

**Environmental Assessment
for the Proposed Great River Energy
Long Lake Substation and 115 kV Transmission Line
Hubbard County, Minnesota**

Henrietta Township

April 2004

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1.0 Summary

Great River Energy (GRE) is proposing to construct a 115/34.5 kilovolt (kV) substation and a short segment of 115 kV transmission line in Hubbard County, near Park Rapids, MN (see Figure 1). These facilities are needed to insure reliable electrical load serving capabilities in the service territory of Itasca-Mantrap Cooperative Electrical Association (Itasca-Mantrap), one of the 28 member cooperatives to whom GRE provides generation and transmission, and the service territory of Minnesota Power (MP).

The project will consist of the following components (see Figure 2):

- Construct the new Long Lake 34.5/115 kV substation east of Park Rapids,
- Construct 0.5 miles of double circuit 115 kV transmission line from this substation west to the existing GRE "HP" line,
- Construct two short segments (approximately 300 feet each) of 34.5 kV transmission line from the substation east to the existing 34.5 kV MP transmission line,
- Install a 115-kV circuit breaker, line exit, bus work, and capacitor bank at GRE's Hubbard Substation,
- Operate the GRE "HP" line between the new Long Lake Substation and the Hubbard Substation at 115 kV (this line was originally built to 115 kV specifications).

2.0 Proposed Facilities

2.1 Project Need

The load of Itasca-Mantrap and MP's Park Rapids area distribution has exceeded the capability of the existing 34.5 kV grid and the 115 kV substations of Badoura and Hubbard that currently serve this area, resulting in serious voltage concerns and transformer loading issues. A new source is required in the area to provide adequate load serving capabilities and to restore the system voltage to North American Electric Reliability Council (NERC) requirements for contingency conditions and eventually, normal system operating conditions.

2.2 Proposed Location

The new substation will be located east of Park Rapids in Section 30, T140N, R34W of Henrietta Township, Hubbard County (see Figure 3). Alternate sites in

Figure 2

Proposed Project

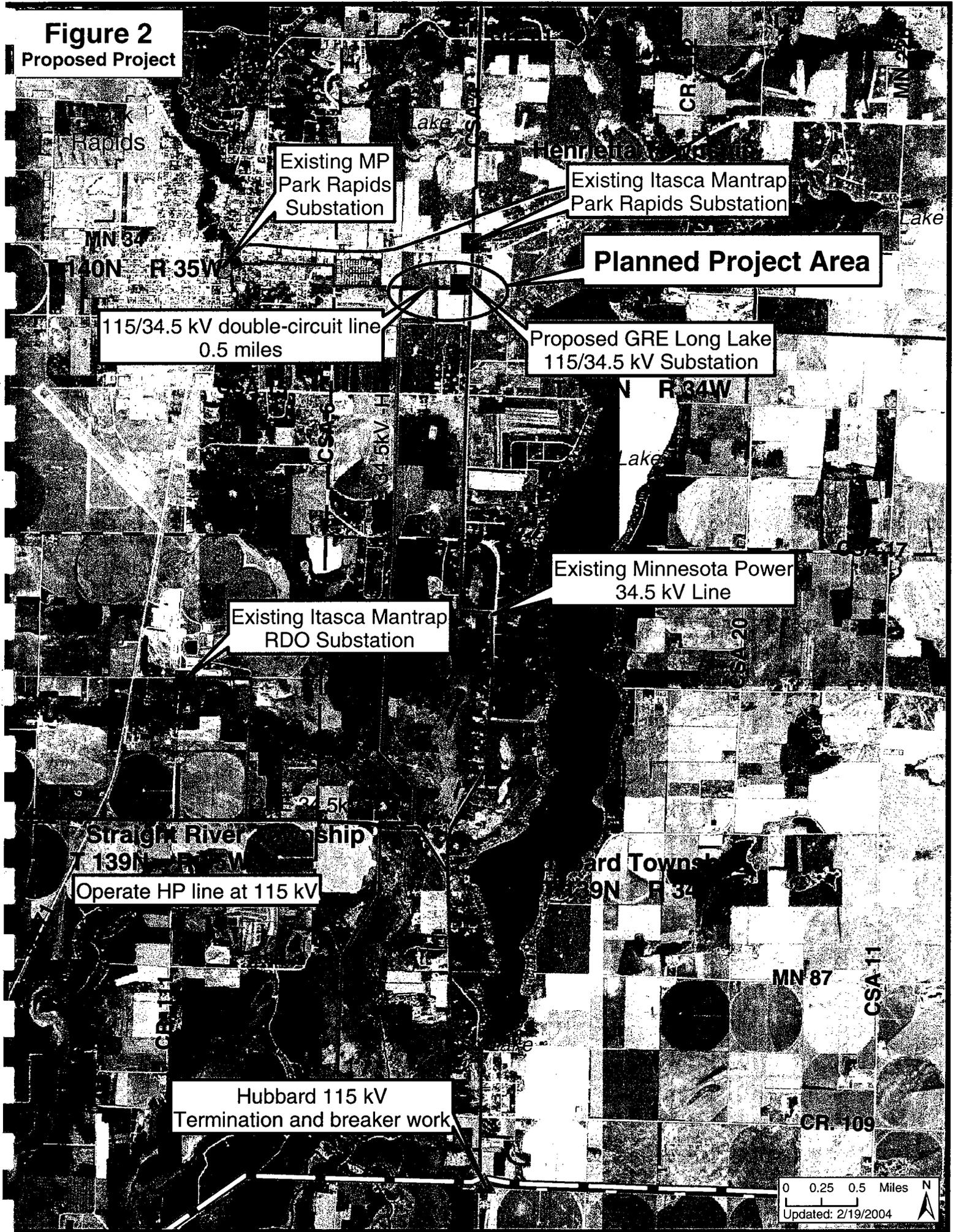


Figure 3
Location Map



the area were considered, but the proposed site was determined to be the most favorable because it is close to the existing transmission infrastructure and it is in a good location for future transmission interconnections. The site also has good road access, is set off the road, and will be screened by existing shelterbelts.

2.3 Ownership

The new substation will be constructed, owned and maintained by GRE, and operated by MP and/or GRE. The 115/34.5 kV transmission facilities will be constructed and maintained by GRE. The 34.5 kV lines will be will be constructed, operated and maintained by MP.

2.4 Substation Design

The substation will be enclosed in a fenced area situated inside a 5.5-acre parcel. An 8-foot high chain link fence including 1-foot of barbed wire around the top will be installed. The fence will be designed to deter animals. A typical 115 kV bulk substation is shown in Figure 4.

Electrical equipment within the substation will include surge arrestors, switches, a 115/34.5 kV power transformer, an emergency station transformer, a preferred station transformer, circuit breakers, and potential transformers. A plot plan for the Long Lake Substation is provided in Figure 5.

2.5 Transmission Facilities

The 115 kV double circuit (6-wire plus a shield wire) transmission line from the new substation west to the existing GRE "HP" line will be single pole wood structures (see Figure 6 – Typical Structure). The average height will be 75 feet above ground with an average span of 280 feet between poles.

The two short segments of 34.5 kV single circuit (4-wire) transmission line from the new substation east to the existing MP 34.5 kV line will be also be single pole wood structures. The average height will be 50 feet above ground with an average span of 250 feet between poles.

2.6 Cost Estimate

Estimated costs for the project are as follows:

| | |
|--|---------------------|
| Long Lake Substation | \$ 2,145,000 |
| Construction of 115 kV Double Circuit line | \$ 298,000 |
| Construction of 34.5 kV Single Circuit line | \$ 40,000 |
| Install 115 kV Circuit Breaker and line exit – Hubbard | \$ 479,000 |
| Install 115 kV Capacitor Bank – Hubbard | \$ 185,000 |
| TOTAL | \$ 3,147,000 |

Figure 4
Typical Bulk Substation

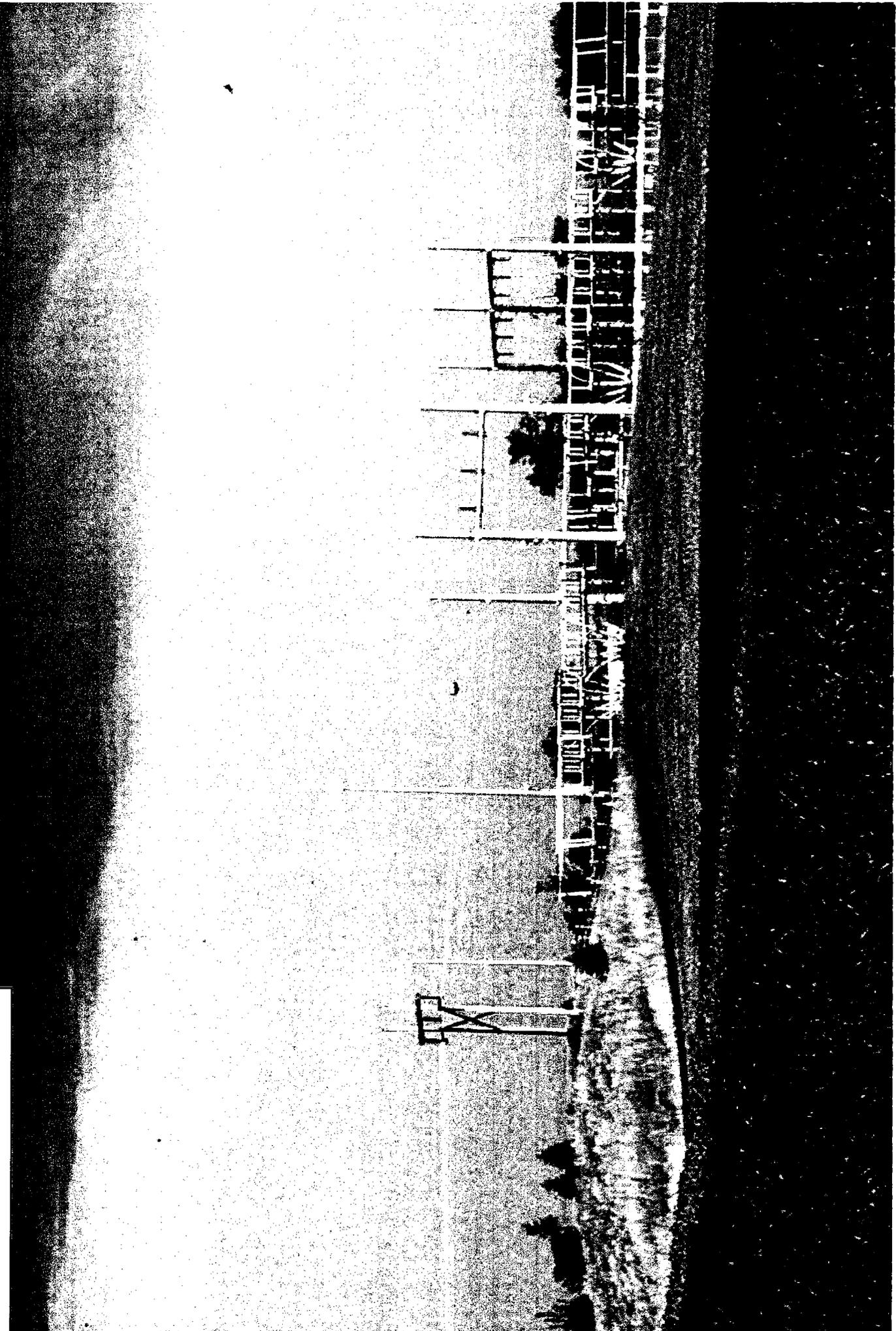
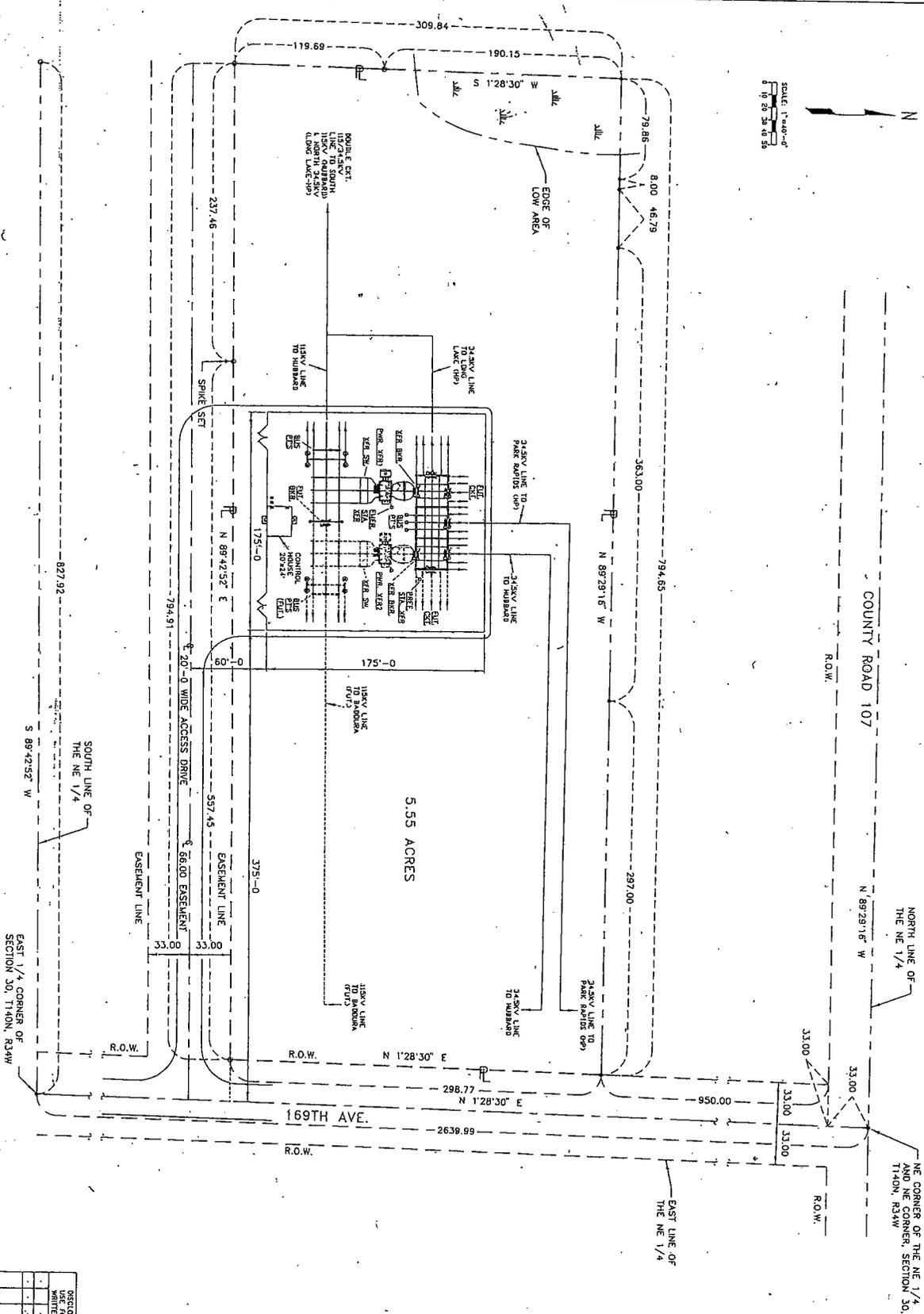


Figure 5 - Long Lake Substation Plot Plan



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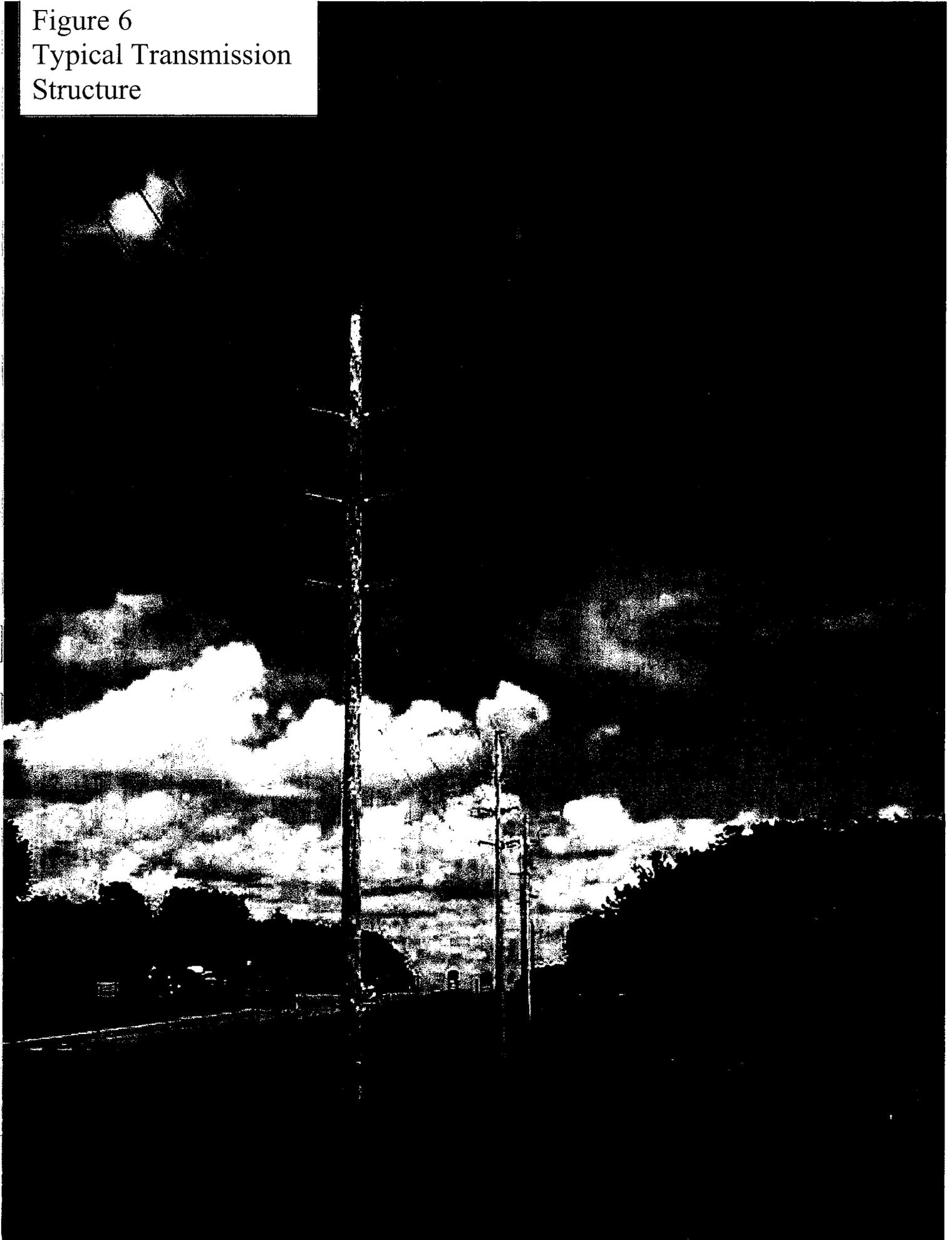
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LONG LAKE SUBSTATION
 GREAT RIVER ENERGY
 PILOT PUMP

Figure 6
Typical Transmission
Structure



3.0 Environmental Analysis

3.1 Natural Environment

The effects of the project on the natural environment, including air, water, vegetation and wildlife have been considered. Responses received from state and federal agencies that reviewed the project are provided in Appendix A.

Air Quality

Because electric substations do not affect air quality, there will be no long-term environmental impacts on the air. Temporary air quality impacts would be expected to occur during the construction phase of the project. However, adverse impacts to the surrounding environment will be minimal because of the short and intermittent nature of the emission and dust-producing construction phase.

Water Resources

No impacts to water resources are anticipated. The substation does not displace any existing wetlands or have any impact on groundwater or other surface waters. The US Army Corps of Engineers was contacted regarding this project and in a response dated November 18, 2003, it was stated that an unnamed wetland located near the project is not subject to regulation by the Corps of Engineers.

There are no Minnesota Department of Natural Resources (DNR) Protected Waters in the vicinity of the project.

Vegetation and Wildlife

The DNR and the United States Department of the Interior Fish and Wildlife Service (USFWS) were contacted regarding vegetation and wildlife resources in the vicinity of the project.

In a letter dated December 5, 2003, the DNR indicated that there are two known occurrences of rare features within an approximate one-mile radius of the proposed project area. However, based on the nature and location of the proposed project, the DNR does not believe it will affect any known occurrences of rare features.

In an e-mail dated January 9, 2004, the USFWS indicated a "no effect" determination for listed species. Effects on area wildlife will be minimal. The substation is designed to deter animal entry. The increased structure heights should not have any significant impact.

3.2 Human Settlement

The closest residences to proposed project are approximately 250 feet away. However, existing tree shelterbelts provide very good screening between these residences and the proposed substation. GRE will augment this screening as necessary. The substation will not cause the displacement of any settlement or recreational area and will not affect any public services.

3.3 Local Land Values

The substation location will utilize screening that presently exists at the site. Additional landscaping and screening will be installed to minimize the effect the substation and transmission line will have on adjacent and surrounding property, particularly the plat of Meadowland Village.

GRE holds the position that transmission lines and related facilities have very little effect on land values. A bibliography of studies related to land values and a study and update on property values in three Pacific Northwest Metropolitan areas are provided in Appendix B.

3.4 Noise

The proposed substation will be designed and constructed to comply with State of Minnesota noise standards. It has been determined that there will be negligible noise at the property boundaries.

The substation transformer will be designed in accordance with ANSI standards.

3.5 Aesthetics

The substation as designed will have minimal impact on aesthetics of the area. The appearance of the substation will be minimized due to the natural vegetative screening at the site.

3.6 Soils and Geology

The proposed site will require some grading and filling. The Natural Resources Conservation Service (NRCS) indicated in an evaluation of November 25, 2003 that no prime or unique farmland will be affected by the project, and that minimal acreage of state and local importance will be affected (see Appendix A).

Minimal erosion may occur at the site during construction, but these short-term impacts can be minimized through the use of Best Management Practices.

3.7 Limited Phase 1 Environmental Site Assessment

There is a new home under construction in the subdivision immediately north of the proposed substation site. When the Henrietta Township Zoning Administrator visited the home site to inspect the newly installed septic system, he noticed old construction type material visible in a spoil pile near the northwest corner of the house, which was likely uncovered during construction of the new home. Pieces of sheet metal, wire, rusted scrap metal, some steel/iron piping, a crushed steel container, construction wood, siding from an old building and sections of log poles that had been burned or charred were visible in this spoil pile. Discovery of this material prompted GRE to commission a Limited Phase 1 Environmental Assessment of the proposed substation site.

On November 25, 2003, a Limited Phase I Environmental Site Assessment was conducted by Larson Environmental Consulting on the parcel of land to be purchased by GRE for the eventual construction of the Long Lake Substation.

The assessment revealed no evidence of any recognized environmental conditions present at this immediate site that would warrant the need for any further environmental assessments. There were no wooden poles observed that appeared to be coated with creosote or any other hazardous material. There were no containers visible that would appear to contain hazardous or toxic materials. Based on interviews with local officials and a review of the aerial photography from this area, it appears that there was once an outdoor drive-in theater that occupied the area immediately north of the target property. It is likely that when the theater closed, the building was demolished and some of the construction debris appears to have been buried in the vicinity of the new home that is under construction.

There is no record of any aboveground or underground storage tanks present at this site. There is one petroleum leak site that has been reported within a one-half mile radius of this site. The closest leak site occurred at the former Earl's Bulk Oil site that is located approximately one-half mile northwest of the target property. There were no vent pipes, fill pipes, manways or evidence of underground storage tanks observed on the subject property.

Based on visual observations, interviews with local officials, and the record search completed from this area, this site does appear to generate or temporarily store hazardous compounds, which may present potential environmental impacts. The site assessment revealed no evidence of any recognized environmental conditions present at this site that would warrant the need for any further environmental assessments. The material that was uncovered on the adjacent property appears to consist of construction material from an old building that once occupied this area.

A copy of the 2004 Phase 1 Environmental Site Assessment is available upon request from GRE or Larson Environmental Consulting.

3.8 Archaeological and Historic Resources

The Minnesota Historical Society State Historic Preservation Office (SHPO) was contacted about the presence of archaeological, historical or architectural resources located on or near the site. SHPO indicated in a letter dated December 8, 2003 that no historic properties eligible for or listed on the National Register of Historic Places will be affected by this project (see Appendix A).

3.9 Transportation

The site will not affect any public right of ways. Access to the site will use existing township roadways. Roadways will be improved as needed for equipment delivery. The closest airport to the proposed substation is the Park Rapids Municipal Airport. In a letter dated November 19, 2003, the Minnesota Department of Transportation, Office of Aeronautics indicated that although a portion of the proposed project is within the limits of the existing and proposed Airport Zoning Ordinance, it appears that the project will not violate any of the restrictions of the ordinances.

3.10 Public Health and Safety

No threats to public health and safety are anticipated for this project. All facilities will be constructed in accordance with the National Electric Safety Code and other industry standards. Construction personnel will be required to follow OSHA regulations. Other safety measures such as warning signs, fencing, and gates will be utilized as needed.

Questions often arise about electric and magnetic fields (EMF), which are invisible lines of force that surround any electrical device. The term EMF refers to electric and magnetic fields that are coupled together such as in high frequency radiating fields. For lower frequencies such as for power lines, EMF should be separated into electric fields and magnetic fields. Transmission lines operate at a frequency of 60 hertz (cycles per second), which is in the non-ionizing portion of the electromagnetic frequency spectrum. Fields are considered ionizing when they cause electrons to eject from their orbits around a normal atom. This will typically occur with frequencies in the range of 10^{16} to 10^{22} hertz.

Magnetic fields result from the flow of electricity (current) in the transmission line. The intensity of the magnetic field is related to the current flow through the conductors. The magnetic field associated with the transmission line surrounds the conductor and rapidly decreases with the distance from the conductor. The value of the magnetic field density is expressed in the unit of gauss (G) or milligauss (mG).

Electric and magnetic fields (EMF) have not been calculated for this project. The most recent and exhaustive studies of the health effects from power frequency fields conclude that the evidence of health risk is weak. Some of these studies are listed below:

- National Institute of Environmental Health Sciences. 2002. *EMF. Electric and Magnetic Fields Associated with the Use of Electric Power*. National Institutes of Health.
- National Research Council. 1997. *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields*.
- Minnesota Department of Health. 2002. *EMF White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options*.
- Electric and Magnetic Fields (EMF): Environmental Health in Minnesota. <http://www.health.state.mn.us/divs/eh/radiation/emf>

4.0 Permits, Approvals and Public Comments

4.1 Overview of the Minnesota Approval Process

This project falls under the State of Minnesota's Power Plant Siting Act, (Minn. Statutes § 116C.51-.69 and Minn. Rules Chapter 4400) for transmission projects over 100 kV and requires a permit from the Minnesota Environmental Quality Board (EQB). However, for eligible projects, a utility may apply to the local unit of government that has jurisdiction over the project for approval instead of applying to the EQB (Minn. Rules pt. 4400.5000). The proposed 115 kV substation and transmission line project is eligible for local review.

This project is located primarily in Henrietta Township, but a portion of the project (equipment installation at GRE's Hubbard Substation, operating a segment of GRE's "HP" line at 115 kV) is located in Hubbard Township. To formalize permitting responsibilities, a Hubbard Township meeting was held at the Hubbard Township Hall on March 4, 2004. The Hubbard Township Board Members, clerk, and four concerned citizens attended. The project was described and the permitting process (including the environmental scoping process, EA table of contents) was reviewed. The Hubbard Township Board approved permitting of the entire project by Henrietta Township.

Henrietta Township has assumed jurisdiction of the project and is the local unit of government responsible for review of the project for both Henrietta and Hubbard townships. Henrietta Township was afforded the opportunity to relinquish its jurisdiction by requesting that EQB assume jurisdiction, but has elected to maintain jurisdiction of the project. As required by the EQB, a project notice was sent to those persons on the EQB Power Plant Siting General Notification list (see Appendix C).

In accordance with EQB rules, an environmental assessment (EA) prepared by the local unit of government with jurisdiction over the project must be completed. Specific requirements include an opportunity for public participation in developing the scope of

the EA before it is prepared, published notice in the EQB Monitor when the EA is available for review, and the procedure for commenting on the EA. Final decision on the project will not be made until at least ten days after the notice appears in the EQB Monitor.

4.2 EA Public Involvement

4.2.1 First Scoping Meeting

The Henrietta Township Planning Commission held a public hearing on March 1, 2004 to solicit input on the scope of the EA (see notice in Appendix C). The Henrietta Township Planning Commission, township board members, and six area residents attended the meeting. Topics discussed and responses given are provided below.

Proximity to Meadowland Estate

An effort was made to meet with owners in the Meadowland Estate development. The landowner closest to the project had no concerns about the project.

Noise and property devaluation

The noise generated by the substation would be similar to that of fluorescent light ballasts.

A brief explanation of property values was given using the Shenehon study as a basis. GRE indicated that no study has been done to address the impact that substations have on land values.

Landscaping plans

Trees will be introduced and GRE will work with the zoning administrator to develop screening plans. It was pointed out that there is little room for screening at the south end of site and moving the facility to the north would move it closer to the platted area.

Future electrical upgrades for the site

The nearby Itasca-Mantrap Park Rapids Substation could be located in the planned substation site in the future and Minnesota Power may install a 115/34.5 conversion at the site. Future improvements would require new permitting.

General health and safety questions

The Minnesota Department of Health brochure on EMF was passed out to attendees.

Other topics of discussion included fencing entire 5 acres, thereby serving notice that there may be future plans to expand the site; the 20-year plan; and screening, particularly on the south side of property. Specific input from area landowners included:

- Mrs. Johnson requested screening on north.
- Health and safety issues need to be addressed in environmental assessment.
- One landowner in the audience voiced support for the project.

Project fact sheets and the draft EA table of contents were handed out to all present. Each item of the EA contents was reviewed, and input from attendees on items to be included in the EA was solicited. The state and local permitting processes were explained, including the second scoping meeting and approval of the EA.

4.2.2 Second Scoping Meeting

Henrietta Township and GRE held a second public meeting on April 22, 2004 to allow citizens in both Henrietta and Hubbard townships an opportunity to provide input on the scope of the EA (see notice in Appendix C). The Henrietta Township Zoning Administrator, a representative from Henrietta Township, a representative from Itasca-Mantrap, and four area residents attended the meeting. Topics discussed and responses given are provided below.

Can 3-phase distribution lines come out of the new substation?

The Long Lake Substation will not be equipped for 3-phase distribution lines. If Itasca-Mantrap decides to move their Park Rapids distribution substation (located just ¼ mile north of the proposed Long Lake Substation) to the Long Lake Substation site in the future, then modifications would be made to accommodate the 3-phase lines.

Is the Long Lake Substation going to be the main power grid coming into this area? If so, what kind of security measures will be in place for the substation?

GRE's Hubbard Substation in Hubbard Township is the main power source for the Park Rapids area. Current security measures include the typical fencing and signage. If security problems were to arise, GRE would likely install video surveillance at the site. GRE will comply with security measures required by the Federal Energy Regulatory Commission (FERC), the National Electric Reliability Council (NERC), and the Homeland Security Act.

The Long Lake Substation will be a specific power delivery point for the Park Rapids area and will also have the typical fencing and signage. The existing SCADA system allows for some station security monitoring. Some additional security measures (such as video surveillance) may be added in the future. The spill plan for the site will be beefed up to deal with a catastrophic event.

Location of the substation is good – it is off the highway and there is good screening.

4.3 Local Permitting

Henrietta Township requires a Building Permit for this project and a rezoning of the land from agriculture/forest to commercial. The Henrietta Township Planning Commission held a public hearing on March 1, 2004 regarding GRE's request for a Building Permit and land rezoning. The Planning Commission approved rezoning of the substation site parcel from agriculture/forest to commercial, with the stipulation that screening would meet township standards and future upgrades would need to be approved by the governing body.

Henrietta Township will act on the Building Permit Application after the EA comment period requirements have been met.

4.4 Other Permits and Approvals

| Government Unit | Type of Approval | Regulated Activity | Status |
|---|---|---|---|
| USDA Rural Utilities Service (RUS) | Environmental Review | Construction of 115 kV substation and transmission line | Approval in process |
| USDA Natural Resources Conservation Service | Environmental Review | Wetland conservation and impact on unique, prime or statewide important farmland | Project will not affect any prime or unique farmland – evaluation of 11/25/03 |
| US Dept. of Interior Fish and Wildlife Service | Threatened and Endangered Species Review | Review of records for federally threatened or endangered species that may exist at or near the substation site or transmission facilities | "No Effect" for listed species determination by USFWS - e-mail dated 1/9/04 |
| US Dept. of the Army Corps of Engineers | Wetland and Waterways Review | Review navigable water and the dredging or filling of US waters including wetlands | Unnamed wetland near proposed project not regulated by COE – letter of 11/18/03 |
| MN Dept. of Natural Resources (DNR) | Environmental Review – Wetlands, Water, Threatened and Endangered Species | Comprehensive review of substation site impacts | The proposed project will not affect rare features – letter dated 12/5/03 |
| Minnesota Department of Transportation – Aeronautics Division | Airspace Concerns | Public and private airports/airstrips | Proposed project will not violate ordinances of Park Rapids Municipal Airport – letter dated 11/19/03 |
| MN Historical Society State Historic Preservation Office (SHPO) | SHPO Review of Nationally Registered Historic Places | Historic preservation | No historic properties will be affected by the project – letter of 12/8/03 |
| Henrietta Township | Building Permit/Land Rezoning | Construction of new facilities | Application in process |