Appendix S

Draft Vegetation Management Plan

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Vegetation Management Plan

Northland Reliability Project

Northland Reliability Project

GREAT RIVER ENERGY. | minnesota power

August 1, 2023

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1. PROJECT SUMMARY

Minnesota Power and Great River Energy (or "Owners") have cooperatively applied for a Certificate of Need and Route Permit ("Application") for the Northland Reliability Project (or "Project") from the Minnesota Public Utilities Commission ("Commission") in Docket Nos. E015, ET2/CN-22-416, E015, ET2/TL-22-415. The Owners propose a route that is located along existing high-voltage transmission lines for more than 85 percent of its length. By locating the Project next to existing high-voltage transmission lines and other existing rights-of-way, the Project can leverage existing corridors rather than creating new ones. As described in the Application, locating the Project along existing transmission line rights-of-way minimizes the potential impact of the Project within the Project Route.

The Project consists of two major segments:

1) Segment 1: construction of a new, approximately 140-mile long, double-circuit 345 kilovolt ("kV") transmission line connecting the existing Iron Range Substation, a new Cuyuna Series Compensation Station (described below), and the existing Benton County Substation; and

2) Segment 2: replacement of two existing high-voltage transmission lines.

    a. Replace an approximately 20-mile 230 kV line with two 345 kV circuits from the Benton County Substation to the new Xcel Energy Big Oaks Substation[1] along existing high-voltage transmission right-of-way on double-circuit 345 kV structures; and

    b. Replace an approximately 20-mile 345 kV line from the Benton County Substation to the existing Xcel Energy Sherco Substation in Sherburne County along existing high-voltage transmission right-of-way using double-circuit 345 kV structures.

The Project will also involve the following improvements to the power grid:

1) Expansion of the existing Iron Range Substation, located near Grand Rapids, and expansion of the existing Benton County Substation, located near St. Cloud, and rerouting existing transmission lines at the Iron Range Substation and Benton County Substation; and

2) Construction of a new Cuyuna Series Compensation Station near the existing Riverton Substation and rerouting an existing transmission line in the Riverton area.

2. PLAN OVERVIEW

The Owners have developed this Vegetation Management Plan (or "Plan") for the Project to address an anticipated common route Permit condition related to vegetation management.

The primary goal of this Plan is to construct the Project and maintain the Project right-of-way in a manner that ensures a safe and reliable transmission lines and associated terminal infrastructure. In addition to the primary goal of ensuring a safe and reliable transmission line, this Plan addresses the following goals:

- Develop and maintain cooperative relationships with landowners along the right-of-way to accommodate reasonable requests and preferences related to right-of-way vegetation management.
- Comply with applicable requirements in federal, state, and local permits, licenses, and/or easements.
- Prevent the introduction and spread of noxious weeds and invasive species ("NWIS") due to the Project.

This Plan reflects vegetation management practices that are consistent with applicable North American Electric Reliability Corporation ("NERC") requirements, as well as requirements set by the Commission, including the implementation of wire/border zone vegetation management (**see Section 12.c**). This Plan also incorporates, where applicable, the Minnesota Department of Commerce's Generic Vegetation Establishment and Management Plan Guidance.

3. SITE DESCRIPTION

a. Existing conditions.

The Project's Proposed Route[2] is composed of roughly 32% forest and shrubs, 33%% agricultural & grassland, 4% developed/open land, and 31% wetland and open water areas.

The topography is gently level to slightly sloping with more lowland topography associated with the northern end of the Project, with more upland, agricultural land near the southern end. Steep localized elevation changes occur, primarily associated with road ditches and water features. Elevations range from about 924 feet to 1462 feet above sea level with higher elevations to the north.

b. Project components.

i. Transmission line right-of-way.

[2] The Proposed Route is defined in Section 1.3 of the Application and is incorporated here by reference.

The Project requires a 150-foot-wide right-of-way (75 feet each side of centerline). For over 85 percent of its length, the Project follows existing high-voltage transmission line rights-of-way. To the extent practicable, the new double-circuit 345 kV transmission line in Segment 1 will be located such that the right-of-way for the Project will overlap with existing rights-of-way 40 to 60 feet to minimize the overall easement required from landowners for the Project. In Segment 2, the existing transmission line will be removed and rebuilt within the existing right-of-way with the Project on double-circuit structures.

ii. Substations.

The Project includes the expansion of two existing substations and the construction of a new series compensation station. These facilities will be constructed on property owned by Minnesota Power or Great River Energy.

iii. Temporary construction areas.

Temporary construction areas typically include stringing equipment setup areas, laydown yards and some access points. Landowner easements are acquired for these temporary construction areas; however, the Owners will use property owned by Minnesota Power or Great River Energy where practicable.

4. MANAGEMENT OBJECTIVES

a. Construct the Project and maintain the Project right-of-way in a manner that ensures a safe and reliable transmission line.

The Owners' primary goal is to construct the Project and then operate and maintain the Project and its right-of-way in a manner that ensures a safe and reliable transmission line.

In response to widespread outages in the United States in the early 2000s, Congress enacted the Energy Policy Act of 2005, which authorized the Federal Energy Regulatory Commission ("FERC") to certify an Electric Reliability Organization ("ERO") to create mandatory, enforceable reliability standards; the standards are subject to FERC review and approval. FERC subsequently designated NERC as the ERO tasked with developing and enforcing standards to ensure the reliability of the transmission system in North America. NERC's standards are developed using a results-based approach that focus on performance, risk management, and entity capabilities, and using an American National Standards Institute-accredited process that ensures the process is open to all persons directly and materially affected by the reliability of the North American bulk power system.[3]

More specifically, NERC developed its Reliability Standard FAC-003 Transmission Vegetation Management Program and began enforcement of that standard in 2007. In recognition of the fact that failure to address vegetation requirements can cause major power outages and injury, NERC is authorized to assess regulatory penalties for non-compliance. This standard is updated from time

[3] *See* North American Electric Reliability Corporation, *Standards, available at* https://www.nerc.com/pa/Stand/Pages/default.aspx.

to time and is reviewed and approved by FERC, just like other NERC reliability standards. NERC has determined that "[m]ajor outages and operational problems have resulted from interference between overgrown vegetation and transmission lines located on many types of lands and ownership situations" and that adhering to standard requirements "will reduce and manage this risk."[4] The purpose of the NERC standard is:

> *To maintain a reliable electric transmission system by using a defense- in-depth[-]strategy to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW, thus preventing the risk of those vegetation-related outages that could lead to Cascading.*[5]

For transmission lines subject to NERC standards, compliance with these standards is required. And, even for transmission lines that are not subject to NERC standards, ensuring safe and reliable construction and operation is paramount. The purpose of this Plan is to meet the objective of a safe and reliable transmission line, consistent with applicable laws, permits, and other requirements, while also minimizing human and environmental impacts associated with vegetation management to the extent possible.

In sum, to ensure safe construction of the Project, the Owners will clear the right-of-way of vegetation in advance of construction. Additional detail regarding the right-of-way preparation and construction process is included in **Section 5**. After construction, the Owners will restore the right-of-way, as discussed in **Section 9**. Thereafter, safe operation of the transmission line is the priority. The Owners will perform regular maintenance and inspections during the life of the transmission line to ensure continued integrity. Generally, the Owners will annually inspect the Project once by air and once on the ground to ensure safe and reliable operations and will implement "wire/border zone" practices, as discussed in more detail in **Section 12**.

b. Additional objectives.

i. Develop and maintain cooperative relationships with landowners along the right-of-way to accommodate reasonable requests and preferences related to right-of-way vegetation management.

The Owners work cooperatively with landowners before, during, and after the construction process regarding easements, rights-of-way, structure locations, restoration, and maintenance (**Section 5.a**, **6, 8, and 9**). This coordination and cooperation is in recognition of the fact that, in most locations under private ownership, the Owners have an easement for the Project – they do not own the property in fee simple – and, in large part, the landowners' use of their property, including the right-of-way, will continue after the Project is constructed and operational.

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[4] *E.g.,* NERC, *Transmission Vegetation Management Standard FAC-003-4 Technical Reference*, at 3 *available at* https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-003-4.pdf.

[5] NERC, *FAC-003-4 Transmission Vegetation Management*, § A(3), *available at* https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-003-4.pdf.

For example, land that is in agricultural production prior to construction of the Project will likely return to agricultural production; similarly, landowners with mowed turf grass will typically want the right-of-way restored with turf grass that the landowner can mow, just like the rest of the parcel. In this way, a transmission line right-of-way is distinct from vegetation management for other types of energy infrastructure (for example, a solar farm where the project operator has exclusive control of the premises).

This Plan acknowledges that the Owners do not have exclusive access to the easement and that the landowner can and will continue to use the land that is subject to an easement in a manner that does not interfere with the safe and reliable operation of the Project and is otherwise lawful. As such, this Plan reflects that the Owners will coordinate with landowners regarding restoration and maintenance, which means that restoration is likely to be consistent with historic vegetation and use, where practicable and consistent with safe and reliable transmission line operation.

ii. Comply with applicable requirements in federal, state, and local permits, licenses, and/or easements.

In addition to the Route Permit, the Project is required to comply with other applicable federal, state, and local permits, licenses, and/or easements. Where those permits, licenses, or easements conflict with this Plan, they shall take precedent over this Plan to the extent they do not violate any code or safety requirement. For example:

- Road right-of-way permits: Where the Project will impact road rights-of-way, the Owners will follow the vegetation management requirements and guidelines of the appropriate road authority. For example, the Minnesota Department of Transportation ("MnDOT") has guidelines regarding seeding methods and mixes for its rights-of-way.
- Stormwater Pollution Prevention Plan ("SWPPP"): As a requirement of the National Pollutant Discharge Elimination System ("NPDES") permit program, a SWPPP must be prepared to meet the site-specific requirements of each project, to outline procedures to minimize erosion, and to mitigate sediment transport during and after construction activities. The SWPPP covers, among other things, temporary erosion and sediment controls best management practices ("BMPs"). Many of those BMPs are reflected in this Plan.
- Minnesota Department of Natural Resources ("MnDNR") licenses/permits: MnDNR licenses or permits may have requirements specific to a certain water crossing or site. Where applicable, the Owners will implement MnDNR-required site specific conditions.

iii. Prevent the introduction and spread of NWIS due to the Project.

During all phases of Project activities, including clearing, construction, operation and maintenance, the Project will minimize the introduction and spread of NWIS along the right-of-way by implementing BMPs that discourage the spread of identified species, and routine cleaning of equipment to remove dirt and plant debris. See **Section 7** below for further detail.

5. RIGHT-OF-WAY PREPARATION & CONSTRUCTION

a. Landowner notification.

Landowners will be notified prior to clearing activities, as required by applicable permit conditions (typically 14 days). Among other things, the notification letter will inform landowners:

- The right-of-way will be staked indicating the extent of clearing activities.
- Landowners can request to keep any of the trees and materials that have been cleared. Requested wood will be cut to no less than eight-foot segments. Requested whole trees, trunks, wood chips or mulch will be placed just outside of the right-of-way.
- All unwanted materials will be removed from the landowner's property.

  Herbicides to prevent regrowth of woody vegetation may be used, the method of application, and the opportunity for them request that no herbicides be used. **See Section 6**.

b. Initial right-of-way clearing.

The right-of-way will be surveyed and marked in advance of tree clearing to identify the extent of Project activities. Staging and lay-down areas will be limited to previously disturbed areas where practicable and will avoid wetlands. Vegetation clearing will be limited to the permanent right-of-way, temporary right-of-way, danger trees off right-of-way, and off-right-of-way access. BMPs will be used to minimize the spread of NWIS. See **Section 7**.

Where Project schedule allows, vegetation clearing will be conducted on firm or frozen ground to minimize rutting and soil erosion. If schedules or weather does not support firm ground, wood or plastic mats or corduroy will be used as necessary to prevent erosion. Mechanical equipment such as feller bunchers or brush cutters may be used for clearing. In areas where clearing with large equipment is not viable, clearing will be done with hand tools such as chain saws.

Vegetation within the right-of-way will be cut at or slightly above the ground surface. Any tree stumps or surface roots in managed turf grasses will be ground to slightly below grade and the hole backfilled with dirt and seeded with an appropriate seed mixture. Any stumps outside of managed turf grass areas will typically be cut or ground such that no more than two inches remain above grade. To minimize soil impacts and erosion potential, the Owners do not typically grub stumps or roots.

Trees (>four inches diameter at breast height ("dbh") or >20 feet tall) cut from a wetland will be moved outside of the wetland. If the materials will be chipped or shredded, that work will be completed outside of wetlands. Brush within a wetland may be cut with a brush mower or similar device as long as the chips/mulch will not exceed one inch in depth. If sufficient brush is present such that debris will exceed one inch, sufficient brush will be hauled out for processing in an upland area.

All materials a landowner has requested to keep are stacked outside the right-of-way. All materials a landowner does not wish to keep are stacked inside the right-of-way for further processing and disposition. Any materials a landowner does not wish to keep will be removed from their property.

These unwanted materials may be offered to other landowners, offered for sale, placed in a composting site, or disposed of at landfill. Landowners within the Project will likely request a significant amount of the materials. The balance of materials will likely be disposed of at the nearest landfill approved to accept this material or another appropriate location.

Trees, trunks and/or limbs cut on private property are typically cut to approximately 8-foot lengths unless the landowner requests longer lengths. Where trees are removed from state and federal property, appropriate licenses/permits will be obtained and followed.

The following figures provide exemplars of right-of-way clearing on Project segments:

Figure 5-1. Segment 1

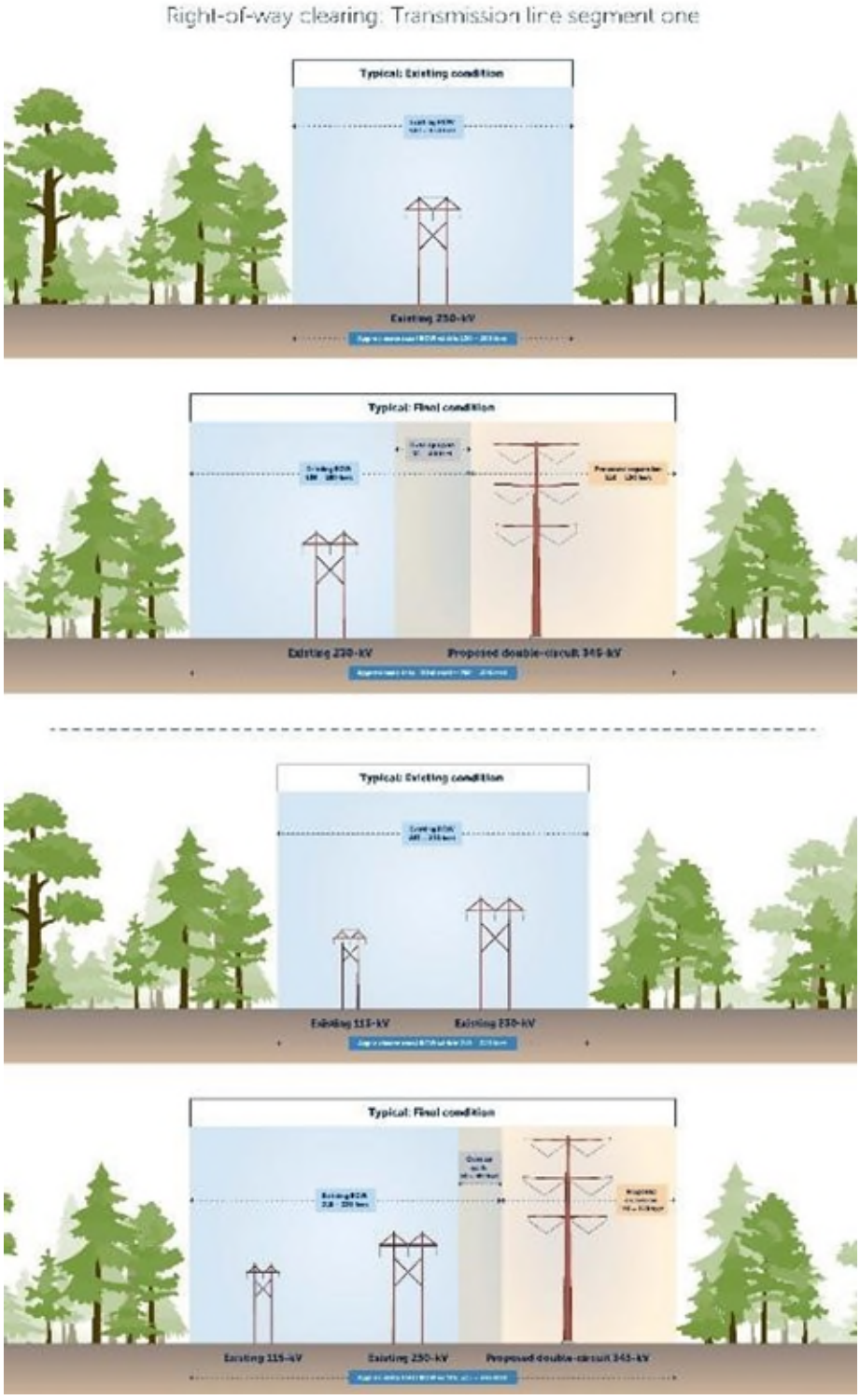
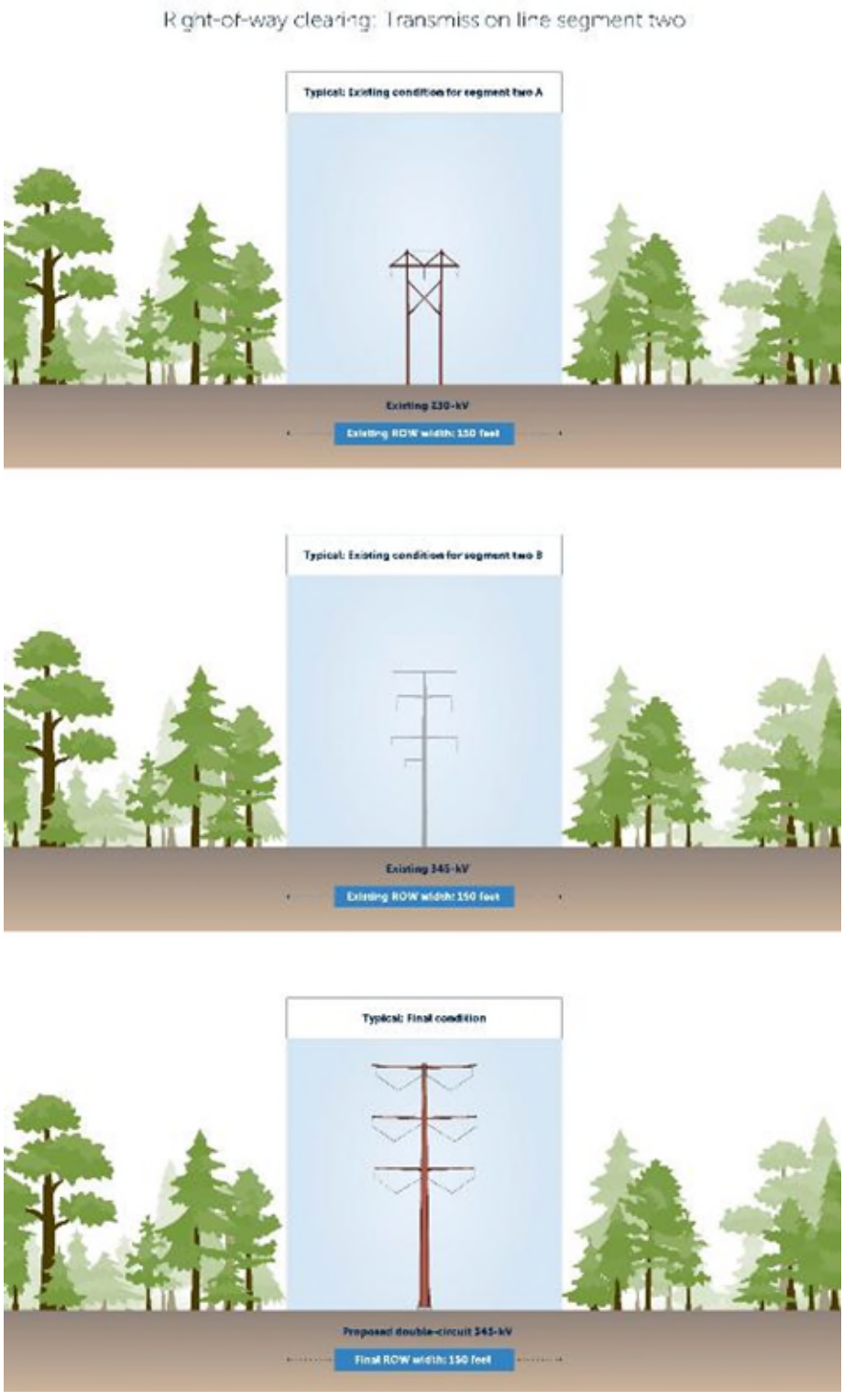


Figure 2-2. Segment 2



c. Erosion & sediment control BMPs.

All work will comply with the SWPPP developed as part of the Project NPDES permit. The SWPPP will define BMPs for erosion and sedimentation prevention and mitigation. Excavating in steeply sloped areas will be avoided to the extent practicable. Due to entanglement issues with small animals, use of erosion control blanket shall be limited to 'bio-netting' or 'natural netting' types and specifically no products containing plastic mesh netting or other plastic components.

d. Right-of-way preparation and construction at public water crossings.

Public Waters are wetlands, water basins, and watercourses of significant recreational or natural resource value in Minnesota as defined by Minnesota Statutes section 103G.005. The Proposed Route crosses 37 MnDNR Public Waterways, 12 Public Water Inventory ("PWI") lakes, and 25 Public Water Wetlands or Basins.

The MnDNR Division of Lands and Minerals regulates utility crossings over, under, or across any state land or public water identified on the Public Waters and Wetlands Maps. A license to cross Public Lands and Waters will be required for all crossings under Minnesota Statutes section 84.415 and Minnesota Rules Chapter 6135.

A minimum 50-foot natural vegetative buffer will be maintained on both banks of stream crossings to maintain habitat and bank stability.

Right-of-way clearing within 30 feet of a non-MnDNR jurisdictional streams or wetlands will be conducted to protect all non-invasive vegetation. Brush species will be left across a majority of the right-of-way, except brush in the wire zone (**see Section 12.c**) will be removed to facilitate right-of-way access. No tall-growing woody vegetation is allowed in the right-of-way.

6. HERBICIDES

Landowners within the Project right-of-way and operators of organic farms on adjacent parcels will be notified 14 days in advance if herbicides will be used on the right-of-way. The notice will indicate what herbicides will be used and the methods of application (e.g., broadcast, selective spot treatment, or basal treatment).

Unless a landowner has specified that no herbicides are to be used on their property, herbicides may be used to treat tree and brush stumps to prevent regrowth, and/or to control listed invasive or noxious weed species (**Section 7**). If organic farming is being practiced on a property adjacent to the right-of-way, see **Section 8** for additional requirements.

Any weed control spraying will be conducted in accordance with State of Minnesota regulations. Herbicides will be used in accordance with manufacturer's specifications and all applicable federal and state regulations.

Herbicides used within or near wetlands or waterbodies must be:

- designed for use in wet areas as designated by manufacture's specifications and federal and state regulations, and
- be used in accordance with manufacturer's specifications as well as all applicable federal and state regulations.

Herbicides will not be used on any state or federal lands without approval of the agency having authority over such land.

7. NOXIOUS WEEDS & INVASIVE SPECIES

During all phases of Project activities including clearing, construction, operation and maintenance, the Project will minimize the introduction and spread of NWIS along the right-of-way by implementing BMPs that discourage the spread of identified species, and routine cleaning of equipment to remove dirt and plant debris. The goal is to prevent new infestations on the right-of-way as a result of construction activities. It is important to note that there may be NWIS already existing on private parcels along the right-of-way. While this does not preclude the Project from responsibility for managing, to the extent practicable, the spread of invasive species pursuant to BMPs, this ability may be limited by pre-existing conditions.

Plant species that are regulated as noxious weeds in Minnesota are listed by the Minnesota Department of Agriculture in its Noxious Weed list.[6] No noxious weeds are currently listed for Itasca, Crow Wing, Morrison, Benton, or Sherburne Counties.

During construction and maintenance, to prevent the spread of noxious weeds from an impacted to a non-impacted area, the Owners will implement the following BMPs:

- Maintenance equipment will be cleaned before it is used in Project right-of-way and between equipment use in a known impacted area and a non-impacted area. Cleaning will consist of scraping or blowing to remove visible dirt and weed debris from machinery and trailers, including tracks and wheels.
- Only weed-free materials (e.g., straw bales, bio-rolls, mulch) will be used in erosion control and only weed-free seed will be used during revegetation.
- Equipment and clothing will be inspected for invasive materials.
- Minimally disturbed areas will be allowed to restore naturally.
- Major infestation areas may be treated with the recommended herbicides (if approved by the landowner) or by mechanical methods such as mowing or burning. The contractor will be required to obtain the necessary permits and/or certifications for the use of applicable herbicides.

Revegetation in non-agricultural areas will be considered successful when the cover of acceptable vegetation is dominant and non-NWIS species density is less than or similar to surrounding lands

[6] County noxious weed list, MN Department of Agriculture, https://www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist/countynoxiousweeds

that have not been affected by the Project. If monitoring indicates a higher density of NWIS, the Project will take appropriate measures to control NWIS.

8. ORGANIC FARMS

There are no known or registered organic farms within or adjacent to the Project right-of-way according to the Minnesota Department of Agriculture[7] or the United States Department of Agriculture Organic Integrity Database.[8] However, if the Project encounters a farm that is working toward certification or a landowner considers its farm to be organic, even if they are not certified, the Owners will work with the landowner to minimize impacts. Special practices would be adhered to within and adjacent to these organic agricultural lands.

If an organic farm were to be developed within or adjacent to the right-of-way, the Owners will work with the organic farmer to ensure that:

- Prohibited substances (as defined by organic farming certification regulations) would not be applied onto organic agricultural land.
- No refueling, fuel or lubricant storage or routine equipment would be allowed on organic agricultural land. If these prohibited substances are used on land adjacent to organic agricultural land, they would be used in such a way to prevent them from entering the organic agricultural land.
- Topsoil and subsoil layers that are removed during construction on these lands for temporary road impacts would be stored separately and replaced in the proper sequence after work is complete.
- Erosion control methods on organic agricultural land would be consistent with the Organic System Plan to the extent feasible. Adjacent to these lands, erosion control procedures would be designed so sediment from non-organic land would not flow into the organic agricultural lands.
- Weed control methods would be consistent with the Organic System Plan to the extent feasible.

9. RESTORATION

a. Overview of restoration process.

Once construction ceases, the right-of-way will be inspected to identify areas impacted by Project activities. Typical impacts might include rutting, soil compaction, soil exposure, and damage to native vegetation, all to varying degrees. Areas of minimal disturbance will be allowed to regenerate naturally. Such areas may include those where erosion is limited to dispersed areas and surrounding existing vegetation provides control of sediments; existing vegetation is matted down

[7] MN Department of Agriculture Organic Farm Directory by County, https://www.mda.state.mn.us/organic-farm-directory-county

[8] US Department of Agriculture Organic Industry Database, https://organic.ams.usda.gov/integrity/

due to vehicle traffic; or areas where drilling spoils are raked into existing vegetation. These areas will be identified at the time of restoration.

All conditions as specified in local, state, and federal permits and private landowner agreements for final restoration and cleanup will be met. Revegetation and restoration of disturbed areas associated with Project activities are intended to protect wetland and water resources from issues associated with sedimentation, to protect wildlife habitat, and reduce the movement of NWIS species within the right-of-way.

Restoration work will be coordinated with each individual landowner by the restoration contractor and/or one of the Owners' land agent, as applicable. Finally, each landowner will be mailed a letter asking if they have any outstanding restoration concerns.

Restoration activities may, as needed, include:

- Collecting and disposal of all work-related debris and trash.
- Discing or grading to repair rutting.
- Regrading areas disturbed by construction or clearing to reflect pre-construction topography.
- Returning floodplains to pre-construction profile if disturbed during construction.
- Applying temporary cover and/or temporary seed to minimize erosion potential to the extent practicable.
- Permanent seeding non-agricultural areas disturbed by transmission line structures to prevent runoff.
- Unless timber, slash or chips have been requested by the landowner, all residual vegetation materials will be removed and properly disposed of off-site. The Owners may request a burning permit from state or local jurisdictions to burn residuals.
- Trees (>4 inches dbh or >20 feet tall) cut from a wetland will be moved outside of the wetland. If the materials will be chipped or shredded, that work will be completed outside of wetlands.
- Brush within a wetland may be cut with a brush mower or similar device as long as the chips/mulch will not exceed one inch in depth. If sufficient brush is present such that debris will exceed one inch, sufficient brush will be hauled out for processing in an upland area.
- In accordance with easements, the Owners land agent will work with any farmers to repair any damages to cropped fields through discing or planting of deep-rooted crops, and compensate them for any crop damage, consistent with the requirements of the Owners easements and any related landowner agreements.
- Temporary access routes, if any, may be left intact with landowner agreement unless otherwise restricted by federal, state, or local regulations. If a temporary access road is to be removed, the land will be returned to its previous use and

restored to pre-construction conditions to the extent practicable unless the landowner requests differently.

- Within wetlands, all construction matting will be removed and vegetation will be allowed to regenerate naturally.

b. Temporary restoration.

Temporary cover and/or seeding may be used as a quick means to minimize soil erosion and reduce the potential for the establishment of NWIS. Temporary seed mixes are considered a cover crop and are made up of annual grasses, have rapid germination, and provide quick ground cover. These seed mixes are not intended to provide multi-year cover. Unless specifically requested by landowners or regulatory agencies, the Project will not establish temporary vegetation on cultivated land or in areas of open water.

Temporary restoration activities will include the repair of rutted surfaces and an even broadcast-seeding of the temporary cover-crop seed mix at a rate of 100 lbs/acre. Temporary vegetation establishment may be expected to be successful between April 1 and September 30. Establishment of temporary vegetation is unlikely to be successful outside of this time window. Temporary use of mulch to stabilize soils may be applied outside of the April 1 through September 30 window.

Straw or wood chip mulch may be used to help stabilize areas of bare soils during the establishment of temporary vegetation or during the period between October 1 and April 1 (winter), except that mulch in wetland areas cannot exceed one inch thick. The contractor will apply mulch during the establishment of temporary vegetation as requested by the landowner or specified in licenses or permits. Wood chip mulch free of soil material and derived from on-site sources, may be used to protect areas where bare soils have been exposed due to tree clearing and construction activities. In winter situations, wood chips may be used to provide protection for bare soils exposed due to Project activities if out of season seeding is not applicable. Woodchip mulch derived from on-site locations may be spread up to 6 inches deep in upland areas to provide ground protection along access paths. Straw mulch may be used outside of the seeding window as a temporary erosion control measure, followed by temporary or permanent seeding at the earliest possible time consisting with specific seed mix planting guideline.

c. Permanent restoration.

Allowing for and encouraging native species to naturally re-establish temporarily disturbed area is a primary BMP for this Project. Appropriate vegetative cover of the right-of-way will be required along the entire length of the Project. In most cases natural revegetation by early successional native species following tree clearing and construction is expected to occur. In areas where native species revegetate the corridor, active restoration may not be required.

Permanent seed mixes for the Project include native seed varieties commonly found and/or available from local seed distributors. The permanent seed mixes are designed to augment the natural colonization of bare ground by local, native seed sources.

In wetlands, the preferred method for revegetation of disturbed areas is reliance on revegetation by resident plant communities. The Owners, in consultation with the appropriate regulatory agencies, will determine whether disturbed areas will require the use of the temporary cover crop only, or seeding with a wetland-specific mix. In areas where the wetland plant community is dominated by native species with rhizomatous root systems that will likely recolonize areas of limited disturbance, bare soils are to be broadcast-seeded with the seasonally appropriate temporary cover-crop seed mix. Large bare soil disturbance areas are defined as greater than 100 square feet of exposed soils that is greater than 2 feet wide. These areas are large enough to preclude revegetation from the local, native seed source. Large bare soil areas should be seeded using wetland seed mix.

Potential seed mixes are identified in **Section 10(b)** below.

10. SEEDING.

a. Preparation.

Seedbed preparation and seeding are to occur following completion of construction activities and site cleanup in any given location and consistent with seasonal conditions (e.g., snow cover or frozen ground may preclude effective grading and seeding). Where construction activities have resulted in erosion or rutting, surface grade will be restored prior to seeding.

In order to minimize ground disturbance along the entire corridor, forested areas will be cleared, but roots and stumps are being left in place. Within areas of cleared forest, it may not be practical to access large areas of ground with seeding and seedbed preparation equipment. In these areas, smaller vehicles may be required to perform tasks such as smoothing ruts, preparing seedbeds with small rakes, and surface packing after seeding. Fertilizers and other soil amendments are not recommended and will only be applied as requested by and agreed to in right-of-way negotiations with individual landowners.

b. Seed mixes.

The Owners will strive to use seed mixes which are native to Minnesota. The following restoration areas and vegetation types are present in and adjacent to the right-of-way:

- Agriculture
- Turf grasses
- Pasture/unmanaged lands
- Road right-of-way

Seed mixes are based on regionally appropriate state seed mixes that are recommended by the Minnesota Board of Water and Soil Resources ("BWSR").[9] The mixes are listed in Table 1. This includes two non-native seed mixes that are formulated for pastures or lawn. The identified seed mixes are examples of suitable mixes for each site and replacements are likely to be needed based

[9] BWSR. Seed Mixes. Available at URL: bwsr.state.mn.us/seed-mixes

on availability at the time of construction. Seed mixes were not selected for wetland areas because it is expected that these areas would regenerate naturally. If re-seeding is required in wetlands, those wetlands will be individually assessed to determine the appropriate seed mix.

Table 1: Default Seed Mixes

Seeding Area	Seed Mix Name (State Seed Code)	Rate (Pure Live Seed [PLS])	Application Methods
Private agriculture	Cover Crop: Winter wheat or Oats	25 lbs/ac.	Broadcast seeder (Vicon or similar) by hand or mounted to equipment. Allow natural revegetation in lightly disturbed soil where sod is intact.
Private turf	Low Maintenance Turf (25-131)	220 lbs/ac.	
Private pastures and hay fields	Sandy General Roadside (25-121)	61 lbs/ac.	
Natural Vegetation: Shaded	Woodland Edge Northwest (36-411)	35.5 lbs/ac.*	
Natural vegetation: Dry Open	Dry Prairie Northwest (35-421)	11 lbs/ac.*	
Natural vegetation: Mesic Open	Mesic Prairie Northwest (35-441)	11 lbs/ac.*	
Unmanaged and Road right-of-way	Native Construction (32-241) **	38 lbs/ac.*	
Wetlands	No seed mix provided. These areas are expected to revegetate naturally.		
*Cover crop is included in these seed mixes ** Other mixes with higher forbs/pollinator content are preferred where site conditions allow.			

i. Pastures and turf: Non-native seed mixes.

The recommended seed mixes will meet the variety of conditions along the right-of-way. There are three seed mixes that are composed on non-native species.

1. **Cover crop** is listed as an option for the row crop fields near the southern end of the Project. The cover crop would use oats for early season planting or winter wheat for late season planting. Both would be installed at 25 lbs/acre.
    a. The cover crop can be used throughout the Project for other temporary cover if needed.
2. **Sandy General Roadside (25-121)** was selected for the areas that are part of the hay fields or potential pastures with grazing livestock.
    a. This mix will be suitable for dry sandy area, but it will also do well in areas with more moderate soil moisture.
3. **Low Maintenance Turf (25-131)** was selected for areas that are manicured and mown as part of lawns.

ii. Native seed mixes.

Native seed mixes were selected to meet the expected variety of conditions present along the right-of-way. If sufficient seeds are not available at the time of seeding, a similar, appropriate seed mix will be used. The three mixes are relatively diverse, with species of grasses and forbs:

1. **Woodland Edge Northwest (36-411)** for use in areas with moderate shade. This is mapped for areas where tree clearing will be expected. However, it should be limited to areas that will receive 50% or more shading from nearby trees after the trees have been removed. Seed mixes are dependent on the year to year harvest, but can include up to:
    a. 11 grass species
    b. 17 forb species
2. **Mesic Prairie Northwest (35-441)** for use in areas with moderate soil moisture and in full sunlight. Existing conditions in these areas will include many roadside ditches on north-facing slopes, near low wet areas, or in richer soils. This was mapped mostly in the southern portion of the Project. Seed mixes are dependent on the year to year harvest, but can include up to:
    a. 9 grass species
    b. 17 forb species
3. **Dry Prairie Northwest (35-421)** for use in areas with dry, sandy soil and in full sunlight. Existing conditions in these areas include many roadsides and fields with natural vegetation especially on south-facing slopes; hilltops and ridges; and other areas that appear to be fairly droughty. This mix will do well in most soil conditions except in or near wetlands. Seed mixes are dependent on the year to year harvest, but can include up to:
    a. 8 grass species
    b. 17 forb species

One of the optional mixes that is not included in the summary table is the Native Construction (32-241) mix, which is lower diversity and generally lower cost than the others selected. This mix can be used in a variety of soil moistures and in full or nearly full sunlight conditions. It is not recommended because of the greater diversity in the preferred mixes but may be a useful back-up seed mix for use in some circumstances—for example, if another seed mix is not available.

c. Seeding methods.

Broadcast seeding may be used at all disturbed areas where bare soil is created. Broadcast seeding will occur at double the rate specified in the seed mixes. Seed is to be uniformly distributed by a mechanical, hand-operated seeder; or in small seeding areas, by hand. Following seeding, the surface is to be raked with a cultipacker, harrow, or hand rake. The bed is to be firmed as appropriate to site conditions.

Hydroseeding may be used at all disturbed upland areas where bare soil is created. Hydroseeding is not approved in wetland locations as the method requires extra access by heavy vehicles. Hydroseeding will occur at double the rate specified in the seed mixes. Seed will be applied in a broadcast, hydromulch slurry. The hydromulch seed mix will allow the contractor to see where application has taken place, ensuring uniform coverage of the seeding area. The hydroseeder must

provide for continuous agitation of slurry and provide for a uniform flow of slurry. Hydroseed slurry is not to be held in the tank for more than one hour prior to application.

Seed drilling may be used in areas where stumps have been removed and a prepared seed bed can be created. However, these areas are expected to be infrequent and may not occur on the Project. Drilled seed will be sown at a depth of 0.25 inches. Seeding equipment will be able to accommodate and uniformly distribute different sizes of seed at the required depth. Feeding mechanisms will be able to evenly distribute different seed types at the rates specified. Seedbed soil is to be suitably firmed immediately following seed drilling.

d. Timing.

Seeding periods for application of the permanent seed mixes are limited to April 1 to June 30, during spring, or when soil temperatures have fallen below 55 degrees Fahrenheit in the fall. Outside of these time windows, temporary seed mixes, applied according to temporary cover crop seed mix specifications, are to be used.

11. MONITORING

After construction, the Owners will monitor areas where seeding and erosion control measures have been implemented and will follow up with reseeding measures where vegetative cover by the specified seed mix, or revegetation by the local, native seed source, is inadequate to provide long term stability and sustainable native plant communities, approximately 70% cover.

12. OPERATION & MAINTENANCE

a. Routine inspections.

The Owners will conduct aerial and/or ground visual inspections of the right-of-way every year to ensure a safe and reliable corridor and to ensure access for maintenance activities or emergencies. Maintenance work will be based on the findings of those inspections.

b. Routine maintenance.

The Owners will periodically clear vegetation from the existing right-of-way to maintain a safe and apparent corridor, and to allow access for maintenance activities or emergencies. The clearing will be done consistent with wire/border zone practices **(see Section 12.c** for more detail on wire/border zone). Clearing typically includes brushing equipment traveling down the right-of-way, which may consist of tracked or rubber-tired equipment to cut brush and trees, hand-held saws or other manual methods. Small cuttings will be left in place, non-merchantable timber or slash will be disposed of where it originates, hauled off-site, or chipped and evenly spread on the right-of-way. If burning is proposed, the Owners will consult with landowners, as well as applicable authorities to obtain necessary authorization or permits.

Project-specific maintenance techniques and mitigation measures include:

- If the surface is unstable such that rutting, soil compaction, or soil mixing may occur, low ground-pressure equipment will be used or maintenance equipment will

be operated from weed-free mats or temporary timber corduroy that will be removed upon completion of the work.

- Steep slopes and slopes leading to water bodies will be cleared by hand, leaving adequate herbaceous or low shrub cover to avoid erosion.
- Vegetation management requirements stipulated in any MnDNR, MNDOT, or local governmental unit licenses or permits will be followed unless in conflict with NERC requirements.
- All extra work areas (such as staging areas and additional spoil storage areas) will be located outside of wetland boundaries, where topographic conditions permit. If topographic conditions do not permit, an alternate location or matting will be used to minimize impacts.

Due to the typically unstable nature of soils in wetlands, and to preserve wetland hydrology and function, special practices are necessary for some operation and maintenance ("O&M") activities as follows:

- Heavy equipment passage through wetlands will be limited to only when necessary to complete the O&M activity.
- The Owners will attempt to complete maintenance clearing during firm or frozen conditions. When firm or frozen conditions are not practicable, maintenance will be done using low ground-pressure equipment (ATVs and the like), or with hand tools.
- Wetlands generally revegetate naturally. If no standing water is present, temporary cover crop as specified may be planted at a rate of 80 pounds per acre. No fertilizer or lime will be applied in wetlands.

c. Wire/border zone.

The Owners use the wire/border zone methodology in maintaining the right-of-way, consistent with typical conditions in Minnesota Route Permits. The wire zone, or clear zone, is generally defined as the center one-third of the measured right-of-way width. Depending on the construction type and design of the structures, the wire zone may be more or less than this distance. The Owners encourage all landowners to contact them regarding any plans to plant or construct within the right-of-way.

The border zone extends from the edge of the wire zone to the edge of the easement right-of-way.

The wire zone is maintained free of any vegetation that would inhibit the Owners from accessing the right-of-way with its equipment or limit its ability to use equipment, such as bucket trucks, to maintain or quickly repair the transmission line. No trees, shrubs, or woody vegetation are allowed to establish within the wire zone. Stumps or roots that could impede equipment travel will be removed by cutting or grinding them at or slightly below the surface.

Within the border zone, low growing brush/shrubs will be allow to reestablish if the species a certain height unless other right-of-way conditions prevent vehicle access. Trees that lie outside of

the easement but have branches and/or foliage that lie within the border zone may be pruned or removed. Again, the Owners encourage landowners to contact them regarding any planting within the right-of-way.

Danger trees are designated by a Certified Arborist and are typically any tree that is leaning, dead, damaged, having poor root structure, or showing signs of internal decay such that the Owners' right-of-way inspectors believe all or portions of the tree may fall into the transmission line. The Project's easements authorize the removal of danger trees outside of the right-of-way. Danger tree removal is a critical aspect of ensuring transmission line reliability and fire prevention.

d. Emergencies.

It may be necessary for the Owners to prune or remove vegetation due to damage caused by weather events or accidents. Such work is typically done to facilitate restoring services on the line. Staff will attempt to notify the landowner prior to entering the property.