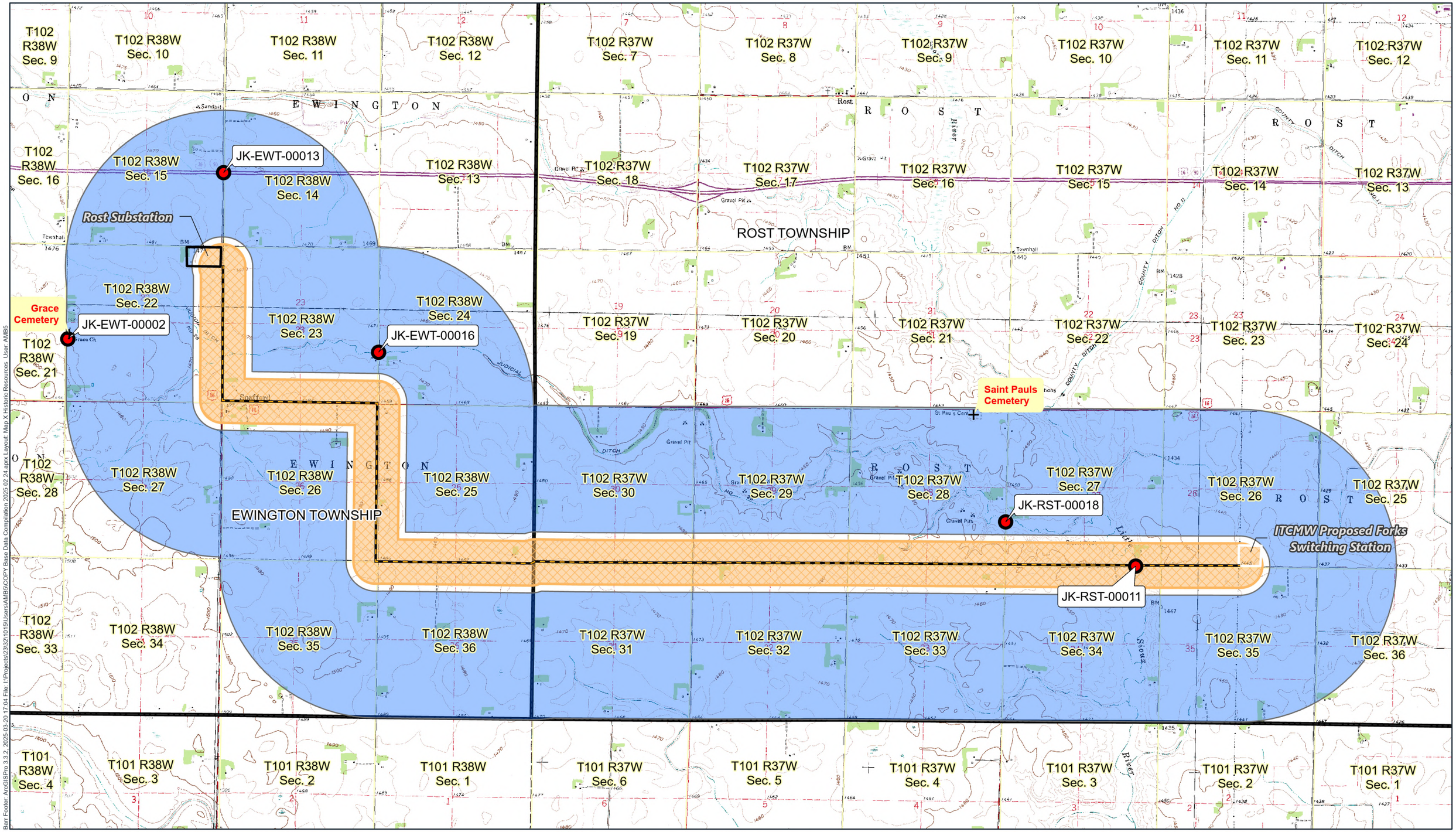


Historic Architectural Resources
Cemetery
Applicant's Proposed Alignment
Route Width (Proposed Route)
1 Mile Buffer

0 3,000 6,000
Feet

Map 4-10

HISTORIC RESOURCES
Forks-Rost 161 kV Project

4.9.2.1 Impacts

Historic resource impacts could result from construction activities such as ROW clearing, placement of structures, construction of access roads, temporary construction areas, and vehicle and equipment operation. Impacts could also result from the removal of historic resources.

Additional impacts can result from transmission line location and operation. Impacts can occur if the project is located near or within view of a historic resource and the resulting change in viewshed negatively affects the setting, feeling, and/or association of the resource. This issue is especially pertinent for cultural resources where the surrounding environment plays a crucial role in defining their character and significance.

However, the project will not have the potential to impact documented NRHP-listed or eligible properties. Bridge L9312/JK-RST-00011 is within the Project area, but this resource is not eligible for listing on the NRHP (Map 4-10). Further, this bridge crosses 770th Street over the Little Sioux River, and the project will parallel this existing transportation infrastructure. The bridge represents infrastructure critical to the function of the rural, agricultural community in the same way that the project will provide critical infrastructure for the community, and thus, the project will not alter this resource's setting, feeling, appearance, and/or association.

4.9.2.2 Mitigation Measures

The preferred impact mitigation for archaeological or historic resources is prudent structure placement to avoid known archaeological resources. However, no previously recorded archaeological or historic resources will be impacted by this project. An archaeological survey may be conducted prior to project construction to determine whether unidentified archaeological resources are present within the project area.

If unanticipated archaeological or historic resources are discovered during construction, as noted in Section 6.4.3 of the Route Permit Application, project construction activities will cease at that location and the SHPO and OSA will be contacted to assist in the development of appropriate resource protection measures.

In addition, if human remains or suspected burial sites are discovered during construction, the state archaeologist will be contacted, and construction will cease at the location until the applicants and the state archaeologist have developed adequate mitigation measures as per Minn. Statute 307.08.

4.10 Natural Environment

Transmission lines have the potential to impact the natural environment through temporary, construction-related impacts and long-term impacts on water resources, vegetation, and wildlife as discussed in the following sections.

4.10.1 Water Resources

Hydrologic features located within the project include streams, wetlands, and groundwater resources. Bothe surface and groundwater resources are addressed in this section.

4.10.1.1 Surface Waters

The project is located in the Little Sioux watershed in south central Minnesota. The Little Sioux River drains south to the Missouri River. The project will cross two named streams – Judicial Ditch 28 and Little Sioux River. Map 4-11 shows the watershed, surface water resources, and water quality impairments in the project.

Surface waters in Minnesota are regulated by different entities at the federal and state levels. The USACE regulates the placement of dredged or fill materials in wetlands and other waters under its jurisdiction. The DNR regulates watercourses, water basins, and wetlands that are designated as significant recreational or natural resources in Minnesota and are referred to as public waters. These waters are delineated in the state's public waters inventory (PWI). The DNR requires a permit for crossing or working within the boundaries of designated public waters. Both Judicial Ditch 28 and the Little Sioux River are identified as public waters Table 4-18.

Section 303(d) of the CWA requires that states publish a list of streams and lakes that are not meeting their designated uses because of excess pollutants (impaired waters) every two years. The Little Sioux River (AUID: 1020003-554) is impaired for Escherichia coli (E. coli) (reference (56)). The MPCA has delegated authority to set water quality standards and list waters as impaired that exceed the standard. Water quality standards are set by a waterbody's beneficial uses into seven classifications:

- Class 1 waters, domestic consumption
- Class 2 waters, aquatic life and recreation
- Class 3 waters, industrial consumption
- Class 4 waters, agriculture and wildlife
- Class 5 waters, aesthetic enjoyment and navigation
- Class 6 waters, other uses and protection of border waters
- Class 7 waters, limited resource value waters

The Little Sioux River is designated as Class 2Bg which means it is intended to support aquatic life and recreation for cool and warm water aquatic life and habitat. Judicial Ditch 28 is designed as Class 2Bg and 3C. The 3C classification refers to waters that have limited resource value.

Table 4-18 Water Courses within the Right-of-Way

Dataset	Crossing Count	Length within the ROW (feet)	Public Water Inventory	Impairment
Judicial Ditch 28	1	107	PWI-039-012	N/A
Little Sioux River	1	108	PWI-039	E. coli
Other Stream Crossings	1	105	N/A	N/A

Wetlands are defined as those areas that are inundated by surface or groundwater with a frequency to support, and under normal circumstances does or would support, a prevalence of vegetation or aquatic

life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands are protected at the federal level under Section 404 of the CWA and at the state level under the Minnesota WCA and the DNR PWI program. According to the USFWS National Wetland Inventory (NWI), four wetlands totaling approximately 3.58 acres are located in the project ROW (Table 4-18).

The applicant's consultant, Merjent, Inc. (Merjent), conducted a desktop wetland determination. The result of the Level 1 wetland determination identified 50 potential palustrine emergent (PEM) wetlands. All were farmed wetlands or wet roadside ditches adjacent to farmed wetlands. Table 4-19 summarizes the results of the desktop delineation. In April 2024, Merjent conducted a field-based wetland delineation within the proposed Forks Switching Station, no wetlands were identified.

Table 4-19 Desktop Delineated Water Features

Dataset	Area within the ROW (acres)	Length within the ROW (feet)
Streams	N/A	289.3
Waterways	N/A	59.8
Wetlands	11.05	N/A

Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Desktop Delineated Stream
Public Waters Inventory (PWI) Watercourse
National Hydrography Dataset (NHD) Flowline
Desktop Delineated Wetland
National Wetlands Inventory (NWI) Non-Forested Wetland

0 650 1,300
Feet

Map 4-11
Page 1 of 5
WATER RESOURCES
Forks-Rost 161 kV Project

T102 R38W
Sec. 27

T102 R38W
Sec. 26

EWINGTON
TOWNSHIP

T102 R38W
Sec. 25

T102 R38W
Sec. 34

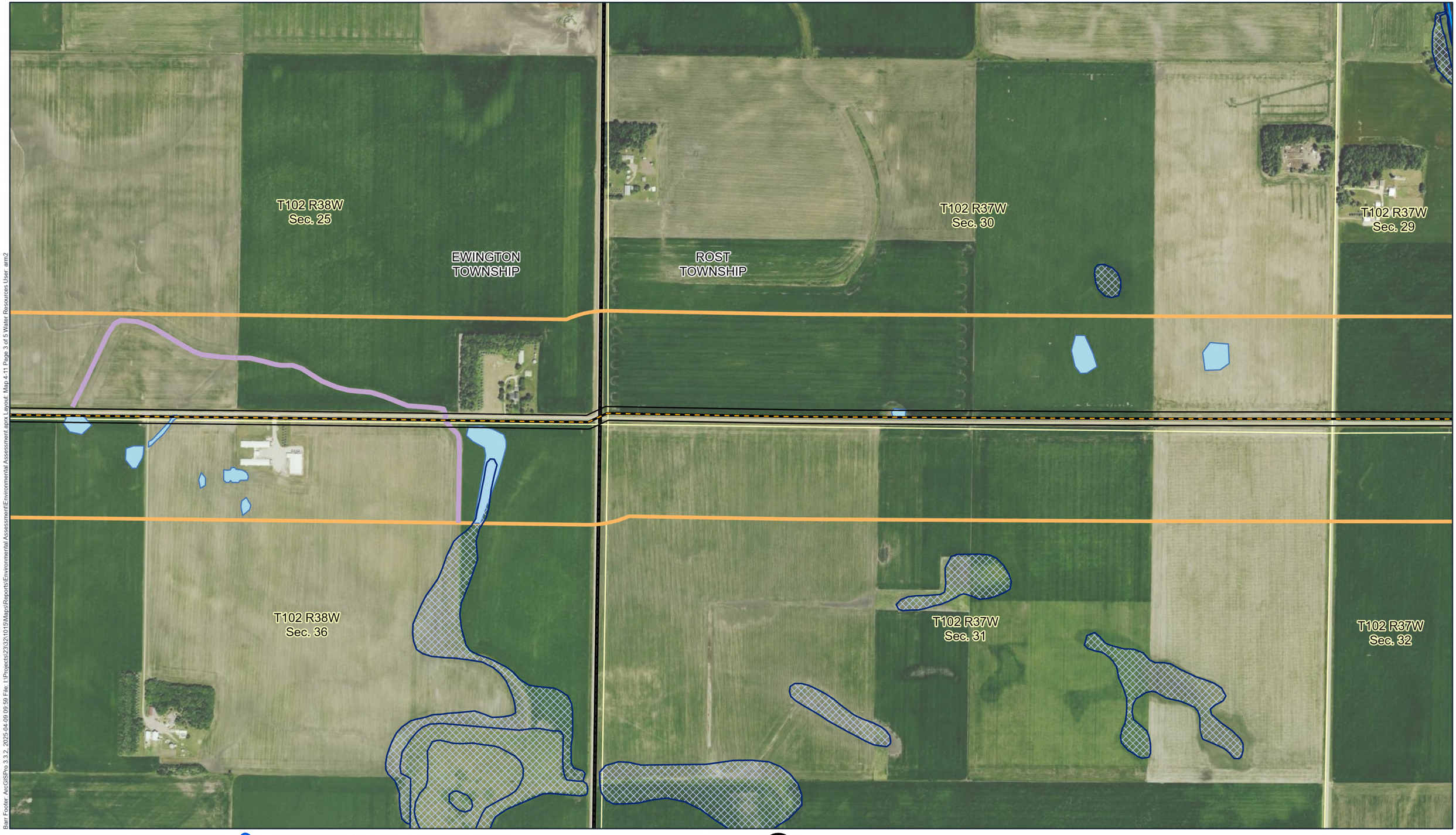
T102 R38W
Sec. 35

T102 R38W
Sec. 36

Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Desktop Delineated Stream
Public Waters Inventory (PWI) Watercourse
National Hydrography Dataset (NHD) Flowline
Desktop Delineated Wetland
National Wetlands Inventory (NWI)
Non-Forested Wetland

0 650 1,300
Feet

Map 4-11
Page 2 of 5
WATER RESOURCES
Forks-Rost 161 kV Project

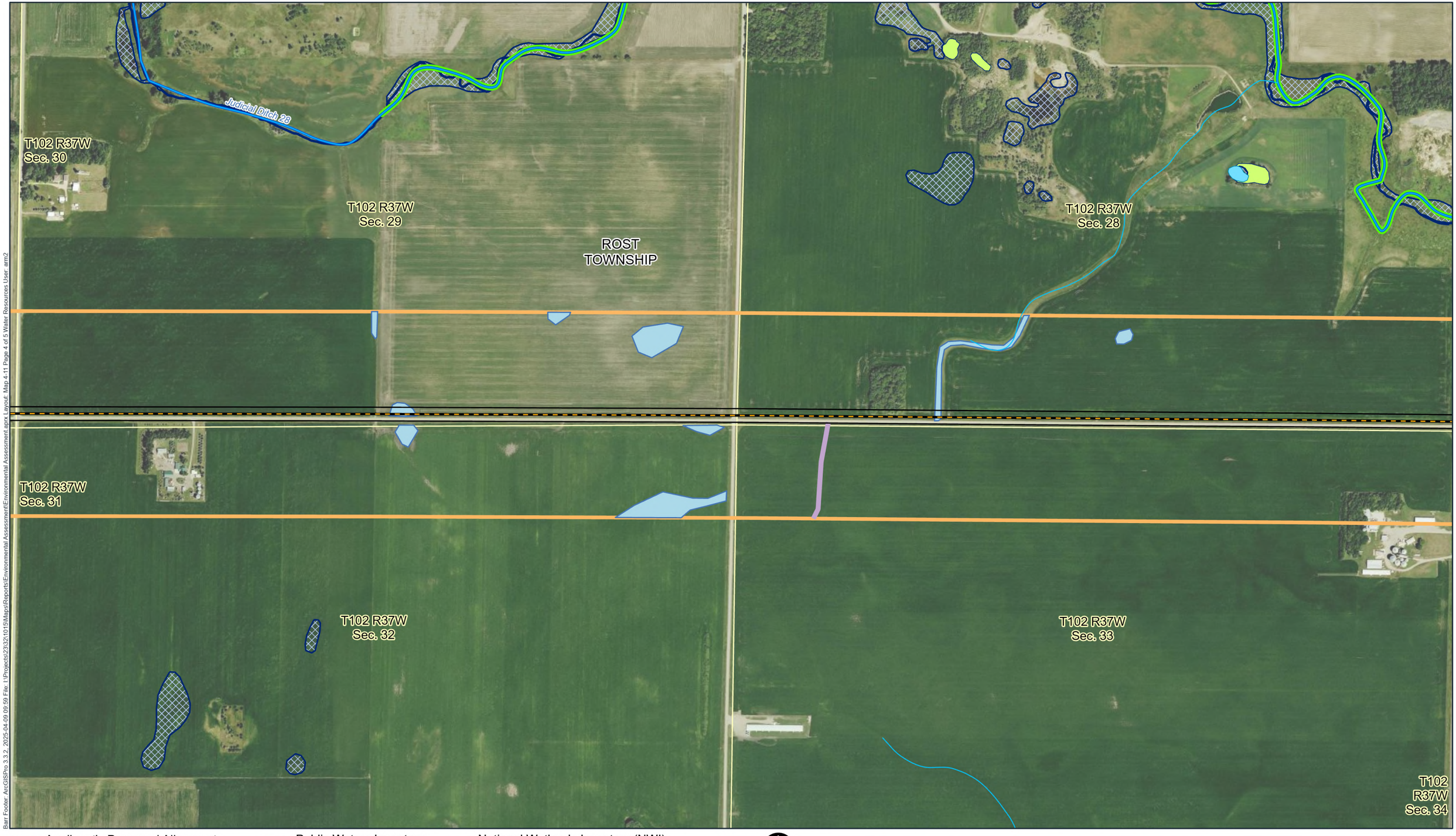


Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Desktop Delineated Stream
Public Waters Inventory (PWI) Watercourse
National Hydrography Dataset (NHD) Flowline
Desktop Delineated Wetland
National Wetlands Inventory (NWI) Non-Forested Wetland

N

0 650 1,300
Feet

Map 4-11
Page 3 of 5
WATER RESOURCES
Forks-Rost 161 kV Project



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- Applicant's Proposed Alignment
- Route Width (Proposed Route)
- Right of Way
- Desktop Delineated Stream
- MPCA Impaired Waters (2024 Draft) Impaired Stream
- Public Waters Inventory (PWI) Watercourse
- National Hydrography Dataset (NHD) Flowline
- Desktop Delineated Wetland

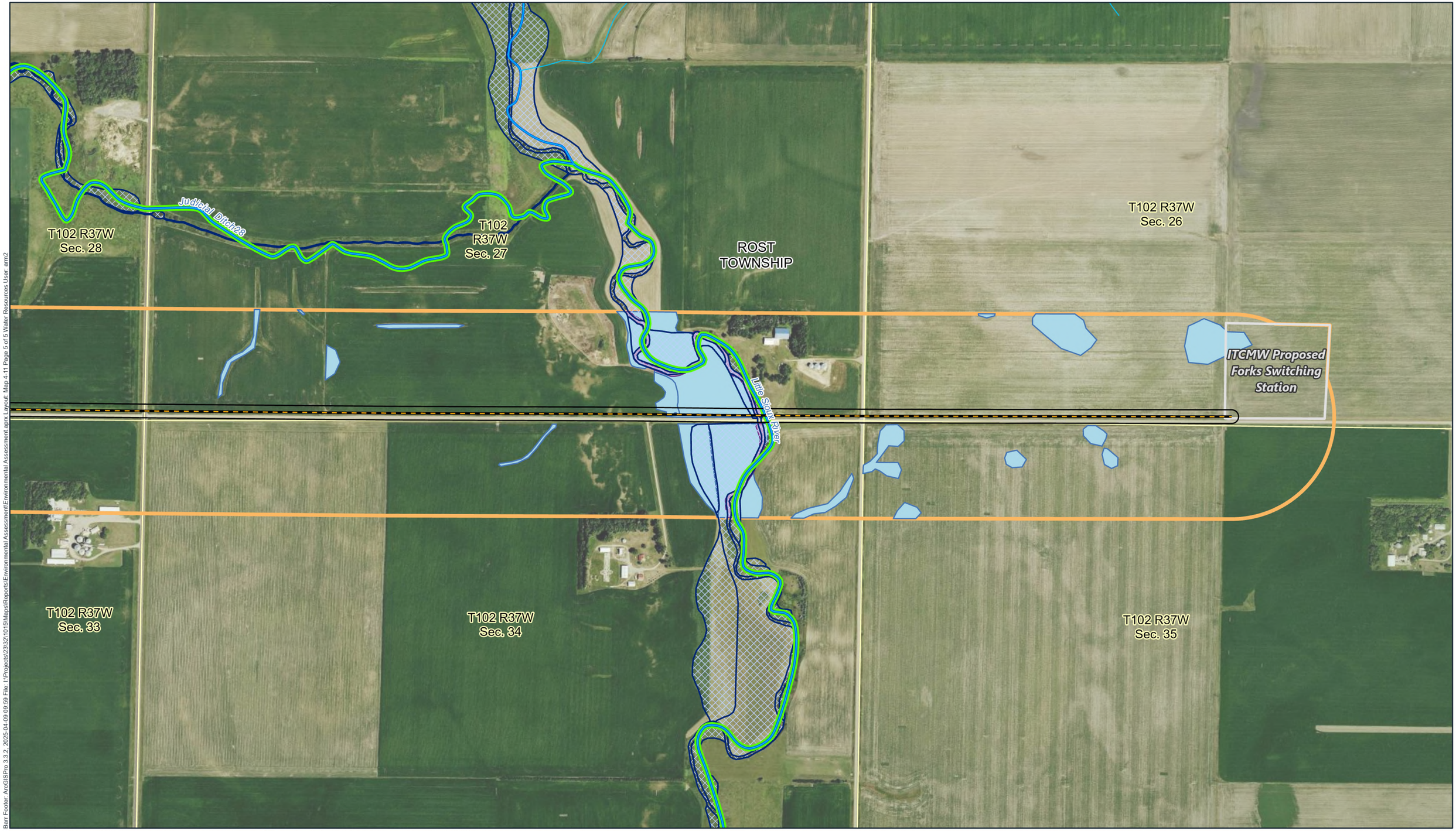
National Wetlands Inventory (NWI)

- Forested Wetland
- Non Forested Wetland

N

0 650 1,300
Feet

Map 4-11
Page 4 of 5
WATER RESOURCES
Forks-Rost 161 kV Project



Barr Footer: ArcGISPro 3.3.2, 2025-04-09 09:59 File: I:\Projects\23\32\1015\Maps\Reports\Environmental Assessment\Environmental Assessment.aprx Layout: Map 4-11 Page 5 of 5 Water Resources User: arm2

- Applicant's Proposed Alignment
- Right of Way
- Route Width (Proposed Route)
- MPCA Impaired Waters (2024 Draft) Impaired Stream
- Public Waters Inventory (PWI) Watercourse
- National Hydrography Dataset (NHD) Flowline
- Desktop Delineated Waterway
- Desktop Delineated Wetland
- National Wetlands Inventory (NWI) Non-Forested Wetland

0 650 1,300
Feet

Map 4-11
Page 5 of 5
WATER RESOURCES
Forks-Rost 161 kV Project

4.10.1.2 Impacts

It is anticipated that impacts to water courses and wetlands will be avoided during construction of the project. Structure locations will be adjusted to avoid disturbing the streams and wetlands. No surface water crossing will be greater than 1,000 feet, meaning all surface waters can be spanned to avoid placing a structure within these resources. Removal of vegetation and soil cover may result in short-term water quality impacts due to increased turbidity.

Wetlands can be impacted by soil erosion and sediment deposition during construction. Sedimentation and ground disturbance in wetlands can make them more susceptible to the establishment of invasive plant species, such as reed canary grass, which will adversely impact wetland function by reducing vegetative biodiversity and altering wildlife habitat.

The project is not expected to contribute to or exacerbate the E. coli impairment on the Little Sioux River.

4.10.1.3 Mitigation Measures

It is anticipated that impacts on water courses and wetlands will be avoided with the construction of this project. No permanent impacts to surface waters or wetlands are anticipated, and mitigation for such impacts is not proposed.

The project will be required to obtain a NPDES/SDS permit for construction stormwater runoff. The applicants will apply for authorization to discharge stormwater associated with construction activity under the MPCA NPDES/SDS Construction Stormwater General permit (MNR100001). The project will develop a SWPPP that will identify BMPs that will be implemented during construction to minimize erosion, and sedimentation impacts to surface waters. Erosion and sedimentation abatement measures, for example, will be employed to mitigate impacts to impaired waters.

4.10.1.4 Groundwater

The DNR divides Minnesota into six groundwater provinces. The project is located within Minnesota's South-Central province (Province 2). This province is characterized as fine-grain surficial aquifers underlain with sedimentary bedrock aquifers (reference (57)). There are no springs located within the ROW. The approximate depth to shallow groundwater is 0-10 feet within the project (reference (58)).

The Minnesota Department of Health maintains the Minnesota Well Index (MWI) which provides information about wells and borings such as location, depth, geology, construction, and static water level. According to the MWI, there are no wells within the ROW.

4.10.1.5 Impacts

Project groundwater impacts are anticipated to be minimal. Potential impacts to groundwater could occur through: (1) surface water impacts infiltrating to groundwater; and/or (2) impacts directly related to constructing structure foundations. Groundwater in the area may be encountered in the shallow quaternary aquifer and sandstone aquifer. Surface water impacts can lead to groundwater impacts; thus, concerns are similar (i.e., construction activities which lead directly to sedimentation or through disturbed soils and vegetation). Mitigation of these impacts can be affected by measures to control soil erosion and sedimentation.

Direct groundwater impacts may occur as a result of the construction and placement of transmission line structures. Structure foundations will generally range from 25 to 40 feet in depth. Since there are no wells

within the ROW, other wells in the vicinity generally are installed to depths deeper than the foundation depths, and since concrete components of the foundations have relatively low solubility, no direct impacts to groundwater are anticipated.

4.10.1.6 Mitigation

Mitigation measures proposed for surface water impacts are also anticipated to provide mitigation for groundwater impacts during construction. The applicant notes that if shallow depths to groundwater resources are identified during geotechnical design of the project, specialty structures with wider, shallower foundations may be used.

4.10.2 Geology

The surface geology within the project area is dominated by quaternary-aged glacial deposits from the most recent Wisconsinan glaciation. Loamy, unmixed sands, silts, and gravels originating from moraine sediments deposited by the Des Moines glacial lobe are most prevalent within the project and are part of the New Ulm Formation. Holocene-aged, post-glacial floodplain alluvium consisting of gravelly sand to sandy silts is present near stream channels (reference (59)). The thickness of the glacial deposits vary depending on the location and type of deposit; thicknesses beneath the project are anticipated to be approximately 300 feet thick or greater (reference (60)). The bedrock underlying the project consists of Cretaceous-aged, undifferentiated materials deposited in marine and non-marine settings. This material consists of conglomerates, sandstones, mudstones, shales, marlstones, siltstones, and minor amounts of lignite intermixed (reference (61)).

Karst topography is formed from the dissolution of carbonate minerals, found in limestone and dolostone, over time from rain and groundwater. Where karst topography is present, there is the potential for encountering common karst features, including sinkholes, caves, and springs. The bedrock that underlies the project does not consist of limestone or dolostone, and the nearest mapped karst feature is a sinking stream located over 60 miles north of the project (reference (62)).

The project's seismic risk is very low, as it is located within an area rated as having less than a 2% chance of damage from natural or human-induced earthquakes in 10,000 years (reference (63)). The most intense earthquake recorded in the area occurred in 1860 and was documented as a seven on the Modified Mercalli Intensity Scale. The majority of the remaining recorded earthquakes were documented as having a magnitude of less than five on the Modified Mercalli Intensity Scale (reference (64)).

Landslides are common throughout Minnesota due to the presence of unconsolidated glacial till deposits at the surface. Landslide susceptibility can vary based on several factors, including the slope angle, water content, and sediment properties. Landslides most commonly occur in Minnesota due to slope failure during heavy rain events (reference (65)).

4.10.2.1 Impacts

The construction methods used for the project will not alter the geology of the region; therefore, no impacts to geologic resources are anticipated as a result of the project. The nearest mapped karst feature is over 60 miles away from the project, and the bedrock is not conducive to forming karst features, so encountering any unmapped features is unlikely. Changes in slope are not anticipated during the project, and as a result, there would be limited risk of landslides.

4.10.2.2 Mitigation Measures

No impacts to geologic resources are anticipated; therefore, no mitigation measures are proposed.

4.10.3 Soils

Soil information for the project was obtained from the USDA NRCS SSURGO database (reference (66)). The dominant soils within the project are loam (38%) and silty clay loam (45%).

According to the SSURGO database, exposed soils in the area have a slight to moderate erosion hazard. The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface.

Soil compaction susceptibility within the area ranges from low to medium. Soil compaction is primarily caused by wheel traffic and occurs when moist or wet soil particles are pressed together, reducing pore space between them.

Hydric soils are present throughout the area. A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile. Hydric soils are typically associated with lowlands and wetlands and are rated by their proportion of hydric soil in the map unit. Approximately 44 acres were classified as hydric, predominantly hydric, or partially hydric. The remaining 57 acres are classified as predominantly non-hydric or not hydric.

4.10.3.1 Impacts

Project soil impacts are anticipated to be minimal and temporary. Soil impacts are dependent, to some extent, on the soil surface conditions at the time of construction. Construction activities that occur on wet soils tend to have longer lasting impacts regardless of the soil type. During dry conditions, soil disturbances will be temporary, minimal, and generally less invasive than typical agricultural practices such as plowing and tilling.

Surface soils would be disturbed by site clearing, grading, and excavation activities at structure locations, pulling and tensioning sites, and setup areas. Soil disturbance will occur during the transport of crews, machinery, materials, and equipment over access routes (primarily along rights-of-way). Soil erosion may occur if surface vegetation is removed, especially on fine textured soils that occur on sloping topography, exposing soils to wind and water erosion. Topsoil could be lost to improper handling or erosion, and loss of soils could adversely impact water resources in the area. Soil compaction and rutting could occur from movement of construction vehicles on access paths and at other locations because of heavy equipment activity.

4.10.3.2 Mitigation Measures

Identifying specific staging areas and associated impacts will be completed during final design. Potential impacts to soils would be minimized by using BMPs for construction of the project as required by the route permit and other state and federal permits. The applicant developed an Agricultural Impact Mitigation Plan for the project; the plan is located in Appendix H. Common measures employed to minimize soil erosion include:

- Using low ground pressure construction equipment, which are designed to minimize impacts to soils in damp areas.
- Implementing measures to minimize erosion and sedimentation during construction and employing perimeter sediment controls, protecting exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling vehicle tracking.
- Grading contours so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. Returning all areas disturbed during construction to pre-construction conditions.
- Obtaining a NPDES construction stormwater permit from the MPCA and preparing a SWPPP.
- Erecting or using sediment control fences that are intended to retard flow, filter runoff, and promote the settling of sediment out of runoff via ponding behind the sediment fence.
- Using erosion control blankets and turf reinforcement mats that are typically single or multiple layer sheets made of natural and/or synthetic materials that provide structural stability to bare surface and slopes.
- Separating topsoil and subsoil and covering stockpiled soils.
- Returning locations, where grading or temporary access is required, to their original land contour and elevation to the greatest extent possible.
- Seeding to establish temporary and permanent vegetative cover on exposed soil. Soils will be revegetated as soon as practicable to minimize erosion.
- Revegetating disturbed areas using weed-free seed mixes and using weed-free straw and hay for erosion control.
- Using mulch to form a temporary and protective cover on exposed soils. Mulch can help retain moisture in the soil to promote vegetative growth, reduce evaporation, insulate the soil, and reduce erosion. A common mulch material used is hay or straw.

4.10.4 Vegetation

The project is within the Coteau Moraines ecological subsection as mentioned in Chapter 4.2. This subsection is a transitory zone of loess, windblown silt, from shallow to deep. Pre-European settlement vegetation consisted of tallgrass prairie dissected by narrow stream margins (reference (4)). Forests were limited to ravines and along river corridors. Wildfire played an important role in maintaining the prairie plant community before settlement.

Present-day vegetation consists of herbaceous agricultural vegetation, cultivated crops, and developed lands. Sensitive vegetation resources, such as native plant communities, and Scientific and Natural Areas are discussed in Chapter 4.11. Table 4-20 provides the area of various landcovers observed within the ROW. According to the NLCD, the majority of the ROW vegetation consists of cultivated cropland and developed open spaces, which consist of roadside ditches.

Table 4-20 NLCD Landcover

Landcover Type	Area within ROW (acres)	Percentage of ROW
Developed, Open Space	39.1	38.3%
Developed, Low Intensity	2.5	2.4%
Developed, Medium Intensity	3.1	3.0%
Developed, High Intensity	0.4	0.4%
Herbaceous	0.4	0.3%
Cultivated Crop	55.5	54.4 %
Emergent Herbaceous Wetlands	1.2	1.2%

4.10.4.1 Impacts

Project construction will result in short-term impacts on existing vegetation, including localized physical disturbance and soil compaction. Construction activities involving the development and use of access roads, staging, and stringing areas will also have short-term impacts on vegetation by concentrating surface disturbance and equipment use. Permanent vegetation clearing will be required in the designated structure installation areas, resulting in an impact area measuring 8 feet in diameter for typical structures and 12 feet in diameter for dead-end and angle structures. Construction will also result in long-term impacts to vegetation by permanently removing taller-growing woody vegetation within the ROW.

Construction and maintenance activities have the potential to result in the introduction or spread of noxious weeds and other non-native species. Noxious weeds could be introduced to new areas through propagating material like roots or seeds transported by contaminated construction equipment. Activities that could potentially lead to the introduction of noxious weeds and other non-native species include ground disturbance that leaves soils exposed for extended periods, introduction of topsoil contaminated with weed seeds, vehicles importing weed seed, and conversion of landscape type.

4.10.4.2 Mitigation Measures

The primary means of mitigating vegetation impacts is to avoid particular vegetation, such as trees, through prudent routing. Mitigation can be achieved, in part, by using existing infrastructure rights-of way (e.g., roadway) such that tree removal is minimized. Mitigation can also be accomplished by spanning areas of sensitive vegetation, native plant communities, and other sensitive ecological resources.

Vegetation impacts can also be mitigated by a number of other strategies, including:

- Follow existing road ROW.
- Limiting new access roads for construction.
- Constructing during fall and winter months to limit plant damage.
- Leaving or replanting compatible plants at the edge of the transmission line ROW.
- Replanting the transmission line ROW with low-growing, native species.
- Limiting vehicle traffic to roads along the ROW and within previously disturbed areas.

Potential noxious weed impacts can be mitigated by:

- Revegetating disturbed areas using weed-free seed mixes and using weed-free straw and hay for erosion control.
- Removal of invasive species/noxious weeds via herbicide and manual means consistent with easement conditions and landowner restrictions.
- Cleaning and inspecting construction vehicles to remove dirt, mud, plant, and debris from vehicles prior to arriving at and leaving construction sites.

Vegetation impacts can also be mitigated by providing compensation to individual landowners through negotiated easement agreements.

4.10.5 Wildlife

The project provides limited habitat for wildlife species, as much of the landscape has been converted to cultivated crops. The project is in a former prairie-dominated landscape that boasts wildlife such as songbirds, white-tailed deer, small mammals, reptiles, and amphibians. The project does not offer areas of cover such as forests or prairies. Perennial vegetation coverage is sparse and limited to roadside ditch, stream corridors, and residential properties. Riparian corridors along major streams offer dense vegetation and some tree cover.

The state of Minnesota is in the Central Flyway of North America. The Central Flyway is a bird migration route that encompasses the Great Plains of the U.S. and Canada. Migratory birds use portions of the Central Flyway as resting grounds during spring and fall migration, as well as breeding and nesting grounds throughout the summer. Within and near the project, there is limited suitable habitat for migratory birds.

Migratory birds are protected under the MBTA of 1918 (16 USC 703-712), which prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Bald eagles (*Haliaeetus leucocephalaus*) and golden eagles (*Aquila chrysaetos*) are protected under the MBTA and the federal BGEPA; 16 USC 668-668d, which specifically prohibits the taking or possession of and commerce in, either alive or dead, of any part, nest, or egg of these eagles.

4.10.5.1 Impacts

For non-avian wildlife, construction activities that generate noise, dust, or disturbance may result in short-term, indirect impacts on wildlife. During project construction, wildlife will generally be displaced within the ROW. Clearing and grading activities could also affect small mammals that may be unable to avoid equipment. Many wildlife species will likely avoid the immediate area during construction; the distance that animals will be displaced depends on the species and the tolerance level of each animal. However, comparable habitat is available adjacent to the project.

Potential impacts to avian species (e.g., songbirds, raptors, and waterfowl) include those described above for non-avian species but also include impacts due to electrocution and collision with transmission line conductors. Electrocution occurs more frequently with larger bird species, such as hawks, because they have wider wingspans that are more likely to create contact with the conductors. To avoid and minimize the potential electrocution of avian species, the project will be constructed in accordance with the Avian Power Line Interaction Committee's (APLIC) safety recommendations (reference (67)). These

recommendations minimize electrocution risk by providing adequate clearance from energized conductors to grounded surfaces and to other conductors.

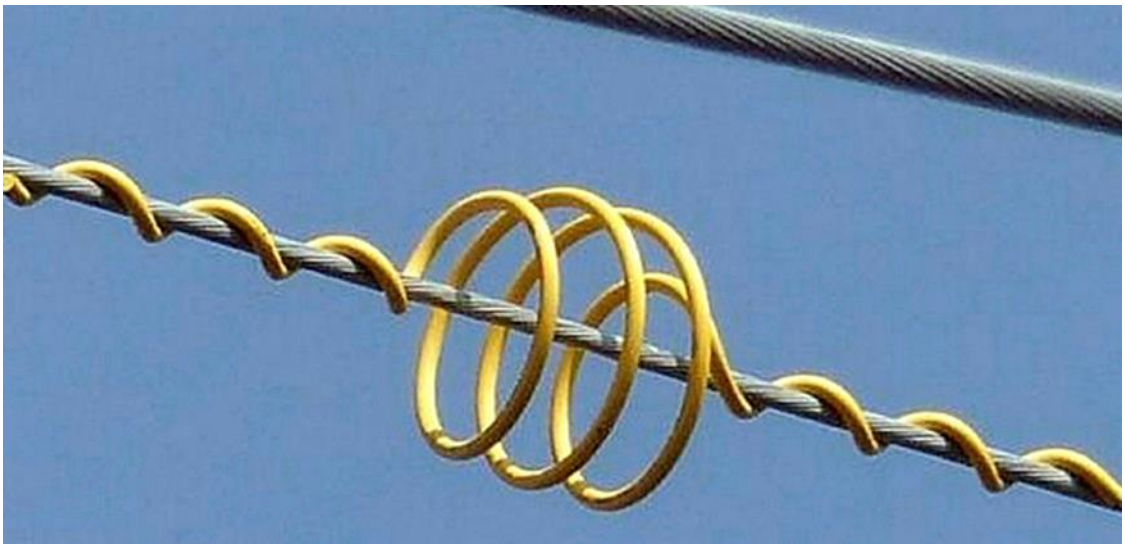
Independent of the electrocution risk, birds may be injured by colliding with transmission line structures and conductors. The collision risk is influenced by several factors including habitat, flyways, foraging areas, and bird size. Waterfowl, especially larger waterfowl such as swans and geese, are more likely to collide with transmission lines. The collision frequency increases when a transmission line is placed between agricultural fields that serve as feeding areas and wetlands or open water, which serve as resting areas. In these areas, it is likely that waterfowl and other birds would be traveling between different habitats, increasing the likelihood of a collision.

The potential long-term project impacts to wildlife are anticipated to be minimal. Potential wildlife impacts can be mitigated or minimized through a few strategies.

4.10.5.2 Mitigation Measures

Bird collisions with transmission lines can be mitigated by configuring the conductors in a single horizontal plane or through the use of bird flight diverters. Diverters enable birds to better see conductors during flight and avoid collisions with them. A typical diverter is shown Figure 4-7. Bird diverters will be installed across the PWI waterway crossings, in accordance with the DNR License to Cross Public Waters. The primary mitigation strategy is to avoid disturbing and placing structures within riparian areas.

Figure 4-7 Bird Flight Diverter



4.11 Rare and Unique Natural Resources

This chapter describes rare and unique natural resources, including federally and state protected species and sensitive ecological resources, which are present throughout the project's geographic area.

Federally endangered or threatened species are protected under Section 7 of the Endangered Species Act (ESA) of 1973. Data on federally protected species were reviewed using the USFWS Information for Planning and Consultation (IPaC) online tool.

State endangered or threatened species are protected under the Minnesota Endangered Species Statute (Minn. Statute 84.0895). The DNR Conservation Explorer online tool (License Agreement #2022-008) was used to assess the presence of sensitive ecological resources in the area. Sensitive ecological resources may provide habitat suitable for federal and/or state protected species.

4.11.1 Protected Species

4.11.1.1 Federally Protected Species

The USFWS IPaC online tool was queried on March 17, 2025, for a list of federally threatened and endangered species, proposed species, candidate species, and designated critical habitat that may be present within the vicinity of the project (Appendix I). The IPaC query identified six federal species that could potentially be in the vicinity of the project, including one endangered species, two threatened species, two proposed endangered species, and one proposed threatened species. These species and their typical habitats are summarized in Table 4-21.

The project does not traverse any federally designated critical habitat.

Table 4-21 Federal Species Potentially Present in the Vicinity of the Project

Scientific Name	Common Name	Federal Status	State Status	Habitat
Myotis septentrionalis	Northern Long-eared Bat	Endangered	Special concern	Forested habitat in active season; caves and mines during inactive season [1]
Perimyotis subflavus	Tricolored Bat	Proposed Endangered	Special concern	Forested habitat in active season; caves and mines during inactive season [2]
Danaus plexippus	Monarch Butterfly	Proposed Threatened	Not listed	Areas with a high number of flowering plants. Presence of milkweed (Asclepias spp.) to complete the caterpillar life stage [3]
Bombus suckleyi	Suckley's Cuckoo Bumble Bee	Proposed Endangered	Not listed	Areas with a high number of flowering plants during active season; overwinter a few inches below the soil surface in mesic hardwoods [4]
Lespedeza leptostachya	Prairie Bush-clover	Threatened	Threatened	Disturbed tallgrass prairie habitats and undisturbed remnant prairies [5]
Platanthera praeclara	Western Prairie Fringed Orchid	Threatened	Endangered	Moist tallgrass prairies and sedge meadows [6]

[1] Source: reference (68)
[2] Source: reference (69)
[3] Source: reference (70)
[4] Source: reference (71)
[5] Source: reference (72)
[6] Source: reference (73)

4.11.1.2 Impacts

Potential short-term impacts on federally protected wildlife species could occur during project construction, will be similar to those described for non-listed species in Chapter 4.10.5, and may include displacement of protected species during construction activities that generate noise, dust, or disturbance of habitat.

Impacts on northern long-eared bats could occur if clearing or construction takes place during the bat's active season when the species are breeding, foraging, or raising pups in forested habitat. Bats may be injured or killed if occupied trees are cleared during the active season, and the species may be disturbed during clearing or construction activities due to noise or human presence.

The tricolored bat is a federal proposed endangered species, which means that the USFWS has determined it is in danger of extinction throughout all or a significant portion of its range and has proposed a draft rule to list it as endangered. Until the rule to list this species is finalized, it is not protected by the take prohibitions of the federal ESA. Potential impacts to tricolored bats are similar to those described for northern long-eared bats.

The monarch butterfly is a federal candidate species, which means that it is a species for which the USFWS has sufficient information to propose listing them as endangered or threatened under the ESA, but their listing has not been finalized yet. Candidate species have no federal protection under the ESA.

The Suckley's cuckoo bumble bee is a federal proposed endangered species, which means that the USFWS has determined it is in danger of extinction throughout all or a significant portion of its range and has proposed a draft rule to list it as endangered. Until the rule to list this species is finalized, it is not protected by the take prohibitions of the federal ESA. Potential impacts to Suckley's cuckoo bumble bee could occur due to suitable habitat removal; however, impacts are anticipated to be minimal given the abundance of comparable habitat in the area.

The prairie bush-clover is a federally and state threatened species that inhabits isolated prairie habitats and remnant prairies on steep slopes. Potential impacts to the prairie bush-clover could occur due to disturbance of habitat during and after construction through physical clearing and herbicide application. However, since the project contains primarily agricultural land and regularly maintained ROW, the project is expected to have no effect on the prairie bush-clover due to the lack of suitable habitat.

The western prairie fringed orchid is a federally threatened species and state endangered species that inhabits remnant native plant communities. Potential impacts to the western prairie fringed orchid could occur due to disturbance of habitat during and after construction through physical clearing and herbicide application. However, since the project contains primarily agricultural land and regularly maintained ROW, the project is expected to have no effect on the western prairie fringed orchid due to the lack of suitable habitat.

4.11.1.3 Mitigation Measures

The primary means to mitigate potential impacts to federally protected species is to avoid routing through habitat utilized by these species. Additionally, impacts can be mitigated by incorporating species (or species type) specific BMPs in coordination with the USFWS. The applicant may be required to conduct field surveys for protected species in coordination with USFWS to determine the presence of particular species along the permitted route. If a protected species is unavoidable, a takings permit may be required, and other permit conditions may be set.

Impacts to northern long-eared bats could be minimized by consulting with USFWS on any necessary northern long-eared bat avoidance or mitigation measures.

4.11.2 State Protected Species

The applicant requested a DNR Natural Heritage Review in July 2023, to determine if any state endangered, threatened, or special concern species have been documented within 1 mile of the project. The NHIS database did not identify any state endangered, threatened, or special concern species within 1 mile of the project.

4.11.2.1 Impacts

No known state protected species have been documented within 1 mile of the project; therefore, no impacts to state protected species are anticipated as a result of the project.

4.11.2.2 Mitigation

Since there are no state protected species documented within 1 mile of the project, mitigation measures for state protected species are not proposed.

4.11.3 Sensitive Ecological Resources

The DNR has established several classifications for sensitive ecological resources across the state, with two being present within the project area (Map 4-9). Both the sensitive ecological resources, the Rost WPA and the Ulbricht WPA are located over one mile from the project. This area is shown in Map 4-9 but is not discussed further in this EA due to distance mitigating any potential for project-related impacts.

There are no state-mapped native plant communities, high conservation value forests, or Lakes of Biological Significance within 1 mile of the project.

4.11.3.1 Impacts

No known sensitive ecological resources have been documented within 1 mile of the project; therefore, no impacts to sensitive ecological resources are anticipated as a result of the project.

4.11.3.2 Mitigation Measures

Since there are no sensitive ecological resources documented within 1 mile of the project, mitigation measures for sensitive ecological resources are not proposed.

4.12 Use or Paralleling of Existing Right-of-Way

Sharing ROW with existing infrastructure minimizes fragmentation of the landscape and can minimize human and environmental impacts (e.g., aesthetic and agricultural impacts). The use and paralleling of existing transportation, pipeline, and electrical transmission systems or rights-of-way is one of the factors that the Commission considers when making a route permit decision (Minn. Rule 7850.4100). As discussed at the beginning of Chapter 3, ROW sharing is defined as co-locating the transmission line with other existing infrastructure ROW to partially share that existing ROW and lessen the overall easement width required for the project.

ROW-sharing opportunities exist for the entire length of the project in Minnesota, where the ROW for the route would be shared with 350th Ave, 780th St., 360th Ave, and 770th St., as depicted in Map 1-1.

4.13 Electric System Reliability

NERC has established mandatory reliability standards for American utilities. For new transmission lines, these standards require the utility to evaluate whether the grid would continue to operate adequately under various contingencies. The effects of these transmission contingencies on the system, and the transmission system's ability to serve load, must be monitored and managed by utilities. Route permits issued by the Commission require permittees to comply with NERC standards (Appendix E).

In developing possible project routes, the applicant analyzed whether these routes created reliability concerns. The applicant indicated that there are no reliability concerns with its proposed route and that this route supports and enhances the reliability of the regional electrical system. Thus, no adverse impacts to electric system reliability are anticipated.

4.14 Cost

As outlined in the RPA, the estimated project construction cost is between $13.5 and $18.8 million. Construction cost estimates rely on the best available information at the filing time of the RPA and include permitting, land acquisition and ROW, design/engineering, materials (e.g., steel, conductor, insulators, etc.), construction costs, and contingency. The cost estimate assumes the applicant will pay prevailing wages for applicable positions during project construction.

Once constructed, operation and maintenance costs associated with the new transmission line would be initially driven by controlling regrowth vegetation within the ROW. The estimated annual cost of ROW maintenance and operation is estimated to cost approximately $2,000 per mile. Storm restoration, annual inspections, and ordinary replacement costs are included in these annual operating and maintenance costs.

4.15 Cumulative Potential Effects

In Minnesota, cumulative potential effects are impacts on the environment that result from:

> *The incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects (Minn. Rule 4410.0200).*

Considering cumulative potential effects serves to assist decision-makers in avoiding decisions about a specific project in isolation. Effects that might seem minimal when viewed in the context of a single project can accumulate and become significant when the broader landscape of all projects is taken into account.

Cumulative effects are discussed for projects that have been planned or are otherwise foreseeable in the project area. The websites of several agencies/local governments were reviewed; these agencies included: the Minnesota Environmental Quality Board, the Commission, the Minnesota Department of Commerce, MnDOT, BWSR, MPCA, and DNR. In addition, the websites for Jackson County were reviewed.

Two projects considered for cumulative potential effects were identified in the project area – the Rost Substation and the Three Waters Wind project. As discussed in Chapter 1.2, Great River Energy has constructed the Rost substation. This project will connect to the Rost Substation at the western terminus of the proposed transmission line.

The Three Waters Wind Project is a potential wind farm in Jackson County, Minnesota (reference (74)). Map 4-12 provides the location of the Rost Substation and the Three Waters Wind project in relation to the project.

4.15.1 Human Settlements

Cumulative potential effects on human settlements are anticipated to be minimal. Future projects will result in aesthetic impacts. The Three Waters Wind project will result in large structures being visible in agricultural lands and along Interstate 90. At night, indicator lights would blink intermittently to notify low flying aircraft; however, the lights are not bright enough to cause noticeable light pollution.

The wind, transmission line, and substation projects are anticipated to minimally impact local zoning and land use, property values, noise, or cultural values.

4.15.2 Transportation and Public Services

Cumulative potential effects on transportation and public services are anticipated to have minimal to no impact. Transportation on local and township roads may have localized congestion as construction occurs if construction of the project overlaps with construction of the Three Waters Wind project.

4.15.3 Public Health and Safety

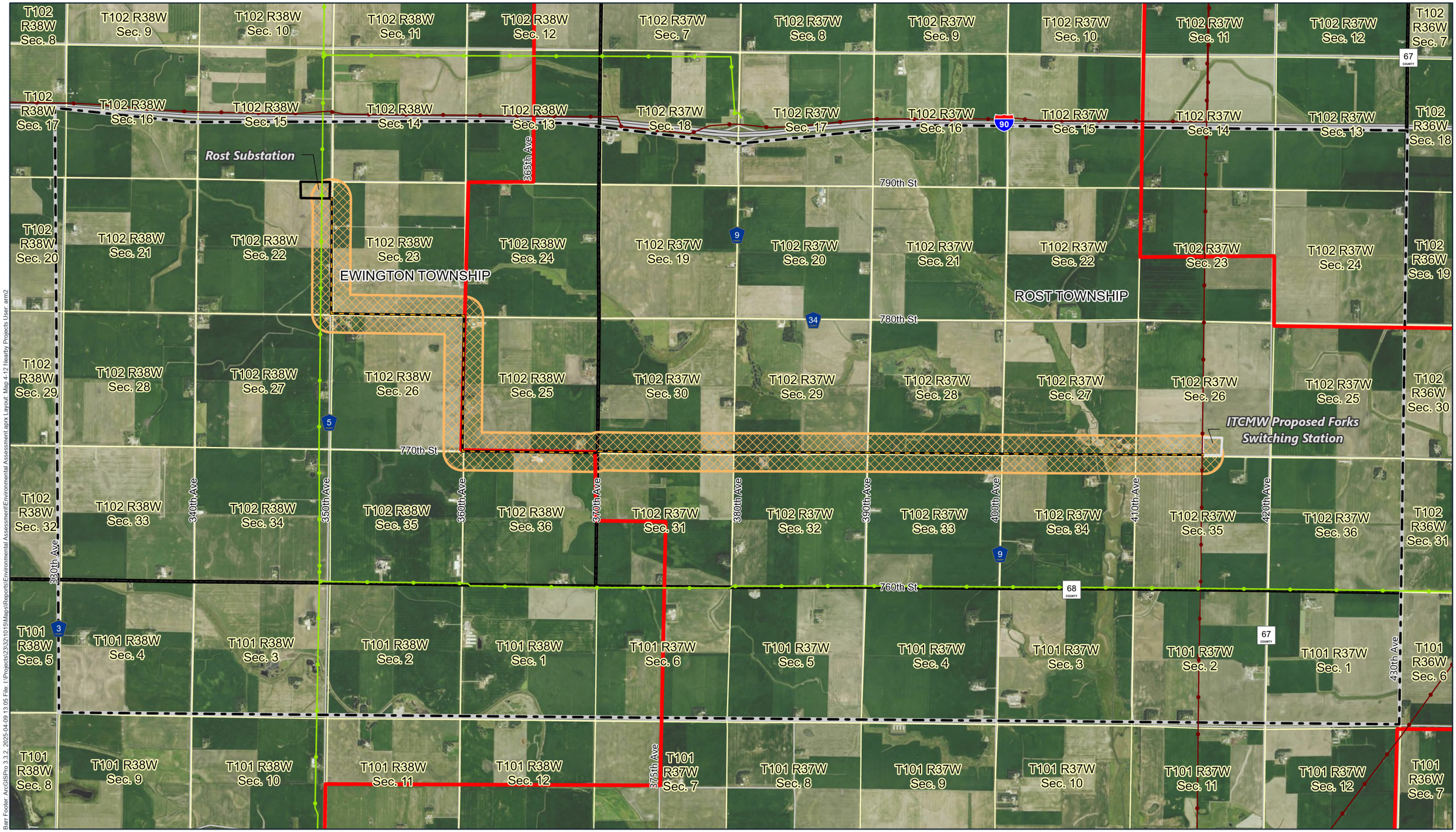
This project, in combination with the wind, transmission line, and substation projects, are not expected to create impacts to public health and safety. Because the Commission imposes a maximum electric field limit of 8 kV/m for new transmission projects, this project as well as the Rost Substation project will have to meet this permit condition. Accordingly, public health impacts related to induced voltages are anticipated to be minimal.

4.15.4 Climate and Air Quality

The project, in combination with the wind, transmission line, and substation projects will minimally impact the climate and air quality. When considered singularly, small amounts of emissions will be associated with each project due to the intermittent operation and maintenance activities of the project via mobile combustion and particulate roadway dust generation.

4.15.5 Land-Based Economies

Cumulative potential effects on land-based economies may occur but are anticipated to be minimal. The construction of wind turbines will necessitate taking small amounts of agricultural land out of production, which include the foundation and access road to the turbine; this is similar to construction of transmission structures.



Applicant's Proposed Alignment
Route Width (Proposed Route)
Forks-Rost Project Area
Three Rivers Project Area

Exsisting Transmission Lines
34kV - 115kV
116kV - 500kV

0 3,500 7,000
Feet

Map 4-12

NEARBY PROJECTS
Forks-Rost 161 kV Project

4.15.6 Archaeological and Historic Resources

The project does not contain known archaeological or historical properties within the ROW or the route width. Other historical features identified within one mile of the project are not considered eligible for preservation or have not been evaluated. The Three Waters Wind project, in its 2019 Site Permit Application, identified a number of potential historical structures and potential cultural resource sites. Most of the locations were not evaluated, some of the sites were listed as not eligible under NRHP, and numerous sites have not been evaluated (reference (75)). Therefore, the project in combination with the wind, and substation projects will minimally impact historical and cultural resources in the project area.

4.15.7 Natural Environment

The cumulative potential effects on the natural environment are expected to be minimal. Construction of the project will result in localized impacts to soil and water resources and will be mitigated by implementing BMPs to minimize impacts. Similarly, erosion control practices will be implemented during construction of the substation and wind projects. Wildlife may be temporarily displaced during construction, although quality wildlife habitat is minimal in the project area. Vegetation impacts are expected to be minimal since the transmission lines will be placed at the edge of agricultural fields, and wind turbines will be placed within agricultural fields.

This project could interact with the Three Waters Wind project to result in an increased potential for avian collisions with energy infrastructure. However, these projects intersect in an agricultural area, where transmission line infrastructure is limited and the potential for collisions are low. Furthermore, BMPs, such as bird flight diverters, would be used where necessary to reduce the potential for impacts.

4.15.8 Rare and Unique Natural Resources

The cumulative potential effects on rare and unique natural resources are expected to be minimal. The wind, transmission line, and substation projects are not within federally protected areas and not within critical habitats for threatened or endangered species.

5 Application of Routing Factors to the Project

The Commission is charged with locating transmission lines in a manner that is "compatible with environmental preservation and the efficient use of resources" and that minimizes "adverse human and environmental impact(s)" while ensuring electric power reliability (Minn. Statute 216E.02). Minn. Statute 216E.03, subdivision 7(b) identifies considerations that the Commission must consider when designating transmission lines routes.

Minn. Rule 7850.4100 lists 14 factors for the Commission to consider in its route permitting decisions, including impacts on human settlements, land-based economies, and the natural environment (see Factors Considered by the Commission for Transmission Line Route Permits sidebar). Through an analysis of the routing factors, this chapter presents the merits of the applicant's proposed route.

Many of the project impacts relative to the applicable routing factors are anticipated to be avoided or minimized by the (1) route selection, (2) general and special conditions in the Commission's route permit, (3) prudent transmission structure placement and placement of the alignment within the permitted route, and (4) the requirements of "downstream" permits such as the construction stormwater permit.

The discussion here focuses on the first 12 routing factors (See Minn. Rule 7850.4100, factors A through L). Routing factors M and N— the unavoidable and irreversible impacts of the project—are discussed at the end of this chapter.

Routing factor G ("mitigate adverse environmental impacts") has several parts and speaks generally to environmental impacts. For purposes of discussion here, and with respect to routing factor G, it is assumed that all routing alternatives are equal with regard to maximizing energy efficiencies and accommodating expansion of transmission capacity. With respect to environmental impacts, the examination of such impacts suggested by routing factor G is included in the discussion of other routing factors and elements that more specifically address an environmental impact (e.g., effects on vegetation and wildlife, routing factor E).

Routing factor I, the use of existing large electric power generating plant sites, is not relevant to this project and is not discussed further.

Finally, routing factors H and J address similar issues, the use or paralleling of existing rights-of-way. Routing factor H relates to the use or paralleling of existing rights-of-way but also includes items

Factors Considered by the Commission for Transmission Line Route Permits

To determine whether to issue a route permit for a high-voltage transmission line, the Commission shall consider the following factors of Minnesota Rules, part 7850.4100:

A. Effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services.

B. Effects on public health and safety.

C. Effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining.

D. Effects on archaeological and historic resources.

E. Effects on the natural environment, including effects on air and water quality resources and flora and fauna.

F. Effects on rare and unique natural resources.

G. Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity.

H. Use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries.

I. Use of existing large electric power generating plant sites.

J. Use of existing transportation, pipeline, and electrical transmission systems or rights-of-way.

K. Electrical system reliability.

L. Costs of constructing, operating, and maintaining the facility which are dependent on design and route.

M. Adverse human and natural environmental effects which cannot be avoided.

N. Irreversible and irretrievable commitments of resources.

that do not have a ROW, such as survey lines, natural division lines, and agricultural field boundaries. Routing factor J relates to the use of existing transportation, pipeline, and electrical transmission rights-of-way. Within this chapter, these factors are considered similarly—the use or paralleling of existing rights-of-way and where there is infrastructure that has a ROW. However, the discussion here emphasizes existing transmission line ROW usage as opposed to other infrastructure ROW.

5.1 Applicant's Proposed Route

The potential impacts of the applicant's proposed route are summarized in Table 5-1 and described further in Chapters 5.1.1 through 5.1.6. Those elements with minimal or no potential to be impacted by the project are not discussed in this Chapter.

Table 5-1 Human and Environmental Impacts of the Applicant's Proposed Route

8.5	Element	Applicant's Proposed Route
Length (miles)		8.5
Human Settlement	Residences within 0-50 feet (count)	0
	Residences within 50-250 feet (count)	4
	Residences within 250-500 feet (count)	2
	Residences within 500-1,000 feet (count)	3
Environmental Justice	Communities of EJ concern crossed by the 100-ft ROW (count)	0
Land-Based Economies	Agricultural land in 100-ft ROW (acres) and Forks Switching Station	67
Archaeological and Historic Resources	Archaeological sites in route width (count)	0
	Historic resources in route width (count)	1 (not eligible)
Water Resources	Stream crossings (count)	3
	PWI crossings (count)	2
	Desktop delineated wetland crossings (count)	9
	Total desktop delineated wetlands in 100-foot ROW (acres)	11.05
Vegetation	Forested landcover in 100-foot ROW (acres)	0
Wildlife	Wildlife Management Areas in 100-foot ROW (acres)	0
	Scientific and Natural Areas in 100-foot ROW (acres)	0
	Potential for Federal- or state-protected species in 100-foot ROW (count)	2
ROW Sharing and Paralleling	Transmission line (miles, percent)	0.86 (10)
	Roadway (miles, percent)	8.5 (100)
	Field, parcel, or section lines (miles, percent)	8.5 (100)
	Total ROW sharing and paralleling (miles, percent)	8.5 (100)
Estimated Cost	Total estimated cost (million)	$13.5- $18.8

5.1.1 Human Settlements

Potential impacts on human settlements are assessed through an evaluation of several elements, as discussed in Chapter 4.3. For most of the human settlement elements, project impacts are anticipated to be minimal. Analysis of impacts on human settlements focuses on those elements where impacts have the potential to occur, which for the project includes aesthetics.

5.1.1.1 Aesthetics

Aesthetic impacts are assessed, in part, through a consideration of the existing viewshed, landscape, may change these aesthetic attributes. Determining the relative scenic value or visual importance in any given area depends, in large part, on the values and expectations held by individuals and communities about the aesthetic resource in question.

Based on the project's proximity to residences, aesthetic impacts may occur as a result of the project. Four residences are located between 50 and 250 feet of the applicant's proposed route. The project will result in the introduction of new infrastructure in a relatively rural area. However, aesthetic impacts may be minimized by sharing existing road and 69 kV transmission line rights-of-way. The applicant has also committed to minimizing permanent impacts to the aesthetics and visual character of the area by avoiding and/or minimizing tree clearing and avoiding residential areas to the extent practicable.

5.1.2 Land-Based Economies

Potential impacts to land-based economies are assessed through an evaluation of the elements discussed in Chapter 4.8. The project will minimally impact the majority of elements considered under land-based economies. Potential agricultural impacts that may occur as a result of the project are discussed further.

5.1.2.1 Agriculture

According to the NLCD, there are 55.5 acres of agricultural land within the ROW. This agricultural land is comprised of hay/pastureland and cultivated crop land and equates to 54.4 percent of the total land cover within the ROW. In addition, there are 11.8 acres of agricultural land within the Forks Switching Station. Permanent impacts to agriculture as a result of the project include loss of farmland due to the Forks Switching Station and structure placement in agricultural fields which can restrict certain types of farming equipment. Impacts to agricultural operations have been mitigated by proposing a project that primarily follows existing roadway ROW. Additionally, the applicant will work with landowners regarding compensation for any unintended impacts (e.g., repair of drain tile).

5.1.3 Archaeological and Historic Resources

A review of the MnSHIP portal indicates that there is one previously inventoried historic resources located within the route width, Bridge L9312/JK-RST-00011. This timber slab bridge, constructed in 1970, crosses the Little Sioux River along 770th street. This resource is not eligible for the NRHP (reference (55)). Therefore, the project does not have the potential to alter this resource's setting, feeling, appearance, and/or association.

5.1.4 Natural Environment

Potential impacts to the natural environment are assessed by looking at several specific elements as described in Chapter 4.10. For some of the elements of the natural environment, impacts from the project

are anticipated to be minimal and are therefore not discussed in this Chapter. This Chapter addresses those elements that do have the potential to be impacted by the project – water resources, vegetation, and wildlife.

5.1.4.1 Water Resources

The project crosses two streams that are identified as public waters – Judicial Ditch 28 and the Little Sioux River– as well as one non-public water stream. In addition, nine wetlands totaling approximately 11.05 acres are located in the project ROW. However, it is anticipated that impacts on water courses and wetlands will be avoided by adjusting structure locations to avoid disturbing the streams and wetlands. No stream or wetland crossing will be greater than 1,000 feet, meaning all stream crossings can be spanned to avoid placing a structure within these resources. In addition, the project will develop a SWPPP that identifies BMPs to be implemented during construction to minimize erosion and sedimentation impacts to surface waters. The applicant will also work with the DNR to obtain appropriate approvals for public water crossings.

5.1.4.2 Vegetation

Present-day vegetation consists of herbaceous agricultural vegetation, cultivated crops, hay and pasture land, and developed lands. Project construction will result in short-term impacts on existing vegetation, including localized physical disturbance and soil compaction. Development and use of access roads, staging, and stringing areas for the project will also have short-term impacts on vegetation by concentrating surface disturbance and equipment use. Permanent vegetation clearing will be required in the designated structure installation areas, resulting in an impact area measuring up to 5 feet in diameter for typical structures and up to 12 feet in diameter for dead-end and angle structures. Construction will also result in long-term impacts to vegetation by permanently removing taller-growing woody vegetation within the ROW.

Mitigation will include following existing road ROW, limiting new access road construction, constructing during fall and winter months to limit vegetation damage, leaving or replanting compatible vegetation at the edge of the transmission line ROW, replanting the transmission line ROW outside of active farmed areas with low-growing, native species, and limiting vehicle traffic to roads along the ROW and within previously disturbed areas.

5.1.4.3 Wildlife

Wildlife in the general vicinity consists of songbirds, raptors, and small mammals. In addition, Minnesota is in the Central Flyway of North America. Migratory birds use portions of the Central Flyway as resting grounds during spring and fall migration, as well as breeding and nesting grounds throughout the summer. Within and near the project, there is limited suitable habitat for migratory birds. Migratory birds are protected under the MBTA.

For non-avian wildlife, construction activities that generate noise, dust, or disturbance may result in short-term, indirect impacts. During project construction, wildlife will generally be displaced within the ROW. Potential impacts to avian species (e.g., songbirds, raptors, and waterfowl) include those described for non-avian species, and also include impacts due to electrocution and collision with transmission line conductors. Independent of the electrocution risk, birds may be injured by colliding with transmission line structures and conductors. Collision risk is influenced by several factors including habitat, flyways, foraging areas, and bird size.

The primary mitigation strategy is to avoid disturbing and placing structures within riparian areas and wetlands. Bird collisions with transmission lines can be mitigated by configuring the conductors in a single horizontal plane or through the use of bird flight diverters.

5.1.5 Rare and Unique Natural Resources

There are six documented federally listed species within 1 mile of the applicant's proposed route. The northern long-eared bat and tricolored bat have the potential to be within the 100-foot ROW and, if present, could potentially be directly impacted by the project if trees are removed during the active nesting period. Impacts on northern long-eared bats and tricolored bats could be minimized by conducting clearing tree activities while the bats are hibernating during their inactive season and avoiding tree removal from June 1 through August 15.

5.1.6 Use of Existing Rights-of-Way

Sharing ROW with existing infrastructure minimizes fragmentation of the landscape and can minimize human and environmental impacts (e.g., aesthetic and agricultural impacts). The project shares ROW for the entire length of the project; the ROW for the route will be shared with the existing road ROW along 350th Ave, 780th St., 360th Ave, and 770th St.

5.2 Summary of Project-Specific Routing Factors

The discussion here uses text and a color graphic to summarize the relative merits of the applicant's proposed route (Table 5-2). The color graphic and related notes for a specific routing factor or element are not meant to suggest that accommodations and/or changes need to be made to the route but are provided as a relative comparison to be evaluated together with all other routing factors. For example, if the applicant's proposed route is "red" for a particular factor or element, this is not meant to indicate a fatal flaw within the proposed route.

For routing factors that express the state of Minnesota's interest in the efficient use of resources (e.g., the use and paralleling of existing rights-of-way), the graphic represents the consistency of the route with these interests. For the remaining routing factors, the graphic represents the magnitude of the anticipated impacts.

Table 5-2 Guide to Relative Merits of the Applicant's Proposed Route

Anticipated Impacts or Consistency with Routing Factor	Symbol
Minimal: Impacts are anticipated to be minimal with mitigation – OR – route option is very consistent with this routing factor.	
Moderate: Impacts are anticipated to be minimal to moderate with mitigation; special permit conditions may be required for mitigation – OR – the route may not be the least impactful with respect to the routing factor.	
Significant: Impacts are anticipated to be moderate to significant and likely unable to be mitigated – OR – route alternative is not consistent with the routing factor or consistent only in part. Indicates that the route is impactful with respect to the routing factor.	

5.2.1 Routing Factors for which Impacts are Anticipated to be Minimal

Potential impacts are anticipated to be minimal for the following routing factors and elements:

- Impacts on human settlements (factor A) – displacement, environmental justice communities, noise, property values, electronic interference, cultural values, zoning and land-use compatibility, and public services.
- Impacts on public health and safety (factor B) – EMF, implantable medical devices, stray voltage, induced voltage, and air quality.
- Impacts on land-based economies (factor C) – forestry, mining, and recreation and tourism.
- Impacts on archaeological and historic resources (factor D).
- Impacts on rare and unique natural resources (factor F) – federal- and state-protected species.
- Impacts on electric system reliability (factor K).
- Costs that are dependent on design and route (factor L).

5.2.2 Routing Factors for which Impacts may be Minimal to Moderate

Potential impacts are anticipated to be minimal to moderate for the following routing factors and elements:

- Impacts on human settlements (factor A) – aesthetics.
- Impacts on land-based economies (factor C) – agriculture
- Impacts on the natural environment (factor E) – water resources, vegetation (flora), and wildlife (fauna).
- Impacts on rare and unique natural resources (factor F) – sensitive ecological resources.
- Use or paralleling of existing rights-of-way (factors H and J).

The relative merits of the applicant's proposed route is included in Table 5-3.

Table 5-3 Summary of Routing Factors for the Applicant's Proposed Route

Routing Factor/Resource	Applicant's Proposed Route	Summary
A. Human Settlement – Displacement, Noise, Aesthetics, Cultural Values, Recreation, and Public Services		There are four residences located between 50 and 250 feet of the applicant's proposed route. Some tree clearing along the ROW may occur. The project will result in a viewshed change for the area.
B. Public Health and Safety		No impacts to public health and safety are anticipated as a result of the project.

Routing Factor/Resource	Applicant's Proposed Route	Summary
C. Land-based Economies – Agriculture, Forestry, Tourism, and Mining		Permanent impacts to agriculture as a result of the project may include loss of farmland due to construction of the Forks Switching Station and structure placement in agricultural fields and restriction of farming equipment. Impacts to agricultural operations have been mitigated by proposing a project that follows existing roadway ROW entirely.
D. Archaeological and Historic Resources		No impacts to archaeological and historic resources are anticipated as a result of the project.
E. Natural Environment – Air and Water Quality Resources and Flora and Fauna		Impacts to water courses and wetlands will be avoided by adjusting structure locations to avoid impacting streams and wetlands. Project construction will result in short- and long-term impacts to existing vegetation. Short-term impacts to non-avian wildlife may occur. Avian electrocution and/or collision may occur as a result of the project.
F. Rare and Unique Natural Resources		The project may result in impacts to northern long eared bats if they are present in the ROW; however, this can be mitigated by conducting clearing activities while the bats are hibernating during their inactive season and avoiding tree removal from June 1 through August 15.
G. Application of Design Options that Maximize Energy Efficiencies, Mitigate Adverse Environmental Effects, and could Accommodate Expansion of Transmission or Generating Capacity		The project has been designed to maximize energy efficiencies and mitigate adverse environmental effects.
H. Use or Paralleling of Existing Rights-of-Way, Survey Lines, Natural Division Lines, and Agricultural Field Boundaries		The project parallels existing road ROW for 100 percent of its length.
J. Use of Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-of-Way		The project parallels existing road ROW for 100 percent of its length.
K. Electrical System Reliability		The project supports electrical system reliability.
L. Costs of Construction, Operating, and Maintaining the Facility which are Dependent on Design and Route		The project has been designed to minimize construction and operating costs to the extent possible.
M. Adverse Human and Natural Environmental Effects which Cannot be Avoided		Unavoidable adverse human and environmental effects have been minimized to the extent possible.
N. Irreversible and Irretrievable Commitments of Resources		Irreversible and irretrievable commitments of resources have been minimized to the extent possible.

5.3 Unavoidable Impacts

Transmission lines are large infrastructure projects that can have adverse human and environmental impacts. Even with mitigation strategies, there are adverse project impacts that cannot be avoided.

Aesthetic impacts cannot be avoided. The project will introduce new transmission line structures, conductors, and a switching station into project area viewsheds. These project features will be visible; therefore, they will have an adverse aesthetic impact, though it will be minimized by paralleling existing infrastructure. Temporary construction-related impacts also cannot be avoided. These include construction-related noise and dust generation and disruption of traffic near construction sites.

While the project will parallel existing infrastructure to the extent practicable, impacts on agriculture cannot be completely avoided. The project requires the construction of the Forks Switching Station, the placement of concrete footings, and the construction of transmission line structures on agricultural land. Potential impacts include loss of tillable acreage and constraints on the layout and management of field operations.

Finally, impacts on the natural environment cannot be avoided. Even if impacts can be limited to the transmission line's ROW, construction and operation of the transmission line will require minor tree removal and brush trimming, as well as clearing at structure sites. These are unavoidable impacts on vegetation. Transmission line conductors can adversely affect avian species by creating opportunities for collisions with the conductors. These collisions could occur despite mitigation strategies such as the use of bird flight diverters.

5.4 Irreversible and Irretrievable Impacts

The commitment of a resource is irreversible when it is impossible or very difficult to redirect that resource for a different future use. An irretrievable commitment refers to the use or consumption of a resource such that it is not recoverable for later use by future generations. These types of commitments are anticipated to occur for the project.

The commitment of land for a transmission line ROW is likely an irreversible commitment. In general, lands in the rights-of-way of large infrastructure projects such as railroads, highways, and transmission lines remain committed to these projects for a relatively long period of time.

Even in instances where a ROW is abandoned, the land within the ROW is typically repurposed for a different infrastructure use, such as a rails-to-trails program, and is not returned to a previous land use. This said, transmission line rights-of-way can be returned to a previous use (e.g., row crop, pasture) by the removal of structures and structure foundations to a depth that supports this use.

There are few commitments of resources associated with the project that are irretrievable. These commitments include the steel, concrete, and hydrocarbon resources committed to the project, though it is possible that the steel could be recycled at some point in the future. Labor and fiscal resources required for the project are also irretrievable commitments.

6 References

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Appendices

Appendix A

Project Scoping Decision

COMMERCE DEPARTMENT

In the Matter of the Application of ITC Midwest LLC for a Route Permit for the Forks 161 kV Switching Station and Forks-Rost Transmission 161 kV Transmission Line in Jackson County, Minnesota

ENVIRONMENTAL ASSESSMENT SCOPING DECISION

DOCKET NO. ET-6675/TL-24-232

The above matter has come before the Commissioner of the Department of Commerce (Department) for a decision on the scope of the environmental assessment (EA) that will be prepared for the Forks 161 kV Switching Station and Forks-Rost 161 kilovolt (kV) transmission line project proposed by ITC Midwest LLC (applicant) in Jackson County, Minnesota.

Project Description

On September 30, 2024, ITC Midwest LLC ("ITC" or "applicant"), filed a route permit application for the Forks 161 kV Switching Station and Forks-Rost 161 kV Transmission Line Project in Jackson County, Minnesota.[1] The project includes construction of approximately 8.5 miles of new 161 kV transmission line starting at a new Rost Substation and terminating at a new Forks Switching Station. The new 161 kV transmission line and Forks Switching Station will be constructed by ITC Midwest. The Rost Substation will be permitted and constructed separately by GRE.[2]

The 161 kV transmission line will consist of a single-circuit, braced post monopole steel structures, spaced approximately 600 to 800 feet apart. ITC is requesting a route width of up to 1,500 feet (750 feet on either side of the proposed transmission line centerline) to provide flexibility to make alignment adjustments during the final right-of-way design to work with landowners, to avoid sensitive natural resources, and to manage construction constraints as necessary. Within the route, the transmission line will require a right-of-way width of 100 feet (typically 50 feet on each side of the transmission line centerline) and in some cases up to 150 feet wide.[3]

Project Purpose

The applicant indicates that the proposed project is the result of a joint study between ITC Midwest, Great River Energy (GRE) and Missouri River Energy Services (MRES) to determine long-term reliability and load serving needs for the Worthington area and to identify potential upgrades that may be needed to the transmission system for area reliability.

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[1] Route Permit Application for the Forks 161 kV Switching Station and Forks-Rost 161 kV Transmission Line Project, ITC Midwest LLC, September 30, 2024, eDockets Numbers – Filing Letter 20249-210581-01; Application (Text) and Appendix A (Completeness Checklist) 20249-210581-02; Appendix B (Project Route Maps); 20249-210581-03, 20249-210581-04; Appendices C (90-day Pre-Application Letter to Local Units of Government) & D (Notice of Intent to File a Route Permit Application Under the Alternative Route Permit Process) 20249-210581-05; Appendix E (Wetland and Other Waters Delineation Report) Part 1 of 2; 20249-210581-06; Part 2 0f 2; 20249-210581-07; Appendix F (Agency and Tribal Outreach) 20249-210581-08; Appendix G (Natural Heritage Information System, USFWS Species List and Phase 1a Cultural Resources Literature Search) Trade Secret (4 parts) 20249-210582-01, 20249-210582-02; 20249-210582-03 and 20249-210582-04; Public Part 20249-210582-05; Appendix H (Open House Materials), Appendix I (Affected Landowner List), Appendix J (Agricultural Impact Mitigation Plan) and Appendix K (Vegetation Management Plan) 20249-210582-06;

[2] Id. Page 6.

[3] Id. P. 7.

The existing transmission configuration in the Worthington area leaves the system susceptible to low voltage conditions when certain transmission facilities are out of service. The Forks-Rost 161 kV transmission line and Forks Switching Station are components of an overall plan with complementary projects that will ensure electrical reliability and resilience in the area's transmission system.[4]

Regulatory Background

In Minnesota, no person may construct a high voltage transmission line without a route permit from the Commission. A high voltage transmission line is defined as a conductor of electric energy designed for and capable of operation at a voltage of 100 kV or more and greater than 1,500 feet in length. The proposed project will consist of approximately 8.5 miles of 161 kV transmission line and therefore requires a route permit from the Commission.

Department Energy Environmental Review and Analysis (EERA) staff is responsible for conducting environmental review of route permit applications on behalf of the Commission.[5] EERA staff will prepare an environmental assessment (EA) that will inform Commission decisions on the applicant's route permit application. The first step in preparing the EA is scoping. The purpose of scoping is to provide citizens, local governments, tribal governments, and agencies an opportunity to focus the EA on those issues and alternatives that are relevant to the proposed project.

Scoping Process

The EA scoping process has two primary purposes: (1) to gather public input on the impacts, mitigation measures, and alternatives to study in the EA, and (2) to focus the EA on those impacts, mitigation measures, and alternatives that will aid in the Commission's decision on the route permit. EERA staff gathered input on the EA scope through two public meetings and an associated comment period. This scoping decision identifies potential impacts and mitigation measures that will be analyzed in the EA.

Public Scoping Meetings

Commission and EERA staff held two public information and EA scoping meetings. One meeting was in-person, and one meeting was virtual. The in-person meeting was held on Wednesday, December 4, 2024, at the Lakefield Community Center, Lakefield, Minnesota. Approximately 20 members of the public attended this meeting. The virtual meeting was held on Wednesday, December 10, 2024. One member of the public attended the virtual meeting.

Public Meeting Comments (December 4, 2024)

The following individuals provided comments and are summarized as follows:

John Dorn

Mr. Dorn inquired about liability in the event of an incident associated with infrastructure project on a landowner's property.[6]

[4] Application, part 1.4, page 3, See eDocket No. 20249-210581-02.
[5] Minnesota Statute 216E.04.
[6] Scoping Comments [eDocket No. 202412-213293-01 , p. 23]

Fred Diemer
Mr. Diemer inquired about electric and magnetic field standards and health effects associated with transmission lines.[7]

Shawna Diemer
Ms. Diemer inquired as to where they can locate studies on electric and magnetic fields.[8]

Virtual Meeting (December 10, 2024)

Roger Pohlman
Mr. Pohlman (Jackson County Commissioner), inquired about the acceptable distance from people's homes and residences to the transmission line. Mr. Pohlman also addressed drainage ditches and field drainage for farmers and asked if damage to agricultural fields would be repaired or farmers compensated.[9]

Written Comments

A 36-day comment period, which began on November 19, 2024, and closed on December 24, 2024, provided the public an opportunity to submit comments to EERA staff on potential impacts and mitigation measures for consideration during the EA scope development process.

The Minnesota Department of Natural (MnDNR) provided comments,[10] including an attachment from the Minnesota Natural Heritage information System.[11] Comments from MDNR noted the following:

1. The presence of a calcareous fen in the project area. MnDNR requested that the applicant prepare a calcareous fen management plan if the project will impact the fen.
2. The possible need for flight diverters at river crossings, fragmented forested patches and near lakes and wetlands.
3. The need to utilize downlit and shielded lighting to minimize blue hue, if the project requires lighting.
4. Avoidance of products containing calcium chloride or magnesium which are used for dust control.
5. The use of erosion control blankets should be limited to "bio-netting" or "natural netting" types, and specifically not products containing plastic mesh netting or other plastic components.

[7] *Id*., p. 29.
[8] *Id*., p. 29.
[9] Scoping Comments [eDocket No. 202412-213294-01, p. 21]
[10] Minnesota Department of Natural Resources, [eDocket No. 202412-213319-01].
[11] MnDNR-Natural Heritage Information System, [eDocket No.202412-213319-02].

Route and Route Segment Proposals

No commenters proposed any new route or route segments for consideration in the EA. EERA staff is not proposing any modifications to ITC Midwest's proposed transmission line route.

Commission Review

On January 8, 2025, EERA staff provided the Commission with a summary of the EA scoping process.[12] The summary noted that no route alternatives were proposed during the scoping process and recommended that the EA evaluate solely the route proposed by the applicant. On January 21, 2025, the Commission agreed with EERA staff and authorized EERA to include only the applicant's proposed route for analysis in the EA.[13]

HAVING REVIEWED THE MATTER, consulted with Department staff, and in accordance with Minnesota Rule 7850.3700, I hereby make the following scoping decision:

MATTERS TO BE ADDRESSED

The issues outlined below will be analyzed in the EA for the proposed ITC Midwest Forks-Rost 161 kV transmission line project. The EA will describe the project and the human and environmental resources of the project area and will provide information on the potential project impacts as they relate to the topics outlined in this scoping decision, as well as possible mitigation measures. It will identify impacts that cannot be avoided, irretrievable commitments of resources, as well as permits from other government entities that may be required for the project. The EA will discuss the relative merits of the applicant's proposed route using the routing factors found in Minnesota Rule 7850.4100.

I. GENERAL DESCRIPTION OF THE PROJECT

- A. Project Description
- B. Project Purpose
- C. Route Description
  1. Route Width
  2. Right-of-Way
- D. Project Costs

II. REGULATORY FRAMEWORK

- A. High Voltage Transmission Line Route Permit
- B. Environmental Review Process
- C. Other Permits and Approvals

[12] January 8, 2024, Minnesota Department of Commerce, EERA Comments and Recommendations on the Scoping Process and Routing Alternatives for the Forks-Rost 161 kV Transmission Line Project [eDocket No. 20251-213673-01].
[13] Commission Order, January 21, 2025, [eDocket No. 20251-214165-01].

III. ENGINEERING AND DESIGN

A. Transmission Line Structures
B. Transmission Line Conductors

IV. CONSTRUCTION

A. Right-of-Way Acquisition
B. Construction
C. Restoration
D. Damage Compensation
E. Operation and Maintenance

V. AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATIVE MEASURES

The EA will include a discussion of the human and environmental resources potentially impacted by the proposed project and the routing alternatives described herein (Section VI). Potential impacts, both positive and negative, of both the project and each alternative will be described. The EA will describe mitigation measures that could reasonably be implemented to reduce or eliminate the identified impacts. The EA will also describe any unavoidable impacts resulting from proposed project implementation.

The EA data and analyses will be commensurate with the importance of potential impacts and the relevance of the information for consideration of mitigation measures. Additionally, EERA staff will consider the relationship between the cost of data and analyses and the relevance and importance of the information in determining the level of detail of information to be prepared for the EA. Less important material may be summarized, consolidated, or simply referenced.

If relevant information cannot be obtained within timelines prescribed by statute and rule, or if the costs of obtaining such information is excessive, or the means to obtain it is not known, EERA staff will include a statement in the EA that such information is incomplete or unavailable and the relevance of that information in evaluating potential impacts.

A. Environmental Setting
B. Human Settlements
    1. Noise
    2. Aesthetics
    3. Displacement
    4. Property Values
    5. Socioeconomics / Environmental Justice
    6. Zoning and Land Use Compatibility
    7. Public Services
    8. Electronic Interference
C. Public Health and Safety
    1. Electric and Magnetic Fields
    2. Implantable Medical Devices
    3. Stray Voltage
    4. Induced Voltage

D. Land Based Economies
    1. Agriculture
    2. Forestry
    3. Mining
    4. Recreation and Tourism
E. Archaeological and Historic Resources
F. Natural Environment
    1. Air Quality
    2. Climate Change and Project Climate Change Resilience
    3. Water Resources
    4. Soils
    5. Vegetation
    6. Wildlife
G. Threatened / Endangered / Rare and Unique Natural Resources
H. Electric System Reliability
I. Operation and Maintenance Costs that are Design Dependent
J. Adverse Impacts that Cannot be Avoided
K. Irreversible and Irretrievable Commitments of Resources
L. Cumulative Potential Effects

VI. ROUTES AND ROUTE ALTERNATIVES TO BE EVALUATED IN THE ENVIRONMENTAL ASSESSMENT

The EA will evaluate the route proposed in the applicant's route permit application.

VII. IDENTIFICATION OF PERMITS

The EA will include a list and description of permits from other government entities that may be required for the proposed project.

ISSUES OUTSIDE THE SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The EA will not consider the following:

A. Any route, route segment, or alignment alternative not specifically identified for study in this scoping decision.
B. Policy issues concerning whether utilities or local governments should be liable for the cost to relocate utility poles when roadways are widened.
C. The way landowners are paid for transmission line right-of-way easements.

SCHEDULE

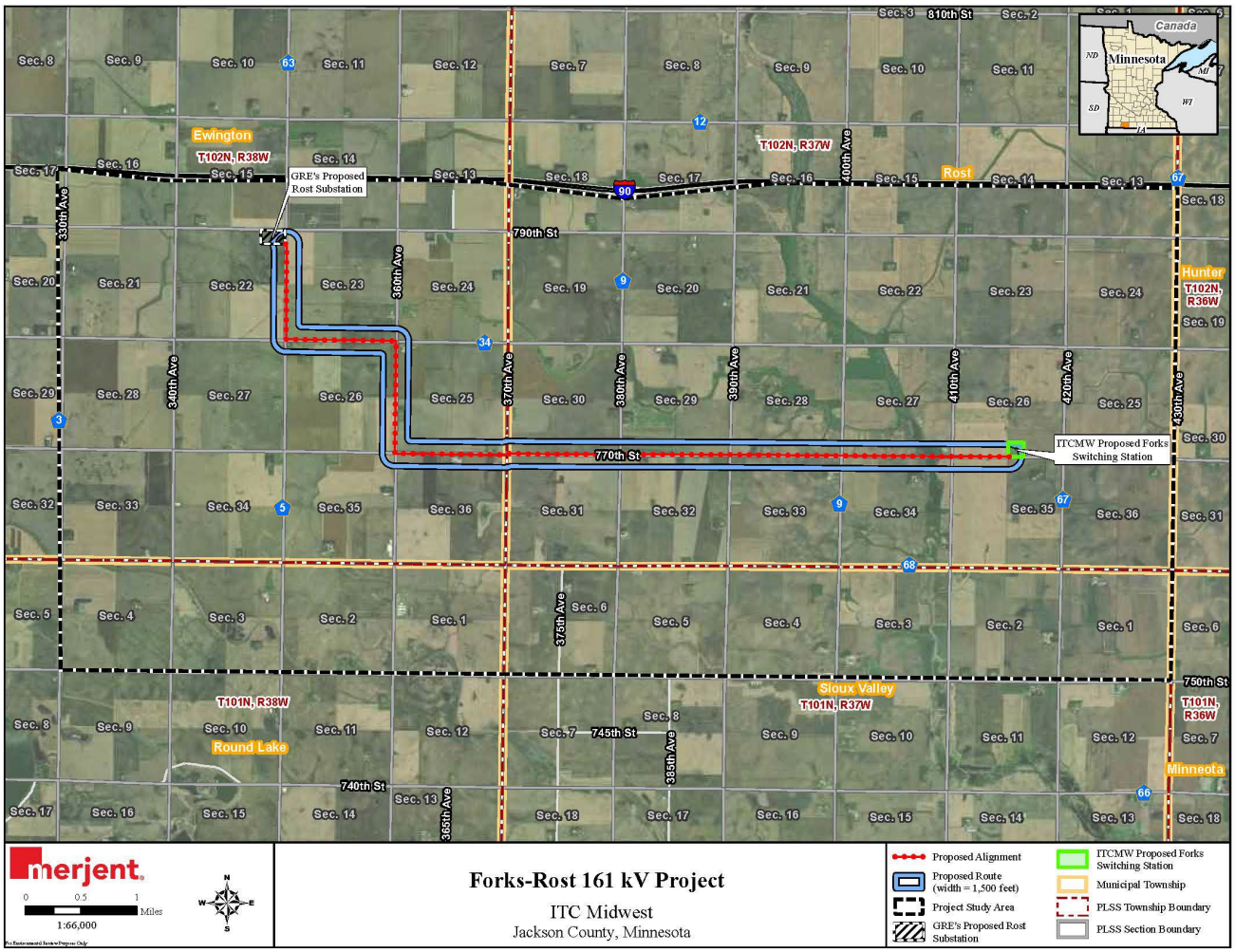
The EA is anticipated to be completed and available in May 2025. Public hearings will be held in the project area after issuance of the EA. Comments on the EA may be submitted into the hearing record.

Signed this 10th day of February, 2025

STATE OF MINNESOTA
DEPARTMENT OF COMMERCE

_____
Pete Wyckoff, Deputy Commissioner

Project Overview Map



CERTIFICATE OF SERVICE

I, Sharon Ferguson, hereby certify that I have this day, served copies of the following document on the attached list of persons by electronic filing, certified mail, e-mail, or by depositing a true and correct copy thereof properly enveloped with postage paid in the United States Mail at St. Paul, Minnesota.

Minnesota Department of Commerce
Environmental Assessment Scoping Decision

Docket No. ET6675/TL-24-232

Dated this **13th** day of **February 2025**

/s/Sharon Ferguson

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
1	Katherine	Arnold	katherine.arnold@ag.state.mn.us		Office of the Attorney General - Department of Commerce	445 Minnesota Street Suite 1400 St. Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
2	Generic	Commerce Attorneys	commerce.attorneys@ag.state.mn.us		Office of the Attorney General - Department of Commerce	445 Minnesota Street Suite 1400 St. Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
3	Bret	Eknes	bret.eknes@state.mn.us		Public Utilities Commission	Suite 350 121 7th Place East St. Paul MN, 55101-2147 United States	Electronic Service		No	24-232Official CC Service List
4	Sharon	Ferguson	sharon.ferguson@state.mn.us		Department of Commerce	85 7th Place E Ste 280 Saint Paul MN, 55101-2198 United States	Electronic Service		No	24-232Official CC Service List
5	Valerie	Herring	vherring@taftlaw.com	Taft Stettinius & Hollister LLP		2200 IDS Center 80 S. Eighth Street Minneapolis MN, 55402 United States	Electronic Service		No	24-232Official CC Service List
6	Raymond	Kirsch	raymond.kirsch@state.mn.us		Department of Commerce	85 7th Place E Ste 500 St. Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
7	James	Mortenson	james.mortenson@state.mn.us		Office of Administrative Hearings	PO BOX 64620 St. Paul MN, 55164-0620 United States	Electronic Service		Yes	24-232Official CC Service List
8	Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us		Office of the Attorney General - Residential Utilities Division	1400 BRM Tower 445 Minnesota St St. Paul MN, 55101-2131 United States	Electronic Service		No	24-232Official CC Service List
9	Mark	Rothfork	mrothfork@itctransco.com	ITC Midwest LLC		100 East Grand Ave, Suite 360 Des Moines IA, 50309 United States	Electronic Service		No	24-232Official CC Service List
10	Will	Seuffert	will.seuffert@state.mn.us		Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
11	Janet	Shaddix Elling	jshaddix@janetshaddix.com	Shaddix & Associates		7400 Lyndale Avenue South Suite 190 Richfield MN, 55423 United States	Electronic Service		Yes	24-232Official CC Service List

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name

Appendix B

Spatial Data Sources

Forks-Rost Transmission Line Project
Spatial Datasources

Responsible	Dataset	Source Link	Date_Recvd	In Project Area Y/N
BWSR	State Conservation Easements	https://gisdata.mn.gov/dataset/plan-stateland-dnr	3/17/2025	N
BWSR	RIM Conservation Easements	https://gisdata.mn.gov/dataset/bdry-bwsr-rim-cons-easements	3/17/2025	N
DNR	Consolidated Conservation & School Trust Lands	https://gisdata.mn.gov/dataset/plan-stateland-dnr	3/17/2025	N
DNR	MBS Railroad Right-of-Way Prairies	https://gisdata.mn.gov/dataset/biota-mcbs-railroad-prairies	3/17/2025	N
DNR	DNR Native Prairies	https://gisdata.mn.gov/dataset/biota-dnr-native-prairies	3/17/2025	N
DNR	MBS Sites of Biodiversity Significance	https://gisdata.mn.gov/dataset/biota-mcbs-sites-of-biodiversity	3/17/2025	Y
DNR	MBS Native Plant Communities by Type	https://gisdata.mn.gov/dataset/biota-dnr-native-plant-comm	3/17/2025	Y
DNR	MN DNR Scientific and Natural Areas	https://gisdata.mn.gov/dataset/bdry-scientific-and-nat-areas	3/17/2025	Y
DNR	Calcareous Fens	https://gisdata.mn.gov/dataset/biota-nhis-calcareous-fens	3/17/2025	N
DNR	DNR Forest Stand	https://gisdata.mn.gov/dataset/biota-dnr-forest-stand-inventory	3/17/2025	N
DNR	Wetland Banking Easement	https://gisdata.mn.gov/dataset/bdry-wetland-banking-easements	3/17/2025	N
DNR	MDNR Old growth stands	https://gisdata.mn.gov/dataset/biota-dnr-forest-inv-old-growth	3/17/2025	N
USFWS	Rusty Patched Bumble High Potential Zones	https://www.arcgis.com/home/item.html?id=b2e7e0c1ddad4f50a20bcfc1bfcfbbcb https://gis-fws.opendata.arcgis.com/	3/17/2025	N
DNR	Lakes of Biological Significance	https://gisdata.mn.gov/dataset/env-lakes-of-biological-signific	3/17/2025	N
HDR	Residences	I:\Projects\23\23\1019\Original_Source_Data\HDR\2025_01_31	3/17/2025	Y
GNIS	Churches	https://www.arcgis.com/home/item.html?id=ce731871e955437dac62f659f5ab5805	3/17/2025	Y
MDE	Schools (Public & Private, > Kindergarten)	https://gisdata.mn.gov/dataset/struc-school-buildings	3/17/2025	N
MDHS	Daycares/Child-care centers/Pre-schools	https://gisdata.mn.gov/dataset/econ-child-care	3/17/2025	N
MDH	Hospitals	https://gisdata.mn.gov/dataset/health-facility-hospitals	3/17/2025	N
MDH	Nursing Homes	https://gisdata.mn.gov/dataset/health-facility-nursing-boarding	3/17/2025	N
Jackson County	Zoning	https://www.co.jackson.mn.us/maps	3/17/2025	Y
MNDOT	Airport/Heliport Locations	https://gisdata.mn.gov/es/dataset/trans-airports	3/17/2025	N
MNDOT	Undocumented or Private Airstrips	https://gisdata.mn.gov/es/dataset/trans-airports	3/17/2025	Y
SHPO	Historic Sites from SHPO	https://geocrm.gisdata.mn.gov/arcgis/rest/services/MnSHIP_public_external/HistoricProp_public_wfs/FeatureServer	3/17/2025	Y
SHPO	MnSHIP Historic Property Points	https://geocrm.gisdata.mn.gov/arcgis/rest/login?redirect=https%3A//geocrm.gisdata.mn.gov/arcgis/rest/services/MnSHIP_public_external/HistoricProp_public_wfs/FeatureServer	3/17/2025	Y
SHPO	MnSHIP Historic Property Lines	https://geocrm.gisdata.mn.gov/arcgis/rest/login?redirect=https%3A//geocrm.gisdata.mn.gov/arcgis/rest/services/MnSHIP_public_external/HistoricProp_public_wfs/FeatureServer	3/17/2025	N
SHPO	MnSHIP Historic Property Polygons	https://geocrm.gisdata.mn.gov/arcgis/rest/login?redirect=https%3A//geocrm.gisdata.mn.gov/arcgis/rest/services/MnSHIP_public_external/HistoricProp_public_wfs/FeatureServer	3/17/2025	N
MNIT	Communication Towers	https://gisdata.mn.gov/dataset/util-fcc	3/17/2025	Y
MNDOT	Native American Reservation Lands	https://www.arcgis.com/home/item.html?id=8fded139728f48b3b374a5dbf41dd4ec	3/17/2025	N
MNDOT	Military Reservation Lands	https://www.arcgis.com/home/item.html?id=6b911a60a5a4465a85fd5c42668bf907	3/17/2025	N
MNDOT	Aggregate Sources	https://www.dot.state.mn.us/materials/asis_GE.html	3/17/2025	Y
DNR	Mineral Leases (Active vs. Ever Offered)	https://gisdata.mn.gov/dataset/plan-state-minleases	3/17/2025	N
UMN	Minnesota Law Enforcement Locations	https://umn.maps.arcgis.com/apps/mapviewer/index.html?layers=ed4469ef539440529daad12013af4bc6	3/17/2025	N
UMN	Minnesota Fire Stations	https://umn.maps.arcgis.com/apps/mapviewer/index.html?layers=678dc7e3a5054456a145ab4e7671abbf	3/17/2025	N
USDA	SSURGO Prime Farmland	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	SSURGO Hydric soils	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	SSURGO Soil map unit symbol	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	SSURGO Soil map unit name	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	SSURGO Erosion Hazard (Off-Road, Off-Trail)	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USGS	NLCD 2022	https://www.usgs.gov/centers/eros/science/national-land-cover-database	3/17/2025	Y
DNR	DNR State Trails	https://gisdata.mn.gov/dataset/trans-state-trails-minnesota	3/17/2025	N
DNR	DNR State Park Trails	https://gisdata.mn.gov/dataset/trans-state-park-trails-roads	3/17/2025	N
DNR	State Forest Camp Grounds	https://gisdata.mn.gov/dataset/struc-state-forest-campgrounds	3/17/2025	N
DNR	Campsites	https://gisdata.mn.gov/dataset/struc-parks-and-trails-campsites	3/17/2025	N
DNR	County/Local Trails	https://gisdata.mn.gov/dataset/trans-state-park-trails-roads	3/17/2025	N
Jackson County	County/Local Parks	https://www.co.jackson.mn.us/maps	3/17/2025	N
DNR	State Parks	https://gisdata.mn.gov/dataset/bdry-dnr-lrs-prk	3/17/2025	N
DNR	State Forests	https://gisdata.mn.gov/dataset/bdry-state-forest	3/17/2025	N
USFW	National Forest	https://gis-fws.opendata.arcgis.com/	3/17/2025	N
USFW	National Parks	https://gis-fws.opendata.arcgis.com/	3/17/2025	N
MNDOT	Scenic Byways	https://gisdata.mn.gov/dataset/trans-routes-tour	3/17/2025	N
DNR	Snowmobile Trails 2024-2025 Season	https://gisdata.mn.gov/dataset/trans-snowmobile-trails-mn	3/17/2025	N
DNR	Water Access Points	https://gisdata.mn.gov/dataset/loc-water-access-sites	3/17/2025	N
DNR	MN DNR State Water Trails	https://gisdata.mn.gov/dataset/trans-water-trails-minnesota	3/17/2025	N
DNR	Hunter Walking Trails	https://gisdata.mn.gov/dataset/trans-hunter-walking-trails	3/17/2025	N
DNR	Wild and Scenic River District	https://gisdata.mn.gov/dataset/bdry-wild-and-scenic-river-admin	3/17/2025	N

Forks-Rost Transmission Line Project
Spatial Datasources

Responsible	Dataset	Source Link	Date_Recvd	In Project Area Y/N
DNR	Hunter Walking Trails	https://gisdata.mn.gov/dataset/trans-state-park-trails-roads	3/17/2025	N
MPCA	MPCA What's in My Neighborhood Sites	https://gisdata.mn.gov/dataset/env-my-neighborhood	3/17/2025	Y
MDH	MDH Wellhead protection area	https://gisdata.mn.gov/dataset/water-wellhead-protection-areas	3/17/2025	N
MDH	MDH County Well Index	https://gisdata.mn.gov/dataset/water-well-information-non-pws	3/17/2025	Y
FEMA	FEMA Floodplain / Flood Hazard Areas	https://msc.fema.gov/portal/advanceSearch	3/17/2025	N
MPCA	MPCA Impaired Streams	https://gisdata.mn.gov/dataset/env-impaired-water-2024-draft	3/17/2025	N
MPCA	MPCA Impaired Lakes	https://gisdata.mn.gov/dataset/env-impaired-water-2024-draft	3/17/2025	N
USGS	NHD Flowlines	https://prd-tnm.s3.amazonaws.com/index.html?prefix=StagedProducts/Hydrography/NHD/State/GDB/	3/17/2025	Y
USGS	NHD Waterbodies	https://prd-tnm.s3.amazonaws.com/index.html?prefix=StagedProducts/Hydrography/NHD/State/GDB/	3/17/2025	Y
DNR	Public Water Inventory Streams	https://gisdata.mn.gov/dataset/water-mn-public-waters	3/17/2025	Y
DNR	Public Water Inventory Basins/Wetlands	https://gisdata.mn.gov/dataset/water-mn-public-waters	3/17/2025	Y
DNR	Trout Streams	https://gisdata.mn.gov/dataset/env-trout-stream-designations	3/17/2025	N
DNR	Trout Lakes	https://gisdata.mn.gov/dataset/env-trout-lake-designation	3/17/2025	N
DNR/USFWS	NWI (MN Update)	https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014	3/17/2025	Y
DNR	MN DNR Shallow Lakes	https://gisdata.mn.gov/dataset/water-shallow-lakes-id-by-wldlif	3/17/2025	N
DNR	MN DNR Wildlife Lakes	https://gisdata.mn.gov/dataset/env-designated-wildlife-lakes	3/17/2025	N
DNR	Outstanding Resource Value Waters	https://gisdata.mn.gov/dataset/env-orv-waters	3/17/2025	N
DNR	Minnesota Spring Inventory	https://files.dnr.state.mn.us/waters/groundwater_section/mapping/cga/c08_fillmore/pdf_files/plate09.pdf	3/17/2025	N
DNR	MN DNR State Wildlife Management Areas	https://gisdata.mn.gov/dataset/bdry-dnr-wildlife-mgmt-areas-pub	3/17/2025	Y
USFWS	MN DNR Waterfowl Production Area	https://hub.arcgis.com/datasets/fedmaps::waterfowl-production-areas/explore?location=44.481474%2C-97.583468%2C9.66	3/17/2025	Y
DNR	MN DNR State Aquatic Management Areas	https://gisdata.mn.gov/dataset/plan-mndnr-fisheries-acquisition	3/17/2025	N
DNR	MN DNR State Game Refuges	MN State Game Refuges Boundaries	3/17/2025	Y
DNR	MN DNR Migratory Fowl Feeding and Resting Areas	https://gisdata.mn.gov/dataset/env-migratory-waterfowl-areas	3/17/2025	Y
USFWS	National Wildlife Refuge	https://www.fws.gov/service/national-wildlife-refuge-system-gis-data-and-mapping-tools https://gis-fws.opendata.arcgis.com/datasets/fws::fws-national-realty-tracts-simplified/explore	3/17/2025	N
USFWS	USFWS Interests	https://catalog.data.gov/dataset/fws-cadastral-geodatabase-external-facing-e829d	3/17/2025	N
Audubon	Audobon Society Important Bird Areas	https://www.arcgis.com/home/webmap/viewer.html?webmap=3b3d225539f8449daf84be6aa89eab50	3/17/2025	N
USFWS	Grassland Bird Conservation Areas	https://www.arcgis.com/home/webmap/viewer.html?webmap=3b3d225539f8449daf84be6aa89eab50	3/17/2025	N
Audubon	Gray Owl Management Area	https://www.arcgis.com/home/webmap/viewer.html?webmap=3b3d225539f8449daf84be6aa89eab50	3/17/2025	N
Merjent	Pipelines	Pipeline Dataset	3/27/2025	Y
Merjent	transmission lines	Transmission Line Dataset	2/27/2025	Y
USDA	Surface texture (sandy loam, loam, silt loam, muck, etc.) – acres by type	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	Rutting Hazard (Slight, Moderate, Severe) – acres by category	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	Highly Erodible soil (by Water) – acres highly erodible by water	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	Highly Erodible soil (by Wind) – acres highly erodible by wind	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
Merjent	Residences	Residences Dataset	2/27/2025	Y
Merjent	Churches	Churches Dataset	2/27/2025	Y
Merjent	Out Building	Out Building Dataset	2/27/2025	Y
Merjent	Junk Yard	Junk Yard Dataset	2/27/2025	Y
Merjent	Desktop Delineated Wetlands	Desktop Delineated Wetlands Dataset	3/27//2025	Y
MNPUC	Three Rivers Wind Project	https://mn.gov/eera/web/project-file/11326/	3/17/2025	Y

Appendix C

Master Data Tables

	Centerline	ROW	Route Width	Residences					Non-Residential Structures				
				Within 50 ft (ROW)	Within 250 ft	Within 500 ft	Within 1,000 ft	Total	Within 50 ft (ROW)	Within 250 ft	Within 500 ft	Within 1,000 ft	Total
Route	Length (mi)	Area (ac)	Area (ac)	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count
Applicant's Proposed Route	8.4	102.1	1562.2	0	4	2	3	9	0	6	20	33	59

	Archaeological Resources				Historic Resources				National Landcover Dataset					Geology	
									Agriculture	Developed	Barren Land	Open Land	Herbaceous	Sink Holes	Karst Topography
	Within 50 ft (ROW)	Within Route Width	Within 1 mi	Total	Within 50 ft (ROW)	Within Route Width	Within 1 mi	Total	Within 50 ft (ROW)	Within 50 ft (ROW)	Within 50 ft (ROW)	Within 50 ft (ROW)	Within 50 ft (ROW)	Within Route Width	Within Route Width
Route	Count	Count	Count	Count	Count	Count	Count	Count	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Count	Area (ac)
Applicant's Proposed Route	0	0	0	0	1	1	4	6	55.5	45.0	0	0.0	0.4	0	0.0

	MN Department of Health County Well Index		National Hydrography Dataset Waterbodies			National Hydrography Dataset Watercourses			National Wetland Inventory Wetlands				Public Water Inventory Streams		
									All		Non Forested				
	Within 50 ft (ROW)	Within Route Width	Crossing	Within 50 ft (ROW)	Within Route Width	Crossing	Within 50 ft (ROW)	Within Route Width	Crossing (> 1,000 ft span)	Crossing (< 1,000 ft span)	Within 50 ft (ROW)	Within Route Width	Crossing	Within 50 ft (ROW)	Within Route Width
Route	Count	Count	Count	Area (ac)	Area (ac)	Count	Length (ft)	Length (ft)	Count	Count	Area (ac)	Area (ac)	Count	Length (ft)	Length (ft)
Applicant's Proposed Route	0	1	0	0	0	3	321.5	6,226.7	0	4	0	16	2	216.3	4,322.3

	Right-of-Way Paralleling / Sharing by Type											
	Rail		Road		Transmission Line		Rail, Road, or Transmission Line		Parcel, Section, or Field		Total Paralleling / Sharing	
	Length		Length		Length		Length		Length		Length	
Route	Length (mi)	Percent	Length (mi)	Percent	Length (mi)	Percent	Length (mi)	Percent	Length (mi)	Percent	Length (mi)	Percent
Applicant's Proposed Route	0.0	0	8.4	100	0.0	0	8.4	100	8.4	100	8.4	100

Appendix D

Property Values

Property Value Supplement

Attempts to correlate proximity to transmission lines with impacts to property values are complicated by the interaction of several relevant factors, including geographic region, land use, variability in perceptions over time, and limited sales data for similar properties before and after the construction of transmission lines. Researchers have generally used survey-based techniques and statistical analyses to make inferences and draw conclusions about the relationship between transmission lines and property values. In general, surveys provide useful insights for estimating price effects based on public opinion, yielding what researchers refer to as "stated preferences." Statistical analyses, on the other hand, reflect the actual behavior of property buyers and sellers in terms of recorded sales prices, providing what researchers refer to as the "revealed preferences." In other words, there is often incongruity between what people think and how they actually behave. Measuring both perceptions and actual behaviors helps researchers understand the relationship between transmission lines and property values.

A recent literature review (Jackson and Pitts 2010, reference 1) examined 17 studies on the relationship between transmission lines and property values to compare their results and to develop some general conclusions. The 17 studies, spanning the time period between 1956 and 2009, were compiled and reviewed by Real Property Analytics, Inc., a private firm specializing in the valuation of property potentially affected by external environmental factors. The Real Property Analytics review was published in the Journal of Real Estate Literature, which is a publication of the American Real Estate Society. The studies evaluated impacts from transmission lines ranging from 69 kilovolts (kV) to 345 kV. They were placed into one of three categories designated by the authors:

- Survey-based studies;
- Statistical sales-based analyses using multivariate analysis to isolate the impact of transmission lines by holding other variables statistically constant; and
- Sales-based analyses not using multivariate analysis but utilizing factors such as sale/resale analysis, price per square foot comparisons, case studies, and "paired sales" analysis, where the values of two homes that are similar in all respects except for proximity to transmission lines are compared.

Upon completion of their review of the studies, Jackson and Pitts (2010, reference 1) concluded the following:

> *"The studies reviewed…generally pointed to small or no effects on sales prices due to the presence of electric transmission lines. Some studies found an effect but this effect generally dissipated with time and distance. The effects that were found ranged from approximately 2% to 9%. Most studies found no effect and in some cases a premium was observed."*

Jackson and Pitts discussed the utility of both survey-based and statistically-based methods, quoting one of the research papers to note that statistical analyses "reflect what buyers and sellers actually do, opposed to what potential buyers say they might do, under specified hypothetical circumstances" Selected findings from Jackson and Pitts's literature review are provided below, along with the year and type of study:

Survey-based studies

- Kinnard, 1967 – Questionnaires were sent to property owners intersected by or abutting transmission line right-of-way (ROW) in 17 Connecticut subdivisions. Over 85 percent indicated

they would purchase again in the same location. Kinnard concluded that property value is not significantly affected by proximity to transmission lines.

- Morgan et al., 1985 – A questionnaire asked participants to rank the risk from transmission lines, electric blankets, and 14 other common hazards. Electric blankets and transmission lines were ranked as presenting the least risk. Participants were then provided with information on electric and magnetic fields (EMF) and associated potential health effects. Subsequent questionnaire responses indicated a change in perception and an increased concern about the risk of EMF.
- Solum, 1985 – Presented a questionnaire to 180 agricultural, recreational, or residential property owners in northwest Wisconsin whose land was encumbered by transmission lines. All three types had some level of concern over the proximity of the lines but for varying reasons. Further interviews indicated that all but one of the properties sold at a market price comparable to non-encumbered properties and that none of the buyers had reduced their purchase offers due to the presence of the transmission line.
- Delaney and Timmons, 1992 – Survey results from 219 real estate appraisers found that 84 percent believed that transmission line proximity results in an average ten percent lower market value. Ten percent of respondents found no effect and six percent thought transmission lines increased property value due to larger lots for similar price.
- Kung and Seagle, 1992 – Sent a questionnaire to homeowners in Memphis and Shelby Counties, Tennessee. Half of the respondents considered the transmission line an eyesore; however, 72 percent of those who thought the lines were an eyesore also said the lines had no effect on the purchase price. Prices of homes adjacent to the transmission line are similar to prices of other homes in the same neighborhood.
- Priestly and Evans, 1996 – Conducted a survey of 445 homeowners living near transmission lines in the San Francisco area. Eighty-seven percent of the 267 respondents felt the transmission line was a negative element in their neighborhood.

Statistical Sales Price Analyses

- Brown, 1976 – Conducted regression analysis on sales of farmland in Saskatchewan, Canada, between 1965 and 1970 and found that the relationship of land value to the number of power line structures was not statistically significant and that the lines did not negatively affect property value. Brown also found that the structures can be an impediment to farming operations.
- Colwell and Foley, 1979 – Examined 200 property sales over a ten-year period in Decatur, Illinois, and found that sales prices increase as distance from a transmission line increases. Property values were approximately six percent lower within 50 to 200 feet of the transmission line, but there was no difference in property value beyond 200 feet.
- Colwell, 1990 – Followed up the study above and confirmed that the selling price of residential property increases as distance from the transmission line increases. The rate of increase slows with distance and eventually disappears.
- Rigdon, 1991 – Evaluated 46 properties sold in Marquette County, Michigan over a five-year period and found no statistically significant relationship between sales price and proximity to a transmission line easement.
- Hamilton and Schwann, 1995 – Reviewed previous literature and found that transmission lines can reduce adjacent property values, but that the reduction is generally less than five percent of property value and that the reduction diminishes at 600 feet.
- Des Rosiers, 1998 – Reviewed property values of 507 homes in the Montreal area and found an average drop in property value of 9.6 percent for homes immediately adjacent to the line. He also

found an average increase of up to 9.2 percent in value for homes one to two lots away from the transmission line and no effect beyond 500 feet.

- Wolverton and Bottemiller, 2003 and Cowger, Bottemiller, and Cahill, 1996 – Two studies, both conducted in Portland, Vancouver, and Seattle, the 2003 work repeating the 1996 study with more rigorous analytical methods. Both applied statistical methods to paired-sales analysis and found no price effect on residential property from proximity to transmission lines. The data also show no difference in appreciation rates between homes near a transmission line and homes further away.
- Chalmers and Voorvaart, 2009 – Studied residential properties sold in Connecticut and Massachusetts between 1999 and 2007 and found proximity to transmission lines to have an insignificant effect on sales prices.

Sales-based analyses

- Carll, 1956 – Compared property values and interviewed owners, buyers, and brokers along a transmission line in Los Angeles and found that residences adjoining the ROW had not sold at a discount and that lenders did not adjust loan amounts for lots adjacent to the ROW.
- Bigras, 1964 – Reviewed over 1,900 deeds of sale and mortgages in Quebec and found that prices for vacant land adjacent to transmission lines were generally higher than the average price of all transactions. Land adjacent to transmission lines was sold faster and was developed to a higher degree than land away from the lines.

Jackson and Pitts (2010) concluded from these studies that proximity to transmission lines results in little or no effect on property value. In studies where transmission lines were found to have impacts to property values, the decrease in values typically ranged from approximately two percent to ten percent. In some instances, increases in property value were found. The following additional studies and reviews generally reach a similar conclusion.

Another recent meta-analysis, Brinkley and Leach (2019) evaluated 54 studies spanning 40 years. Their research found that half of the literature and studies on the impact of power lines concluded no effect on property values, and the other half showed a loss in property values of 2 to 10%. While home value studies showed mostly no price impacts, with effects ranging from a 2 to 9% decrease in price, some homes experienced a price premium. Half of the studies showed negative impacts with the range of 3-6%. Significant effects are noticeable to properties closer than 60 meters with an average decrease in value from 0.2 to 27.3%. Ranges of value impact within energy types show a great deal of uncertainty and many under-researched caveats in planning for energy infrastructure. For example, the impact of overhead powerlines is mixed, with results prefaced by access to viewsheds. The distance of maximal impact for powerlines was 200 meters, with a range of average value change of a 10% increase (if including improved access to greenspace) to a 30% decrease.

Brinkley and Leach (2019 found that studies after 1979 showed a more consistent reduction between 5-10%. Though many studies assert that visual impacts are the greatest predictor of property prices, the influence of buried power lines has yet to be assessed and so is not included in this meta-analysis. Research suggests that diminution in price for properties near the power lines tends to disappear anywhere from five to fourteen years after construction. This could be because of vegetation growth that acts as a cover. No studies conducted property value assessments in relation to community perception or knowledge about the development or involvement in job creation.

Thomas and Welke (2017) performed an event study to examine the revealed price effect on residential properties from an upgrade to high-voltage transmission towers that were constructed on an existing ROW. The study looked at a period of two years where existing 220 kV towers that were not in use were upgraded to 500 kV towers, then three years later, they were removed, and the lines were buried. They found a significant loss in value from the upgrade for encumbered (8.3%) and abutting (4.9%) properties, and insignificant losses when the older towers were present, even for lots with an easement. Their conclusions are consistent with previous studies that found the price impact is initially large but diminishes over time. Thomas and Welke (2017) concluded that their results were consistent with other research findings:

- Over time, price impact is diminished.
- Price impact effects vanish beyond about 100 meters.
- The proximate sales results are largely driven by abutting lots.
- Encumbered sales are significantly negatively affected and abutting properties somewhat less so.

They further found no evidence that public information prior to the construction of the towers affected sales prices, even if the property abutted or was encumbered by the ROW. They did find that the burying of the 500 kV cables required disruption to immediately proximate homeowners, but presumably at a much lower level than towers. More research would need to be done on effects post burying of the lines.

Between 1978 and 1982, Jensen and Weber and the Jensen Management Company conducted three studies in west-central Minnesota. The studies in 1978 and 1982 are of particular interest since they consider effects to agricultural land. The 1978 study found that the landowners cited an inconvenience to the presence of the line but had not paid less for their land (Weber and Jensen 1978, reference 2). The 1982 study, however, found there was a broad range of effects from no effect to a 20 percent reduction, which depended on the amount of disruption to farm operations (Jensen and Weber 1982, reference 3).

The David Wyman and Chris Mothorpe's study, "The Pricing of Power Lines: A Geospatial Approach to Measuring Residential Property Values" (Reference 8), examines the relationship between high-voltage transmission lines and vacant property prices in Pickens County, South Carolina, using geospatial techniques. Analyzing 5,455 vacant lot sales in Pickens County, South Carolina, the study concluded that the proximity and visibility of these lines (based on geospatial analysis techniques) influence property values. Vacant lots adjacent to power lines experienced an average price discount of 44.9 percent, while those non-adjacent vacant properties up to 1,000 feet away saw a price discount of 17.9 percent. Visibility, particularly of transmission towers, amplifies this effect, with properties that had an unobstructed view resulting in greater devaluation. They state that their findings are site-specific to this study, and caution that pricing discounts for vacant properties in rural settings may not be generalizable to complex suburban settings or properties with residential housing structures. This study was also limited to a sample that excluded parcels larger than 20 acres in size.

James A. Chalmers' study, "High-Voltage Transmission Lines and Rural, Western Real Estate Values," (Reference 7) investigates the impact of 500 kV transmission lines on property values of agricultural, residential, and recreational uses throughout 640 miles of Montana between 2000 and 2010. The study was done using a combination of 49 transactions and an even larger number of lot sales in 7 subdivisions. The study utilized personal interviews, sales comparisons, and paired sales techniques. The research found that three issues were dominant: Use, size, and substitutes. If the property was more heavily oriented to residential use - it was more vulnerable to transmission line impacts, whereas property-oriented more toward purely recreational use were much less vulnerable to impacts. Properties that were oriented to agricultural use showed no price effects of transmission lines. The larger the

property, the less vulnerable it was to impacts. There can be price and absorption (that is – the time it takes a property to sell) effects if there are alternative properties similar to the subjected property. If the property affected is relatively unique and the transmission line is one of several differentiating factors, the property is less vulnerable to price and absorption effects. The study emphasized that the market response to high-voltage lines varies greatly depending on location, property-specific factors, and the visibility of the lines.

In the final EIS on the Arrowhead-Weston Electric Transmission Line Project, the Wisconsin Public Service Commission (PSC) addressed the issue of property value changes associated with high-voltage transmission lines. This document summarized the findings of approximately 30 papers, articles, and court cases covering the period from 1987 through 1999. The Arrowhead-Weston EIS provides six general observations (reference 4):

- The potential reduction in sale price for single-family homes may range from zero to 14 percent.
- Adverse effects on the sale price of smaller properties could be greater than effects on the sale price of larger properties.
- Other amenities, such as proximity to school 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.
- The adverse effects appear to diminish over time.
- Effects on sale price are most often observed for properties crossed by or immediately adjacent to a power line, but effects have also been observed for properties farther away from the line.
- The value of agricultural property is likely to decrease if the power line poles are placed in an area that inhibits farm operations.

The Arrowhead-Weston Electric Transmission Line Project environmental impact statement (EIS) reported that in Midwest states such as Minnesota, Wisconsin, and the Upper Peninsula of Michigan, the average decrease appears to be between four and seven percent. The EIS noted that it is very difficult to make predictions about how a specific transmission line would affect the value of specific properties.

An additional potential adverse effect of transmission lines on adjacent properties is on the ability of homeowners and developers to obtain Federal Housing Administration (FHA) and/or Housing and Urban Development (HUD) loans. Section 2.2(J) of the current HUD guidebook 4150.2 addresses this issue in the following FAQ:

> *FAQ: Is a property eligible for FHA if there are overhead or high-voltage power lines nearby?*
>
> *The appraiser must indicate whether the dwelling or related property improvements are located within the easement serving a high-voltage transmission line, radio/TV transmission tower, cell phone tower, microwave relay dish or tower, or satellite dish (radio, TV cable, etc.).*
>
> *1) If the dwelling or related property improvement is located within such an easement, the lender must obtain a letter from the owner or operator of the tower indicating that the dwelling and its related property improvements are not located within the tower's (engineered) fall distance in order to waive this requirement.*
>
> *2) If the dwelling and related property improvements are located outside the easement, the property is considered eligible and no further action is necessary. The appraiser, however, is*

instructed to note and comment on the effect on marketability resulting from the proximity to such site hazards and nuisances.

In general, and for the safe operation of the line, a residence cannot be located within a transmission line ROW; thus, all residences near the project would fall into category 2 (a dwelling located “outside the easement”). For this category, the HUD appraiser is directed to comment on any effects on marketability resulting from the transmission line. These comments could affect loan values if an appraiser believes the residence is nevertheless located so near the transmission line that the line could be a hazard or nuisance.

References

1. Jackson and Pitts, 2010. The Effects of Transmission Lines on Property Values: A Literature Review. Journal of Real Estate Literature. Volume 18, No 2.

2. Weber, William V. and Glenn A. Jensen. 1978. A Study of High Voltage Power Line Easements and their Effect on Farm Land Values in West Central Minnesota. Luverne, Minnesota: Jensen Management Service.

3. Jensen, Glenn A. and William V. Weber. 1982. High Voltage Transmission Lines and their Effect on Farm Land Value in West Central Minnesota. Luverne, Minnesota: Jensen Management Service, Inc.

4. 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.

5. Brinkley, Catherine and Leach, Andrew. 2019. Energy Next Door: A Meta-Analysis of Energy Infrastructure Impact on Housing Value. Energy Research & Social Science. DOI: 10.1016/j.erss.2018.11.014

6. Thomas, Charles and Welke, Gerd. 2017. The Effect of HVTLs on Property Values: An Event Study. International Real Estate Review. Volume 20, No 2.

7. Chalmers, James A., 2012. High-Voltage Transmission Lines and Rural, Western Real Estate Values. The Appraisal Journal. Volume 80, No. 3.

8. Wyman, David, and Mothorpe, Chris, 2018. The Pricing of Power Lines: A Geospatial Approach to Measuring Residential Property Values. Journal of Real Estate Research. Volume 40, No. 3.

Appendix E

Draft Route Permit

EERA STAFF PROPOSED MODIFICATIONS TO THE COMMISSION'S SAMPLE PERMIT ARE SHOWN BY STRIKEOUTS AND UNDERSCORING IN RED

STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION

ROUTE PERMIT FOR THE
~~[PROJECT NAME]~~
FORKS-ROST 161 kV TRANSMISSION PROJECT

A HIGH-VOLTAGE TRANSMISSION LINE AND ASSOCIATED FACILITIES

IN
[JACKSON COUNTY]

ISSUED TO
~~[PERMITTEE]~~ ITC MIDWEST LLC

PUC DOCKET NO. [~~Docket Number~~ ET6675/TL-24-232]

In accordance with the requirements of Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850 this route permit is hereby issued to:

~~[Permittee]~~ ITC MIDWEST LLC

ITC MIDWEST LLC [the "Permittee"] is authorized by this route permit to construct and operate a new 161 kV high voltage transmission line and associated facilities ~~[Provide a description of the project~~ authorized by the Minnesota Public Utilities Commission].

The high-voltage transmission line shall be constructed within the route identified in this route permit and in compliance with the conditions specified in this route permit.

Approved and adopted this ____ day of [Month, Year]

BY ORDER OF THE COMMISSION

_____
Will Seuffert, Executive Secretary

To request this document in another format such as large print or audio, call 651-296-0406 or 800-657-3782 (voice). Persons with a hearing or speech impairment may call using their preferred Telecommunications Relay Service or email consumer.puc@state.mn.us for assistance.

CONTENTS

ATTACHMENTS

~~**SAMPLE PERMIT**~~ **DRAFT PERMIT** [~~Project Name~~ Beaver Creek Transmission Line Project and PUC Docket No. ET6675/TL-24-232]

1 ROUTE PERMIT

The Minnesota Public Utilities Commission (Commission) hereby issues this route permit to ~~[Permittee Name]~~ ITC Midwest LLC (Permittee) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850. This route permit authorizes the Permittee to construct and operate a new 161 kV high voltage transmission line and associated facilities ~~[Provide a description of the project as authorized by the Commission] ([Project Name, if applicable]~~, henceforth known as Transmission Facility). The high-voltage transmission line shall be constructed within the route identified in this route permit and in compliance with the conditions specified in this route permit.

1.1 Pre-emption

Pursuant to Minn. Stat. § 216E.10, this route permit shall be the sole route approval required for construction of the transmission facilities and this route permit shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose governments.

2 TRANSMISSION FACILITY DESCRIPTION

~~[Provide a description of the Transmission Facility as authorized by the Commission]~~

The transmission facility includes the construction and operation of approximately 8.5 miles of 161 kV transmission line and associated facilities between the existing Rost Substation in the northeast quarter of section 22 in Ewington Township and the new Forks Switching Station in the south half of section 26 in Rost Township in Jackson County, Minnesota, as identified in the attached route maps and described below.

The Transmission Facility is in the following:

County	Township Name	Township	Range	Section
Jackson	Ewington	102N	37W	22, 23, 24, 25, 26, 27, 35, 36
Jackson	Rost	102N	38W	26, 27, 28, 29, 30, 31, 32, 33, 34, 35

2.1 Structures

~~[Provide a detailed description of the structures authorized by the Commission]~~
The Forks-Rost transmission line project will consist of single circuit monopole steel structures spaced approximately 600 to 800 feet apart. Transmission structures will range in height from 80 to 120 feet above ground, depending upon the terrain and environmental constraints. The average diameter of the steel structures at ground level is 3 to 5 feet. Electrical conductors attached to structures will be oriented in a delta or vertical configuration. In the delta configuration there is one overhead ground wire at the top, two phases on one side and a single phase on the other) supported by suspension insulators at tangent structures and strain insulators at tension structures (i.e., dead-end structures). Dead-end structures will use a vertical conductor configuration. Any structure with a line angle of greater than two degrees will be supported on a drilled shaft concrete foundation. Foundation depths are dependent upon geotechnical data and final design.

2.2 Conductors

~~[Provide a detailed description of the conductors authorized by the Commission]~~
The single circuit structures will have three single conductor phase wires and one shield wire. It is anticipated that the phase wires will be "T2 Grosbeak" which consists of two aluminum conductor steel reinforced (ACSR) "Grosbeak" conductors in a twisted pair configuration or a conductor with similar electrical capacity and mechanical strength properties. The shield wire will be a 48-count optical ground wire.

The table below details specifics on the various structure and conductor types as presented in the route permit application.

Line Type	Conductor	Structure		Foundation	Height	Span
		Type	Material			
161 kV	Proposed phase wires are T2 Grosbeak aluminum conductor steel reinforced ACSS) "Grosbeak" or conductor with similar electrical capacity and mechanical strength	Monopole with davit arms and suspension insulators	Steel	Direct Embeded or Vibratory Caisson	80 to 120	600 to 800
161 kV		Monopole with strain insulator attachments directly to pole	Steel	Concrete Foundation	80 to 120	600 to 800

	properties. The shield wire will be a 48- count optical ground wire					

2.3 Substations and Associated Facilities

~~[Provide a detailed description of the associated facilities and substations as authorized by the Commission]~~

The Forks Switching Station, located in in the south half of section 26 in Rost Township, will be equipped with SF6 gas circuit breakers with current sensing transformers, voltage sensing and station service type transformers, and a control enclosure which will house required relaying equipment and a supervisory control and data acquisition (SCADA) equipment. The Forks Switching Station will initially have three 161 kV transmission lines connected to it and the Switching Station will initially have a ring bus configuration. In addition to the new Forks-Rost 161 kV line that will be constructed, the existing ITC Midwest Lakefield Junction-Dickinson County 161 kV line will be cut into the Forks Switching Station creating a Forks-Lakefield Junction and Dickinson County-Forks 161 kV lines.

3 DESIGNATED ROUTE

The route designated by the Commission is depicted on the route maps attached to this route permit (Designated Route). The Designated Route is generally described as follows:

~~[Provide detailed description of the authorized route including the route widths and any other specifics relevant to each segment. Also include a reference to the relevant route map to be attached to the route permit.]~~

The Forks-Rost 161 kV Transmission Line will begin at the new Rost Substation operated by Great River Energy, near the intersection of County Road 5 and 790th Street in Jackson County. The 161 kV transmission line will exit the substation and run south along County Road 5 to 780th Street for approximately 1 mile, where it will turn east and run for 1 mile to 360th Avenue. The transmission line will run south on 360th Avenue for 1 mile before turning east and continuing on 770th Street for approximately 5.5 miles, where it will then enter the new Forks Switching Station on the west.

The Designed Route includes an anticipated alignment and a right-of-way. The right-of-way is the physical land needed for the safe operation of the transmission line. The Permittee shall locate the alignment and associated right-of-way within the Designated Route unless otherwise

authorized by this route permit or the Commission. The Designated Route provides the Permittee with flexibility for minor adjustments of the alignment and right-of-way to accommodate landowner requests and unforeseen conditions.

Any modifications to the Designated Route or modifications that would result in right-of-way placement outside the Designated Route shall be specifically reviewed by the Commission in accordance with Minn. R. 7850.4900 and Section 10 of this route permit.

4 RIGHT-OF-WAY

This route permit authorizes the Permittee to obtain a new permanent right-of-way for the transmission line up to [~~number~~100] feet in width. The permanent right-of-way is typically [~~number~~50] feet on both sides of the transmission line measured from its centerline or alignment.

The anticipated alignment is intended to minimize potential impacts relative to the criteria identified in Minn. R. 7850.4100. The final alignment must generally conform to the anticipated alignment identified on the route maps unless changes are requested by individual landowners and agreed to by the Permittee or for unforeseen conditions that are encountered or as otherwise provided for by this route permit.

Any right-of-way or alignment modifications within the Designated Route shall be located so as to have comparable overall impacts relative to the factors in Minn. R. 7850.4100, as does the right-of-way and alignment identified in this route permit and shall be specifically identified and documented in and approved as part of the plan and profile submitted pursuant to Section 9.1 of this route permit.

Where the transmission line parallels existing highway and other road rights-of-way, the transmission line right-of-way shall occupy and utilize the existing right-of-way to the maximum extent possible; consistent with the criteria in Minn. R. 7850.4100, and the other requirements of this route permit; and for highways under the jurisdiction of the Minnesota Department of Transportation (MnDOT), the procedures for accommodating utilities in trunk highway rights-of-way.

5 GENERAL CONDITIONS

The Permittee shall comply with the following conditions during construction and operation of the Transmission Facility over the life of this route permit.

5.1 Route Permit Distribution

Within 30 days of issuance of this route permit, the Permittee shall provide all affected landowners with a copy of this route permit and the complaint procedures. An affected landowner is any landowner or designee that is within or adjacent to the Designated Route. In no case shall a landowner receive this route permit and complaint procedures less than five days prior to the start of construction on their property. The Permittee shall also provide a copy of this route permit and the complaint procedures to the applicable regional development commissions, county environmental offices, and city and township clerks. The Permittee shall file with the Commission an affidavit of its route permit and complaint procedures distribution within 30 days of issuance of this route permit.

5.2 Access to Property

The Permittee shall notify landowners prior to entering or conducting maintenance within their property, unless otherwise negotiated with the landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of the Minnesota Department of Commerce (Department of Commerce) staff or Commission staff.

5.3 Construction and Operation Practices

The Permittee shall comply with the construction practices, operation and maintenance practices, and material specifications described in the permitting record for this Transmission Facility unless this route permit establishes a different requirement in which case this route permit shall prevail.

5.3.1 Field Representative

The Permittee shall designate a field representative responsible for overseeing compliance with the conditions of this route permit during construction of the Transmission Facility. This person shall be accessible by telephone or other means during normal business hours throughout site preparation, construction, cleanup, and restoration.

The Permittee shall file with the Commission the name, address, email, phone number, and emergency phone number of the field representative at least 14 days prior to the pre-construction meeting. The Permittee shall provide the field representative's contact information to affected landowners, local government units and other interested persons at least 14 days prior to the pre-construction meeting. The Permittee may change the field representative at any time upon notice to the Commission, affected landowners, local government units and other interested persons. The Permittee shall file with the Commission

an affidavit of distribution of its field representative's contact information at least 14 days prior to the pre-construction meeting and upon changes to the field representative.

5.3.2 Employee Training - Route Permit Terms and Conditions

The Permittee shall train all employees, contractors, and other persons involved in the Transmission Facility construction regarding the terms and conditions of this route permit. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.3 Independent Third-Party Monitoring

Prior to any construction, the Permittee shall propose a scope of work and identify an independent third-party monitor to conduct construction monitoring on behalf of the Department of Commerce. The scope of work shall be developed in consultation with and approved by the Department of Commerce. This third-party monitor will report directly to and will be under the control of the Department of Commerce with costs borne by the Permittee. Department of Commerce staff shall keep records of compliance with this section and will ensure that status reports detailing the construction monitoring are filed with the Commission in accordance with scope of work approved by the Department of Commerce.

5.3.4 Public Services, Public Utilities, and Existing Easements

During Transmission Facility construction, the Permittee shall minimize any disruption to public services or public utilities. To the extent disruptions to public services or public utilities occur these shall be temporary, and the Permittee shall restore service promptly. Where any impacts to utilities have the potential to occur the Permittee shall work with both landowners and local entities to determine the most appropriate mitigation measures if not already considered as part of this route permit.

The Permittee shall cooperate with county and city road authorities to develop appropriate signage and traffic management during construction. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.5 Temporary Workspace

The Permittee shall limit temporary easements to special construction access needs and additional staging, or lay-down areas required outside of the authorized right-of-way. Temporary space shall be selected to limit the removal and impacts to vegetation. The Permittee shall obtain temporary easements outside of the authorized transmission line right-

of-way from affected landowners through rental agreements. Temporary easements are not provided for in this route permit.

The Permittee may construct temporary driveways between the roadway and the structures to minimize impact using the shortest route feasible. The Permittee shall use construction mats to minimize impacts on access paths and construction areas. The Permittee shall submit the location of temporary workspaces and driveways with the plan and profile pursuant to Section 9.1.

5.3.6 Noise

The Permittee shall comply with noise standards established under Minn. R. 7030.0010 to 7030.0080. The Permittee shall limit construction and maintenance activities to daytime working hours to the extent practicable.

5.3.7 Aesthetics

The Permittee shall consider input pertaining to visual impacts from landowners or land management agencies prior to final location of structures, rights-of-way, and other areas with the potential for visual disturbance. The Permittee shall use care to preserve the natural landscape, minimize tree removal and prevent any unnecessary destruction of the natural surroundings in the vicinity of the Transmission Facility during construction and maintenance. The Permittee shall work with landowners to locate the high-voltage transmission line to minimize the loss of agricultural land, forest, and wetlands, and to avoid homes and farmsteads. The Permittee shall place structures at a distance, consistent with sound engineering principles and system reliability criteria, from intersecting roads, highways, or trail crossings.

5.3.8 Soil Erosion and Sediment Control

The Permittee shall implement those erosion prevention and sediment control practices recommended by the Minnesota Pollution Control Agency (MPCA) Construction Stormwater Program. If construction of the Transmission Facility disturbs more than one acre of land or is sited in an area designated by the MPCA as having potential for impacts to water resources, the Permittee shall obtain a National Pollutant Discharge Elimination System/State Disposal System Construction Stormwater Permit from the MPCA that provides for the development of a Stormwater Pollution Prevention Plan that describes methods to control erosion and runoff.

The Permittee shall implement reasonable measures to minimize erosion and sedimentation during construction and shall employ perimeter sediment controls, protect exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling

vehicle tracking. Contours shall be graded as required so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. All areas disturbed during construction of the Transmission Facility shall be returned to pre-construction conditions.

5.3.9 Wetlands and Water Resources

The Permittee shall develop wetland impact avoidance measures and implement them during construction of the Transmission Facility. Measures shall include spacing and placing the power poles at variable distances to span and avoid wetlands, watercourses, and floodplains. Unavoidable wetland impacts as a result of the placement of poles shall be limited to the immediate area around the poles. To minimize impacts, the Permittee shall construct in wetland areas during frozen ground conditions where practicable and according to permit requirements by the applicable permitting authority. When construction during winter is not possible, the Permittee shall use wooden or composite mats to protect wetland vegetation.

The Permittee shall contain soil excavated from the wetlands and riparian areas and not place it back into the wetland or riparian area. The Permittee shall access wetlands and riparian areas using the shortest route possible in order to minimize travel through wetland areas and prevent unnecessary impacts. The Permittee shall not place staging or stringing set up areas within or adjacent to wetlands or water resources, as practicable. The Permittee shall assemble power pole structures on upland areas before they are brought to the site for installation.

The Permittee shall restore wetland and water resource areas disturbed by construction activities to pre-construction conditions in accordance with the requirements of applicable state and federal permits or laws and landowner agreements. The Permittee shall meet the USACE, Minnesota Department of Natural Resources (DNR), Minnesota Board of Water and Soil Resources, and local units of government wetland and water resource requirements.

5.3.10 Vegetation Management

The Permittee shall minimize the number of trees to be removed in selecting the right-of-way specifically preserving to the maximum extent practicable windbreaks, shelterbelts, living snow fences, and vegetation in areas such as trail and stream crossings where vegetative screening may minimize aesthetic impacts, to the extent that such actions do not violate sound engineering principles or system reliability criteria.

The Permittee shall remove tall growing species located within the transmission line right-of-way that endanger the safe and reliable operation of the transmission line. The Permittee shall leave undisturbed, to the extent possible, existing low growing species in the right-of-way or replant such species in the right-of-way to blend the difference between the right-of-way and

adjacent areas, to the extent that the low growing vegetation that will not pose a threat to the transmission line or impede construction.

5.3.11 Application of Pesticides

The Permittee shall restrict pesticide use to those pesticides and methods of application approved by the Minnesota Department of Agriculture (MDA), DNR, and the U.S. Environmental Protection Agency (EPA). Selective foliage or basal application shall be used when practicable. All pesticides shall be applied in a safe and cautious manner so as not to damage adjacent properties including crops, orchards, tree farms, apiaries, or gardens. The Permittee shall contact the landowner at least 14 days prior to pesticide application on their property. The Permittee may not apply any pesticide if the landowner requests that there be no application of pesticides within the landowner's property. The Permittee shall provide notice of pesticide application to landowners and beekeepers operating known apiaries within three miles of the pesticide application area at least 14 days prior to such application. The Permittee shall keep pesticide communication and application records and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.12 Invasive Species

The Permittee shall employ best management practices to avoid the potential introduction and spread of invasive species on lands disturbed by Transmission Facility construction activities. The Permittee shall develop an Invasive Species Prevention Plan and file it with the Commission at least 14 days prior to the pre-construction meeting. The Permittee shall comply with the most recently filed Invasive Species Prevention Plan.

5.3.13 Noxious Weeds

The Permittee shall take all reasonable precautions against the spread of noxious weeds during all phases of construction. When utilizing seed to establish temporary and permanent vegetative cover on exposed soil the Permittee shall select site appropriate seed certified to be free of noxious weeds. To the extent possible, the Permittee shall use native seed mixes. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.14 Roads

The Permittee shall advise the appropriate governing bodies having jurisdiction over all state, county, city, or township roads that will be used during the construction phase of the Transmission Facility. Where practical, existing roadways shall be used for all activities associated with construction of the Transmission Facility. Oversize or overweight loads

associated with the Transmission Facility shall not be hauled across public roads without required permits and approvals.

The Permittee shall construct the fewest number of site access roads required. Access roads shall not be constructed across streams and drainage ways without the required permits and approvals. Access roads shall be constructed in accordance with all necessary township, county or state road requirements and permits.

The Permittee shall promptly repair private roads or lanes damaged when moving equipment or when accessing construction workspace, unless otherwise negotiated with the affected landowner.

5.3.15 Archaeological and Historic Resources

The Permittee shall make every effort to avoid impacts to archaeological and historic resources when constructing the Transmission Facility. In the event that a resource is encountered, the Permittee shall consult with the State Historic Preservation Office and the State Archaeologist. Where feasible, avoidance of the resource is required. Where not feasible, mitigation must include an effort to minimize Transmission Facility impacts on the resource consistent with State Historic Preservation Office and State Archaeologist requirements.

Prior to construction, the Permittee shall train workers about the need to avoid cultural properties, how to identify cultural properties, and procedures to follow if undocumented cultural properties, including gravesites, are found during construction. If human remains are encountered during construction, the Permittee shall immediately halt construction and promptly notify local law enforcement and the State Archaeologist. The Permittee shall not resume construction at such location until authorized by local law enforcement or the State Archaeologist. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.16 Avian Protection

The Permittee in cooperation with the DNR shall identify areas of the transmission line where bird flight diverters will be incorporated into the transmission line design to prevent large avian collisions attributed to visibility issues. Standard transmission design shall incorporate adequate spacing of conductors and grounding devices in accordance with Avian Power Line Interaction Committee standards to eliminate the risk of electrocution to raptors with larger wingspans that may simultaneously come in contact with a conductor and grounding devices. The Permittee shall submit documentation of its avian protection coordination with the plan and profile pursuant to Section 9.1.

5.3.17 Drainage Tiles

The Permittee shall avoid, promptly repair, or replace all drainage tiles broken or damaged during all phases of the Transmission Facility's life unless otherwise negotiated with the affected landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.18 Restoration

The Permittee shall restore the right-of-way, temporary workspaces, access roads, abandoned right-of-way, and other public or private lands affected by construction of the Transmission Facility. Restoration within the right-of-way must be compatible with the safe operation, maintenance, and inspection of the transmission line. Within 60 days after completion of all restoration activities, the Permittee shall file with the Commission a Notice of Restoration Completion.

5.3.19 Cleanup

The Permittee shall remove and properly dispose of all construction waste and scrap from the right-of-way and all premises on which construction activities were conducted upon completion of each task. The Permittee shall remove and properly dispose of all personal litter, including bottles, cans, and paper from construction activities daily.

5.3.20 Pollution and Hazardous Wastes

The Permittee shall take all appropriate precautions to protect against pollution of the environment. The Permittee shall be responsible for compliance with all laws applicable to the generation, storage, transportation, clean up and disposal of all waste generated during construction and restoration of the Transmission Facility.

5.3.21 Damages

The Permittee shall fairly restore or compensate landowners for damage to crops, fences, private roads and lanes, landscaping, drain tile, or other damages sustained during construction. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.4 Electrical Performance Standards

5.4.1 Grounding

The Permittee shall design, construct, and operate the transmission line in a manner so that the maximum induced steady-state short-circuit current shall be limited to five milliamperes root mean square (rms) alternating current between the ground and any non-stationary object within the right-of-way, including but not limited to large motor vehicles and agricultural equipment. All fixed metallic objects on or off the right-of-way, except electric fences that parallel or cross the right-of-way, shall be grounded to the extent necessary to limit the induced short-circuit current between ground and the object so as not to exceed one milliampere rms under steady state conditions of the transmission line and to comply with the ground fault conditions specified in the National Electric Safety Code. The Permittee shall address and rectify any induced current problems that arise during transmission line operation.

5.4.2 Electric Field

The Permittee shall design, construct, and operate the transmission line in such a manner that the electric field measured one meter above ground level immediately below the transmission line shall not exceed 8.0 kV/m rms.

5.4.3 Interference with Communication Devices

If interference with radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices is caused by the presence or operation of the Transmission Facility, the Permittee shall take whatever action is necessary to restore or provide reception equivalent to reception levels in the immediate area just prior to the construction of the Transmission Facility. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.5 Other Requirements

5.5.1 Safety Codes and Design Requirements

The Permittee shall design the transmission line and associated facilities to meet or exceed all relevant local and state codes, the National Electric Safety Code, and North American Electric Reliability Corporation requirements. This includes standards relating to clearances to ground, clearance to crossing utilities, clearance to buildings, strength of materials, clearances over roadways, right-of-way widths, and permit requirements.

5.5.2 Other Permits and Regulations

The Permittee shall comply with all applicable state statutes and rules. The Permittee shall obtain all required permits for the Transmission Facility and comply with the conditions of those permits unless those permits conflict with or are preempted by federal or state permits and regulations.

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission an Other Permits and Regulations Submittal that contains a detailed status of all permits, authorizations, and approvals that have been applied for specific to the Transmission Facility. The Other Permits and Regulations Submittal shall also include the permitting agency name; the name of the permit, authorization, or approval being sought; contact person and contact information for the permitting agency or authority; brief description of why the permit, authorization, or approval is needed; application submittal date; and the date the permit, authorization, or approval was issued or is anticipated to be issued.

The Permittee shall demonstrate that it has obtained all necessary permits, authorizations, and approvals by filing an affidavit stating as such and an updated Other Permits and Regulations Submittal prior to commencing construction. The Permittee shall provide a copy of any such permits, authorizations, and approvals at the request of Department of Commerce staff or Commission staff.

6 SPECIAL CONDITIONS

The special conditions shall take precedence over other conditions of this permit should there be a conflict.

~~[Add Special Conditions in accordance with the record of the docket]~~

6.1 Calcareous Fen

Should any calcareous fens be identified within the project area, the Permittees must work with DNR to determine if any impacts will occur during any phase of the Project. If the Project is anticipated to impact any calcareous fens, the Permittees must develop a Calcareous Fen Management Plan in coordination with the DNR, as specified in Minn. Stat. § 103G.223. Should a Calcareous Fen Management Plan be required, the approved plan must be submitted concurrently with the plan and profile required in Section 9.2 of the Permit.

6.2 Facility Lighting

For all new lighting installations at Project substations and facilities associated with substations, the Permittees shall utilize downlit and shielded lighting to reduce harm to birds, insects, and other animals. Lighting utilized shall minimize blue hue. The Permittees shall keep records of

compliance with this section and provide them upon the request of Commission staff.

6.3 Dust Control

To protect plants and wildlife from chloride products that do not break down in the environment, the Permittees are prohibited from using dust control products containing calcium chloride or magnesium chloride during construction and operation of the Project. The Permittees shall keep records of compliance with this section and provide them upon the request of Commission staff.

6.4 Wildlife-Friendly Erosion Control

The Permittee shall use only "bio-netting" or "natural netting" types of erosion control materials and mulch products without synthetic (plastic) fiber additives.

7 DELAY IN CONSTRUCTION

If the Permittee has not commenced construction or improvement of the route within four years after the date of issuance of this route permit the Permittee shall file a Failure to Construct Report and the Commission shall consider suspension of this route permit in accordance with Minn. R. 7850.4700.

8 COMPLAINT PROCEDURES

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission the complaint procedures that will be used to receive and respond to complaints. The complaint procedures shall be in accordance with the requirements of Minn. R. 7829.1500 or Minn. R. 7829.1700, and as set forth in the complaint procedures attached to this route permit.

Upon request, the Permittee shall assist Department of Commerce staff or Commission staff with the disposition of unresolved or longstanding complaints. This assistance shall include, but is not limited to, the submittal of complaint correspondence and complaint resolution efforts.

9 COMPLIANCE REQUIREMENTS

Failure to timely and properly make compliance filings required by this route permit is a failure to comply with the conditions of this route permit. Compliance filings must be electronically filed with the Commission.

9.1 Pre-Construction Meeting

Prior to the start of construction, the Permittee shall participate in a pre-construction meeting with Department of Commerce and Commission staff to review pre-construction filing requirements, scheduling, and to coordinate monitoring of construction and site restoration activities. Within 14 days following the pre-construction meeting, the Permittee shall file with the Commission a summary of the topics reviewed and discussed and a list of attendees. The Permittee shall indicate in the filing the anticipated construction start date.

9.2 Plan and Profile

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission, and provide the Department of Commerce, and the counties where the Transmission Facility, or portion of the Transmission Facility, will be constructed with a plan and profile of the right-of-way and the specifications and drawings for right-of-way preparation, construction, structure specifications and locations, cleanup, and restoration for the Transmission Facility. The documentation shall include maps depicting the plan and profile including the right-of-way, alignment, and structures in relation to the route and alignment approved per this route permit.

The Permittee may not commence construction until the earlier of (i) 30 days after the pre-construction meeting or (ii) or until the Commission staff has notified the Permittee in writing that it has completed its review of the documents and determined that the planned construction is consistent with this route permit.

If the Commission notifies the Permittee in writing within 30 days after the pre-construction meeting that it has completed its review of the documents and planned construction, and finds that the planned construction is not consistent with this route permit, the Permittee may submit additional and/or revised documentation and may not commence construction until the Commission has notified the Permittee in writing that it has determined that the planned construction is consistent with this route permit.

If the Permittee intends to make any significant changes in its plan and profile or the specifications and drawings after submission to the Commission, the Permittee shall notify the Commission, the Department of Commerce, and county staff at least five days before implementing the changes. No changes shall be made that would be in violation of any of the terms of this route permit.

9.3 Status Reports

The Permittee shall file with the Commission monthly Construction Status Reports beginning with the pre-construction meeting and until completion of restoration. Construction Status Reports shall describe construction activities and progress, activities undertaken in compliance with this route permit, and shall include text and photographs.

If the Permittee does not commence construction of the Transmission Facility within six months of this route permit issuance, the Permittee shall file with the Commission Pre-Construction Status Reports on the anticipated timing of construction every six months beginning with the issuance of this route permit until the pre-construction meeting.

9.4 In-Service Date

At least three days before the Transmission Facility is to be placed into service, the Permittee shall notify the Commission of the date on which the Transmission Facility will be placed into service and the date on which construction was completed.

9.5 As-Builts

Within 90 days after completion of construction, the Permittee shall submit to the Commission copies of all final as-built plans and specifications developed during the Transmission Facility construction.

9.6 GPS Data

Within 90 days after completion of construction, the Permittee shall submit to the Commission, in the format requested by the Commission, geo-spatial information (*e.g.*, ArcGIS compatible map files, GPS coordinates, associated database of characteristics) for all structures associated with the Transmission Facility and each substation connected.

9.7 Right of Entry

The Permittee shall allow Commission designated representatives to perform the following, upon reasonable notice, upon presentation of credentials and at all times in compliance with the Permittee's site safety standards:

(a) To enter upon the facilities easement of the property for the purpose of obtaining information, examining records, and conducting surveys or investigations.
(b) To bring such equipment upon the facilities easement of the property as is necessary to conduct such surveys and investigations.
(c) To sample and monitor upon the facilities easement of the property.

To examine and copy any documents pertaining to compliance with the conditions of this route permit.

10 ROUTE PERMIT AMENDMENT

This route permit may be amended at any time by the Commission. Any person may request an amendment of the conditions of this route permit by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The Commission may amend the conditions after affording the Permittee and interested persons such process as is required under Minn. R. 7850.4900.

11 TRANSFER OF ROUTE PERMIT

The Permittee may request at any time that the Commission transfer this route permit to another person or entity (transferee). In its request, the Permittee must provide the Commission with:

(a) the name and description of the transferee;
(b) the reasons for the transfer;
(c) a description of the facilities affected; and
(d) the proposed effective date of the transfer.

The transferee must provide the Commission with a certification that it has read, understands and is able to comply with the plans and procedures filed for the Transmission Facility and all conditions of this route permit. The Commission may authorize transfer of the route permit after affording the Permittee, the transferee, and interested persons such process as is required under Minn. R. 7850.5000.

12 REVOCATION OR SUSPENSION OF ROUTE PERMIT

The Commission may initiate action to revoke or suspend this route permit at any time. The Commission shall act in accordance with the requirements of Minn. R. 7850.5100, to revoke or suspend this route permit.

Appendix F

EMF Supplement

Appendix F Electric and Magnetic Fields Supplement

There is concern about the potential for adverse health effects from exposure to electric and magnetic Fields (EMF) as the result of residing near high voltage transmission lines (HVTLs). Extremely low-frequency (ELF) - EMF that is emitted from HVTLs does not have the energy to ionize molecules or to heat them; however, they are fields of energy and thus have the potential to produce effects.

In the 1970s, epidemiological studies indicated a possible association between childhood leukemia and EMF levels. Since then, various types of research, including animal studies, epidemiological studies, clinical studies and cellular studies, have been conducted to examine the potential health effects of EMF. Scientific panels and commissions have reviewed and studied this research data. These studies have been conducted by, among others, the National Institute of Environmental Health Sciences (NIEHS), the World Health Organization (WHO), the International Agency for Research on Cancer (IARC), the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) and the Minnesota State Interagency Working Group (MSIWG). In general, these studies concur that:

- Based on epidemiological studies, there is a weak association between childhood leukemia and EMF exposure. There is however no consistent association between EMF exposure and other diseases in children or adults.

- Laboratory, animal, and cellular studies fail to show a cause and effect relationship between disease and EMF exposure at common EMF levels. A biological mechanism for how EMFs might cause disease has not been established.

Because a cause and effect relationship cannot be established, yet a weak association between childhood leukemia and EMF exposure has been shown: 1) the potential health effects of EMF are uncertain; 2) no methodology for estimating health effects based on EMF exposure exists; 3) further study of the potential health effects of EMF is needed; and 4) a precautionary approach, including regulations and guidelines, is needed in designing and using all electrical devices.

Researchers continue to study potential health effects related to ELF-EMF and potential causal mechanisms. The following sections provide brief summaries from scientific panels and commissions that have examined the potential health impacts of ELF-EMF.

In 1992, the U.S. Congress authorized the Electric and Magnetic Fields Research and Public Information Dissemination Program (EMF-RAPID program). Congress instructed NIEHS and the U.S. Department of Energy to direct and manage a program of research and analysis aimed at providing scientific evidence to clarify the potential for health risk from exposure to ELF-EMF. The program provided the following conclusions to Congress (NIEHS 1999, reference F1):

- “The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak.

- Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status. The lack of consistent positive findings in animal or mechanistic studies weakens the belief that this

association (the epidemiological association between ELF-EMF and childhood leukemia) is actually due to ELF-EMFs but it cannot completely discount the epidemiological findings.

- The NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as a continued emphasis on education both the public and regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or non-cancer outcomes provide sufficient evidence of a risk to currently warrant concern."

In 2002, the EMF-RAPID program published a detailed question and answer pamphlet summarizing research on ELF-EMF and potential health effects. The pamphlet is available at: http://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf

World Health Organization

In 1996, the WHO established the International EMF Project to study the potential health impacts of EMF. The project develops and disseminates information on EMF and public health. In 2007, the WHO issued an environmental health monograph on ELF-EMF (WHO 2007, reference F2). The monograph concluded:

- "Scientific evidence suggesting that everyday, chronic low-intensity (above 0.3 – 0.4 μT) power-frequency magnetic field exposure poses a health risk is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukemia. Uncertainties in the hazard assessment include the role that control selection bias and exposure misclassification might have on the observed relationship between magnetic fields and childhood leukemia. In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern.

- A number of other diseases have been investigated for the possible association with ELF magnetic field exposures. These include cancers in children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease.

- The use of precautionary approaches is warranted. However, electric power brings obvious health, social and economic benefits and precautionary approaches should not compromise these benefits. Furthermore, given both weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia and the limited impacted on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus, the costs of precautionary measures should be very low. The costs of implementing exposure reductions would vary from one country to another, making it very difficult to provide general recommendation for balancing the costs against the potential risk from ELF fields."

International Agency for Research on Cancer

Since 1969, the IARC has been evaluating the carcinogenic risks of chemicals and other agents, such as viruses and radiation. In 2001, the IARC convened a working group of scientists to evaluate possible carcinogenic risks to humans from exposure to EMF (IARC 2002, reference F3). These scientists concluded that ELF magnetic fields are possibly carcinogenic to humans (a "Group 2B carcinogen"). Group 2B carcinogens are agents for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence for carcinogenicity in experimental animals. The working group concluded:

- "Since the first report suggesting an association between residential ELF electric and magnetic fields and childhood leukemia was published in 1979, dozens of increasingly sophisticated studies have examined this association. In addition, there have been numerous comprehensive review, meta-analyses and two recent pooled analyses. In one pooled analysis…no excess risk was seen for exposure to ELF magnetic fields below 0.4 μT and a twofold excess risk was seen for exposure above 0.4 μT. [In the other study] a relative risk of 1.7 for exposure above 0.3 μT was reported.

- No consistent relationship has been seen in studies of childhood brain tumors or cancers at other sites and residential ELF electric and magnetic fields.

- While a number of studies are available, reliable data on adult cancer and residential exposure to ELF electric and magnetic fields, including the use of appliances, are sparse and methodologically limited…. Although there have been considerable number of reports, a consistent association between residential exposure and adult leukemia and brain cancer has not been established."

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR)

The SCENIHR serves as an advisory committee to the European Commission. At the request of the Commission, the SCENIHR reviewed possible adverse health impacts due to EMF. In 2007, the committee concluded (SCENIHR 2007, reference F4):

- "The previous conclusion (by a prior advisory committee, the Scientific Committee on Toxicity, Ecotoxicity and the Environment, CSTEE) that ELF magnetic fields are possibly carcinogenic, chiefly based on occurrence of childhood leukemia, is still valid. For breast cancer and cardiovascular disease, recent research has indicated that an association is unlikely. For neurodegenerative diseases and brain tumors, the link to ELF fields remains uncertain."

- In vitro studies have documented that that low intensity ELF can inhibit the anti-proliferative effect of tamoxifen on a specific subclone of human MCF-7 breast cancer cells (Blackman et al. 2001, reference F5; Ishido et al. 2001, reference F6; Girgert et al. 2005, reference F7). There is a need for independent replication of certain studies suggesting genotoxic effects and for better understanding of combined effects of ELF magnetic fields with other agents, their effects on free radical homeostasis, as well as of the possible implications of ELF field inhibition of tamoxifen effects.

In 2009, the committee updated its prior opinion after reviewing new studies of ELF-EMF (SCENIHR 2009, reference F8) and concluded:

- "The new information available is not sufficient to changes the conclusions of the 2007 opinion. The few new epidemiological and animal studies that have addressed ELF exposure and cancer do not change the previous assessment that ELF magnetic fields are a possible carcinogen and might contribute to an increase in childhood leukemia. At present, in vitro studies did not provide a mechanistic explanation of this epidemiological finding.

- New epidemiological studies indicate a possible increase in Alzheimer's disease arising from exposure to ELF. Further epidemiological and laboratory investigations of this observation are needed."

- There remains a need for independent replication of certain studies suggesting genotoxic effects and for better understanding of combined effects of ELF magnetic fields with other agents, their effects on free radical homeostasis, as well as of the possible implications of ELF field inhibition of tamoxifen effects.

Minnesota State Interagency Working Group (MSIWG)

In 2002, the MSIWG on EMF issues was formed to examine the potential health impacts of EMF and to provide science-based information to policy makers in Minnesota. Working group members included representatives from the Department of Commerce, Department of Health, Pollution Control Agency, Public Utilities Commission, and Environmental Quality Board. The working group issued a white paper entitled "A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options" (MSIWG on EMF Issues 2002, reference F9). The white paper concluded:

- "Some epidemiological results do show a weak but consistent association between childhood leukemia and increasing exposure to EMF... However, epidemiological studies alone are considered insufficient for concluding that a cause and effect relationship exists and the association must be supported by data from laboratory studies. Existing laboratory studies have not substantiated this relationship… nor have scientists been able to understand the biological mechanism of how EMF could cause adverse effects. In addition, epidemiological studies of various other diseases, in both children and adults, have failed to show any consistent pattern of harm from EMF.

- 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 dismissed. Construction of new generation and transmission facilities to meet increasing electrical needs in the state is likely to increase exposure to EMF and public concern regarding potential adverse health effects.

- Based on its review, the Work Group believes the most appropriate public health policy is to take a prudent avoidance approach to regulating EMF. Based upon this approach, policy recommendations of the Work Group include:

    - Apply low-cost EMF mitigation options in electric infrastructure construction projects;

    - Encourage 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."

References

F1. National Institute of Environmental Health Sciences, 1999. NIEHS Report on Health Effects from Exposure to Power-line Frequency Electric and Magnetic Fields. NIH Publication No. 99-4493

F2. World Health Organization, 2007. Environmental Health Criteria 238 (2007): Extremely Low Frequency (ELF) Fields. ISBN 978-92-4-157238-5

F3. International Agency for Research on Cancer, 2002. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Volume 80. Non-Ionizing Radiation, Part 1: Static and Extremely Low-Frequency (ELF) Electric and Magnetic Fields. Summary of Data Reported and Evaluation

F4. Scientific Committee on Emerging and Newly Identified Health Risks, 2007. Possible Effects of Electromagnetic Fields (EMF) on Human Health. Accessed November 2018 at: http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_007.pdf

F5. Blackman, C. F., Benane, S. G., & House, D. E. (2001). The Influence of 1.2 µT, 60 Hz Magnetic Fields on Melatonin- and Tamoxifen-Induced Inhibition of MCF-7 Cell Growth. Bioelectromagnetics (22), pp. 122-128.

F6. Ishido, M., Nitta, H., & Kabuto, M. (2001). Magnetic fields (MF) of 50 Hz at 1.2 µT as well as 100 µT cause uncoupling of inhibitory pathways of adenylyl cyclase mediated by melatonin 1a receptor in MF-sensitive MCF-7 cells. Carcinogenesis, 22(7), pp. 1043-1048.

F7. Girgert, R., Schimming, H., Korner, W., Grundker, C., & Hanf, V. (2005). Induction of tamoxifen resistance in breast cancer cells by ELF electromagnetic fields. Biochemical and Biophysical Research Communications (336), pp. 1144–1149.

F8. Scientific Committee on Emerging and Newly Identified Health Risks, 2009. Health Effects of Exposure to EMF. Accessed November 2018 at: http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf

F9. The Minnesota State Interagency Working Group on EMF Issues, 2002. A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options. Accessed November 2018 at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7B474587DD-E5C5-4A6E-95BC-7BC805CE4975%7D&documentTitle=20101-45731-07

Appendix G

GHG Calculations

ITC Midwest LLC.
Forks-Rost Transmission Line Project
GHG Calculations

Table 1. Summary of Construction GHG Emissions

Emission Source	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e (metric tons)
Direct Sources				
Mobile Combustion	6,045.85	8.20E-01	4.96E-01	6,200.30
Temporary Land Use Change	-	-	-	47.69
TOTAL - ALL SOURCES	**6,045.85**	**0.82**	**0.50**	**6,247.99**

Table 2. Summary of Operations GHG Emissions

Emission Source	CO_2 (metric tons/year)	CH_4 (metric tons/year)	N_2O (metric tons/year)	CO_2e (metric tons/year)
Direct Sources				
Mobile Combustion	1.83	2.32E-04	1.32E-04	1.88
Permanent Land Use Change	-	-	-	2.67
TOTAL - ALL SOURCES	**1.83**	**2.32E-04**	**1.32E-04**	**4.55**

Table 3. Conversions

Unit	Amount	Unit
1 US ton	2000	lbs
1 US ton	0.907185	metric tons
1 US ton	907.185	kg
1 US ton	907185	grams
1 metric ton	1000	kg
1kg	1000	grams
1 lb	0.453592	kg
1 lb	453.592	grams
1 MWh	1000	kWh
1 hectare	2.47105	acres
1 MJ	0.372506136	hp-h
US gallon (diesel)[1]	144.945	MJ
US gallon (diesel)	53.9929019	hp-h
US gallon (gasoline)[1]	126.833	MJ
US gallon (gasoline)	47.24606261	hp-h

[1] US Energy Information Administration, 2024. https://www.eia.gov/energyexplained/units-and-calculators/energy-conversion-calculators.php

Table 4. Global Warming Potentials

Greenhouse Gas Name	CAS Number	Chemical Formula	Global Warming Potential (100-yr.) [1]
Carbon dioxide	124–38–9	CO_2	1
Methane	74–82–8	CH_4	28
Nitrous oxide	10024–97–2	N_2O	265

[1] Global Warming Potentials, 100-Year Time Horizon, Table A-1 to Subpart A of Part 98, Title 40

Table 5. Construction Emissions from Fuel Combustion Sources

Equipment Type[1]	Fuel Type[1]	Number of Units[1]	Annual Operating Time per Unit[1] (hours)	Estimated Horsepower [1]	CO_2 Emission Factor[2] (kg/gal)	CH_4 Emission Factor[3] (g/gal)	N_2O Emission Factor[3] (g/gal)	CO_2 Emission Factor[2] (lb/hr)	CH_4 Emission Factor[3] (lb/hr)	N_2O Emission Factor[3] (lb/hr)	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e[4] (metric tons)
Backhoe	Diesel Fuel	2	1116	75	10.21	1.01	0.94	31.27	3.09E-03	2.88E-03	31.66	3.13E-03	2.91E-03	32.52
Bulldozer	Diesel Fuel	2	744	250	10.21	1.01	0.94	104.22	1.03E-02	9.60E-03	70.34	6.96E-03	6.48E-03	72.26
Concrete Mixer Truck	Diesel Fuel	8	384	325	10.21	1.01	0.94	135.49	1.34E-02	1.25E-02	188.80	1.87E-02	1.74E-02	193.93
Dump Truck	Diesel Fuel	3	1674	300	10.21	0.92	0.56	125.07	1.13E-02	6.86E-03	284.90	2.57E-02	1.56E-02	289.76
Excavator	Diesel Fuel	1	372	325	10.21	1.01	0.94	135.49	1.34E-02	1.25E-02	22.86	2.26E-03	2.10E-03	23.48
Pickup Truck	Motor Gasoline	5	9300	150	8.78	2.86	1.48	53.78	1.75E-02	9.06E-03	1,134.23	3.69E-01	1.91E-01	1,195.24
Skid steer loader	Diesel Fuel	3	2790	50	10.21	1.01	0.94	20.84	2.06E-03	1.92E-03	79.14	7.83E-03	7.29E-03	81.29
Large Crane	Diesel Fuel	1	744	15	10.21	1.01	0.94	6.25	6.19E-04	5.76E-04	2.11	2.09E-04	1.94E-04	2.17
Medium Crane	Diesel Fuel	2	2976	450	10.21	1.01	0.94	187.60	1.86E-02	1.73E-02	506.48	5.01E-02	4.66E-02	520.24
Hydrovac Truck	Diesel Fuel	1	930	200	10.21	0.92	0.56	83.38	7.51E-03	4.57E-03	35.17	3.17E-03	1.93E-03	35.77
Semitruck/Trailer	Diesel Fuel	1	360	500	10.21	0.92	0.56	208.45	1.88E-02	1.14E-02	34.04	3.07E-03	1.87E-03	34.62
Bucket Truck	Diesel Fuel	4	5952	400	10.21	0.92	0.56	166.76	1.50E-02	9.15E-03	1,800.83	1.62E-01	9.88E-02	1,831.55
Digger Truck	Diesel Fuel	4	5952	400	10.21	0.92	0.56	166.76	1.50E-02	9.15E-03	1,800.83	1.62E-01	9.88E-02	1,831.55
Loader	Diesel Fuel	1	960	300	10.21	1.01	0.94	125.07	1.24E-02	1.15E-02	54.46	5.39E-03	5.01E-03	55.94
TOTAL	--	--	--	--	--	--	--	--	--	--	**6,045.85**	**8.20E-01**	**4.96E-01**	**6,200.30**

[1] Based on information provided by ITC Midwest LLC on 03/13/2025.

[2] CO_2 emissions calculated using the EPA CCCL emission factors for mobile combustion, Table 2: Mobile Combustion CO_2, 2025. https://www.epa.gov/system/files/documents/2025-01/ghg-emission-factors-hub-2025.pdf

Fuel Type	CO_2 Emission Factor (kg/gal)
Diesel Fuel	10.21
Motor Gasoline	8.78

[3] CH_4 and N_2O emissions calculated using the EPA CCCL emission factors for construction/mining equipment, Table 5: Mobile Combustion CH_4 and N_2O for Non-Road Vehicles, 2025. https://www.epa.gov/system/files/documents/2025-01/ghg-emission-factors-hub-2025.pdf

Vehicle Type	Fuel Type	CH4 Emission Factor (g/gal)	N2O Emission Factor (g/gal)
Construction/Mining Equipment	Diesel Equipment	1.01	0.94
Construction/Mining Equipment	Diesel Off-road Trucks	0.92	0.56
Construction/Mining Equipment	Gasoline Off-Road Trucks	2.86	1.48

[4] CO2e calculated by equation A-1 of 40 CFR 98.2, which states the total CO2e is equal to the GWP for each pollutant multiplied by the potential pollutant emissions.

Table 6. Construction Land Use Change GHG Emissions

Temporary Land Use Change[1]	Area of Land Change[1] (acres)	2022 Net CO_2 Flux for Converted Land Type[2][3] (M metric tons CO_2e)	2022 Total US Land Use Change to Settlement[4] (thousands of hectares)	CO_2e Emission Factor (metric tons CO_2e/acre)	CO_2e[5] (metric tons)
Cropland to Settlement	55.50	2.9	1,228	0.96	39.78
Grassland to Settlement	0.37	7.5	1,648	1.84	0.51
Wetland to Settlement	1.19	0.1	14	2.89	2.58
Settlement remaining Settlement	45.01	15.4	43,748	0.14	4.81
TOTAL	**102.07**	**-**	**-**	**-**	**47.69**

[1] Estimated from development area delineation files and NLCD land cover estimates. Assuming project "Right-of-Way" as the construction development area.

[2] Table 6-136: Net CO2 Flux from Soil, Dead Organic Matter and Biomass Carbon Stock Changes for Land Converted to Settlements, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf

[3] Table 6-119: Net CO2 Flux from Soil C Stock Changes in Settlements Remaining Settlements, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.

[4] Table 6-5: Land Use and Land-Use Change for the U.S. Managed Land Base for All 50 States, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf

[5] Emissions are calculated for an assumed 9-month duration of temporary disturbances as per the route permit application construction timeline; April 2026 to December 2026.

Table 7. Operation Emissions from Fuel Combustion Sources

Activity	Activity Frequency[1]	Equipment Type[1]	Fuel Type[1]	Number of Units[1]	Operating Time[1] (hours/yr)	Estimated Horsepower[1]	CO_2 Emission Factor[2] (kg/gal)	CH_4 Emission Factor[3] (g/gal)	N_2O Emission Factor[3] (g/gal)	CO_2 Emission Factor[4] (lb/hr)	CH_4 Emission Factor[4] (lb/hr)	N_2O Emission Factor[4] (lb/hr)	CO_2 (metric tons/yr)	CH_4 (metric tons/yr)	N_2O (metric tons/yr)	CO_2e[5] (metric tons/yr)
Vegetation Management	Annual	Bucket Truck	Diesel Fuel	1	16	400	10.21	0.92	0.56	190.57	1.72E-02	1.05E-02	1.38	1.25E-04	7.59E-05	1.41
Vegetation Management	Annual	Chipper	Motor Gasoline	1	16	72	8.78	3.02	1.50	25.81	8.88E-03	4.41E-03	0.19	6.44E-05	3.20E-05	0.20
Vegetation Management	Annual	Skid steer mower	Diesel Fuel	1	8	110	10.21	0.67	0.49	45.86	3.01E-03	2.20E-03	0.17	1.09E-05	7.99E-06	0.17
Inspection	Annual	Pickup Truck	Motor Gasoline	1	4	150	8.78	2.86	1.48	53.78	1.75E-02	9.06E-03	0.10	3.18E-05	1.64E-05	0.10
TOTAL		--		--	--	--				--	--		**1.83**	**2.32E-04**	**1.32E-04**	**1.88**

[1] Activity, frequency, equipment type, number of units, estimated horsepower, and operating time provided electronically by ITC Midwest LLC. on 03/13/2025 and 03/26/2025.

[2] CO_2 emissions calculated using the EPA CCCL emission factors for mobile combustion, Table 2: Mobile Combustion CO_2, 2025. https://www.epa.gov/system/files/documents/2025-01/ghg-emission-factors-hub-2025.pdf

Fuel Type	CO2 Emission Factor (kg/gal)
Diesel Fuel	10.21
Motor Gasoline	8.78

[3] CH_4 and N_2O emissions calculated using the EPA CCCL emission factors for construction/mining equipment, Table 5: Mobile Combustion CH_4 and N_2O for Non-Road Vehicles, 2025. https://www.epa.gov/system/files/documents/2025-01/ghg-emission-factors-hub-2025.pdf

Vehicle Type	Fuel Type	CH4 Emission Factor	N2O Emission Factor
Lawn and Garden Equipment	Diesel	0.67	0.49
Lawn and Garden Equipment	Gasoline (4 stroke)	3.02	1.50
Agricultural Equipment	Diesel Off-Road Trucks	0.92	0.56
Construction/Mining Equipment	Gasoline Off-Road	2.86	1.48

[4] Emission factors converted to lb/hr using conversion rates of 53.993 hp-hr/gal for diesel, and 47.246 hp-hr/gal for gasoline.

[5] CO_2e calculated by equation A-1 of 40 CFR 98.2, which states the total CO_2e is equal to the GWP for each pollutant multiplied by the potential pollutant emissions.

Table 8. Operation Land Use Change GHG Emissions

Temporary Land Use Change[1]	Area of Land Change[1] (acres)	2022 Net CO_2 Flux for Converted Land Type[2][3] (M metric tons CO_2e)	2022 Total US Land Use Change to Settlement[4] (thousands of hectares)	CO_2e Emission Factor (metric tons CO_2e/acre)	CO_2e[5] (metric tons)
Cropland to Settlement	11.76	2.9	1,228	0.96	2.67
Settlement remaining Settlement	0.08	15.4	43,748	0.14	2.69E-03
TOTAL	**11.84**	**-**	**-**	**-**	**2.67**

[1] Estimated from development area delineation files and NLCD land cover estimates. Assuming project "Right-of-Way" as the construction development area.

[2] Table 6-136: Net CO2 Flux from Soil, Dead Organic Matter and Biomass Carbon Stock Changes
for Land Converted to Settlements, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf

[3] Table 6-119: Net CO2 Flux from Soil C Stock Changes in Settlements Remaining Settlements, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.

[4] Table 6-5: Land Use and Land-Use Change for the U.S. Managed Land Base for All 50 States, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf

[5] The switching station will be located within an 11.8-acre area, with final expected dimensions of 375 feet by 325 feet (2.8-acre) per the route permit application.

Appendix H

Agricultural Impact Mitigation Plan

FORKS 161 kV SWITCHING STATION AND FORKS-ROST 161 kV TRANSMISSION LINE PROJECT

ITC Midwest LLC

Agricultural Impact Mitigation Plan

Docket Number

ET6675/TL-24-232

Prepared by:

merjent

September 2024

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DEFINITIONS

Agricultural Land	Land that is actively managed for cropland, hayland, or pasture, and land in government set-aside programs.
Certifying Agent	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Cropland	Land actively managed for growing row crops, small grains, or hay.
Decertified or Decertification	Loss of Organic Certification.
Easement	The agreement(s) and/or interest in privately owned Agricultural Land held by ITC Midwest by virtue of which it has the right to construct, operate and maintain the transmission line together with such other rights and obligations as may be set forth in such agreement.
Final Clean-up	Transmission line activity that occurs after the power line has been constructed. Final Clean-up activities may include: removal of construction debris, de-compaction of soil as required, installation of permanent erosion control structures, final grading, and restoration of fences and required reseeding. Once Final Clean-up is finished, Landowner will be contacted to settle all damage issues and will be provided a form to sign acknowledging final construction settlement.
Inspector	Full-time on-site inspector retained by ITC Midwest to verify compliance with requirements of this AIMP during construction of the transmission line. The Inspector will have demonstrated experience with transmission line construction on Agricultural Land.
ITC Midwest	ITC Midwest LLC, a Michigan limited liability company. May also include agents and contractors of ITC Midwest, where appropriate.
Landowner	Person(s), or their representatives, holding legal title to Agricultural Land on the transmission line route from whom ITC Midwest is seeking, or has obtained, a temporary or permanent Easement. “Landowner” includes Tenant, if any.
Non-Agricultural Land	Any land that is not “Agricultural Land” as defined above.
Prohibited Substance	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.600 through 7 CFR 205.605 using the criteria provided in 7 USC 6517 and 7 USC 6518.
Project	Proposed 161 kilovolt transmission line from new Forks Switching Station to new Rost Substation in Jackson County, Minnesota
Proposed Route	“Route” means the location of a high voltage transmission line between two end points. The route may have a variable width of up to 1.25 miles. (Minnesota Statute 216E.01)
Right-of-Way	The Agricultural Land included in permanent and temporary Easements which ITC Midwest acquires for the purpose of constructing, operating and maintaining the transmission line. Also “ROW.”
Subsoil	Soil that is not Topsoil and located immediately below Topsoil.

Tenant	Any person(s) lawfully renting or sharing land for agricultural production which makes up the “Right-of-Way” as defined in this AIMP.
Tile	Artificial subsurface drainage system.
Topsoil	The uppermost horizon (layer) of the soil, typically with the darkest color and highest content of organic matter.

1.0 INTRODUCTION

ITC Midwest LLC (ITC Midwest) developed this Agricultural Impact Mitigation Plan (AIMP) with the Minnesota Department of Agriculture (MDA) in compliance with Minnesota Statutes Section 216E.10, subdivision 3(b). The AIMP identifies measures ITC Midwest will take during construction of its Forks 161 kilovolt (kV) Switching Station and Forks-Rost 161 kV Transmission Line Project (Project) to avoid, minimize, mitigate, repair, or provide compensation for impacts on Agricultural Land.

The Project will include the construction of the new Forks Switching Station southwest of the City of Lakefield, Minnesota, and a new approximately 8.5 mile long 161 kV high voltage transmission line from the new Forks Switching Station to the new Rost Substation to be permitted separately and constructed by Great River Energy, east of the City of Worthington, Minnesota. The AIMP and its provisions will be implemented during construction and restoration activities that ITC Midwest undertakes for the Project prior to filing notice of completion of construction with the Minnesota Public Utilities Commission (Commission).

ITC Midwest has asked the Commission to approve a Proposed Route with a width of 1,500 feet (750 feet on either side of the proposed transmission centerline). At a minimum, the Project will have a Right-of-Way (ROW) that is 100 feet wide (typically 50 feet on each side of the transmission centerline).

Capitalized words and other defined terms have the meanings given to them in this AIMP. Use of “Landowner” in this AIMP may be construed to read “Landowner and/or Tenant.”

This AIMP and its construction standards and policies apply only to construction activities occurring on privately-owned Agricultural Land. If agricultural drain Tiles are encountered, whether on Non-Agricultural Land or Agricultural Land, ITC Midwest will implement construction standards relating to the repair of Tile on Agricultural Lands discussed further in this AIMP.

No organic farms have been identified along or adjacent to the Proposed Route. If that changes prior to construction of the Project, portions of this AIMP will be updated to identify standards and policies as they apply to Organic Agricultural Land, and those portions of the AIMP will apply only to the types of lands defined in the National Organic Program Rules (7 C.F.R. Parts 205.100; 205.101, and 205.202).

Construction standards and policies identified in this AIMP can be modified through terms in an easement or other agreement between ITC Midwest and the Landowner, as appropriate. In such cases, the Easement or other agreement will control.

2.0 GENERALLY

ITC Midwest will negotiate in good faith with each Landowner to secure an agreement containing the conditions or provisions necessary to implement the provisions of this AIMP. The mitigative actions set forth in this AIMP are subject to negotiation and approval or change by Landowner so long as such changes are negotiated with and acceptable to ITC Midwest. Mitigative actions will be executed by qualified contractors retained by ITC Midwest, unless otherwise specified or agreed upon by the Landowner. ITC Midwest and the Landowner may agree that certain activities will be performed by Landowner. ITC Midwest maintains a damage claim policy outlining

compensation policies for damage to property, including but not limited to crop damages, and will provide a copy of this policy to the Landowner during Easement acquisition negotiations.

Unless otherwise specified in this AIMP or in an easement or other agreement negotiated between ITC Midwest and Landowner, construction standards and policies or mitigative actions will be implemented within 90 days after completion of Final Clean-up activities on Agricultural Land. Weather conditions or other circumstances identified by mutual agreement between Landowner and ITC Midwest may delay implementation of mitigative actions after Final Clean-up. Where practicable, ITC Midwest may make temporary repairs. These temporary repairs may be made to minimize additional property damage or interference with the Landowner's access to the subject Agricultural Land.

ITC Midwest or its contractors will implement the construction standards and policies or mitigative actions identified within this AIMP so long as such activities do not conflict with any applicable Federal or State rules, regulations, permits, licenses, approvals, or conditions obtained by ITC Midwest for the Project. Should any activity within this AIMP be determined to be unenforceable due to Federal or State rules, regulations, permits, licenses, approvals, or conditions, ITC Midwest will inform the Landowner and will identify a reasonable alternative activity.

Prior to ROW preparation for, or construction of, the Project, ITC Midwest will make a good faith effort to provide each Landowner with contact information, including a phone number and address, that can be used to contact ITC Midwest regarding any impacts to Agricultural Land or other construction-related concerns or questions. ITC Midwest will provide updated information to the Landowner within a reasonable time of any change to ITC Midwest contacts.

3.0 CONSTRUCTION STANDARDS

3.1 MITIGATIVE ACTIONS

ITC Midwest will reasonably restore and/or compensate the Landowner, as appropriate, for damages caused by ITC Midwest as a result of Project construction, and as outlined in this plan. ITC Midwest will decide whether to restore land and/or compensate the Landowner after a discussion with the Landowner.

3.2 ADVANCE NOTICE OF ACCESS

ITC Midwest will make good faith efforts to provide notice to the Landowner in advance of the commencement of construction activities on Agricultural Land. Notice may include personal contact, email, letter, or telephone contact.

3.3 ITC MIDWEST AGRICULTURAL INSPECTOR

ITC Midwest's Agricultural Inspector will:

1. Be a full-time member of ITC Midwest's inspection team.

2. Be responsible for verifying ITC Midwest's compliance with the provisions of this AIMP during construction.

3. Work collaboratively with other members of ITC Midwest's construction team and land agents in achieving compliance with this AIMP.

4. Observe construction activities on Agricultural Land on a regular basis.

5. Have the authority to stop construction activities that are determined to be out of compliance with the provisions of this AIMP.

6. Document instances of noncompliance and work with construction personnel to identify and implement appropriate corrective actions as needed.

7. Provide construction personnel with training on provisions of this AIMP before construction begins.

8. Provide construction personnel with field training on specific topics as needed.

3.4 POLE PLACEMENT AND TEMPORARY ACCESS ROUTES

During the design of the Project, ITC Midwest's engineering, land, and permitting staff will seek input from Landowner, as practicable, to identify pole placement locations and to address issues that arise regarding poles. Prior to construction, the land agents will review the staked pole locations with the Landowner when requested to do so by the Landowner.

ITC Midwest will discuss the location of temporary access routes to be used for construction purposes with the Landowner.

A. Temporary access routes will be designed so as to not impede proper drainage and will be built to mitigate soil erosion on or near the temporary access routes.

B. After Final Clean-up, temporary access routes may be left intact through mutual agreement of the Landowner and ITC Midwest unless otherwise restricted by Federal, State, or local regulations.

C. If a temporary access route is to be removed, the Agricultural Land upon which the temporary access route is constructed will be returned to its previous use and restored to reasonably equivalent condition as existed prior to construction.

3.5 SWITCHING STATION CONSTRUCTION

The Project will require construction of the new Forks Switching Station. During construction, ITC Midwest will segregate Topsoil that must be removed for groundwork. At ITC Midwest's sole discretion, excess Topsoil may be made available to a Landowner who wishes to use this Topsoil on their property in an upland location. If the Topsoil is made available to a Landowner in other areas of the Project, it will be provided "as is" and the Landowner, not ITC Midwest, will be responsible for verifying that the quality of the Topsoil meets the Landowner's farming requirements. The Landowner is solely responsible for obtaining any required local, state, or federal permits or permissions that may be necessary for the placement of Topsoil on his or her property.

3.6 AGRICULTURAL TILE

ITC Midwest will contact an affected Landowner for their knowledge of Tile locations prior to installation of the transmission line. ITC Midwest will attempt to identify Tile if the Landowner does not know if Tile is located at the proposed pole location. Tile that is damaged, cut, or removed as a result of ITC Midwest's location efforts will be promptly repaired. The repair will be reported to the Inspector.

If Tile is damaged by Project construction, the Tile will be repaired with materials of the same quality as that which was damaged. If Tiles on or adjacent to the transmission line construction area are adversely affected by construction, ITC Midwest will take such actions as are necessary to restore the Tile function, including the relocation, reconfiguration, and replacement of the existing Tile. ITC Midwest will correct Tile repairs, as needed, after completion of the transmission line construction, provided the repairs were made by ITC Midwest or their agents or designees.

The affected Landowner may elect to negotiate a fair settlement with ITC Midwest for the Landowner to undertake the responsibility for repair, relocation, reconfiguration, or replacement of damaged Tile. In the event the Landowner chooses to undertake the responsibility for repair, relocation, reconfiguration, or replacement of the damaged Tile, ITC Midwest will have no further liability for the identified damaged Tile.

The following standards and policies apply to the Tile repairs completed by ITC Midwest:

1. Tiles will be repaired with materials of the same or reasonably comparable quality as that which were damaged.

2. If water is flowing through a damaged Tile, temporary repairs will be promptly installed and maintained until such time that permanent repairs can be made.

3. Before completing permanent Tile repairs in an area where a Landowner or ITC Midwest has identified a potential concern arising from Project construction, Tiles will be examined within the work area to check for Tile that might have been damaged by construction equipment. If Tiles are found to be damaged, they will be repaired so they operate as well after construction as before construction began.

4. ITC Midwest will make efforts to complete permanent Tile repairs within a reasonable timeframe after Final Clean-up, taking into account weather and soil conditions.

5. Following completion of Final Clean-up and damage settlement, ITC Midwest will be responsible for correcting and repairing Tile breaks, or other damages to Tile systems that are discovered on the Right-of-Way to the extent that such breaks are the result of Project construction. These damages are usually discovered after the first significant rain event. ITC Midwest will provide the Landowner with contact information should Tile damage issues be identified after Final Clean-up. ITC Midwest will not be responsible for Tile repairs performed by the Landowner.

ITC Midwest will be responsible for installing additional Tile or other drainage measures, including adding Topsoil, as necessary to properly drain wet areas along the Right-of-Way (ROW) caused by the construction of the Project.

3.7 TOPSOIL SEGREGATION

In order to protect and preserve the Topsoil during Project construction, ITC Midwest will separate the Topsoil from the other subsoil materials when all earthmoving activities, excavation, or trenching are taking place. There may be limited situations where excavated subsoil will be temporarily stored on adjacent, undisturbed Topsoil. In these situations, subsoil will be returned to the excavation with as little disturbance of the underlying Topsoil as practicable. During the excavation backfill process, the subsoil will be backfilled into the excavations first and compacted as necessary, followed by Topsoil replaced to the approximate locations from which it was removed.

3.8 SOIL COMPACTION/RUTTING

Compaction will be alleviated as practicable on cropland traversed by construction equipment. ITC Midwest will work with the Landowner to alleviate compaction during suitable weather conditions in a mutually agreeable manner.

ITC Midwest will repair damage incurred due to compaction, ruts, erosion, and/or washing of soil caused by electric line construction. If, by mutual agreement, the Landowner repairs such damage, ITC Midwest will reimburse the Landowner for the reasonable cost of labor and the use of equipment to repair damage incurred due to compaction, ruts, erosion, and/or washing of soil caused by electric line construction. ITC Midwest will make such payments within a reasonable period of time following final clean up and after receiving a statement substantiating the Landowner’s repair costs.

After Final Clean-up, ITC Midwest will pay for the reasonable cost of repairs to the Landowner's equipment if the equipment is damaged during repair of compaction, ruts, erosion, and/or washing of soil by materials or debris ITC Midwest left on the ROW during construction.

3.9 EXCESS SOIL AND ROCKS

Excess soil and rock will be removed from the site unless otherwise requested by the Landowner. After Final Clean-up and restoration of Agricultural Lands, ITC Midwest will make good faith efforts to obtain written acknowledgement of completion of such activities from the Landowner.

3.10 CONSTRUCTION DEBRIS

ITC Midwest will remove construction-related debris and material that is not an integral part of the transmission line from the Landowner's property at ITC Midwest's cost. Such material may include excess construction materials or litter generated by the construction crews.

3.11 PROCEDURES FOR DETERMINATION OF DAMAGES AND COMPENSATION

ITC Midwest will maintain a procedure for processing Landowner claims for construction-related damages, including but not limited to crop damages. The procedure is intended to standardize and minimize Landowner concerns regarding the recovery of damages, to provide a degree of

certainty and predictability for Landowner and ITC Midwest, and to foster good relationships among ITC Midwest and Landowner over the long term. A copy of the procedure will be provided to Landowner during easement acquisition negotiations.

Damage claim negotiations between ITC Midwest and any affected Landowner will be voluntary in nature. ITC Midwest will offer to compensate Landowners according to the terms of ITC Midwest's damage claim policy in effect at the time the easement is executed and recorded. The compensation offered is only an offer to settle, and the offer shall not be introduced in any proceeding brought by the Landowner to establish the amount of damages ITC Midwest must pay.

3.12 NOXIOUS WEED CONTROL

When requested, ITC Midwest will work with neighboring Landowners to determine adequate noxious weed control measures on lands owned by ITC Midwest for the Forks Switching Station. The intent of such noxious weed control measures is to prevent the spread of noxious weeds onto adjacent Agricultural Land. Any noxious weed control spraying will be in accordance with State of Minnesota regulations.

3.13 SOIL CONSERVATION PRACTICES

Soil conservation practices such as terraces and grassed waterways that are damaged by the transmission line's construction will be restored to their pre-construction condition as near as possible. ITC Midwest will attempt to work with the Landowner to identify and document the pre-construction conditions of these features.

3.14 IRRIGATION

The Proposed Route does not intersect an operational spray irrigation system. If an irrigation system is installed across or adjacent to the Proposed Route prior to Project construction, ITC Midwest will work with the Landowner to establish an acceptable amount of time the irrigation system may be out of service.

Appendix I

USFWS IPaC Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793

In Reply Refer To: 03/18/2025 01:16:12 UTC
Project Code: 2025-0070247
Project Name: Forks-Rost EA

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species
The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance
Please refer to refer to our Section 7 website for guidance and technical assistance, including step-by-step instructions for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, USDA Rural Development projects, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A demonstration video showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of “no effect” or “may affect, not likely to adversely affect." In each case, the Service has compiled and analyzed the best available information on the species’ biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a “Not Likely to Adversely Affect” (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a “May Affect” determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for “May Affect” determinations unless otherwise indicated in your output letter.

Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review. If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

Northern Long-Eared Bats
Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected. For bat activity dates, please review Appendix L in the Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines.

Examples of unsuitable habitat include:
- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:
- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or
- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC

species list report for your records.

If any of the above activities are proposed, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the northern long-eared bat and tricolored bat range-wide D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys helps to determine if prohibited take might occur and, if not, will generate an automated verification letter. Additional information about available tools can be found on the Service's northern long-eared bat website.

Whooping Crane
Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "Establishment of a Nonessential Experimental Population of Whooping Cranes in the Eastern United States."

Other Trust Resources and Activities
Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. It is the responsibility of the project proponent to survey the area for any migratory bird nests. If there is an eagle nest on-site while work is on-going, eagles may be disturbed. We recommend avoiding and minimizing disturbance to eagles whenever practicable. If you cannot avoid eagle disturbance, you may seek a permit. A nest take permit is always required for removal, relocation, or obstruction of an eagle nest. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination
While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. **Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.**

Minnesota
Minnesota Department of Natural Resources - Endangered Resources Review Homepage
Email: Review.NHIS@state.mn.us

Wisconsin
Wisconsin Department of Natural Resources - Endangered Resources Review Homepage
Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
(952) 858-0793

PROJECT SUMMARY

Project Code: 2025-0070247
Project Name: Forks-Rost EA
Project Type: Distribution Line - New Construction - Above Ground
Project Description: Construction of a 161 kilovolt (kV) transmission line.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@43.615133650000004,-95.3552643744611,14z

Counties: Jackson County, Minnesota

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee *Bombus suckleyi* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10885	Proposed Endangered

FLOWERING PLANTS

NAME	STATUS
Prairie Bush-clover *Lespedeza leptostachya* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4458	Threatened
Western Prairie Fringed Orchid *Platanthera praeclara* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1669	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

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1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (MBTA). Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their nests, should follow appropriate regulations and implement required avoidance and minimization measures, as described in the various links on this page.

The data in this location indicates that no eagles have been observed in this area. This does not mean eagles are not present in your project area, especially if the area is difficult to survey. Please review the 'Steps to Take When No Results Are Returned' section of the Supplemental Information on Migratory Birds and Eagles document to determine if your project is in a poorly surveyed area. If it is, you may need to rely on other resources to determine if eagles may be present (e.g. your local FWS field office, state surveys, your own surveys).

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the

Department of Interior U.S. Fish and Wildlife Service (Service). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The Service interprets the MBTA to prohibit incidental take.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
Franklin's Gull *Leucophaeus pipixcan* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10567	Breeds May 1 to Jul 31
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Northern Harrier *Circus hudsonius* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8350	Breeds Apr 1 to Sep 15
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

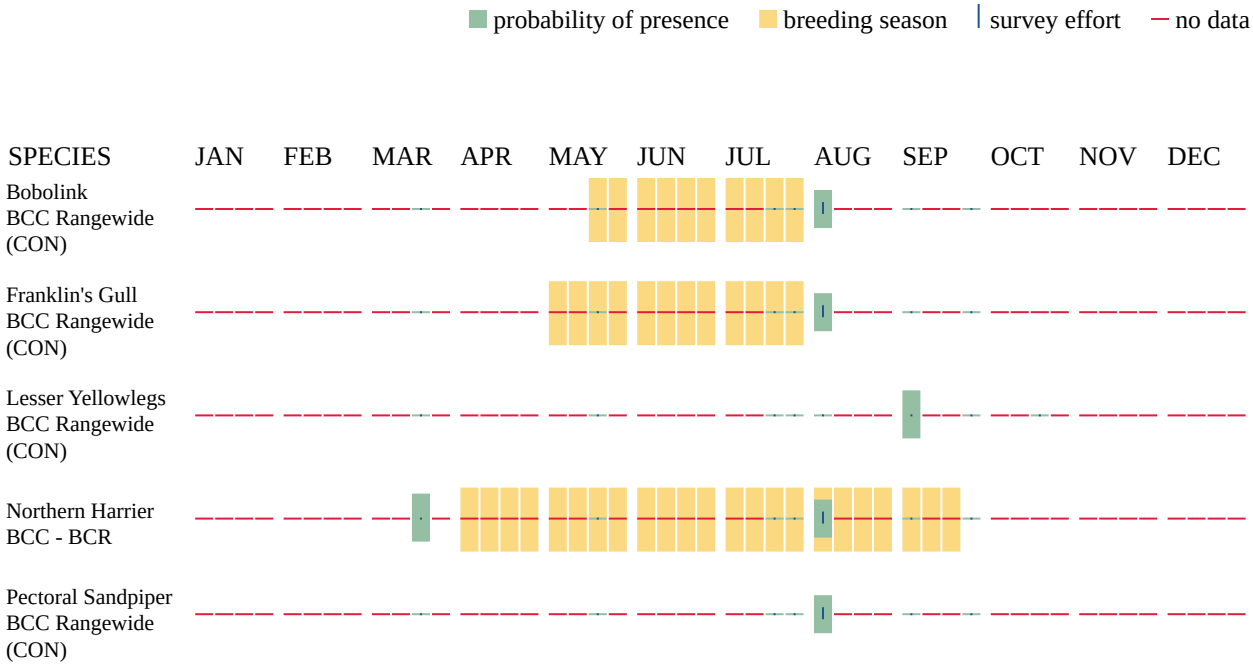
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R5UBFx
- R4SBC
- R2UBH

FRESHWATER EMERGENT WETLAND

- PEM1A

IPAC USER CONTACT INFORMATION

Agency: Private Entity
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