

# **Great Northern Transmission Line**

## ***Floodplain and Wetland Assessment***

Prepared for  
U.S. Department of Energy  
Office of Electricity Delivery and Energy Reliability

January 2016

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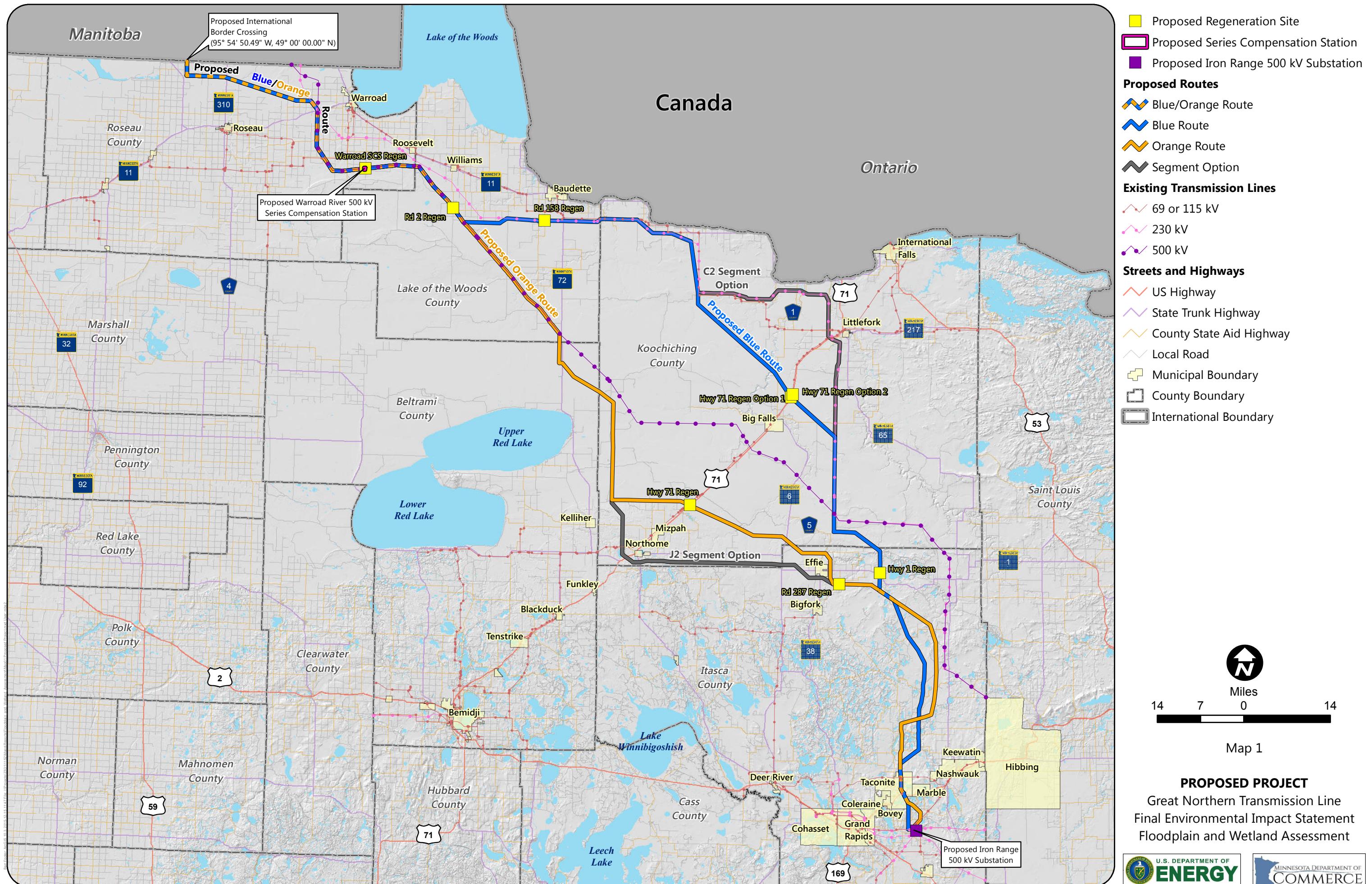
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## 1.0 Introduction

Minnesota Power, a regulated utility division of ALLETE, Inc. (Applicant), proposes to construct and operate the Great Northern Transmission Line, which is an approximately 220-mile long, 500 kilovolt (kV) overhead, single-circuit, alternating current (AC) transmission line. The proposed Great Northern Transmission Line (proposed Project) would cross the international border from Canada into the United States in Roseau County, Minnesota, and it would connect to the proposed Iron Range 500 kV Substation that would be located adjacent to the existing Blackberry Substation near Grand Rapids, Minnesota (Map 1). The proposed Project would carry hydropower generated by facilities operated by Manitoba Hydro, a Canadian electric utility, and would support the regional electric grid.

The following floodplain and wetland assessment was prepared to evaluate potential impacts to floodplains and wetlands from the proposed Project. The assessment was prepared following the May 24, 1977 Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) and the U.S. Department of Energy (DOE) regulations for implementing these Executive Orders as set forth in Title 10, Part 1022, of the Code of Federal Regulations (CFR) (Compliance with Floodplain and Wetland Environmental Review Requirements). This assessment is a component of the National Environmental Policy Act (NEPA) documentation regarding the proposed Project. Information provided in this report is consistent with the Great Northern Transmission Line Final Environmental Impact Statement (DOE and Minnesota Department of Commerce 2015); see this document for additional details regarding the proposed Project.



## 2.0 Project Description

The proposed Project involves construction, operation, and maintenance of a 220-mile, overhead, single-circuit 500 kV AC transmission line between the Minnesota-Manitoba border crossing northwest of Roseau, Minnesota. The transmission line would connect into the proposed Iron Range 500 kV Substation that would be located near the existing Blackberry 230/115 kV Substation near Grand Rapids, Minnesota.

The Applicant proposed one international border crossing location (the border crossing for the Proposed Border Crossing-Blue/Orange Route) and two route alternatives in its amended Presidential permit application (Minnesota Power 2014). The proposed international border crossing is located at the Minnesota-Manitoba border (latitude 49° 00' 00.00" N and longitude 95° 54' 50.49" W), roughly 2.9 miles east of Highway 89 in Roseau County, Minnesota (Map 1). The two proposed route alternatives are referred to as the Proposed Orange Route and the Proposed Blue Route and are shown on Map 1. Both of the proposed route alternatives would originate at the proposed international border crossing and would follow the same route for approximately 71 miles, after which the Proposed Blue Route heads east, paralleling an existing 230 kV transmission line, and the Proposed Orange Route continues southeast paralleling an existing 500 kV transmission line (Map 1). The proposed route alternatives meet up again east of Effie, Minnesota, where they both travel south along separate corridors to the proposed Iron Range 500 kV Substation (Map 1). The Proposed Blue Route is 215.2 miles long and would parallel an existing transmission line for approximately 39 percent of its length, while the Proposed Orange Route is 215.7 miles long and would parallel an existing 500 kV transmission line for approximately 31 percent of its length.

Based on comments received from the public and agencies during the Applicant's route selection process, the Applicant also identified two additional route segments as potential options along the proposed route alternatives (Minnesota Power 2014). These segment options include the following:

- The Applicant compared two segments for the Proposed Blue Route: the C1 Segment Option which is part of the Proposed Blue Route, and the C2 Segment Option, which is an alternate to the C1 Segment Option.
- The Applicant compared two segments for the Proposed Orange Route: the J1 Segment Option which is part of the Proposed Orange Route, and the J2 Segment Option, which is an alternate to the J1 Segment Option.

The proposed Project also contains associated facilities, including construction of a new 500 kV Series Compensation Station (a structure which would house the 500 kV series capacitor banks necessary for reliable operation and performance of the proposed transmission line), regeneration stations, a new Iron Range 500 kV Substation (which would be constructed east of the existing Blackberry 230/115 kV Substation), and necessary access roads, construction lay-down areas and fly-in sites (Minnesota Power 2014). The preliminary locations of these associated facilities are shown on Map 1. Locations of access roads, construction lay-down areas, and fly-in sites will not be determined until the Minnesota Public Utilities Commission (MN PUC) selects a final route; see Section 2.9.7 of the Final Environmental Impact

Statement for additional information on this process (DOE and Minnesota Department of Commerce 2015) .

This floodplain and wetland assessment evaluates impacts to floodplains and wetlands from the international border crossing, route alternatives, segment options, and associated facilities proposed by the Applicant as described in their Presidential permit application (Minnesota Power 2014). Additional information is available in the Final Environmental Impact Statement (DOE and Minnesota Department of Commerce 2015).

## 3.0 Floodplain and Wetland Descriptions

This section summarizes the existing floodplain and wetland resources within the proposed Project.

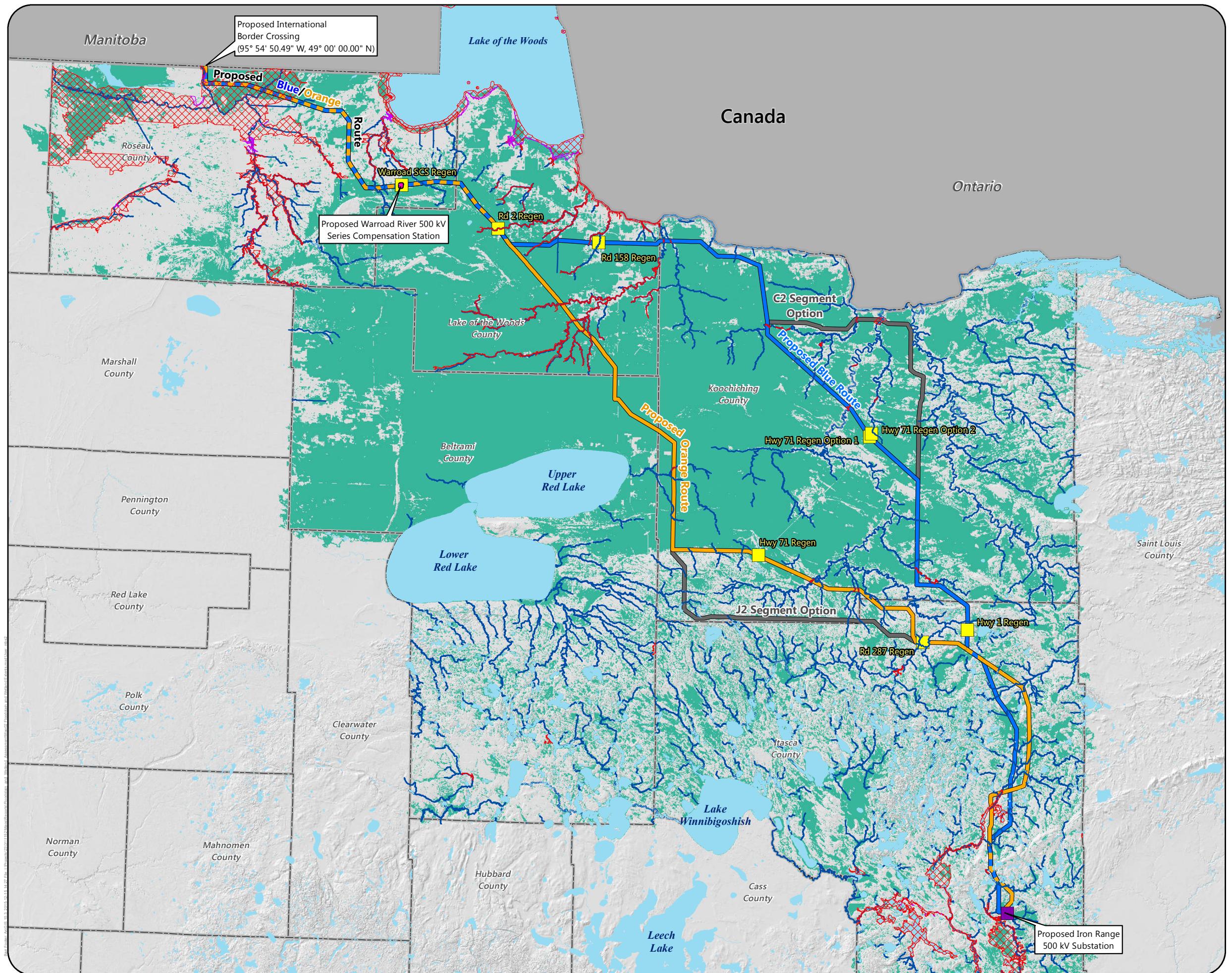
### 3.1 Floodplains

Executive Order 11988 (Floodplain Management) requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. DOE has rules specifically addressing floodplains and wetlands (10 CFR 1022). DOE requires identification of proposed actions located in a floodplain with an opportunity for early public review of such proposed actions, preparing floodplain assessments, and issuing statements of findings for such actions in a floodplain. In assessing the proposed Project's impacts on floodplains, DOE's assessment must discuss: (a) positive and negative, direct and indirect, and long and short-term effects on floodplains and (b) impacts on natural and beneficial floodplains values (10 CFR 1022.13(a)(2)). This regulation also requires the evaluation of the effects of a proposed floodplain action on lives and property.

Locations of designated floodplains were determined using Federal Emergency Management Agency (FEMA) maps. FEMA delineates floodplains and determines flood risks in areas susceptible to flooding. FEMA identifies both base floodplain (100-year floodplain) and critical action floodplain (at minimum, a 500-year floodplain) (Map 2 and Map 3). The base floodplain that FEMA uses has a one percent chance of flooding in any given year, while the critical action floodplain has, at a minimum, a 0.2 percent chance of flooding in any given year. A critical action would be any federal agency action for which even a slight chance of flooding would be too great (such as the storage of highly volatile, toxic, or water reactive materials).

FEMA-designated 500-year floodplain is present within the ROWs associated with the proposed route alternatives. However, the federal agency action for this assessment involves the construction of a transmission line, which would not involve highly volatile, toxic, or water reactive materials, therefore, it is not a critical action. As such, no critical action will occur in the floodplain, and therefore, no critical action floodplain exists for the proposed Project. Only the FEMA-designated 100-year floodplain is evaluated in this assessment.

Table 1 summarizes the acreage of FEMA-designated 100-year floodplain in the ROW for the proposed route alternatives and segment options.



- Proposed Regeneration Site
- Proposed Series Compensation Station
- Proposed Iron Range 500 kV Substation

- Proposed Routes**
- Blue/Orange Route
- Blue Route
- Orange Route
- Segment Option
- Public Water Inventory Watercourse
- National Wetland Inventory\*
- FEMA Floodplain Data\*\***
- 100-Year Floodplain
- 500-Year Floodplain
- Municipal Boundary
- County Boundary
- International Boundary

**Notes:**

- \* Wetlands are only shown for counties intersecting the proposed project.
- \*\* Digital floodplain (DFIRM) data only available for Roseau County. Floodplains in vicinity of the proposed project were digitized from FIRM in all other areas.

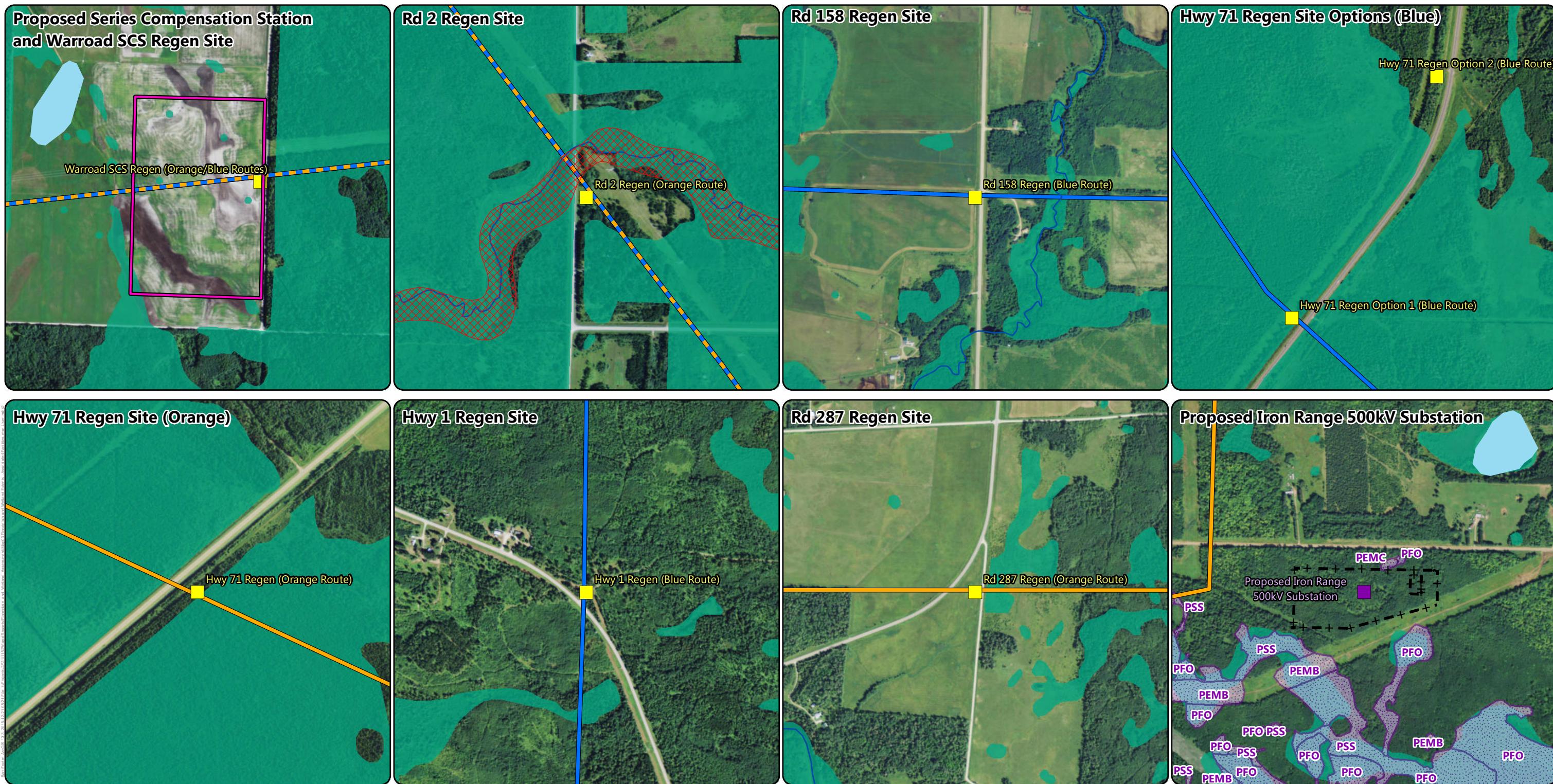
- Sources:**
- \* U.S. Fish and Wildlife Service. Statewide National Wetland Inventory. National Wetlands Inventory. [Online] 1997. <http://www.fws.gov/wetlands/Data/State-Downloads.html>
  - \*\* Minnesota Power. FEMA Floodplain/Flood Hazard Areas. Minnesota Power as published by FEMA on <https://msc.fema.gov/portal>. 2014.



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**FLOODPLAIN AND WETLAND EXTENTS**  
Great Northern Transmission Line  
Final Environmental Impact Statement  
Floodplain and Wetland Assessment



- Proposed Regeneration Site
- Proposed Series Compensation Station
- Proposed Iron Range 500 kV Substation
- × Proposed Iron Range Substation Fence Line

#### Proposed Routes

- ▲ Blue/Orange Route
- ▲ Blue Route
- ▲ Orange Route
- ▲ Segment Option

- ~~~~ Public Water Inventory Watercourse

- National Wetland Inventory
- Delineated Wetland Boundary\*

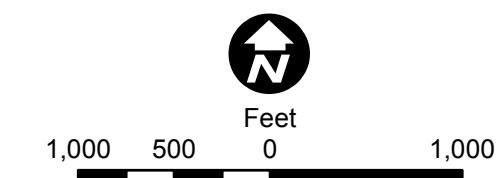
#### FEMA Floodplain Data\*\*

- 100-Year Floodplain
- 500-Year Floodplain
- Municipal Boundary
- County Boundary

#### Notes:

- \* Delineated wetland boundaries only available at the proposed Iron Range Substation site.

- \*\* Digital floodplain (DFIRM) data only available for Roseau County. Floodplains in vicinity of the proposed project were digitized from FIRM in all other areas.



Map 3

## FLOODPLAIN AND WETLAND EXTENTS -ASSOCIATED FACILITIES

Great Northern Transmission Line  
Final Environmental Impact Statement  
Floodplain and Wetland Assessment

**Table 1**      **Acres of FEMA-designated 100-year floodplain in ROW of Proposed Route Alternatives and Segment Options**

<b>Proposed International Border Crossing/Route Alternatives/Segment Options</b>	<b>100-year Floodplain (acres in ROW)</b>
Proposed International Border Crossing	0
Proposed Blue Route	350
Proposed Orange Route	368
C1 Segment Option (Proposed Blue Route)	8
C2 Segment Option	28
J1 Segment Option (Proposed Orange Route)	3
J2 Segment Option	0

### **3.1.1 Proposed International Border Crossing**

The proposed international border crossing is not located in a FEMA-designated 100-year floodplain (Table 1).

### **3.1.2 Proposed Route Alternatives**

The proposed route alternatives have comparable acreages of FEMA-designated 100-year floodplain in their ROWs (Table 1; Map 2). The Proposed Blue Route and the Proposed Orange Route have 350 acres and 368 acres present in the ROW, respectively.

The Proposed Blue Route crosses FEMA-designated 100-year floodplain associated with the Roseau River/Sprague Creek, Winter Road River, Peppermint Creek, Baudette River West Fork, Rapid River, Rapid River East Fork, Black River, Big Fork River, and Reilly Brook.

The Proposed Orange Route crosses FEMA-designated 100-year floodplain associated with the Roseau River/Sprague Creek, Winter Road River, Troy Creek, Rapid River (Main and North Branch), Chase Brook, Wade Brook, Tamarack River, and the Prairie River.

### **3.1.3 Proposed Segment Options**

The C2 Segment Option has more acres of FEMA-designated 100-year floodplain within the ROW (28 acres) than the corresponding portion of the Proposed Blue Route (C1 Segment Option; 8 acres) (Table 1; Map 2). The C1 Segment Option (Proposed Blue Route) crosses FEMA-designated 100-year floodplain associated with the Black River, while C2 Segment Option crosses FEMA-designated 100-year floodplain associated with the Big Fork River.

The J1 Segment Option (Proposed Orange Route) crosses a minimal amount of FEMA-designated 100-year floodplain (3 acres) associated with three unnamed tributaries to Deer Creek (Table 1; Map 2). The J2 Segment Option does not cross any FEMA-designated 100-year floodplain (Table 1).

### **3.1.4 Associated Facilities**

No FEMA-designated 100-year floodplain has been identified at the location of the proposed 500 kV Series Compensation Station, regeneration stations, or Iron Range 500 kV Substation (Map 3). Locations of access roads, construction lay-down areas, and fly-in sites will not be identified until the MN PUC selects a final route; therefore, the presence of FEMA-designated 100-year floodplain within these areas has not been assessed for this document.

## **3.2 Wetlands**

Executive Order 11990 (Protection of Wetlands), requires federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. To meet these objectives, the Executive Order requires federal agencies to consider alternatives to wetland impacts and to minimize potential wetland impacts if an activity affecting a wetland cannot be avoided.

As noted above in Section 3.1, DOE has rules specifically addressing wetlands (10 CFR 1022.1-1022.24). For an action proposed in a wetland, the effects on the survival, quality, and values of the wetland shall be evaluated. In assessing the proposed Project's impacts on wetlands, DOE's assessment must discuss: (a) positive and negative, direct and indirect, and long and short-term effects on wetlands and (b) impacts on natural and beneficial wetland values (10 CFR 1022.13(a)(2)). Section 1022.14 states that, if there is no practicable alternative to avoiding wetland impacts, "then DOE shall design or modify its action in order to minimize potential harm to or within the....wetland consistent with the policies set forth in Executive Order 11988 and Executive Order 11990."

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas (10 CFR 1022.4). Wetlands across the proposed Project were identified using United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps and are classified into different types according to the USFWS's Cowardin Classification System (Cowardin et al. 1979). The NWI tends to underestimate wetlands on the landscape, especially in forested conditions. As such, wetland acreages are only estimated in this assessment; wetland acreages will be more accurately quantified during field delineations required for the permitting process.

The proposed Project crosses through NWI-identified wetland, with large peatland complexes dominating the western and central portions of the proposed Project area and small- to medium-sized wetlands dominating the eastern portion of the proposed Project area (Map 2). Forested and shrub wetlands represent the dominant wetland types across the proposed Project area.

Table 2 summarizes the acreages of NWI-identified wetlands within the ROW for the proposed route alternatives and segment options.

**Table 2**      **Acres of NWI-identified wetlands in ROW of Proposed Route Alternatives and Segment Options**

<b>Proposed International Border Crossing/Route Alternatives/Segment Options</b>	<b>Total acres of wetland in ROW</b>	<b>Wetland Types* (acres in ROW)</b>					
		<b>PEM</b>	<b>PSS</b>	<b>PFO</b>	<b>PUB</b>	<b>River</b>	<b>Lake</b>
Proposed International Border Crossing	0.09	0	0	0.09	0	0	0
Proposed Blue Route	3,706	545	1,167	1,976	6	5	7
Proposed Orange Route	3,430	404	1,277	1,737	9	1	2
C1 Segment Option (Proposed Blue Route)	728	14	80	633	<0.5	1	0
C2 Segment Option	829	66	175	585	1	2	0
J1 Segment Option (Proposed Orange Route)	510	21	96	388	5	0	0
J2 Segment Option	353	28	97	215	13	0	0

\*Wetland types are based on the USFWS Cowardin Classification System (Cowardin et al. 1979): PEM (palustrine emergent wetland), PSS (palustrine scrub-shrub wetland), PFO (palustrine forested wetland, PUB (palustrine unconsolidated bottom pond).

### **3.2.1 Proposed International Border Crossing**

The proposed international border crossing is located entirely within an NWI-identified forested wetland (0.09 acres).

### **3.2.2 Proposed Route Alternatives**

The proposed route alternatives generally have comparable acreages of NWI-identified wetlands in their ROWs, with 3,706 acres and 3,403 acres present in the ROW for the Proposed Blue Route and Proposed Orange Route, respectively (Table 2; Map 2). The Proposed Blue Route passes through more emergent, forested, river, and lake wetlands, while the Proposed Orange Route passes through more shrub and pond wetlands (Table 2).

### **3.2.3 Proposed Segment Options**

The C1 Segment Option (Proposed Blue Route) passes through fewer acres of NWI-identified wetland (728 acres) compared to the C2 Segment Option (829 acres) (Table 2). The C1 Segment Option (Proposed Blue Route) passes through more forested wetland, while the C2 Segment Option passes through more shrub and emergent wetland (Table 2).

The J1 Segment Option (Proposed Orange Route) passes through more NWI-identified wetland (510 acres) than the J2 Segment Option (353 acres) (Table 2). The J1 Segment Option (Proposed Orange Route) passes through considerably more forested wetland than the J2 Segment Option (Table 2).

### **3.2.4 Associated Facilities**

Only one of the eight potential locations for regeneration stations is located in an area with NWI-identified wetland (Map 3). The Hwy 71 (option 1) regeneration station is located entirely (0.13 acre footprint) in an area mapped as NWI-identified emergent and forested wetland (Map 3).

Approximately 0.9 acres of scattered emergent NWI-identified wetlands are present in the 60-acre site for the proposed Series Compensation Station (Map 3).

The Applicant conducted a field wetland delineation and identified a 0.3 acre shallow marsh/forested wetland complex located in the 23-acre site for the proposed Iron Range 500 kV Substation (Map 3).

Locations of access roads, construction lay-down areas, and fly-in sites will not be identified until the MN PUC selects a final route; therefore, the presence of NWI-identified wetland within these areas has not been assessed for this document.

## 4.0 Floodplain and Wetland Impacts

The assessment area used to determine potential impacts to floodplains and wetlands includes the 200-foot ROW for the proposed route alternatives and segment options and the area within the boundaries for the associated facilities.

### 4.1 Floodplains

Short-term indirect adverse impacts on floodplains may occur from soil erosion and sediment deposition during construction. Sedimentation and ground disturbance in floodplains can make them more susceptible to establishment of invasive plant species, such as reed canary grass, which would adversely impact function by reducing vegetative biodiversity and altering wildlife habitat. However, Best Management Practices, such as erosion control measures, would be used to minimize potential impacts.

Long-term direct adverse construction-related impacts on floodplains could occur when the proposed Project crosses FEMA-designated 100-year floodplain areas larger than 1,250 feet wide, which is the typical spannable distance for transmission line structures. In these situations, spanning floodplains is not feasible and permanent placement of fill to construct structure foundations within the floodplain would be necessary. It is expected that structure placement would have minimal impacts on the general functioning of the floodplain or water flow, flood water storage capacity, or flooding in those floodplains as the volume displaced by the structures would likely be small in the context of the setting. FEMA does not require mitigation for construction within the floodplain, though local floodplain permitting entities could require mitigation, such as compensatory storage, as part of their floodplain permit conditions.

Currently construction details, such as the placement of transmission line structures for the proposed international border crossing, along the proposed route alternatives or segment options, and exact locations of associated facilities, are not known. Impacts resulting from construction and placement of transmission line structures in FEMA-designated 100-year floodplain would be quantified during Project design once the final route has been selected by the MN PUC.

#### 4.1.1 Proposed International Border Crossing

As indicated above in Section 3.1.1, the proposed international border crossing is not located in a FEMA-designated 100-year floodplain; therefore impacts to FEMA-designated 100-year floodplain would not be anticipated for the proposed international border crossing.

#### 4.1.2 Proposed Route Alternatives

As indicated in Table 1 and on Map 2, the Proposed Blue Route and the Proposed Orange Route have comparable acreages of FEMA-designated 100-year floodplain in their ROWs. The Proposed Blue Route and the Proposed Orange Route would cross FEMA-designated 100-year floodplain areas that are too large to span. As such, the Proposed Blue Route and the Proposed Orange Route would require construction and placement of transmission line structures within FEMA-designated 100-year floodplain.

#### **4.1.3 Proposed Segment Options**

The C1 Segment Option (Proposed Blue Route) and the C2 Segment Option Variation would cross FEMA-designated 100-year floodplain areas that are too large to span; both segment options would therefore require construction and placement of transmission line structures within FEMA-designated 100-year floodplain (Map 2).

As indicated in Table 1, the J2 Segment Option does not cross FEMA-designated 100-year floodplain. Although the J1 Segment Option (Proposed Orange Route) would cross FEMA-designated 100-year floodplain, all areas are less than 1,250 feet wide and could therefore be spanned (Map 2). No impacts to FEMA-designated 100-year floodplain would be anticipated from either segment option.

#### **4.1.4 Associated Facilities**

No FEMA-designated 100-year floodplain has been identified at the location of the proposed 500 kV Series Compensation Station, regeneration stations, or Iron Range 500 kV Substation; therefore, no impacts to FEMA-designated 100-year floodplain would be anticipated (Map 3). Locations of access roads, construction lay-down areas, and fly-in sites will not be identified until the MN PUC selects a final route; therefore, potential impacts to FEMA-designated 100-year floodplain have not been determined for this document.

### **4.2 Wetlands**

Short-term indirect adverse impacts on wetlands may occur from soil erosion and sediment deposition during construction. Sedimentation and ground disturbance in wetlands can make them more susceptible to establishment of invasive plant species, such as reed canary grass, which would adversely impact wetland function by reducing vegetative biodiversity and altering wildlife habitat. However, Best Management Practices, such as erosion control measures, would be used to minimize potential impacts.

Similar to floodplains, long-term construction-related direct adverse impacts on wetlands could occur when the proposed Project crosses wetlands larger than 1,250 feet wide, which is the typical spannable distance for transmission line structures. In these situations, spanning wetlands would not be feasible and permanent placement of fill to construct structure foundations within wetlands would be necessary. Impacts to wetlands from permanent fill would be expected to be minimal because of the localized extent of the impact (1,936 square feet per structure).

Preparing the site and installing structures may have short-term indirect adverse impacts on 0.92 acres per structure (200 feet by 200 feet) by soil compaction associated with concentrating surface disturbance and equipment use (Minnesota Power 2014). Impacts to wetlands could be minimized or mitigated through use of construction matting to traverse wetlands, timing construction in these areas to take place during frozen conditions, and use of low ground pressure equipment to the extent practical. Construction access through wetlands could also be minimized through the use of helicopters to assist with construction activities, as appropriate.

Long-term direct construction- and operation/maintenance-related adverse impacts on wetlands would also occur when woody vegetation within the ROW is cleared to maintain low-stature vegetation, which is necessary for safe and efficient operation of the transmission line. Removal of woody vegetation within a forested or shrub wetland would not reduce overall wetland acreage, but it would convert the forested or shrub wetland area to a different vegetation community and wetland type. Conversion of forested or shrub wetlands to another wetland type would alter wetland function as a result of changes to vegetation cover and associated changes in habitat, wetland hydrology, and nutrient dynamics.

Mitigation would be required for structure foundations placed within wetland boundaries, as well as for conversion of wetland from one type to another. The Applicant is currently developing a wetland mitigation plan in collaboration with the U.S. Army Corps of Engineers to meet the agency's compensatory mitigation requirements.

Currently construction details, such as the placement of transmission line structures for the proposed international border crossing, along the proposed route alternatives or segment options, and exact locations of associated facilities, are not known. Impacts resulting from construction and placement of transmission line structures in wetlands would be quantified during Project design once the final route has been selected by the MN PUC.

#### **4.2.1 Proposed International Border Crossing**

The proposed international border crossing is located in an NWI-identified forested wetland that exceeds 1,250 feet in width, the average spanning length allowable for structures. As such, one or more transmission line structures would likely be placed within this NWI-identified wetland. Furthermore, this forested wetland would undergo wetland type conversion (0.09 acres) following the clearing of woody vegetation in the ROW.

#### **4.2.2 Proposed Route Alternatives**

As indicated in Table 2 and on Map 2, the Proposed Blue Route and the Proposed Orange Route generally have comparable acreages of NWI-identified wetlands in their ROWs. Because wetland crossings often exceed 1,250 feet, the average spanning length allowable for structures, neither the Proposed Blue Route nor the Proposed Orange Route can avoid wetland impacts by spanning. Therefore, both proposed route alternatives would have direct long-term impacts on wetlands as a result of the placement of transmission line structures within them. Although Project design details are not currently known for either the Proposed Blue Route or the Proposed Orange Route, impacts from the placement of transmission line structures in wetlands would likely similar for either proposed route alternative.

Both the Proposed Blue Route and the Proposed Orange Route would require conversion of over 3,000 acres of forested and shrub NWI-identified wetlands to herbaceous wetland types within the ROW. The Proposed Blue Route would require wetland type conversion of approximately 3,143 acres: 1,976 acres of forested wetland and 1,167 acres of shrub wetland (Table 2). The Proposed Orange Route would require wetland type conversion of approximately 3,014 acres: 1,737 acres of forested wetland and 1,277 acres of shrub wetland (Table 2).

#### **4.2.3 Proposed Segment Options**

All proposed segment options would cross NWI-identified wetlands wider than 1,250 feet, the average spanning length allowable for structures (Map 2). As such, all proposed segment options would have direct long-term impacts on wetlands as a result of the placement of transmission line structures within them. However, Project design details are not currently known for any of the proposed segment options and therefore these direct impacts cannot be quantified at this time.

The C2 Segment Option would require more wetland type conversion of NWI-identified wetlands (760 acres) than the C1 Segment Option (Proposed Blue Route; 713 acres) (Map 2). However the C1 Segment Option (Proposed Blue Route) would require conversion of more forested wetland (633 acres) than the C2 Segment Option (585 acres). The C2 Segment Option would require conversion of more shrub wetland (175 acres) than the C1 Segment Option (Proposed Blue Route; 80 acres) (Table 2).

The J1 Segment Option (Proposed Orange Route) would require more wetland type conversion of NWI-identified wetland (484 acres) than the J2 Segment Option (312 acres; Table 2) (Map 2). The J1 Segment Option (Proposed Orange Route) would require conversion of more forested wetland (388 acres) than the J2 Segment Option (215 acres; Table 2). However, both the J1 Segment Option (Proposed Orange Route) and the J2 Segment Option would require conversion of just under 100 acres of shrub wetland (Table 2).

#### **4.2.4 Associated Facilities**

Because the proposed Hwy 71 (option 1) regeneration station is located entirely within an NWI-identified wetland, construction at this site would result in direct long-term impacts of approximately 0.13 acres (the regeneration station footprint) of NWI-identified emergent and forested wetland (Map 3).

The proposed 500 kV Series Compensation Station would permanently impact 6 acres of land. In order to avoid wetland impacts the proposed 500 kV Series Compensation Station would need to be constructed in an area that avoids the 0.9 acres of NWI-identified wetlands. However, a field wetland delineation would need to be conducted to ensure avoidance of wetlands in the southern portion of the site.

The proposed Iron Range 500 kV Substation would have direct long-term impacts on approximately 0.3 acres of a shallow marsh/forested wetland complex identified by the Applicant (Map 3).

Locations of access roads, construction lay-down areas, and fly-in sites will not be identified until the MN PUC selects a final route; therefore, potential impacts to NWI-identified wetlands have not been determined for this document.

## **5.0 No Action Alternative**

Under the No Action Alternative the DOE would not issue a Presidential permit and the proposed Project, including all transmission lines and associated facilities, would not be constructed. If the proposed Project were not constructed, environmental impacts associated with the proposed Project, including potential impacts to floodplains and wetlands would not occur.

## **6.0 Statement of Findings**

The proposed Project would adversely affect floodplains and wetlands. However, impacts to floodplain and wetland resources from the proposed Project would not result in subsequent impacts to lives or property.

## 7.0 References

Cowardin, L.M., V. Carter, F.C. Golet, R.T. LaRoe. Classification of Wetlands and Deepwater Habitats of the United States. s.l. : U.S. Fish and Wildlife Service, 1979. p. 103. FWS/OBS079/31.

Minnesota Power. Application for Presidential Permit and Route Permit. Great Northern Transmission Line. [Online] 2014. <http://www.greatnortherneis.org/Home/documents>.

U.S. Department of Energy Office of Electricity Delivery and Energy Reliability and Minnesota Department of Commerce Energy Environmental Review and Analysis. Great Northern Transmission Line Project, Final Environmental Impact Statement. October 2015.

## 8.0 Acronyms

AC	alternating current
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
FEMA	Federal Emergency Management Agency
kV	kilovolt
MN PUC	Minnesota Public Utilities Commission
NEPA	National Environmental Policy Act
NWI	National Wetland Inventory
PEM	palustrine emergent wetland
PFO	palustrine forested wetland
PSS	palustrine scrub-shrub wetland
PUB	palustrine unconsolidated bottom pond
ROW	right of way