4.0 Assessment of Impacts and Mitigation

The majority of the proposed project is located along existing road or utility ROWs and impacts to the environment are expected to be minimal and short-term, therefore little mitigation will be required. GRE will minimize environmental impacts during construction of the project.

Correspondence relative to environmental conditions in the project area and responses received from state and federal agencies that reviewed the project are provided in Appendix C.

4.1 Description of Environmental Setting

The proposed transmission line corridor is located in an area that is primarily agricultural (see Zoning Maps, Figures 4-1 to 4-4).

4.2 Impacts on Human Settlement

There may be impacts to a couple farm homesteads close to the ROW. Great River Energy will work with the landowners to minimize those impacts. Pole placement will be reviewed and discussed with each landowner to minimize tree loss and visual impacts in those areas close to farmsteads.

4.2.1 Socioeconomics

The local economy is based primarily on agriculture and small businesses. Approximately 5-10 workers will be required for construction of the new line. During construction, there would be a small impact on the local community due to revenue created from expenditures of the construction crew (local community services, hotels, restaurants, construction materials). No permanent jobs will be created by this project.

4.2.2 Displacement

The reconstructed transmission line will not cause the displacement of any residence and will not affect any public services.

Figure 4-1 City of Sartell Zoning Map

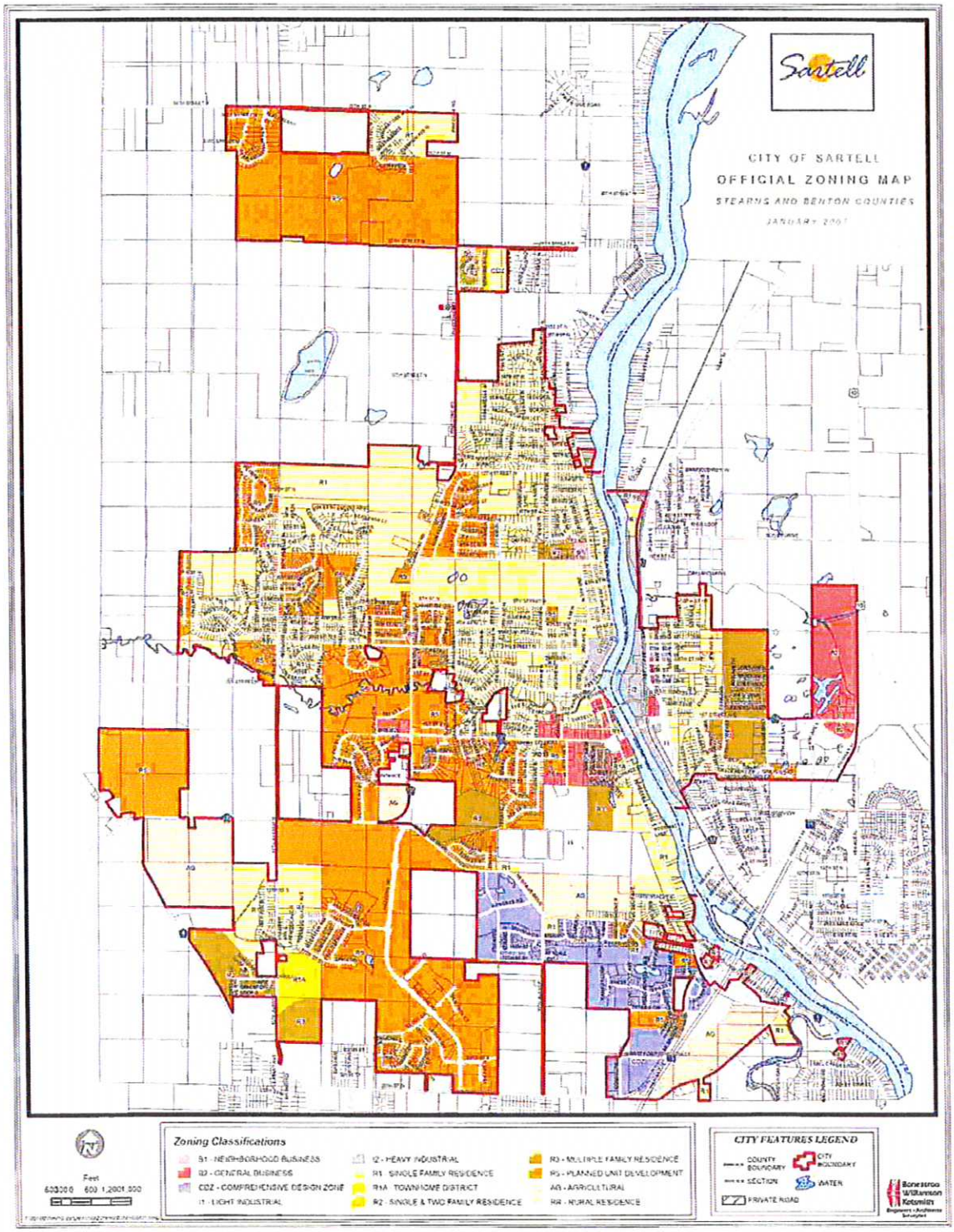


Figure 4-2 LeSauk Township Zoning Map

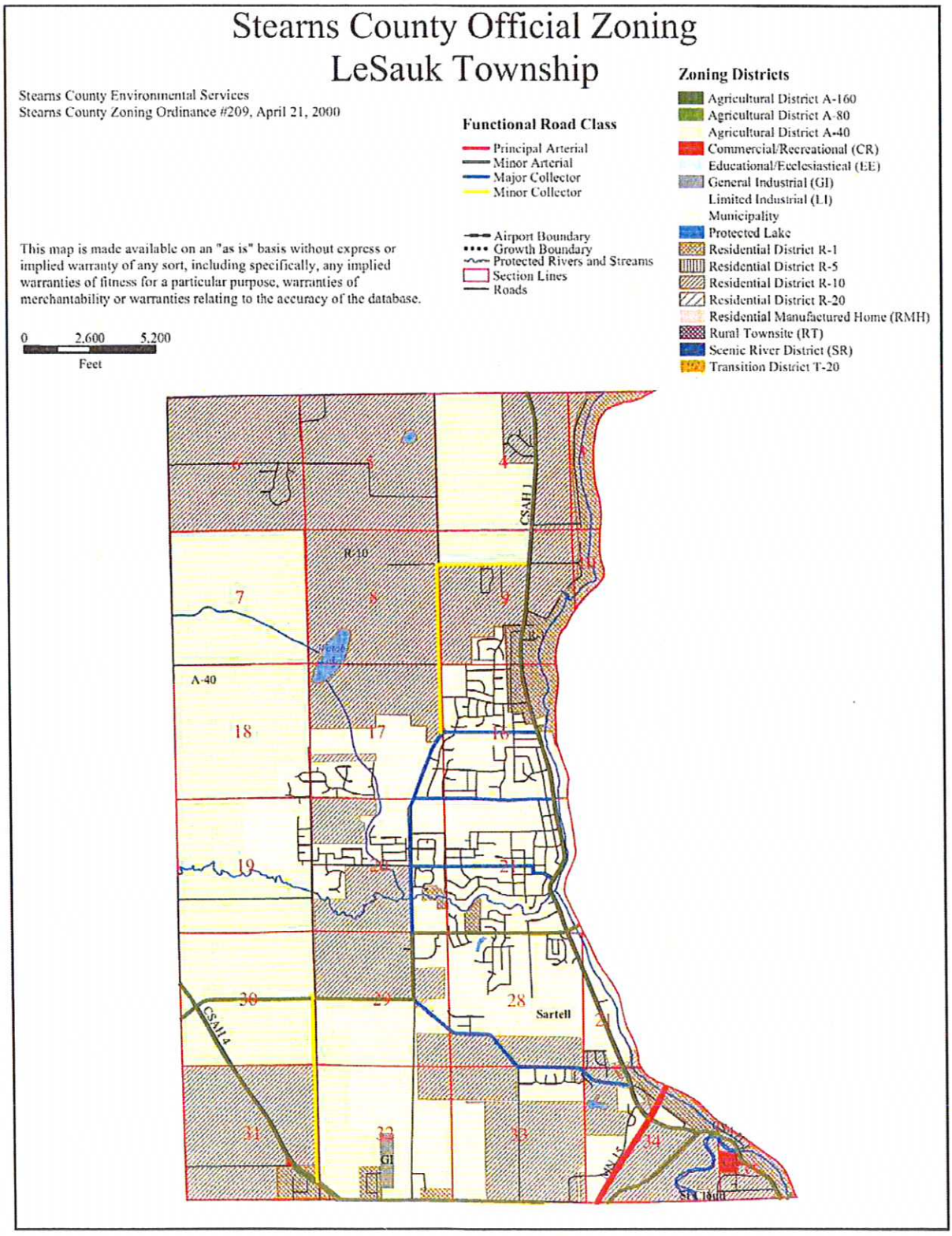


Figure 4-3 St. Wendel Township Zoning Map

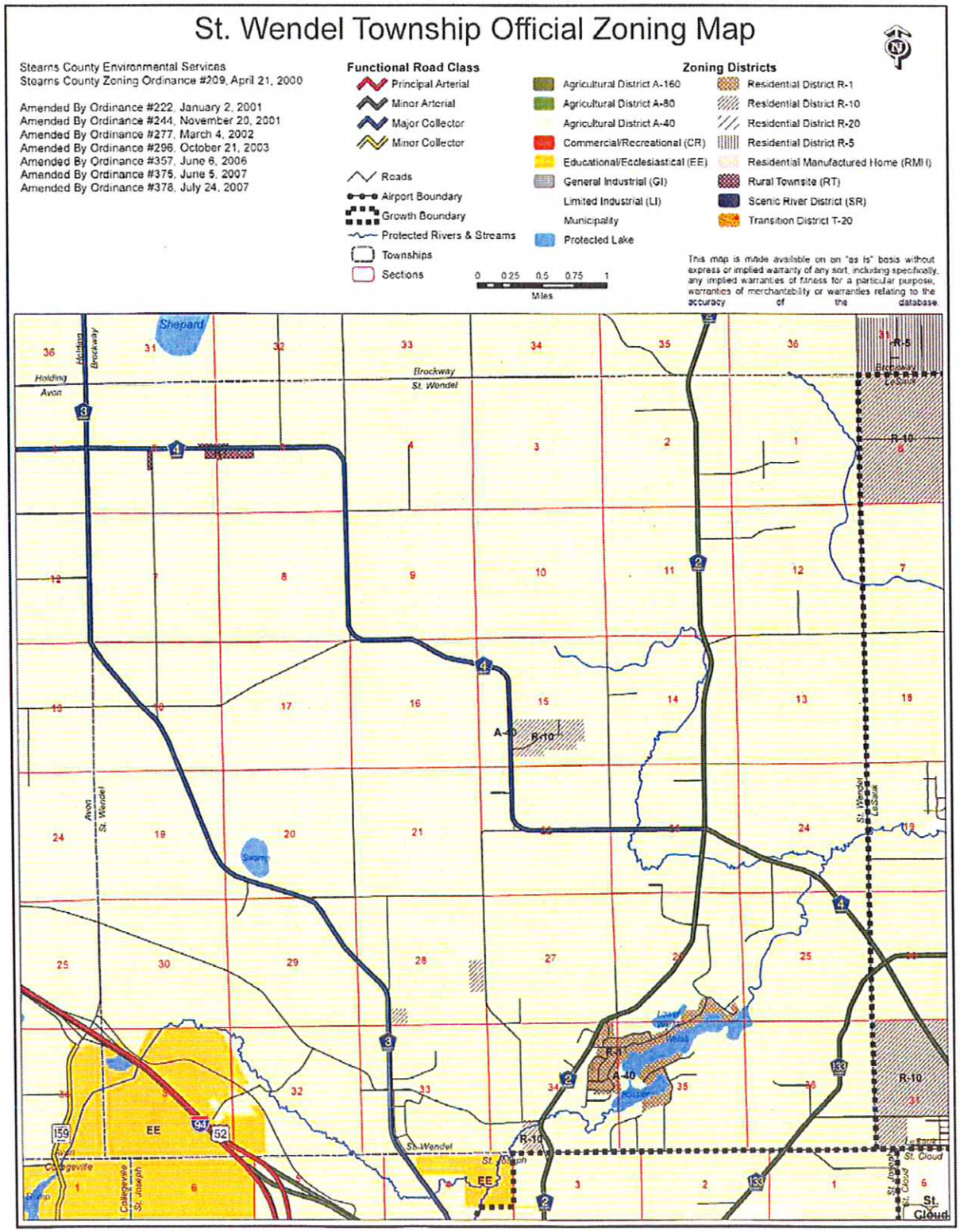
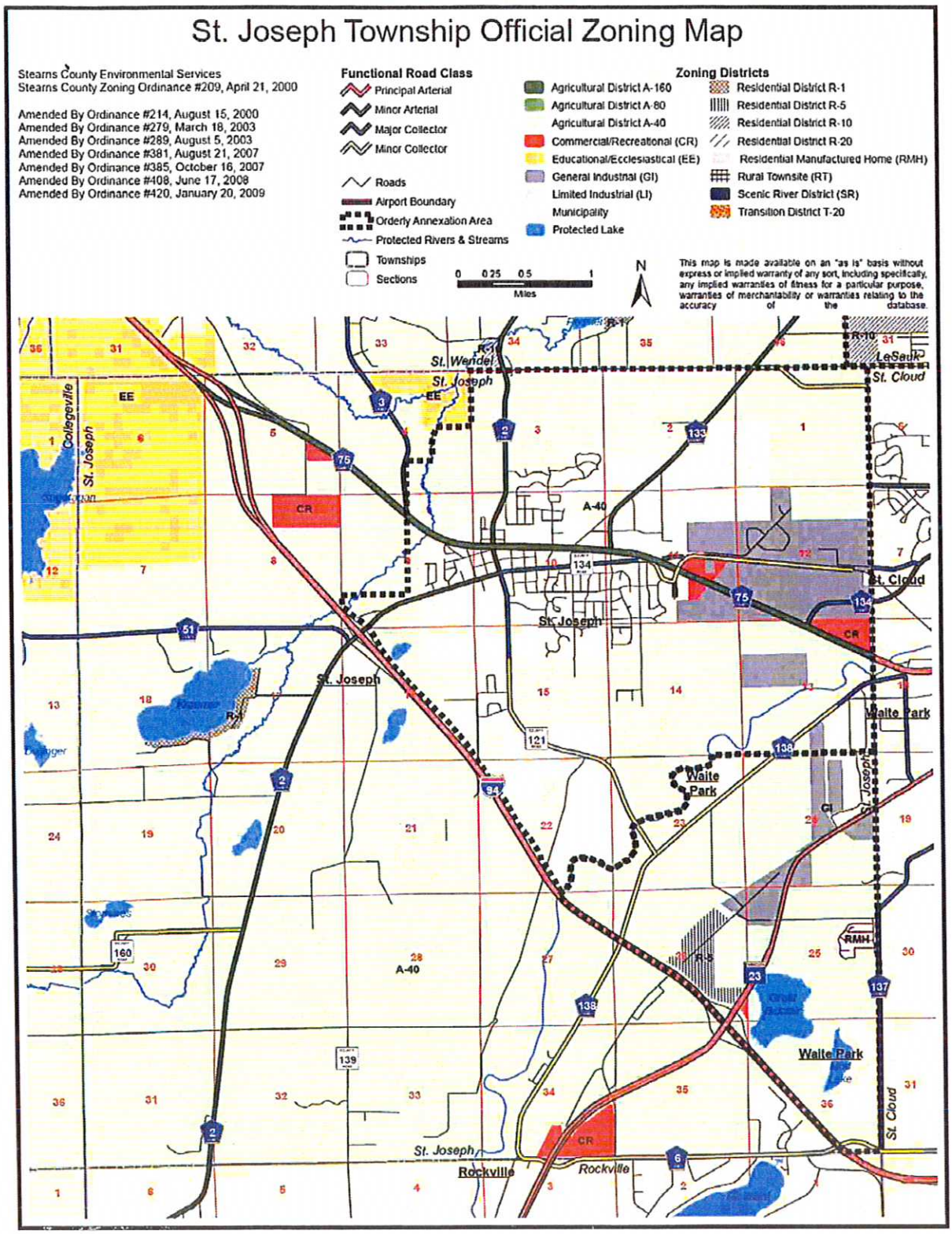


Figure 4-4 St. Joseph Township Zoning Map



4.2.3 Noise

Noise is comprised of a variety of sounds of different intensities, across the entire frequency spectrum. Humans perceive sound when sound pressure waves encounter the auditory components in the ear. These components convert these pressure waves into perceivable sound. Transmission conductors and transformers at substations produce noise under certain conditions. The level of noise or its loudness depends on conductor conditions, voltage level, and weather conditions.

Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight". The A-weighted scale (dBA) corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA, the A-weighted sound level recorded in units of decibels. A noise level change of 3 dBA is barely perceptible to human hearing. A 5-dBA change in noise level, however, is clearly noticeable. A 10-dBA change in noise levels is perceived as a doubling of noise loudness, while a 20-dBA change is considered a dramatic change in loudness. Table 1 below shows noise levels associated with common, everyday sources. Noise levels for a 115 kV transmission line would be between 0 and 18 dBA, depending on the weather.

Table 4-1

Common Noise Sources and Levels

Sound Pressure Level (dB)	Typical Sources
120	Jet aircraft takeoff at 100 feet
110	Jet aircraft at 400 feet
90	Motorcycle at 25 feet
80	Garbage disposal
70	City street corner
60	Conversational speech
50	Typical office
40	Living room (without TV)
30	Quiet bedroom at night

Source: Environmental Impact Analysis Handbook, ed. By Rau and Wooten, 1980

In Minnesota, state rules have been established to regulate noise levels by land use types. Land uses such as picnic areas, churches or commercial land are assigned to an activity category based on the type of activities occurring in each respective land use. Activity categories are then categorized based on their sensitivity to traffic noise. The Noise Area Classification (NAC) is listed in the Minnesota Pollution Control Agency (MPCA) noise regulations to distinguish the categories.

Noise emission from a transmission line increases during heavy rain and wet conductor conditions. In foggy, damp, or rainy weather conditions, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires. During heavy rain, the general background noise level is usually greater than the noise from the transmission line and few people would be out near the transmission line. As a result, people do not normally notice audible noise from a transmission line during heavy rain. This is confirmed by calculated levels during a heavy rain (one inch per hour) that shows noise levels for a 115 kV line at less than 25% of the most sensitive state NAC (NAC 1). During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines will produce audible noise at approximately household background levels. During dry weather, audible noise from transmission lines is barely perceptible. The proposed substation would be designed and constructed to comply with state noise standards.

4.2.4 Aesthetics

The proposed transmission line as designed will have some impact on the aesthetics of the immediate corridor. To limit the visual impact, the proposed alignment will follow as close as possible to the existing road and utility corridors for the majority of its length.

4.2.5 Human Health and Safety

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

Electric and Magnetic Fields

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 or milligauss.

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:

- Wisconsin Public Service Commission. January 2008. EMF- Electric & Magnetic Fields. http://psc.wi.gov/thelibrary/publications/electric/electric12.pdf

- National Institute of Environmental Health Sciences. 2002. *EMF. Electric and Magnetic Fields Associated with the Use of Electric Power.* National Institutes of Health.

- Minnesota Department of Health. 2002. *EMF White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options.*

Projected EMF values calculated for this project are:

Phase 1 - Upgraded Section of Transmission Line: The magnetic field will be 6.59 milligauss under the centerline and 3.02 milligauss at the edge of the ROW under peak conditions; 3.93 milligauss under the centerline and 1.80 milligauss at the edge of the ROW under average conditions.

Phase 2 - New Section of Transmission Line: The magnetic field will be 2.19 milligauss under the centerline and 1.01 milligauss at the edge of the ROW under peak conditions; 1.32 milligauss under the centerline and 0.60 milligauss at the edge of the ROW under average conditions.

The EMF values are low at the edge of the ROW and will be negligible at residences near the lines.

4.2.6 Public Services

Impacts to other utilities (gas, telephone, electric, water, sewer) will be avoided or minimized. Public services would not be affected by the construction and operation of the proposed transmission line.

4.2.7 Transportation

Most of the proposed transmission line will be built along or parallel to existing utility or road ROW. The proposed transmission line would cross county roads at a few places. Temporary road closures or lane reductions may be necessary during construction of the transmission line. Operation of the proposed transmission line will not affect the major roads in the area (CSAH 133 and CSAH 4).

The proposed project is over two miles from the nearest private and commercial airport (Thens Private Airstrip and Guggenberger Airport). The Minnesota Department of Transportation, Division of Aeronautics was contacted regarding any potential impacts

to airports in the vicinity. An email reply dated 3/24/09 indicated that the project is well clear of any state-funded airports (Appendix C).

4.3 Impacts on Land-based Economies

4.3.1 Recreation/Tourism

The proposed project crosses a snowmobile trail. The lines will span the trail so that poles and guy wires will be outside of the trail. Guy wires in the area will be marked with visible guy guards. There is also a bike trail that runs along CSAH 33. The line will remain outside of the road ROW and should not interfere with the bike trail. The project is not expected to affect recreational or tourism opportunities.

4.3.2 Agriculture

The proposed project would impact some farmland; however, most of the disturbance will be limited to the area immediately surrounding the transmission structures. Guy wires and anchors may be required in some areas, although they will be minimized to the extent possible to reduce the impact on agricultural activities and irrigation systems that might travel in close proximity of the transmission route. GRE will work closely with each landowner to minimize impacts to farmland, including scheduling work to minimize impacts to crops and land. GRE representatives will work directly with landowners to address crop damages or impacts to farmland. In cases where soil compaction occurs; the construction crews or a restoration contractor would use various methods to alleviate the compaction as negotiated with landowners.

4.3.3 Mining and Forestry

There are no mining or forested areas in the vicinity of the project.

4.4 Archaeological and Historic Resources

A Phase 1a literature review of the project area conducted in October 2008 indicated that there are no recorded historical structures within one mile of the proposed construction locations (letter from Westwood dated 11/12/08, Appendix C). Westwood also conducted a site visit and concluded that there will be no adverse impact on known or suspected historic properties as a result of this project. The Minnesota State Historic Preservation Office (SHPO) concurred with these findings in a letter dated 3/17/09 that stated "we conclude that 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" (Appendix C).

4.5 Natural Environment

4.5.1 Air Quality

Because transmission lines do not affect air quality, there will be no long-term environmental impacts on the air from operation of the transmission line.

During construction of the proposed transmission line, there would be emissions from vehicles and other construction equipment and fugitive dust from ROW clearing. Temporary air quality impacts caused by the proposed construction-related emissions would be expected to occur during this phase of activity. The magnitude of these emissions is influenced heavily by weather conditions and the specific construction activity taking place. Adverse impacts to the surrounding environment would be minimal because of the short and intermittent nature of the emission and dust-producing construction phases.

4.5.2 Water Resources, Wetlands and Soils

Minimal impacts to water resources are anticipated. The proposed transmission line will not cross any Minnesota Department of Natural Resources (DNR) Public Waters (Figure 4-5).

The US Army Corps of Engineers (USACE) was contacted regarding this project and they sent a letter dated March 9, 2009 (Appendix C) stating that the proposed location "is not within the regulatory jurisdiction of the Corps of Engineers. No permanent work will be done in a navigable water of the United States, and no dredged or fill material, including that associated with mechanical land clearing, will be discharged in any water of the United States, including wetlands." A USACE permit will not be required for the transmission line. The Sartell Substation will be located near a small wetland. SEA will work with the USACE during design of the substation to address any potential impacts to the wetland.

Soils along the transmission route are generally are loamy sands and sandy loams with 0-6 percent slopes.

4.5.3 Vegetation and Wildlife/Rare and Unique Natural Resources

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 an email dated February 26, 2009, (Appendix C) the DNR concurred with GRE's assessment that the project will not negatively impact any known occurrences of rare features (Figure 4-6).

The USFWS website indicated that there are no federally listed threatened or endangered species or other federal trust resources in Stearns County. http://www.fws.gov/midwest/endangered/LISTS/minnesot-cty.html

Effects on area wildlife will be minimal.

Figure 4-5 DNR Public Waters Map

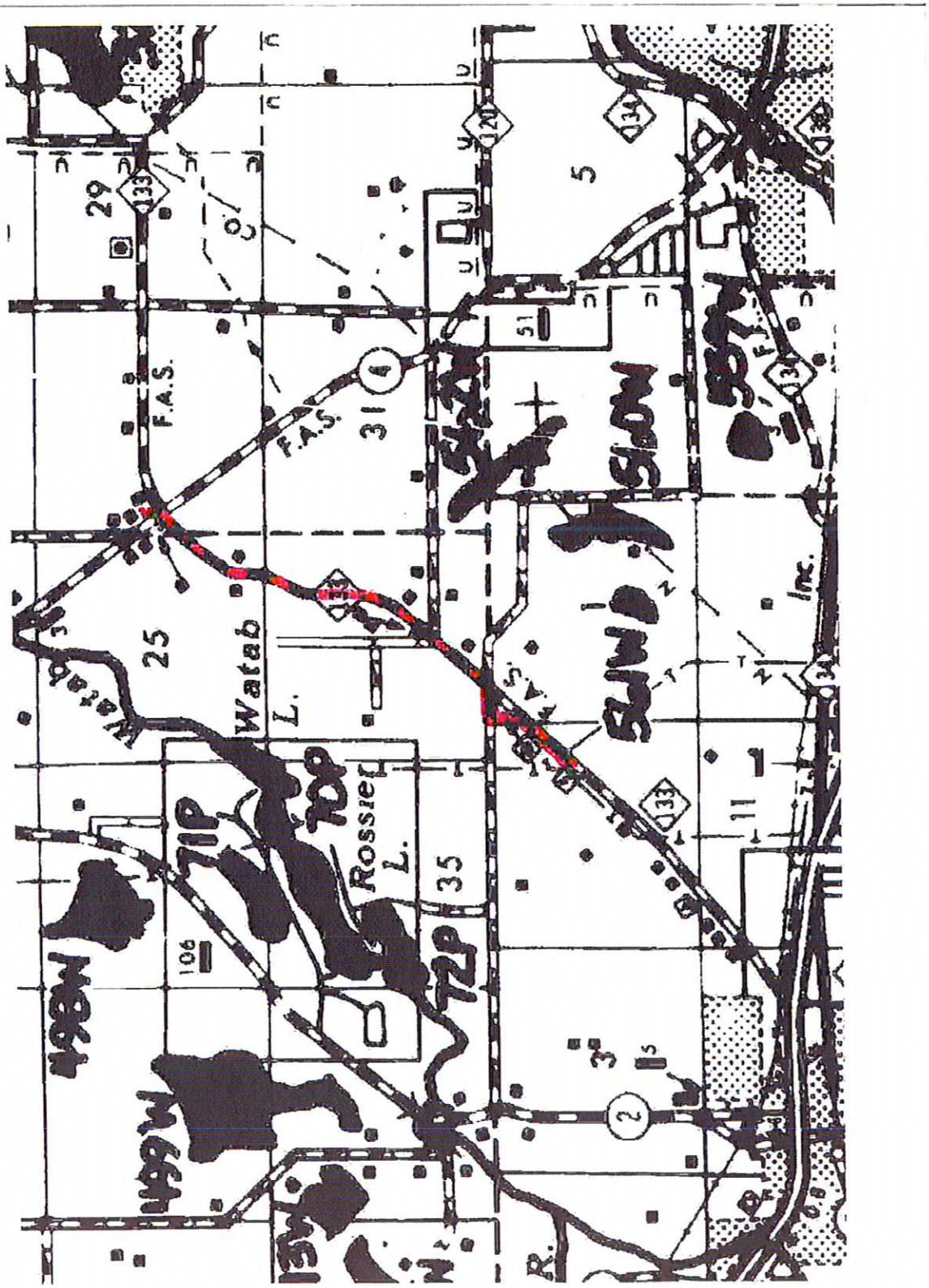
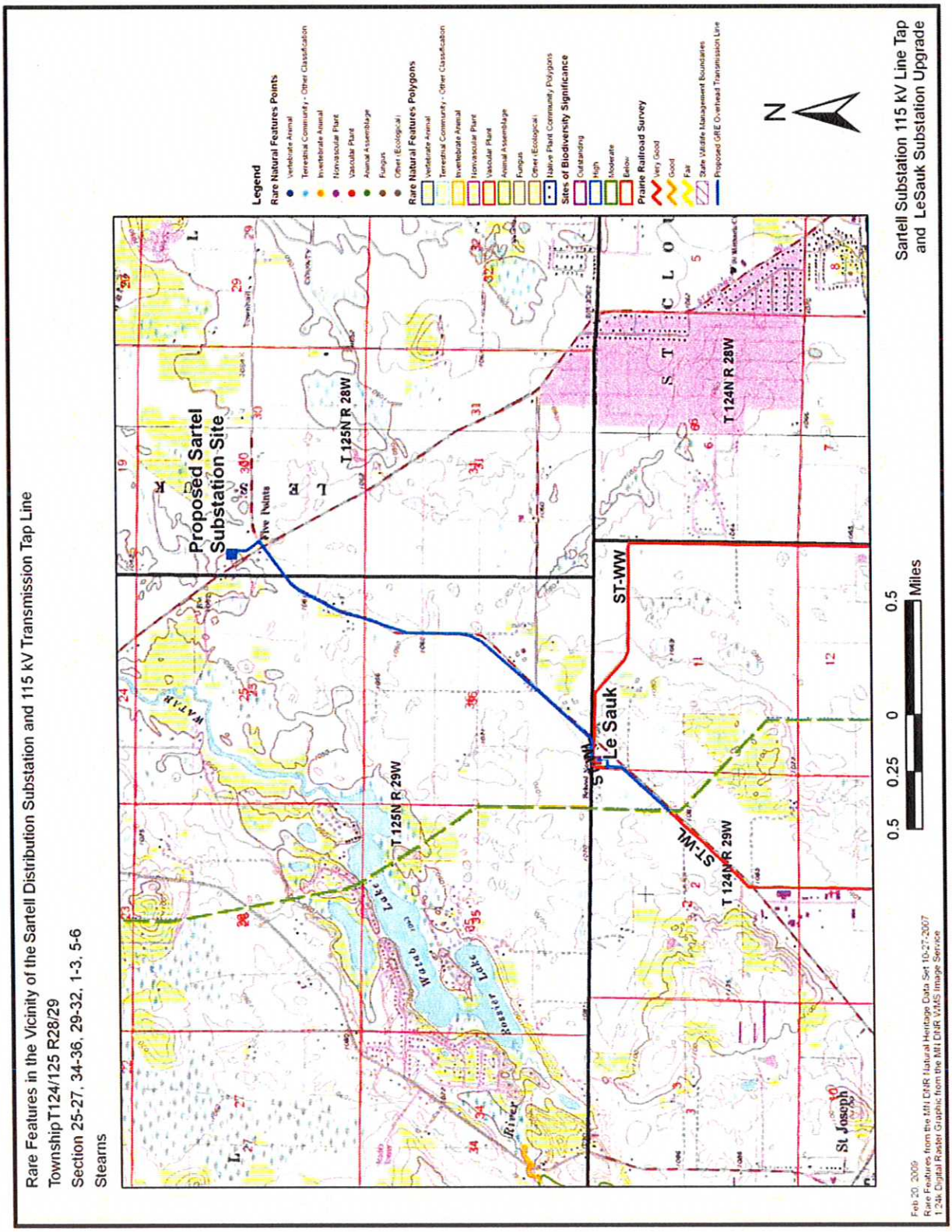


Figure 4-6 Rare Features Map



5.0 Regulatory Permits and Approvals Required

Permit requirements or approvals anticipated for this project and the status of each are shown below in Table 5-1.

Table 5-1 Regulatory Permits and Approvals Required

Government Unit	Type of Approval	Regulated Activity	Status
US Dept. of Interior Fish and Wildlife Service (USFWS)	Threatened and Endangered Species Review	Review of records for federally threatened or endangered species that may exist at or near the proposed transmission facilities	USFWS website - Stearns County does not have species of concern. http://www.fws.gov/midwest/endangered/LISTS/minnesot-cty.html
US Dept. of the Army Corps of Engineers (USACE)	Wetland and Waterways Review	Review navigable water and the dredging or filling of US waters including wetlands	3/9/09 letter - no navigable waters in the area. USACE has no jurisdiction.
MN Dept. of Natural Resources (DNR)	Environmental Review – Wetlands, Water, Threatened and Endangered Species; Trails	Comprehensive review of transmission line impacts	2/26/09 email - no known occurrences of rare features in the vicinity of the project.
MN Historical Society State Historic Preservation Office (SHPO)	SHPO Review of Nationally Registered Historic Places	Historic preservation	3/17/09 letter - no properties listed on the National or State Registers of Historic places, no known or suspected archaeological properties in the area.
Minnesota Department of Transportation-Aeronautics Division	Airspace Concerns	Public and private airports/airstrips	3/24/09 email - this project will not adversely affect the airports in the area; no objection to the project.
Minnesota Pollution Control Agency (MPCA)	National Pollutant Discharge Elimination System (NPDES) Permit	Stormwater Pollution Prevention Plan (SWPPP) and stormwater permit required for disturbance of ≥ one acre	A SWPPP will be prepared by SEA for the substation. No permit required for GRE's transmission line projects (< one acre of disturbance).
MnDOT	State Highway Crossing Permit	Permit required prior to construction	None required.
DNR Lands and Minerals	License to Cross Public Water	License required if project crosses DNR Public Waters	None required.
DNR Lands and Minerals	License to Cross Public Land	License required if project crosses DNR Land	None required.
Stearns County Highway Department	County Highway Crossing Permit	Permit required prior to construction.	All required permits will be acquired for construction.
Stearns County	Conditional Use Permit – Transmission Lines	Construction of new facilities	The application was submitted by GRE and is in process.
City of Sartell	Conditional Use Permit – Substation	Construction of new facilities	An application will be submitted by SEA in 2010.