

7.0 ROUTES 2 AND 2A ENVIRONMENTAL EVALUATION

This chapter describes the existing conditions of the natural and built environments, the potential effects to these environments and recommended mitigation for the proposed Project. Section 7.1 discusses the existing environmental conditions within *Study Area 2*, as depicted on Map 7-1. Section 7.2 and following discuss *Route* specific issues (Map 7-2), including potential direct/indirect effects and mitigation.

Detailed route maps are included in Appendix A.

7.1 Environmental Setting

Study Area 2 includes Route 2 and Route 2A for the 230 kV Boswell to Essar Mine Substation transmission line. The north and west boundaries of Study Area 2 generally follow the existing 94 Line (230 kV). The south boundary follows the existing 28 Line (115kV) and the east boundary generally follows within two miles of TH 65. The proposed substation terminus point is located within the southeast corner of this Study Area 2.

The Nashwauk Uplands DNR Ecological Subregion covers the east two-thirds of the Study Area 2, and the St. Louis Moraines Ecological Subregion encompasses the west third. The Nashwauk Uplands are characterized by end moraines, rolling till plains and flat outwash plains that are associated with the Rainy Lobe glacier. St. Louis Moraines are characterized by rolling and steep slopes formed by end moraines deposited by the St. Louis and Koochiching sub lobes. Lakes, bogs, and potholes are common features within both the Nashwauk Uplands and St. Louis Moraines Ecological Subregions. This area typically receives between 24 to 27 inches of annual precipitation.

Within the Study Area are 22 PWI lakes, 15 PWI wetlands, and about 16 reaches of PWI streams and tributaries. The most frequent NWI wetland types in the Study Area 2 are forested and scrub shrub.

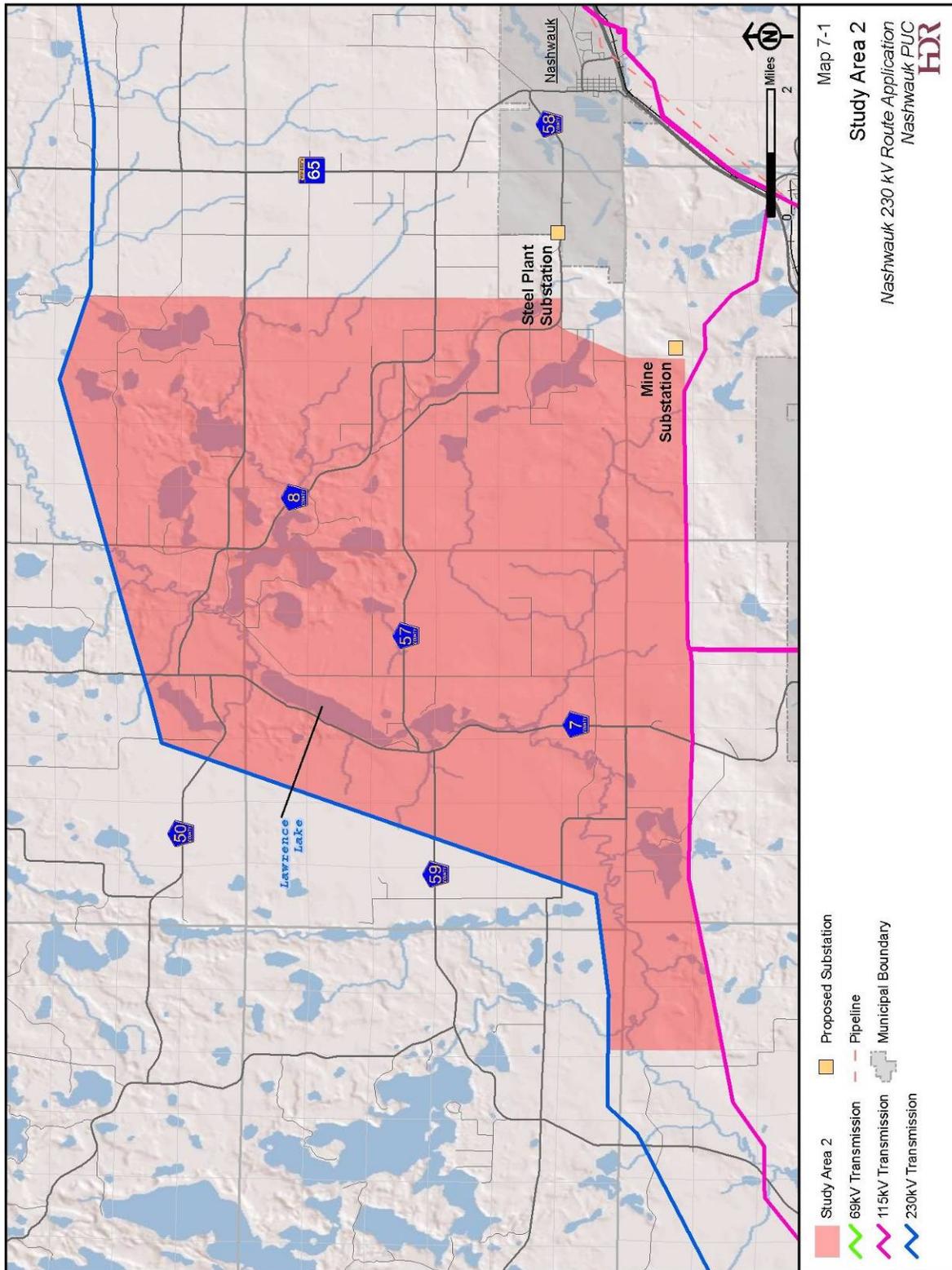
Study Area 2 is situated in the Mississippi – Grand Rapids watershed (Huc#7010103). See Section 6.1 for more information.

Pre-settlement vegetation in the Study Area generally consisted of mixed hardwood and coniferous forests. Today, the dominant vegetation is quaking aspen (DNR ECS, 2008). According to GAP data, approximately 48 percent of Study Area 2 is forested, with forestry being the most common land use in this region. About 36 percent is shrubland and about 6 percent is in agriculture use (crop/grasslands). The southeast corner of the Study Area 2, north of the cities of Marble and Calumet, consists of Mesabi Iron Range mineland. These minelands are largely comprised of stockpiles, ore pits, and tailing basins. Many of the mineland areas that are not being actively mined are associated with forest landcover.

Human settlement within the Study Area is typically concentrated along roads and lakes, with the heaviest densities along CSAH 7, O'Reilly Lake, Lawrence Lake, Snaptail Lake, Crooked Lake, and Shoal Lake. The scattered upland clearings within the Study Area are typically associated with these residential developments.

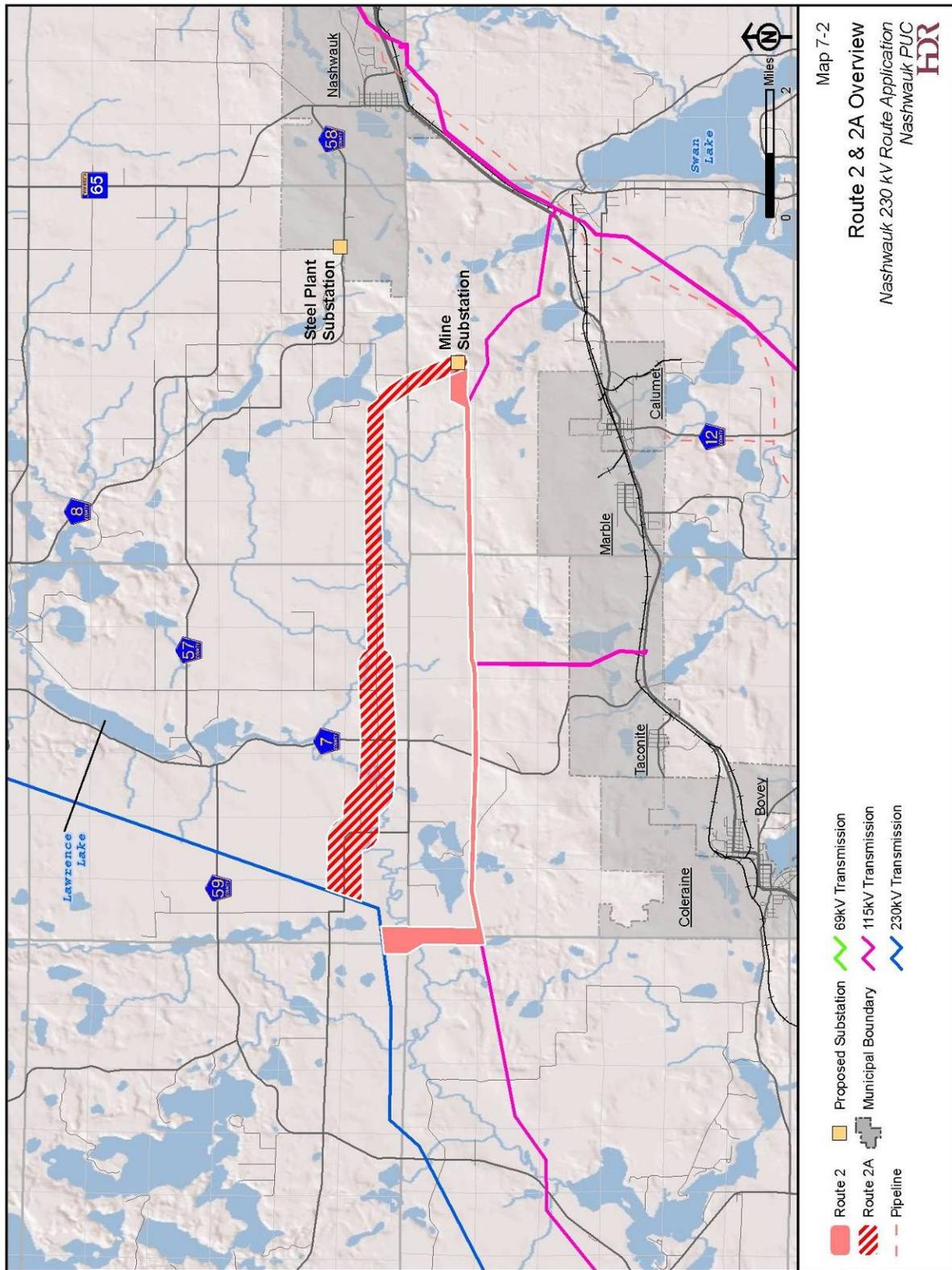
Conservation efforts within these ecological regions are focused on habitat areas for bald eagles, red-shouldered hawks (*Buteo lineatus*), northern goshawks, wood thrushes (*Hylocichla mustelina*), ovenbirds (*Seiurus aurocapillus*), Canada lynx, spruce grouse, bobolinks, Connecticut warblers, gray jays, ospreys, trumpeter swans and northern brook lampreys, four-toed salamanders (*Hemidactylum scutatum*), least darters (*Etheostoma microperca*) and Blanding's turtles (*Emydoidea blandingii*). These areas would include mixed hardwood-pine, red-white pine, jack pine and lowland coniferous forest habitats, along with large river headwaters (MN DNR ECS 2008).

Map 7-1: Study Area 2



Map 7-1
Study Area 2
Nashwaug 230 kV Route Application
Nashwaug PUC
HDR

Map 7-2: Routes 2 & 2A Overview



7.2 Human Settlement

7.2.1 Public Health and Safety

Public health and safety issues are the same as those discussed for Routes 1 and 1A. See Section 6.2.1 for a discussion of public health and safety.

7.2.2 Airports, Landing Strips, and Airplane Safety

There are no airports or airstrips within one mile of Route 2 or Route 2A.

Direct/Indirect Effects

Construction of Route 2 or Route 2A would not affect airports, landing strips, or airplane safety.

Mitigation

Since no airports or airstrips would be affected, no mitigation is required.

7.2.3 Land Use

Introduction

Existing land uses and zoning areas within Route 2 and Route 2A were identified using the Minnesota GAP data provided by the DNR, and the Itasca County Environmental Service Division zoning map.

Land Cover

Land cover within Route 2 and Route 2A consists primarily of forests and shrub lands, with lesser areas of agriculture and aquatic environment. The following table summarizes the GAP land uses that are within Route 2 and Route 2A. Appendix A identifies land cover along Route 2 and Route 2A.

Table 7-1: GAP Land Cover Types and Subtypes for Route 2 and Route 2A

GAP Land Cover Type	Route 2		Route 2A	
	Area (Acres)	% of Route	Area (Acres)	% of Route
Aquatic Environment	7	0.6	61	2.5
Aquatic	7	0.6	60	2.4
Marsh	0	0.0	1	<0.1
Agriculture	12	1.0	304	12.3
Cropland	1	0.1	105	4.2
Grassland	11	0.9	199	8.0
Forest	880	73.6	1,016	41.1
Lowland Conifer	102	8.5	19	0.8
Upland Conifer	55	4.6	89	3.6
Lowland Deciduous	92	7.7	89	3.6
Upland Deciduous	632	52.8	820	33.1
Shrubland	296	24.8	1,093	44.2
Lowland Shrub	112	9.4	370	14.9
Upland Shrub	185	15.5	724	29.3
Total	1,196	100.0	2,475	100.0

Zoning

Most of Route 2 has been zoned a mixture of farm residential and industrial by Itasca County. The eastern endpoint on the ESM property has been zoned municipal. Nearly all of Route 2A is zoned farm residential. A 300-foot shoreland district buffer has been zoned around PWI and a 1,000-foot shoreland district buffer has been zoned around PWI lakes within Route 2 and Route 2A (ICESD, 2009).

State Lands

Itasca County parcel data indicates that the State of Minnesota owns several parcels that are crossed by Route 2 near O'Reilly Lake and near the Prairie River. All of these parcels are managed by MnDOT, except for a parcel near the Prairie River that is managed by the DNR. State lands comprise approximately 10 percent of Route 2 and are not present in Route 2A.

County Lands

Scattered parcels of county owned land are crossed by Route 2 and Route 2A. Most of these parcels are located in the western half of the routes. County lands comprise approximately 15 percent of Route 2 and less than 5 percent of Route 2A.

Direct/Indirect Effects

Land Cover

Based on GAP data, the primary permanent impact within the rights-of-way of Route 2 and Route 2A would be a conversion of forest lands to a non-forest use, with Route 2 likely requiring greater forest clearing. Permanent impacts to agricultural lands, forest lands, and shrub lands would occur where transmission line structures fall within these cover types. Temporarily impacts to agricultural lands may also occur within right-of-way areas during transmission line construction. No impacts to aquatic environments (i.e. lakes) are anticipated for either route.

See Section 6.3.1, 6.3.2, and 6.5.6 for a full discussion of agriculture, forestry, and flora, and Section 6.5.2–6.5.4 for a full discussion of water resources.

Within the exception of the permanent land impacts resulting for transmission line structure placement, agricultural lands under or adjacent to the transmission line could still be used for agricultural practices following construction.

Zoning

Transmission lines are considered an essential service as defined in Section 24.2.100 of the 2009 Itasca County Zoning Ordinance. Essential services are typically not regulated under Itasca County zoning ordinances.

Public Lands

About 35.3 acres of Itasca County-owned lands and about 16.4 acres of State-owned lands (14.3 acres owned by MnDOT and 2.1 acres by DNR Division of Lands & Minerals) would be crossed by the potential Route 2 right-of-way. About 5.5 acres of County-owned lands and no State lands would be crossed by the potential Route 2A right-of-way.

Mitigation

See Section 6.2.3 for a discussion of land use mitigation.

7.2.4 Displacement

Introduction

See Section 6.2.4 for a discussion of displacement.

Direct/Indirect Effects

Table 7-2 provides an estimate of the number of residences located within 500 feet of the proposed centerline for Route 2 and Route 2A. Appendices A.2 to A.11 contain detailed figures which includes the location of homes in the vicinity of these routes.

Table 7-2: Number of Residences Proximate to Proposed Alignment

Route	Within ROW	ROW edge to 150 ft	150 to 300 ft	300 to 500 ft	Total Residences within 500 ft	Density (homes/mile)
Route 2	0	1	4	4	9	0.87
Route 2A	0	0	3	5	8	0.84

Mitigation

No displacement of residences or businesses is anticipated due to construction of Route 2 or Route 2A proposed transmission line alignments. Final right-of-way alignment and structure location decisions would strive to maximize the distance from homes and commercial buildings.

7.2.5 Aesthetics

Introduction

See Section 6.2.6 for general aesthetics information.

Direct/Indirect Effects

Route 2

Nine homes are located within 500 feet of the proposed Route 2 transmission line centerline. No homes are located within the 500- to 1,000-foot viewshed of the proposed Route 2 transmission line centerline. A majority of the route would be collocated with an existing 115 kV line, in a remote (cross-country) location, and not create a new visual impact.

Route 2A

Eight homes are located within 500 feet of the proposed Route 2A transmission line centerline. Additionally, there are four homes located 500 to 1,000 feet from the proposed Route 2A transmission line centerline that could view the transmission line through a forest opening. Route 2A may introduce a new visual impact to these residences.

Mitigation

Mitigation requirements for Routes 2 and 2A would be the same as those discussed for Routes 1 and 1A. See Section 6.2.6 for aesthetics mitigation.

7.2.6 Socioeconomic Factors

Socioeconomic evaluation for Routes 2 and 2A would be the same as discussed for Routes 1 and 1A. See Section 6.2.7 for a discussion of socioeconomic information and effects.

7.2.7 Cultural Values

The cultural values evaluation for Routes 2 and 2A would be the same as discussed for Routes 1 and 1A. See Section 6.2.8 for a discussion of cultural values information and effects.

7.2.8 Recreation

Introduction

See Section 6.2.9 for additional general information on recreation.

Figure 3 shows the locations of recreational facilities within the vicinity of Routes 2 and 2A. These include Hill Annex Mine State Park, Lawron Snowmobile Trail, and a public access on the south side of O'Reilly Lake. No WMAs, SNAs, Wilderness Areas, or Wild and Scenic Rivers are located within the routes.

Hill Annex Mine State Park is located within the cities of Marble and Calumet. This state park encompasses a mine pit that was decommissioned in 1978, and offers tours highlighting mine history and local geology.

The Lawron Snowmobile Trail is part of a statewide grant-in-aid snowmobile system that is funded with state money that is administered through the DNR.

Direct/Indirect Effects

Route 2

The north boundary of Hill Annex Mine State Park is located about one mile south of the proposed Route 2 transmission line centerline. The State Park would not be directly or indirectly affected by the proposed Route 2 transmission line centerline since distance, existing vegetation, and existing topography would screen the transmission line from the State Park viewshed.

The proposed Route 2 transmission line centerline parallels the Lawron Snowmobile Trail for about two miles of its alignment. The proposed centerline also crosses the Lawron Snowmobile Trail at three locations. The Lawron snowmobile trail currently follows an existing transmission line right-of-way. While the proposed Route 2 transmission line centerline would not alter the current land use of the existing right-of-way, it may temporarily affect access to this section of the Lawron Snowmobile Trail if construction takes place during the winter snowmobile season. Depending on the final location of the transmission line, it is also possible that minor route realignments to the Lawron Snowmobile trail may be required to ensure safe snowmobile traffic flow.

Direct effects to the O'Reilly Lake public access are not expected.

Route 2A

The proposed Route 2A transmission line centerline parallels the Lawron Snowmobile Trail for about two miles of its alignment. Potential effects to the Lawron Snowmobile would be similar to the effects caused by Route 2, as discussed above.

Public water access to Big Sucker Lake is about 500 feet from the proposed Route 2A centerline. Access to Big Sucker Lake would not be temporarily or permanently impacted by construction of the proposed

Route 2A centerline. The Route 2A transmission line may, however, introduce a new visual element to the foreground as seen from the southwest side of Big Sucker Lake.

Mitigation

The Applicants would collaborate with local snowmobile clubs if realignment of existing grant-in-aid snowmobile trails is required.

7.2.9 Public Services

Introduction

There are no local public services facilities within one mile of Route 2 or Route 2A.

Direct/Indirect Effects

Routes 2 and 2A would not affect public services.

Mitigation

No mitigation is necessary.

7.2.10 Environmental Justice

Introduction

See Section 6.2.11 for general environmental justice information. For this discussion, the Project Area represents the block groups that are included in Routes 2 and 2A.

Direct/Indirect Effects

Minority Concentrations

Less than 3 percent of the Project Area's residents are members of a racial minority, which is less than the ROC and the state of Minnesota (Table 7-3).

Table 7-3: Racial Characteristics within the Project Area, ROC, and Minnesota

		White	Native American	Asian	Other Races	Total
Project Area	Total	4,111	53	6	52	4,222
	Percent	97.4	1.3	0.1	1.3	100
ROC	Total	41,632	1,497	120	743	43,992
	Percent	94.6	3.4	0.3	1.7	100
State of Minnesota	Total	4,400,282	54,967	141,968	322,262	4,919,479
	Percent	89.4	1.1	2.9	6.6	100

Source: USCB, 2000.

In addition of the races listed above, Hispanic, which is classified as an ethnicity rather than a distinct race, account for less than one percent of the total population in the affected area, 0.8 percent in the ROC, and 2.9 percent in the state (USCB, 2000). Based on this analysis, the Project would not have a disproportionate effect on minority populations.

Poverty and Low-Income Concentrations

Based on the 2000 U.S. Census, approximately 11.0 percent of the Project Area is comprised of low-income individuals (Table 7-4). This is similar to the ROC and higher than the State of Minnesota poverty level (USCB, 2000). Median household income in the Project Area is slightly lower than the ROC and much lower than the State of Minnesota. Based on this analysis, the Project would not have a disproportionate effect on low-income populations.

Table 7-4: Poverty Level and Income in 2000

Characteristic	Study Area	ROC	State of Minnesota
Individuals			
Number of Persons Below Poverty Level (1999)	520	4,576	380,476
Percent of Persons Below Poverty Level (1999)	12.3	10.4	7.9
Households			
Median Household Income (1999)	\$36,267	\$36,234	\$47,111

Source: USCB, 2000.

* Average of 4 census block group median household income. Values ranged from \$28,466 to \$45,875.

Mitigation

Since disproportional impacts are not expected to occur, no mitigation is required.

7.2.11 Transportation

Introduction

Roadways, railways, and pipelines are discussed in this section.

Route 2

Roadways

Route 2 crosses one CSAH and one local street; it does not parallel any existing roads. There are no existing railways within Route 2. The route parallels the proposed Mesaba Energy Project pipeline for about three miles along the east side of the route.

MnDOT has recorded the AADT for county and trunk highways in Itasca County. The AADTs available for Route 2 are listed in Table 7-5.

Table 7-5: AADTs at the Route 2 Transmission Line Centerline Crossings

Location	AADT	Parallel Length (Miles)	Year Surveyed
CSAH 7	1,300	0	2005

Source: MNDOT, <http://www.dot.state.mn.us/traffic/data/html/volumes.html>, accessed March 24, 2009

Railways

Route 2 does not cross any railways.

Crude Oil and Natural Gas Pipelines

The proposed Route 2 transmission line would parallel the state approved NPUC pipeline project which, has not been constructed for about a mile.

*Route 2A**Roadways*

Route 2A crosses two CSAHs and three CRs. Route 2A parallels CR 334 for 1 mile, CR 328 for 0.65 mile and CSAH 60 for 0.65 miles. There are no existing railways within the route. The proposed Route 2A transmission line centerline crosses the approved Nashwauk Public Utilities Commission Pipeline, which has not been constructed, near the Essar Mine Substation.

The AADTs available for Route 2A are listed in Table 7-6. Road crossings are sorted from east to west.

Table 7-6: AADTs at the Route 2A Transmission Line Centerline Crossings

Location	AADT	Parallel Length (Miles)	Year Surveyed
CR 334	5	1.00	2005
CR 336	235	0	2005
CSAH 7	1,300	0	2005
CR 328	20	0.65	2005
CSAH 60	215	0.65	2005

Source: MNDOT, <http://www.dot.state.mn.us/traffic/data/html/volumes.html>, accessed March 24, 2009

Railways

Route 2A does not cross any railways.

Crude Oil and Natural Gas Pipelines

The proposed Route 2A transmission line centerline crosses the state approved NPUC pipeline route near the Essar Mine Substation. This pipeline has not been constructed.

Direct/Indirect Effects*Roadways*

Direct and indirect effects on roads would be similar to those discussed for Routes 1 and 1A. See Section 6.2.12 for additional information.

Railways

Since no railways are crossed, no impacts are expected.

Crude Oil and Natural Gas Pipelines

When an HVTL is located adjacent to a pipeline right-of-way, the pipeline may be subject to electrical interference from electric and magnetic induction, conductive interference and capacitive effects. Magnetic induction is the primary effect of the high voltage AC transmission line on a buried pipeline during normal (steady state) operation. This form of interference is due to the magnetic field produced by the AC current flowing in the conductors of the transmission line coupling with the metallic pipeline, inducing a voltage and associated current on the pipeline.

Conductive interference is a concern when a transmission line fault occurs in proximity to the pipeline, as it can cause AC currents to enter the pipeline at coating holidays (flaws in the coating) and produce a voltage gradient across the pipeline coating. Magnetic induction effects are also a concern during a fault because the phase current in at least one phase (conductor) of the high voltage AC transmission line is elevated.

Capacitive effects are typically only a concern during pipeline construction when long sections of the pipeline are above ground. To prevent contact shock hazards, proper horizontal and vertical separation between the transmission line's conductors and equipment used during pipeline construction and maintenance (such as cranes and shovels) must be maintained.

If these electrical interference effects are great enough during normal operation, then a potential shock hazard exists for anyone that touches an aboveground part of the pipeline, such as a valve or cathodic protection test station. In addition, during normal operation, if the induced AC current density at a flaw in the pipeline coating is great enough, AC pipeline corrosion may occur. Lastly, damage to the pipeline coating can occur if the voltage between the pipeline and surrounding soil becomes excessive during a fault condition.

The National Association of Corrosion Engineers has standards that ensure that pipeline integrity would not be degraded nor personnel safety compromised because of AC interference from a transmission line constructed and operated adjacent to a pipeline. AC interference effects can be predicted with computer modeling and if necessary mitigated by reducing the impedance of the transmission structure grounds, grounding the pipeline in conjunction with de-couplers, burying gradient control wires along the pipeline burying mats under aboveground facilities (such as valves) and using dead fronts at test stations.

Mitigation

Roadways

Mitigation for roadway impacts would be the same as that discussed for Routes 1 and 1A. See Section 6.2.12.

Railways

Since no railways are crossed, no mitigation is required

Crude Oil and Natural Gas Pipelines

The NPUC has indicated that if the ESM Project natural gas pipeline right-of-way would share right-of-way with the ESM Project transmission lines, the pipeline's design would include analysis of AC interference levels and installation of any required AC mitigation to insure that the Project's high voltage AC transmission lines could be safely collocated with the gas pipeline. The mitigation techniques for AC interference on pipelines include reducing the impedance of the transmission structure grounds, grounding the pipeline in conjunction with de-couplers, burying gradient control wires along the pipeline or burying ground mats under aboveground facilities (such as valves) and using dead fronts at test stations. None of these mitigation methods would be expected to require additional right-of-way. Reducing transmission impedance consists of adding stacked or parallel ground rods to the structure grounding system. This is done adjacent to the transmission structure, thus no additional transmission line right-of-way would be required. Grounding a pipeline typically occurs within the existing pipeline right-of-way through a de-coupler device to prevent DC cathodic protection current from flowing to the ground. Gradient control wires are typically copper conductors buried parallel to and adjacent to the pipeline (typically 5 to 10 feet).

Ground mats consist of an eight-foot-square section of conductors buried underneath where pipeline personnel stand when operating a valve. Dead fronts consist of replacing the existing test sections with test sections that are non-conductive and require no additional land. Lastly, additional "coupon stations" are sometimes installed to monitor the pipeline to insure that mitigation measures are effective at preventing AC pipeline corrosion. These facilities are installed adjacent to the pipeline and use coupons

that are exposed to the same environment as the pipeline and are monitored to determine if AC corrosion is occurring. This typically would not require additional right-of-way.

7.2.12 Agricultural Production

Introduction

See Section 6.3.1 for agricultural statistics in Itasca County and for a definition of prime farmland.

There are 424 acres of prime farmland mapped within Route 2 and 720 acres of prime farmland mapped within Route 2A. The majority of these mapped prime farmland areas are currently forested. Figure 4 displays agricultural resources in the Project vicinity.

Direct/Indirect Effects

In areas where cropland is crossed, temporary impacts such as soil compaction and crop damages with the rights-of-way may occur during construction, depending on the time of construction. Permanent impacts would occur where transmission line structures are placed on agricultural land.

Route 2

Route 2 would temporarily affect less than one acre of agricultural land (GAP crop/grassland) within the right-of-way. About one structure would be placed on agricultural land. About 25 structures would be placed in areas mapped as prime farmland. The impacts to prime farmland area would be small relative to the 424 acres of prime farmland within Route 2.

Route 2A

Route 2A would temporarily affect about 22 acres of agricultural land (GAP crop/grassland) within the right-of-way. About 10 structures would be placed on agricultural land. About 21 structures would be placed in areas mapped as prime farmland. The impacts to prime farmland area would be small relative to the 720 acres of prime farmland within Route 2A.

Mitigation

Routes 2 and 2A

Mitigation for agricultural impacts would be the same as that discussed for Routes 1 and 1A. See Section 6.3.1 for agriculture production mitigation.

7.2.13 Forestry

Introduction

According to GAP data (Table 7-1) about 74 percent of Route 2 is forested and about 41 percent of Route 2A is forested. Although quantitative information on private forest harvest trends within Route 2 and Route 2A are not readily available, Blandin Paper, which is known to manage much of its land for forestry resources, owns about 70 percent of the land within the routes. Figure 5 displays the forest resources near Route 2 and Route 2A.

Direct/Indirect Effects

Route 2

It is estimated that the proposed Route 2 right-of-way would convert approximately 84 acres of forestland into a non-forest use. It is likely that some of this forest clearing would permanently impact land that is currently being managed for forestry resources. This impact is small in relation to the forest resources available, and is not expected to affect the local forestry economy.

Route 2A

It is estimated that the proposed Route 2A right-of-way would convert approximately 63 acres of forestland into a non-forest use. It is possible that some of this forest clearing would permanently impact land that is currently being managed for forestry resources. This impact is small in relation to the forest resources available, and is not expected to affect the local forestry economy.

Mitigation

Mitigation for forestry impacts would be the same as that discussed for Routes 1 and 1A. See Section 6.3.2 for forestry mitigation.

7.2.14 Tourism

Introduction

Tourism within the vicinity of Route 2 and Route 2A is generally associated with the recreational activities and cultural values discussed in Section 6.2.8. There are public accesses within 1,000 feet of both Route 2 and Route 2A.

Direct/Indirect Effects

Most of the lands near the proposed Route 2 and Route 2A rights-of-way are privately held and are not readily accessible by the public from roadways or waterways. The recreational resources that generate tourism in the area are not expected to be affected by the construction of the proposed Route 2 or Route 2A transmission line.

Mitigation

No impacts to area tourism are anticipated due to the presence of the transmission line, therefore no mitigation is necessary.

7.2.15 Mining

Introduction

Essar Steel owns mining rights within the eastern one mile of both Route 2 and Route 2A. See Section 6.4.3 and for a description of mining resources. See Figure 5 for the locations of mining resources within the vicinity of Route 2 and Route 2A.

Direct/Indirect Effects

Direct and indirect effects on mining would be similar to those discussed for Routes 1 and 1A. See Section 6.3.4 for mining effects.

Mitigation

See Section 6.3.4 for mining mitigation.

7.3 Archaeological and Historic Resources

Introduction

See Section 6.4 for general archaeological and historic resources information.

Route 2

Table 7-7 presents the results of a search of available background information for Route 2. Two architectural sites were previously recorded within one mile of the Route 2 centerline, and none have been evaluated for listing on the NRHP.

Table 7-7: Architectural sites within one mile of Route 2

County	Site Number	Site Name	Location			NRHP Status
			T	R	S	
Itasca	IC-LAW-003	Lawrence Township Hall	57	24	34	Not evaluated
Itasca	IC-LAW-004	Bridge No. 7415	57	24	33	Not evaluated

Additionally, there is an unconfirmed report of burial mounds in the vicinity of Little Sucker Lake that are within one mile of Route 2. A landowner reported two Native American burial sites to the Deputy County Surveyor that were shown to him years ago in the Little Sucker Lake area along CSAH 58. The exact location has not been verified.

Route 2A

Table 7-8 presents the results of a search of available background information for Route 2A. Three architectural sites were previously recorded within one mile of the Route 2A centerline, and none have been evaluated for listing on the NRHP.

Table 7-8: Architectural sites within one mile of Route 2A

County	Site Number	Site Name	Location			NRHP Status
			T	R	S	
Itasca	IC-LAW-002	Church	57	24	27	Not evaluated
Itasca	IC-LAW-003	Lawrence Township Hall	57	24	34	Not evaluated
Itasca	IC-LAW-004	Bridge No. 7415	57	24	33	Not evaluated

Additionally, there is an unconfirmed report of burial mounds in the vicinity of Little Sucker Lake that are within one mile of Route 2A. A landowner reported two Native American burial sites to the Deputy County Surveyor that were shown to him years ago in the Little Sucker Lake area along CSAH 58. The exact location has not been verified.

Direct/Indirect Effects*Routes 2 and 2A*

No previously recorded cultural resources within one mile of the proposed Route 2 and Route 2A centerlines would be impacted by construction or operation of the Project. The potential existence of the burial mounds in the vicinity of Sucker Lake needs to be further investigated prior to construction to ensure there would not be any disturbance in accordance with Minnesota Statute 307.08.

Mitigation

See Section 6.4 for archaeological and historic resources mitigation.

7.4 Natural Resources

7.4.1 Air

Air quality evaluation would be the same as that discussed for Routes 1 and 1A. See Section 6.5.1 for the Air quality discussion.

7.4.2 Rivers and Streams

Introduction

See Section 6.5.2 for the general surface water discussion.

Figure 5 illustrates the locations of water resources identified within the vicinity of Route 2 and Route 2A.

Direct/Indirect Effects

Route 2

There are two perennial streams potentially crossed by the proposed Route 2 transmission line centerline. Three of these streams are classified as PWI watercourses. A non-PWI intermittent stream is also crossed by the proposed transmission line centerline. A list of these watercourses and crossing locations are provided in Table 7-9.

Table 7-9: Streams and Rivers Crossed by Route 2

Stream/River Name	Type	PWI	Designated Trout Stream	Proposed Transmission Line Crossing
Prairie River	Perennial	Yes	No	Sec 31, T57N, R24W
Unnamed tributary to Prairie River	Perennial	Yes	No	Sec 6, T56N, R24W
Unnamed stream	Intermittent	No	No	Sec 10, T56N, R24W

Route 2A

There are five perennial streams potentially crossed by the proposed Route 2A transmission line centerline. All of these streams are classified as PWI watercourses. A non-PWI intermittent stream is also crossed by the proposed transmission line centerline. A list of these watercourses and crossing locations are provided in Table 7-10.

Table 7-10: Streams and Rivers Crossed by Route 2A

Stream/River Name	Type	PWI	Designated Trout Stream	Proposed Transmission Line Crossing
Prairie River	Perennial	Yes	No	Sec 33, T57N, R24W
Unnamed tributary to Prairie River	Perennial	Yes	No	Sec 35, T57N, R24W
Sucker Brook (crossing #1)	Perennial	Yes	No	Sec 36, T57N, R24W
Unnamed tributary to Sucker Brook	Perennial	Yes	No	Sec 36, T57N, R24W
Sucker Brook (crossing #2)	Perennial	Yes	No	Sec 31, T57N, R23W
Unnamed tributary to Sucker Brook	Intermittent	No	No	Sec 32, T57N, R23W

Since all rivers, streams, and ditches would be spanned by transmission structures, no structures would be located within these features, and no direct impacts are anticipated. Indirect impacts could include sedimentation reaching surface waters during construction due to ground disturbance by excavation, grading, construction traffic, and dewatering of holes drilled for transmission structures. This could temporarily degrade water quality due to turbidity.

Mitigation

Best management practices would be installed and maintained to prevent soil erosion from entering surface water. The Project would develop a SWPPP as part of the NPDES permit required by the MPCA.

7.4.3 Lakes and Wetlands

Introduction

Lakes and wetlands were identified using NWI mapping (USFWS, 2007) and PWI mapping (DNR, 2008). Figure 5 illustrates the locations of NWI and PWI wetlands near Route 2 and Route 2A.

Route 2

There are about 174 acres of NWI wetlands within Route 2, which represents about 15 percent of the Route 2. Table 7-11 lists the type and acreage of NWI mapped wetlands within the route.

Table 7-11: NWI Wetlands within Route 2

NWI Type	Acres	Percent of Route
Freshwater Emergent	4	0.4
Freshwater Forested	139	11.7
Scrub Shrub	31	2.6
Total	174	14.7

Route 2A

There are about 512 acres of NWI wetlands within Route 2A, which represents about 21 percent of the Route 2A. Table 7-12 lists the type and acreage of NWI mapped wetlands within the route.

Table 7-12: NWI Wetlands within Route 2A

NWI Type	Acres	Percent of Route
Freshwater Emergent	34	1.4
Freshwater Forested	268	10.8
Scrub Shrub	191	7.7
Freshwater Lake or Pond	12	0.5
Riverine	7	0.3
Total	512	20.7

Direct/Indirect Effects

Three types of impacts to wetland areas would result from the Project: permanent impacts, forest conversion impacts, and temporary impacts.

Permanent wetland impacts would occur where dredging or filling is required for transmission line installation. The area of permanent impact is anticipated to equal 20 square feet per H-frame structure. Permanent impacts would generally be limited to wetlands than are wider than the typical 800-foot transmission line span.

Forest conversion wetland impacts would occur where the clearing for forested wetlands areas would occur within the transmission line right-of-way. Removal of woody forest vegetation within a wetland area would not require dredging or filling, but would convert the forested wetland to a different vegetative class and thus a different wetland type.

Temporary wetland impacts due to construction activities may occur to wetland areas that are not permanently impacted or permanently converted to another wetland type. Temporary wetland impacts may include temporary soil compaction or temporary vegetation removal.

Route 2

Approximately seven proposed NWI wetland crossings would be wider than the typical 800-foot transmission line span, with the longest crossing being about 3,000 feet. There are no PWI lakes or wetlands crossed by the proposed Route 2 transmission line centerline. Based on an 800-foot transmission line span, the Applicants calculate that 18 H-Frame transmission line structures would be located within an NWI wetland area, representing 360 square feet of permanent wetland impacts. See Table 7-13 for wetland forest conversion and temporary wetland impacts.

Table 7-13: NWI Wetland Forest Conversion and Temporary Impacts Within Route 2

NWI Wetland Impact Type	Acres
Forest conversion	24
Temporary	7

There are no PWI lakes or wetlands crossed by the proposed Route 2 transmission line centerline.

Route 2A

Approximately four proposed NWI wetland crossings would be wider than the typical 800-foot transmission line span, with the longest crossing being about 5,300 feet. Based on an 800-foot transmission line span, the Applicants calculate that 12 H-Frame transmission line structures would be located within an NWI wetland area, representing 240 square feet of permanent wetland impacts. See Table 7-14 for wetland forest conversion and temporary wetland impacts for the 130-foot-wide intended right-of-way for Route 2A.

Table 7-14: NWI Wetland Forest Conversion and Temporary Impacts Within Route 2A

NWI Wetland Impact Type	Acres
Forest conversion	16
Temporary	19

One PWI wetland would be crossed by the proposed Route 2A transmission line centerline. This wetland could be spanned.

Mitigation

Mitigation for lake and wetland impacts would be the same as that discussed for Routes 1 and 1A. See Section 6.5.3 for more information.

7.4.4 Water Quality

Introduction

There are no impaired lakes, wetlands, or watercourses within one mile of Route 2 or Route 2A. See Section 6.5.4 for additional general water quality information

Direct/Indirect Effects

No impacts to impaired waters are anticipated.

Mitigation

No mitigation is required.

7.4.5 Floodplains

Introduction

A FEMA 100-year floodplain has been mapped where along the Prairie River. FEMA floodplain data has not been fully developed for Itasca County and other floodplain areas are likely present, but have not been included in the FEMA GIS dataset. These areas include riparian areas adjacent to the watercourses mentioned in Section 7.5.2 Rivers and Streams. See Section 6.5.5 for additional general floodplain information.

Direct/Indirect Effects

Route 2

The FEMA floodplain of the Prairie River is approximately 2,000 feet wide at the proposed Route 2 transmission line crossing. Two to three structures would be placed within this FEMA floodplain.

Route 2A

No transmission structures are expected to be placed within 100-year floodplain areas.

Mitigation

Best management practices would be installed and maintained to prevent soil erosion from entering surface water. The Project would develop a SWPPP as part of the NPDES permit required by the MPCA.

7.4.6 Flora

Introduction

See Section 6.5.6 for general flora information

Direct/Indirect Effects*Route 2*

Approximately 53 acres of forest clearing, would take place within the right-of-way of Route 2. About four acres of this forest clearing may include lowland black ash. Approximately seven acres of lowland coniferous forest, which may include tamarack, lowland black spruce, and lowland white cedar, would also be cleared within the right-of-way. Flora within the cleared right-of-way area would be converted from forest habitat with an understory and forb layer adapted to lower light conditions, to an open habitat that would be dominated by species adapted to higher light conditions, which often includes a predominance of native shrubs and grasses.

Construction equipment has the potential spread noxious weed-propagating material to new locations. The Applicants would comply with Minnesota noxious weed laws as described in Minnesota Rules Chapter 1505 and would observe county weed lists where they occur.

Route 2A

Approximately 63 acres of forest clearing, would take place within the right-of-way of Route 2A. About five acres of this forest clearing may include lowland black ash. Less than one acre of lowland coniferous forest, which may include tamarack, lowland black spruce, and lowland white cedar, would also be cleared within the right-of-way. See Route 2 effects for additional information.

Mitigation

Mitigation for impacts to flora would be the same as that discussed for Routes 1 and 1A. See Section 6.5.6 for flora mitigation.

7.4.7 Fauna***Introduction***

See Section 6.5.7 for additional general fauna information.

Direct/Indirect Effects

Route 2 and Route 2A are located within the Nashwauk Uplands and St. Louis Moraines Ecoregions. According to GAP data, Route 2 could contain suitable habitat for 66 SGCN. Route 2A could contain habitat for 57 SGCN. The full list of Nashwauk Uplands and St. Louis Moraines listed SGCN that have potential habitat within the Routes is included in Appendix G.

See also Section 6.5.7 for additional discussion of direct and indirect effects on wildlife.

Mitigation

Mitigation of potential effects would be the same as those described for Routes 1 and 1A. See Section 6.5.7 for mitigation.

7.5 Rare and Unique Natural Resources***Introduction****Federal*

The Project area is within the overall range of the Canada lynx (listed as a federal Threatened species in March 2000) and the gray wolf (listed as a federal Threatened species in the mid-1970s and as a state species of concern). On May 4, 2009, the gray wolf was de-listed by the USFWS in the western Great Lakes states, including Minnesota. The USFWS determined that gray wolves in the Western Great Lakes

had recovered and no longer require the protection of the Endangered Species Act. The USFWS will continue to work with states and tribes to monitor wolf populations for at least five years to ensure ongoing survival.

According to the DNR's NHIS data, there is one record of a bald eagle nest within two miles of the edge of Route 2A, near Lower Hanson Lake. There are no documented bald eagle nests within two miles of Route 2.

State

Route 2

There are no SNAs within one mile of Route 2.

There are no NHIS records of state endangered, threatened, or special concern species within Route 2. There are six NHIS records, representing five *Botrychium* species, within one mile of the edge of Route 2. This includes two endangered, one threatened plant, and two special concern species.

Table 7-13: NHIS Records Located Within One Mile of Edge of Route 2

Scientific Name	Common Name	Type	State Status	Last Observed	NHIS Records
<i>Botrychium oneidense</i>	Blunt-lobed Grapefern	Plant	E	2005	1
<i>Botrychium pallidum</i>	Pale Moonwort	Plant	E	1999	1
<i>Botrychium rugulosum</i>	St. Lawrence Grapefern	Plant	T	1999	1
<i>Botrychium minganense</i>	Mingan Moonwort	Plant	SPC	2005	1
<i>Botrychium simplex</i>	Least Moonwort	Plant	SPC	1999	2

NHIS data records no bald eagle nests within two miles of the edge of Route 2. Bald eagles, however, are known to reside near waterbodies in the surrounding area.

Route 2A

There are no SNAs within one mile of Route 2A.

One NHIS record of a special concern mollusk species (Black Sandshell) is located within Route 2A (Table 7-14).

Table 7-14: NHIS Records within Route 2A

Scientific Name	Common Name	Type	State Status	Last Observed	NHIS Records
<i>Ligumia recta</i>	Black Sandshell	Mollusk	SPC	2003	1

There are seven NHIS records representing five *Botrychium* species and one mollusk species, within one mile of the edge of Route 2A. This includes two endangered, one threatened, and three special concern species.

Table 7-15: NHIS Records Located Within One Mile of Edge of Route 2A

Scientific Name	Common Name	Type	State Status	Last Observed	NHIS Records
<i>Ligumia recta</i>	Black Sandshell	Mollusk	SPC	2003	1
<i>Botrychium oneidense</i>	Blunt-lobed Grapefern	Plant	E	2005	1
<i>Botrychium pallidum</i>	Pale Moonwort	Plant	E	1999	1
<i>Botrychium rugulosum</i>	St. Lawrence Grapefern	Plant	T	1999	1
<i>Botrychium minganense</i>	Mingan Moonwort	Plant	SPC	2005	1
<i>Botrychium simplex</i>	Least Moonwort	Plant	SPC	1999	2

Additionally, NHIS data records one bald eagle nest (near lower Hanson Lake) within two miles of the edge of Route 2A.

Direct/Indirect Effects

No watercourses are anticipated to be impacted by the project, thus no impacts are expected to the state special concern black sandshell mollusk. Other effects would be the same as those discussed for Routes 1 and 1A. See Section 6.6 for additional effects.

Mitigation

Mitigation for sensitive species impacts would be the same as those discussed for Routes 1 and 1A. See Section 6.6 for mitigation.

7.6 Summary of Impacts

Table 7-16 below provides a comparison summary of impacts for Routes 2 and 2A. While both routes have similar impacts, Route 2 was selected as the Preferred Route because it would parallel and utilize an existing transmission line right-of-way for nearly 80 percent of its length, would require fewer roadway crossings, and would be constructed in a more remote location away from residences and tourists.

Table 7-16: Routes 2 and 2A Summary of Impacts and Factors Considered

Factor	Route 2 (Preferred Route) and Associated Facilities	Route 2A (Alternate Route) and Associated Facilities	Summary
Effects on Human Settlement			
Public Health and Safety	The Applicants would ensure that all safety requirements are met during the construction and operation of the proposed transmission line and associated facilities.		
Land Use	Approximately 84 acres of forest would be converted to a non-forest use. About 35.3 acres of county owned lands and 16.4 acres of state-owned lands would be crossed by the right-of-way.	Approximately 63 acres of forest would be converted to a non-forest use. About 5.5 acres of county owned lands would be crossed by the right-of-way.	Route 2A is expected to permanently impact approximately 21 fewer acres of forest area than Route 2. Route 2 would affect about 29.8 more acres of county lands and about 16.4 acres of state lands.
Displacement	No displacement is anticipated.		

Factor	Route 2 (Preferred Route) and Associated Facilities	Route 2A (Alternate Route) and Associated Facilities	Summary
Noise	Transmission line and substation noise levels are not predicted to exceed MPCA noise limits.		
Aesthetics	Would likely affect visual quality within open landscapes in proximity of the transmission line, but would not introduce a new land use. Dependent upon structure location and design may affect the viewshed from the O'Reilly Lake public boat access. Would alter the visual landscape along the Lawron-Day Brook snowmobile trail. There are nine homes within 500 feet of the proposed route centerline.	Would likely affect visual quality within open landscapes in proximity of the transmission line and would introduce a new land use. May affect the viewshed from the Big Sucker Lake public boat access; dependent upon structure location and design. There are eight homes within 500 feet of the proposed route centerline.	Much of Route 2 is in a remote location, and includes an existing transmission line. Route 2 would introduce an additional transmission line to a section of snowmobile trail. Route 2A has one fewer home within 500 feet of the proposed route centerlines. Route 2A would introduce a new land use for the majority of its length.
Socioeconomic Factors	Effects would generally be short-term or beneficial. Forestry resources would be removed from production.		
Cultural Values	No impacts to cultural values are anticipated.		
Recreation	Route 2 would parallel approximately two miles of the Lawron Snowmobile Trail, which may need to be altered as part of transmission line construction. The snowmobile trail follows Route 2 within an existing transmission line right-of-way (115 kV 28 Line), so Route 2 would not change the current land use at this section of snowmobile trail. Route 2 construction may temporarily limit access to the O'Reilly Lake public water access.	Route 2A would parallel approximately two miles of the Lawron Snowmobile Trail, which may need to be altered as part of transmission line construction. Route 2A may introduce a new land use to this section of snowmobile trail along CR 334. Route 2A may also cross the Lawron Trail up to three times between CSAH 7 and Clearwater Rd. Route 2A may impact the viewshed from the south side of Big Sucker Lake.	Route 2 and 2A may require altering the alignment of sections of the Lawron Snowmobile Trail. Route 2A would introduce a new land use near the Lawron Snowmobile Trail along CR 334.
Public Services	No impacts to Public Services are anticipated.		
Environmental Justice	No disproportional impacts to minority or low income populations would occur.		

Factor	Route 2 (Preferred Route) and Associated Facilities	Route 2A (Alternate Route) and Associated Facilities	Summary
Transportation	One CSAH and one local street would be crossed.	Two CSAHs and three CRs would be crossed. CSAH 60 would be paralleled for 0.65 miles and two CRs would be paralleled for 1.65 miles. The approved Nashwauck Public Utilities Commission pipeline would be paralleled.	Route 2A would cross and parallel more roadways than Route 2. Route 2A would parallel the approved Nashwauck Public Utilities Commission pipeline.
Radio, Television, and Cellular Phone	No impacts to radio, television, or cellular phone are anticipated.		
Effects on Land-based Economies			
Agriculture	Approximately one acre of temporary impacts to agriculture is anticipated for construction of the Route 2 transmission line. One transmission structure may be placed on agricultural land (GAP crop/grassland). About 25 structures would be placed on soils mapped as prime farmland, most of which is currently forested.	Approximately 22 acres of temporary impacts to agriculture are anticipated for construction of the Route 2A transmission line. About 10 transmission structures would be placed on agricultural land (GAP crop/grassland). About 21 structures would be placed on soils mapped as prime farmland, most of which is currently forested.	Route 2 would cause approximately 21 fewer acres of temporary agricultural impacts and would require the placement of about nine to 10 less transmission structures on agricultural land. Route 2A would impact slightly fewer soils mapped as prime farmland, much of which is currently forested.
Forestry	Route 2 would impact 84 acres of forest resources.	Route 2A would impact 63 acres of forest resources.	Route 2A is expected to permanently impact approximately 21 fewer acres of forest area than Route 2.
Tourism	No impacts to tourism are anticipated.		
Mining	Essar Steel owns mining rights within the eastern one mile of Route 2. The Applicants are working closely with ESM to ensure that the proposed line would not inhibit existing or proposed mining activities.	Essar Steel owns mining rights within the eastern three-quarter of a mile of Route 2A. The Applicants are working closely with ESM to ensure that the proposed line would not inhibit existing or proposed mining activities.	Route 2A would have slightly fewer impacts to lands available to be used for future mining activities.
Effects on Archaeological and Historic Resources			

Factor	Route 2 (Preferred Route) and Associated Facilities	Route 2A (Alternate Route) and Associated Facilities	Summary
Archaeological Resources	The potential existence of Native American burial mounds in the vicinity of Little Sucker Lake needs to be further investigated prior to construction.	The potential existence of Native American burial mounds in the vicinity of Little Sucker Lake needs to be further investigated prior to construction.	The potential existence of Native American burial mounds in the vicinity of Little Sucker Lake needs to be further investigated prior to construction.
Historic Resources	No previously recorded historic resources within one mile of the proposed Route 2 centerline would be impacted by the proposed transmission line.	No previously recorded historic resources within one mile of the proposed Route 2A centerline would be impacted by the proposed transmission line.	No previously recorded historic resources within one mile of the proposed Route 2 or Route 2A centerline would be impacted by the proposed transmission line.
Effects on the Natural Environment			
Air Quality	The maximum one-hour concentration of ozone during worst case weather is estimated at 0.0007 ppm. This is well below both federal and state standards. No air quality impacts due to the operation of the transmission line are anticipated. Temporary air quality impacts caused by construction vehicle emissions and fugitive dust from right-of-way clearing are expected to occur.		
Water Resources	Approximately 18 transmission line structures would be placed within wetlands, representing 360 sq-ft of permanent impacts. About 24 acres of wetland forest conversion impacts and seven acres of temporary wetland impacts would occur. The proposed route centerline crosses two PWI streams and one intermittent non-PWI stream.	Approximately 12 transmission line structures would be placed within wetlands, representing 240 sq-ft of permanent impacts. About 16 acres of wetland forest conversion impacts and 19 acres of temporary wetland impacts would occur. The proposed route centerline crosses four PWI streams and one intermittent non-PWI stream.	Route 2 would have six more transmission structures placed within wetlands. Route 2 would have 8 more acres of wetland forest conversion and 12 fewer acres of temporary wetland impacts. Route 2 would have approximately two fewer stream crossings.

Factor	Route 2 (Preferred Route) and Associated Facilities	Route 2A (Alternate Route) and Associated Facilities	Summary
Flora	Approximately 84 acres of impacts would occur to forests, primarily quaking aspen. Lesser impacts to lowland deciduous forest (four acres) may also occur adjacent to streams and tributaries crossed by the right-of-way. Approximately seven acres of impacts to lowland coniferous forests would be impacted, located in a wetland area about 2.5 to four miles west of the proposed taconite plant substation.	Approximately 63 acres of impacts would occur to forests, primarily quaking aspen. Lesser impacts to a lowland deciduous forest (five acres) may also occur in the vicinity of Big Sucker Lake and Sucker Brook. Less than one acre of impacts to lowland coniferous forests would likely occur within the right-of-way.	Route 2 and 2A have similar lengths and similar right-of-way areas and would have similar potential to impact local flora. Route 2A would likely impact fewer lowland coniferous forests than Route 2.
Fauna	Route 2 could potentially impact avian species that may be using a local flyway.	Route 2A could potentially impact avian species that may be using a potential local flyway.	Both Routes have the potential for avian collisions.
Effects on Rare and Unique Natural Resources			
Rare and Unique Natural Resources	No NHIS records are located within Route 2. There are six NHIS records, representing five <i>Botrychium</i> species, within one mile of the edge of Route 2. This includes two endangered, one threatened plant, and two special concern species.	One NHIS record of a special concern mollusk species (Black Sandshell) is located within Route 2A. There are seven NHIS records, representing five <i>Botrychium</i> species and one mollusk species, within one mile of the edge of Route 2A. This includes two endangered, one threatened, and three special concern species. Additionally, NHIS data records one bald eagle nest (near lower Hanson Lake) within two miles of the edge of Route 2A.	Since all watercourses would be spanned, neither Route is expected to impact any species recorded in the 2008 NHIS database. Areas that have not been surveyed within the right-of-way, particularly in the vicinity of forested wetlands, may have the potential to harbor sensitive plant species. There is the potential for bald eagles to pass through the route areas.
Application of Design Options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity			
General	The design options of the facilities along both the Preferred Route and Alternate Route maximize energy efficiencies and mitigate adverse environmental effects.		
Use of Existing Transportation, Pipeline and Electrical Transmission Systems or ROWs			

Factor	Route 2 (Preferred Route) and Associated Facilities	Route 2A (Alternate Route) and Associated Facilities	Summary
Existing Transportation, Pipeline and Electrical Transmission systems or ROWs	Approximately 78% of the route follows the right-of-ways of existing transportation, pipeline, and electrical transmission systems.	Approximately 19% of the route follows the right-of-way of existing transportation, pipeline, and electrical transmission systems.	The Preferred Route follows a greater percentage of existing rights-of-way by co-locating with the existing 115 kV Line #28.
Electrical System Reliability			
Electrical System Reliability	Both routes would support the reliable operation of the transmission system.		
Costs of Constructing, Operating, and Maintaining the Facility, which are Dependent on Design and Route			
Costs	The distance of the Preferred Route is 10.7 miles and has an estimated cost of \$9.3 million.	The distance of the Alternate Route is 9.6 miles and has an estimated cost of \$8.3 million.	The shorter distance of the Route 2A contributes to a lower overall cost of the Project.
Irreversible and Irretrievable Commitments of Resources			
General	Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects result primarily from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with this Project that are irreversible and irretrievable, but those few are resources primarily related to construction. Construction resources that would be used to construct the Project include aggregate resources, concrete, steel, and hydrocarbon fuel. During construction, vehicles would be traveling to and from the site, utilizing hydrocarbon fuels. These commitments of resources are similar for both routes proposed.		Route 2A has approximately six fewer structures and a 1.1 mile shorter length, resulting in fewer commitments of resources.
Route specific	The overall length of the Preferred Route is 10.7 miles, which would require approximately 71 structures.	The overall length of the Alternate Route is 9.6 miles, which would require approximately 65 structures.	

Note: For Route 2, area impacts are based upon a proposed 115 foot wide new right-of-way where an existing transmission line is paralleled and a proposed 130 foot new right-of-way in new corridors. Route 2A area impacts are based upon a proposed 130 foot new wide right-of-way.