1 through the City of Farmington. This mitigates the tree loss along Highway 3 by avoiding that corridor altogether. It also avoids two of the three river crossings where the transmission line would have crossed the Rother property. Additionally, it avoids coordinating a new corridor with the city along the planned extension of 208th Street. This route variation is shown in Figures 14 and 15.

The east end of this alternative begins by spanning Highway 3 where the City of Farmington Alternative ends. It crosses west along an industrial development along the abandoned railway corridor. It crosses the Vermillion River once and proceeds along the south end of the school district property north of Rambling River Park, where it meets the existing Xcel Energy 69 kV line along Akin Road. On September 20, 2004, the Farmington City Council failed to authorize support for this alternative.

7.0 Feasibility

According to GRE engineering analyses of all alternative route segments, the cost of constructing, operating, and maintaining the facilities along the proposed route is no higher, and is likely to be lower, than along any of the alternative routes they evaluated during the planning process. The proposed route relies on existing rights-of-way to the extent technically and economically feasible.

7.1 Alternate Route Segment Feasibility

7.1.1 Rother Bypass #1

This alternative avoids entirely the need to run a transmission line along the heavily developed Highway 3 corridor. The line along Highway 3 would, given the width of state highway right-of-way, run close to the front of several homes and businesses. If the line were placed on the east side, two homes and three businesses would be affected, including the necessary clearing of the trees fronting those businesses. The line placed on the west would front eight parcels and affect existing trees buffering those properties from the state highway. If State Highway 3 were expanded, it would likely involve the construction of two additional lanes to the west of the existing roadway.

This alternative segment also avoids dissecting the Rother property on the northern boundary of the proposed line. The route as originally proposed by GRE has to deal with the City of Farmington's indefinite plans to build a new 208th Street across that same property. The city and the utility would have to cooperate on a corridor that has yet to be determined. The owner also has plans to create a residential development on his property.

This segment would also exit on the west end directly to the existing Xcel Energy 69 kV line that would be double-circuited with the new 115 kV line and run directly to the new substation. One part of this plan runs from Highway 3 to the Rambling River Park. It runs by one house and otherwise parallels a lumberyard and other commercial properties. One option after the river crossing is a direct route over the city park. Another option is where the line could run at the boundary of the back lot line of three houses where they meet the middle school property.

This alternative reduces the number of crossings of the Vermillion River from three to one, as opposed to the GRE plan. It would also clean up the other distribution line crossings of the river if GRE agrees to bury those lines.

See photo, figure 16 – West across river (existing single-phase line)

The railroad corridor just west of Highway 3 is developed with commercial properties. The former railroad right-of-way corridor no longer exists; however, sufficient room appears to be available to construct along what is now the north property line of the old right-of-way. Clearances and underground utility information have not been determined and may affect the constructability of the route. This route would then cross through the City of Farmington's Rambling River Park. Portions of the park were acquired with federal money from The Land and Water Conservation Fund, a federally funded grant program for outdoor recreation area development and acquisition, and federal approval would be needed to cross that area. The route alternative as proposed, however, proceeds to the north of that area.

7.1.2 Rother Bypass #2

This plan differs from the first Rother alternative in its final plotting directly over the school district property. As in Rother Bypass #1, the same route along the railroad right-of-way appears to be constructible. However, when this route crosses the School District property, no right-of-way corridor or property line exists. As drawn it would cross over the existing tennis courts, hockey rinks and baseball fields. Additionally, according to Doug Bonar, Director of Buildings & Grounds for the School District, the district is tentatively planning a school addition in this general area.

7.1.3 City of Farmington Alternative

A coincidence of the city alternative segment is that it starts directly along the first Rother alternative, offering a convenient continuation. It starts at Highway 3 and would then proceed eastward through an existing corridor – the abandoned railway right-of-way. With the city’s plan to extend 210th Street through this same right-of-way, there is a substantial useable corridor available to the utility. With the city’s plan to widen and clear the area for street passage, there would be little additional tree clearing required for placement of the transmission line.

See photo, figure 17 – Eastward along abandoned railway right-of-way

The alternative segment alleviates a number of placement difficulties inherent in the original GRE proposal. The proposed line would cross open city and Legion properties that are slated for development. The line would likely have to pass directly over a corner of the Legion building or nearly over a corner of an existing residence. These problems are avoided by using the existing corridor and exiting the transmission line only two blocks further south down Highway 3.

Great River Energy has discussed this route segment with the City of Farmington. It has less impact on residences, follows an existing distribution line, and is an open commercial corridor.

7.1.4 Empire Citizens #1

The first citizens’ option proposes to follow the abandoned railway corridor. Whereas that corridor remains fairly defined within the city limits, it is very difficult to ascertain exactly where the corridor is in Empire Township. It is no longer a defined corridor by landmark, utility use, roadway or any visible remnant. That corridor contains cropland currently in production.

See photo, figure 18 – East from Biscayne Avenue, approximating RR right-of-way

This line segment alternative creates a new corridor and crosses tillable lands. Meanwhile, some farmers along this route have objected to the loss of cropland and the interference the structures would impose on irrigation systems. Two affected landowners at the western portion of this segment signed the submission by the citizens’ group, but favored only routes further south. Both responded to the EQB separately objecting to the alternative that would cross their cultivated land. The owners specifically claim it would be impossible to use center-pivot irrigation systems with transmission poles and wires dissecting their properties. There are two large sod farms that also employ extensive irrigation systems at the eastern end of this alternate segment.

This alternative route segment will cross 12 properties. It follows a diagonal path that is no longer a defined corridor. The former railroad right-of-way is now part of the surrounding properties and is being farmed. There are center pivot irrigation systems crossing this route and new pivots being planned. Access to construct and maintain the line would be through the farm fields, which would be difficult for maintenance and disruptive to farming operations in the summer.

7.1.5 Empire Citizens #2

While expansion of the road system is in planning, there may still be sufficient easement for erecting the transmission lines along much of the alternate segment in Empire Township. However, once the segment enters Farmington, it needs to create a corridor through intense housing and commercial development.

Additionally, the line would then need to traverse the equally heavily-developed Highway 3 corridor. Not only is the corridor heavily populated, but Highway 3 may also be expanded to the west of the existing roadway. If the road is improved, it will be a major road widening and acquisition project.

Once this route reaches Highway 3, it needs to turn north. There is no available right-of-way to continue in a straight line along Ash Street. Ash Street reconstruction has been approved by the City of Farmington and work will commence shortly. The City has stated that there is no room available for additional utilities along this corridor.

As shown on Figure 9, the route would turn north along Highway 3. This is a heavily congested area before intersecting GRE's proposed route. It would pass 32 parcels on the east side and 30 parcels on the west side.

This route alternative is longer than ten miles.

7.1.6 Empire Citizens #3

The third segment alternative follows defined transportation and utility corridors along 210th Street, Biscayne Avenue and, finally, along Route 66. A new corridor would be created where it passes behind ten residential properties that front Route 66, and again raises the issue of crossing cropland areas for that short section. Two farmers that signed the "Opposition and Counter Proposal" prepared by the "Save the 210th Street Residents Group" wrote separately to object to this alternative that traverses their cultivated properties.

See photo, figure 19 – Southwest from CR 66 looking toward farm on Biscayne Avenue

Again, this option would exceed ten miles for the total project. In this case, or in the original proposed line, easements along home fronts will need to be negotiated.

County Road 66 is a relatively open corridor with some areas where homes are built close to the road. The CR 66 alternative bypasses the homes close to Biscayne Avenue by routing the line behind them, crossing farm fields with no defined corridor. There are two center pivot irrigation systems across the highway from each other, and the line may affect their operation.

7.1.7 Empire Citizens #4

The citizen's fourth alternative segment follows the applicants' proposed line for the most part, specifically from where 210th Street enters Empire Township to the Baker property limits. There is no clear option to get from 210th Street to the ravine that runs parallel north of the properties in question. Additionally, there is no ravine continuing past Blaine Avenue, where the segment is continued according to this proposal. There are also issues with sod farming and irrigation systems.

The viability of this option may be enhanced by rerouting the line back down to 210th Street at Blaine Avenue, and continuing east to the Empire Substation from that point. The advantages of the plan are that it avoids difficulties inherent for fronting properties that have buildings and flora within or near the proposed routing.

See photo, figure 20 – Development north of 210th Street; an irrigation ravine further north

This route would create a new corridor with no noticeable property divisions. The land proposed to be crossed is currently being farmed and part of a sod farm operation. This route avoids the homes along 210th street; however, five new homes currently being built would be directly along the alternative segment, and four additional homes would be in close proximity. Access to construct and maintain the line would be through the farm fields, which would be difficult for maintenance and disruptive to farming operations in the summer.

The citizens suggest this plan as being less disruptive to a number of property owners on the proposed line while preserving more tree growth along the 210th Street road frontage. As in citizens' alternate #2, at some points this segment must cross through irrigated farm lands, in this case two separate sod farms. Unless the plan comes back south along Blaine Avenue, there is no obvious corridor for the diversion to return to 210th Street. As well, there is no obvious corridor for the point where the segment diverts north to bypass the citizens' properties until it connects on the north to the irrigation ravine.

7.1.8 Empire Citizens #5

Alternative segment #5 bypasses entry into the City of Farmington through the heavily developed corridor along Highway 50. This proposal includes the intersection of the alternative segment with a proposed new Interceptor sewer line.

The citizens suggest that GRE could share easements with the Interceptor, which they anticipate at up to 100 feet. The Interceptor would actually have a 50-foot easement, upon which the power line could not be erected. They also suggest that GRE could "piggy-back" on a Met Council EIS for review.

Easements may or not be able to be shared along this segment where the transmission line would shadow the wastewater treatment interceptor line. Easements to accommodate both may or may not be possible. However, the Interceptor is in the planning stages. This route has not been finalized and will not be finalized before routing of the transmission line has been permitted. Secondly, the date of implementation and the timing of easement negotiation for the Interceptor are also undetermined.

The Met Council has no immediate plans for this project. Christy Mackaman of the Met Council related to GRE officials that the proposed route along 225th Street is not scheduled until 2030. The Met Council

proposed corridor cuts through a designated prairie grass planting and wetland on the Dakota County Fairgrounds.

This route would be over 10 miles in length.

7.2 Route Impacts on Existing Development

Many of the discussions above concerning route feasibility refer to housing units and commercial development. The issue of homes and businesses along any route is clearly an important variable within the overall discussion of locating the best transmission line route. To fairly compare impact on homes and business, GRE produced a count of units along each of the proposed routes and alternatives.

All routes were compared, and counts were produced for complete routes, even if the alternative only concerned a shorter segment of the whole route distance. The routes in this comparison are from the end points of the Empire Substation in Empire Township and the new Vermillion River Substation within the City of Farmington. See Table 2 below.

Table 2. Comparison of Impacts on Existing Development

	Commercial	Residential	Apartment	Townhouse	Places of Worship	School
GRE Proposed	13	40			1	1
Rother Bypass #1	18	30				1
Rother Bypass #2	18	32				1
Farmington City	14	40			1	1
Empire Citizens #1	15	21			1	1
Empire Citizens #2	24	100	1	4	3	1
Empire Citizens #3	12	28			1	1
Empire Citizens #4	13	27			1	1
Empire Citizens #5	8	47			2	1

Property counts were calculated from 400' on each side of the route centerline in township areas.
 Property counts were calculated from 100' on each side of the route centerline in city areas.

-end-