



**Federal Energy
Regulatory
Commission**

**Office of
Energy Projects**

December 2020

Northern Natural Gas

Docket No. CP20-503-000

Northern Lights 2021 Expansion Project

Environmental Assessment

Washington, DC 20426

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 4
Northern Natural Gas
Northern Lights 2021 Expansion
Project
Docket No. CP20-503-000

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the Northern Lights 2021 Expansion Project (Project), proposed by Northern Natural Gas (Northern) in the above-referenced docket. Northern requests authorization to construct the Project, which will consist of (1) an 0.80-mile-long extension of its 24-inch-diameter Willmar D Branch Line; (2) a 0.63-mile-long 24-inch-diameter Carlton Interconnect Loop; (3) replacement of the 0.08-mile-long 8-inch-diameter Viking Interconnect Branch Line with a 12-inch-diameter branch line of the same length; (4) a new compressor station (Hinckley Compressor Station); (5) modifications of the Pierz Compressor Station and Interconnect; and (6) additional above-grade facilities including a launcher, receiver, and valve setting. The Project facilities would be in Dakota, Scott, Carlton, Morrison, and Pine counties in Minnesota.

The EA assesses the potential environmental effects of the construction and operation of the Project in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA). FERC staff concludes that approval of the proposed Project, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The Commission mailed a copy of the *Notice of Availability* of the EA to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested individuals and groups; and newspapers and libraries in the project area. The EA is only available in electronic format. It may be viewed and downloaded from the FERC's website (www.ferc.gov), on the natural gas environmental documents page (<https://www.ferc.gov/industries-data/natural-gas/environment/environmental-documents>). In addition, the EA may be accessed by using the eLibrary link on the FERC's website. Click on the eLibrary link (<https://elibrary.ferc.gov/eLibrary/search>), select "General Search" and enter the docket number in the "Docket Number" field, excluding the last three digits (i.e., CP20-503). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659.

The EA is not a decision document. It presents Commission staff's independent analysis of the environmental issues for the Commission to consider when addressing the merits of issues raised in this proceeding. Any person wishing to comment on the EA may do so. Your comments should focus on the EA's disclosure and discussion of potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on the Project, it is important that we receive your comments in Washington, DC on or before 5:00 pm Eastern Time on **January 14, 2021**.

For your convenience, there are three methods you can use to file your comments to the Commission. The Commission encourages electronic filing of comments and has staff available to assist you at (866) 208-3676 or FercOnlineSupport@ferc.gov. Please carefully follow these instructions so that your comments are properly recorded.

- (1) You can file your comments electronically using the [eComment](#) feature on the Commission's website (www.ferc.gov) under the link to [FERC Online](#). This is an easy method for submitting brief, text-only comments on a project;
- (2) You can also file your comments electronically using the [eFiling](#) feature on the Commission's website (www.ferc.gov) under the link to [FERC Online](#). With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "[eRegister](#)." You must select the type of filing you are making. If you are filing a comment on a particular project, please select "Comment on a Filing"; or
- (3) You can file a paper copy of your comments by mailing them to the Commission. Be sure to reference the project docket number (CP20-503-000) on your letter. Submissions sent via the U.S. Postal Service must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852.

Filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered. Only intervenors have the right to seek rehearing or judicial review of the Commission's decision. At this point in this proceeding, the timeframe for filing timely intervention requests has expired. Any person seeking to become a party to the proceeding must file a motion to intervene out-of-time pursuant to Rule 214(b)(3) and (d) of the Commission's Rules of Practice and

Procedures (18 CFR 385.214(b)(3) and (d)) and show good cause why the time limitation should be waived. Motions to intervene are more fully described at <https://www.ferc.gov/ferc-online/ferc-online/how-guides>.

Additional information about the Project is available from the Commission's Office of External Affairs, at **(866) 208-FERC**, or on the FERC website (www.ferc.gov) using the [eLibrary](#) link. The eLibrary link also provides access to the texts of all formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to <https://www.ferc.gov/ferc-online/overview> to register for eSubscription.

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TECHNICAL ABBREVIATIONS AND ACRONYMS

AIMP	Agricultural Impact Mitigation Plan
ATWS	additional temporary workspace
BCR	Bird Conservation Region
BMPs	best management practices
Certificate	Certificate of Public Convenience and Necessity
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalents
dBA	decibels on the A-weighted frequency scale
DOT	U.S. Department of Transportation
DWSMA	Drinking Water Supply Management Area
EA	environmental assessment
EAB	emerald ash borer
EI	environmental inspector
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gases
HAP	Hazardous Air Pollutant
HDD	horizontal directional drill
HDD Plan	Horizontal Directional Drill Monitoring, Inadvertent Return Response, and Contingency Plan
HP	horsepower
HPZ	High Potential Zone (for the rusty patched bumble bee)
HUC	Hydrologic Unit Code
IBA	Important Bird Area
MAOP	maximum allowable operating pressure
MBTA	Migratory Bird Treaty Act
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
MP	milepost
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NGA	Natural Gas Act
NHIS	Natural Heritage Information System
NHPA	National Historic Preservation Act
NOI	<i>Notice of Intent to Prepare an Environmental Assessment for the Planned Northern Lights 2021 Expansion Project and Request for Comments on Environmental Issues</i>

NO _x	nitrogen oxides
NRCS	Natural Resources Conservation Service
NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
OEP	FERC's Office of Energy Projects
PEM	palustrine emergent
PFO	palustrine forested
PHMSA	U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration
Plan	FERC <i>Upland Erosion Control, Revegetation, and Maintenance Plan</i>
PM _{2.5}	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to 10 microns
Procedures	FERC <i>Wetland and Waterbody Construction and Mitigation Procedures</i>
Project	Northern Lights 2021 Expansion Project
PRP	Petroleum Remediation Program
PSD	Prevention of Significant Deterioration
PSS	palustrine scrub-shrub
RSEA	Regionally Significant Ecological Area
scf	standard cubic feet
SHPO	State Historic Preservation Office
SO ₂	sulfur dioxide
SPCC Plan	Spill Prevention Control and Countermeasure Plan
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Office
TNWM	Transient Non-Community Inner Wellhead Management Zone
tpy	tons per year
TWS	temporary workspace
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WHPA	Wellhead Protection Area

SECTION A – PROPOSED ACTION

A.1 INTRODUCTION

The staff of the Federal Energy Regulatory Commission (Commission or FERC) prepared this environmental assessment (EA) to assess the environmental impacts of the Northern Lights 2021 Expansion Project (Project). On July 31, 2020, Northern Natural Gas (Northern) filed an application with the Commission (Docket No. CP20-503-000) pursuant to Section 7(c) of the Natural Gas Act (NGA) and Part 157 of the Commission’s regulations. Northern is seeking authorization to construct a 24-inch-diameter pipeline loop and a pipeline extension totaling 1.43 miles; replace a 0.08-mile-long 8-inch-diameter branch line with 12-inch-diameter pipeline of the same length; construct one new compressor station; and modify, including installing additional compression, one existing compressor station and interconnect, all located in various counties in Minnesota. Prior to filing its application, Northern participated in the Commission’s pre-filing process for the Project under Docket No. PF20-1-000.

We¹ prepared this EA in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing NEPA (Title 40 of the Code of Federal Regulations Parts 1500-1508 [40 CFR 1500-1508])² and the Commission’s implementing regulations under 18 CFR 380.

FERC is the lead federal agency for authorizing interstate natural gas transmission facilities under the NGA, and the lead federal agency for preparation of this EA. No other agencies elected to become cooperating agencies for the preparation of this EA.

The EA is an integral part of the Commission’s decision-making process on whether to issue Northern a Certificate to construct and operate the proposed facilities. We prepared this EA to assess the environmental impacts that would likely occur as a result of construction of the Project. Our principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that could result from implementation of the proposed action;
- identify and recommend reasonable alternatives and specific mitigation measures, as necessary, to avoid or minimize Project-related environmental impacts; and
- facilitate public involvement in the environmental review process.

¹“We,” “us,” and “our” refers to environmental staff of the Commission’s Office of Energy Projects.

² On July 16, 2020, CEQ issued a final rule, Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act (Final Rule, 85 Fed. Reg. 43,304), which was effective as of September 14, 2020; however, the NEPA review of this project was in process at that time and was prepared pursuant to the 1978 regulations.

Northern has requested a Certificate by March 16, 2021, to begin construction in Spring 2021 to meet an in-service date of November 1, 2021.

A.2 PROJECT PURPOSE AND NEED

According to Northern, the proposed facilities are required to serve the firm transportation requirements of Northern's customers associated with increased energy needs, which were identified through an open season held August 13 through September 24, 2019. If constructed, Northern's facilities would provide for incremental winter peak day firm service of 45,693 dekatherms per day (45.6 million cubic feet per day) serving residential, commercial, and industrial customer market growth in Northern's Market Area.

Under Section 7(c) of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decisions on economic issues, including need, and environmental impacts. Approval would be granted if, after consideration of both environmental and non-environmental issues, the Commission finds that the Project is in the public convenience and necessity.

A.3 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

The topics addressed in section B of this EA include geology and soils; groundwater, surface water, and wetlands; fisheries, vegetation, wildlife, and special status species; land use, recreation, and visual resources; cultural resources; socioeconomics; air quality and noise; reliability and safety; and cumulative impacts. The EA also assesses the no-action alternative and system alternatives, including a no-compression alternative (see section C). The EA describes the affected environment as it currently exists, discusses the environmental consequences of the proposed Project, identifies measures proposed by Northern to reduce impacts, and presents our additional recommended mitigation measures, which are summarized in section D.

As the lead federal agency for the Project, FERC is required to comply with Section 7 of the Endangered Species Act, as amended (ESA) and Section 106 of the National Historic Preservation Act (NHPA). These statutes have been considered in the preparation of this EA. In addition to FERC, other federal, state, and local agencies may use this EA in approving or issuing any permits necessary for all or part of the proposed Project. Permits, approvals, and consultations for the Project are discussed in section A.10 of this EA.

A.4 PUBLIC REVIEW AND COMMENT

On December 6, 2019, the Commission granted Northern's request to use FERC's pre-filing process under Docket No. PF20-1-000. The pre-filing process is designed to encourage early involvement by citizens, governmental entities, non-governmental organizations, and other interested parties in the development of planned natural gas

transmission projects, prior to the filing of a formal application. During the pre-filing process, we worked with Northern and interested stakeholders, including federal and state agencies, to identify and resolve Project-related issues. We participated in bi-weekly conference calls with Northern to discuss relevant Project issues, and we encouraged Northern to communicate frequently with the public and resource agencies throughout the pre-filing process.

Northern conducted two public open house meetings on February 17 and 18, 2020, in Cold Spring and Prior Lake, Minnesota, respectively. The open houses covered the Paynesville Branch Line Loop³ and the Willmar D Branch Line Extension; landowners and stakeholders potentially affected by these two branch lines were invited and encouraged to attend these information-sharing open houses. Both open houses were publicized via the local newspapers and through direct mail invitation to property owners, customers, regulatory agencies, and public officials. FERC staff and forty-one individuals attended the open houses. Affected landowners were provided with a landowner-specific aerial map that detailed the proposed construction plan for their parcels. Landowners were able to review this map with Northern's engineering team and provide requests for design revisions. Landowners also were able to discuss easement concerns with Northern's land agents.

In the pre-filing period, the planned Project initially included the Paynesville Branch Line Loop (5.64 miles of new pipe); however, this component was eliminated from the Project prior to the formal application. Also during pre-filing, the Willmar D Branch Line Extension was reduced from 1.97 miles to 0.80 mile of new pipeline, and the Carlton Interconnect Loop was reduced from 0.69 mile to 0.63 mile of new pipeline.

Comments were received at Northern's open house meetings, through Northern's Project-dedicated email and phone number, and by direct phone calls to Northern. Northern filed a compilation of comments received and its responses to the Docket on August 24, 2020⁴. During the pre-filing period Northern also consulted with and received comments from the MPCA, the Minnesota Department of Natural Resources (MDNR), and Minnesota Department of Agriculture (MDA).

Three minor route deviations were also evaluated and developed in consultation with landowners during pre-filing. These included two minor routing alternatives for the Willmar D Branch Line Extension and a minor route alternative for the Carlton Interconnect Loop. The original routings would have been installed via an open-cut through multiple residential properties or across a golf course. However, Northern designed an alternative using a horizontal directional drill (HDD) to avoid multiple points

³ In the pre-filing period, the planned Project initially included the Paynesville Branch Line Loop (5.64 miles of new pipe); however, this component was ultimately eliminated from the Project.

⁴ Available on eLibrary at accession no. 20200731-5243.

of inflection and reduce the number of properties crossed via open trench. No alternatives were considered for the Viking Interconnect Branch Line since the replacement pipeline would be installed within the same trench as the existing pipeline within an existing Northern facility.

On July 9, 2020, we issued in Docket No. PF20-1-000 a *Notice of Intent to Prepare an Environmental Assessment for the Planned Northern Lights 2021 Expansion Project and Request for Comments on Environmental Issues* (NOI). The NOI was mailed to interested parties including affected landowners (as defined in the Commission's regulations); federal, state, and local officials; Native American tribes; agency representatives; environmental and public interest groups; and local libraries and newspapers.

We received six comments in response to the NOI: from the U.S. Environmental Protection Agency (EPA), the City of Hinckley, the Minnesota Pollution Control Agency (MPCA), the Minnesota Department of Transportation, and two landowners. One of the landowner comments was in reference to a pipeline segment that was deleted from the Project following issuance of the NOI. The other landowner requested consideration of a sound barrier by their residence.

This EA addresses the potential environmental impacts of Northern's proposed Project and the concerns identified in response to the NOI and during pre-filing, as well as concerns identified by commenters and other permitting or resource agencies. These issues are summarized below and in table A.4-1, and are further addressed, as applicable, in the relevant sections of this EA.

Table A.4-1 Environmental Issues Identified During the Pre-filing Process	
Issue	EA Section Addressing Issue
General Project Description	A.2
Project purpose/need	A.2
Construction timeline and schedule	A.7
Location of Project components; construction techniques; pipeline depth	A.8; A.8.1; A.8.2
Cathodic protection	A.9.4; B.2.8; B.10.2
Hazardous waste plan	A.8.1
Geology and Soils	B.1; B.2
Compaction	B.2.4
Bio-netting and natural erosion control blankets	B.2.3
Impacts on farmland	B.2.2; B.5
Stormwater management	B.2
Water Resources, Fisheries, and Wetlands	B.3; B.4
Waterbody crossings; water quality	A.8.2.3; B.3.2
Hazardous materials, waste disposal, and spills	B.3.1; B.3.2; B.3.3
Water wells	B.3.1
Dewatering activities	A.8.2.4; B.3.4
Stormwater and wastewater permits and plans; public waters permits	A.8; A.10-1; B.3.2
Trout streams	B.3.2; B.4.1
Wetland topsoil segregation and depth of cover	A.8.2.4
Wetland Impacts, Avoidance, Minimization, and Mitigation	B.3.3
Hydrostatic Testing	A.8.1; B.3.4
Vegetation	B.4
Revegetation and invasive species monitoring (post construction)	A.7; B.4.2
Long-term maintenance plan for vegetation, including pollinators, timing, and spraying	A.8
Native grasses and trees	B.4.2
Oak wilt	B.4.2
Wildlife and Threatened and Endangered Species	B.4
Wildlife habitat; wildlife escape ramps	B.4.3
Pollinator friendly seed mixes	B.4.3
Federally and state-listed species and critical habitat	B.4.1; B.4.4
Blanding's turtle avoidance plan	B.4.4
Land Use, Visual Resources, and Recreation	B.5
Residential construction and landscaping restoration	B.5.1.5
Visual screening at aboveground facilities and appurtenances	B.5.4
Crop damage	A.8.2.6; B.5
Cultural Resources	B.6
Tribal consultation	B.6.2
Socioeconomics	B.7
Future housing developments	B.7.1
Labor force source	B.8
Air Quality and Noise	B.8; B.9
Noise and dust during construction	B.9; B.8.3
Noise and vibration during operation	B.9.2
Greenhouse gas emissions	B.11.2
Impacts on air quality	B.8
Reliability and Safety	B.10
Cumulative Impacts	B.11
Climate change	B.11.2
Alternatives	Section C
PCBs; asbestos, and sandblasting	A.8.1

A.5 PROPOSED FACILITIES

The Project would include construction of the following facilities in Minnesota:

- about 0.80 mile of 24-inch-diameter Willmar D Branch Line Extension in Dakota⁵ and Scott counties;
- about 0.63 mile of 24-inch-diameter Carlton Interconnect Loop in Carlton County;
- replacement of the 0.08-mile-long 8-inch-diameter Viking Interconnect Branch Line with a 12-inch-diameter branch line of the same length in Morrison County;
- the new greenfield natural gas-fired Hinckley Compressor Station, including one International Organization for Standardization-rated 11,153-horsepower (HP) Solar Taurus 70 natural gas-fired turbine, one natural gas-fired fuel gas heating skid, and one natural gas-fired backup electric generator in Pine County;
- modifications of the Pierz Compressor Station and Interconnect consisting of an additional 1,100-HP electric motor-driven reciprocating compressor unit in Morrison County (The Interconnect currently includes an existing 8-inch-diameter pipe and a 6-inch-diameter meter. Construction at the Interconnect would replace the piping and meter with larger diameter equipment.); and
- appurtenant facilities including one new pig⁶ receiver and one new pig launcher, a new valve setting, and associated piping and valves in Scott and Carlton counties.

Additionally, one temporary access road, four new facility driveways, three existing facility driveways, and one staging area are proposed for use during construction of the Project. The general location of the Project is shown on figure A.5-1, and U.S. Geological Survey (USGS) 7.5-minute quadrangle topographic maps are provided in appendix A.

⁵ Less than 100 feet of the Willmar D Branch Line Extension is located in Dakota County, all of which is inside an existing Northern facility.

⁶ A “pig” is a tool that the pipeline company inserts into and pushes through the pipeline for cleaning the pipeline, conducting internal inspections, or other purposes.

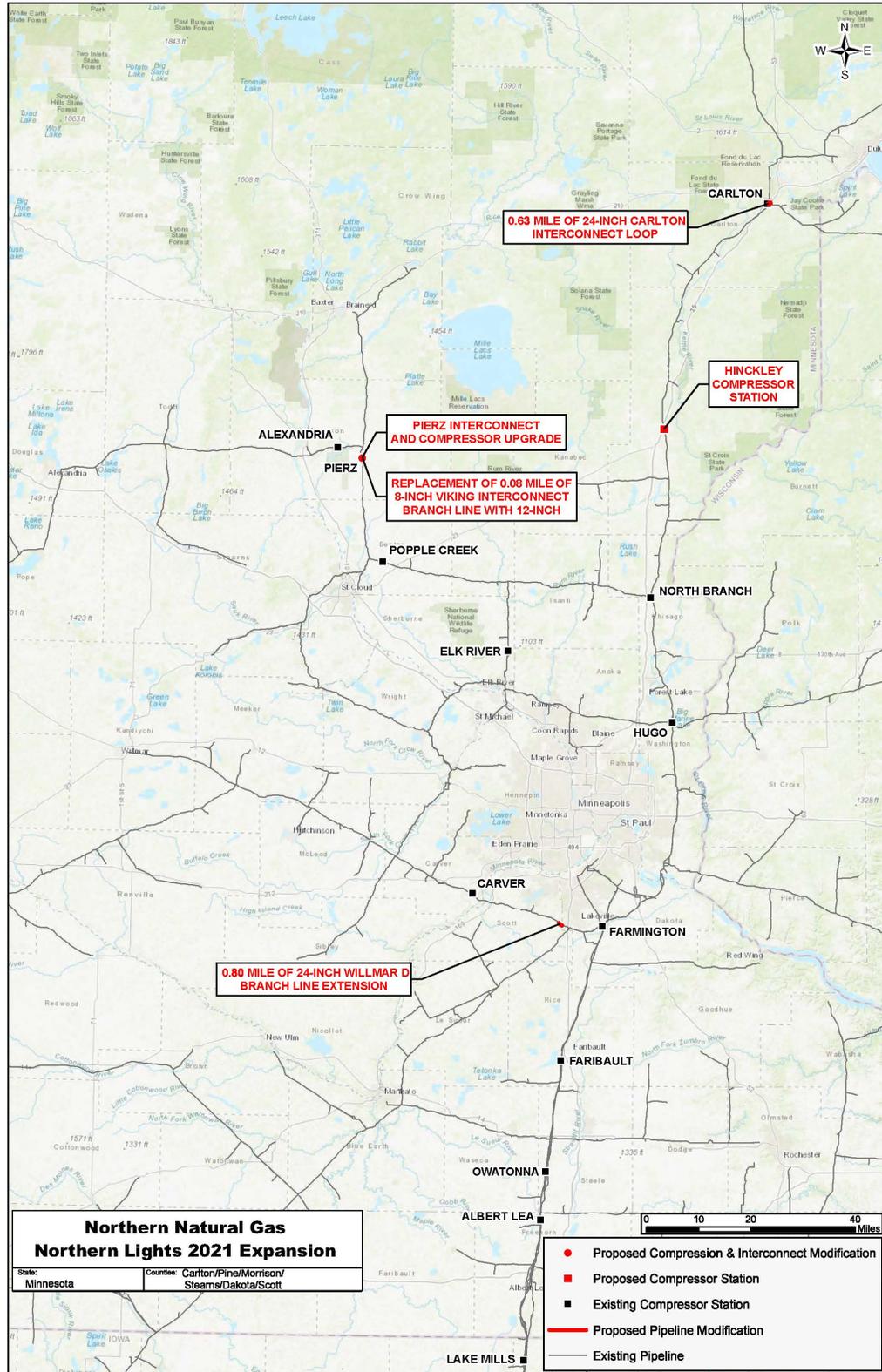


Figure A.5-1 Project Location

A.6 LAND REQUIREMENTS

Construction of the Project would disturb about 32.5 acres of land. The total acreage required for operation of all Project facilities is about 9.5 acres. Land requirements for construction and operation of the Project are summarized in table A.6.1-1, and typical rights-of-way cross section construction diagrams and alignment sheets are in appendix A. The specific locations and dimensions of the temporary workspace (TWS), additional temporary workspace (ATWS), access road, staging area, and aboveground facilities for the Project are shown on the topographic and aerial base maps provided in appendix A.

Pipeline Facilities

The land disturbed by construction of the Project pipeline facilities would include the permanent and construction rights-of-way; ATWS needed for typical pipeline construction procedures; ATWS for specialized construction procedures; a construction staging area; and a new temporary access road on the Willmar D Branch Line Extension. Northern would use nominal 100-foot-wide construction rights-of-way in uplands and a 75-foot-wide construction rights-of-way through non-agricultural wetlands to minimize impacts except where noted⁷ in section A.8 and appendix B. Northern is in the process of obtaining new pipeline easements, where required.

ATWS of varying widths would be required adjacent to the TWS in certain locations for specialized construction methods such as HDD, wetland, and waterbody crossing locations; at the beginning and end of each pipeline segment; pipeline crossovers; and for road crossings. In addition, one temporary access road and one staging area would be used for access, pipe and equipment storage, staging of crews and equipment parking during construction of the pipelines. TWS, ATWS, the one temporary access road and the staging area would be restored to pre-construction conditions to the extent practicable after construction. Locations, dimensions, and existing land use for ATWS and the staging area are provided in table A.6.1-2.

⁷ Northern has requested a modification to our Procedures to increase the construction right-of-way to a width greater than 75 feet in one wetland along the Carlton Interconnect Loop to accommodate the tie-in pipeline from two directions with the connection to the launcher.

Table A.6.1-1 Land Requirements for the Project			
Facility		Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline Facilities			
<i>Willmar D Branch Line Extension</i>			
Pipeline right-of-way		3.9	1.7
ATWS		4.6	0.0
Access Road		1.2	0.0
Subtotal		9.7	1.7
<i>Carlton Interconnect Loop</i>			
Pipeline right-of-way		1.0	0.3
ATWS		4.9	0.0
Staging Area		1.3	0.0
Subtotal		7.2	0.3
<i>Viking Interconnect Branch Line^a</i>			
Pipeline right-of-way		0.0	0.0
ATWS		0.0	0.0
Subtotal		0.0	0.0
Pipeline Appurtenant Facilities			
Willmar D Branch Line Extension	Willmar 24-inch MNB75603 receiver (valve installation) ^b	0.0	0.0
	Willmar Branch Line Valve Setting installation	0.1	0.1
Carlton Interconnect Loop	Carlton Interconnect Loop launcher installation	0.5	0.4
	Carlton Compressor Station receiver installation	0.3	0.0 ^c
Subtotal		0.8^d	0.5
Pipeline Total		17.7	2.5
Aboveground Facilities			
Hinckley Compressor Station	New compressor station	10.6	6.3
Pierz Compressor Station and Interconnect	Modified compressor station and interconnect	4.2	0.7
Aboveground Facility Total		14.8	7.0
Project Total		32.5	9.5
^a No construction corridor or ATWS is proposed for the Viking Interconnect Branch Line, as it overlaps with the proposed ATWS and expansion for the Pierz Compressor Station. ^b An existing facility is the kick-off point for the Willmar D Branch Line Extension. No expansion of the existing facility will occur. ^c New receiver will be wholly within the existing Carlton Compressor Station. ^d Values do not sum due to rounding.			

Table A.6.1-2 Additional Temporary Workspace and Staging Area				
ID	MP	Type	Existing Land Use	Total Area (acres)
Willmar D Branch Line Extension				
ETWS1	1.39	ATWS	Industrial/Commercial	0.8
			Open Land	0.4
ETWS2	1.42	ATWS	Forest/Woodland	<0.1
			Open Land	0.5
ETWS3	1.80	ATWS	Forest/Woodland	0.1
ETWS4	1.80	ATWS	Forest/Woodland	0.1
			Open Land	0.1
ETWS5	1.89	ATWS	Forest/Woodland	<0.1
			Open Land	<0.1
ETWS6	1.89	ATWS	Open Land	0.2
ETWS7	1.93	ATWS	Forest/Woodland	0.1
			Open Land	0.2
			Residential	0.9
ETWS8	2.02	ATWS	Agricultural	0.7
			Residential	<0.1
ETWS9	2.09	ATWS	Open Land	0.5
ETWS10	2.15	ATWS	Industrial/Commercial	0.2
			Open Land	0.4
			Residential	0.1
Subtotal				4.6
Carlton Interconnect Loop				
ETWS1	0.00	ATWS	Industrial/Commercial	0.2
			Wetlands	<0.1
			Open Land	<0.1
ETWS2	0.00	ATWS	Industrial/Commercial	0.1
ETWS3	0.59	ATWS	Forest/Woodland	1.6
			Industrial/Commercial	2.6
			Open Land	0.1
			Wetlands	0.2
SA1	0.63	Staging Area	Industrial/Commercial	0.6
			Open Land	0.1
			Wetlands	<0.1
			Industrial/Commercial	0.6
Subtotal				6.2
Pierz Compressor Station and Interconnect				
ETWS1	0.00	ATWS	Industrial/Commercial	1.3
			Agricultural	3.0
Subtotal				4.2
Hinckley Compressor Station				
ETWS1	N/A	ATWS	Agricultural	7.1
			Industrial/Commercial	0.2
			Wetlands	3.2
Subtotal				10.6
PROJECT TOTAL				25.6

Temporary disturbances include the TWS, ATWS, travel lanes⁸, the access road, and a staging area. Permanent disturbances include the permanently maintained rights-of-way centered on the new pipelines, and the operational footprints of the new Hinckley Compressor Station, the expanded Pierz Compressor Station and Interconnect, and the launcher and receiver. Most of the permanently maintained rights-of-way would be allowed to revert to preconstruction conditions (mostly agricultural use) following construction.

Pipeline Appurtenant Facilities

The proposed Project includes installation of one pig launcher and one pig receiver and a valve setting. Construction and operation of the aboveground appurtenances would occur within the confines of the workspace boundaries of the Project, and permanent easements would be acquired for these facilities, where required. The pipeline appurtenant facilities would affect about 0.8 acre of land during construction and 0.5 acre during operation, as summarized in table A.6.1-1.

Aboveground Facilities

The proposed Project includes one greenfield compressor station and modifications to an existing compressor station and interconnect. With regards to the Pierz Compressor Station and Interconnect, Northern currently owns a 190-foot by 175-foot lot (0.8 acre). Northern would expand the existing compressor station by 0.7 acre to the west and south. Construction of the new aboveground facilities would include the new gravel footprint along with the four new permanent driveways that would be installed and three existing driveways that would be modified. The aboveground facilities would affect about 14.8 acres of land during construction and about 7.0 acres during operation, as summarized in table A.6.1-1. Northern has acquired the land required for the new and expanded compressor stations. ATWS of varying sizes would be required during construction of the aboveground facilities, as shown in table A.6.1-2

A.7 CONSTRUCTION SCHEDULE

Northern proposes to begin construction in spring 2021 to place the Project in service by November 1, 2021. Revegetation and restoration measures would be employed as soon as possible following construction per federal and state permit conditions, and disturbed areas would be stabilized and reclaimed, weather permitting⁹,

⁸ Travel lanes are footpaths used to lay out tracking wires during HDD operation. The length of the travel lanes is dependent on the length of the HDD. There would be no ground disturbance, and any required vegetation removal would be completed by hand. Northern would limit hand clearing of vegetation to either a single 5-foot-wide path or two 3-foot-wide paths for the travel lane. Vegetation clearing would be limited to branches necessary for safe passage and to lay tracking wires.

⁹ Northern has provided a Project-specific Winter Construction Plan in the event that construction cannot be completed within the timeframe Northern expects.

by December 2021. Northern would, at a minimum, conduct inspections after the first and second growing seasons and would continue to monitor the success of revegetation for up to 3 years following construction, or until revegetation is successful. Northern's post-construction inspections also would include monitoring for noxious and invasive weeds.

Northern anticipates using one spread for construction of each Project component for a total of four spreads. The average workforce for the Project would consist of approximately 300 to 350 construction workers, including inspection personnel. The workforce would be divided among the components with approximately 100 construction workers per pipeline spread and up to 70 workers at each compressor station facility.

The approximate construction timeframe would be 60 to 90 days per spread, with the exception of the two compressor stations, which are estimated to take 240 days, working concurrently. Pipeline and compressor station construction would generally take place Monday through Saturday during daylight hours, from 7:00 a.m. to 7:00 p.m. However, Northern states that certain activities, including longer HDDs and installation of tie-ins, pressure testing, and commissioning may extend beyond normal construction hours and into Sunday. In particular, two of the proposed HDD crossings may be conducted continuously (24 hours per day) at critical times such as during pullback (see further discussion in section A.8.2.1, below). In certain cases, the extension of construction activities for the two identified HDDs would likely require nighttime construction activities. These are addressed within this EA. If construction activities need to take place outside normal daytime working hours, noise mitigation measures would be implemented as described in section B.9.1.

A.8 CONSTRUCTION, OPERATION, AND MAINTENANCE PROCEDURES

The Project would be designed, constructed, removed, tested, operated, and maintained in accordance with the U.S. Department of Transportation (DOT) Minimum Federal Safety Standards in 49 CFR 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, and other applicable federal and state regulations. Project facilities would be marked and identified in accordance with applicable regulations. In accordance with 49 CFR 192, the pipelines would be inspected for leakage as part of scheduled operations and maintenance. Northern also would participate in the local One Call system for the state. These standards are in accordance with the National Pipeline Safety Act of 1968, as amended.

Northern would adopt our *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures)¹⁰ for the Project. Northern has requested modifications of the

¹⁰ The FERC Plan and Procedures are a set of construction and mitigation measures developed to minimize the potential environmental impacts of the construction of pipeline projects in general. The FERC Plan and

requirements of the Procedures in seven locations, which are listed in appendix B and further discussed in section B.3.5. We have reviewed these modifications and find them acceptable.

In order to minimize potential environmental impacts, Northern has developed the following construction and reclamation plans specific to the Project, which we have reviewed and find acceptable:

- HDD Plan and Profiles and Site-Specific HDD Plans;
- Horizontal Directional Drill Monitoring, Inadvertent Return Response, and Contingency Plan (HDD Plan);
- Winter Construction Plan;
- Wetland Restoration Plan;
- Spill Prevention, Control, and Countermeasures Plan (SPCC Plan);
- Agricultural Impact Mitigation Plan (AIMP);
- Noxious Weed Control Plan; and
- Unanticipated Discovery Plan for Cultural Resources and Human Remains.

Northern also would develop individual Stormwater Pollution Prevention Plans (SWPPP) for each Project component that would incorporate the requirements and best management practices from federal and state permits and our Plan and Procedures.

Northern would employ at least one environmental inspector (EI) for each construction spread. The EIs would be on site during construction to ensure Northern's compliance with the measures outlined in our Plan and Procedures, the FERC Certificate, Northern's Project-specific construction and reclamation plans, and all other environmental permit requirements from construction through restoration. The EIs would have the authority to stop activities that are not in compliance with agency requirements until corrective action has been taken. Northern would conduct environmental training sessions in advance of construction to ensure that all individuals working on the Project are familiar with the environmental mitigation measures appropriate to their jobs and the EI's authority.

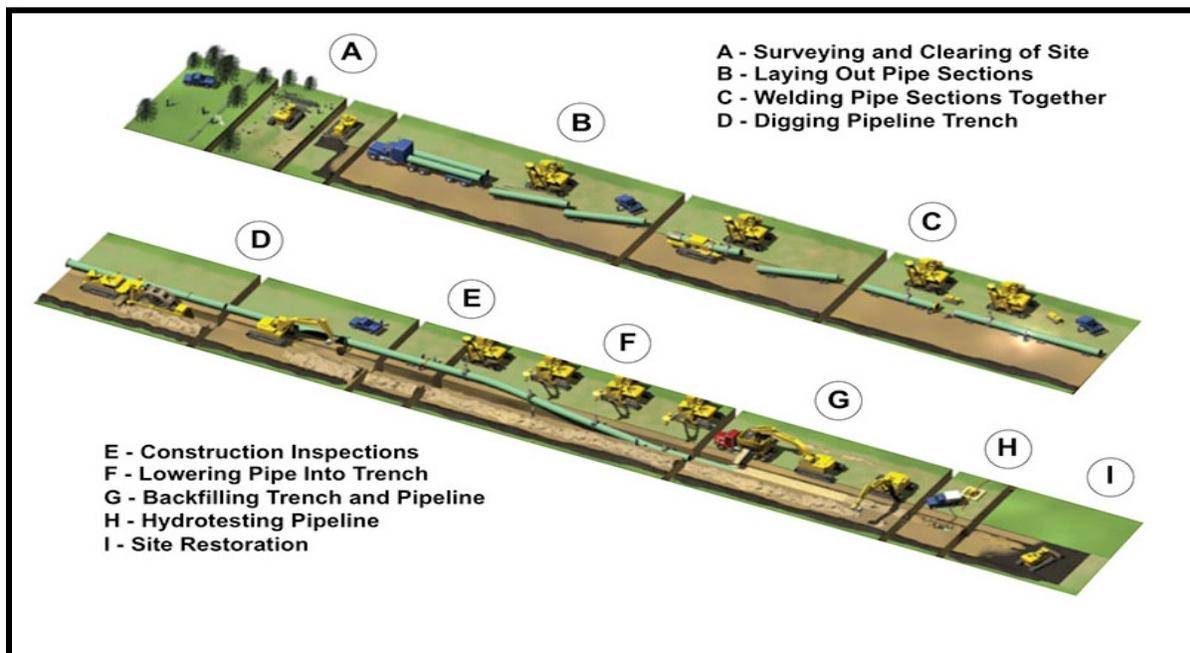
Procedures can be viewed on the FERC website at www.ferc.gov/industries/gas/enviro/plan.pdf and <http://www.ferc.gov/industries/gas/enviro/procedures.pdf>.

Northern has established an Environmental Complaint Resolution Procedure that provides landowners whose properties are crossed by the Project with directions for identifying and resolving their environmental mitigation problems or concerns. Prior to construction, Northern would provide the resolution procedure, including Northern's toll-free telephone number (888-367-6671), to each landowner whose property is crossed by the Project, with instructions on how to lodge a complaint or ask questions.

A.8.1 Conventional Pipeline Construction Sequence

Construction of the proposed pipeline facilities for the Project would incorporate conventional overland construction techniques and standard sequences of activities. This typically consists of a sequential process of surveying, clearing, grading, excavating, pipe stringing and bending, welding, lowering-in and backfilling, hydrostatic testing, cleanup, and restoration. Crews working on each stage of construction generally proceed along the pipeline right-of-way in one continuous operation; however, multiple factors including the need for specialized construction techniques, tie-in locations, required access for commissioning activities, and soil conditions may affect the construction sequencing. Figure A.8.1-1 shows the typical construction sequence for installation of a new pipeline. Northern would coordinate the sequence in an effort to minimize the total time a tract of land would be disturbed and, therefore, exposed to erosion and temporarily precluded from normal use. The activities at any single point would last approximately 6 to 12 weeks under the optimal construction sequencing scenario.

Figure A.8.1-1 Typical Construction Sequence



Prior to construction, Northern would stake the pipeline centerline and the limits of the construction rights-of-way, ATWS, staging area, road crossings, access road, known underground facilities, and environmentally sensitive areas. Northern would coordinate with Minnesota's Gopher State One Call to have existing underground utilities identified and flagged to minimize the potential for accidental damage during pipeline construction.

Pursuant to DOT requirements, the pipelines would have a minimum of 30 to 36 inches of cover from the top of the pipeline to the natural ground surface in normal soil conditions and a minimum of 36-48 inches of cover in agricultural land, depending on type of agricultural production. Additional depth of cover to address landowner concerns would be determined during the rights-of-way negotiation process. In wetland areas Northern has agreed to install the pipeline with a minimum depth of cover of 48 inches as requested by the MDNR.

Trench excavation is necessary to install and bury the pipeline. Clearing and grading of the right-of-way would precede excavation of the trench. The trench would be excavated with a rotary trenching machine, a track-mounted backhoe, or similar equipment. Excavated subsoil would be stockpiled along the right-of-way on the side of the trench away from the construction traffic and pipe assembly area, and the topsoil piles protected against erosion. In agricultural areas, subsoil would be stockpiled separately from topsoil until backfill.

Crossovers for livestock and wildlife consisting of gaps in the spoil piles and pre-welded pipe and areas of unexcavated trench spoils would be created along the Project corridor. Wildlife escape ramps and passages would be constructed to reduce wildlife entrapment in the excavated trenches. Northern would minimize the length of time the trenches are open to minimize the chance of wildlife entrapment. Northern's EIs would inspect the trench on a daily basis. If a trapped species is identified as threatened or endangered, Northern would consult with the appropriate regional MDNR non-game wildlife specialist prior to proceeding with removal of the species.

After trench excavation, pipe sections would be delivered to the right-of-way and placed on skids adjacent to the trench. Qualified welders would weld the pipe sections together, and certified inspectors would utilize visual and non-destructive methods to test the integrity of the welds according to industry protocol. Previously uncoated pipe ends and welded areas would be sandblasted to remove dirt, rust, or corrosion, and then field coated with an industry-approved anti-corrosion coating; inspectors would check the entire pipe for defects in the coating and make repairs as needed. The trench would then be cleaned of any debris, and side booms would be used to lower the pipeline into the trench.

After the pipe is positioned in the trench, crews would backfill the trench with the previously excavated material. Where topsoil is stored separately from subsoil, the crews would backfill the subsoil first and then replace the topsoil over the subsoil. In certain instances, topsoil replacement may be delayed if frozen or saturated conditions would inhibit proper soil handling and restoration procedures. Following backfill, a small crown of material may be left over the pipeline to account for any future soil settlement that might occur.

Hydrostatic testing would be conducted in accordance with DOT regulations codified at Title 49 CFR 192 to verify the integrity of the pipeline before being placed into service. Hydrostatic test water would be obtained in compliance with state regulations and existing water rights. Hydrostatic test water would be containerized, tested, and discharged on site in upland areas in accordance with the FERC Plan and applicable state and local permit requirements, or transported to an approved wastewater disposal facility.

Northern would use a licensed asbestos abatement contractor to perform an evaluation of all pipeline coatings at tie-in locations and removal of the existing Viking Interconnect Branch Line. If asbestos is detected, this licensed contractor would complete removal and disposal of any asbestos-containing materials per state and federal regulations. The Viking Interconnect Branch Line replacement pipe would be installed in the same trench used for removal. During pipe removal, secondary containment would be placed below the pipe at each cut to catch unexpected liquids that may be present in the pipe. Liquids captured in secondary containment would be tested for PCBs and disposed of properly.

Northern would contain all waste generated during sandblasting activities. Northern would cover the ground with plastic liner or other suitable material to collect falling waste. A shrouding system or curtains would be used to contain all airborne particulates generated during the process. Once the waste is containerized, the waste would be stored in drums, roll-off boxes, or other suitable containers pending the results of toxicity testing. If the material is non-hazardous, Northern would transport and dispose of the material in accordance with Minnesota's non-hazardous waste requirements. If the material is hazardous, Northern would transport and dispose of the material in accordance with applicable hazardous disposal requirements. Any other hazardous waste generated as part of the Project would be disposed of in accordance with Northern's SPCC Plan. The SPCC Plan provides restrictions and mitigation measures to limit potential impacts associated with the release of fuels, lubricants, or other potentially toxic materials used during routine construction. Refueling and storage of hazardous materials would be prohibited within 100 feet of wetlands during construction, unless otherwise approved by FERC.

Northern does not anticipate importing any off-site soil for use as backfill; however, Northern has committed to using certified "clean" backfill in the event off-site

soil is needed. Following trenching, pipe lowering, and backfilling, all disturbed areas would be final-graded and restored as closely as possible to preconstruction contours. In accordance with our Plan, weather and season permitting, Northern would complete final cleanup (including replacement of topsoil where applicable, final grading, and installation of permanent erosion control devices) within 20 days after the trench is backfilled. In residential areas, cleanup and restoration would occur within 10 days of backfilling. A travel lane may be left open temporarily to allow access by construction traffic for activities such as tie-in locations, hydrostatic testing and other commissioning activities; when access is no longer required, the travel lane would be removed and the right-of-way restored. Construction debris, trash, surplus materials, and temporary structures would be removed from the construction rights-of-way and disposed of in accordance with applicable federal, state, and local regulations.

Cathodic protection is an electrochemical process that applies electric current to a metal to slow or stop corrosion rates compared to unprotected or partially protected pipe. Cathodic protection facilities would be installed, as applicable, within one year, post-construction, along the pipelines. The cathodic protection system would be maintained through bimonthly rectifier inspection readings and annual cathodic potential readings to ensure that proper cathodic protection levels are maintained. Northern would tie the new and replacement pipelines into its existing cathodic protection system and conduct impressed current testing to determine the additional amount of current needed to place the pipelines under cathodic protection. Northern would complete modifications or additions, as needed, to the current cathodic protection system to include the pipeline and aboveground facilities.

A.8.2 Special Construction Procedures

In addition to the standard construction methods discussed above, Northern would implement special construction procedures where warranted by site-specific conditions, as discussed below.

A.8.2.1 Horizontal Directional Drill

The HDD method is achieved by drilling a small-diameter pilot hole under the area to be crossed and enlarging the hole through successive reaming until it is large enough to accommodate a prefabricated segment of pipe. A slurry of drilling mud is circulated through the drilling tools to lubricate the drill bit, remove drill cuttings, and promote borehole stability during drilling and/or the reaming process. Drilling mud primarily consists of bentonite, a non-toxic, naturally occurring sedimentary clay mixed with water. Northern would restrict the use of drilling additives to those on the Minnesota Department of Health (MDH) approved list of drilling fluids and additives. Northern has committed to submitting the actual additives to us for review and approval once a drilling contractor is retained.

Pipe sections are generally staged and welded within a TWS area on the opposite side of the crossing and then pulled through the drilled hole. During drilling, the pilot hole and other pre-ream efforts can be shut down at the end of each day; however, the pullback would likely be done in one continuous effort, which could extend after normal working hours. The pullback for some of the shorter crossings can likely be done in one daytime shift (e.g., 12 hours); however, for the longer crossings and those involving multiple pullback (welding) sections, the pullback would likely extend beyond a daytime shift into the nighttime (after 7:00 p.m.).

Table A.8.2-1 lists the crossing locations, length, approximate duration, and specific features that would be avoided by each crossing. HDDs would not be used to cross under any residences. Northern plans to complete three HDDs for the Project; two HDDs have the potential for the pull-backs to extend past 7:00 p.m. These HDDs are indicated by footnote “b” in table A.8.2-1. Northern has indicated that pullback activities for these two HDDs would commence no later than 9:00 a.m. to reduce the potential for work to extend past 7:00 p.m. Northern has stated that no state or local permits would be required to complete nighttime work on the two HDDs.

HDD Crossing Drawing^a	Begin Mile Post (MP)	End MP	Length (feet)	Approx. Duration (days)	Features Avoided by HDD
Willmar D Branch Line Extension					
WBL P4-1 ^b	1.44	1.81	2,017	21	Lucerne Trail, Wetland WIL-W01, Wetland WIL-W02, Wetland WIL-W04, Stream WIL-S01 & Stream WIL-S02
WBL P4-2	1.92	2.04	624	7	Wetland WIL-W07 & Stream WIL-S03
Carlton Interconnect Loop					
CIL P4-1 ^b	0.04	0.60	2,972	21	Pine Hill Golf Course, Wetland CIL-W02 & Open Water CIL-OW1
^a Plan and Profile Drawings (e.g., P4-1) are provided in Appendix 1A (Northern's HDD Plan) of Northern's Resource Report 1, which can be accessed via FERC's eLibrary at Accession no. 20200731-5243.					
^b HDDs with the highest potential to require nighttime work.					

When nighttime activities are needed to complete an HDD, Northern would use noise mitigation measures to address noise at nearby noise sensitive areas (NSA) and reduce impacts on nearby NSAs (e.g., residences, schools, churches, hospitals) when pullback efforts extend into the night. The potential noise impacts on NSAs and mitigation measures Northern would implement to reduce noise at NSAs during drilling are discussed in section B.9.1.

A 5-foot-wide travel lane or two parallel 3-foot-wide travel lanes would be utilized between the HDD entry and exit points to follow the drill head and monitor for inadvertent releases of drilling mud. Limited hand-trimming of branches on shrubs and

trees to facilitate foot traffic could occur within the travel lane. No equipment or vehicles would use the travel lanes.

The execution of the HDD method requires the use of drilling mud under pressure, and the potential exists for an inadvertent release of drilling mud. Northern has prepared an HDD Plan that outlines specific procedures and methods for addressing an inadvertent release or return of drilling mud. This plan includes procedures for monitoring, detection, isolating, stopping, and cleanup of inadvertent releases, as well as making necessary agency notifications. We have reviewed the content of this plan and find it acceptable.

Temporary impacts from the HDD would primarily result from the TWS at the entry and exit of each crossing and at workspace for the pull-back pipeline assembly and stringing. Northern's contractor would be responsible for the disposal of the drilling mud in accordance with federal or state waste disposal requirements. Northern would obtain consent from disposal site landowners prior to disposal of drilling mud.

The HDD method would be used at three locations to minimize impacts on roads, residential areas, wetlands, and waterbodies by avoiding ground surface disturbance between the drill entry and exit points. Activity between the HDD entry and exit points would be limited to foot travel and minimal hand clearing by construction personnel for temporary placement of the guide wires to follow the drill head and to monitor for inadvertent release of drilling mud. Should the initial HDD not be successful, Northern's secondary crossing method would be to attempt to re-drill.

A.8.2.2 Conventional Bore

Conventional bores consist of digging a bellhole on each side of the feature to be crossed and using a drill to cut a hole between the bellholes. A sacrificial casing that would be slightly larger than the diameter of the pipeline may be installed and an auger would be used to remove the cuttings from the casing. Once the bore is completed, the pipeline is welded to the boring pipe and pulled into place. The boring pipe is then removed. If required, voids between the pipeline and soil may be filled with a sand-cement mix.

A.8.2.3 Road Crossings

Northern would construct across public and private roads using conventional bore or HDD. The road crossings are summarized in table A.8.2-2. The crossings would be completed in accordance with DOT requirements (49 CFR 192) and the requirements of any crossing permits obtained for the Project. Northern would implement appropriate safety procedures, and traffic warning signs, detour signs, and other traffic control devices, as applicable.

Project Component ¹	Road Name	MP	Surface Type	Primary Crossing Method	Secondary Crossing Method
Willmar D Branch Line Extension	Lucerne Trail	1.58	Gravel	HDD	HDD
	Private driveway	1.69	Gravel		
	Huntington Way	2.08	Paved	Bore	Bore
¹ No public roads are crossed for the Carlton Interconnect Loop and Viking Interconnect Branch Line.					

Since the public roads and private driveway would be crossed by boring or HDD, impacts on the roadway surfaces would be avoided. Additionally, utilizing conventional bore or HDD would avoid restrictions to access for residential owners and the general public. A majority of the Project components would be constructed in rural areas with typically low-flow traffic patterns. The impact on traffic and transportation facilities and public inconvenience at crossings would be minimized by Northern's road crossing plans. Northern does not anticipate the need for any traffic control plans, as all public roads and driveways would remain open during construction. Northern would coordinate with local highway departments in advance of construction of each Project component. The pipeline would be buried to a depth of at least 4 feet below the road ditch, or in accordance with permit requirements, and would be designed to withstand anticipated external loading.

A.8.2.4 Waterbody Crossings

Northern's pipeline facilities would cross waterbodies using HDD methods as described in section A.8.2.1 or conventional bore methods as described in section A.8.2.2. Northern completed field surveys for the Project in October and November 2019 and April 2020. Crossings would be constructed in accordance with the measures specified in the Procedures and Northern's construction plans. HDDs and conventional bores have been designed by a qualified crossing engineer. An on-site engineer or EI would inspect all waterbody crossings during construction to document compliance with design criteria and permit conditions.

Northern has requested a modification to the FERC Procedures for the Willmar D Branch Line Extension and Carlton Interconnect Loop as described in appendix B. Further details regarding waterbody crossing impacts and mitigation for this Project are discussed in section B.3.2.

A.8.2.5 Wetland Crossings

Northern completed field surveys for the Project in October and November 2019 and April 2020. Northern would cross wetlands using the HDD method as described in

section A.8.2.1, conventional bore as described in Section A.8.2.2., or the open-cut method described below. Crossing of wetlands would be completed in accordance with the measures specified in the Procedures, USACE permit conditions, and Northern's construction plans. Northern is requesting a modification to the FERC Procedures for the Willmar D Branch Line Extension and Carlton Interconnect Loop as described in appendix B.

Wetlands crossed via HDD would require no removal of vegetation or result in direct impact from construction equipment. Foot-traffic travel lanes would be utilized for temporary placement of guide wires to follow the drill head and monitor for inadvertent releases of drilling mud. Limited hand-trimming of vegetation could occur within the foot-traffic travel lane between the HDD entry and exit points. Sediment barriers would be installed between the edges of the construction workspace and the wetland boundaries.

While open cutting wetlands, the clearing of vegetation would be limited to trees and shrubs, which would be cut flush with the surface of the ground and removed from the wetland. Stump removal, grading, topsoil segregation, and excavation would be limited to the area immediately over the trenchline. During clearing, sediment barriers, such as silt fence and staked straw bales, would be installed and maintained adjacent to wetlands and within ATWS as necessary to minimize the potential for sediment runoff. Sediment barriers would be installed across the full width of the construction rights-of-way at the base of slopes adjacent to wetland boundaries. Silt fence or straw bales installed across the working side of the rights-of-way may be removed during the day when vehicle traffic is present and would be replaced each night. Sediment barriers would also be installed within wetlands along the edge of the rights-of-way, where necessary, to minimize the potential for sediment to run off the construction rights-of-way and into wetland or other sensitive areas outside the construction work area. If trench dewatering is necessary in wetlands, the trench water would be discharged in stable, vegetated, upland areas and/or through a filter bag or siltation barrier. No heavily silt-laden water would be allowed to flow into a wetland.

Construction equipment working in wetlands would be limited to that essential for rights-of-way clearing, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the rights-of-way. In areas of saturated soils or standing water, low-ground-weight construction equipment and/or timber riprap, prefabricated equipment mats, or terra mats would be used to reduce rutting, mixing of topsoil and subsoil, and compaction. In unsaturated wetlands, the top layer of topsoil, up to 12 inches, would be stripped from the trenchline and stored separately from the subsoil. At the request of the MDNR, Northern also would, to the extent possible, segregate vegetated wetland masses or rooted clumps in mucky or inundated wetlands to replenish the native seed bank during restoration.

Where wetland soils are saturated and/or inundated, the pipeline may be installed using the push-pull technique. The push-pull technique generally involves stringing and

welding the pipeline outside of the wetland and excavating the trench through the wetland using a backhoe supported by equipment mats. The water that seeps into the trench can be used to “float” the pipeline into place together with a winch and flotation devices attached to the pipe. After the pipeline is floated into place, the floats are removed and the pipeline allowed to sink into place. Pipe installed in saturated wetlands is typically coated with concrete or equipped with set-on weights to provide negative buoyancy. After the pipeline sinks to the bottom of the trench, a trackhoe working on equipment mats backfills the trench and completes cleanup. For wetlands crossed using the push-pull method, Northern would install the pipeline a minimum of 4 feet below the benthic soil surface at the request of the MDNR.

Prior to backfilling, Northern would install trench breakers where necessary to prevent the subsurface drainage of water from wetlands. Where topsoil has been segregated from subsoil, the subsoil would be backfilled first followed by the topsoil. Equipment mats, terra mats, and timber riprap would be removed from wetlands following backfilling.

Further details regarding wetland impacts and mitigation for this Project are discussed in section B.3.3.

A.8.2.6 Residential Areas

No residences are within 25 feet of the edge of the proposed construction workspaces. Three residences are within 50 feet of the edge of workspace. Northern would attempt to limit impacts on property owners and would use special construction techniques, such as installation of safety fencing along the construction corridor in residential areas; and/or providing flagmen or installing signage on either side of road crossings to direct traffic during construction. See section B.5.1 for additional discussion on residential areas.

A.8.2.7 Active Cropland

Construction in agricultural areas would be conducted in accordance with our Plan and Procedures and Northern’s AIMP. To conserve topsoil, full-width right-of-way topsoil removal would be conducted in actively cultivated and rotated cropland and improved pasture. A maximum of 12 inches of topsoil would be segregated. Where the existing topsoil is less than 12 inches, Northern would remove and segregate the actual depth of the topsoil to the extent practicable. The topsoil and subsoil would be stored in separate windrows on the construction rights-of-way and stabilized to minimize mixing. Also, following construction, Northern would remove excess rock in cultivated cropland, pastures, and hayfields and would test topsoil and subsoil for compaction. Further information regarding soils and agricultural land is provided in sections B.2 and B.5.1.

Northern did not identify any existing drain tiles in the Project area. Any drain tiles discovered during grading or trenching would be flagged at each right-of-way edge,

and survey data would be collected at the location of any broken tiles. Northern commits to repair damaged or broken drain tiles following construction. Drain tile repairs would be made by a qualified drain tile specialist, the landowner, or a landowner's representative. The quality, size, and flow of replacement tile would equal or exceed that of the damaged tile.

Following construction, topsoil and subsoil would be tested for compaction in agricultural areas. As applicable, the contractor would plow subsoil in accordance with the soil compaction mitigation procedures described in our Plan. Compaction testing would be conducted to verify compaction is relieved to a level equal to or better than adjacent undisturbed areas. Once plowing of the subsoil is complete, the segregated topsoil would be returned to the rights-of-way. The restoration activity would be considered complete once the topsoil has been disked and raked to near pre-construction conditions. Northern would remove excess rock from at least the top 12 inches of soil in all cultivated or rotated cropland, managed pastures, hayfields, and residential areas, as well as other areas at the landowner's request such that the size, density, and distribution of rock on the construction work area shall be similar to adjacent areas not disturbed by construction.

If construction requires the removal of private property features, such as gates or fences, they would be repaired following construction. Northern would implement its Project-specific Noxious Weed Plan to prevent, mitigate, and control the spread of noxious weeds during construction and operation of the Project.

A.8.2.8 Blasting

No blasting is anticipated in association with the Project. If an area of unrippable shallow bedrock is encountered and blasting becomes necessary, Northern would develop a site-specific Blasting Plan, which would be submitted to us for review and approval, and comply with any required permits.

A.8.3 Aboveground Facilities Construction

Construction of compressor stations and aboveground piping and related facilities would include general activities such as clearing and grading, access road installation, foundation installation, erection of aboveground facilities, installation of piping equipment, testing of equipment, and timely cleanup and restoration of the Project area. Construction activity and storage of construction material would be limited to the approved Project workspaces, and waste materials would be disposed of in a manner consistent with state and local regulations.

Prior to ground-disturbing activities, erosion and sediment control devices would be installed in accordance with Northern's individual SWPPPs. After site preparation is complete at each aboveground facility, excavation would be performed, as necessary, to accommodate the new concrete foundations. Forms would be set, rebar installed, and the

concrete poured and cured in accordance with minimum strength requirements. Backfill would be compacted in place, and excess soil would be evenly spread within the station yard or hauled off for proper disposal.

The aboveground compression unit facilities would be installed after foundations are completed. The buildings would be constructed, and equipment and control systems installed in compliance with applicable local, state, and federal code requirements. Non-screwed piping would be welded using procedures in accordance with American Petroleum Institute Standard 1104 (API, 1999). Aboveground piping would be cleaned and painted according to Northern's specifications and in accordance with regulatory requirements.

Prior to placing the Project facilities in service, all controls and safety equipment and systems, such as emergency shutdown systems, relief valves, gas and fire detection, and other protection equipment would be tested. Pressure testing would be conducted on piping, in accordance with the requirements of DOT pipeline safety regulations (49 CFR 192), Northern's testing specifications and applicable permits. Testing would follow all applicable federal, state, and local requirements.

Upon completion, the Project areas would be cleaned and restored in accordance with applicable state and federal permits and plans. Final grading would be completed, gravel surfaces refreshed (as needed), and grass or appropriate vegetation seeded per specifications. Compliance with the individual project SWPPPs and other permanent mitigation measures would be verified in accordance with applicable permits.

A.8.4 Operations and Maintenance

The Project would be designed, constructed, tested, operated, and maintained in accordance with the DOT Minimum Federal Safety Standards in 49 CFR 192, FERC directives in 18 CFR 380.15, and maintenance requirements in FERC's Plan and Procedures. All Project facilities would be marked and identified in accordance with applicable regulations.

The pipelines would be inspected by Northern on a routine basis, which would provide information on possible leaks, third-party construction activities, erosion, encroachment, and other potential problems that may affect the safety and operation of the pipelines. As stated above, cathodic protection facilities would be installed, as applicable, within one year along the pipelines and would be regularly monitored and inspected periodically to ensure proper and adequate corrosion protection.

Routine vegetation maintenance is normally not required in agricultural cropland or grazing areas, residential areas, or in herbaceous wetlands. However, large brush and trees may be periodically removed in accordance with the Plan and Procedures if Northern determines trees or deep-rooted shrubs in the area could damage the pipelines' protective coating, obscure periodic surveillance, or interfere with potential repairs.

Routine vegetation maintenance in upland areas would be conducted on a 50-foot-wide strip centered over the pipelines with a frequency of not more than once every three years; however, a corridor approximately 10 feet in width and centered over the pipelines would be cleared at a frequency necessary to maintain the 10-foot-wide corridor in an herbaceous state. In wetlands, a 10-foot-wide corridor centered on the pipelines would be cleared at a frequency necessary to maintain an herbaceous state. In addition, trees within 15 feet of the pipelines with roots that may compromise the integrity of the pipeline coating would be selectively removed from the rights-of-way. Northern would not conduct any routine vegetation mowing or clearing in wetlands or riverine environments that are between HDD entry and exit points. Also, Northern would not clear vegetation across waterbodies crossed by conventional bores; Northern would maintain a 25-foot buffer between any clearing activities and the edge of the waterbody banks. Routine vegetation maintenance would not occur between April 15 and August 1 to protect nesting migratory birds and other animals (including pollinators). Herbicides would be used only in accordance with applicable agency requirements and with landowner approval. Northern has stated that herbicides would not be used in open water areas and would only use chemicals approved by the EPA.

Northern would also perform regular operation and maintenance activities on equipment at the aboveground facilities associated with the Project. These activities would include calibration, inspection, and scheduled routine maintenance. Northern would install a ground bed for cathodic protection inside the greenfield Hinckley Compressor Station. Within one year of construction at the Pierz Compressor Station and Interconnect, Northern would conduct an evaluation of the cathodic protection system requirements. Northern would install cathodic protection upgrades as required under the appropriate regulatory authority.

Northern states that no new permanent staff would be required to operate the new pipeline facilities after completion of construction of the Project nor would any new permanent staff be added for the additional workload associated with the operation of the above-grade facilities.

A.8.5 Environmental Compliance Inspection and Monitoring

Prior to construction, Northern would conduct environmental training for the construction personnel. Construction contractors would receive environmental training applicable to their job duties, and construction management and environmental inspectors (EI) would receive all Project-specific information. The training program would focus on the Plan and Procedures; Northern's Agricultural Impact Mitigation Plan; Project-specific Certificate and other permit conditions; regulatory requirements, such as those pertaining to endangered species, cultural resources, or wetlands; and other Project-specific mitigation plans. Northern has committed to employing at least one EI per spread during construction and restoration. The EIs would also be responsible for the monitoring

construction of the Project. EIs would have the authority to stop activities that violate the Project's environmental conditions and to order appropriate corrective action.

Northern would conduct post-construction monitoring to document restoration and revegetation of disturbed areas and to address any landowner concerns. Northern would monitor upland areas after the first and second growing seasons following restoration or until revegetation is successful in accordance with the Plan and Procedures. Northern would also submit quarterly monitoring reports to FERC to document the status of revegetation in disturbed areas. These reports would describe the results of post-construction inspections, any problem areas, landowner/agency concerns, and corrective actions taken. Monitoring would cease if an area meets performance standards at the end of the second year (or in any subsequent year).

In addition, FERC staff would periodically inspect the Project throughout construction to independently audit the EIs to ensure compliance with the environmental conditions of the Certificate. FERC staff would continue to monitor and inspect the disturbed areas until restoration and revegetation are deemed successful.

A.9 NON-JURISDICTIONAL FACILITIES

Under Section 7 of the NGA, and as part of its decision regarding whether or not to approve the facilities under its jurisdiction, the Commission is required to consider all factors bearing on the public convenience and necessity. Occasionally, proposed projects have associated facilities that do not come under the jurisdiction of the FERC. These non-jurisdictional facilities may be integral to a project (for instance, a natural gas-fueled power plant at the end of a jurisdictional pipeline) or they may be minor, non-integral components of the jurisdictional facilities that would be constructed and operated because of a project.

The proposed Hinckley Compressor Station would require a new electric power line to provide electric service from the City of Hinckley. The new station also would require a new communications line, and the office would require water and sanitary facilities. A third-party contractor would install these facilities and obtain any necessary permits and authorizations. These facilities are discussed further in section B.11 of this EA. No other non-jurisdictional facilities are planned.

A.10 SECTION 2.55(A) AND BLANKET CERTIFICATE FACILITIES

In addition to the Section 7 facilities and appurtenances listed above, Northern also plans to construct and/or modify certain existing facilities during the same time period as the Project pursuant to section 2.55(a) of the FERC's regulations and the automatic provisions of its blanket certificate granted in Docket No. CP82-401-000¹¹.

¹¹ Northern Natural Gas, 20 FERC ¶ 62,410 (1982).

According to Northern, these facilities will be constructed/installed independently of whether the Commission issues a Certificate for the Northern Lights 2021 Expansion Project. A list of these facilities is provided in appendix C.

A.11 PERMITS, APPROVALS, AND REGULATORY CONSULTATIONS

Table A.11-1 lists the major federal, state, and local permits, approvals, and consultations for construction and operation of the Project and provides the status as of the date of this filing. Northern would be responsible for obtaining and abiding by all permits and approvals required for construction and operation of the Project regardless of whether they appear in the table or not.

Table A.11-1 Permits, Approvals, and Consultations for the Project		
Administering Agency	Permit or Approval	Status
Federal		
FERC	Certificate for construction and operation of interstate natural gas transmission pipeline facilities	Section 7 application filed July 31, 2020.
EPA	Clean Air Act permits and approvals	Delegated to the state (MPCA).
	Clean Water Act (CWA) Section 401 Water Quality Certification	Delegated to the state (MPCA).
	CWA Section 402 permits for wastewater or stormwater discharges	Delegated to the state (MPCA).
USACE, St. Paul District	CWA Section 404 – Dredge and Fill Utility Regional General Permit	Project Pre-Construction Notification submitted September 1, 2020. Wetland impacts expected to fall under the Regional General Permit 3 – pre-construction notification. Response anticipated January 2021.
U.S. Fish and Wildlife Service (USFWS), Twin Cities Field Office	Section 7 ESA, Bald and Golden Eagle Protection Act, and Migratory Bird Treaty Act – consultation clearance request for Minnesota	Informal consultation initiated November and December 2019. Effect determination concurrence request submitted by Northern to USFWS on October 7, 2020. USFWS concurred with Northern's determinations on October 13, 2020.
Native American Tribes	NHPA, Section 106 Consultation to determine impacts on Traditional Cultural Properties	Informal consultation initiated November and December 2019. Letters including the draft field survey reports and Unanticipated Discoveries Plan were transmitted by Northern on July 21, 2020.
State – Minnesota		
MPCA	Clean Air Act, Prevention of Significant Deterioration Minor/Title V Major Air Construction Permit	Informal consultation initiated November and December 2019. Permit application was submitted on August 5, 2020.
	Section 401 Water Quality Certification	To be authorized as part of Regional General Permit 3.
	National Pollutant Discharge Elimination System (NPDES) Stormwater Permit	Informal consultation initiated November and December 2019. Permit application

Table A.11-1 Permits, Approvals, and Consultations for the Project		
Administering Agency	Permit or Approval	Status
		submittals anticipated February/March 2021.
	NPDES Hydrostatic Test Water Discharge Permit	Informal consultation initiated November and December 2019. Permit application submittals anticipated February/March 2021.
	NPDES Trench Water Discharge Permit	Informal consultation initiated November and December 2019. Authorization would be included in NPDES stormwater permit.
MDNR	MN Permit and Reporting System Water Appropriation Permit for Pit Trench Water	Informal consultation initiated November and December 2019. Permit application submittals anticipated February/March 2021.
	State Protected Species Consultation	Northern submitted a Natural Heritage Review Request on July 16, 2020. The MDNR issued consultation letter on October 7, 2020 including approval of Blanding's turtle avoidance plan.
State Historical Society of Minnesota	Section 106 Consultation, NHPA	Informal consultation initiated November and December 2019. Draft field survey reports and Unanticipated Discoveries Plan were submitted on July 16, 2020. On August 5, 2020, the Minnesota State Historic Preservation Office issued a determination that no historic properties would be affected.
MDA	Comments on Northern's Agricultural mitigation plan and Noxious weed mitigation plan	Coordination initiated in July 2020. Responses received July 2020.

SECTION B – ENVIRONMENTAL ANALYSIS

The environmental consequences of constructing and operating the Project would vary in duration and significance. Four levels of impact duration were considered: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction with the resource returning to preconstruction condition immediately after restoration or within a few months. Short-term impacts could continue for up to three years following construction. Long-term impacts would last more than three years, but the affected resource would eventually recover to preconstruction conditions. Permanent impacts could occur as a result of any activity that modifies a resource to the extent that it would not return to preconstruction conditions during the life of the Project, such as the construction of aboveground facilities or permanent removal of forest vegetation. An impact would be considered significant if it would result in a substantial adverse change in the physical environment.

In this section, we discuss the affected environment, general construction and operational impacts, and proposed mitigation to minimize or avoid impacts for each resource. Northern, as part of its proposal, agreed to implement certain measures to reduce impacts on environmental resources. We evaluated Northern's proposed mitigation measures to determine whether additional measures would be necessary to reduce impacts. Where we identify the need for additional mitigation, our recommended measures appear as bulleted, boldfaced paragraphs in the text. We will recommend that these measures be included as specific conditions to any authorization that the Commission may issue to Northern. Conclusions in this EA are based on our analysis of the environmental impact and the following assumptions:

- Northern would comply with all applicable federal laws and regulations;
- the proposed facilities would be constructed as described in section A of this document; and
- Northern would implement the mitigation measures included in its application and supplemental filings to the FERC.

The analysis in this EA is based upon Northern's application and supplemental findings and our experience with the construction and operation of natural gas infrastructure. However, if the Project is approved and proceeds to the construction phase, it is not uncommon for a project proponent to require modifications (e.g., minor changes in the workspace configurations). These changes are often identified by a company once on-the-ground implementation work is initiated. Any Project modification would be subject to review and approval from FERC's Director of the Office of Energy Projects (OEP) and any other permitting/authorizing agencies with jurisdiction.

B.1 GEOLOGY

B.1.1 Physiographic Settings and Geologic Conditions

The Project is within two physiographic provinces. The Hinckley Compressor Station and the Carlton Interconnect Loop are within the Superior Uplands Province of the Laurentian Uplands, and the remaining Project components are within the Central Lowlands Province of the Interior Plains (Fenneman, 1928). The Superior Uplands is part of the core of the North American continent called the Canadian Shield and is within the southern extension of the Laurentian Upland province. The basement rocks of the Laurentian Upland province were metamorphosed about 2.5 billion years ago during the Kenoran orogeny. The rocks of the Superior Upland are mostly Precambrian metamorphic and sedimentary rocks covered with a veneer of glacial deposits. The Central Lowlands is the largest physiographic province in the continuous U.S., which were subjected to repeated glaciations during the Pleistocene epoch. During the Pleistocene Epoch of the Quaternary Period (which ranges from approximately 2.5 million to 11,700 years ago), most of the region that encompasses the State of Minnesota experienced a series of glacial and interglacial periods. During this time, large lobes of ice periodically covered all but the southeast corner of the state, which is known as the “driftless area.” When the glaciers advanced, eroded material was picked up by the ice sheets and then deposited as thick layers of drift as the glaciers receded (Lusardi et al., 2019). Facilities for the Project are underlain by 50 feet or more of glacial drift (Boerboom, 2001; Boerboom, 2009; Lusardi, 2014; Setterholm, 2006).

Generally, the topography of the Project area consists of level to gently rolling terrain, with occasional hills formed by glacial moraines or valleys formed by flowing water. The Willmar D Branch Line Extension has the highest topographic relief of the Project components at 1,084 feet above mean sea level to 1,132 feet above mean sea level.

Based on the soil survey data, the Project facilities are located in areas with a depth to bedrock of 78 inches or greater (Boerboom, 2001; Boerboom, 2009; Lusardi, 2014; Setterholm, 2006). Geotechnical borings did not encounter areas of bedrock at depths that would impact open-cut trenching or facility construction. Shale bedrock of the Thomson Formation was encountered at depths between 41.5 and 47.5 feet below ground surface (fbg) on the Carlton Interconnect Loop. Boring refusal, interpreted to be the bedrock surface, was encountered in all borings completed for the Hinckley Compressor Station, at depths between 22 and 24.6 fbg. Based on the Natural Resources Conservation Service (NRCS) soil data and the site-specific geotechnical soil borings, blasting is not anticipated during construction.

B.1.2 Mineral Resources

No active, inactive, or planned coal or metallic (e.g., iron ore, copper, nickel, or titanium) mines were identified within 0.25 mile of the Project area, and no oil or gas

production wells were identified within 0.25 miles of the Project area. While some oil and gas exploration has occurred in Minnesota, no commercially viable oil and gas extraction has occurred, and the geologic characteristics of the state make any future petroleum discoveries highly unlikely (U.S. Energy Information Administration, 2020). The MDNR Division of Lands and Minerals website indicates two surface-mined mineral resources are located within 0.25 mile of the Carlton Interconnect Loop (MDNR, 2020g). The surface mines identified were a source of sand and gravel and both have been reclaimed and no further activity is occurring at either location. Therefore, we conclude that the Project would not impact mineral and non-mineral resources.

B.1.3 Paleontological Resources

Northern conducted a review of existing paleontological information for Minnesota. While fossils may be found throughout the state, unique paleontological resources are not known to exist within the proposed locations of the Project (MDNR, 2020f; Paleobiology Database, 2020). If significant paleontological resources are encountered during construction, the construction contractor would report the finding to Northern's on-site EI. The EI would temporarily suspend construction activities in the immediate area of the paleontological finding while a qualified paleontologist is consulted. In addition, Northern would notify us and the MDNR. Therefore, we conclude that significant paleontological resources are unlikely to be affected by construction or operation of the Project.

B.1.4 Geologic Hazards

Geologic hazards are natural physical conditions that can, when present, result in damage to land and structures or injury to people. Potential geologic hazards in the Project area were determined through database searches and literature and topographic map reviews, and include seismicity (earthquakes and faults), slope stability and landslides, subsidence and karst conditions, flooding/scour, soil liquefaction, and volcanism. The review of available data showed that the Project area is not characterized by soil liquefaction, volcanic conditions, subsidence, surface faults, or susceptible to landslides; thus, the Project would not be affected by these hazards. Seismic hazards, flooding, and karst conditions are discussed below.

Seismic Hazards

The shaking during an earthquake can be expressed in terms of the acceleration as a percent of gravity (g), and seismic risk can be quantified by the motions experienced at the ground surface or by structures during a given earthquake expressed in terms of g. USGS National Seismic Hazard Probability Mapping shows that for the Project area, within a 50-year period, there is a 2 percent probability of an earthquake with an effective peak ground acceleration (PGA) of 2 to 4 percent g; and a 10 percent probability of an earthquake with an effective PGA of less than 1 percent g being exceeded (USGS, 2018).

For reference, PGA of 10 percent g (0.1g) is generally considered the minimum threshold for damage to older structures or structures not constructed to resist earthquakes.

While Minnesota is one of the least seismically active states in the U.S., there have been at least 14 earthquakes in the state over the last 160 years (Minnesota Geological Survey, 1979; USGS, 2020a). The closest recorded earthquake to the Project is the Willmar/Svea earthquake that occurred February 9, 1994 (USGS, 2020a). This earthquake had a magnitude of 3.1 on the Richter scale and was located approximately 20 miles west of the Willmar D Branch Line Extension. We conclude that Project components are at low risk of earthquake related damages.

Flooding

Based on review of available Federal Emergency Management Agency (FEMA) flood maps and FEMA Risk Maps for Dakota, Pine, and Scott counties, Minnesota, none of the Project facilities located within these counties would be within a flood hazard area (FEMA, 1982, 1987, 2012). FEMA Risk Maps have not been prepared for Carlton or Morrison counties. There are no drainage swales, intermittent creeks, or perennial streams that cross the Project components in Carlton and Morrison counties, which include the Carlton Interconnect Loop, the Viking Interconnect Branch Line or the Pierz Compressor Station and Interconnect; however, perennial streams are located within 1 mile of these Project components. Northern has stated that flooding has not been observed at the Pierz Compressor Station and Interconnect or the Carlton Compressor Station since their installation. No evidence of flash flooding (e.g., disturbed vegetation and sediment deposition above the ordinary high-water mark) or scouring was observed during the wetland field surveys.

Although the likelihood of flooding in the Project area on any given year is small, if flooding should occur, it is not expected to affect the pipelines. Construction of the pipeline would not impact flood elevations because the pipeline would be buried, and the surface restored to pre-construction contours to the extent practicable. For streams that are crossed by HDD (two crossings total), the pipe would be buried a minimum of 100 feet below the base of a stream, and for conventional bores (two crossings total), the pipe would be buried 8 to 10 feet below the base of the stream, reducing the threat of scour to expose the pipeline. Northern would closely monitor the pipeline during periods of high-impact weather events, including flash floods. On-site and aerial monitoring would identify areas requiring immediate remediation. Aboveground facilities would be constructed outside of FEMA flood hazard zones.

Karst Conditions

The effects of glaciation influence the development and preservation of karst areas in the Midwestern United States. Surface expression of sinkholes are unlikely in areas

where carbonate bedrock is covered by more than 50 feet of glacially derived sediments such as stratified drift and till (Weary and Doctor, 2014).

The USGS map of karst and potential karst areas in the United States identifies portions of the Willmar D Branch Line Extension as the only Project component underlain with carbonate bedrock (Weary and Doctor, 2014). USGS mapping indicates the carbonate bedrock in the area of the Willmar D Branch Line Extension is overlain by over 50 feet of unconsolidated glacial material. Northern completed five geotechnical borings to depths between 30 and 150 fbg for the Willmar D Branch Line Extension. Bedrock was not encountered in any of the borings for the Willmar D Branch Line Extension; as such, Northern does not anticipate encountering bedrock at this Project location during construction. Due to the thickness of the unconsolidated overburden and the results of the geotechnical borings, the potential for encountering karst features along the Willmar D Branch Line Extension is considered low.

B.1.5 Geotechnical Investigations

Northern completed a geotechnical investigation for the Project. Specifically, Northern completed geotechnical borings at the Hinckley Compressor Station site and in the vicinity of proposed HDDs and conventional bores. For the Pierz Compressor Station, Northern used previously obtained geotechnical data from November 2010. Northern completed geotechnical borings at the proposed HDD and conventional bore locations to identify and characterize subsurface geology and to investigate the feasibility of successfully utilizing the HDD method as proposed for the Project (see section A.8.2.1).

B.1.5.1 Pipeline Geotechnical Investigations

Northern completed five geotechnical borings to depths between 30 and 150 fbg for the Willmar D Branch Line Extension. The borings were completed along the pipeline centerline in the vicinity of the proposed HDDs. The most prevalent soil type encountered was sandy lean clay. Several borings also contained silty sand at depths below 25 feet. Bedrock was not encountered in any of the borings.

Northern completed four geotechnical borings to depths between 56.5 and 70 fbg for the Carlton Interconnect Loop. The borings were completed along the pipeline centerline in the vicinity of the HDD. The most prevalent soil types encountered were silty sand, clayey sand, sandy lean clay, and poorly graded sand with silt. Bedrock was encountered in all borings, at depths between 41.5 and 47.5 fbg, consisting of slate interpreted to be from the Thomson Formation. Length of an HDD alignment, pipeline diameter, and subsurface material are factors in the technical feasibility of an HDD installation. Subsurface conditions that can affect the feasibility of an HDD include excessive rock strength and abrasiveness, unconsolidated gravel and boulder materials, poor bedrock quality, solution cavities and artesian conditions. HDD pipe installations may fail, primarily due to encountering unexpected geologic conditions such as

transitioning from coarse unconsolidated materials into bedrock or if the pipe were to become lodged in the hole during pullback operations. During HDD operations, drilling fluid consisting primarily of water and bentonite clay is pumped under pressure through the inside of the drill pipe and flows back (returns) to the drill entry point along an annular space between the outside of the drill pipe and the drilled hole. Because the drilling fluid is pressurized, in certain conditions it can seep into the surrounding rocks and sediment. Formational drilling fluid losses typically occur when the drilling fluid flows through the pore spaces in the soil through which the HDD drilling profile passes or within fractures contained in the rock formation. Inadvertent returns are more likely to occur in more permeable soils or via fractures or fissures in bedrock. Chances for an inadvertent return to occur are greatest near the drill entry and exist points where the drill path has the least amount of ground cover.

Northern has proposed to use the HDD method to cross infrastructure (roads) and sensitive resources (wetlands and waterbodies) at 3 locations. A summary of the geotechnical investigations and feasibility assessments for the crossings follows.

WBL P4-1

The total crossing length of the proposed WBL P4-1 HDD is 2,017 feet. Northern completed two geotechnical borings along the proposed alignment to depths of approximately 150 feet below the ground surface. The primary geotechnical conditions encountered were sandy lean clay, silty sand, poorly graded sand, and clayey sand. The proposed profile shows the HDD at a depth of approximately 130 feet beneath Lucerne Trail. Based on available analysis, a majority of the drill path would be within layers of sandy lean clay. A hydrofracture risk assessment determined that there would be an elevated risk of an inadvertent return near the exit point of the drill. Mitigation could include partially tripping the drill pipe to clean/condition the bore prior to drilling the last 700 feet of the drill at reduced pressures. A relief well could be drilled within the property on the east side to reduce the chance of an inadvertent release beneath wetland WIL-W01.

WBL P4-2

The total crossing length of the proposed WBL P4-2 HDD is 624 feet. Northern completed one geotechnical boring along the proposed alignment to the depth of approximately 60 feet below the ground surface. The primary geotechnical conditions encountered were lean clay, sandy lean clay, and silty sand. The proposed profile shows the HDD at a depth of approximately 17 feet beneath wetland WIL-W07. Based on available analysis, a majority of the drill path would be within layers of sandy lean clay.

A hydrofracture risk assessment determined that there would be an elevated risk of an inadvertent return near the exit point of the drill. Mitigation could include partially

tripping the drill pipe to clean/condition the bore prior to drilling the last 200 feet of the drill at reduced pressures.

CIL P4-1

The total crossing length of the proposed CIL P4-1 HDD is 2,972 feet. Northern completed four geotechnical borings along the proposed alignment to depths ranging from 60 to 70 feet below the ground surface. The primary geotechnical conditions encountered were silty sand, clayey sand, slate, silty clay, silt, poorly graded sand with silt, and weathered slate. The proposed profile shows the HDD at a depth of 184 feet beneath Open Water CIL-OW1. Based on available analysis, a majority of the drill path would be within bedrock slate layers.

A hydrofracture risk assessment determined that there would be an elevated risk of an inadvertent return near the exit point of the drill. Mitigation could include partially tripping the drill pipe to clean/condition the bore prior to drilling the last 1,000 feet of the drill at reduced pressures. The HDD could be drilled using two rigs and the intersect method, which would reduce drilling pressure across the second half of the HDD.

In the event of an inadvertent return, Northern would implement measures outlined in its HDD Plan. Northern's HDD Plan would ensure that drill operations are monitored and adjusted to avoid potential inadvertent returns, and if one should occur, the release would be contained to the extent practicable and remediated. We have reviewed Northern's HDD Plan and find it acceptable.

Based on the above analyses, we conclude that subsurface conditions identified by the geotechnical borings would not render the HDDs infeasible. With consideration of the measures in Northern's HDD Plan, we conclude that potential impacts from HDD construction and potential inadvertent releases would not be significant.

B.1.5.2 Aboveground Facility Geotechnical Investigations

On November 11, 2010, Northern completed two geotechnical borings to a depth of 25 fbg in the area of the existing Pierz Compressor Station and Interconnect and Viking Interconnect Branch Line. Soils generally consisted of 1 foot of topsoil followed by 7 feet of fine to medium sand, followed by 18 feet of clayey sand with gravel. The results of the geotechnical investigation indicate that slab foundations with spread footings or piers would support the larger structures like the compressor and auxiliary building; however, some subgrade stabilization and/or local soil corrections could be required. Northern would comply with these recommendations for the design of the expansion at the Pierz Compressor Station.

Northern has completed ten geotechnical borings to depths between 22 and 24.6 fbg for the new Hinckley Compressor Station site. The borings were completed at proposed building locations and other select locations across the property. Soils

generally consisted of 1 foot of topsoil followed by 12 feet of silty sand or poorly graded sand, followed by 10 to 11 feet of clayey sand or silty sand. Boring refusal, interpreted to be the bedrock surface, was encountered in all borings, at depths between 22 and 24.6 fbg. The geotechnical report indicates that Northern should remove existing topsoil, fill materials, organic soils, and unstable soils from below the proposed building and slab footprints to a depth of 1.0 to 1.5 fbg. The results of the geotechnical investigation also indicate that the auxiliary building could be supported on conventional spread footings, the compressor building utilizing a concrete mat slab foundation, and exterior slabs supported by frost depth footings of piers on native soils or on granular structure fill, provided that the subgrade has been prepared as recommended. Northern would comply with these recommendations for the design of the expansion at the Hinckley Compressor Station.

Construction and operation of the Project would result in less than significant impacts on geologic resources, and any potential geological hazards encountered during construction would be adequately minimized with implementation of measures contained in the FERC Plan and in Northern's HDD Plan.

B.2 SOILS

B.2.1 Existing Characteristics

Soil characteristics within the Project area were identified and assessed using the NRCS soil surveys of Carlton, Dakota, Morrison, and Scott counties and the NRCS Soil Survey Geographic Database (SSURGO, NRCS, 2020), which is a digital version of the original county soil surveys developed by the NRCS for use with a geographic information system. No soil survey information, digital or print, is available for the proposed site of the Hinckley Compressor Station in Pine County; therefore, the Hinckley Compressor Station is not specifically discussed below. Project activities such as clearing, grading, excavation, backfilling, heavy equipment traffic, and restoration have the potential to adversely affect soil characteristics such as water infiltration, storage and routing, and soil nutrient levels, thus reducing soil productivity. Other possible soils impacts include mixing of topsoil and subsoil layers, compaction, rutting, and alteration of drainage characteristics.

Soils were evaluated for characteristics that could affect construction or increase the potential for soil impacts during construction. These characteristics include farmland designation, compaction potential, erodibility by wind, erodibility by water, and revegetation potential. None of the soils within the Project area are classified as stony and rocky or containing shallow bedrock (less than 60 inches of ground surface). A description of these soil characteristics within the Project area, including impacts, are listed in table B.2.1-1. Mitigation measures for these soil limitations are described below.

**Table B.2.1-1
Soil Limitations Affected by the Proposed Project**

Project Component	Total Acres (Ac)	Prime Farmland ¹		Farmland of Statewide Importance		Highly Erodible ²		Wind Erodible ³		Hydric ⁴		Highly Compaction Prone ⁵		Highly Corrosive to Steel		Shallow to Bedrock ⁶		Revegetation Concerns ⁷	
		Ac	%	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%
Willmar D Branch Line Extension	9.8	4.5	46	2.5	25	4.8	49	0	0	1.7	17	1.7	17	3.3	34	0	0	1.7	17
Carlton Interconnect Loop	7.9	0	0	0.2	2	0	0	0	0	0	0	<0.1	<1	3.5	44	0	0	<0.1	<1
Hinckley Compressor Station ⁸	10.6	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Pierz Compressor Station and Interconnect ⁹	4.2	4.2	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

¹ Includes "all areas are prime farmland" and "prime farmland if drained." Total acres of agricultural land are digitized in a geographic information system based on field observations and desktop review and represent current land use. Prime farmland is based on NRCS soil classifications and may not match actual agricultural land use.

² Includes soils that have an Erosion Hazard rating of Severe or Very Severe. Erosion Hazard based on slope and soil erosion factor (K).

³ Includes soils that have Wind Erodible Group rating of 1 or 2.

⁴ Includes soils that have a Hydric Rating of Hydric.

⁵ Includes soils that have a Compaction Potential rating of High.

⁶ Includes soils that have lithic or paralithic bedrock within 60 inches or less of the soil surface.

⁷ Revegetation is based on potential for seedling mortality rate class. A rating of low indicates the soil has properties that will decrease the potential for successful revegetation.

⁸ The NRCS soil survey is not complete for the portion of Pine County, Minnesota, that includes the Hinckley Compressor Station site. Northern consulted with the local NRCS office to obtain preliminary maps; however, preliminary maps do not exist.

⁹ The Viking Interconnect Branch Line is not included as it shares the same ATWS as the Pierz Compressor Station and Interconnect. Therefore, in order to avoid duplication of acres affected, Northern did not include the Viking Interconnect Branch Line in the table.

B.2.2 Prime Farmland

The U.S. Department of Agriculture (USDA) defines prime farmland as land that has the best combination of physical and chemical characteristics for growing food, feed, forage, fiber, and oilseed crops. Unique farmland is land that is used for production of specific high-value food and fiber crops. In addition, soils may be considered of statewide or local importance if those soils are capable of producing a high yield of crops when managed according to accepted farming methods. Construction in agricultural areas and pasture areas would temporarily disrupt ongoing agricultural activities and eliminate use of the land for the duration of construction, with permanently impacted areas at aboveground facilities converted to industrial use.

Within the Project area, the following acres are designated as prime farmland:

- About 4.5 acres (46 percent) of the Willmar D Branch Line Extension construction workspaces. Less than 0.1 acre of prime farmland would be permanently impacted due to operation of aboveground facilities; and
- About 4.2 acres (100 percent) of the Pierz Compressor Station and Interconnect construction workspaces. About 0.7 acre of prime farmland would be permanently impacted by operation of Project facilities.

Northern's existing facilities within the Project footprint currently occupy 1.0 acre of designated prime farmland. Northern's proposed facilities would result in a loss of approximately 0.7 acre of prime farmland in Scott and Morrison counties; this is significantly less than the 237,960 acres of prime farmland identified in these two counties.

Within the Project area, the following acres are designated as farmland of statewide importance:

- About 2.5 acres (25 percent) of the Willmar D Branch Line Extension construction area; and
- About 0.2 acre (12 percent) of the Carlton Interconnect Loop construction area.

Northern's existing facilities within the Project footprint currently occupy 0.2 acre of farmland of statewide importance. Northern would permanently impact less than 0.1 acre of farmland of statewide importance at the Willmar D Branch Line Extension in Scott County, which would be permanently impacted by installation of above-grade appurtenances. About 43,336 acres of farmland of statewide importance are identified in Scott County. The acres of farmland of statewide importance that would be permanently converted by the Project are minimal when compared to the acres available in the county.

During construction, potential impacts on agricultural soils would be minimized and mitigated in accordance with our Plan and the AIMP. These include measures to conserve and segregate the upper 12 inches of topsoil, alleviate soil compaction, protect and maintain existing drainage tile and irrigation systems, prevent the introduction of weeds, and retain existing soil productivity. The Plan also includes restoration and revegetation measures, such as seedbed preparation, fertilization, and seeding to actively promote revegetation. Following construction, agricultural activities would be allowed to resume without restrictions except within the fencelines of aboveground facilities and within the footprint of permanent access driveways. We conclude that impacts on prime farmland soils would be temporary and not significant.

B.2.3 Soil Erosion and Revegetation Potential

Soil erosion is the wearing away of physical soil properties by wind and water and could result in a loss of soil structure, organic matter, nutrients, all of which, when present, contribute to healthy plant growth and ecosystem stability. Clearing removes protective vegetation cover and exposes soils to the effects of wind and water, which can increase soil erosion and the transport of sediment to sensitive resource areas. Increased rainfall in the spring and fall can also result in increased erosion in agriculture areas where vegetation has been cleared.

Soil erosion potential is affected by the soil lithology, including mineralogy, grain size, texture, and organic content. Soil erosion potential is also influenced by slope and exposure to erosion mechanisms. About 4.8 acres (49 percent of the total impacted acreage) of soil crossed by the Willmar D Branch Line Extension are classified as highly erodible by water (determined by an NRCS Erosion Hazard rating of Severe or Very Severe). No other Project components contain water-erodible soils. Also, no Project components contain soils that are susceptible to erosion by wind.

Revegetation is part of the final restoration required for the Project. Revegetation would be required on all land except active croplands. Revegetation would be required to terminate the erosion control permits obtained for the Project. The revegetation potential of soils that would be disturbed by the Project is based on the potential for seedling mortality rating class developed by NRCS. About 1.7 acres (17 percent) of soils within the Project area exhibit low revegetation potential.

To minimize soil erosion from wind and water, Northern would implement measures, as specified in our Plan, the SWPPPs, and applicable Project-specific permits. Temporary erosion control measures, including interceptor diversions (e.g., slope breakers) and sediment filter devices (e.g., straw bales, silt fence, sediment basins), would be installed prior to initial ground disturbance, where feasible. If some limited clearing and grubbing is necessary to allow for installation, temporary erosion control measures would be installed immediately following ground disturbance. As required, temporary trench breakers would be installed immediately following ditch excavation to

reduce runoff velocities in the trench during construction. Mulch or erosion control matting may be used on slopes to prevent erosion during construction. Best Management Practices (BMPs), such as spraying water as needed, would be implemented to limit wind erosion. Per the MDNR, Northern would commit to limiting use of erosion control blanket to “bio-netting” or “natural netting” types, and specifically not products containing plastic mesh netting or other plastic components, to minimize entanglement issues with small animals. Also, Northern would not use hydro-mulch products with synthetic (plastic) fiber additives in areas that drain to Minnesota Public Waters.

The temporary erosion control devices would be inspected on a daily basis by Northern and after each rainfall event of 0.5 inch or greater to ensure controls function properly. Northern would re-seed temporary workspaces in accordance with individual landowner requirements, the SWPPPs, and/or NRCS recommendations. Graded areas and other disturbed areas requiring revegetation would be seeded to establish a permanent vegetation cover. Depending on site conditions, revegetation could include soil amendments such as lime, fertilizing, seeding, and mulching. Seedbed preparation would not be undertaken when excessively wet or frozen soil conditions exist. After a relatively smooth seedbed has been prepared, seed would be applied to all areas with exposed soils using a broadcast spreader or a seed drill. Northern would use seed mixes and seeding rates recommended by state and local agencies. Mulch would be applied as needed. In the event final restoration is not completed by December 2021, Northern would abide by its Winter Construction Plan. Temporary erosion control measures would remain in-place until restoration is successful.

Permanent erosion control devices (e.g., trench breakers, flexible channel liners, turf-reinforcement mats, slope breakers) would be monitored by Northern during the long-term operation and maintenance of the Project.

B.2.4 Hydric Soils, Rutting, and Compaction

Soil compaction can occur by the repeated movement of heavy machinery across soils, particularly soils with high shrink-swell potential and poor drainage characteristics (i.e., soils with high clay content). These impacts can result in an increase in agricultural operating and labor costs, decreased productivity, and damage to field equipment. About 1.7 acres (17 percent) of the Willmar D Branch Line Extension and less than 0.1 acre (less than 1 percent) of the Carlton Interconnect Loop contain soils that are highly prone to compaction (determined by an NRCS Compaction Potential rating of High). Northern would de-compact subsoil in accordance with our Plan. Northern would perform soil compaction mitigation in severely compacted residential areas based on coordination with landowners. In agricultural land, these measures include using appropriate deep-tillage equipment such as a paraplow or chisel plow. In agricultural and residential lands, compaction testing would be conducted to verify compaction is relieved to a level equal to or better than adjacent undisturbed areas. Once decompaction of the subsoil is

complete, the segregated topsoil would be returned to the right-of-way. Decomaction would be completed on the restored topsoil using shallow-ripping tools.

In order to minimize rutting, Northern would stabilize its access road using gravel or timber equipment mats. If rutting occurs along the access road, Northern would require its construction contractor(s) to provide maintenance equipment to repair the ruts to pre-construction conditions or better as soon as ground conditions permit.

Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Generally, hydric soils are those soils that are poorly and very poorly drained. About 1.7 acres (17 percent) of the soils that would be affected by construction of the Willmar D Branch Line Extension are considered hydric. Hydric soils are susceptible to rutting and compaction. Northern would minimize compaction with measures contained in our Plan and Procedures.

B.2.5 Soil Contamination

Northern conducted a database search using publicly available data to identify facilities with potential and/or actual sources of contamination within a 0.25-mile buffer (Facility Registry Services and MDH Petroleum Remediation Program [PRP]). No known contaminated areas, landfills, hazardous waste sites, or other special use areas are within 0.25 mile of the Project workspaces, with the exception two sites discussed below. On March 16, 1998, a used oil leak was identified within the existing Carlton Compressor Station, which is a part of the Carlton Interconnect Loop (EPA Registry ID 110003819627 and MDH PRP Site ID LS0011141). The MDH PRP states the spill site was closed June 12, 2002, indicating the cleanup was completed and no further action was required.

The MDH PRP database identified a gasoline release located about 0.24 mile southeast of an ATWS (ETWS 1) along the Willmar D Branch Line Extension (MDH PRP Site ID LS0008928). The leak was reported November 6, 1995, and consisted of unleaded gasoline. The PRP states the spill site was closed January 12, 1996, indicating the cleanup was completed and no further action was required.

Project-related soil contamination resulting from spills or leaks of fuels, lubricants, and coolant from construction equipment would be minimized by Northern's adherence to its SPCC Plan, which specifies cleanup procedures in the event of spills or leaks of hazardous materials. Should a spill occur, Northern and its contractors would follow the SPCC Plan to contain the spill of any material that may contaminate soils and to ensure that the spill area is cleaned up and the materials are disposed of in an appropriate manner.

Northern would also follow the procedures outlined in its SPCC Plan in the event contaminated soils are encountered during construction. Should Northern encounter

contaminated soil during construction, Northern would stop work in the vicinity of the contaminated soil. Northern would assess the contamination to determine the type and extent of contamination. Depending on the type and extent of the contamination, Northern would implement appropriate measures to contain the contamination and create a safe work environment. Measures could include over-excavation, containerizing the contaminated media, and appropriate disposal. Work in the vicinity of the contamination would only resume after appropriate containment and remediation efforts are completed, in consultation with the appropriate state or federal environmental agencies.

Given the characteristics of Project area soils and the impact minimization and mitigation measures that would be implemented through adherence to the FERC Plan and Procedures and Northern's SPCC Plan, we conclude that impacts on soils would be minor.

B.3 WATER RESOURCES AND WETLANDS

B.3.1 Groundwater

Groundwater resources in Minnesota are generally abundant but not evenly distributed, due to major glacial events and sedimentation processes. The groundwater aquifers used for public and private water sources within Minnesota may be in unconsolidated depositional units or lithified bedrock units, depending on the location.

As outlined by the USGS (USGS, 2003), the Willmar D Branch Line Extension, the Carlton Interconnect Loop, and the Hinckley Compressor Station are underlain by the Cambrian-Ordovician Aquifer System. The Cambrian-Ordovician Aquifer system is comprised of multiple aquifers confined by the Maquoketa confining unit, with underlying Precambrian sedimentary rocks, commonly referred to as the Hinckley Sandstone. The Maquoketa and Hinckley Sandstone units are then connected to Cambrian rocks, which outcrop in the Hollandale Embayment (USGS, n.d.). The Cambrian-Ordovician Aquifer System also underlies portions of Wisconsin, Iowa, Michigan, and Illinois and is often under stress from extensive groundwater withdrawals because the water is suitable for all uses. Hydrologic units within the Cambrian-Ordovician Aquifer System include the Maquoketa confining unit, the St. Peter-Prairie du Chien-Jordan aquifer, the St. Lawrence-Franconia confining unit, the Ironton-Galesville aquifer, the Eau Claire confining unit, and the Mount Simon aquifer (USGS, n.d.). Aquifers in this system are hydraulically connected with the overlying surficial aquifers. Well-yields and groundwater quality within these aquifers are variable, likely due to recharge that occurred during continental glaciation (USGS, n.d.).

The Viking Interconnect Branch Line and the Pierz Compressor Station and Interconnect are within a county not underlain by a principal aquifer but underlain by buried sand aquifers hydraulically connected to surficial sand deposits. Sand thickness in northwest and central locations of Morrison County can be greater than 100 feet, with

saturated course-grained sediments acting as aquifers (MDNR, 2019). Due to the high percentage of sand (and some gravel) in surficial layers, precipitation moves downward relatively quickly, eventually becoming groundwater. With a shallow depth to bedrock in many places, groundwater can take days to weeks to travel 1 mile through the aquifer (MDNR, 2019). Well yields within these systems are often poor and variable with drilled wells serving as cisterns, primarily located where bedrock is less than 150 feet below the land’s surface (MDNR, 2019).

As defined by the EPA, an aquifer may be termed “sole-source” if the aquifer supplies at least 50 percent of the drinking water for its service area, or if there are no reasonably available alternative drinking water sources should the aquifer become contaminated. This designation is formally dictated by the state primary agency. No EPA-designated sole-source aquifers are located beneath or within 1 mile of the proposed Project (EPA, 2019a).

Based on information provided in section B.1.4 above, portions of the Willmar D Branch Line Extension are within areas with the potential for karst features; however, geotechnical investigations conducted for the Project did not identify any areas of karst within the Project boundary. Since no areas of karst would likely be affected by the Project, Northern identified wells within 150 feet of the Project area. In Minnesota, the County Well Index is the most complete record of well construction and location information. The index is updated and maintained by the Minnesota Geological Survey, in cooperation with the MDH. Northern utilized groundwater data from the County Well Index to obtain information on known public and private wells located within 150 feet and 400 feet of the construction workspaces, respectively. This information is provided below in table B.3.1-1 (MDH, 2019).

Table B.3.1-1 Water Supply Wells within 150 feet of the Project Area				
MP	Supply Type	Well Use	Feet from Project Boundary and Direction	Feet from Center Line and Direction
Willmar D Branch Line Extension				
1.72	Private	Unidentified	139, Northeast	149, Northeast
1.80	Private	Unidentified	Within Workspace	52, Southwest
1.81	Private	Unidentified	98, Southwest	173, Southwest
1.96	Private	Unidentified	55, Northeast	111, Northeast
2.18	Private	Unidentified	136, Northeast	245, Northeast
Pierz Compressor Station and Interconnect				
N/A	Private	Domestic	Within ATWS	26, South

Five private wells are located within 150 feet of the Willmar D Branch Line Extension, one of which is located within a Project workspace. One private well, owned by Northern, is within the existing Pierz Compressor Station. No private wells were

located within 150 feet of the Carlton Interconnect Loop or Hinckley Compressor Station site. No public wells were identified within 400 feet of the Project.

The Minnesota Spring Inventory is the most complete record of springs and spring locations in Minnesota and is updated and maintained by the MDNR. A review of the inventory data did not identify any springs within 150 feet of the Project (MDNR, 2020a). Northern did not observe any springs/seeps during walkdowns and landowners have not provided any additional information regarding springs/seeps.

Wellhead Protection Areas (WHPA) are available through a database maintained by the MDH (MDH, 2020). Based on review of the database, none of the proposed Project facilities are within WHPAs.

Minnesota has established Drinking Water Supply Management Areas (DWSMA) that surround both surface and subsurface public water supply wells that contain WHPAs (MDA, 2020). DWSMAs are typically managed by cities, with managing entities outlined in associated Wellhead Protection Plans. Per the MDA interactive map (MDA, 2020), none of the proposed Project facilities are within 500 feet of DWSMAs (MDA, 2020).

A Transient Non-Community Inner Wellhead Management Zone (TNWM) is a 200-foot buffer around a public water supply. Per the MDA interactive map (MDA, 2020) the proposed centerline of the Carlton Interconnect Loop is located approximately 90 feet north of the Pine Hill Golf Club #2 TNWM, at MP 0.31. At the nearest location to the Pine Hill Golf Club #2 TNWM, the HDD/pipeline would be at a depth of 177 feet. Project workspaces are beyond 400 feet from the well associated with the TNWM. Due to the anticipated depth of the HDD/pipeline and centerline being located outside the Pine Hill Golf Club #2 TNWM, impacts on the Pine Hill Golf Club #2 TNWM by the Project are not anticipated.

As discussed above in section B.2.5, two registered environmental sites were identified within 0.25 mile of the Project. Both sites were listed as closed indicating the cleanup was completed and no further action was required.

Construction and Operation Impacts and Mitigation

Pipeline construction activities may affect groundwater resources through minor, temporary impacts to shallow aquifers in proximity to the proposed facilities. These impacts may include increased turbidity, groundwater table fluctuations, short-term disruption of recharge, localized flow along the pipeline trench, or contamination from a spill or leak of hazardous substances.

HDD or conventional bore crossings are proposed for the waterbodies and most wetland crossings for the Project. HDDs and several conventional bores would exceed typical trench depths and likely penetrate the shallow water table. To minimize the

potential for groundwater contamination, Northern would restrict the use of drilling additives to those on the MDH approved list of drilling fluids and additives, which is more restrictive than the American National Standards Institute/National Sanitation Foundation 60 certified list and would limit its use of additives that contain polyacrylamides to upland areas. By implementing the protective measures set forth in the SPCC Plan and HDD Plan, long-term contamination due to HDD or conventional bore activities is not anticipated.

An inadvertent spill or release of fuel or hazardous materials during construction could affect groundwater if not cleaned up properly. To minimize the risk of potential fuel or hazardous materials spills, Northern would implement its SPCC Plan, which includes preventive measures such as personnel training for proper handling of fuel and hazardous materials, equipment inspection, and refueling procedures to reduce the likelihood of spills. The SPCC Plan also includes mitigation measures to reduce potential impacts should a spill occur. In the unlikely event that undocumented sites with contaminated soils or groundwater are encountered during construction, measures would be implemented to isolate and contain the suspected soil or groundwater contamination. Northern would collect and test samples of the substrate or groundwater to identify the contaminants. Once the type, magnitude, and extent of the contamination are determined, Northern would either develop a response plan the crossing or avoid the site.

Specific BMPs that Northern would implement to prevent impacts on groundwater resources including conducting refueling and storage of hazardous materials greater than 200 feet from a private well, installing protective fencing around all wellheads in or adjacent to the construction work areas, and prohibiting overnight parking near wellheads.

Two private wells are within proposed Project workspaces. Northern would install protective fencing around these wells and post signs adjacent to the fencing to prohibit overnight parking of equipment. No refueling or storage of hazardous liquids would be allowed within a 200-foot radius of the identified private wells or any other private well. Additionally, no refueling or storage of hazardous liquids would be allowed within 400 feet of community or municipal water wells, if identified.

With landowner approval, Northern would conduct pre- and post-construction well testing for private wells within 150 feet of open-cut trench activities, for private wells within 150 feet of the Project workspaces; and for the Pine Hill Golf Club #2 well since the construction work area for the Carlton interconnect loop would be within the well's TNWM. The tests would be used to determine whether any construction-related impacts occurred. If a well does not have appropriate sample ports, Northern would coordinate with landowners to sample the nearest available yard hydrant or outside hose bib. In the event the results indicate the well water quality or yield has been adversely impacted as a result of Project construction, Northern would provide a clean water source to the

landowner until a permanent solution is implemented. The damaged well would be restored to its former capacity and quality to the extent practical.

Due to the nature of the construction operation, certain equipment (e.g., HDD and boring rigs) cannot be moved for refueling and may, therefore, be located within a well’s set-back radius. In cases where refueling needs to occur within the set-back radius, Northern would have an EI present for the operation and would have spill response equipment onsite and readily available. Secondary containment would be required for stationary equipment within the setback radius per Minnesota regulations.

We find that by implementing the measures discussed above, Northern’s SPCC Plan, HDD Plan, and our Plan and Procedures, construction activities are unlikely to result in significant impacts on groundwater resources.

B.3.2 Surface Waters

Northern completed an assessment of surface water resources in the Project area through a review of USGS topographic maps, USGS National Hydrography Dataset, and National Wetlands Inventory data. Additionally, field survey data were collected between October 14 and December 10, 2019, and April 1 and April 9, 2020. Surface water resources within the Project area are located within six watersheds. Table B.3.2-1 lists the watershed and river basins crossed by the Project. The Project, as proposed, would not impact any known watershed protection areas or public water supply reservoirs.

Table B.3.2-1 Watersheds Crossed by the Project			
MP		Watershed (Hydrology Unit Code 12)	River Basin
From	To		
Willmar D Branch Line Extension			
1.39	1.60	South Creek (70400010202)	Lower Mississippi
1.60	2.19	Credit River (70200121107)	Minnesota
Carlton Interconnect Loop			
0.00	0.63	Otter Creek (40102011504)	Great Lakes
Viking Interconnect Branch Line			
0.00	0.08	Lower Skunk River (70102010303)	Upper Mississippi
Hinckley Compressor Station			
N/A	N/A	Grindstone River (70300030503)	St. Croix River Basin
Pierz Compressor Station and Interconnect			
N/A	N/A	Lower Skunk River (70102010303)	Upper Mississippi

Waterbodies crossed by the Project would consist of two intermittent streams and one open water feature (associated with the Pine Hill Golf Course). One intermittent stream (WIL-S04) would be crossed twice; therefore, there would be four total crossings. Table B.3.2-2 lists the waterbodies crossed including approximate milepost, waterbody

name, flow regime, crossing width, state water quality use designation, fishery type, and proposed crossing method.

Table B.3.2-2 Waterbodies Crossed by the Project						
MP	Waterbody	Waterbody Type	Crossing Width (feet)	State Water Quality Use Designations ^a	Fishery Type	Crossing Method
Willmar D Branch Line Extension						
1.77	WIL-S02 (Unnamed)	Intermittent	8	2B, 3C, 4A, 4B, 5, 6	Warm Water	HDD ^b
2.13	WIL-S04 (Unnamed)	Intermittent	15	2B, 3C, 4A, 4B, 5, 6	Warm Water	Conventional Bore
2.13	WIL-S04 (Unnamed)	Intermittent	15	2B, 3C, 4A, 4B, 5, 6	Warm Water	Conventional Bore
Carlton Interconnect Loop						
0.25 - 0.39	CIL-OW2	Open Water	235	2B, 3C, 4A, 4B, 5, 6	Warm Water	HDD
^a State Water Classification: Class 1 = Domestic Consumption (none crossed). Class 2B = Aquatic Life and Recreation, warm water. Class 3C = Industrial Consumption, chlorides standard "C." Class 4 = Agriculture and Wildlife, irrigation purposes ("A") and use by livestock and wildlife ("B"). Class 5 = Aesthetic Enjoyment and Navigation. Class 6 = Other Uses and Protection of Border Waters. Class 7 = Limited Resource Value Waters (none crossed)						
^b Waterbody would also be crossed by a temporary clear span bridge within an access road.						

No waterbodies crossed by the Project are included in the National Wild and Scenic Rivers System (National Wild and Scenic River System, n.d.) or designated Minnesota Outstanding Resource Value Waters. Trout, and the gravel stream-bed habitats they require, are sensitive to environmental impacts such as sedimentation. Trout streams receive additional protections under rules administered by the MPCA, MDNR and USACE. A list of trout streams in Minnesota, available in Minnesota Rule 6240.0050, was reviewed and no proposed Project facilities would cross a designated trout stream (MDNR, 2020d).

Minnesota Statute Section 103G.005, Subdivision 15, defines public waters using several criteria, including waters of the state that have been determined to be navigable waters and watercourses with a total drainage area greater than two square miles at their mouth. Pipelines that cross a Minnesota public water would require an MDNR Public Waters Work Permit. According to the MDNR, the Willmar D Branch Line Extension is located near a public water wetland (#70028900). Northern confirmed with the MDNR area hydrologist that the Project workspace would be above the ordinary highwater mark of the public water wetland. Additionally, the Project workspace is more than 95 feet from the public water wetland and therefore would not directly impact the wetland. As such, a Public Waters Work Permit would not be required for the Project.

Under Section 303(d) of the Clean Water Act, states are required to assess all waters of the state to determine if they meet water quality standards; list waters that do not meet standards and update the list biannually; and conduct total maximum daily load

studies to set pollutant-reduction goals needed to restore waters to the extent that they meet water quality standards for designated uses. No waterbodies crossed by the Project are designated as impaired (MPCA, 2020b).

Navigable waters are designated by the USACE and regulated under Section 10 of the Rivers and Harbors Act of 1899. The Project does not cross any waters identified as USACE Section 10 Waters (USACE, n.d.).

No waterbodies crossed by the Project have sufficient flow rates to provide a reliable potable surface water supply. Additionally, no waterbodies crossed by the Project were designated by Minnesota for domestic consumption.

Construction and Operation Impacts and Mitigation

Construction of the Project across or near waterbodies has the potential to result in short-term and minor direct impact on waterbodies from construction adjacent to stream channels, clearing and grading of adjacent lands, trench dewatering, and unanticipated releases of drilling mud or chemical contaminants, including fuels and lubricants. These construction activities could result in temporary modification of aquatic habitats through indirect impacts such as increased erosion, sedimentation and/or turbidity, and decreased dissolved oxygen concentrations.

Construction practices would follow our Plan and Procedures and the Project SWPPPs, which contain BMPs intended to reduce ground disturbance, minimize erosion and sediment runoff, and promote revegetation within the construction area. Northern's EIs would document that all construction workspace along with the waterbody boundaries are staked by a civil survey firm prior to the start of construction. The refueling setback at each waterbody also would be demarcated with signage placed by Northern's EIs.

As mentioned above, Northern proposes to cross two waterbodies via HDD and one waterbody (at two locations) via a single conventional bore. HDDs and conventional bores would generally avoid impacts to the bed and banks of waterbodies and prevent turbidity and sedimentation that could occur when using open-cut crossing methods. Northern would implement BMPs and stage inadvertent return containment materials prior to the start of each HDD and conventional bore, as outlined in its HDD Plan. The inadvertent return containment materials would be deployed in the stream in the event of an inadvertent release of drilling mud. We have reviewed Northern's HDD Plan and find that impacts on waterbodies due to an inadvertent release would be minimized to the extent practicable.

If trench dewatering is necessary, water would be pumped from the trench via a submersible pump equipped with a float and then discharged through a geotextile filter bag and/or straw bale dewatering structure to a well-vegetated upland area. Dewatering

would be conducted, as necessary, to aid in pipe installation and would avoid the flow of silt-laden water directly into waterbodies.

An inadvertent release of drilling fluid or a spill of fuel or equipment-related fluids could impact water quality and consequentially impact fisheries. To minimize the potential for an inadvertent release of drilling fluid to impact fisheries, Northern would implement its HDD Plan that includes procedures for monitoring, detection, isolating, stopping, and restoring inadvertent releases, and would make all necessary agency notifications. During construction, Northern would ensure its contractors have sufficient spill containment material and supplies needed to contain any inadvertent release of drilling mud that occurs near a waterbody. The contractor would assign personnel to continuously monitor the HDD activities, including walking the HDD path between entry and exit points and visually inspecting for a release. If the drill operator notes the loss of drilling mud or other indicators of a release, the HDD would be temporarily suspended to allow the contractor and/or Northern's EI time to locate the release. If the release is in or adjacent to a waterbody, Northern would deploy the BMPs that were previously staged by each waterbody to contain the drilling fluid. Northern would report any releases in the vicinity of a waterbody to the USACE, Minnesota Duty Officer, who in turn would notify the appropriate state and local agencies.

For all waterbody crossings, fuels, lubricants, or other potentially hazardous materials used during routine construction can temporarily impact aquatic habitats and resources if released into the environment. The SPCC Plan for the Project and our Procedures provide restrictions and mitigation measures to minimize potential impacts associated with the release of toxic or hazardous materials. For example, refueling and storing of hazardous materials would be prohibited within 100 feet of a waterbody during construction. In addition, the SPCC Plan contains measures to mitigate, clean up, and report releases should any occur. Based on these measures, we find the potential for a release of fuel or hazardous material into a waterbody would be minimized to the extent practicable, and impacts would not be significant.

Prior to placing the Project into service, the pipeline segments and aboveground facilities would be hydrostatically tested. The pipeline segments would be filled with water obtained from an off-site source and brought onto the site. Hydrostatic test water would be containerized, tested and discharged on site in upland areas in accordance with the applicable state and local permit requirements or transported to an off-site disposal location. Hydrostatic test water would not be discharged in the vicinity of streams. Water would be directed away from the waterbodies to minimize impacts to water flow and scour potential from large amounts of water. Hydrostatic test water would not be allowed to flow into any designated trout streams. BMPs, which include diversion dikes, straw bales, and channels, would be utilized to direct hydrostatic test water away from sensitive features, waterways, and wetlands.

The Minnesota Clean Water Act Section 401 Water Quality Certification requires pre- and post-construction water sampling for all waterbodies crossed by open-cut construction methods. Because Northern intends to cross all waterbodies using HDD and conventional bore, Northern would not need to collect pre-construction water samples. However, Northern would collect post-construction water samples in the event an inadvertent release occurs in a waterbody.

Northern would construct its facilities in accordance with the FERC's Procedures, and regulations and requirements of applicable permits such as National Pollutant Discharge Elimination System stormwater discharge permits. Based on these measures and the information above, we conclude impacts on waterbodies would be minimized to the extent practical and would not be significant.

B.3.3 Wetlands

Northern performed a desktop review of the Project area using National Wetlands Inventory, USGS, national hydrography, and NRCS soils data, as well as aerial orthophotography to identify potential wetlands. Additionally, field surveys of the Project were completed between October 14 and December 10, 2019; and April 1, April 9, and June 16, 2020, to locate and verify the presence of wetlands using the USACE Wetland Delineation Manual (Environmental Laboratories, 1987) and related documents (USACE, 2010, 2012). Field surveys were completed for 100 percent of the parcels crossed by the Project.

Table B.3.3-1 lists all wetlands that would be crossed by the Project, including milepost, wetland identification, National Wetlands Inventory classification, crossing length, anticipated crossing method, and construction and operation impact acreages.

Construction and Operation Impacts and Mitigation

A total of 11 wetlands would be crossed by the Project. The Project would result in approximately 4.0 acres of temporary impacts and 0.3 acre of permanent impacts on wetlands. The Project would cause the temporary impact of 3.22 acres of farmed wetland and permanent loss (i.e., fill) of 0.12 acre of farmed wetland due to the construction of the Hinckley Compressor Station. Construction of the Carlton Interconnect Loop would impact up to 0.71 acre with 0.15 acre of permanent loss of wetland and 0.02 acre of conversion of palustrine scrub-shrub (PSS) wetland to palustrine emergent (PEM) wetland from rights-of-way maintenance. Construction of the Willmar D Branch Line Extension would result in 0.02 acre of temporary wetland impact, but no permanent wetland impacts, loss, or conversion.

Table B.3.3-1 Wetlands Crossed by the Project								
MP		Wetland ID	Wetland Class ^a	Length of Pipeline Crossing (feet)	Primary crossing Method	Area Affected by Construction (acres)	Area Affected by Operation (acres)	
From	To						Operation Fill ^d	Operation Conversion ^{c, e}
Willmar D Branch Line Extension								
1.46	1.47	WIL_W01	PEM1A	38	HDD	0.0	0.0	0.0
1.54	1.54	WIL_W02	PEM1C	28	HDD	0.0	0.0	0.0
1.65	1.67	WIL_W04	PEM1A	105	HDD	0.0	0.0	0.0
1.88	1.88	WIL_W06	PEM1B	55	Open Cut	0.02	0.0	0.0
1.99	2.00	WIL_W07	PFO1B	51	HDD	0.0	0.0	0.0
2.12	2.13	WIL_W10	PEM1C	39	Conventional Bore	0.0	0.0	0.0
2.13	2.14		PFO1B	72		0.0	0.0	0.0
Subtotal				388		0.02	0.0	0.0
Carlton Interconnect Loop								
0.00	0.00	CIL-W07	PEM1B	N/A	Permanent Driveway	0.01	0.01	0.0
0.00	0.02		PSS1B	N/A	TWS and Proposed Facility	0.48	0.14	0.02 ^{b,e}
0.02	0.13		PSS1B	649	HDD	0.0	0.0	0.0
0.13	0.13		PEM1C	43	HDD	0.0	0.0	0.0
0.38	0.48	CIL-W02	PFO1B	410	HDD	0.0	0.0	0.0
0.48	0.56		PSS1B	556		0.0	0.0	0.0
ATWS 3		CIL-W06	PEM1B	N/A	ATWS	0.21	0.0	0.0
Staging Area1		CIL-W08	PEM1B	N/A	Staging Area	0.01	0.0	0.0
Subtotal				1,658		0.71	0.15	0.02
Hinckley Compressor Station								
N/A		HCS-W01	PEM1Bf	N/A	ATWS and Proposed Facility	3.22	0.12	0.0
Subtotal				0.0		3.22	0.12	0.0
Project Total				2,046		3.95	0.27	0.02
^a Wetland Classification based on Cowardin, Classification of Wetlands and Deepwater Habitats: PFO1B – Palustrine Forested – seasonally saturated (Hardwood Swamp), PSS1B – Palustrine Scrub-Shrub – seasonally saturated (Shrub-Carr), PEM1A - Palustrine Emergent – temporarily flooded (Wet Meadow), PEM1B - Palustrine Emergent – seasonally saturated (Wet Meadow), PEM1C - Palustrine Emergent – persistent -- seasonally flooded (Shallow Marsh), PEM1Bf -- Palustrine Emergent– farmed (Farmed Wetland). ^b Based on a 10-foot-wide corridor centered on the pipeline that would be cleared at a frequency necessary to maintain the right-of-way in an herbaceous state. ^c Wetland crossed by the Project via HDD techniques. Northern would not conduct maintenance between the HDD entry and exit pits; therefore, no impacts on the wetland would occur during operation. ^d Operational impacts are a result of permanent impacts from the installation and operation of an above-grade facility. ^e Operational impacts are a result of permanent impacts from the conversion of PSS wetland to a PEM community.								

Wetlands would be crossed by either HDD, conventional bore, or open-cut installation. Northern would utilize HDD and conventional bore crossings under select wetlands to substantially reduce impacts on these wetlands. In wetlands that are crossed via HDD, limited hand-trimming of vegetation could occur within the travel lanes. During operation, Northern would not conduct routine removal of vegetation along the HDD drill paths; therefore, no conversion or permanent impact on PEM, PSS, or palustrine forested (PFO) wetlands crossed by HDD are anticipated.

Northern would use a 75-foot-wide construction corridor through wetlands that would be open cut, with the exception of one instance at the Carlton Interconnect Loop, where the width of the construction right-of-way would be greater than 75 feet due to the need to tie-in the pipeline from two directions with the connection to the launcher (see appendix B). Construction equipment in wetlands would be limited to that which is essential for clearing the rights-of-way, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the rights-of-way.

Temporary impacts on wetlands within the construction workspace could include the removal of vegetation and disturbance of soils. Construction activities in nearby uplands can disturb the surface soils and cause subsequent sedimentation from disturbed areas into wetlands. To minimize the potential for sedimentation of wetlands from construction activities, erosion and sediment control measures would be installed prior to initial ground disturbance, where feasible. If some limited clearing and grubbing is necessary to allow for installation, temporary erosion control measures would be installed immediately following ground disturbance. The erosion control devices would be installed near the wetland boundaries, maintained in working condition throughout construction, and would remain in place until the adjacent upland areas are successfully revegetated as specified in our Procedures.

Northern would follow its Project Wetland Restoration Plan and the remaining measures within the Procedures to avoid or minimize impacts on wetlands. These measures include, but are not limited to:

- temporary impacts on wetlands would be minimized by placement of construction mats over the travel lane;
- the upper one foot of topsoil from the wetlands would be segregated, except in areas of standing water¹², and would be used during restoration;

¹² At the request of the MDNR, Northern has committed to segregate, to the extent practical, topsoil and plant material in saturated and inundated wetland for use during restoration.

- construction equipment in the wetlands would be limited to that essential for clearing the right-of-way, excavating the trench, installing the pipeline, backfilling the trench and restoring the construction right-of-way; and
- following construction and final grading, Northern would stabilize and reseed the construction work areas in accordance with its site-specific wetland restoration plan to reduce the potential for the re-colonization of noxious weeds in wetlands crossed by the Project.

Compaction of wetland soils and rutting within wetlands due to equipment operation can affect wetland hydrology and revegetation. Compaction would be minimized by limiting equipment operation in wetlands and installing temporary equipment mats, as necessary. Soil characteristics also can be changed during construction because of inadvertent mixing of topsoil and subsoil during grubbing and trenching. Northern also would attempt to segregate vegetated wetland masses or rooted clumps in mucky or inundated wetlands to replenish the native seed bank during restoration.

Permanent changes in surface and subsurface hydrology through a wetland can have a long-term impact on the habitat type and quality. To minimize the potential for hydrological drainage impacts and ensure that wetlands are not drained along the pipeline, Northern would install trench plugs at the entrance and exit of the pipeline trench through wetlands. Any confining layers that are breached during construction would be restored during backfilling. Restoration of each wetland would involve returning contours to pre-construction levels and removing temporary erosion control measures.

Wetland crossings completed using the HDD or conventional bore method would, for the most part, avoid and minimize the potential for wetland impacts resulting from erosion, sedimentation, and/or excess turbidity by avoiding surface disturbance in and immediately adjacent to the wetlands. However, as described above, the potential for accidental releases of drilling mud exists. Impacts from an inadvertent release would be minimized by implementation of Northern's HDD Plan, which includes procedures for monitoring, detection, isolating, stopping, and cleanup of inadvertent releases, as well as making necessary agency notifications.

Permanent erosion control devices would be installed during restoration and may include slope breakers, interceptor diversion devices, and/or vegetation cover in adjacent upland areas to minimize long-term sedimentation into the wetlands. Energy dissipation devices may be installed at the down-slope end of surface water diversion devices to prevent erosion off the right-of-way into wetlands.

Northern's SPCC Plan provides restrictions and mitigation measures to limit potential impacts associated with the release of fuels, lubricants, or other potentially toxic

materials used during routine construction. Refueling and storage of hazardous materials would be prohibited within 100 feet of wetlands during construction, unless otherwise requested by Northern and approved by the FERC.

Following construction, wetlands within construction workspaces, including wetland areas within the operational boundary, would be allowed to revegetate naturally to their original condition. PEM wetlands, dominated primarily by low-growing sedges, rushes, and other herbaceous vegetation, would revert within one to three growing seasons. Following construction, Northern would restore wetlands temporarily impacted by construction to pre-Project conditions to the extent practicable, thereby restoring wetland function. There would be permanent impacts on one wetland at the Hinckley Compressor Station (wetland HCS-W01), where 0.12 acre of emergent farmed wetland would be converted to the footprint of compressor station facility.

Northern prepared a site-specific wetland restoration plan to mitigate the temporary construction impacts. As recommended by the NRCS and the local Soil and Water Conservation District offices, Northern would utilize USDA and Minnesota Board of Water and Soil Resource seed mixes, planting densities, and application rates during restoration. Based on the information provided above, we conclude that the Project would not have significant impacts on wetlands.

B.3.4 Hydrostatic Testing and Water Use

Hydrostatic testing would be conducted in accordance with DOT regulations in 49 CFR 192 to verify the integrity of the pipe and the piping components before being placed into service. Hydrostatic test water would be obtained from local municipal sources and brought to the Project in compliance with state regulations and existing water rights. No chemical additives would be mixed with the hydrostatic test water. Table B.3.4-1 includes the reference mileposts, the approximate volume of water to be used and potential water sources and discharge locations.

Table B.3.4-1 Mileposts, Water Volume and Sources, and Discharge Locations for Hydrostatic Testing				
Project Component	Number of Test Sections	Begin MP	End MP	Volume (gallons, approx.)
Willmar D Branch Line Extension	1	1.39	2.19	91,100
Carlton Interconnect Loop	1	0.00	0.63	72,100
Viking Interconnect Branch Line	1	0.00	0.08	1,170
Hinckley Compressor Station	N/A	N/A	N/A	35,000
Pierz Compressor Station and Interconnect	N/A	N/A	N/A	5,000

Following testing, Northern may discharge the water to upland areas to prevent runoff into wetlands or waterbodies, or haul the water off for disposal at an approved facility. Discharge of test water would be conducted in accordance with the FERC

Procedures and National Pollutant Discharge Elimination System permits, and would employ an energy-dissipating device such as a straw bale dewatering structure. Discharge rates would be controlled to prevent erosion, scouring, sedimentation, flooding, or the introduction of foreign or toxic substances into adjacent waterbodies. Hydrostatic test waters discharged in well-vegetated upland areas would be at sufficient distances from surface waters and with low enough discharge rates that waterbodies would not be impacted. Northern may also utilize hydrostatic test water for the control and mitigation of fugitive dust in areas disturbed for construction, such as access roads. If so, actual amounts of water used for dust control would vary based on climatic conditions at the time of construction.

No significant water quality impacts are anticipated as a result of discharge from hydrostatic testing. The new pipeline facilities would consist of new steel pipe that would be free of chemicals or lubricants, and no additives would be used.

B.3.5 Requested Modifications to the FERC Procedures

Northern has adopted the May 2013 version of our Procedures, but has requested modifications to the wetland and waterbody setback requirements in seven locations, including for an access road, ATWS/staging area in or adjacent to wetlands, a TWS more than 75 feet within wetland due to site-specific constraints, and for an access road over a waterbody. Appendix B summarizes the requested deviations where the requirements of the Procedures cannot be met due to site-specific conditions and Northern's justification for a modification. We have reviewed these modifications and find them to be acceptable.

B.4 FISHERIES, VEGETATION, AND WILDLIFE

B.4.1 Fisheries

Waterbodies that would be crossed by the Project consist of two intermittent streams crossed by the Willmar D Branch Line Extension and one open water feature (associated with the Pine Hill Golf Course) crossed by the Carlton Interconnect Loop. All three of the waterbodies that Northern proposes to cross for construction of the Project are freshwater and warmwater fisheries.

No essential fish habitat occurs within or near the Project area. No federally listed or state-listed or special concern fish species have the potential to occur near the Project area. Further discussion of federal and state-listed species is in section B.4.4.

Construction and Operation Impacts and Mitigation Measures

Habitat alterations could lead to temporary loss of habitat and changes in behavior in fish. Alterations of water quality could also increase stress, injury, and/or mortality among fish and other aquatic species. For the Project, Northern would complete two waterbody crossings via HDD and two crossings of one waterbody via conventional bores. Vegetation removal at waterbody crossings would be limited as no open-cut crossings are proposed. Northern would implement its HDD Plan and follow our Plan and its Procedures to control erosion and sedimentation and to minimize impacts on waterbodies.

Northern would minimize potential impacts on fishery and aquatic resources by implementing the Procedures and through the use of HDD or conventional bore methods at waterbody crossings, as well as by implementing an SPCC Plan, hydrostatic test water protocols, and other mitigations discussed in the surface waters discussion above (section B.3.2). Therefore, we conclude that impacts on fisheries and aquatic resources from the Project would be sufficiently minimized, temporary, and not significant.

B.4.2 Vegetation

The vegetation cover types impacted by the Project would include:

- Agriculture – active farmed cropland (mainly corn and soybean);
- Forested upland – hardwood forest, mixed hardwood conifer forest, and pine plantation;
- Open land – non-forested rangeland, non-agricultural fields, and other disturbed areas that are dominated by a mixture of mid-grass or short-grass species, introduced grass species, and annual species; and
- Wetlands.

Table B.4.2-1 lists the acreage of each cover type that would be impacted by construction and operation of the Project.

Northern identified the dominant vegetation of each cover type during field surveys for the Project conducted in October and November 2019 and April 2020. Agricultural land was the dominant vegetation cover type and was found to be primarily corn and soybeans.

Forested upland present within the Willmar D Branch Line Extension project area include American elm, amur maple, American basswood, bigtooth aspen, black cherry, blue spruce, and boxelder. Upland forested areas within the Carlton Interconnect Loop project area consist of conifer-hardwood forest dominated by sugar maple, American basswood, yellow birch, white ash, red oak, white oak, aspen, eastern hemlock, red pine, and white pine. No forested land is present within the Hinckley Compressor Station or the Pierz Compressor Station and Interconnect project areas.

Common species in open land areas included non-native grasses including Kentucky bluegrass, smooth brome, reed canary grass and orchard grass. The wetlands that would be crossed by the Project are classified as seasonally flooded, wet meadow, shallow marsh, hardwood swamp, shrub-carr, and farmed wetland. Seasonally flooded wetlands were dominated by boxelder, common buckthorn, meadow willow and reed canary grass. Species observed within wet meadows and shallow marsh consisted of barnyard grass, fowl bluegrass, giant goldenrod, green bulrush, Kentucky bluegrass, lake sedge, lance-leaf aster, reed canary grass and narrowleaf cattail. Hardwood swamps were dominated by American cranberry bush, common buckthorn, eastern cottonwood, giant goldenrod, green ash, lance-leaf aster, nannyberry, reed canary grass, woolgrass balsam poplar, black ash, Canada bluejoint, cinnamon fern, lake sedge, marsh horsetail, narrowleaf cattail, paper birch, pussy willow, redosier dogwood, reed canary grass, sandbar willow and speckled alder. Species observed within the shrub-carr wetlands included balsam fir, balsam poplar, Bicknell's sedge, black ash, Canada bluejoint, cockspur hawthorn, hybrid cattail, lake sedge, pussy willow, quaking aspen, redosier dogwood, speckled alder, tamarack, green ash, narrow panicle rush, redtop, and sandbar willow.

Data were obtained from the Minnesota Geospatial Commons website to determine the presence or absence of known native plant communities within the Project. This includes an evaluation of Regionally Significant Ecological Areas (RSEA), which are natural areas or ecologically significant terrestrial or wetland areas identified by the MDNR. One RSEA was mapped, between MPs 1.90 and 2.19, within the Willmar D

Table B.4.2-1 Construction and Operation Impacts on Vegetation Cover Types in the Project Area (acres)								
Facility	Agricultural		Forested		Wetland		Open Land	
	Const ^a	Oper ^b						
Willmar D Branch Line Extension								
Pipeline right-of-way ^a	0.6	0.3	1.5	0.7	<0.1	0	1.8	0.7
ATWS	0.7	0	0.3	0	0	0	2.3	0
Temporary Access Roads	0	0	1.0	0	0	0	0	0
Permanent Access Roads	0	0	0	0	0	0	0	0
Pipeline Appurtenant Facilities ^c	0	0	0	0	0	0	0.1	0.1
Subtotal	1.3	0.3	2.8	0.7	<0.1	0	4.2	0.8
Carlton Interconnect Loop								
Pipeline right-of-way ^a	0	0	0.1	0	0.3	<0.1	<0.1	0
ATWS	0	0	1.6	0	0.2	0	0.2	0
Staging Area	0	0	0.6	0	<0.1	0	0.1	0
Temporary Access Roads	0	0	0	0	0	0	0	0
Permanent Access Roads	0	0	0	0	<0.1	<0.1	0	0
Pipeline Appurtenant Facilities ^c	0	0	0	0	0.1	0.1	0.1	0.1
Subtotal	0	0	2.3	0	0.7	0.2	0.3	0.1
Hinckley Compressor Station								
Subtotal	7.2	6.2	0	0	3.2	0.1	0	0
Pierz Compressor Station and Interconnect/ Viking Interconnect Branch Line								
Subtotal	3.0	0.7	0	0	0	0	0	0
Total^d	11.5	7.1	5.2	0.7	4.0	0.3	4.5	0.9
^a Temporary cleared areas consist of that portion of the construction rights-of-way and ATWS that would be allowed to revegetate following construction. ^b Permanently cleared areas consist of those portions of the permanent rights-of-way that would be maintained. ^c Aboveground pipeline facility footprints for area outside the permanent pipeline rights-of-way are included. Area inside the permanent pipeline right-of-ways included in the permanent pipeline acres. ^d The totals shown in this table do not include unvegetated areas such as Industrial/Commercial land; therefore, these numbers will not equal the total area of disturbance for the Project. Note: Values may not sum due to rounding.								

Branch Line Extension and given an ecological score of 1¹³. There are no other unique, sensitive, or protected vegetation types identified within the Project area.

The primary vegetation cover types affected by construction of the Project would be agricultural and forested land, which comprises 11.5 and 5.2 acres of the workspace, respectively. Trees would be cleared within the construction footprint to provide a safe work area; however, the woody vegetation would be allowed to regrow in areas only used as temporary workspace. A total of 0.7 acre of forested land would undergo routine vegetation maintenance within a 50-foot-wide corridor in uplands, all within the Willmar D Branch Line Extension operational boundary. No forested land is within the proposed operational boundary of the Carlton Interconnect Loop, and no forested land would be impacted by the construction or operation of the aboveground facilities for the Project.

Approximately 4.0 acres of wetland would be temporarily impacted by construction of the Project. Wetland impacts and Northern's proposed measures to minimize impacts are presented in section B.3.3.

Temporary impacts on open lands are expected along the proposed construction corridor due to grading and trenching activities during pipeline installation. The temporary construction corridor and ATWS would be allowed to revert to open land use after completion of construction. Approximately 0.9 acre of impact from routine maintenance on open land would occur during operation. In upland areas, routine vegetation maintenance would be conducted on a 50-foot-wide strip centered over the pipeline with a frequency of not more than once every three years. In addition, a 10-foot-wide strip over the pipeline may be maintained in an herbaceous state by mowing, cutting, and trimming on an annual basis.

Scott County is listed as a county with an emerald ash borer (EAB) quarantine (MDA, 2020b). The Willmar D Branch Line Extension is inside the EAB county quarantine area, but outside the generally infested area as mapped by the MDA in Scott County.

The MDNR tracks oak wilt in Minnesota (MDNR, 2020b). Oak wilt is caused by an invasive fungus that may affect and kill all species of oak trees. According to the MDNR's mapping, all of the Project is within the oak-wilt infected area. The high-risk time when oaks are most susceptible to infection from oak wilt is from April 1 through July 15. If the spring is unusually warm, the risk of oak wilt can occur before April. If the daily high temperature is about 60 degrees Fahrenheit or higher for six consecutive

¹³ The MDNR gives each RSEA a score of 1, 2, or 3, with 3 as the highest possible score and 1 as the lowest possible score. Scores are based on how well continuous natural areas meet standards for size, shape, connectivity, adjacent land use, and species diversity. A score of '1' is for areas that are smaller in size; may have less diversity of vegetation cover types; may have more adjacent cover types or land uses that could adversely affect the area; or may be an isolated native plant community mapped and given a score of moderate biodiversity significance by the Minnesota County Biological Survey.

days, there may be a risk of oak wilt. The MDA also recognizes Dutch elm disease as a fungus that can kill elm trees and other species (MDA, 2020c). The MDA does not have regulations or quarantine zones for Dutch elm disease but recommends limiting removal and disposal of elm trees.

Northern obtained lists of noxious and invasive weeds that could be present in the Project area from the USDA Introduced, Invasive, and Noxious Plants database (USDA, 2020) and the MDA (MDA, 2020). Northern also conducted field surveys for noxious and invasive weeds within the Project area in October and November 2019 and April 2020. The species identified within the Project area and their locations are listed in table B.4.2-2.

Table B.4.2-2 Noxious Weed Species Observed in the Project Area	
MP	Noxious Species Observed
Willmar D Branch Line Extension	
1.40	Canada thistle
1.43	common buckthorn
1.67	common buckthorn
Carlton Interconnect Loop	
0.05	common tansy

Construction and Operation Impacts and Mitigation Measures

During construction, the pipeline rights-of-way and workspaces would be cleared of vegetation to the extent necessary to allow for safe working conditions, resulting in direct impacts on vegetation. The clearing of forested areas would result in a long-term impact, even in temporary work spaces.

Following construction of the pipeline, areas cleared or otherwise disturbed for construction would revert to pre-construction vegetation cover types, with the exception of forested areas along the operational pipeline rights-of-way. Northern would implement measures to revegetate temporary workspace areas in accordance with the Plan and the SWPPPs, including reseeded. During operation, routine vegetation maintenance of the permanent pipeline rights-of-way, including tree removal, would be necessary to allow for visibility and access to the pipeline for required patrols and surveys. The permanent rights-of-way would be periodically mowed, but not more frequently than every three years, in accordance with the vegetation maintenance restrictions outlined in our Plan and Procedures. However, a corridor approximately 10 feet in width and centered over the pipeline would be cleared at a frequency necessary to maintain the 10-foot-wide corridor in an herbaceous state.

Northern has developed a Project-specific Noxious Weed Plan to prevent, mitigate, and control the spread of noxious weeds during construction and operation of the proposed facilities. Northern would provide Project contractors with information and training about measures to be taken to prevent the spread of noxious weeds in

uncontaminated areas and about controlling the proliferation of weeds present in the Project area. Noxious weed control measures would be implemented in accordance with existing regulations and jurisdictional land management agencies or landowner agreements. Treatment methods would be based on species-specific and area-specific conditions (e.g., proximity to water, wetlands, riparian areas or agricultural area) and time of year.

Prior to excavation activities, silt fence would be installed around the boundaries of noxious weed areas to prevent the transport of noxious weed seeds, roots, or rhizomes to areas without invasive plants. An equipment cleaning program would be used to prevent spread of noxious weed seed and debris. Equipment traveling out of noxious weed areas would be cleaned until free of soil and plant debris prior to proceeding into an area without invasive plants. Water from the cleaning stations would be collected and transported off-site to an appropriate disposal facility. All equipment entering or leaving the noxious weed areas would be logged with the date and time of entry and exit, and confirmation that it was cleaned. Where construction mats are used, a layer of geotextile fabric or a functional equivalent would be placed under construction mats to further limit contact with the noxious weeds. If noxious weeds are present within the HDD pullback area, these areas would be entirely covered by geotextile fabric and construction mats. We have reviewed Northern's Noxious Weed Plan and find these measures, as well as Northern's adherence to the Plan, adequate to minimize the potential for weeds to be introduced or spread due to the Project.

In general, the majority of impacts on vegetation types, such as agricultural, open lands, and wetlands, would be short-term impacts, as these areas would be expected to return to preconstruction vegetation cover within one or two growing seasons after construction. Forested impacts, however, are longer term..

The Willmar D Branch Line Extension crosses through one RSEA on private land between MPs 1.90 and 2.19. This area is comprised of wetlands WIL-W10, WIL-W07, and WIL-W06; forest; pasture; and residential land. The pipeline would be installed by open-cut excavation within the pasture and residential areas, and the wetland and forested area would be crossed by HDD and conventional bore. Since no clearing, except hand-trimming, would occur between the HDD and conventional bore entry and exit points, there would be no permanent impacts on the wetland vegetation or forested areas. Impacts on the RSEA outside of the HDD and conventional bore areas would be to herbaceous pasture and residential areas and would be of short duration. Northern would restore its workspaces to preconstruction condition, to the extent practicable; therefore, the impacts on this RSEA would be temporary and of short duration. No long-term permanent impacts would occur.

Northern would comply with the MDA EAB quarantine regulations and not transport ash trees (limbs, branches, stumps or chips) outside of the quarantine zone. Northern typically would leave cut trees on the landowner's property for landowner use.

The locations for any stacking of timber for landowners' use must comply with our Plan at section III.E. If a landowner requests that Northern remove cut trees, Northern would find a disposal location within each EAB county quarantine area to prevent moving potentially infected wood outside of the quarantine area.

Northern would attempt to limit disturbance to oak stands during high-risk times; however, avoidance of all oak removal may not be possible. If Northern removes oaks between April 1 and July 15, Northern would comply with MDNR recommendations to apply water-based paint or shellac immediately to the cuts. If an infected oak tree is cut, Northern would not remove it from the property but instead burn or tarp the infected tree to prevent the spread of the disease in compliance with local ordinances.

Northern would not transport cut elm trees outside of the counties where they originated. Further, if a tree is suspected to be infected with Dutch elm disease, Northern would follow MDNR recommendations and chip, burn, or bury the tree in compliance with local ordinances.

In conclusion, construction and operation of the Project would result in short- and long-term impacts on vegetation. With the implementation of restoration methods outlined in the FERC Plan and Procedures, Northern's SPCC Plan, and Northern's Noxious Weed Plan, we conclude that impacts on vegetation would not be significant.

B.4.3 Wildlife and Migratory Birds

Because vegetation type is an important component of wildlife habitat and often determines wildlife species distribution, the vegetation community types described in section B.4.2 have been adapted to define wildlife habitat types within the Project area. The Project area comprises agricultural, forested land, open land, and wetland habitat.

Some of the major wildlife species that are common in the area of the Willmar D Branch Line Extension are white-tailed deer, gray fox, eastern cottontail rabbit, red squirrel, and chipmunk. Woodchuck, muskrat, and beaver may occasionally be present, and less common animals in the area include otter and mink. House wrens, northern cardinals, American goldfinches, blue jays, song sparrows and common yellowthroats are common in open land and residential areas. Forest bird species that could be present include wood thrush, scarlet tanager and ovenbird. Game birds that could be present include Canada goose, ring-necked pheasant, wild turkey, and gray partridge. Waterfowl such as wood ducks, mallards, blue-winged teal, ruddy duck, and hooded mergansers are found in and around the wetlands and waterways. Raptor species that could be present include sharp-shinned hawk, Cooper's hawk, broad-winged hawk, and great horned owl.

Some of the major wildlife species in the vicinity of the Carlton Interconnect Loop, Hinckley Compressor Station, and Pierz Compressor Station and Interconnect include white-tailed deer, black bear, eastern gray wolf, gray squirrel, red squirrel, snowshoe hare, and porcupine. Red fox, bobcat, coyote, muskrat, fisher, mink, otter,

raccoon, and beaver are the main furbearers. A small herd of elk was released in the region of the Carlton Interconnect Loop, and the number of elk continues to increase. The forests and grasslands provide habitat for most of the birds native to central Minnesota. Cardinals, woodpeckers, and songbirds are common. Game birds include ruffed grouse, sharp-tailed grouse, ring-necked pheasant, and gray partridge. Waterfowl include ring-necked duck, lesser scaup, bufflehead, common goldeneye, and Canada goose. Birds of prey include northern harrier, broad-winged hawk, rough-legged hawk, barred owl, and occasionally bald eagles. Waterfowl such as wood ducks, mallards, blue-winged teal, ruddy duck, and hooded mergansers are found in and around the wetlands and waterways.

Important Bird Areas (IBA) are discrete sites that provide essential habitat for one or more bird species and include habitat for breeding, wintering, and/or migrating birds (Audubon, 2020). None of the Project components cross an IBA. The nearest IBAs to the Project include the Murphy-Hanrehan Park Reserve IBA and the Lower Minnesota River Valley IBA located approximately 2.4 miles and 7.25 miles, respectively, northeast of the Willmar D Branch Line Extension.

The Project components would not cross any public lands managed by local, state, or federal agencies or wildlife management areas, conservation lands, parks, trails, or designated natural or scenic areas.

Construction and Operation Impacts and Mitigation Measures

Project construction activities would have temporary, minor, and localized impacts on wildlife habitat and wildlife populations. No impacts on wildlife at a community or regional level are anticipated as a result of the Project. Construction activities such as clearing rights-of-way and workspace would reduce feeding, nesting, and cover habitat until vegetation has become re-established. Mobile species may be disturbed or displaced temporarily from portions of their habitats, and mortality of individuals of less mobile species, such as some small mammals, reptiles, or amphibians, may occur. Indirect wildlife impacts associated with construction noise and increased human activity would be temporary and could include abandoned reproductive efforts, displacement, and avoidance of work areas. However, both direct and indirect impacts on wildlife along the construction corridor, and other work areas, generally would be of short duration and limited to the period of construction activities.

Much of the Project would be constructed in agricultural and previously disturbed areas. Wildlife displaced during construction is expected to temporarily relocate to suitable nearby habitat. Disruption of wildlife movement is expected to be minor because no permanent barriers to wildlife would be constructed.

Northern's EIs would inspect the trench for wildlife daily prior to construction and would remove any wildlife trapped in the trench upon discovery and contact MDNR staff

if the species was determined to be threatened or endangered. EIs would also inspect the trench for any livestock daily. Additionally, in locations where wildlife activity is anticipated, Northern would install ramps in the trench at regular intervals to provide an exit for wildlife that may fall into the trench; Northern would also provide gaps in spoil piles and pipe stringing to allow wildlife to exit the construction corridor. Fencing, ramps, and gaps would be assessed on a site-specific basis, with the landowner, and would be applied based on the presence or absence of livestock and the amount of wildlife activity in a given area. Northern would implement our Plan and Procedures and would minimize the amount and time of open trench to minimize impacts on wildlife and livestock.

Approximately 3 acres of emergent, farmed wetland at the Hinckley Compressor Station would be temporarily impacted during construction but would not be inside the operational footprint of the facility. Northern would plant a wetland seed mix containing native forbs and grasses to enhance vegetation diversity, specifically for pollinators in the wetland during restoration. The seed mix also would contain several milkweed species to provide foraging for Monarch butterflies. Northern also would plant a mix of native grasses and flowers along the north side of the Hinckley Compressor Station and all sides of the Willmar valve lot. The grass and flower mix would contain plants for pollinators, including Monarch butterflies.

Northern belongs to the Wisconsin Department of Natural Resources Karner Blue Butterfly Habitat Conservation Plan Partnership and its approval for inclusion in the U.S. Fish and Wildlife Service (USFWS) Nationwide Monarch Butterfly Candidate Conservation Agreement for Energy and Transportation Lands is pending. Northern would plant pollinator friendly species within Northern-owned properties as part of the Project. Northern would also offer landowners the option of utilizing pollinator friendly seed mixtures on privately owned lands within the Project workspaces.

Northern would use BMPs in accordance with the Plan and its Procedures to reduce ground disturbance, minimize erosion and sediment runoff, and promote revegetation within the construction area. The SPCC Plan for the Project provides restrictions and mitigation measures to minimize potential impacts associated with the release of fuels, lubricants, or other potentially toxic or hazardous materials used during routine construction. Northern would limit vegetation removal at waterbody crossings by use of HDDs, conventional bores, and adherence to the Procedures.

Following construction, workspaces outside the permanent rights-of-way would revert or be restored in accordance with our Plan and Procedures. Impacts on non-forested upland and wetland habitats disturbed by construction but not within the operational footprint of the Project would be temporary and are expected to return to pre-construction vegetation cover within one or two growing seasons after construction is completed. Based on the vegetation types present, previously disturbed areas and siting the facilities adjacent to existing rights-of-way, the presence of similar habitats adjacent

to and in the vicinity of construction activities, and the implementation of our Plan and Procedures, we conclude that construction and operation of the Project would not significantly impact wildlife.

Migratory Birds

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (16 United States Code [U.S.C.] §§703-711), which prohibits the taking of any migratory bird, or a part, nest, or eggs of any such bird, except under the terms of a valid permit issued pursuant to federal regulations. Bald and Golden Eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 U.S.C. §§668-668d).

Executive Order 13186 (66 Federal Register 3853) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and to avoid or minimize adverse effects on migratory birds through enhanced collaboration with the USFWS. Executive Order 13186 states that emphasis should be placed on species of concern, priority habitats, and key risk factors and that particular focus should be given to addressing population-level impacts. On March 30, 2011, the USFWS and the Commission entered into a Memorandum of Understanding that focuses on avoiding or minimizing adverse effects on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies.

Bird Conservation Regions (BCR) are geographically based subsets of the larger Birds of Conservation Concern list. The Project would be within the Boreal Hardwood Transition BCR (BCR 12) and the Prairie Hardwood Transition BCR (BCR 23). The Willmar D Branch Line Extension and Pierz Compressor Station and Interconnect would be entirely within BCR 23. The Carlton Interconnect Loop and the Hinckley Compressor Station would be entirely within BCR 12. The species listed in BCR 12 and 23¹⁴ represent bird species of concern, including those protected under the MBTA (and some non-MBTA-protected species), that represent the USFWS' highest conservation priorities (USFWS, 2008).

The Boreal Hardwood Transition region is characterized by coniferous and northern hardwood forests, nutrient-poor soils, and numerous clear lakes, bogs, and river flowage. All of the world's Kirtland's warblers breed within this region, as do the majority of golden-winged warblers and Connecticut warblers. Other important forest birds include the black-billed cuckoo, veery, and rose-breasted grosbeak. Yellow rail are among the important wetland species. Although breeding ducks are sparsely distributed, stable water conditions allow for consistent reproductive success. Wood duck, mallard, American black duck, ring-necked duck, and common goldeneye are common breeding

¹⁴ Refer to table 3.4-2 in Resource Report 3 (Accession number 20200731-5243) for a full list of the migratory bird species likely to occur in the Project area.

species in this region. Threats to wetland habitat in this region include recreational development, cranberry operations, peat harvesting, and drainage.

The Prairie Hardwood Transition contains remnant populations of greater prairie chicken in grasslands and cerulean warbler and other forest-breeding migrants to the northeast. Early successional habitat is used by golden-winged warblers, Henslow's sparrows, and American woodcock. Glaciation has resulted in numerous pothole-type wetlands and shallow lakes providing important waterfowl habitats ranging from emergent marshes and diked impoundments to normally ice-free deepwater habitats valuable for diving ducks. This region supports breeding waterfowl, including mallard, blue-winged teal, wood duck, and redhead (North American Bird Conservation Initiative, 2020).

Most migratory bird nesting activity in Minnesota occurs from mid-April to mid-July; however, some migratory birds are known to nest outside of the primary nesting season periods. Northern anticipates beginning construction in April or May 2021, within the primary nesting season, with construction continuing through November 2021. Northern would have a biologist conduct a pre-construction nest survey for breeding birds within the Project workspaces.

The impact of grading, clearing, and excavation of open uplands, agricultural lands, non-forested wetlands, and developed lands would be short in duration because these land use types would likely return to their preconstruction conditions within a few growing seasons. The effect of clearing, grading, and rights-of-way maintenance in forested habitats would be more prominent and long-term to permanent because these areas may not be restored to their preconstruction vegetation cover potentially for decades, if at all. To minimize impacts on migratory bird habitat, Northern has designed the Project to use HDDs and conventional bores to the extent practicable to avoid surface impacts on waterways and wetlands and forested lands.

Northern would not conduct routine vegetation maintenance of the rights-of-way more frequently than once every 3 years in upland areas; however, a corridor approximately 10 feet in width and centered over the pipeline would be cleared at a frequency necessary to maintain the 10-foot-wide corridor in an herbaceous state. Routine vegetation maintenance would not occur between mid-April to mid-July to minimize the potential for impacts on migratory bird species that may use the permanent rights-of-way for nesting. Therefore, we conclude that impacts on migratory birds from construction of the Project would largely be temporary and not be significant.

To further minimize impacts, Northern would have a qualified biologist conduct avian surveys no more than seven days prior to construction activities. If an occupied raptor nest is observed, Northern would suspend construction activities within 660 feet of the nest during breeding season or until the fledglings have left the area. If a non-raptor nest is observed, Northern would suspend construction activities within 100 feet of the

nest until the MDNR and USFWS are contacted to determine any necessary avoidance or mitigation measures, such as workspace buffering, prior to continuing ground-disturbing activities in the vicinity of an active nest.

B.4.4 Special Status Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA and those species that are state endangered or threatened. Section 7 of the ESA requires the lead federal agency (in this case, FERC) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat of a federally listed species. The agency is required to consult with the USFWS to determine whether any federally listed endangered or threatened species or any of their designated critical habitat are located in the vicinity of a proposed project and to determine the proposed action's potential effects on those species or critical habitats.

Northern conducted field surveys for the Project area in October and November 2019 and April 2020 to identify potential habitat for sensitive species. Appendix D identifies the federally listed and state-listed species with the potential to occur in the Project area, species habitat requirements, and our determination of effect. Species-specific discussions are also provided in the following subsections.

Federally Listed Species

The federally listed species that are known to occur or potentially occur within the Project in Carlton, Dakota, Morrison, Pine, and Scott counties are the northern long-eared bat, rusty patched bumble bee, prairie bush clover, Canada lynx, gray wolf, and piping plover. No federally listed threatened or endangered or special concern fish species are known to occur near the Project.

Northern, acting as our non-federal representative for the purpose of complying with Section 7(a)(2) of the ESA, initiated informal consultation with the USFWS Twin Cities Ecological Services Field Office on July 23, 2020, with a follow-up letter on October 6, 2020. In an email dated October 13, 2020, the USFWS agreed with *no effect* findings for gray wolf, prairie bush clover, and piping plover. We have reviewed the information and agree that the Project would have no effect these three species. As such, section 7 consultation for these three species is complete and they are not discussed further. The USFWS also concurred with Northern's determination that the Project *is not likely to adversely affect* the rusty patched bumble bee and Canada lynx. These species, as well as the federally threatened northern long-eared bat, are discussed below.

Northern Long-eared Bat

During winter, northern long-eared bats use large caves and mines that have large passages and entrances, constant temperatures, and high humidity with no air currents. No caves or mines were identified in the vicinity of the proposed Project; however, portions of the Willmar D Branch Line Extension and the Carlton Interconnect Loop may contain suitable summer habitat for the northern long-eared bat. Tree clearing within the workspaces is proposed for the Willmar D Branch Line Extension and the Carlton Interconnect Loop. Potential impacts on individual bats may occur if clearing or construction takes place when the species is breeding, foraging, or raising pups in its summer habitat. Bats may be injured or killed if occupied trees are cleared during this active window, and the species may be disturbed during clearing or construction activities due to noise or human presence.

Dakota County (Willmar D Branch Line Extension) is listed as a county with documented occurrences of white-nose syndrome-infected hibernacula (USFWS, 2019b) and is within the white nose syndrome buffer zone per the USFWS Final 4(d) Rule¹⁵. Carlton County (Carlton Interconnect Loop) is also within the white nose syndrome buffer zone per the Final 4(d) Rule (USFWS, 2019b). Northern queried the MDNR Natural Heritage Information System (NHIS) database for occurrences and locations for known bat maternity roost trees and hibernacula. According to the NHIS database, the Willmar D Branch Line Extension and the Carlton Interconnect Loop are not within 0.25 mile of a known, occupied hibernaculum, or within 150 feet of known, occupied maternity roost trees for northern long-eared bat.

Tree clearing is proposed for these Project components; and because potential suitable habitat is present, we have determined the Willmar D Branch Line Extension and the Carlton Interconnect Loop *may affect* this species. Northern submitted the northern long-eared bat 4(d) Rule Streamlined Consultation Form on July 23, 2020. Per the USFWS's streamlined consultation process, after 30 days of no response, Section 7 consultation for the ESA is considered complete. No additional consultation or response from the USFWS was received. As such, we have determined that the Project *is not likely to adversely affect* the northern long-eared bat and would not cause prohibited take under the Final 4(d) Rule.

There is no suitable habitat for the northern long-eared bat within the Project area for the Pierz Compressor Station and Interconnect, the Viking Interconnect Branch Line,

¹⁵ The Final 4(d) Rule for NLEB specifically defines "take" prohibitions for the species. Incidental take is prohibited if it occurs within a hibernaculum, if it results from tree removal activities within 0.25 mile of a known hibernaculum, or if it results from removal of a known occupied maternity roost or trees within 150 feet of the maternity roost during pup season (June 1 through July 31).

nor the Hinckley Compressor Station site. Additionally, no tree clearing is proposed for these Project components. Accordingly, construction and operation of the Pierz Compressor Station and Interconnect, Viking Interconnect Branch Line and Hinckley Compressor Station would have *no effect* on the northern long-eared bat. Section 7 consultation is complete for this species.

Canada Lynx

The federally threatened Canada lynx inhabits moist, cool, boreal spruce-fir forests. In the Great Lakes region, Canada lynx habitat is forest that is a mix of evergreens and hardwoods.

There is potential lynx habitat within the Carlton Interconnect Loop, although it is fragmented by roads and residential land, making it less likely lynx would find the habitat and use it (Ruediger et al., 2000). Northern proposes clearing 2.3 acres of forested land within temporary workspaces for the Carlton Interconnect Loop.

Suitable boreal forest habitat for the Canada lynx is not present in the vicinity of the proposed Hinckley Compressor Station. The MDNR NHIS database was also reviewed for element occurrences for the Canada lynx in the vicinity of the Hinckley Compressor Station, and none were identified in Pine County. Therefore, construction at the compressor station would have *no effect* on the species.

Because there is potential lynx habitat within the Carlton Interconnect Loop, which would be temporarily impacted by construction, we have determined that the Project *is not likely to adversely affect* the Canada lynx. The USFWS' October 13, 2020 concurrence letter to Northern completes Section 7 consultation for this species.

Rusty Patched Bumble Bee

The federally endangered rusty patched bumble bee has been observed in a variety of habitats, including prairies, forest, marshes, agricultural landscapes, and residential parks and gardens. They require habitat with floral resources (which provide them nectar and pollen) from April to September, undisturbed nesting sites (underground and abandoned rodent cavities or clumps of grasses) with proximity to floral resources, and overwintering sites for hibernating queens (USFWS, 2019c).

No MDNR NHIS occurrences for the rusty patched bumblebee are present within the Project area. However, the USFWS High Potential Zone (HPZ) for the rusty patched bumble bee encompasses the entire Willmar D Branch Line Extension from MP 1.39 to MP 2.19, and the proposed workspaces for the Willmar D Branch Line Extension cross approximately 9.8 acres of the HPZ, as shown in figure B.4.4-1.

Land cover within the workspace of the Willmar D Branch Line Extension is a mix of shrub thicket, fallow fields, pastures, open land, hardwood forest, mixed

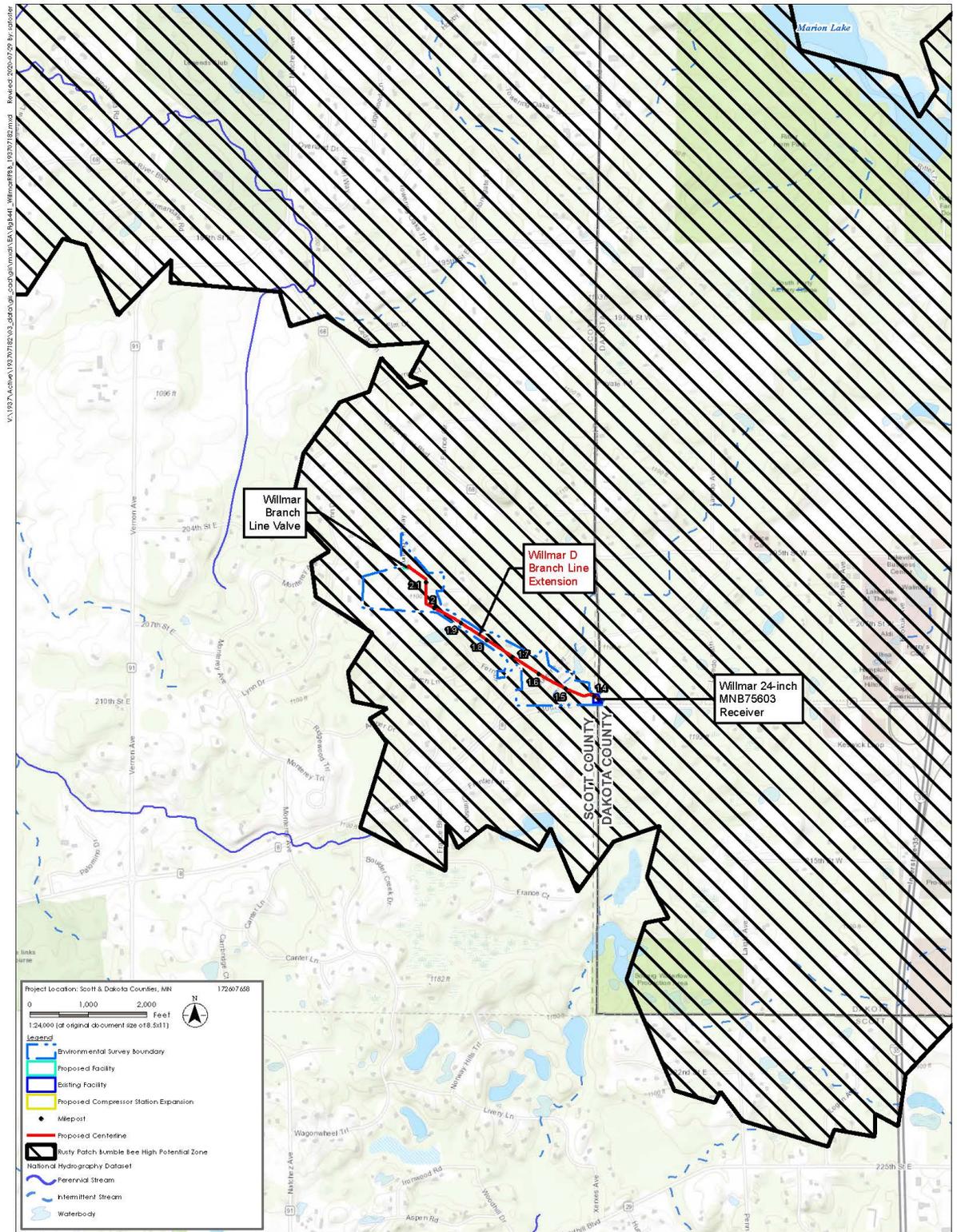
hardwood/conifer forest, residential housing, and industrial lands. The pastures, open land, and woodlands are all potential foraging habitat for the rusty patched bumble bee. The woodland habitat is potential overwintering habitat. The upland open land and woodland edges are potential nesting habitat.

Northern prepared a survey protocol for conducting floristic surveys and presence/absence surveys for the rusty patched bumble bee and submitted these protocols to the USFWS Twin Cities Field Office for review May 7, 2020. The USFWS, via email, responded May 22, 2020, stating that the USFWS had no comments or concerns regarding the survey protocols.

In the survey protocols, Northern committed to conduct four floristic surveys, initiating May 2020 and subsequently every five weeks after the initial survey. The surveys cover the portions of the Willmar D Branch Line Extension where vegetation would be cleared during construction, but are not being conducted in areas where impacts would be avoided through HDD (from MP 1.45 to 1.68). Northern conducted the initial floristic survey May 27, 2020, and submitted the results to the USFWS June 8, 2020. The results of the initial floristic survey indicated that presence/absence surveys should be conducted from MP 1.39 to MP 1.45 and from 1.80 to 1.90, as suitable habitat was identified in these areas. The results of the second floristic survey completed in June 2020 found similar results with a slightly expanded presence/absence survey corridor near MP 1.90. The results of the second floristic survey were submitted to USFWS on July 23, 2020, as part of initiation of information Section 7 consultation.

Northern completed the presence/absence surveys between July 31 and August 22, 2020, which was the approximate peak of the rusty patched bumble bee flight season. Six species of bumble bees were observed within the Project area; however, no rusty patched bumble bees were observed. Northern determined that it is unlikely that the Project area harbors colonies of rusty patched bumble bees. Additionally, it is unlikely that the Project area would be used for rusty patched bumble bee nesting or hibernation based on low floral diversity and compacted soils. While it appears that no rusty patched bumble bees are currently utilizing the Project area, the Project would temporarily affect rusty patched bumble bee foraging habitat within an HPZ mapped area. Based on this finding, we have determined that the proposed Project *is not likely to adversely affect* the rusty patched bumble bee. The USFWS' October 13, 2020 concurrence letter to Northern completes Section 7 consultation for this species.

Figure B.4.4-1 Rusty Patch Bumble Bee HPZ



State-Listed Species

There are nine state-listed species known to occur or potentially occur within the Project area in Carlton, Dakota, Morrison, Pine, and Scott counties. Of these species, the prairie bush clover, the piping plover, and the northern long-eared bat are also federally listed and discussed above. The remaining six species are Blanding's turtle and five mussel species, described below.

Blanding's Turtle

Wetland complexes and adjacent sandy uplands are necessary to support viable populations of Blanding's turtles. Calm, shallow waters, including wetlands associated with rivers and streams with rich aquatic vegetation, are especially preferred. In Minnesota, this species appears fairly adaptable, utilizing a wide variety of wetland types and riverine habitats in different regions of the state (MDNR, 2020e). In southeastern Minnesota, open marshes and bottomland wetlands provide summer and winter habitat. Ephemeral wetlands are utilized in spring and early summer, while deeper marshes and backwater pools are utilized in both the summer and winter. Adjacent uplands with sandy soils and natural vegetation may be utilized by turtles from May 15 to June 30 and August 1 to September 30.

Northern assumed presence of the Blanding's turtle in areas of appropriate habitat where turtles have been documented in the past. The only suitable habitat for Blanding's turtle crossed by the Project is located within the Willmar D Branch Line Extension and near the Pierz Compressor Station and Interconnect and Viking Interconnect Branch Line Extension. Northern currently plans to use HDD or conventional bore to cross under the waterbody and wetland complexes with suitable Blanding's turtle habitat. Northern's HDD and conventional bore entry and exit points would be in areas adjacent to the waterbodies being crossed. Northern would install turtle fence with J-hooks between the entry and exit points and any suitable turtle habitat.

There is one known occurrence of Blanding's turtle within 1 mile of the Pierz Compressor Station and Interconnect and the Viking Interconnect Branch Line. The agricultural land cover within this Project area is not suitable habitat for adult Blanding's turtles; however, there are wetlands and a creek with oxbows that are suitable habitat located nearby. A female turtle may travel from this suitable habitat to the upland area within or near the Project area when looking for a nesting site. Northern would install silt fence on all sides of the workspace to minimize the possibility of a turtle entering.

In addition to the measures presented above, Northern would implement applicable MDNR recommendations and would train construction personnel regarding identification of the Blanding's turtle and the proper implementation of the MDNR recommendations. Northern coordinated with the MDNR regarding the use of HDD as an avoidance protocol and developed additional BMPs, including a Blanding's Turtle

Avoidance Plan, to minimize impacts to the turtle. The MDNR reviewed Northern's Blanding's Turtle Avoidance Plan and determined that the the avoidance measures identified in the plan sufficiently reduce the likelihood of take. Based on the measures proposed above, we conclude that the Project would not significantly impact the Blanding's turtle.

Mussels

Five state-listed mussel species occur in the vicinity of the Hinckley Compressor Station, including the black sandshell, creek heelsplitter, elktoe, fluted-shell, and mucket. All of these species, with the exception of the creek heelsplitter, prefer medium to large river systems. The creek heelsplitter prefers creeks, small rivers, and headwaters of larger river systems. No waterbodies are present within the Hinckley Compressor Station; therefore, we conclude that the Project would not impact these five mussel species.

B.5 LAND USE, RECREATION, AND VISUAL RESOURCES

B.5.1 Land Use

Land use in the Project area consists of agriculture, upland forest/woodland, wetlands, open land, residential, and industrial/commercial lands (table B.5.1-1). Open water along the Project would be crossed via HDD; therefore, no impacts on open water are anticipated. Agricultural land is the predominant land use type that would be disturbed during construction and operation of the Project. The total proposed acreage to be disturbed for temporary construction of all Project facilities is 32.5 acres. The total permanent acreage required for operation of all Project facilities is 9.5 acres, including the pipelines combined with the aboveground facilities.

B.5.1.1 Agricultural Land

Agriculture is the dominant land use that would be impacted by the Project. About 11.5 acres of agricultural land would be impacted by construction activities, including temporary workspace, ATWS, a staging area, and the access road. About 7.1 acres of agricultural land would be affected by the permanent operation of the pipeline and aboveground facilities, with about 6.9 acres permanently converted to industrial/commercial land use. The Project would require a new easement for 87 percent of the operational rights-of-way in agricultural land. No specialty crops, including nurseries, vineyards, orchards, citrus groves, dairies, aquaculture, or tree farms were identified near Project facilities. Agricultural activities would be allowed to resume on 4.6 acres over the permanent pipeline rights-of-way following Project completion and restoration.

Table B.5.1-1 Acreage Affected by Construction and Operation of the Project															
Facility	Agricultural		Forest/ Woodland		Wetland		Open Land		Residential		Industrial/ Commercial		Total ⁵		
	Cons	Oper	Cons	Oper	Cons	Oper	Cons	Oper	Cons	Oper	Cons	Oper	Cons	Oper	
Willmar D Branch Line Extension															
Pipeline Right-of-way ^{1,2}	0.6	0.3	1.5	0.7	<0.1	0.0	1.8	0.7	<0.1	0.0	<0.1	0.0	3.9	1.7	
<i>Within Existing Easement</i>	<0.1	<0.1	1.1	0.3	<0.1	0.0	0.5	0.3	0.0	0.0	0.0	0.0	1.7	0.6	
<i>Outside Existing Easement</i>	0.6	0.3	0.4	0.4	0.0	0.0	1.2	0.5	<0.1	0.0	<0.1	0.0	2.2	1.1	
ATWS	0.7	0.0	0.3	0.0	0.0	0.0	2.3	0.0	0.3	0.0	1.0	0.0	4.6	0.0	
<i>Within Existing Easement</i>	0.0	0.0	0.2	0.0	0.0	0.0	0.6	0.0	0.1	0.0	0.5	0.0	1.4	0.0	
<i>Outside Existing Easement</i>	0.7	0.0	0.2	0.0	0.0	0.0	1.7	0.0	0.2	0.0	0.5	0.0	3.2	0.0	
Access Road ³	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	<0.1	0.0	1.2	0.0	
Pipeline Appurtenant Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	<0.1	<0.1	0.1	0.1	
Valve Setting ⁴	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	<0.1	<0.1	0.1	0.1	
Permanent Driveway ³	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1	<0.1	<0.1	
Subtotal⁵	1.3	0.3	2.8	0.7	<0.1	0.0	4.2	0.8	0.4	0.0	1.0	<0.1	9.8	1.8	
Carlton Interconnect Loop³															
Pipeline Right-of-way ^{1,2}	0.0	0.0	0.1	0.0	0.3	<0.1	<0.1	0.0	0.0	0.0	0.5	0.3	1.0	0.3	
<i>Within Existing Easement</i>	0.0	0.0	0.0	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	0.1	<0.1	0.1	<0.1	
<i>Outside Existing Easement</i>	0.0	0.0	0.1	0.0	0.3	<0.1	<0.1	0.0	0.0	0.0	0.4	0.2	0.9	0.3	
ATWS	0.0	0.0	1.6	0.0	0.2	0.0	0.2	0.0	0.0	0.0	2.9	0.0	4.9	0.0	
<i>Within Existing Easement</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.6	0.0	
<i>Outside Existing Easement</i>	0.0	0.0	1.6	0.0	0.2	0.0	0.2	0.0	0.0	0.0	2.3	0.0	4.3	0.0	
Staging Area ³	0.0	0.0	0.6	0.0	<0.1	0.0	0.1	0.0	0.0	0.0	0.6	0.0	1.3	0.0	
Aboveground appurtenances	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.5	0.1	0.8	0.4	
Launcher	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.1	0.6	0.3	
<i>Within Existing Easement</i>	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	0.0	<0.1	0.0	<0.1	<0.1	
<i>Outside Existing Easement</i>	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.1	0.6	0.3	

Table B.5.1-1 Acreage Affected by Construction and Operation of the Project															
Facility	Agricultural		Forest/ Woodland		Wetland		Open Land		Residential		Industrial/ Commercial		Total ⁵		
	Cons	Oper	Cons	Oper	Cons	Oper	Cons	Oper	Cons	Oper	Cons	Oper	Cons	Oper	
Permanent Driveways	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0	0.00	0.00	0.2	0.1	0.2	0.1	
<i>Within Existing Easement</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	
<i>Outside Existing Easement</i>	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	
Subtotal⁵	0.0	0.0	2.3	0.0	0.7	0.2	0.3	0.1	0.0	0.0	4.6	0.4	7.9	0.7	
Pipeline Subtotal⁵	1.3	0.3	5.2	0.7	0.7	0.2	4.5	0.9	0.4	0.0	5.6	0.4	17.7	2.5	
Aboveground Facilities															
Hinckley Compressor Station	7.2	6.2	0.0	0.0	3.2	0.1	0.0	0.0	0.0	0.0	0.2	<0.1	10.6	6.3	
Facility Expansion ETWS	7.1	6.2	0.0	0.0	3.2	0.1	0.0	0.0	0.0	0.0	0.2	0.0	10.6	6.3	
<i>Within Existing Easement</i>	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	0.0	0.6	0.5	
<i>Outside Existing Easement</i>	6.6	5.6	0.0	0.0	3.2	0.1	0.0	0.0	0.0	0.0	0.2	0.0	10.0	5.8	
Permanent Driveway ³	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1	<0.1	<0.1	
Pierz Compressor Station and Interconnect⁶	3.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.1	4.2	0.7	
Facility Expansion ATWS	3.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	<0.1	4.2	0.7	
<i>Within Existing Easement</i>	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.00	0.8	0.0	
<i>Outside Existing Easement</i>	2.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	<0.1	3.4	0.7	
Permanent Driveway ³	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1	<0.1	<0.1	
Aboveground Facilities Subtotal⁵	10.1	6.9	0.0	0.0	3.2	0.1	0.0	0.0	0.0	0.0	1.5	0.1	14.8	7.0	
Project Within Existing Easement	0.6	0.5	1.3	0.3	0.1	<0.1	1.2	0.3	0.1	0.0	2.0	<0.1	5.3	1.2	
Project Outside Existing Easement	10.8	6.6	3.9	0.4	3.9	0.3	3.3	0.6	0.3	0.0	5.1	0.4	27.3	8.3	
PROJECT TOTAL⁵	11.5	7.1	5.2	0.7	4.0	0.3	4.5	0.9	0.4	0.0	7.1	0.5	32.5	9.5	
¹ Construction right-of-way is based on a 100-foot-wide corridor in uplands and a 75-foot-wide corridor in wetlands. Operational right-of-way is based on 50-foot-wide corridor in uplands and 10-foot-wide corridor in wetlands. ² Northern also included impacts for a 5-foot-wide or two 3-foot-wide travel lanes between HDD entry and exit points in the pipeline right-of-way calculations. ³ Outside existing easement. ⁴ Within existing easement. ⁵ Subtotals and Totals may not equal the sum of the addends due to rounding. ⁶ The Viking Interconnect Branch Line workspace is completely within the ATWS required for the modifications of the Pierz Compressor Station and Interconnect.															

Construction and Operation Impacts and Mitigation

The primary impacts on agricultural land during construction would include temporary reductions in agricultural production in areas of cultivated cropland and potential reduced yields of future crops. Agricultural land in the construction area generally would be taken out of production for one growing season while Project facilities are constructed. Northern would employ the erosion and sediment control and restoration measures (e.g., soil stabilization, topsoil segregation, compaction avoidance) detailed in the Plan and its AIMP to minimize and mitigate impacts on agricultural lands. Additional descriptions of the construction methods and mitigation measures Northern would implement on agricultural lands are provided in sections A.8.3.7 and B.2.2, above.

Revegetation of agricultural areas would be considered successful when crop growth and vigor are similar to adjacent undisturbed portions of the same field, unless the easement agreement specifies otherwise. Problems with topsoil replacement, soil-profile compaction, rocks, and drainage and irrigation systems resulting from construction in active agricultural areas would continue to be monitored and corrected until restoration is successful. Resumption of agricultural operations following Project construction and/or planting of a cover crop would aid in the restoration of soil structure and productivity that could take several years to achieve success, depending on site-specific conditions and land use practices. Northern proposes to compensate landowners for temporary or permanent crop loss resulting from construction and operation of the Project. Based on these measures, we conclude impacts on agricultural areas would be minimized to the extent practical.

B.5.1.2 Forest/Woodland

About 5.2 acres of upland forest, including 2.8 acres for the Willmar D Branch Line Extension and 2.3 acres for the Carlton Interconnect Loop, would be temporarily impacted by the construction of the Project. The Project would require new easements for 54 percent of the operational rights-of-way in forested land, while 46 percent overlaps with existing easement. No forested land would be impacted by the construction or operation of the Project aboveground facilities.

Construction and Operation Impacts and Mitigation

Where trees would be cleared within the construction workspace to provide an adequate and safe work surface, the woody vegetation would be allowed to regrow only in areas used as temporary workspace. A total of 0.7 acre of forested land would be permanently cleared as part of routine vegetation maintenance within a 50-foot-wide corridor in uplands. Forested wetland crossed by HDD would not be permanently impacted since Northern does not plan to conduct routine vegetation maintenance between the HDD entry and exit pits in forested areas. Based on these measures, we

conclude that impacts on forest/woodland areas would be minimized to the extent practical and would not be significant.

B.5.1.3 Open Land

About 4.5 acres of open land would be temporarily impacted by construction of the Project, including fallow land or former cropland and/or other disturbed areas. Open land also includes mowed areas of mixed weeds and grass along roadsides and existing access driveways and unmowed grass/shrub areas within residential neighborhoods. About 0.9 acre of open land would be impacted by the permanent operation of the pipeline during routine maintenance, and 0.2 acre of open land would be permanently converted to industrial/commercial land for a valve setting and launcher facility.

Construction and Operation Impacts and Mitigation

Temporary impacts on open land are expected along the proposed construction corridor during pipeline installation due to grading, trenching, backfilling, and restoration. However, Northern's use of its SWPPPs and our Plan would minimize impacts on open land crossed by the Project. Temporary workspace and ATWS areas would be allowed to revert to open land use after completion of construction. In upland areas, routine vegetation maintenance would be conducted within a 50-foot-wide strip of the permanent rights-of-way with a frequency of not more than once every three years. In addition, a 10-foot-wide strip over the pipeline could be maintained in an herbaceous state by mowing, cutting, and trimming on an annual basis. Based on these measures, we conclude the Project's impacts on open land would not be significant.

B.5.1.4 Industrial/Commercial Land

The Project's direct impacts on industrial/commercial/roads land use types include impacts within the property lines of existing Northern facilities and existing roads and road rights-of-way during Project construction. Project construction would temporarily affect 7.1 acres of industrial/commercial land, and operation would permanently impact 0.5 acre of industrial/commercial land. The Project would require new easement for approximately 94 percent of the rights-of-way in industrial/commercial land while about 7 percent overlaps with existing easement.

Construction and Operation Impacts and Mitigation

Road crossings would be completed using conventional boring techniques or HDD, which would avoid impacts on the road and road rights-of-way. Industrial land used for ATWS would be restored to pre-construction condition and use. Most impacts on industrial/commercial land would be temporary and minor.

B.5.1.5 Residential Land

About 0.4 acre of landscaped residential land on six residential lots would be impacted by construction and operation of the Willmar D Branch Line Extension pipeline. No residential land would be impacted by construction or operation of aboveground facilities associated with the Project. Three residences and a garage are within 50 feet of the Willmar D Branch Line Extension construction workspace. The location of these residences and garage in relation to the Project, as well as the workspace type and distance and direction from the workspace are presented in table B.5.1-2.

Building Type	MP	Workspace Type	Distance from Workspace	Direction from Workspace
Willmar D Branch Line Extension				
Single-family home	1.80	ATWS	43	Southwest
Single-family home	1.86	ATWS	48	West
Garage	1.86	TWS	5	Southwest
Single-family home	1.98	ATWS	33	North

Construction and Operation Impacts and Mitigation

Northern's nominal existing permanent right-of-way is 50 feet wide. Where the Willmar D Branch Line Extension deviates from the existing right-of-way, a new 50-foot-wide easement would be created. Northern's current operations of its easement would continue post-construction; i.e., certain uses would continue to be prohibited, such as the construction of structures (residences, buildings, swimming pools, etc.) within the easement, and the growth of large trees. Additionally, to facilitate periodic inspections as required by federal regulations, Northern would conduct routine vegetation clearing on the permanent right-of-way. This would consist of mowing the width of the permanent right-of-way in upland areas where the pipe was installed by conventional trenching. Northern would not conduct routine vegetation clearing over pipeline segments installed by HDD.

Northern has prepared site-specific residential construction drawings for the three residences within 50 feet of workspaces. These are included in appendix D. **We encourage landowners to review and comment on plans for their respective properties.** At these three residences, Project construction would be within approximately 25 feet of residences or garage, while the pipeline trench would be more than 100 from the structure. To minimize impacts on residential properties, Northern has committed to implementing the following measures, which complies with our Plan.

- Northern would notify landowners by phone call and certified mailing 10 days in advance of construction.
- Northern would minimize the duration of open trench and construction disturbance time near residences (anticipate one to two weeks). The trench in these areas would be secured with safety fencing at the end of each day of construction. Vehicle speeds would be restricted on the rights-of-way to 10 miles per hour in the vicinity of the residences.
- The edge of the construction workspace would be fenced with safety fencing extending a minimum of 100 feet either side of the residence. Fencing would remain in place until final cleanup is complete.
- The construction workspace would be regularly watered to control fugitive dust emissions.
- Residential access would not be impacted and would be unrestricted throughout construction.
- Residential utilities would be located prior to construction and all utility services would be maintained throughout construction.
- Topsoil would be segregated from areas to be excavated or graded and stockpiled for redistribution during restoration.
- No mature trees or landscaping would be removed from within the edge of the construction workspace unless necessary for the safe operation of construction equipment or as specified in landowner agreements.
- All lawn and landscape areas would be restored in the construction workspace immediately after cleanup operations, or as specified in landowner agreements, consistent with the requirements of our Plan.

Based on these measures, we conclude the Project's impacts on residential land would not be significant.

B.5.1.6 Wetland

The Project would temporarily impact about 4.0 acres of wetland from construction activities. Less than 0.1 acre of wetland would be affected by operation of the Carlton Interconnect Loop and would be subject to routine clearing and maintenance. About 0.2 acre of wetland would be permanently impacted by operation of the Carlton Interconnect Loop launcher; about 0.1 acre of wetland would be filled and permanently impacted by operation of the Hinckley Compressor Station. No wetlands would be

impacted by construction or operation of the other aboveground facilities or the Viking Interconnect Branch Line. Impacts on wetlands in the Project area are discussed in more detail in sections A.8.3.5 and B.3.3.

B.5.2 Planned Developments and Zoning

The Project is located in areas zoned as agricultural, agricultural-residential, and industrial/commercial. With respect to planned residential, commercial, or other development projects, the Carlton Interconnect Loop is in the vicinity of a proposed oil pipeline and a City of Carlton water line; however, construction of the Project would not impact these facilities. No other planned developments were identified in the vicinity of Project components.

B.5.3 Recreation and Special Use Areas

The Carlton Interconnect Loop is located about 220 feet north of the Willard Munger State Trail, a paved multi-use recreational trail that utilizes an abandoned railroad easement to connect the cities of Hinckley and Duluth. This trail is on the opposite side of County Road 61 from the proposed launcher facility. Impacts on the use of the trail within the Project area include temporary noise disturbances and elevated traffic during construction activities. Impacts on the use of the recreational trail are expected to be minor and temporary.

A portion of the Carlton Interconnect Loop would cross Pine Hill Golf Course, a private golf course. Impacts on the private golf course would be minimized as the Carlton Interconnect Loop would cross under the golf course via HDD. No workspace is proposed on the golf course; however, guide wires or hand-held sensing equipment may be used to steer the drill, so there may be some interruption to the use of the golf course during the HDD operation. There would be minor noise impacts during construction, but the impacts would be temporary. No long-term or permanent impacts are anticipated at the golf course.

Based on a review of USGS topographic maps, aerial photographs, and agency websites, the remaining Project components would not cross any public lands managed by local, state, or federal agencies; wildlife management areas; conservation lands; parks; trails; or designated natural or scenic areas. No national historic and culturally significant areas would be affected by the Project.

B.5.4 Visual Resources

No special or unique features or viewsheds are present in or near the Project area. Lands crossed by the Project are relatively flat with rural development, crop fields, roadways, and utility rights-of-way and facilities.

The Carlton Interconnect Loop would cross a private golf course via HDD; however, visible impacts from the presence of construction equipment and related activity would be temporary and minor. Visual impacts with respect to cultural resources are discussed in more detail in section B.6.

The Willmar D Branch Line Extension would consist largely of buried pipeline with the exception a new valve setting; therefore, visual effects of this Project facility would be minimal. There would be some permanent visual impact related to the valve setting, given the location and height of this new above-grade facility. To reduce the visual impact, Northern would implement screening measures, such as planting native grasses and plants (at an average 4-6 in height) around the valve setting. Remaining visual impacts from the Willmar D Branch Line Extension would be limited to construction activities and minimal clearing along the pipeline.

Visual impacts associated with the Project pipelines would be greatest during construction, with both heavy equipment and disturbed soils present along the rights-of-way. Most impacts would be short-term and temporary, primarily limited to areas requiring extra workspaces, and would be reversed once post-construction restoration and revegetation have been completed. Permanent visual changes would involve cleared permanent pipeline rights-of-way in forested areas, the installation of pipeline markers, and the permanent aboveground facilities along the pipeline rights-of-way. To minimize impacts on visual resources, Northern aligned the proposed pipeline routes, where feasible, adjacent to existing pipeline and road rights-of-way. Northern also attempted to align the pipeline to avoid aesthetic features to the extent possible. Therefore, construction of the pipeline would cause temporary visual impacts; however, it would not result in any significant long-term impacts.

Permanent visual impacts would result from the Willmar D Branch Line Extension valve setting (discussed above) and from the construction of the new Hinckley Compressor Station. Northern would use neutral paint colors on the compressor station buildings and piping and would also plant native grasses and plants along the north side of the station to provide a visual buffer to the surrounding area. Due to these measures, as well as the rural location of the Hinckley Compressor Station site, no significant permanent impact on visual resources would occur.

The expansion of the Pierz Compressor Station, which would also include the replacement of the Viking Interconnect Branch Line, would not create a substantial change in the long-term visual impact at the site, as it already operates as a compressor station. Additional buildings and infrastructure would be painted to match existing facilities. Based on its co-location at an existing facility, no significant permanent impact on visual resources would occur.

B.6 CULTURAL RESOURCES

Section 106 of the NHPA, as amended, requires the FERC to take into account the effect of its undertakings on properties listed, or eligible for listing, on the National Register of Historic Places, and to afford the Advisory Council on Historic Preservation an opportunity to comment. Northern, as a non-federal party, is assisting the FERC in meeting our obligations under Section 106 and its implementing regulations at 36 CFR 800. Northern completed cultural resource surveys and submitted archaeological survey reports for the Project to the FERC and the Minnesota State Historic Preservation Office (SHPO). Based on the results of the cultural resources investigations, Northern recommended that the proposed Project construction activities would not have a direct or indirect effect on any historic properties. On August 5, 2020, the SHPO commented on the survey reports and agreed with Northern that no historic properties would be affected by the Project. We agree with the SHPO and have determined that the Project would have no effect on historic properties. Accordingly, FERC has completed its compliance requirements with Section 106 of the National Historic Preservation Act for the Project.

Northern sent Project notification letters to 25 federally recognized Native American Tribes and informed them about the Project on December 10, 2020. The letters introduced the Project and provided Project mapping, cultural resource survey reports, and the Unanticipated Discoveries Plan. The 25 Tribes include: the Apache Tribe of Oklahoma, Bad River Band of the Lake Superior Chippewa Indians, Cheyenne and Arapaho Tribes of Oklahoma, Flandreau Santee-Sioux Tribe, Fond Du Lac Band of the Minnesota Chippewa Tribe, Fort Belknap Indian Community, Grand Portage Band of the Minnesota Chippewa Tribe, Iowa Tribe of Kansas and Nebraska, Keweenaw Bay Indian Community, Lac du Flambeau Band of Lake Superior Chippewa Indians, Leech Lake Band of the Ojibwe, Lower Sioux Indian Community, Menominee Indian Tribe of Wisconsin, Mille Lacs Band of Ojibwe, Minnesota Chippewa Tribe, Prairie Island Indian Community, Red Cliff Band of Lake Superior Chippewa Indians, Santee Sioux Nation, Shakopee Mdewakanton Sioux Community, Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, Sakaogon Chippewa Community, Spirit Lake Tribe, Upper Sioux Community, and the White Earth Band of the Minnesota Chippewa Tribe. On July 22, 2020, Northern resubmitted coordination letters to these Tribes.

On December 5, 2019, the Leech Lake Band of the Ojibwe informed Northern that it had no known record of sites of cultural or religious importance in the Project area and requested that it be notified if any human remains or culturally affiliated objects are discovered. The Flandreau Santee Sioux Tribe Tribal Historic Preservation Office (THPO) confirmed receipt of the documents, and Northern followed up with a phone call on September 16, 2020. The Fort Belknap Indian Community THPO confirmed receipt of the documents and did not have any immediate concerns with the Project, but if there were any inadvertent discoveries that work should be stopped, and the tribe should be informed. On September 17, 2020, Northern followed up with a phone call to the Fort Belknap Indian Community THPO and stated that the Unanticipated Discoveries Plan

would be followed, and the tribe would be notified. The Iowa Tribe of Kansas and Nebraska THPO stated that it had no concerns on a September 24, 2020 phone call. The Lac Du Flambeau Band of Lake Superior Chippewa Indians THPO stated that it had no concerns with the Project on a follow up phone call on September 17, 2020. On September 24, 2020, the Shakopee Mdewakanton Sioux Community THPO responded via email and stated that it noticed that the State Archaeologist Office was not contacted for the historical data search; and further recommended that Northern use environmental monitors approved by the Minnesota Indian Affairs Council. Northern has received a no effect determination concurrence from the Minnesota SHPO which satisfies any concerns with the Minnesota State Archaeologist Office, and Northern states that it would continue to work with the Shakopee Mdewakanton Sioux Community THPO on monitoring.

On July 9, 2020, we sent our NOI to the same 25 federally recognized Native American Tribes listed above. In addition, we sent formal consultation letters to these Tribes on September 29, 2020¹⁶, both through the U.S. Postal Service and by e-mail.

The Shakopee Mdewakanton Sioux Community replied to our consultation letter via e-mail on September 30, 2020 informing us that it had been working with Northern on the Project and that the Community was having trouble accessing documents using FERC's elibrary system. We responded to the Shakopee Mdewakanton Sioux Community on September 30, 2020, confirming that if any Project changes occurred, we would keep them informed. On October 6, 2020, the Fond Du Lac Band of Chippewa left a phone message informing us of needed changes to our mailing contact, and that the tribe would provide comments on the Project. To date we have not received any further correspondence from any of the contacted tribes.

B.6.3 Unanticipated Discoveries Plan

Northern provided a plan to address the unanticipated discovery of archaeological materials and human remains encountered during Project activities. The plan describes the process of halting construction activities in the vicinity of the discovery and notifying interested parties, including federally recognized Indian Tribes who request notification. Northern submitted the plan for review and comment to the Minnesota SHPO on July 16, 2020. On August 5, 2020, the Minnesota SHPO found the plan to be acceptable. We have reviewed the plan and found it acceptable.

¹⁶ A consultation letter was not sent to the Leech Lake Band of the Ojibwe as they had informed Northern on December 5, 2019, that it had no known record of sites of cultural or religious importance in the Project area and requested that it be notified if any human remains or culturally affiliated objects are discovered.

B.7 SOCIOECONOMICS

The socioeconomic impact associated with construction of the Project would be short-term and localized primarily because of the relatively short construction period of eight months. Population (worker) influx as a result of construction would be divided over the Project areas, which would limit the local impact on housing, public services, and infrastructure (e.g., fire, medical, education, police, transportation). Some beneficial economic impact would be realized through local and non-local construction payroll expenditures, purchases of construction goods and materials, and increased tax revenues in the various counties.

B.7.1 Population, Housing, and Employment

Table B.7.1-1 provides a summary of selected demographic and socioeconomic conditions by county for the Project area. Population estimates in the Project area range from 29,600 in Pine County to 429,000 in Dakota County. The current unemployment rate for the State of Minnesota is 3.2 percent, while the unemployment rates in the counties crossed by the Project range from 2.8 percent (Scott County) to 5.7 percent (Pine County). Carlton County has the lowest rental vacancy rate at 2.7 percent, and Pine County has the highest at 8.8 percent. Table B.7.1-2 provides additional information regarding available housing in the Project area.

The Project would employ about 300 to 350 construction workers over the eight month construction period and would need up to 100 personnel, including inspection personnel, per spread for construction of the Project pipeline and up to 70 workers at each compressor station facility. The construction workforce would consist of personnel hired by the contractor from outside the area and include pipeline facility construction specialists, supervisory personnel, and inspection personnel who would temporarily relocate to the area. Some construction staff likely would be hired locally. Census data show that each county crossed by the Project has manufacturing listed as one of the top four employment sectors (four of the five counties lists manufacturing in the top two). Many of the skills needed for employment in the manufacturing sector transfer to the construction industry, which would increase Project construction employment opportunities. Following construction, no new permanent staff would be added for the additional workload associated with the operation of the aboveground facilities.

The impacts on the population near the Project area are expected to be temporary and relatively minor. Non-local workers are unlikely to bring family members with them to the Project areas due to the short duration of construction. With the abundant supply of hotels/motels, campgrounds, and seasonal housing, and the relatively small increase in population that would be experienced due to the influx of non-local construction personnel, we do not anticipate any significant impacts on the local population and housing.

State/County	Population (1,000) ^a	Rental Vacancy Rate (percent) ^b	Per Capita Income (dollars) ^a	Civilian Labor Force ^c	Unemployment (%) ^c	Top Three Employment Sectors ^{b, d}
Minnesota	5,639.6		36,245	3,109.7	3.2	EH, RT, PS
Project						
Dakota	429.0	3.2	40,441	242.8	2.9	EH, PS, M
Scott	149.0	4.5	39,952	83.8	2.8	EH, M, RT
Carlton	35.9	2.7	28,117	17.9	4.6	EH, M, RT
Morrison	33.4	3.3	28,792	17.9	5.2	EH, M, RT
Pine	29.6	8.8	25,302	15.1	5.7	EH, RT, AE
Sources:						
^a U.S. Department of Commerce, Bureau of the Census, State and County Quick Facts, 2019 Estimate.						
^b U.S. Department of Commerce, Bureau of the Census, 2014-2018 American Community Survey 5-year estimates.						
^c 2019 Annual Averages from the Minnesota DEED.						
^d Employment Sectors: EH = Educational, health, and social assistance; M = Manufacturing; PS Professional, scientific, management, administrative, and waste management services; RT = Retail trade; AE = Arts, entertainment, and recreation, and accommodation and food services.						

Project County ^a	Housing Units ^b	Total Vacant Housing Units ^b	Vacant Housing Units For Rent ^b	Seasonal, Recreational or Occasional Use ^b	Number of Hotels and Motels ^c	Number of Campgrounds ^d
Dakota	165,119	4,975	1,399	735	377	32
Scott	50,538	2,028	405	430	172	16
Carlton	15,989	2,571	74	1,699	184	101
Morrison	16,109	2,621	101	1,899	68	36
Pine	17,486	6,796	210	5,505	35	42
^a All counties impacted by the Project are located in Minnesota.						
^b U.S. Department of Commerce, Bureau of the Census, 2014-2018 American Community Survey 5-year estimates.						
^c Yellowbook, 2020 (Number of "hotels and motels" as advertised on www.yellowbook.com). Some of these hotels and motels may be located in adjacent municipalities.						
^d Yellowbook, 2020 (Number of "campgrounds" as advertised on www.yellowbook.com). Some of the campgrounds may be located in adjacent municipalities.						

B.7.2 Public Services, Infrastructure, and Traffic

A wide range of public services and facilities are presently available throughout the Project area, including law enforcement, fire departments, medical emergency services, and medical facilities, as well as public and private schools. Table B.7.2-1 summarizes the number of existing public services by public service type available in each county crossed by the Project.

County	Public Schools ^a	Private Schools ^a	Sheriff's Departments ^b	Police Departments ^b	Fire and Rescue Departments ^c	Hospitals/Beds ^d
Dakota	157	52	1	11	11	3/284
Scott	81	16	1	7	7	2/142
Carlton	26	3	1	2	10	2/105
Morrison	23	2	1	2	8	1/49
Pine	17	2	1	0	13	1/30
Sources: ^a Public School Review, 2020. ^b USACOPS, 2020. ^c Fire Department.net, 2020. ^d Minnesota Department of Health, 2020. Healthcare Provider Directory.						

The non-local workforce would be relatively small compared to the current local populations in counties crossed by the Project and would not result in major impacts on the availability of local community facilities, commodities, or services. Due to the relatively small number of workers required for the Project, the small subset of workers that would temporarily relocate to the area, and construction occurring primarily in summer months when schools are closed, we do not anticipate that school-aged children would move to the area, and do not anticipate a significant increase in the number of children expected to enroll in local schools as a result of the Project.

Short-term impacts would likely occur along some roadways from the movement of workers and the delivery of equipment and materials, including the transport of hydrostatic test water. Delivery of construction materials and hydrostatic test water would mostly occur during off-peak traffic hours. Construction vehicles would generally use county and township roads to access the Project area, which may temporarily affect local traffic. Northern's construction contractors would comply with all seasonal load limits and require all construction vehicles, including tanker trucks used to haul hydrostatic test water, to be equipped with safety equipment. To minimize the impact on local traffic, Northern would implement traffic control measures and take necessary safety precautions.

With respect to the adequacy of Project area medical facilities to handle Project-related injuries, the U.S. Bureau of Labor Statistics reports that in 2018 the incidence rate (number of injuries and illnesses per 100 full-time workers) for Oil and Gas Pipeline and Related Structures Construction was 0.7 recordable cases per year. For comparison, this compares to 2.9 recordable cases for residential building construction or 3.7 recordable cases for all industries including private, state, and local government. With a maximum estimate of 350 pipeline construction workers, area hospitals and urgent care facilities are expected to have adequate capacity to respond to Project-related injuries.

B.7.4 Environmental Justice Populations

In accordance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, we address the potential for disproportionately high and adverse health or environmental effects of the Project on minority and low-income populations. The affected environment was established in accordance with guidance from the CEQ's Environmental Justice Guidance Under NEPA (1997), and the Federal Interagency Working Group's Promising Practices for Environmental Justice Methodologies in NEPA Reviews (2016).

Minority populations are defined where either (a) the minority population of the affected area exceeds 50 percent, or (b) the minority population of the affected area is meaningfully greater (defined by FERC as 10 percentage points) than the minority population percentage in the general population or other appropriate unit of geographic analysis. "Minority populations" is defined as individuals who are members of the following population groups: American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Black or African American, two or more races, or Hispanic. Low-income populations are those that fall within the annual statistical poverty thresholds from the U.S. Department of Commerce, Bureau of the Census Population Reports, Series P-60 on Income and Poverty. If the percent of the low income population in an identified block group is equal to or greater than that of the county then an environmental justice community is present.

As shown in table B.7.4-1, the counties and Census Block Groups crossed by the Project have total minority populations that comprise less than 50 percent of the population. Minority population percentages of the Block Groups crossed by the Project are lower than their respective counties. All of the Block Groups in the Project area have poverty levels below their respective counties. We conclude the Project would not affect environmental justice communities; therefore, there would be no disproportionate affect on racial, ethnic, or low-income population groups.

Location	Low Income Population Percent^b	Percent Minority^{a,c}
UNITED STATES	33	38.9
State of Minnesota	25	19.7
Dakota County	18	21.0
Census Tract 608.20, Block Group 3	1	7.0
Scott County	15	18.2
Census Tract 810, Block Group 1	3	7.8
Carlton County	28	11.8
Census Tract 704, Block Group 5	25	6.4
Morrison County	31	4.2
Census Tract 7805, Block Group 2	23	2.3
Pine County	36	10.6
Census Tract 9505, Block Group 1	30	6.8
Source: U.S. Department of Commerce, Bureau of the Census, 2014-2018 American Community Survey 5-Year Estimates. ^a Percentage reported as people who reported their ethnicity and race as something other than non-Hispanic white. ^b U.S. Department of Commerce, Bureau of the Census, 2014-2018 American Community Survey 5-Year Estimates, Selected Economic Characteristics. ^c U.S. Department of Commerce, Bureau of the Census, 2014-2018 American Community Survey 5-year Estimates, Calculated from Hispanic or Latino Origin by Race.		

As discussed throughout this EA, potentially negative environmental effects associated with the Project would be minimized and/or mitigated, as applicable. As such, there is no evidence that the Project would disproportionately impact the health, social, or economic conditions of minority or low-income communities.

B.8 AIR QUALITY

The Project would result in temporary impacts on regional air quality through the short-term construction activities associated with each project component. The Project would also result in permanent impacts associated with long-term operation of the modified and new compressor stations.

B.8.1 Existing Air Quality

Construction and operation of the Project would affect local and regional air quality. Federal and state air quality standards are designed to protect human health and the environment from airborne pollutants. The EPA has developed National Ambient Air Quality Standards (NAAQS) for criteria air pollutants such as nitrogen oxides (NO_x) and carbon monoxide (CO), ozone, sulfur dioxide (SO₂), and inhalable particulate matter (PM_{2.5} and PM₁₀). PM_{2.5} includes particles with an aerodynamic diameter less than or equal to 2.5 microns, and PM₁₀ includes particles with an aerodynamic diameter less than or equal to 10 microns. The Clean Air Act identifies two class types of NAAQS: primary standards and secondary standards. Primary standards are limits set to protect the public health of the most sensitive populations, such as asthmatics, children, and the

elderly. Secondary standards are limits set to protect public welfare, such as protection against visibility impairment or damage to vegetation, wildlife, and structures.

Greenhouse gases (GHG), the most common of which are carbon dioxide (CO₂), methane, nitrous oxide, ozone, hydrofluorocarbons and perfluorocarbons, are naturally occurring pollutants in the atmosphere and products of human activities, including burning fossil fuels. Fossil fuel combustion emits CO₂, methane, and nitrous oxide. GHG emissions are generally calculated in terms of carbon dioxide equivalents (CO₂e) where the atmospheric heating potential of each gas is expressed as a multiple of the atmospheric heating potential of CO₂.

The EPA designates the attainment status of an area on a pollutant-specific basis based on whether an area meets the NAAQS. Areas that meet the NAAQS are termed “attainment areas.” Areas that do not meet the NAAQS are termed “nonattainment areas.” Areas for which insufficient data are available to determine attainment status are termed “unclassifiable areas.” Areas formerly designated as nonattainment areas that have subsequently reached attainment are termed “maintenance areas.” This Project would be located in attainment areas.

B.8.2 Permitting/Regulatory Requirements

The Clean Air Act of 1970, 42 U.S.C §§7401 et seq., amended in 1977 and 1990, is the basic federal statute governing air quality. In addition to the NAAQS, air emissions and equipment would be subject to various other federal and state air quality regulations. The federal air quality requirements are contained in 40 CFR Parts 50 through 99 including:

- New Source Review (NSR);
- State and Title V Operating Permit Programs;
- New Source Performance Standards (NSPS); and
- National Emission Standards for Hazardous Air Pollutants (HAP).

Preconstruction air permitting programs that regulate the construction of new stationary sources of air pollution and the modification of existing stationary sources are commonly referred to as NSR. Major NSR requirements are established on a federal level but may be implemented by state or local permitting authorities under either a delegation agreement with the EPA or as a State Implementation Plan program approved by the EPA. Major NSR has two components: the Prevention of Significant Deterioration (PSD) permitting program and the nonattainment area NSR permitting program. PSD requirements include the use of Best Available Control Technology, air quality impact analyses, and additional impact analyses. Nonattainment NSR

requirements for nonattainment pollutants include Lowest Achievable Emission Rate, emission offsets, and an alternatives analysis.

Emissions from the pipelines and the pipeline appurtenant facilities during operation would be minimal and would not be considered a major stationary source under NSR. Neither the new Hinckley Compressor Station nor the modified Pierz Compressor Station would be considered a major stationary source under NSR since the potential to emit one or more regulated criteria air pollutants would not exceed 250 tons per year (tpy). In addition to criteria pollutants, PSD regulations require an evaluation of potential GHG emission rates only if a facility is subject to PSD for another pollutant. The compressor stations would not be subject to the GHG Tailoring Rule established in the federal PSD standards in 40 CFR 52 because the facilities are not otherwise applicable sources. Therefore, PSD requirements would not be applicable to the Project.

The Title V permit program in 40 CFR 70 requires sources of air pollutants to obtain operating permits if the source has the potential to emit greater than 100 tpy of any air pollutant, 10 tpy of any single HAP, or 25 tpy of any combination of HAPs. These sources are referred to as major sources. Stationary sources are not required to obtain a Title V permit on the sole basis of GHG emissions levels (i.e., exceeding the Title V major source threshold for GHG only). The Hinckley Compressor Station would not be considered a major stationary source and would not require a Title V or Part 70 air operation permit. The Pierz Compressor Station and Interconnect utilizes electric driven compressors and would not be considered a major stationary source and would not require a Title V or Part 70 air operation major source permit.

NSPS in 40 CFR 60 regulate certain emissions from specific source categories. Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines) would apply to the emergency generator at the Hinckley Compressor Station. The emissions standards in Subpart KKKK (Standards of Performance for Stationary Combustion Turbines) would apply to the new turbine at the Hinckley Compressor Station. Subpart OOOOa (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution) would apply to the two compressor stations.

The National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines, Subpart ZZZZ, would apply to the emergency generator at the Hinckley Compressor Station. By complying with Subpart JJJJ, the applicable provisions of Subpart ZZZZ of the NESHAP rules (Part 63) are met. Northern would comply with the requirements of Subpart JJJJ.

Minnesota requires that stationary sources subject to NSPS or NESHAP requirements must obtain a state permit under Minnesota Rule 7007.0250. This regulation applies to the Hinckley Compressor Station. The air permit application for the

Hinckley Compressor Station was submitted by Northern to the MPCA on August 5, 2020, and a copy has been provided to us¹⁷.

B.8.3 Construction Emissions

Construction of the Project would result in intermittent and temporary emissions of criteria pollutants. These emissions generally include fugitive dust (PM₁₀ and PM_{2.5}) generated from soil-disturbing activities, such as earthmoving and wind erosion of disturbed areas, and vehicle traffic during construction. The amount of dust generated during construction would be a function of precipitation, vehicle numbers and types, vehicle speeds, and roadway characteristics. Dust emissions would be greater during dry periods and in areas of fine-textured soils. Northern would implement stabilization of unpaved roads and access roads near residences and restrict vehicle speeds on unpaved roads to 15 miles per hour to prevent the emissions of fugitive dust generated by construction vehicles. Gravel tracking pads or similar track-out prevention methods would be required at all Project egress points. All paved roadways would be swept daily, or more often if track-out of mud or soil is evident.

Construction results in combustion emissions from diesel- and gasoline-fueled vehicles used in various construction activities. Combustion-related emissions would include NO_x, CO, volatile organic compounds (VOC), SO₂, PM₁₀ and PM_{2.5}, small amounts of HAPs, and GHGs. The EPA requires manufacturers of on- and off-road engines to certify their products to engine emission standards based on the year of manufacture. For diesel engines, the emission standards have been phased in over the past two decades in four steps, referred to as Tier 1 to Tier 4. The engine must comply with the emission standards throughout its life. In 2010, the EPA required the sulfur concentration in diesel fuels be lowered from historical concentration of 500 parts per million to 15 parts per million (ultra-low sulfur diesel fuel), which allows diesel engines to meet current Tier 4 emission requirements. Proper maintenance of construction equipment and use of low-sulfur diesel fuel would reduce engine emissions during construction of the Project. To reduce emissions from internal combustion engines, idling of construction vehicles would be limited.

Except for the HDDs discussed in section B.9.1, construction activities would generally take place during daylight hours (7:00 a.m. to 7:00 p.m.). This schedule would allow equipment operators to assess the presence of fugitive emissions and to implement abatement measures, as needed. Northern would employ dust control measures such as watering the access road, storage piles, and disturbed surfaces during construction and restoration. Additional measures that would be implemented include imposing a vehicle speed restriction on unpaved roads, using gravel tracking pads at egress points to remove dirt from tires and tracks, and restoring disturbed areas following construction.

¹⁷ Available on FERC eLibrary under a accession number 202000928-5087.

Prior to the completion of the Project, Northern would vent the existing 0.08-mile-long Viking Interconnect Branch Line prior to the start of the same ditch replacement. Prior to the completion of the Project, existing pipelines that connect to the proposed Carlton Interconnect Loop would require venting so the tie-ins to the active lines can be completed. The pressure of the pipeline would be reduced through drawdown, and Northern would vent the remaining gas. Approximately 2.1 million standard cubic feet (scf) of gas would be vented for the Project, resulting in 1,445 tons of GHG emissions as CO_{2e}. No venting would be planned as part of the Willmar D Branch Line Extension tie-ins as they would occur via hot tap.

Table B.8.3-1 summarizes the estimated emissions of criteria pollutants, total HAPs, and GHGs from construction equipment and material deliveries. The GHG emissions associated with the Project construction are principally from CO₂.

The potential emissions summarized in table B.8.3-1 were estimated using EPA non-road emission factors, EPA AP-42 emission factors for fugitive particulate emissions, GHG emission methodology found in 40 CFR 98, and engineering calculations (EPA 2019a, 2019b, 2004a, 2004b).

Table B.8.3-1 Construction Emissions Summary for the Project									
County/Activity	Emissions (tons)								
	Criteria Pollutants						CO_{2e}	Formal- dehyde	Total HAPs
	NO_x	CO	VOC	SO₂	PM₁₀	PM_{2.5}			
Dakota and Scott, Minnesota									
Engine emissions	28.7	5.8	1.6	0.0	0.9	0.9	1,316	0.2	0.3
Unpaved roads	-	-	-	-	5.5	0.6	-	-	-
Earthmoving	-	-	-	-	1.9	0.2	-	-	-
Subtotal	28.7	5.8	1.6	0.0	8.3	1.7	1,316	0.2	0.3
Carlton, Minnesota									
Engine emissions	28.7	5.8	1.6	0.0	0.9	0.9	1,316	0.2	0.3
Unpaved roads	-	-	-	-	5.6	0.6	-	-	-
Earthmoving	-	-	-	-	1.7	0.2	-	-	-
Venting	-	-	4.2	-	-	-	1,208	-	-
Subtotal	28.7	5.8	5.8	0.0	8.2	1.7	2,524	0.2	0.3
Morrison, Minnesota									
Engine emissions	44.4	10.0	3.2	0.0	1.8	1.7	2,062	0.4	0.6
Unpaved roads	-	-	-	-	1.5	0.2	-	-	-
Earthmoving	-	-	-	-	8.4	0.8	-	-	-
Venting	-	-	0.8	-	-	-	237	-	-
Subtotal	44.4	10.0	4.0	0.0	11.7	2.7	2,299	0.4	0.6

Table B.8.3-1 Construction Emissions Summary for the Project									
County/Activity	Emissions (tons)								
	Criteria Pollutants						CO _{2e}	Formal- dehyde	Total HAPs
	NO _x	CO	VOC	SO ₂	PM ₁₀	PM _{2.5}			
Pine, Minnesota									
Engine emissions	31.3	7.4	2.5	0.0	1.4	1.3	1,475	0.3	0.5
Earthmoving	-	-	-	-	2.5	0.3	-	-	-
Subtotal	31.3	7.4	2.5	0.0	3.9	1.6	1,475	0.3	0.5
Total	133.1	29.0	13.9	0.0	32.1	7.7	7,614	1.1	1.7

Construction-related emission estimates are based on typical diesel-fueled construction equipment, hours of operation, and vehicle miles traveled by the construction equipment and supporting vehicles for each construction spread. Through the implementation of the work practices described above and given the short duration of the construction activities, the temporary emissions during construction of the Project would be minor, and the impact of these emissions would be localized. Therefore, we conclude these emissions would not have a significant impact on regional air quality.

B.8.4 Operational Emissions

The Project would include construction of a new compressor station (Hinckley Compressor Station) and modifications to the existing Pierz Compressor Station and Interconnect. Operational methane emission estimates associated with leaks and releases from the Project aboveground pipeline appurtenances, which are launchers/receivers and a valve setting, have been calculated. Annual methane emissions from Project appurtenances are estimated to average 13 tpy of CO_{2e}. Pig launch events, among Project sources that release methane, would occur about every seven years.

The operational sources of air emissions at the Hinckley Compressor Station would include one International Organization for Standardization-rated 11,153-HP Solar Taurus 70 natural gas-fired turbine; a 0.3- million British thermal units per hour natural gas-fired fuel gas heating skid, a 630-kilowatt (850-HP) EPA-certified natural gas-fired backup electric generator, and facility fugitive VOC emissions, including blowdown events. During normal operation of the compressor station, a unit shutdown event would occur about 20 times per year, resulting in 10 blowdown events per year. Northern estimates 29,500 scf (about 20.2 tons of CO_{2e}) of natural gas would be vented per blowdown event. Northern estimates a full station blowdown event would release 97,500 scf of natural gas; however, a full blowdown event would not be a planned event. Emission estimates of criteria pollutants and HAPs for the Hinckley Compressor Station, per year of operation, are presented below in table B.8.4-1.

Activity	Emissions (tons per year)								
	Criteria Pollutants						CO ₂ e	Single HAP	Total HAPs
	NO _x	CO	VOC	SO ₂	PM ₁₀	PM _{2.5}			
Solar Taurus 70 turbine	25.1	27.7	13.8	0.5	5.0	5.0	42,353	0.2	0.3
Fuel gas heater	0.1	0.1	0.0	0.0	0.0	0.0	144	0.0	0.0
Backup generator	0.9	1.7	0.4	0.0	0.0	0.0	189	0.0	0.1
Facility fugitives	-	-	1.1	-	-	-	-	-	-
Maximum potential emissions	26.1	29.5	15.3	0.5	5.0	5.0	42,686	0.3	0.4

The new operational sources of air emissions at the Pierz Compressor Station and Interconnect would include facility fugitive VOC emissions, including blowdown events. The existing Pierz Compressor Station includes one electric motor-driven compressor and ancillary equipment, which also emit VOCs from fugitive releases and blowdowns. During normal operation of the compressor station, a unit shutdown event would occur about 15 times per year. This evaluation assumes 20 shutdown events per year would result in a blowdown to be conservative, with 15,000 scf of natural gas vented per compressor unit blowdown event at the Pierz Compressor Station and Interconnect. Northern estimates a full station blowdown event would release 45,000 scf of natural gas; however, a full blowdown event would not be a planned event. The estimated potential emissions of criteria pollutants and HAPs for the existing Pierz Compressor Station, proposed new operational sources at the Pierz Compressor Pierz Compressor Station and Interconnect, and total modified station, per year of operation, are presented below in table B.8.4-2.

Activity	Emissions (tons per year)								
	Criteria Pollutants						CO ₂ e	Single HAP	Total HAPs
	NO _x	CO	VOC	SO ₂	PM ₁₀	PM _{2.5}			
Project facility fugitives	-	-	0.3	-	-	-	51	-	-
Maximum potential emissions – Project	-	-	0.3	-	-	-	51	-	-
Existing permitted facility potential emissions	-	-	0.5	-	-	-	77	-	-
Total potential emissions from modified station	-	-	0.8	-	-	-	128	-	-

The potential emissions summarized in tables B.8.4-1 and B.8.4-2 were estimated using manufacturer-supplied emission factors, EPA AP-42 emission factors, EPA protocol for equipment leak emission estimates, GHG emission methodology found in 40 CFR 98, assumptions that the Hinckley and Pierz Compressor Stations operate

continuously at full capacity (8,760 hours) per year, and engineering calculations (EPA 2019a, 2019b, 1995). The operational emissions of the emergency generator at the Hinckley Compressor Station are limited to 500 hours per year per MPCA permitting requirements.

An ambient air quality analysis was conducted to demonstrate compliance with ambient air quality standards for criteria pollutants at the Hinckley Compressor Station. The modified Pierz Compressor Station would not emit criteria pollutants requiring modeling to demonstrate NAAQS compliance; therefore, no modeling was performed for the proposed modifications at the Pierz Compressor Station. The air quality modeling was completed using AERMOD, using the proposed new air emissions sources; the modeling parameters are presented in table B.8.4-3 and results are presented in table B.8.4-4.

Compressor Station	Source ID	Stack Data				Pollutant Emission Rate (lb/hr)			
		Height (feet)	Temp (F)	Exit Velocity (feet per second)	Exit Diameter (feet)	NO _x	CO	SO ₂	PM _{2.5} /PM ₁₀
Hinckley	Solar Taurus 70 turbine	54	854	124	4.8	14.29	20.71	0.12	1.27
	Process Heater Firetube #1	13	700	3.7	0.55	0.03	0.02	0.0002	0.0021

Pollutant	Averaging Period	Model Concentration	Background Concentration ^a	Total Concentration	NAAQS
NO ₂	1 hour	23.24	49.51	72.75	188.0
NO ₂	Annual	0.82	8.46	9.28	100.0
SO ₂	1 hour	0.27	13.97	14.24	196
PM ₁₀	24 hour	0.58	30.0	30.58	150
PM ₁₀	Annual	0.06	not provided	not provided	150
PM _{2.5}	24 hour	0.59	16.0	16.59	35
PM _{2.5}	Annual	0.06	5.6	5.66	12
CO	1 hour	24.66	916	1,717	40,000
CO	8 hour	572.50	572.5	581.3	10,000

^a NO₂, SO₂ and CO background concentrations obtained from Inver Grove Heights ID 270370423 monitoring station. PM₁₀ background concentrations obtained from Virginia ID 271377001 monitoring station. PM_{2.5} background concentrations obtained from Brainard ID 270353204 monitoring stations.

Conservative modeling, presented above, shows the anticipated air quality impacts to be well below the NAAQS, which are set to be protective of human health, including sensitive subpopulations.

Air quality impacts from operation of the Project compressor stations would be minimized by the use of equipment, emissions controls, and operating practices; and maintenance testing and monitoring would ensure ongoing compliance with regulations during operation. Compliance with federal and state air regulations and state permit requirements would ensure that air quality impacts would be minimized during installation and operation of the compressor units at the Hinckley Compressor Station and the Pierz Compressor Station and Interconnect.

Northern has committed to utilize programs to reduce methane, a contributor to greenhouse gas emissions, under the EPA STAR program and to explore all technologies and practices suggested by the EPA to reduce methane reduction. The STAR program is a voluntary partnership among the oil and gas industries, engaging all segments of the natural gas industry – production, transmission, and distribution. STAR encourages oil and natural gas companies to adopt cost-effective technologies and practices that improve operational efficiency and reduce methane emissions.

We conclude that emissions generated during operation would not have significant impacts on local or regional air quality.

B.9 NOISE

Noise is generally defined as sound with intensity greater than the ambient or background sound pressure level. Construction and operation of the Project would affect overall noise levels in the Project area.

The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetation cover. Two measures that relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is an A-weighted sound level containing the same energy as the instantaneous sound levels measured over a specific time period. Noise levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, the L_{dn} is the L_{eq} plus a 10 decibel on the A-weighted scale (dBA) penalty added to account for people's greater sensitivity to sound levels during late evening and early morning hours (between the hours of 10:00 p.m. and 7:00 a.m.). The A-weighted scale is used to assess noise impacts because human hearing is less sensitive to low and high frequencies than mid-range frequencies.

The human ear's threshold of perception for noise change is considered to be 3 dBA; 6 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise (Bies and Hansen, 1988).

In 1974, the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA,

1974). This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate the potential noise impacts from the proposed Project at NSAs. NSAs are defined as homes, schools, churches, or any location where people reside or gather. FERC requires that the noise attributable to any new or modified compressor station during full load operation not exceed an L_{dn} of 55 dBA at any NSAs. Due to the 10-dB nighttime penalty added prior to the logarithmic calculation of the L_{dn} , for a facility to meet the 55 dBA L_{dn} limit, it must be designed such that actual constant noise levels on a 24-hour basis do not exceed 48.6 dBA L_{eq} at any NSA.

For construction, we require that any activities having the potential to occur on a 24 hour per day basis (during nighttime hours), including HDDs, should be performed with the goal that the activity's noise contribution at any NSA not exceed 55 dBA L_{dn} (48.6 L_{eq}), or no more than 10 dBA over background if ambient noise levels are above 55 dBA L_{dn} . For operation, we require that any continuously operating sources, including compressor stations, contribute no more than an L_{dn} of 55 dBA at any NSAs.

In addition to federal standards, Minnesota has established noise rules at Minnesota Administrative Rules Section 7030.0040, administered by the MPCA. Carlton and Morrison counties' noise regulations reference the MPCA standards. No other county-level noise regulations were identified within the Project area. The cities of Carlton, Hinckley, Pierz, and Prior Lake have local noise ordinances. However, construction activities associated with the Project would not be conducted within the city limits of the named communities, and therefore municipality noise ordinances would not apply.

B.9.1 Construction Noise

Construction and operation of the Project is expected to create noise impacts. Noise impacts during construction would be temporary, and mainly associated with heavy equipment operation, including HDD rigs. In order to limit noise impacts, construction activities generally would be conducted during the daytime (7:00 a.m. to 7:00 p.m.), except in cases where nighttime construction may be necessary. Certain activities, including longer HDDs, tie-ins, testing, and commissioning, may extend beyond normal construction hours, as necessary. In particular, as mentioned above, HDDs may be conducted continuously (24 hours per day) at critical times, such as during pullback of the pipe into the drill hole on the longer drills and when pipe sections would need to be welded during pullback. Table B.9.1-1 provides the unmitigated and mitigated noise levels at the nearest NSAs for each of the drill entry/exit points.

Noise ratings for HDD rigs and supporting equipment (mud pumps, bentonite mixing systems, and excavators) are available from equipment manufacturers' specification sheets for each piece of equipment or comparable class of equipment.

Noise emissions measured from past projects would also be considered. A noise reading of 94.9 dBA was taken within 10 feet of the loudest piece of proposed equipment, the hydraulic power unit, on a unit with a pull power of 880,000 to 1.2 million pounds per square inch (psi). The noise reading taken from a smaller unit with a pull power of 100,000 to 200,000 psi was measured at 86.2 dBA within 10 feet of the unit. These readings correspond to the noise specifications presented by the HDD suppliers.

The distance between the entry and exit pits for the proposed HDDs to the nearest NSAs for each component of the Project have been estimated. The cumulative acoustical impact of the HDD operations at the pit entry and exit was evaluated at each of the identified NSAs. The noise impacts were determined with and without active noise mitigation measures, examples of which are listed below. The impacts also considered the usage factor for the various pieces of equipment to be utilized at each HDD exit and entry pit. Using this information, the noise impacts from HDD operations on the nearest NSAs have been modeled.

HDDs are generally known to produce noise having the potential to impact NSAs up to a distance of 0.5 mile from the HDD entry and exit pits. Northern identified NSAs within 0.5 mile of each HDD and assumed the HDD pit nearest to each NSA would be the entry pit; therefore, the maximum potential noise impact was modeled for each NSA. NSA maps for the Project are included in appendix E. The Project's HDD operations, including drilling and pullback, would typically take place during daytime hours, but may extend into nighttime hours, if necessary, to ensure the success of the drill (e.g., during critical times such as pipe pullback). Northern stated that it expects the following HDDs would require continuous operation beyond daytime hours to complete:

- HDDs WBL P4-1 and CIL P4-1 are candidates to require 24-hour construction activities due to multiple pullbacks, length of pullback and complexity of drill. Pullback activities for these HDDs would commence no later than 9:00 a.m. to reduce the potential for work to extend past 7:00 p.m.

As shown in table B.9.1-1, the unmitigated HDD noise levels could exceed 55 dBA L_{dn} at some NSA locations, which are all residences. In the event that HDD operations extend into nighttime hours (7:00 p.m. to 7:00 a.m.) and normal work practice standards are insufficient to reduce the noise impact from HDD operations, Northern has proposed to implement one or more of the following noise mitigation measures:

- institute work practices such as reduced idling and fitting equipment with residential mufflers;
- utilize a smaller and more modern HDD rig than was utilized for the noise model;

- install sound barrier walls between entry pits and NSA locations;
- install sound enclosures around critical equipment such as the drill rig, mud pump engine, and shaker; and
- offer temporary relocation to the residents.

According to Northern's HDD Plan, Northern would contact residents near an HDD prior to drilling to inform them about the drill schedule and duration and would discuss potential mitigation, including relocation only if residents find relocation to be preferable to the proposed noise mitigation.

Noise barriers consist of two- or three-sided walls constructed of sound absorptive materials that can be installed between the equipment and the NSAs of concern. The walls would be 12 to 25 feet tall and be as near the equipment as possible, while allowing for air movement and worker safety. It is assumed noise barriers would reduce the noise impact from operations by 12 dBA.

Where additional noise reduction is required beyond that achievable by noise barriers, portable noise enclosures would be built directly around critical noise generating equipment, such as the drilling rig, the mud rig, and the shaker. Noise enclosures are more effective than barrier walls. Noise barriers incorporated into the modeling summarized in table B.9.1-1 as proposed by Northern would mitigate the noise impact from HDDs WBL P4-1 and WBL P4-2 by up to an estimated 20 dBA.

If required, temporarily relocation would be offered to residents, especially those within about 400 feet of the entry or exit pit, if HDD operations continue past 7:00 p.m.

With implementation of appropriate noise-reducing and buffering measures listed above, table B.9.1-1 shows what the estimated, mitigated noise levels would be at those locations where unmitigated HDD noise would exceed 55 dBA L_{dn} . Based on these measures, HDD noise levels would be below 55 dBA L_{dn} at most NSAs. In the instances where nighttime drilling is modeled to exceed 55 dBA L_{dn} , actual noise readings would be taken at the time of the HDD and additional noise mitigation measures employed, as needed, to meet the goal of 55 dBA L_{dn} .

To ensure that noise from HDD operations at nearby NSAs would not be significant, **we recommend that:**

- **Prior to construction of the WBL P4-1 and WBL P4-2 HDDs, Northern should file with the Secretary of the Commission (Secretary), for the review and written approval by the Director of OEP, or the Director's designee, a HDD noise mitigation plan to reduce the projected noise levels attributable to the proposed HDD operations at NSAs. During**

drilling operations, Northern should implement the approved plan, monitor noise levels, document the noise levels in the biweekly status reports, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than a L_{dn} of 55 dBA at the NSAs.

Due to the fact that existing ambient noise exceeds an L_{dn} of 55 dBA at HDD CIL P4-1, we would recommend requiring additional mitigation only if the combined contribution of HDD noise from either the entry or exit site and existing ambient noise exceeds 10 dBA over the existing ambient noise level. As shown in table B.9.1-1, the combined contribution of HDD noise and existing ambient noise is less than 10 dBA over existing ambient noise levels; therefore, we are not recommending noise mitigation for this HDD.

Temporary increases in noise levels from construction are predicted to be perceptible at nearby NSAs, but would be partially mitigated if construction is conducted during daytime hours to the extent practicable. Northern indicates that nighttime activities in addition to HDDs, including tie-ins, testing, and other time-sensitive construction activities, may be conducted to maintain the Project schedule, which may result in some additional noise impact at nearby NSAs. However, at all times engine idling and other non-essential noise impacts would be minimized, and all engine-driven machinery would be equipped with mufflers. Based on the proposed mitigation measures and our recommendation, we conclude that construction-related noise would be minimized and mitigated to the extent practical, and would not be significant.

Table B.9.1-1 Estimated Noise Levels at NSAs for Project HDDs												
HDD	Duration (days) ^a	NSA	Distance and Direction		Ambient (L _{dn} ,dBA)	Unmitigated			Mitigated			
			Entry Site ^b	Exit Site ^b		HDD Noise Level (dBA)	HDD + Ambient (L _{dn} ,dBA)	Increase Above Ambient (dBA)	Mitigation ^c	HDD Noise Level (dBA)	HDD + Ambient (L _{dn} ,dBA)	Increase Above Ambient (dBA)
Willmar D Branch Line Extension												
WBL P4-1	21 days	A	358 W	1,622 SE	47.7	61	70	22	E	50	55	8
		B	610 NW	1,462 SE	47.7	57	65	17		49	54	6
		C	615 SE	2,507 SE	47.7	57	65	17		49	52	4
		D	132 SE	1,945 NW	47.7	70	79	31	B, E	50	56	8
WBL P4-2	7 days	D	302 SE	893 SE	47.7	63	71	24	B, E	50	55	8
		E	295 NW	354 E	50.6	64	72	22		52	57	6
		F	422 SE	823 SW	50.6	61	69	18		51	54	4
Carlton Interconnect Loop												
CIL P4-1	21 days	Z	1,522 SW	2,338 SE	57.5	58	60	2	N/A	N/A	N/A	N/A
^a Assumes 24-hour operations for all drills and includes drilling operations from initial pilot hole drilling through final pullback, but does not include time needed for staging of equipment and equipment removal after installation. ^b Assumes the pit closest to each NSA would be the entry pit, to provide worst-case analysis. ^c Mitigation measures would be used only when HDD operations extend into nighttime hours (7:00 p.m. to 7:00 a.m.). Mitigation measures include: A. Institute work practices such as reduced idling, fitting equipment with residential mufflers B. Utilize a small and more modern HDD rig than was utilized for the noise model C. Install sound barrier walls between entry pit and NSA D. Install sound barrier walls between entry and exit pits and NSAs E. Install sound enclosures around critical equipment such as the drill rig, mud pump engine, shaker F. Temporary relocation of residents, if affected NSAs choose this option over the use of the above mitigation												

B.9.2 Operational Noise

Compressor units and engines are the principal source of noise at compressor stations. The type of equipment and associated ancillary systems proposed for the new Hinckley Compressor Station would minimize vibration outside of the station boundary.

In March 2020, Northern conducted ambient sound surveys at the nearest NSAs to the proposed new Hinckley Compressor Station and the expanded Pierz Compressor Station and Interconnect. Table B.9.2-1 summarizes the results of the ambient sound surveys as well as Northern's acoustical analyses to estimate noise impacts from full-load operation of Project equipment at the nearest NSAs.

Compressor Station	Nearest NSA	Distance of NSA from Compressor Station (feet)	Project Acoustic Impact (dBA)			
			Existing Ambient Background L _{dn}	Compressor Station Contribution L _{dn}	Cumulative Background and Compressor Station L _{dn}	Increase Above Existing Ambient
Hinckley	Residence "Y"	800	58	52	59	1
Pierz	Residence "U"	1,123	42 ^a	40 ^b	44	2

a Includes noise contribution of existing Pierz Compressor Station at or near full capacity at the time of the measurement.

b Includes estimated contribution of proposed Project compressor unit only.

The incremental noise impacts from the operation of the Hinckley Compressor Station at the nearest residence (NSA Y on the map of noise sensitive areas in appendix D) is one decibel above ambient levels; this estimated incremental impact is imperceptible to the human ear. The incremental noise impact on the closest NSA to the Pierz Compressor Station (the residence at location U) would be two decibels above ambient limits.

Even though the Hinckley Compressor Station is sited in a rural area, the ambient noise levels exceed 55 dBA L_{dn} because the Hinckley Compressor Station is near Interstate 35, a source of traffic-related noise. During scoping we received comments from the City of Hinckley concerning noise and vibration and from a nearby landowner whose property is between the Hinckley Compressor Station site and the Interstate and who requested consideration of a sound barrier between their residence and the Project. The Project, as designed, and our recommended condition below, would ensure that any noise attributable to the Hinckley Compressor Station would fall under an L_{dn} of 55 dBA at all nearby NSAs, including the landowner's residence. Any noise attributable to traffic along Interstate 35 is not within our jurisdiction and we require mitigation only sufficient to limit noise attributable to any FERC-jurisdictional source, including compressor stations, to no more than an L_{dn} of 55 dBA.

As detailed in Northern's Operation Equipment Noise Analysis for the proposed new Hinckley and modified Pierz Compressor Stations, Northern incorporated proposed noise mitigation measures at each of the compressor stations into its predictive noise analysis, including acoustically insulated compressor buildings; air inlet and exhaust silencers; a unit blowdown silencer; and insulated, self-closing, and well-sealed access doors. If deemed necessary, Northern would also install acoustical pipe insulation on aboveground outdoor piping.

The Hinckley Compressor Station and modified Pierz Compressor Station would employ a blowdown system including blowdown silencer that serves the compressor units at each station. The stations would be designed to allow a blowdown to occur during one-half of all unit shutdown events. During the period of commissioning and testing of the stations, a unit blowdown could occur up to four times per day and typically only during the daytime. During normal operation of the new Hinckley and modified Pierz Compressor Stations, after the commissioning period, a unit shutdown event would occur about 20 times per year, resulting in about 10 blowdown events per year at each station. The blowdown silencers equipped at each station would be capable of meeting a sound level specification of 60 dBA at 300 feet. Noise from blowdowns from the Hinckley Compressor Station at the nearest NSA (Y) from the modified Pierz Compressor Station and at the nearest NSA (U) would be approximately 51 dBA and 48 dBA, respectively.

The results of Northern's noise analyses indicate that if the anticipated and recommended noise control measures for the new equipment are successfully implemented, the noise attributable to the Project compressor stations would be lower than 55 dBA L_{dn} at nearby NSAs. In addition, because noise sources that could cause perceptible vibration (e.g., turbine exhaust noise) would be adequately mitigated, there should not be any Project-related perceptible increase in vibration at any NSA during compressor station operation.

In order to confirm that noise attributable to the new Hinckley and modified Pierz Compressor Stations does not exceed an L_{dn} of 55 dBA at any NSA, **we recommend that:**

- **Northern should file noise surveys with the Secretary no later than 60 days after placing the new Hinckley and modified Pierz Compressor Stations in service. If a full load condition noise survey is not possible, Northern should provide an interim survey at the maximum possible horsepower load and provide the full load survey within 6 months. If the noise attributable to the operation of the equipment at each of the Hinckley and Pierz Compressor Stations under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, Northern should:**

- a. **file a report with the Secretary, for review and written approval by the Director of OEP, or the Director's designee, on what changes are needed;**
- b. **install the additional noise controls to meet the level within 1 year of the in-service date; and**
- c. **confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

Based on the noise analysis above, the noise mitigation measures that Northern proposes to implement at the new Hinckley and modified Pierz Compressor Stations, and our recommendation, we conclude that operation-related noise would not result in significant noise impacts.

B.10 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. Methane is non-toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Methane has an auto-ignition temperature of 1,000 degrees Fahrenheit and is flammable at concentrations between 5.0 percent and 15.0 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite and burn if there is an ignition source. A flammable concentration within an enclosed space in the presence of an ignition source can explode. Methane is buoyant at atmospheric temperatures and disperses rapidly in air.

B.10.1 Safety Standards

The DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) is mandated to provide pipeline safety under 49 United States Code Chapter 601. PHMSA administers the DOT's national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response associated with pipeline facilities. Many of the regulations are written as performance standards that set the level of safety to be attained and require the pipeline operator to use various technologies to achieve safety. PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local levels.

The PHMSA pipeline standards are published in 49 CFR 190 through 199. Part 192 specifically addresses natural gas pipeline safety issues. Under a Memorandum of Understanding with FERC on Natural Gas Transportation Facilities, dated January 15, 1993, PHMSA has the exclusive authority to promulgate federal safety standards in the transportation of natural gas. Section 157.12(a)(9)(vi) of FERC's regulations require that an applicant certify that it would design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection. Alternatively, an applicant must certify that it has been granted a waiver of the requirements of the safety standards by PHMSA in accordance with Section 3(e) of the Natural Gas Pipeline Safety Act. FERC accepts this certification and does not impose additional safety standards.

If FERC becomes aware of an existing or potential safety problem, there is a provision within the Memorandum to promptly alert PHMSA. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under FERC's jurisdiction. FERC also participates as a member of PHMSA's Technical Pipeline Safety Standards Committee, which determines if proposed safety regulations are reasonable, feasible, and practicable.

Project Design Requirements

The piping and aboveground facilities associated with the Northern Lights 2021 Expansion Project must be designed, constructed, operated, and maintained in accordance with the PHMSA Minimum Federal Safety Standards in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. PHMSA specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

Pipeline Safety

In addition to the requirements reviewed above, PHMSA also defines area classifications, based on population density near the pipeline and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile-length of pipeline. The four area classifications are defined below:

- Class 1: Location with 10 or fewer buildings intended for human occupancy;
- Class 2: Location with more than 10 but less than 46 buildings intended for human occupancy;

- Class 3: Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by more than 20 or more people on at least 5 days a week for 10 weeks in any 12-month period; and
- Class 4: Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operations. For instance, pipelines constructed in Class I locations must be installed with a minimum depth cover of 18 inches in consolidated rock and 30 inches in normal soil. Class 2, 3 and 4 locations, as well as drainage ditches of public roads and railroad crossings require a minimum cover of 24 inches in consolidated rock and 36 inches in normal soil.

Class locations also specify the maximum distance to a sectionalizing block valve (i.e., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, maximum allowable operating pressure (MAOP), inspection and testing of welds, and the frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas.

Table B.10.1-1 summarizes the Class locations crossed by the Project pipeline facilities. Changes in population density near the proposed facilities would be monitored by Northern to document that the new facilities meet the appropriate design criteria and safety standards where class locations change. If a subsequent increase in population density adjacent to the rights-of-way results in a change in class location for the pipeline, Northern may replace sections of pipe, reduce the MAOP of the line, or take other similar safety measures to achieve the required measure of safety and comply with PHMSA requirements for the new class location.

Table B.10.1-1 Class Locations for the Project Pipeline Facilities			
Beginning MP	Ending MP	Existing Class for Proposed Facilities	Design Class for Proposed Facilities ¹⁸
Willmar D Branch Line Extension			
1.39	1.43	Class 2	Class 3
1.43	1.61	Class 1	Class 3
1.61	2.18	Class 2	Class 3
Carlton Interconnect Loop			
0.00	0.69	Class 1	Class 3
Viking Interconnect Branch Line			
0.00	0.08	Class 1	Class 3

PHMSA's Pipeline Safety Regulations require operators to develop and follow a written integrity management program that contains all the elements described in 49 CFR 192.911 and address the risks on each transmission pipeline segment. PHMSA has also published rules that define high consequence areas where a gas pipeline accident could do considerable harm to people and their property. Once a pipeline operator has determined the high consequence areas along its pipeline, it must apply the elements of its integrity management program to the applicable segments of the pipeline. Northern has determined the Project, as designed, would not affect any high consequence areas, thereby alleviating the need for further consideration relative to 49 CFR 192.761(f).

Emergencies

PHMSA's minimum standards for operating and maintaining pipeline facilities include the requirement to establish a written plan governing these activities. Each pipeline operator is required under 49 CFR 192.615 to establish an emergency plan that includes procedures to minimize the hazards of a natural gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- emergency system shutdown and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of

¹⁸ Available on eLibrary under accession no. 202000731-5243.

an emergency; and

- protecting people first and then property and making them safe from actual or potential hazards.

PHMSA requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. As part of PHMSA'S requirements, Northern must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Northern would provide the appropriate training to local emergency service personnel before the Project is placed in service.

On October 1, 2019, PHMSA issued new regulations modifying and expanding the standard pipeline safety standards under 49 CFR 191 and 192. These regulations, in part, established: new standards for in-line inspections; requirements for newly established moderate consequence areas; requirements to consider seismicity and geotechnical risks in its integrity management plan for the pipeline; new regulations on pipeline patrol frequency for HCAs, moderate consequence areas, and grandfathered pipelines; a policy to reconfirm MAOP for certain pipelines; installation of pressure relief for pig launcher/receivers; and reporting requirements for exceedances of MAOP to PHMSA. These regulations went into effect on July 1, 2020.

B.10.2 Pipeline Accident Data

PHMSA requires all operators of natural gas transmission pipelines to notify it of any significant incident and to submit a report within 20 days. Significant incidents are defined as any leaks that:

- caused a death or personal injury requiring hospitalization; or
- involve property damage of more than \$50,000 (1984 dollars).¹⁹

During the 20-year period from 1998 through 2017, a total of 1,365 significant incidents were reported on the more than 300,000 total miles of natural gas transmission pipelines nationwide (PHMSA, 2019). Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table B.10.2-1 provides a distribution of the causal factors as well as the number of each incident by cause.

¹⁹ \$50,000 in 1984 dollars is approximately \$122,500 as of March 2018 (U.S. Bureau of Labor Statistics, 2018b).

The dominant causes of pipeline incidents are corrosion and pipeline material, weld or equipment failure constituting 53.2 percent of all significant incidents. The pipelines included in the data set in table B.10.2-1 vary widely in terms of age, diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

Cause	Number of Incidents^a	Percentage of All Incidents
Corrosion	324	23.7
Excavation ^b	198	14.5
Pipeline material, weld or equipment failure	403	29.5
Natural force damage	148	10.8
Outside force ^c	90	6.6
Incorrect operation	54	4.0
All other causes ^d	148	10.8
Total	1,365	-

^a All data acquired from PHMSA significant incident files (PHMSA, 2019).
^b Includes damage from third-party excavation, operator/contractor excavation damage and previous damage due to excavation.
^c Fire, explosion, vehicle damage, previous damage, intentional damage.
^d Miscellaneous causes or unknown causes.

The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents and material failure, since corrosion and pipeline stress and strain are time-dependent processes. The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe.

Outside force, excavation, and natural forces are the next three most significant causes of pipeline incidents, totaling 32.5 percent of significant pipeline incidents. These result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage. Older pipelines have a higher frequency of outside-forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller-diameter pipelines; which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movement.

Table B.10.2-2 provides a breakdown of excavation, outside force and natural force incidents by cause.

Cause	Number of Incidents	Percentage of All Incidents
Third-party excavation damage	160	36.7
Operator excavation damage	26	6.0
Previous damage due to excavation	12	2.8
Heavy rain/floods	78	17.9
Earth movement	29	6.7
Lightning/temperature	30	6.9
Natural force (other)	11	2.5
Vehicle (not engaged with excavation)	52	11.9
Fire/explosion	10	2.3
Previous mechanical damage	6	1.4
Fishing or maritime activity	9	2.1
Intentional damage	1	0.2
Electrical arcing from other equipment/facility	1	0.2
Unspecified/other outside force	11	2.5
Total	436	
^a Excavation, Outside Force, and Natural Force from table B.10.2-1.		
^b All data acquired from PHMSA significant incident files (PHMSA, 2019).		

Since 1982, operators have been required to participate in One Call public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The One Call program is a service used by public utilities and some private sector companies (e.g., oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. Northern would use the state's One Call system, Minnesota's Gopher State One Call, for utility line locates prior to excavation.

B.10.3 Impact on Public Safety

Northern would comply with all applicable DOT pipeline safety standards as well as regular monitoring and testing of the pipeline. While pipeline failures are rare, the potential for pipeline systems to rupture and the risk to nearby residents is discussed below.

The incident data summarized in table B.10.2-1 above include pipeline failures of all magnitudes with widely varying consequences.

Table B.10.3-1 presents the average annual injuries and fatalities that occurred on natural gas transmission lines for the 5-year period between 2015 and 2019. Most

fatalities from pipelines are due to local distribution pipelines, which are not regulated by FERC. These are natural gas pipelines that distribute natural gas to homes and businesses after transportation through interstate natural gas transmission pipelines. In general, these distribution lines are smaller diameter pipes and/or plastic pipes which are more susceptible to damage. Local distribution systems typically do not have large rights-of-way and pipeline markers common to the FERC-regulated natural gas transmission pipelines.

Year	Injuries	Fatalities
2015	16	6
2016	3	3
2017	3	3
2018	7	1
2019	8	1

^a All data acquired from PHMSA significant incident files (PHMSA, 2019).

The nationwide totals of accidental fatalities from various anthropogenic and natural hazards are listed in table B.10.3-2 in order to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. However, direct comparisons between accident categories should be made cautiously because individual exposures to hazards are not uniform among all categories. The data nonetheless indicate a low risk of death due to incidents involving natural gas transmission pipelines compared to the other categories. Furthermore, the fatality rate is much lower than the fatalities from natural hazards such as lightning, tornadoes, or floods.

Cause	Annual Number of Deaths
All accidents	117,809
Motor Vehicle	45,343
Poisoning	23,618
Falls	19,656
Injury at work	5,113
Drowning	3,582
Fire, smoke inhalation, burns	3,197
Floods ^b	81
Lightning ^b	49
Tornado ^b	72
Tractor Turnover	62
Natural gas distribution lines ^c	14
Natural gas transmission pipelines ^d	2
^a All data, unless otherwise noted, reflect 2005 statistics from U.S. Census Bureau, Statistical Abstract of the United States: 2010 (129th Edition) Washington, DC, 2009. ^b National Oceanic Atmospheric Administration's National Weather Service, Office of Climate, Water and Weather Services, 30-year average (1985-2014) http://www.weather.gov/om/hazstats.shtml . ^c Bureau of Labor Statistics, 2007 Census of Occupational Injuries. ^d PHMSA significant incident files (PHMSA, 2019).	

The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1999 to 2018, there were 86 significant incidents, averaging 9 injuries and 3 fatalities per year (PHMSA, 2019). The number of significant incidents over the more than 300,000 miles of natural gas transmission lines indicates the risk is low for an incident at any given location. Northern's construction and operation of the Project would represent a minimal increase in risk to the nearby public. We conclude that with Northern's implementation of safety design criteria including that required by the DOT/PHMSA, the Project would be constructed and operated safely.

B.11 CUMULATIVE IMPACTS

B.11.1 Cumulative Impacts

In accordance with NEPA and FERC policy, we evaluated the potential for cumulative impacts of the Project. Cumulative impacts were assessed for the proposed Project when compared to other past, present, and reasonably foreseeable future activities. The CEQ regulations define cumulative impact as "the impact on the environment which results from the incremental impact of the action [being studied] when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking

place over a period of time. This cumulative impacts analysis includes actions meeting the following three criteria:

- the action impacts a resource area also potentially impacted by the proposed Project;
- the action causes the impacts within all or part of the Project area; and
- the action causes this impact within all or part of the time span for the potential impacts from the proposed Project.

As described in section B of this EA, constructing and operating the Project would temporarily and permanently impact the environment. The Project would affect geology and soils, water resources and wetlands, vegetation and wildlife, land use, visual resources, recreation, cultural resources, socioeconomics, air quality, and noise. The proposed facilities could contribute to cumulative impacts on these resource areas; however, Northern would minimize adverse impacts associated with the Project by implementing mitigation measures identified in section B of this EA.

Table B.11.1-1 summarizes the resource-specific geographic boundaries that were considered in this analysis and justification for each. Actions outside of these boundaries are not evaluated because their potential to contribute to a cumulative impact diminishes with increasing distance from the Project. In addition to the geographic scope, the temporal relationship between the Project and other activities in the area were evaluated. Since the Project would be constructed in 2021, most impacts are anticipated to occur the same year with restoration quickly following construction. Therefore, short-term (construction-related) cumulative impacts were considered for other actions in the geographic scope and same temporal scope. Operational impacts were evaluated on a long-term basis.

Table B.11.1-1 Resource-Specific Geographic Regions for Determining Cumulative Impacts of the Project			
Resource(s)	Cumulative Impact Geographic Scope	Justification for Geographic Scope	Temporal Scope
Geology and Soils	Area of disturbance of the Project and other activities that would be overlapping or abutting each other	Project impacts on geology and soils would be highly localized and limited to the Project area during active construction. Cumulative impacts on geology and soils would only occur if construction of other projects were geographically overlapping or abutting Northern's Project.	Construction through revegetation
Surface Water and Wetlands	Hydrologic Unit Code (HUC) 12 watershed boundary	Impacts on surface waters and wetlands can result in downstream contamination or turbidity; therefore, the geographic scope we used to assess cumulative impacts on waterbodies is the HUC-12 subwatersheds crossed by the Project.	Construction through revegetation; except areas of permanent conversion of wetlands/vegetation (including permanent tree clearing)
Groundwater	HUC-12 watershed boundary	For similar reasons as stated above in Surface Water and Wetlands, contributions towards cumulative impact on wetlands and groundwater were assessed within the HUC-12 subwatershed.	Construction through revegetation
Vegetation and Wildlife	HUC-12 watershed boundary	For similar reasons as stated above in Surface Water, contributions towards cumulative impact on vegetation and wildlife were assessed within the HUC-12 subwatershed.	Construction through revegetation; except areas of permanent conversion of vegetation (including permanent tree clearing)
Cultural Resources	APEs	Project impacts on cultural resources would be highly localized and limited to the Project footprint during active construction.	Limited to construction duration unless permanent impacts to cultural resources (buried or visual) occur
Land Use and Recreation	1.0 mile from the Project	Project impacts on general land uses would be restricted to the construction workspaces. Land use in the Project area is mainly agricultural and industrial/commercial land. Therefore, we considered a 1.0-mile distance from the Project for the geographic scope because this would cover any land use/recreational impacts that could be incremental to the Project.	Limited to construction except for areas of permanent land use conversion
Visual Impacts	0.25 mile from pipelines and road crossings and 0.50 mile from the aboveground facilities	The geographic scope for assessing cumulative impacts on viewshed includes the surrounding area where a new facility would be visible. One new compressor station would be constructed, and one compressor station would be modified, and pipeline appurtenances facilities within Northern's rights-of-way would be constructed. The geographic scope would be limited to areas where clearing of mature trees would occur. Because the area is generally flat to gentle rolling hills,	Long term, through operational duration of the Project

Table B.11.1-1 Resource-Specific Geographic Regions for Determining Cumulative Impacts of the Project			
Resource(s)	Cumulative Impact Geographic Scope	Justification for Geographic Scope	Temporal Scope
		we considered a distance of about 0.5 mile appropriate.	
Socioeconomics and Traffic	Affected counties	Due to the Project's limited scope and the short construction duration, the geographic scope for assessing contributions to cumulative impacts on socioeconomics and traffic were evaluated on a countywide basis.	Limited to construction duration
Air Quality – Construction	0.5 mile from the Project	Since construction emissions are localized, the geographic scope used to assess potential cumulative impacts on air from construction activities was set at 0.5 mile from the Project area.	Limited to construction duration
Air Quality - Operation	50 kilometers (31 miles) surrounding the Hinckley Compressor Station	A conservative geographic scope for the purpose of identifying other projects with the potential to contribute to air quality impacts within 50 km.	Long term, through operational duration of the Project
Noise – Construction	NSAs within the immediate proximity (0.25 mile) of construction activities	The geographic scope for assessing potential cumulative impacts on construction noise was determined to be areas within proximity to the construction activities.	Limited to construction duration
Noise-- Operation	1.0 mile surrounding aboveground facilities	The geographic scope identifies other projects that would affect the same NSAs within 1 mile of the aboveground facilities.	Long term

Table B.11.1-2 identifies past, present, and reasonably foreseeable projects or actions that occur within the geographic scope of each resource area. These projects were identified through conversations with local planning and zoning officials, research of publicly available information, and review of aerial and satellite imagery. One of the Section 2.55(a) or Blanket Certificate Projects listed in appendix C, installation of new piping at the Carlton Compressor Station, is within the geographic scopes for this Project.

<p align="center">Table B.11.1-2 Details of other Actions with Potential Cumulative Impacts on Resources within the Geographic and Temporal Scope Considered</p>						
Project	County/State	Description	Approximate Project Footprint and Land Use	Estimated Construction Timeframe	Distance/Direction to Proposed Project	Resources Considered
Past and Present Actions						
Piping and valves at Carlton Compressor Station	Carlton County, MN	Under Section 2.55(a), Northern will install approximately 160 feet of 20-inch-diameter piping with associated valves and fittings would be installed.	4.6 acres of industrial land inside Northern's Carlton Compressor Station.	Concurrent with NL 2021 Project	Overlapping workspace	Soils, geology, wetlands and surface water, groundwater, air quality – construction and noise-construction
Enbridge Line 3 Construction	Carlton County, MN	Replacement of the 34-inch-diameter Enbridge Line 3 crude oil pipeline with a modern 36-inch-diameter crude oil pipeline from Joliette, North Dakota, to Clearbrook, Minnesota.	The project would span 1,097 miles in the United States and Canada. The U.S. portion would consist of 364 miles of pipeline. Specifically, Line 3 consists of approximately 23.0 miles of pipeline in Carlton County; 5.2 miles in HUC 40102011504; and 1.5 miles of pipeline within one mile of the Carlton Interconnect Loop.	Construction started in December 2020 and will continue into 2021	The current route presented by the Minnesota Department of Commerce in its route permit reissuance (dated May 1, 2020) is 115 feet south of ATWS 3 on the Carlton Interconnect Loop. The proposed receiver site is approximately 1,100 feet north of Line 3.	Soils, geology, groundwater, surface water resources (wetlands), vegetation and wildlife, land use, visual resources, construction – air, construction – noise, socioeconomics and traffic.
Future Actions						
Hinckley Compressor Station non-jurisdictional facilities	Pine County, MN	Construction of new electric power line, communications line, and septic mound to serve the proposed Hinckley Compressor	<0.1 acre of industrial and agricultural land	Concurrent with NL 2021 Project	Work would occur within the road right-of-way adjacent to the proposed compressor station and within the	Soils, geology, groundwater, land use, visual resources

**Table B.11.1-2
Details of other Actions with Potential Cumulative Impacts on Resources within the Geographic and Temporal Scope Considered**

Project	County/State	Description	Approximate Project Footprint and Land Use	Estimated Construction Timeframe	Distance/Direction to Proposed Project	Resources Considered
		Station. A private well also would be required.			compressor station footprint and shares HUC-12 (70300030503)	
MN 13 Mill and Overlay	Scott County, MN	In-place recycling, bituminous mill and overlay, and shoulder work on MN Hwy 13 from MN 19 in Cedar Lake Township to 0.1 mile south of MN 282 in Spring Lake Township	7.0 miles within the existing road rights-of-way	2022	Approximately 6.5 miles west of the Willmar D Branch Line Extension	Socioeconomics and traffic.

The actions considered in our cumulative impact analysis are included based on the likelihood of their impacts coinciding with impacts from Northern's Project, meaning the other actions have current or ongoing impacts or are "reasonably foreseeable." The actions we considered are those that could affect similar resources during the same timeframe as Northern's proposed Project. The anticipated cumulative impacts of the Project and these other actions are discussed below.

Geology and Soils

The Project's impact on geology and soils would be highly localized and limited primarily to the workspaces during the period of active construction; cumulative impacts on geology and soils would only occur if other geographically overlapping or abutting projects were constructed at the same time (and place) as the Project. Actions identified in table B.11.1-2 within the geographic and temporal scopes for geology and soils are the Northern piping at Carlton Compressor Station, Hinckley Compressor Station non-jurisdictional facilities, and Enbridge Line 3 projects.

The Hinckley Compressor Station non-jurisdictional facilities would be constructed within the Hinckley Compressor Station or adjacent road right-of-way. There would be a minor cumulative increase in the potential for soil erosion or other soil impacts. However, Northern would implement BMPs to limit erosion and sedimentation. Northern would implement our Plan to minimize impacts on soils.

During construction, Northern would temporarily impact approximately 7.92 acres of soil of the Carlton Interconnect Loop, including installation of 0.38 acre of gravel fill for the Carlton Interconnect Loop to install a new launcher. Based on a review of publicly available data, Enbridge's project does not appear to require any above-grade facilities adjacent to the Carlton Interconnect Loop. The two projects' workspaces do not overlap but come within approximately 15 feet. Each company has SWPPPs that establish BMPs to limit impacts on soils through construction and restoration. Apart from the 0.38 acre on Northern's Project, soils for both projects would be restored to the extent practicable by backfilling with the segregated subsoil and topsoil layers and completing decompaction, where appropriate.

The Carlton Compressor Station piping installation would take place within the Carlton Compressor Station footprint at the same time as the Interconnect Project. There would be a minor cumulative increase in the potential for soil erosion or other soil impacts. However, Northern would implement BMPs to limit erosion and sedimentation. Northern would implement our Plan to minimize impacts on soils.

Northern's Project would not result in impacts on mineral resources, nor would the other actions occurring within the geographic and/or temporal scopes of the Project. Northern does not anticipate any work in karst areas, near geological hazards, or areas of shallow bedrock.

We conclude that the limited Project area and the measures Northern would adopt to minimize impacts on soils would prevent any significant contribution to cumulative impacts on geology and soils from the proposed Project in consideration with the other identified actions.

Surface Water and Wetlands

The geographic scope for assessing cumulative impacts on wetlands and surface water resources includes each Hydrologic Unit Code (HUC)-12 watershed crossed by the Project (table B.11.1-3). The temporal scope is limited to the duration of construction through revegetation except areas of permanent conversion of wetlands/vegetation (including permanent tree clearing). The action in table B.11.1-2 that is within the geographic and temporal scope for wetlands and surface water is the Enbridge Line 3 Project, which would share a HUC-12 with the Carlton Interconnect Loop.

Table B.11.1-3 Project Component HUC-12 Locations		
Facility	County	Watershed (HUC-12)
Willmar D Branch Line Extension	Dakota and Scott	South Creek (70400010202)
	Scott	Credit River (70200121107)
Carlton Interconnect Loop	Carlton	Otter Creek (40102011504)
Hinckley Compressor Station	Pine	Grindstone River (70300030503)
Pierz Compressor Station and Interconnect and Viking Interconnect Branch Line	Morrison	Lower Skunk River (70102010303)

Surface Water

While construction of the Carlton Interconnect Loop would not directly affect surface waters, one waterbody (an open water feature) would be crossed via an HDD, limiting potential waterbody impacts from construction of the proposed Project. The Carlton Compressor Station piping installation would take place within the Carlton Compressor Station footprint at the same time as the Interconnect Project. There would be a minor cumulative increase in the potential for soil erosion leading to sedimentation of nearby waterways. However, Northern would implement BMPs to limit erosion and sedimentation. Northern would implement our Plan and Procedures to minimize impacts on water quality.

The only other action described above that could also have direct or indirect impacts on waterbodies is the Enbridge Line 3 Project. Due to the avoidance of the Project's direct impacts on these waterbodies by use of HDD construction methods, as well as mitigation of indirect impacts through implementation of our Plan and Procedures and Northern's BMPs and HDD Plan, we conclude that any contribution to cumulative impacts on waterbodies from the Project in consideration with the other identified actions would be negligible.

Wetlands

The Carlton Interconnect Loop portion of Northern's proposed Project is the only facility that shares the HUC-12 (40102011504) with the Enbridge Line 3 Project (Line 3). Based on a review of Enbridge's Supplemental Information for Application filed with the USACE (Enbridge, 2018), Line 3 would temporarily impact approximately 15.63 acres of PEM wetland; 3.19 acres of PSS wetland; and 0.05 acre of PFO wetland within HUC 12 40102011504. Additionally, construction of Line 3 would permanently convert approximately 4.78 acres of PFO and 1.92 acres of PSS wetland within HUC 12 40102011504. Enbridge indicated that they would reduce the width to a 95-foot construction corridor in wetlands, co-locate approximately 90 percent of the route, and typically use about 40 feet of existing right-of-way in their construction workspace. Enbridge would provide compensatory mitigation for wetland type conversion of scrub-shrub and forested wetlands as well as temporal loss. Enbridge has purchased mitigation credits from USACE-approved mitigation banks to compensate for losses including acres from Bank Service Area 1, which serves the HUC 12. Additionally, Enbridge would conduct post-construction wetland monitoring during the growing season in years 1, 3 and 5 post construction.

The Carlton Compressor Station piping installation would take place within the Carlton Compressor Station footprint at the same time as the Interconnect Project. There would be a minor cumulative increase in the potential for soil erosion potentially leading to the sedimentation of nearby wetlands. However, Northern would implement BMPs to limit erosion and sedimentation. Northern would implement our Plan and Procedures to minimize impacts on wetlands.

The Carlton Interconnect Loop would impact about 0.5 acre of PSS and 0.2 acre of PEM wetlands during construction, and operation of the facility would permanently convert 0.14 acre of PSS wetland to PEM and permanently fill less than 0.1 acre of PSS wetland. Northern has minimized wetland impacts on this component to the extent practicable and would restore wetlands to pre-construction condition, including restoration of subsoil, topsoil and contours. Wetland impacts for Northern's proposed Project would be minimized by use of standard construction methods and mitigation measures outlined in our Plan, Procedures, and Northern's SPCC Plan. In addition, Northern would complete post-construction wetland monitoring annually until restoration is deemed successful per the Procedures and USACE requirements.

Within the shared HUC-12, the total temporary and permanent wetland impacts of the Carlton Interconnect Loop and the Enbridge Line 3 Project would be 19.6 and 6.9 acres, respectively. When compared to the total acres of wetland in the HUC-12, these numbers represent less than 1 percent of overall wetlands. Based on the limited impacts to wetlands as a result of the Northern Project, including the proposed HDD crossing, the assumption that the majority of wetland impacts for the Enbridge Line 3 Project would be minor and temporary, the compensatory mitigation Enbridge is planning to implement, and the fact that wetlands would be restored to pre-construction conditions, we conclude that the Project, when considered with other actions in the vicinity, would not result in significant cumulative impacts on wetlands.

Groundwater

Similar to surface water resources, the geographic scope for assessing cumulative impacts on groundwater includes each HUC-12 watershed crossed by the Project. The temporal scope is limited to the duration of construction through revegetation, with the exception of areas of permanent conversion of vegetation. Three actions share a geographic and temporal scope with Northern's proposed Project.

The Hinckley Compressor Station and the Hinckley Compressor Station non-jurisdictional facilities share a HUC-12 (70300030503). Construction of the compressor station along with the private well and septic mound could have an impact on groundwater resources in the area as the water table is shallow. Construction may cause short-term changes in the water level and turbidity of shallow groundwater resources. These impacts are expected to be localized and short-term as water levels would quickly re-establish equilibrium and turbidity levels would subside. Construction and operation activities are not expected to impact groundwater quality from releases of fuel or hazardous materials given that protocols prescribed in the SPCC Plan would be followed. The private well and septic mound would be constructed in accordance with local and state permits. The private well would be cased through the shallow ground water table, and the mound system would have a drainage field sufficient to adequately treat and manage the flow from the system.

The Carlton Compressor Station piping installation would take place within the Carlton Compressor Station footprint at the same time as the Interconnect Loop. There would be short-term changes in the water level and turbidity of shallow groundwater resources and the potential for spills during construction. However, Northern would implement BMPs to limit erosion and sedimentation. Northern would implement its SPCC to minimize impacts on groundwater.

As mentioned above, the Enbridge Line 3, Carlton Interconnect Loop, and Carlton Piping projects share a HUC 12. Construction and operations activities from any of these projects are not expected to impact groundwater quality from releases of fuel or hazardous materials given that protocols prescribed in each company's SPCC Plans

would be followed. We conclude that any contribution to cumulative impacts on groundwater from the proposed Project would be negligible.

Vegetation and Wildlife

Cumulative impacts on vegetation and wildlife, including threatened and endangered species affected by the Project, could occur in the HUC-12 watersheds crossed by the Project with other actions constructed at the same time. Other actions which share a HUC-12 with Northern's Project are identified in the surface water discussion above. The construction activities associated with clearing, grading, removal of vegetation, and the potential for the establishment of invasive plant species occurring during the same timeframe and area can result in cumulative impacts. In addition, changes of these environments can also cause alteration of wildlife habitat, displacement of wildlife, and other secondary effects such as forest fragmentation. To account for both direct and indirect effects of the Project, the geographic scope was evaluated to the watershed level for the Project areas, which we found appropriate based on the relative rural nature of the construction footprints.

The other action that could have direct or indirect impacts on vegetation is the Enbridge Line 3 Project. As a pipeline project, most impacts associated with the Enbridge Line 3 Project would be expected to be temporary and minor. The Carlton Interconnect Loop portion of Northern's proposed Project is within the same HUC-12 (40102011504). Northern's construction activities within this HUC-12 would temporarily impact about 3.3 acres of vegetation (forested land, wetland, and open land), and operation of the facility would permanently affect 0.3 acre of vegetation. The vegetation communities affected by the construction of the Carlton Interconnect Loop primarily include about 2.3 acres of forest/woodland, 0.7 acre of wetland, and 0.3 acre of open land. No agricultural land would be affected by the Carlton Interconnect Loop. Operation of the facility would permanently impact about 0.2 acre of wetland and 0.1 acre of open land.

Northern designed its Project to minimize impacts on mature forested areas to the extent practicable. All of the 2.3 acres of forest impacted by Northern's Carlton Interconnect Loop would be allowed to revegetate to pre-construction conditions, although this would still represent a long-term impact on these forested areas. We anticipate that there would be minor contributions to temporary cumulative impacts on herbaceous vegetation and wildlife species. However, the forested habitats within the vicinity of the Project area are already fragmented. Additionally, temporary workspaces would be allowed to revert to pre-construction conditions following construction of the Project and, therefore, would minimize the potential for any significant contribution to cumulative impacts on wildlife or vegetation from the Project.

The Enbridge Line 3 Project, as a large utility pipeline, would affect wildlife and could contribute to a cumulative impact. However, impacts on general wildlife would be

expected to be primarily during construction of the projects and would be minor in nature. Construction workspaces would be restored, post-construction, along both of these pipeline projects and no long-term impacts to wildlife are anticipated.

According to the Supplemental Information for Application filed with the USACE in September 2018, Enbridge has initiated its Section 7 consultation with the USFWS and prepared a Biological Assessment in fall 2018. Enbridge proposed a number of measures to minimize impacts to threatened and endangered species. Impacts on local wildlife populations and vegetation within the shared HUC-12 would be minimal for both projects. Northern's Carlton Interconnect Loop would disturb approximately 3.3 acres of vegetation cover. Northern's Section 7 review determined that the federally listed northern long-eared bat has potential habitat within the Carlton Interconnect Loop workspaces. Northern used the 4(d) Rule Streamlined Consultation Form to ensure that any incidental take of the northern long-eared bat is not prohibited by the 4(d) Rule. Construction and operation of the Carlton Interconnect Loop is not likely to result in long-term or cumulative impacts on vegetation or wildlife. No substantial changes in land cover, habitat availability, or suitability are anticipated as a result of the proposed Project.

Based on the minimal impact associated with the Carlton Interconnect Loop, the fact that the Enbridge Line 3 project and Northern's Carlton Interconnect Loop would not be under construction simultaneously, and the siting efforts to avoid impacts to vegetation and wildlife, the impact on vegetation and wildlife from the proposed Project would not have a significant cumulative impact when considered with other identified projects.

Land Use and Recreation

The construction and operation of the Project and other future actions would require the temporary and permanent use of land, which would result in temporary and permanent impact/conversion of land use. Most of the Project's impacts on general land uses would be restricted to the construction workspaces; therefore, the geographic scope for land use and recreation used was one mile from the edge of the Project. The temporal scope would be limited to the duration of construction. Of the actions identified in table B.11.1-2, two actions would be within the geographic and temporal scope.

Northern's Project would allow most areas to revert to preconstruction conditions. The Hinckley Compressor Station would permanently convert about 6.3 acres of land to an industrial facility. This land is primarily agricultural (6.2 acres). The Hinckley Compressor Station non-jurisdictional facilities would be constructed within or adjacent to the Hinckley Compressor Station and would contribute to minimal cumulative impacts to land use as the non-jurisdictional facilities occupy a small portion of land adjacent to the proposed compressor station. Since the non-jurisdictional facilities would only

contribute to a minimal cumulative impact, we conclude cumulative impacts on land use would not be significant.

The Enbridge Line 3 project would increase the amount of pipeline right-of-way that Enbridge maintains (Minnesota Commerce Department, 2020) but, overall, would not significantly affect land use as no permanent facilities would be installed in the vicinity of Northern's Project. Construction and operation of the Carlton Interconnect Loop would have minor effects on land use, including installation and operation of a launcher and receiver (approximately 0.38 acre of land use converted to industrial/commercial land). Areas disturbed during construction would be restored in accordance with the Plan and Procedures and the Project SWPPP. Since the impacts associated with the Enbridge Line 3 project and Northern's Carlton Interconnect Loop would be relatively minor and temporary in nature and would only contribute to a minimal cumulative impact, we conclude cumulative impacts on land use would not be significant.

No Project-related impacts on recreation are anticipated and none of the other actions considered within the geographic scope of the Project would impact recreation. Therefore, we conclude that there would be no cumulative impact to recreation.

Visual Impacts

The geographic scope for assessing cumulative impacts on viewsheds includes 0.25 mile around the pipeline and 0.5 mile around where a new aboveground facility would be visible, including areas where clearing of mature trees would occur. The temporal scope is long term; i.e., throughout the operational duration of the Project. Of the actions identified in table B.11.1-2, two actions would be within the geographic and temporal scope. Operation of the Hinckley Compressor Station and its non-jurisdictional facilities would alter existing visual resources; however, no other actions were identified within the viewshed of the Hinckley Compressor Station.

The Enbridge Line 3 project would install pipeline within 0.25 mile of the Carlton Interconnect Loop. Enbridge is not installing any above-grade facilities within 0.5 mile of the Carlton Interconnect Loop. If both projects are in construction at the same time, there would be cumulative visual impacts from construction equipment and clearing and grading activities. Long term visual impacts from the two pipelines would be minimized as both are paralleling existing pipeline corridors and/or would be installed by HDD, which limits the construction footprint and clearing (visual impacts). Northern's Project would have a negligible contribution to visual cumulative impacts.

We conclude that the Project's cumulative impacts on visual resources would not be significant.

Socioeconomics

We anticipate that most socioeconomic impacts from Northern's Project would occur within impacted counties and would be limited to the duration of construction. Two other actions listed in table B.11.1-2 are within the geographic and temporal scope of Northern's Project and could affect socioeconomics and traffic, the Minnesota State Highway 13 Mill and Overlay Project consisting of milling and shoulder work for Minnesota State Highway 13 and the Enbridge Line 3 project. Northern's Project and these actions would generate temporary construction jobs, increase local spending, and increase tax revenues. We concluded in section B that the proposed Project would not disproportionately affect racial, ethnic, or low-income population groups. The socioeconomic impact associated with construction of Northern's Project would be short term and localized primarily because of the relatively short construction period (approximately 2-3 months) for installation of the Willmar D Branch Line Extension and the Carlton Interconnect Loop.

Population influx as a result of construction would occur near cities with available rental units or campgrounds capable of housing the temporary workers. Impacts on public services and infrastructure (e.g., fire, medical, education, police and transportation) would be limited as workers are anticipated to use available temporary housing resources. Northern anticipates that each pipeline spread would require a maximum of 100 construction workers and inspectors. Northern would not add additional full-time positions to operate the proposed facilities. Beneficial impacts associated with construction of the Project and other actions include temporary construction jobs, increased local spending, and tax revenues.

Deliveries of pipe and other construction materials for the other county-wide projects could coincide, resulting in some minor cumulative impact on traffic. These impacts would be expected to be localized, minor, and short-term (only lasting for a few minutes to perhaps a day). Due to separate workspaces and temporary access roads/points, the Enbridge Line 3 project and Northern's Project do not overlap. Both projects are close to two larger road systems, Highway 61 and Interstate 35, that can handle the incremental traffic load for the two projects. Northern has stated it would work with its contractor to develop travel routes for construction vehicles that would avoid the DOT construction projects to the best of its ability. Northern does not intend to close any roads during construction. Based on this information, we do not anticipate that Northern's Project, when considered with the other actions, would result in any significant cumulative impact on public services, traffic, or availability of housing.

Air Quality

Of the actions identified in table B.11.1-2, two actions would be within the geographic and temporal scope and could affect air quality: the Enbridge Line 3 project and Northern's project to install piping at its existing Carlton Compressor Station.

Emissions from construction of the Project's Carlton Interconnect Loop and Enbridge Line 3 would be temporary and minor. Neither of the actions would require construction or operations permits for air emissions. Simultaneous construction of the interconnect loop and Enbridge Line 3 could result in cumulative air quality impacts from fugitive dust generation due to soil disturbance and the operation of vehicles and equipment.

Simultaneous construction of the Project and Northern's proposed station piping inside the Carlton Compressor Station would be completed concurrently using the same equipment that is already onsite for the Project. Extending the use of equipment already onsite by several weeks would minimize air emissions for Northern's Carlton Compressor Station project, and any increases of air emissions above the Project would be negligible.

The cumulative impact contribution to air quality from the proposed Project construction activities and the two other actions is expected to be minimal for the following reasons.

- Project construction activities would occur over a short duration (approximately 8 months, of which the Carlton Interconnect Loop would only take 2-3 months).
- Fugitive emissions would be intermittent, generally low-level releases, and consist of larger dust particles that are expected to settle out of the atmosphere within proximity to their release point (i.e., long-range transport of fugitive dust emissions is not anticipated).
- Vehicle equipment and fugitive dust emissions are not expected to exceed ambient air quality standards.

We identified no proposed or reasonably foreseeable major operational sources of air emissions within 50 kilometers of the Hinckley Compressor Station, or any other sources in close proximity to the station; therefore, emissions from sources in the 50-kilometer region surrounding the Hinckley Compressor Station are sufficiently captured in the background concentrations summarized in table B.8.4-4, and when combined with maximum modeled concentrations for the station, fall well below the NAAQS for all modeled pollutants. Although it is likely that some minor sources may be proposed or reasonably foreseeable within the geographic scope of the Hinckley Compressor Station, these sources are not expected to appreciably increase the background concentrations reported in table B.8.4-4 to levels that would prevent the station's ability to demonstrate NAAQS compliance.

Based on this information, we do not anticipate that Northern's Project, when considered with the other actions, would result in any significant cumulative impact on air quality.

Cultural Resources

Cumulative impacts on cultural resources would only occur if other actions were to affect the same historic properties as Northern's Project. No impacts on cultural resources are anticipated as a result of the proposed Project; therefore, no cumulative impacts would result from the Project in consideration of other past, present, and future projects in the APE.

Noise

Concurrent construction and operation of the Project and other actions in the vicinity of the same NSA could result in cumulative sound level impacts. Temporary cumulative impacts on noise could occur if an action is being actively constructed within the immediate vicinity and at the same time as construction of Northern's Project. Simultaneous construction of the Project's Carlton Interconnect Loop, the Enbridge Line 3 project and the Carlton Compressor Station piping project could contribute to temporary cumulative impacts on noise as each would occur within 1 mile of the others. However, noise impacts associated with construction of the Project and these two other nearby projects would be temporary and short term. Noise mitigation measures would include minimizing engine idling and other non-essential noise impacts, equipping machinery with mufflers, and positioning non-noise generating equipment between the drilling operation and nearby NSAs, among others.

We identified no proposed or reasonably foreseeable projects within the geographic scope for the proposed modified Pierz Compressor Station or new Hinckley Compressor Station having the potential to cumulatively add to noise levels at nearby NSAs when combined from noise from either of these stations. Therefore, the expected total noise levels at nearby NSAs attributable to the modified Pierz Compressor Station and new Hinckley Compressor Station are sufficiently captured when combined with the existing measured ambient noise levels summarized in table B.9.2-1.

Therefore, we conclude that construction and operation of the Project in combination with the Enbridge Line 3 and Carlton Compressor Station project would not result in significant contribution to cumulative impacts on nearby NSAs.

B.11.2 Climate Change

We received comments from the EPA expressing concern about the Project's contribution to global climate change. Climate change is the variation in climate (including temperature, precipitation, humidity, wind, and other meteorological variables) over time, whether due to natural variability, human activities, or a combination of both,

and cannot be characterized by an individual event or anomalous weather pattern. For example, a severe drought or abnormally hot summer in a particular region is not a certain indication of climate change. However, a series of severe droughts or hot summers that statistically alter the trend in average precipitation or temperature over decades may indicate climate change. Recent research has begun to attribute certain extreme weather events to climate change (U.S. Global Change Research Program [USGCRP], 2018).

The leading U.S. scientific body on climate change is the USGCRP, composed of representatives from 13 federal departments and agencies.²⁰ The Global Change Research Act of 1990 requires the USGCRP to submit a report to the President and Congress no less than every four years that “1) integrates, evaluates, and interprets the findings of the USGCRP; 2) analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and 3) analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years.” These reports describe the state of the science relating to climate change and the effects of climate change on different regions of the United States and on various societal and environmental sectors, such as water resources, agriculture, energy use, and human health.

In 2017 and 2018, the USGCRP issued its *Climate Science Special Report: Fourth National Climate Assessment*, Volumes I and II (Fourth Assessment Report) (USGCRP, 2017; and USGCRP, 2018, respectively). The Fourth Assessment Report states that climate change has resulted in a wide range of impacts across every region of the country. Those impacts extend beyond atmospheric climate change alone and include changes to water resources, transportation, agriculture, ecosystems, and human health. The United States and the world are warming; global sea level is rising and acidifying; and certain weather events are becoming more frequent and more severe. These changes are driven by accumulation of GHG in the atmosphere through combustion of fossil fuels (coal, petroleum, and natural gas), combined with agriculture, clearing of forests, and other natural sources. These impacts have accelerated throughout the end of the 20th and into the 21st century (USGCRP 2018).

GHGs were identified by the EPA as pollutants in the context of climate change. GHG emissions do not cause local impacts; rather, it is the combined concentration in the atmosphere that causes global climate and these are fundamentally global impacts that feedback to localized climate change impacts. Thus, the geographic scope for cumulative analysis of GHG emissions is global rather than local or regional. For example, a project

²⁰ The USGCRP member agencies are: USDA, Department of Commerce, Department of Defense, Department of Energy, Department of Health and Human Services, Department of the Interior, Department of State, DOT, EPA, National Aeronautics and Space Administration, National Science Foundation, Smithsonian Institution, and U.S. Agency for International Development.

1 mile away emitting 1 ton of GHGs would contribute to climate change in a similar manner as a project 2,000 miles distant also emitting 1 ton of GHGs.

Climate change is a global phenomenon; however, for this analysis, we will focus on the existing and potential cumulative climate change impacts in the Project area. The USGCRP's Fourth Assessment Report notes the following observations of environmental impacts are attributed to climate change in the Midwest region (USGCRP, 2017; USGCRP, 2018):

- increased rainfall from April to June has been the most impactful climate trend for agriculture in the Midwest, providing a favorable supply of soil moisture while also reducing flexibility for timing of spring planting and increasing soil erosion;
- increases in warm-season absolute humidity and precipitation have eroded soils, created favorable conditions for pests and pathogens, and degraded the quality of stored grain;
- daily minimum temperatures have increased in all seasons due to increasing humidity, considered a factor in reducing grain weight in corn due to increased nighttime plant respiration;
- warming winters have increased the survival and reproduction of existing insect pests and already are enabling a northward range expansion of new insect pests and crop pathogens into the Midwest;
- threats from a changing climate are interacting with existing stressors such as invasive species and pests to increase tree mortality and reduce forest productivity; and
- storm water management systems, transportation networks, and other critical infrastructure are already experiencing impacts from changing precipitation patterns and elevated flood risks.

The USGCRP's Fourth Assessment Report notes the following projections of climate change impacts in the Project region (Midwest United States) with a high or very high level of confidence²¹ (USGCRP, 2018):

²¹ The report authors assessed current scientific understanding of climate change based on a available scientific literature. Each "Key Finding" listed in the report is accompanied by a confidence statement indicating the consistency of evidence or the consistency of model projections. A high level of confidence results from "moderate evidence (several sources, some consistency, methods vary and/or documentation limited, etc.), medium consensus." A *very* high level of confidence results from "strong evidence (established theory, multiple sources, consistent results, well documented and accepted methods, etc.), high consensus."

<https://science2017.globalchange.gov/chapter/front-matter-guide/>

- increases in growing-season temperature in the Midwest are projected to be the largest contributing factor to declines in the productivity of U.S. agriculture. Projected changes in precipitation, coupled with rising extreme temperatures before mid-century, will reduce Midwest agricultural productivity to levels of the 1980s without major technological advances. Increases in humidity in spring through mid-century are expected to increase rainfall, which will increase the potential for soil erosion and further reduce planting-season workdays due to waterlogged soil;
- threats from a changing climate are interacting with existing stressors such as invasive species and pests to increase tree mortality and reduce forest productivity. Without adaptive actions, these interactions will result in the loss of economically and culturally important tree species such as paper birch and black ash and are expected to lead to the conversion of some forests to other forest types or even to non-forested ecosystems by the end of the century;
- species and ecosystems, including the important freshwater resources of the Great Lakes, will be increasingly at risk when climate stressors, like temperature increases, increasingly interact with land-use change, habitat loss, pollution, nutrient inputs, and nonnative invasive species;
- the annual cost of adapting urban storm water systems to more frequent and severe storms is projected to exceed \$500 million for the Midwest by the end of the century; and
- at-risk communities in the Midwest are becoming more vulnerable to climate change impacts such as flooding, drought, and increases in urban heat islands.

It should be noted that while the impacts described above taken individually may be manageable for certain communities, the impacts of compound extreme events (such as simultaneous heat and drought, wildfires associated with hot and dry conditions, or flooding associated with high precipitation on top of saturated soils) can be greater than the sum of the parts (USGCRP, 2018). The GHG emissions associated with construction and operation of the Project were identified and quantified in section B.7 of the EA. Construction and operation of the Project would increase the atmospheric concentration of GHGs in combination with past, current, and future emissions from all other sources globally and contribute incrementally to future climate change impacts.

Currently, there is no universally accepted methodology to attribute discrete, quantifiable, physical effects on the environment to the Project's incremental contribution to GHGs. We have looked at atmospheric modeling used by the EPA, National Aeronautics and Space Administration, the Intergovernmental Panel on Climate Change, and others, and we found that these models are not reasonable for project-level analysis for a number of reasons. For example, these global models are not suited to determine

the incremental impact of individual projects, due to both scale and overwhelming complexity. We have also reviewed simpler models and mathematical techniques to determine global physical effects caused by GHG emissions, such as increases in global atmospheric CO₂ concentrations, atmospheric forcing, or ocean CO₂ absorption. We could not identify a reliable, less complex model for this task and we are not aware of a tool to meaningfully attribute specific increases in global CO₂ concentrations, heat forcing, or similar global impacts to project-specific GHG emissions. Similarly, it is not currently possible to determine localized or regional impacts from GHG emissions from the Project.

Absent such a method for relating GHG emissions to specific resource impacts, we are not able to assess potential GHG-related impacts attributable to this Project. Without the ability to determine discrete resource impacts, we are unable to determine the significance of the Project's contribution to climate change. Additionally, we have not been able to find any GHG emission reduction goals established at the federal level.²² However, the State of Minnesota, within which all of the Project's operational emissions would occur, has statutory targets enacted in 2007 for reducing emissions to 30 percent below 2005 levels by 2025 and 80 percent below 2005 levels by 2050.²³ As indicated in tables B.8.4-1 and B.8.4-2 within section B.8.4 above, direct GHG emissions from the operation of the Project, and primarily from operation of the new Hinckley Compressor Station on a potential (8,760 hours per year) basis, would result in annual CO₂e emissions of about 43,141 tons (39,219 metric tons),²⁴ which would represent 0.06 percent and 0.19 percent of Minnesota's 2025 and 2050 GHG goals, respectively.²⁵

B.11.3 Conclusions on Cumulative Impacts

Impacts associated with Northern's Project would be relatively minor. The impacts from other existing and proposed actions or general activities within the geographic scope of analysis are also expected to be minor. Our project-specific and resource-specific (based on appropriate geographic scope) analysis leads us to conclude that the Project would contribute to a negligible cumulative impact when the effects of the proposed Project are added to past, present, and reasonably foreseeable actions.

²² The national emissions reduction targets expressed in the EPA's Clean Power Plan were repealed, Greenhouse Gas Emissions From Existing Electric Utility Generating Units; Revisions to Emissions Guidelines Implementing Regulations, 84 Fed. Reg. 32,250, 32,522-32,532 (July 8, 2019). In November 2020, the U.S. officially withdrew from the Paris climate accord.

²³ We reviewed the U.S. State Greenhouse Emission Targets site for individual state requirements at: <https://www.c2es.org/document/greenhouse-gas-emissions-targets/>

²⁴ A metric ton is approximately equal to 1.1 ton.

²⁵ Based on data found at: <https://www.eia.gov/environment/emissions/state/>.

SECTION C – ALTERNATIVES

In preparing this EA, we considered several alternatives to the proposed action to determine whether they would be environmentally preferable over the Project. These alternatives include the no-action alternative and system alternatives (including a no-compression alternative). Site alternatives for the Hinckley Compressor Station were not assessed as the proposed site was environmentally acceptable and no comments on site selection or alternatives were received during scoping. In addition, site alternatives were not assessed for the modification of the Pierz Compressor Station and Interconnect because it is an expansion of an existing facility. Likewise, the Willmar D Branch Line Extension, Carlton Interconnect Loop, and Viking Interconnect Loop (and associated launcher, receiver, and valves) would be constructed within or adjacent to Northern's existing pipeline easements in areas that have been disturbed by prior construction activities, or would be installed by HDD to avoid impacts on sensitive resources. Constructing a pipeline within an existing utility corridor is an accepted strategy for reducing environmental impacts compared to the development of new greenfield pipeline rights-of-way. We did not receive any comments on, or objections to the pipeline segments during scoping, nor did we identify any significant impacts on resources. Therefore, we did not evaluate alternatives that would create new or expanded right-of-way for the pipeline portions of the Project.

The following evaluation criteria were used to determine whether an alternative would be environmentally preferable:

- technical feasibility and practicality;
- significant environmental advantage over the proposed action; and
- ability to meet the Project's stated objectives.

Our analysis that follows is based on information provided by the applicant, review of publicly available information, scoping comments, and our independent research.

C.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the environmental impacts associated with the Project and analyzed in this EA would not occur. Northern would not construct any component of the Project and, consequently, would be unable to meet the natural gas demands of its customers. The customers, however, would still likely require additional natural gas transportation capacity to meet residential, commercial, and industrial growth demands. This includes the delivery of natural gas to heat homes and businesses, supplying natural gas for appliance and machinery operation. Other projects could be constructed to supply the natural gas offered by Northern, and such alternative projects could require the construction of additional and/or new facilities in the same or other

locations to meet the Project objectives. These alternatives would result in their own set of specific environmental impacts that could be greater or equal to those associated with the current proposal, and would transfer impacts from one location to another. For these reasons we are not recommending the no-action alternative.

C.2 SYSTEM ALTERNATIVES

System alternatives would generally use existing, modified, or proposed pipeline systems to meet the purpose and need of the Project. For a system alternative, we considered a different receipt point from Northern Border Pipeline Company. According to information provided by Northern²⁶, this system alternative would require compression modifications at the existing Faribault Compressor Station and the installation of more than 20 miles of new pipe and thus would increase environmental and landowner impacts. Since this alternative offers no significant environmental advantage over the proposed Project, we do not recommend it.

C.2.1 Other Pipeline Systems

Two other interstate natural gas pipelines, Northern Border Pipeline Company and Viking Gas Transmission Company, operate within the southern Minnesota area, were considered as possible alternatives to the Project. However, the Northern Border Pipeline is approximately 90 miles southwest of the Willmar D Branch Line Extension, and while the Viking Gas Transmission System is connected to Northern's pipeline system at the Pierz Compressor Station, it is more than 40 miles from the Hinckley Compressor Station and about 90 miles from the Carlton Interconnect Loop. Due to the distance from the other interstate natural gas pipelines to the Project area and the widespread delivery points served by the Project, we have concluded that the Northern Border and Viking Gas Transmission pipeline systems are not viable alternatives to the proposed Project.

C.2.2 No-Compression Alternative

In order to reduce permanent land use impacts from new aboveground facilities, we considered an alternative that would rely on additional looping or pipeline extensions rather than the new Hinckley Compressor Station. However, if we were to recommend a pipeline alternative to the Hinckley Compressor Station, it would require approximately 42.7 miles of 30-inch-diameter loop. This would impact more landowners, including landowners that may not be currently crossed by any pipeline facilities, and result in greater impacts (i.e., larger footprint) on environmental resources including high-quality shrub and forested wetlands near Carlton, Minnesota. The no-compression alternative for the Hinckley Compressor Station would eliminate a permanent aboveground facility and the associated land use, visual, and operational air and noise impacts discussed for this facility in sections B.5, B.8, and B.9 of this EA. However, we have concluded that land use and visual impacts would not be significant; impacts from air emissions from the

²⁶ Refer to Northern's Resource Report 10 in a accession no. 20200731-5243.

modified station, combined with existing ambient concentrations, would remain below the NAAQs; and, with our recommendations above, the modified station would not result in significant noise impacts at any nearby NSA. We believe that the environmental and landowner impacts related to an additional 42.7 miles of pipeline do not offer a significant environmental advantage over the proposed Project; thus we do not recommend this alternative.

C.3 ALTERNATIVES CONCLUSION

We conclude that the proposed Project, as modified by our recommended mitigation measures, is the preferred alternative to meet the project objectives.

SECTION D – STAFF'S CONCLUSIONS AND RECOMMENDATIONS

Based upon the analysis in this EA, we have determined that if Northern constructs and operates the proposed facilities in accordance with its application, supplements, and staff's recommended mitigation measures below, approval of the Project would not constitute a major federal action significantly affecting the quality of the human environment.

We recommend that the Commission Order contain a finding of no significant impact and that the following mitigation measures be included as conditions to any Certificate the Commission may issue:

1. Northern shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. Northern must:
 - a. request any modification to these procedures, measures, or conditions in a filing with the Secretary of the Commission (Secretary);
 - b. justify each modification relative to site-specific conditions;
 - c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
 - d. receive approval in writing from the Director of the Office of Energy Projects (OEP), or the Director's designee, **before using that modification.**
2. The Director of the OEP, or the Director's designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of environmental resources during construction and operation of the Project. This authority shall allow:
 - a. the modification of conditions of the Order;
 - b. stop-work authority; and
 - b. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from Project construction and operation.
3. **Prior to any construction**, Northern shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EIs' authority and have been or will be trained on the implementation of the environmental mitigation measures

appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, Northern shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

Northern's exercise of eminent domain authority granted under NGA Section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. Northern's rights of eminent domain granted under NGA Section 7(h) does not authorize it to increase the size of its natural gas facilities to accommodate future needs or to acquire a rights-of-way for a pipeline to transport a commodity other than natural gas.

5. Northern shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP, or the Director's designee, **before construction in or near that area.**

This requirement does not apply to extra workspace allowed by the Commission's *Upland Erosion Control, Revegetation, and Maintenance Plan* and/or minor field realignments per landowner needs and requirements which do not affect other landowners or sensitive environmental areas such as wetlands. Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

- a. implementation of cultural resources mitigation measures;
- b. implementation of endangered, threatened, or special concern species mitigation measures;
- c. recommendations by state regulatory authorities; and

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- d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.
6. **Within 60 days of the acceptance of the Certificate and before construction activities begin**, Northern shall file an Implementation Plan for the Project with the Secretary for review and written approval by the Director of OEP, or the Director's designee. Northern must file revisions to the plan as schedules change. The plan shall identify:
- a. how Northern will implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;
 - b. how Northern will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;
 - c. the number of environmental inspectors assigned (per spread), and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;
 - d. company personnel, including environmental inspectors and contractors, who will receive copies of the appropriate material;
 - e. the location and dates of the environmental compliance training and instructions Northern will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change);
 - f. the company personnel (if known) and specific portion of Northern's organization having responsibility for compliance;
 - g. the procedures (including use of contract penalties) Northern will follow if noncompliance occurs; and
 - h. for each discrete facility, a Gantt or PERT chart (or similar Project scheduling diagram), and dates for:
 - i. the completion of all required surveys and reports;
 - ii. the environmental compliance training of onsite personnel;
 - iii. the start of construction; and
 - iv. the start and completion of restoration.
7. Northern shall employ at least one EI for the Project. The EIs shall be:

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- a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;
 - b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
 - c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;
 - d. a full-time position, separate from all other activity inspectors;
 - e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
 - f. responsible for maintaining status reports.
8. Beginning with the filing of its Implementation Plan, Northern shall file updated status reports with the Secretary on a **biweekly** basis until all construction and restoration activities are complete. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:
- a. an update on Northern's efforts to obtain the necessary federal authorizations;
 - b. the construction status of each Project spread, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally-sensitive areas;
 - c. a listing of all problems encountered and each instance of noncompliance observed by the EI(s) during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);
 - d. a description of the corrective actions implemented in response to all instances of noncompliance;
 - e. the effectiveness of all corrective actions implemented;
 - f. a description of any landowner/resident complaints that may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
 - g. copies of any correspondence received by Northern from other federal, state, or local permitting agencies concerning instances of non-compliance, and Northern's response.

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9. Northern must receive written authorization from the Director of OEP, or the Director's designee, **before commencing construction of any Project facilities.** To obtain such authorization, Northern must file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).
 10. Northern must receive written authorization from the Director of OEP, or the Director's designee, **before placing the Project into service.** Such authorization will only be granted following a determination that rehabilitation and restoration of the rights-of-way and other areas affected by the Project are proceeding satisfactorily.
 11. **Within 30 days of placing the authorized facilities in service,** Northern shall file an affirmative statement with the Secretary, certified by a senior company official:
 - a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
 - b. identifying which of the conditions in the Order Northern has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.
 14. **Prior to construction of the WBL P4-1 and WBL P4-2 HDDs,** Northern shall file with the Secretary, for the review and written approval by the Director of OEP, or the Director's designee, a HDD noise mitigation plan to reduce the projected noise levels attributable to the proposed HDD operations at NSAs. During drilling operations, Northern shall implement the approved plan, monitor noise levels, document the noise levels in the biweekly status reports, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than a L_{dn} of 55 dBA at the NSAs.
 15. Northern shall file noise surveys with the Secretary **no later than 60 days** after placing the new Hinckley and modified Pierz Compressor Stations in service. If a full load condition noise survey is not possible, Northern shall provide an interim survey at the maximum possible horsepower load and provide the full load survey **within 6 months.** If the noise attributable to the operation of the equipment at each of the Hinckley and Pierz Compressor Stations under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, Northern shall:

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- a. file a report with the Secretary, for review and written approval by the Director of OEP, or the Director's designee, on what changes are needed;
 - b. install the additional noise controls to meet the level within 1 year of the in-service date; and
 - c. confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.
16. **Within 5 days of receipt of a water quality certification issued by the Minnesota Pollution Control Agency**, Northern shall file the complete certification, including all conditions, and all conditions attached to the water quality certification constitute mandatory conditions of this Certificate Order. **Prior to construction**, Northern shall file, for review and written approval by the Director of OEP, or the Director's designee, any revisions to its Project design necessary to comply with the water quality certification conditions.

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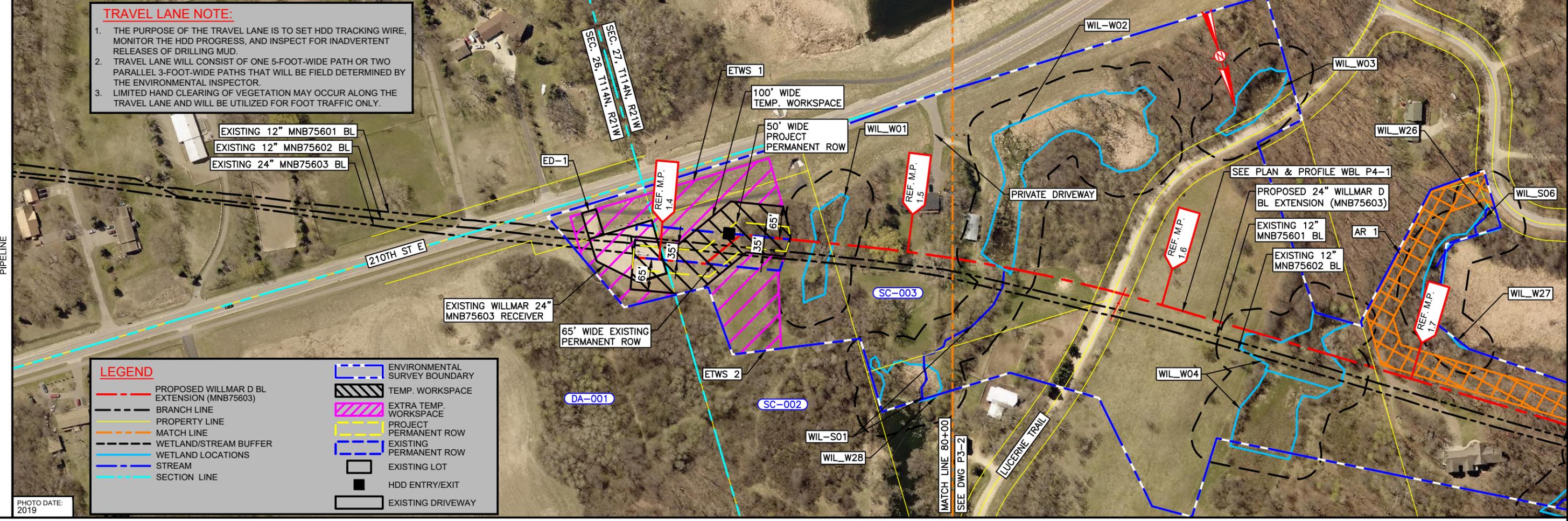
APPENDIX A
Project Maps and Drawings

TRACT NO.	DA-001	SC-002	SC-003
OWNERSHIP	SEC 26, T114N, R21W	SEC 27, T114N, R21W	SEC 27, T114N, R21W
USAGE	PIPELINE	PIPELINE	PIPELINE
DEPTH OF COVER (ft)	4	4	4
RODDAGE	21.58	21.58	14.55
EASEMENT	UNKNOWN	UNKNOWN	UNKNOWN

STATIONING	73+39 BEGIN PROPOSED 24" WILLMAR D BRANCH LINE EXTENSION	73+92 REF. M.P. 1.4	73+99 WIRE FENCE	74+01 WALL	74+02 WALL	74+04 PROPERTY LINE & SECTION LINE	74+86 P.I. 44+722 - LT	75+22 EXISTING MNB75602 BL	75+44 EXISTING MNB75601 BL	75+79 P.I. 45+00'00" RT & HDD ENTRY TIE-IN	76+00 WIRE FENCE	76+79 WETLAND/STREAM BUFFER	77+16 WIRE FENCE	77+31 WETLAND	77+60 PROPERTY LINE	77+68 WETLAND	78+17 P.C. 52+452" RT	78+19 WETLAND/STREAM BUFFER	78+37 WIRE FENCE	79+20 REF. M.P. 1.5	79+85 WIRE FENCE	80+00 MATCH LINE
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TRAVEL LANE NOTE:

1. THE PURPOSE OF THE TRAVEL LANE IS TO SET HDD TRACKING WIRE, MONITOR THE HDD PROGRESS, AND INSPECT FOR INADVERTENT RELEASES OF DRILLING MUD.
2. TRAVEL LANE WILL CONSIST OF ONE 5-FOOT-WIDE PATH OR TWO PARALLEL 3-FOOT-WIDE PATHS THAT WILL BE FIELD DETERMINED BY THE ENVIRONMENTAL INSPECTOR.
3. LIMITED HAND CLEARING OF VEGETATION MAY OCCUR ALONG THE TRAVEL LANE AND WILL BE UTILIZED FOR FOOT TRAFFIC ONLY.



DESIGN FACTOR	0.5
CLASS LOCATION	
HYDROSTATIC TEST PRESS (P.S.I.G.)	1000
M.A.O.P. (P.S.I.G.)	661'
PIPE DETAIL	73+39 to 80+00

Figure 1-4					
F	ISSUED FOR FERC	JM	7/23/2020	TH	GC
NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D

FILED WITH FERC
 ANY CHANGES FROM WHAT IS SHOWN MUST BE IDENTIFIED AND REVIEWED BY REGULATORY BEFORE IMPLEMENTATION

STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				
FAC. CODE: N/A		REL. W.O.: N/A		
PL#	N/A	CONST. YR	2021	
STA#	N/A	POI#	N/A	
DESIGN	TH	DATE	3/5/20	
DRAWN	JM	DATE	3/5/20	
ASBUILT				
FILE NO.:	N/A			
SCALE:	1"=100'			

PROPOSED 24" WILLMAR D BRANCH LINE EXTENSION ALIGNMENT SHEET
 SEC. 26 & 27, T114N, R21W
 DAKOTA & SCOTT COUNTY, MINNESOTA

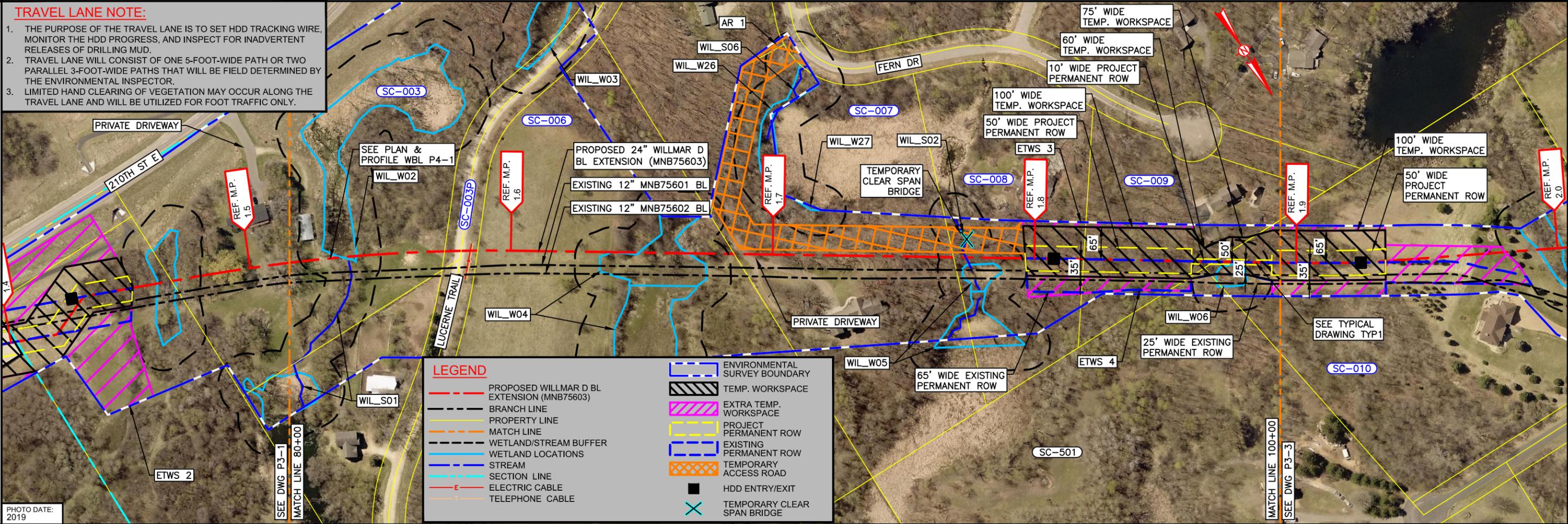
Northern Natural Gas
 PROJECT NO.
 DWG. NO. P3-1

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COUNTY & STATE	SCOTT COUNTY, MINNESOTA							
TRACT NO. & OWNERSHIP	SC-003	SC-003P	SC-006	SC-007	SC-008	SC-009	SC-010	
USAGE	PIPELINE	PIPELINE	PIPELINE	PIPELINE	PIPELINE	PIPELINE	PIPELINE	
DEPTH OF COVER (ft)	4		4	4	4	4	4	
RODDAGE	17.70	4.06	32.67	26.85	15.88	16.00	8.06	
EASEMENT	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	
STATIONING	80+00 MATCH LINE 80+22 WETLAND/STREAM BUFFER 80+56 WIRE FENCE 81+06 WETLAND 81+35 WETLAND 81+53 WIRE FENCE 81+85 WETLAND/STREAM BUFFER 82+84 WIRE FENCE 82+92 PROPERTY LINE & ROW LINE 83+21 WIRE FENCE 83+26 CL OF LUCERNE TRAIL 83+36 EDGE OF ROAD 83+86 PROPERTY LINE & ROW LINE 83+59 WIRE FENCE 83+66 BURIED ELECTRIC CABLE 83+69 BURIED TELEPHONE CABLE 83+82 WIRE FENCE 84+48 REF MP 1.6 84+80 P.T. 5'24'52" RT 85+78 WETLAND/STREAM BUFFER 86+49 WIRE FENCE 86+51 WETLAND 86+56 WETLAND 86+87 WETLAND 87+07 WETLAND 88+06 WETLAND 88+86 WETLAND/STREAM BUFFER 88+87 WIRE FENCE 88+98 PROPERTY LINE 89+20 EDGE OF ROAD 89+28 CL OF PRIVATE DRIVEWAY 89+39 EDGE OF ROAD 89+76 REF MP 1.7 93+10 WETLAND/STREAM BUFFER 93+41 PROPERTY LINE 93+66 STREAM 94+80 WETLAND/STREAM BUFFER 95+04 REF MP 1.8 95+43 HDD EXIT 96+03 PROPERTY LINE 98+27 WETLAND/STREAM BUFFER 98+67 PROPERTY LINE 99+76 WETLAND/STREAM BUFFER 100+00 MATCH LINE							

TRAVEL LANE NOTE:

1. THE PURPOSE OF THE TRAVEL LANE IS TO SET HDD TRACKING WIRE, MONITOR THE HDD PROGRESS, AND INSPECT FOR INADVERTENT RELEASES OF DRILLING MUD.
2. TRAVEL LANE WILL CONSIST OF ONE 5-FOOT-WIDE PATH OR TWO PARALLEL 3-FOOT-WIDE PATHS THAT WILL BE FIELD DETERMINED BY THE ENVIRONMENTAL INSPECTOR.
3. LIMITED HAND CLEARING OF VEGETATION MAY OCCUR ALONG THE TRAVEL LANE AND WILL BE UTILIZED FOR FOOT TRAFFIC ONLY.



DESIGN FACTOR	0.5			
CLASS LOCATION				
HYDROSTATIC TEST PRESS (P.S.I.G.)	1000			
M.A.O.P. (P.S.I.G.)	2000'			
PIPE DETAIL	80+00			100+00

Figure 1-4					
F	ISSUED FOR FERC	JM	7/23/2020	TH	GC
NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D

FILED WITH FERC
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STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

FAC. CODE	N/A	REL. W.O.	N/A
PL#	N/A	CONST. YR	2021
STA#	N/A	POI#	N/A
DESIGN	TH	DATE	3/5/20
DRAWN	JM	DATE	3/5/20
ASBUILT			
FILE NO.	N/A		
SCALE	1"=100'		

PROPOSED 24" WILLMAR D BRANCH LINE EXTENSION ALIGNMENT SHEET
SEC. 27, T114N, R21W
SCOTT COUNTY, MINNESOTA

Northern Natural Gas

PROJECT NO.

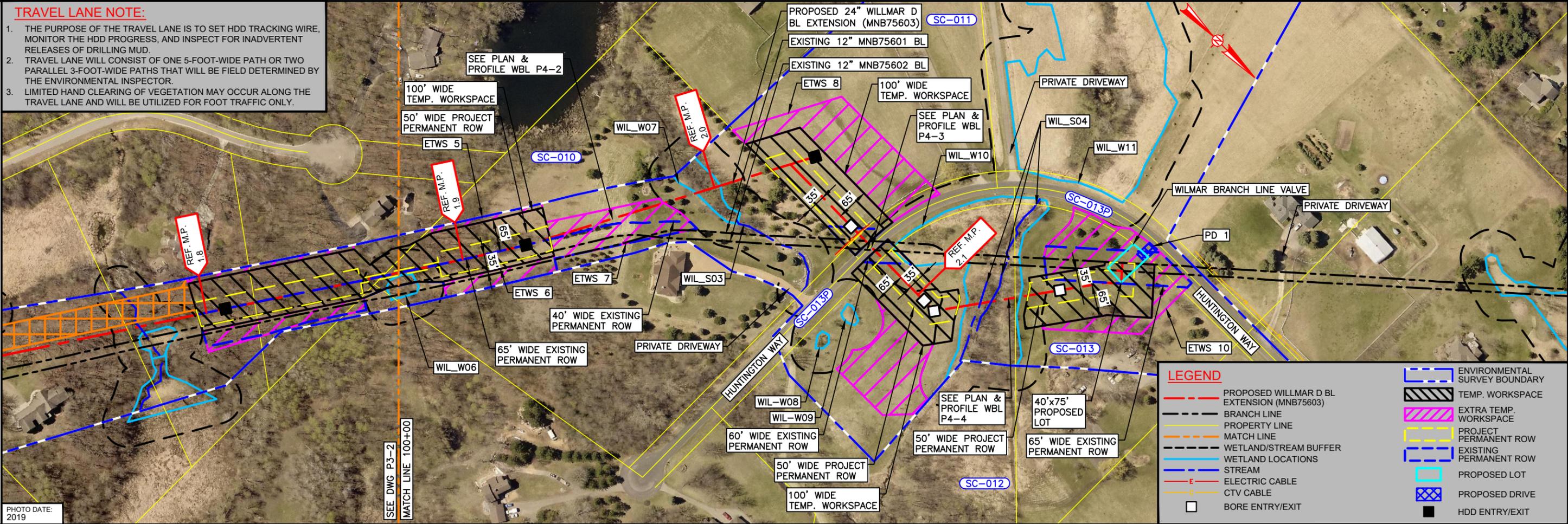
DWG. NO. **P3-2**

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COUNTY STATE	SCOTT COUNTY, MINNESOTA				
TRACT NO.	SC-010	SC-011	SC-013P	SC-012	SC-013
OWNERSHIP	SEC 27, T114N, R21W	SEC 27, T114N, R21W	SEC 27, T114N, R21W	SEC 27, T114N, R21W	SEC 27, T114N, R21W
USAGE	PIPELINE	PIPELINE	PIPELINE	PIPELINE	PIPELINE
DEPTH OF COVER (1)	4	4	4	4	4
RODDAGE	41.27	14.73	4.00	18.79	15.67
EASEMENT	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
STATIONING	100+00 MATCH LINE	100+32 REF. MP 1.9 101+50 HDD EXIT 101+71 P.I. 3'31'00" LT 102+14 TREE LINE	104+52 TREE LINE 104+54 WETLAND/STREAM BUFFER	105+22 WETLAND 105+60 REF. MP 2.0 105+73 WETLAND/STREAM BUFFER	106+74 TREE LINE 106+81 PROPERTY LINE 106+82 WIRE FENCE 107+20 P.I. 62'32'23" RT & HDD TIE-IN 108+95 BORE EXIT 109+15 WIRE FENCE 109+17 BURIED CTY. CABLE 109+24 PROPERTY LINE 109+36 EXISTING MNB75602 BL 109+43 EDGE OF ROAD 109+46 WETLAND/STREAM BUFFER 109+57 CL OF HUNTINGTON WAY 109+63 EXISTING MNB75601 BL 109+64 EDGE OF ROAD 109+90 PROPERTY LINE 110+77 WETLAND/STREAM BUFFER

TRAVEL LANE NOTE:

1. THE PURPOSE OF THE TRAVEL LANE IS TO SET HDD TRACKING WIRE, MONITOR THE HDD PROGRESS, AND INSPECT FOR INADVERTENT RELEASES OF DRILLING MUD.
2. TRAVEL LANE WILL CONSIST OF ONE 5-FOOT-WIDE PATH OR TWO PARALLEL 3-FOOT-WIDE PATHS THAT WILL BE FIELD DETERMINED BY THE ENVIRONMENTAL INSPECTOR.
3. LIMITED HAND CLEARING OF VEGETATION MAY OCCUR ALONG THE TRAVEL LANE AND WILL BE UTILIZED FOR FOOT TRAFFIC ONLY.



DESIGN FACTOR	0.5
CLASS LOCATION	
HYDROSTATIC TEST PRESS (P.S.I.G.)	1000
M.A.O.P. (P.S.I.G.)	1559'
PIPE DETAIL	100+00 to 115+59

Figure 1-4			
F ISSUED FOR FERC	JM 7/23/2020	TH	GC
NO.	REVISION - DESCRIPTION	BY	DATE

STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

FILED WITH FERC
 ANY CHANGES FROM WHAT IS SHOWN MUST BE IDENTIFIED AND REVIEWED BY REGULATORY BEFORE IMPLEMENTATION

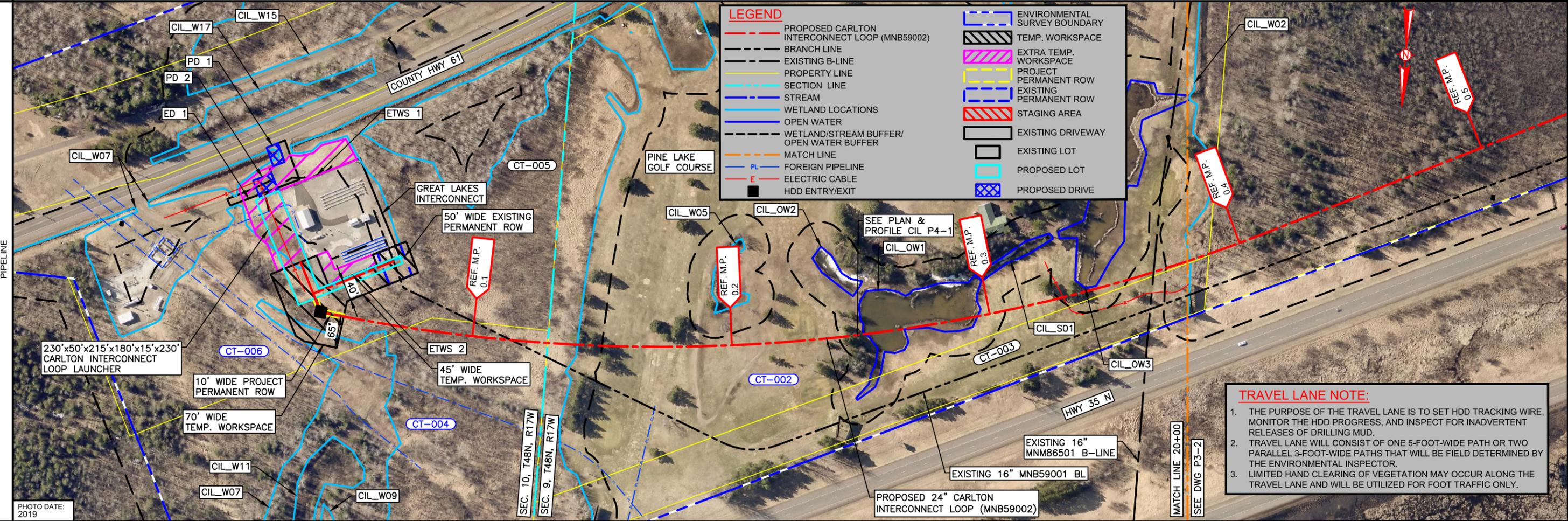
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PL# N/A	CONST. YR 2021
STA# N/A	PO# N/A
DESIGN TH	DATE 3/5/20
DRAWN JM	DATE 3/5/20
ASBUILT	
FILE NO.: N/A	
SCALE: 1"=100'	

PROPOSED 24" WILLMAR D BRANCH LINE EXTENSION ALIGNMENT SHEET
 SEC. 27, T114N, R21W
 SCOTT COUNTY, MINNESOTA

PROJECT NO. _____
 DWG. NO. **P3-3**

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COUNTY & STATE				CARLTON COUNTY, MINNESOTA			
TRACT NO. & OWNERSHIP		CT-006 SEC 10, T48N, R17W		CT-004 SEC 10, T48N, R17W		CT-002 SEC 9, T48N, R17W	
USAGE		PIPELINE		PIPELINE		UNKNOWN	
DEPTH OF COVER (ft)		4		4		4	
RODDAGE		15.58		25.82		79.82	
EASEMENT		UNKNOWN		UNKNOWN		UNKNOWN	
STATIONING	0+00 BEGIN PROPOSED 24" CARLTON INTERCONNECT LOOP TIE-IN 0+32 WETLAND 0+82 WETLAND 1+76 P.I. 90°12'54" LT & FACILITIES PIPING 2+10 TREE LINE 2+16 P.I. 56°46'27" LT & HDD ENTRY 2+51 P.C. 16°18'43" LT 3+95 PROPERTY LINE 5+28 REF MP 0.1 6+07 EXISTING MNB59001 BL 6+82 PROPERTY LINE & SECTION LINE 7+42 WETLAND 7+92 WETLAND/STREAM BUFFER 10+56 REF MP 0.2 12+74 OPEN WATER BUFFER 13+27 OPEN WATER 15+59 OPEN WATER 15+84 REF MP 0.3 16+17 OPEN WATER BUFFER 17+27 OPEN WATER BUFFER 17+37 BURIED ELECTRIC CABLE 18+73 OPEN WATER BUFFER 19+54 WETLAND BUFFER 20+00 MATCH LINE						



TRAVEL LANE NOTE:

1. THE PURPOSE OF THE TRAVEL LANE IS TO SET HDD TRACKING WIRE, MONITOR THE HDD PROGRESS, AND INSPECT FOR INADVERTENT RELEASES OF DRILLING MUD.
2. TRAVEL LANE WILL CONSIST OF ONE 5-FOOT-WIDE PATH OR TWO PARALLEL 3-FOOT-WIDE PATHS THAT WILL BE FIELD DETERMINED BY THE ENVIRONMENTAL INSPECTOR.
3. LIMITED HAND CLEARING OF VEGETATION MAY OCCUR ALONG THE TRAVEL LANE AND WILL BE UTILIZED FOR FOOT TRAFFIC ONLY.

DESIGN FACTOR	0.5		
CLASS LOCATION	HYDROSTATIC TEST PRESS (P.S.I.G.)		
M.A.O.P. (P.S.I.G.)	1090		
PIPE DETAIL	2000'		
	0+00		20+00

Figure 1-4					
F	ISSUED FOR FERC	AC	7/23/2020	TH	GC
NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D

FILED WITH FERC
 ANY CHANGES FROM WHAT IS SHOWN MUST BE IDENTIFIED AND REVIEWED BY REGULATORY BEFORE IMPLEMENTATION

STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

FAC. CODE	N/A	REL. W.O.	N/A
PL#	N/A	CONST. YR	2021
STA#	N/A	POI#	N/A
DESIGN	TH	DATE	3/25/2020
DRAWN	AC	DATE	3/25/2020
ASBUILT			
FILE NO.	N/A		
SCALE	1"=100'		

PROPOSED 24" CARLTON INTERCONNECT LOOP ALIGNMENT SHEET
 SEC. 10 & 9, T48N, R17W
 CARLTON COUNTY, MINNESOTA

Northern Natural Gas

PROJECT NO.

DWG. NO. **P3-1**

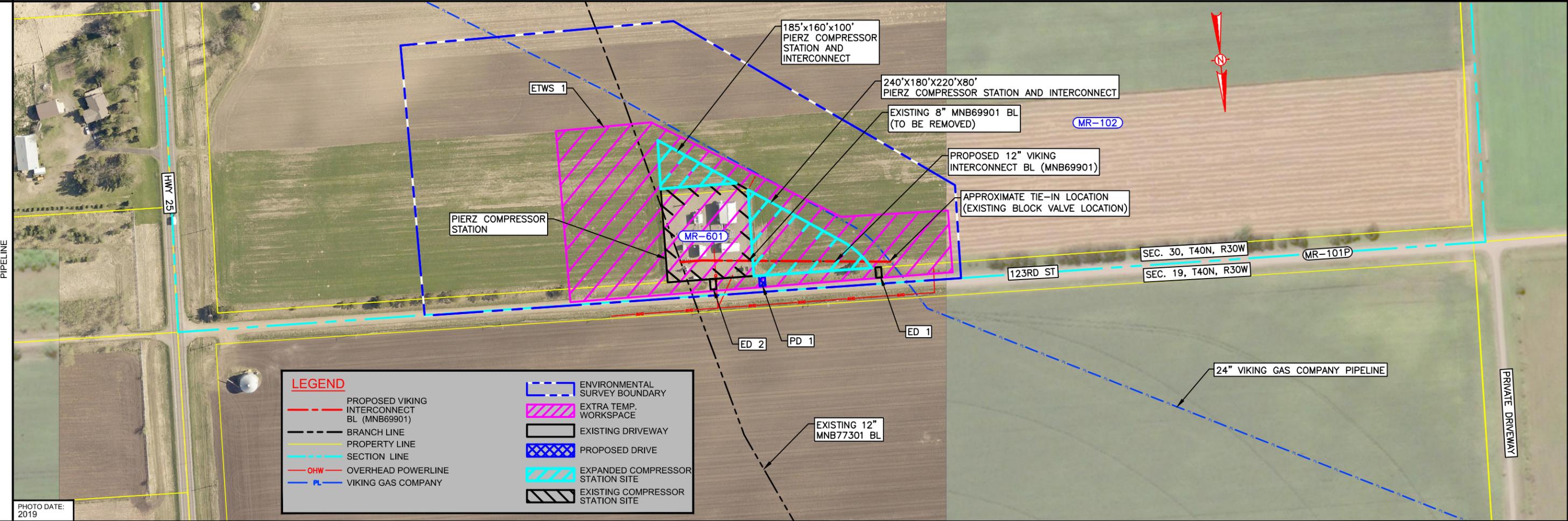
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COUNTY & STATE	MORRISON COUNTY, MINNESOTA		
TRACT NO. & OWNERSHIP	MR-601	MR-102	
USAGE	PIPELINE	PIPELINE	
DEPTH OF COVER (ft)	4	4	
RODDAGE	7.57	16.85	
EASEMENT	UNKNOWN	UNKNOWN	

STATIONING

0+00 BEGIN PROPOSED 12" VIKING INTERCONNECT BRANCH LINE
 0+22 P.I. 4'31'06" RT
 0+48 O/H WIRE
 1+25 PROPERTY LINE

4+03 END PROPOSED 12" VIKING INTERCONNECT BRANCH LINE



LEGEND	
	PROPOSED VIKING INTERCONNECT BL (MNB69901)
	BRANCH LINE
	PROPERTY LINE
	SECTION LINE
	OVERHEAD POWERLINE
	VIKING GAS COMPANY
	ENVIRONMENTAL SURVEY BOUNDARY
	EXTRA TEMP. WORKSPACE
	EXISTING DRIVEWAY
	PROPOSED DRIVE
	EXPANDED COMPRESSOR STATION SITE
	EXISTING COMPRESSOR STATION SITE

DESIGN FACTOR	0.5						
CLASS LOCATION							
HYDROSTATIC TEST PRESS (P.S.I.G.)							
M.A.O.P. (P.S.I.G.)							
PIPE DETAIL	<table border="1"> <tr> <td>0+00</td> <td>403'</td> <td>4+03</td> </tr> <tr> <td></td> <td>12" PIPE</td> <td></td> </tr> </table>	0+00	403'	4+03		12" PIPE	
0+00	403'	4+03					
	12" PIPE						

Figure 1-4					
F ISSUED FOR FERC	AC	7/23/2020	TH	GC	
NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D

FILED WITH FERC
 ANY CHANGES FROM WHAT IS SHOWN MUST BE IDENTIFIED AND REVIEWED BY REGULATORY BEFORE IMPLEMENTATION

STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

FAC.CODE: N/A	REL.W.O.: N/A
PL# N/A	CONST.YR 2021
STA# N/A	PO# N/A
DESIGN TH	DATE 3/25/2020
DRAWN AC	DATE 3/25/2020
ASBUILT	
FILE NO.: N/A	
SCALE: 1"=100'	

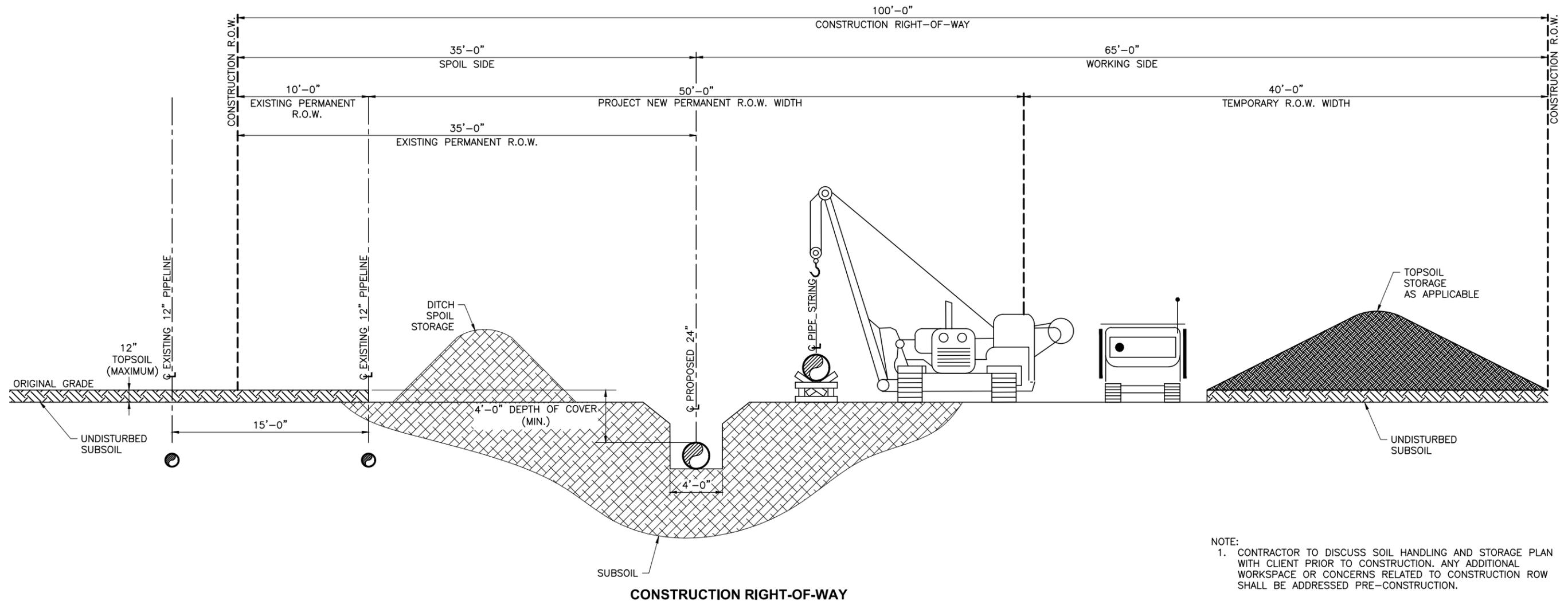
PROPOSED 12" VIKING INTERCONNECT BRANCH LINE ALIGNMENT SHEET
 SEC. 30, T40N, R30W
 MORRISON COUNTY, MINNESOTA

PROJECT NO.

DWG. NO. **P3-1**

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Meriel, Jeffrey 7/21/2020 2:08 P.M.:\\NNG-2021-NL-B-RW-CONFIGURATION\WILLMAR\ROW1



NOTE:
 1. CONTRACTOR TO DISCUSS SOIL HANDLING AND STORAGE PLAN WITH CLIENT PRIOR TO CONSTRUCTION. ANY ADDITIONAL WORKSPACE OR CONCERNS RELATED TO CONSTRUCTION ROW SHALL BE ADDRESSED PRE-CONSTRUCTION.

MP FROM	MP TO	REF DWG	DIRECTION OF LAY
1.39	1.42	P3-1	EAST TO WEST
1.44	1.86	P3-1 TO P3-2	WEST TO EAST
1.89	1.93	P3-2 TO P3-3	WEST TO EAST

LEGEND
 TOPSOIL
 SUBSOIL

Figure 1-10

NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D
F	ISSUED FOR FERC	HD	7/23/2020	TH	GC

FILED WITH FERC
 ANY CHANGES FROM WHAT IS SHOWN MUST BE IDENTIFIED AND REVIEWED BY REGULATORY BEFORE IMPLEMENTATION

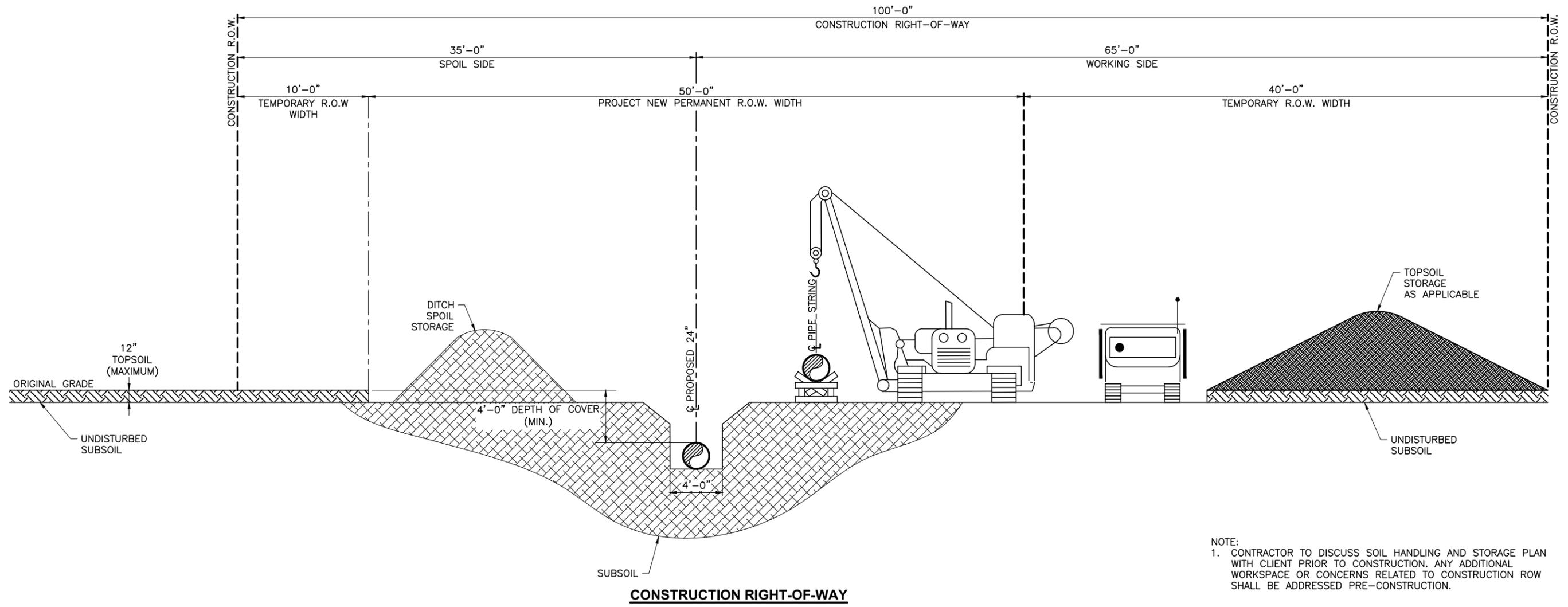
STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

FAC. CODE: N/A	REL. W.O. N/A
PL# N/A	CONST. YR 2021
STA# N/A	
DESIGN TH	DATE 3/03/20
DRAWN HD	DATE 3/03/20
ASBUILT	
FILE NO.: ROW1	
SCALE: NTS	

PROPOSED 24"
WILLMAR D BRANCH LINE EXTENSION
CONSTRUCTION R.O.W
SEC. 26, 27, 28 & 21, T114N, R21W
DAKOTA & SCOTT COUNTY, MINNESOTA


 PROJECT NO.
 DWG. NO.
WBL ROW1

Meriel, Jeffrey 7/21/2020 2:07 P.M.:\\NNG-2021-NL-B-RW-CONFIGURATION\WILLMAR\ROW2



NOTE:
 1. CONTRACTOR TO DISCUSS SOIL HANDLING AND STORAGE PLAN WITH CLIENT PRIOR TO CONSTRUCTION. ANY ADDITIONAL WORKSPACE OR CONCERNS RELATED TO CONSTRUCTION ROW SHALL BE ADDRESSED PRE-CONSTRUCTION.

MP FROM	MP TO	REF DWG	DIRECTION OF LAY
2.02	2.07	P3-3	NORTH TO SOUTH
2.08	2.11	P3-3	SOUTH TO NORTH
2.11	2.19	P3-3	EAST TO WEST

LEGEND
 TOPSOIL
 SUBSOIL

Figure 1-10

NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D
F	ISSUED FOR FERC	HD	7/23/2020	TH	GC

FILED WITH FERC
 ANY CHANGES FROM WHAT IS SHOWN MUST BE IDENTIFIED AND REVIEWED BY REGULATORY BEFORE IMPLEMENTATION

STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

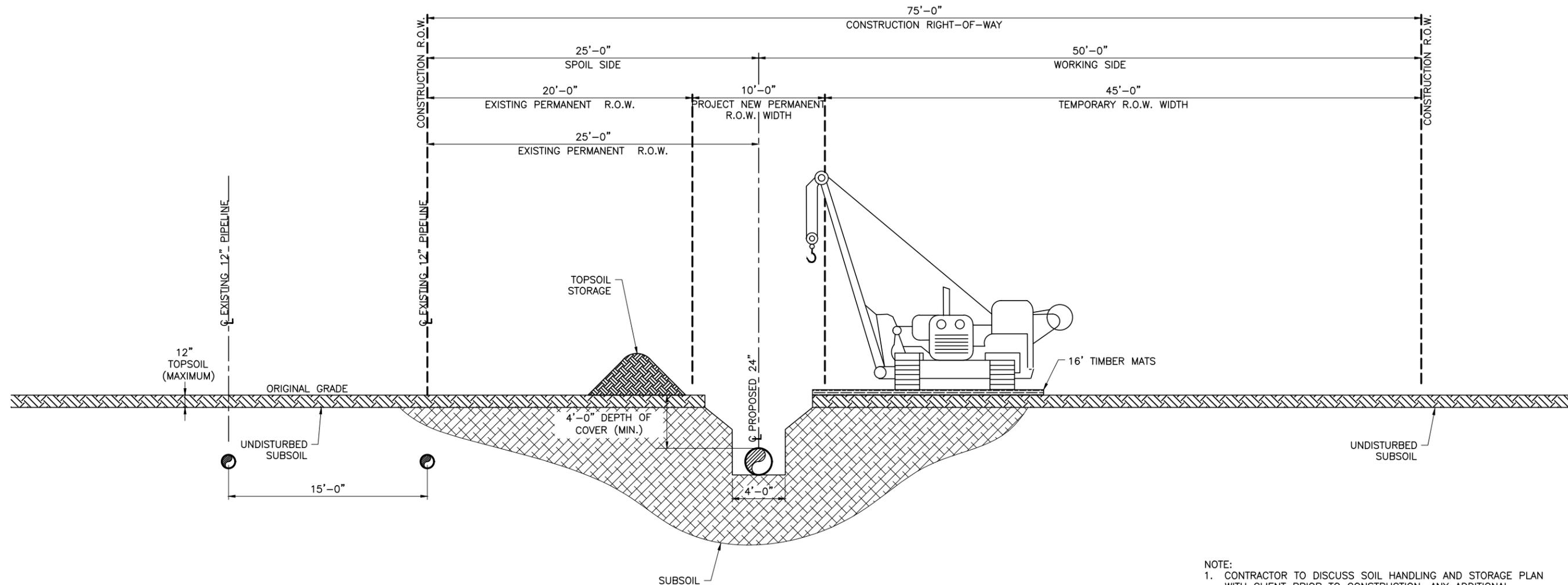
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STA# N/A	
DESIGN TH	DATE 3/03/20
DRAWN HD	DATE 3/03/20
ASBUILT	
FILE NO.: ROW2	
SCALE: NTS	

PROPOSED 24"
WILLMAR D BRANCH LINE EXTENSION
CONSTRUCTION R.O.W
SEC. 27 & 28, T114N, R21W
SCOTT COUNTY, MINNESOTA


 PROJECT NO.
 DWG. NO.
WBL ROW2



Meriel, Jeffrey 7/21/2020 2:09 P.M.:\\NNG_2021_NL_B_ROW_CONFIGURATION\WILLMAR_ROW3



CONSTRUCTION RIGHT-OF-WAY WITHIN A WETLAND

- NOTE:
1. CONTRACTOR TO DISCUSS SOIL HANDLING AND STORAGE PLAN WITH CLIENT PRIOR TO CONSTRUCTION. ANY ADDITIONAL WORKSPACE OR CONCERNS RELATED TO CONSTRUCTION ROW SHALL BE ADDRESSED PRE-CONSTRUCTION.
 2. DUE TO A REDUCED CONSTRUCTION RIGHT OF WAY WIDTH, SUBSOIL WILL BE STORED ON TIMBER MATS OR TRANSPORTED TO ADJACENT UPLANDS FOR STORAGE.

MP FROM	MP TO	REF DWG	DIRECTION OF LAY
1.86	1.89	P3-2	WEST TO EAST

LEGEND

TOPSOIL

SUBSOIL

Figure 1-10

NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D
F	ISSUED FOR FERC	HD	7/23/2020	TH	GC

FILED WITH FERC
ANY CHANGES FROM WHAT IS SHOWN MUST BE IDENTIFIED AND REVIEWED BY REGULATORY BEFORE IMPLEMENTATION

STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

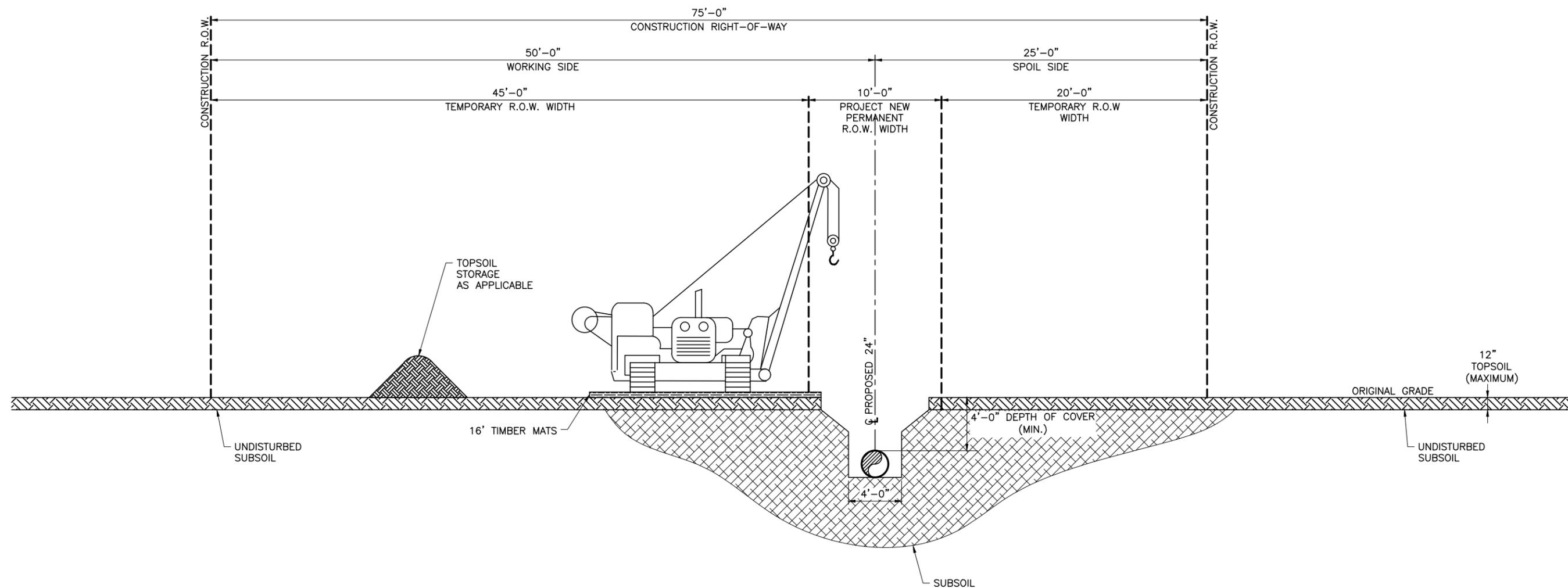
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PL# N/A	CONST. YR 2021
STA# N/A	
DESIGN TH	DATE 3/02/20
DRAWN HD	DATE 3/02/20
ASBUILT	
FILE NO.: ROW3	
SCALE: NTS	

PROPOSED 24"
WILLMAR D BRANCH LINE EXTENSION
CONSTRUCTION R.O.W
SEC. 27, T114N, R21W
SCOTT COUNTY, MINNESOTA

Northern Natural Gas

PROJECT NO.

DWG. NO. **WBL ROW3**



CONSTRUCTION RIGHT-OF-WAY WITHIN A WETLAND

- NOTE:
1. CONTRACTOR TO DISCUSS SOIL HANDLING AND STORAGE PLAN WITH CLIENT PRIOR TO CONSTRUCTION. ANY ADDITIONAL WORKSPACE OR CONCERNS RELATED TO CONSTRUCTION ROW SHALL BE ADDRESSED PRE-CONSTRUCTION.
 2. DUE TO A REDUCED CONSTRUCTION RIGHT OF WAY WIDTH, SUBSOIL WILL BE STORED ON TIMBER MATS OR TRANSPORTED TO ADJACENT UPLANDS FOR STORAGE.

MP FROM	MP TO	REF DWG	DIRECTION OF LAY
0.00	0.05	P3-1	SOUTH TO NORTH

LEGEND

TOPSOIL

SUBSOIL

Meriel, Jeffrey 7/21/2020 1:58 PM: \\NNG_2021_NL_B_RW_CONFIGURATION\CARLTON\ROW1

Figure 1-10

NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D
F	ISSUED FOR FERC	HD	7/23/2020	TH	GC

FILED WITH FERC
ANY CHANGES FROM WHAT IS SHOWN MUST BE IDENTIFIED AND REVIEWED BY REGULATORY BEFORE IMPLEMENTATION

STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

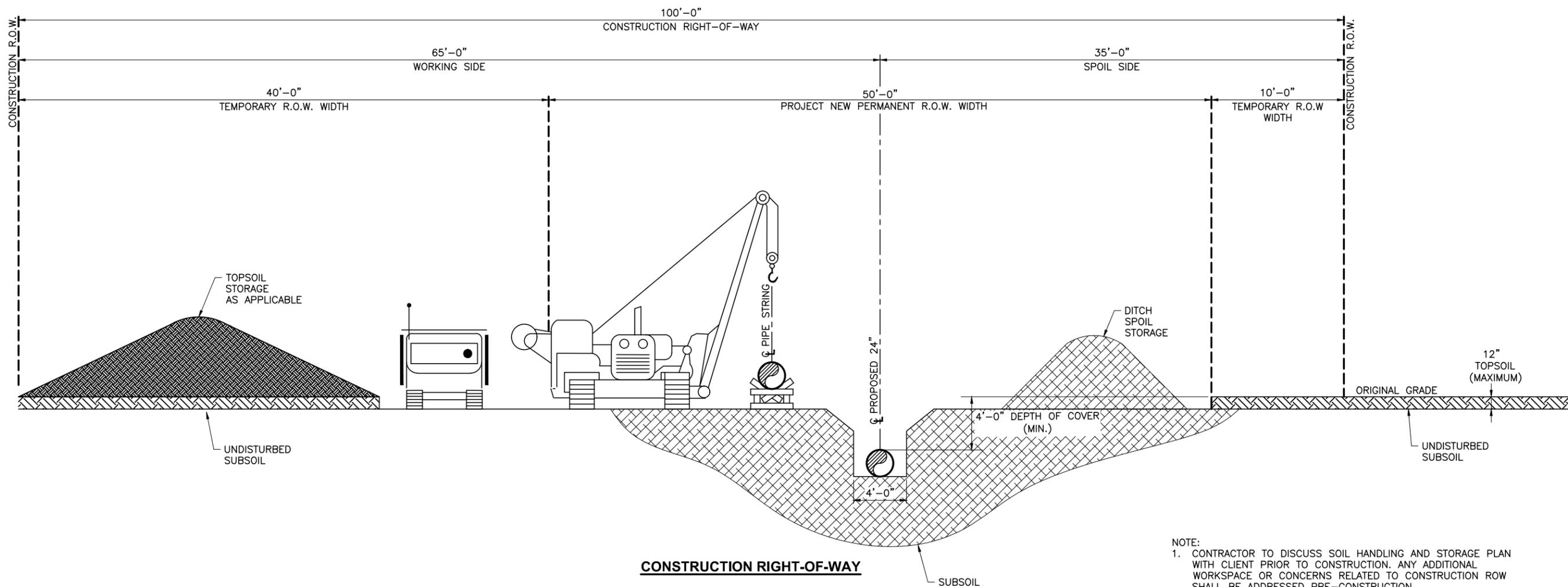
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PL# N/A	CONST. YR 2021
STA# N/A	
DESIGN	TH
DRAWN	HD
ASBUILT	
FILE NO.: ROW1	
SCALE: NTS	

PROPOSED 24"
CARLTON INTERCONNECT LOOP
CONSTRUCTION R.O.W
SEC. 10 & 9, T48N, R17W
CARLTON COUNTY, MINNESOTA

Northern Natural Gas

PROJECT NO.

DWG. NO.
CIL ROW1



NOTE:
 1. CONTRACTOR TO DISCUSS SOIL HANDLING AND STORAGE PLAN WITH CLIENT PRIOR TO CONSTRUCTION. ANY ADDITIONAL WORKSPACE OR CONCERNS RELATED TO CONSTRUCTION ROW SHALL BE ADDRESSED PRE-CONSTRUCTION.

MP FROM	MP TO	REF DWG	DIRECTION OF LAY
0.59	0.63	P3-2	NORTH TO SOUTH

LEGEND

	TOPSOIL
	SUBSOIL

Meriel, Jeffrey 7/21/2020 2:05 PM: \\NNG_2021_NL_B_RW_CONFIGURATION\CARLTON\ROW2

Figure 1-10

NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D
F	ISSUED FOR FERC	HD	7/23/2020	TH	GC

FILED WITH FERC
 ANY CHANGES FROM WHAT IS SHOWN MUST BE IDENTIFIED AND REVIEWED BY REGULATORY BEFORE IMPLEMENTATION

STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

FAC. CODE: N/A	REL. W.O. N/A
PL# N/A	CONST. YR 2021
STA# N/A	
DESIGN TH	DATE 2/28/20
DRAWN HD	DATE 2/28/20
ASBUILT	
FILE NO.: ROW1	
SCALE: NTS	

PROPOSED 24" CARLTON INTERCONNECT LOOP CONSTRUCTION R.O.W
 SEC. 10 & 9, T48N, R17W
 CARLTON COUNTY, MINNESOTA

PROJECT NO. _____
 DWG. NO. **CIL ROW2**

APPENDIX B
ATWS within 50 feet of Wetlands and Waterbodies

Appendix B
Additional Temporary Workspace Within 50 Feet of Wetland or Waterbody

Project Component	MP	Wetland Type ¹	Temporary Impact on Wetland (Acres)	Description	Alternatives to Procedures	Justification
Willmar D Branch Line Extension	1.78	PEM1A/PEM1C	0.00	Access road (AR 1) located within 15, 34, and 25 feet, respectively, of field-delineated wetlands WIL-W27, WIL-W04, and WIL-W05	VI.B.1.a Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland and waterbody boundaries, except where adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.	Access road is required for HDD; access road follows an existing driveway for the first half of the access road so has the least impact on environment. Northern proposes to install redundant silt fence to protect the wetlands and install a temporary clear span bridge to cross the waterbody.
Carlton Interconnect Loop	0.00 and Launcher	PEM1B	0.02	ETWS1 located within field delineated wetland CIL-W07	VI.B.1.a Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland and waterbody boundaries, except where adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.	ETWS is required to install the new launcher facility and for set-up of the HDD drill rig and supporting equipment. The wetland complex surrounds the delivery point; Northern minimized wetland impacts to the extent practicable. Northern proposes to install redundant silt fence to protect the wetland.

Carlton Interconnect Loop	0.00 and Launcher	PSS1B	0.00	ETWS2 located within 20 feet of field delineated wetland CIL-W07	VI.B.1.a Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland and waterbody boundaries, except where adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.	ETWS is required to install the new launcher facility and station piping to the delivery point. The wetland complex surrounds the delivery point; Northern minimized wetland impacts to the extent practicable. Northern proposes to install redundant silt fence to protect the wetland.
Carlton Interconnect Loop	0.02	PEM1B/PSS1B	0.49	TWS in wetland CIL-W07 exceeds 75 feet in width	VI.A.3 Limit the width of the construction right-of-way to 75 feet or less. Prior written approval of the Director is required where topographic conditions or soil limitations require that the construction right-of-way width within the boundaries of a federally delineated wetland be expanded beyond 75 feet.	At the start of the loop, Northern proposes to tie-in pipeline from two directions along with the connection to the launcher.

<p>Carlton Interconnect Loop</p>	<p>0.63</p>	<p>PEM1B</p>	<p>0.21</p>	<p>ETWS 3 located within field delineated wetland CIL-W06</p>	<p>VI.B.1.a Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland and waterbody boundaries, except where adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.</p>	<p>ETWS required for stringing/welding pipe for HDD pull back. HDD is required to minimize impacts on golf course and large wetland complex. No grading will occur in wetland as it will only be used for stringing pipe. Northern proposes to install redundant silt fence to protect the wetland.</p>
<p>Carlton Interconnect Loop</p>	<p>0.63</p>	<p>PEM1B</p>	<p>0.01</p>	<p>Staging area 1 is located in wetland CIL-W08</p>	<p>VI.B.1.a Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland and waterbody boundaries, except where adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.</p>	<p>Staging area is located in wetland CIL-W08 and adjacent to wetland CIL-W06. Staging area is required for the pipe, contractor storage, and receiver installation. Northern proposes to install redundant silt fence to protect the wetlands.</p>

Hinckley Compressor Station	N/A	PEM1Bf	3.22	ETWS 1 is located in wetland HCS-W01	VI.B.1.a Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland and waterbody boundaries, except where adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.	Northern proposes to construct a greenfield compressor station at a location optimized for system requirements. A farmed wetland borders the western edge of the station. Northern designed the rock area so the permanent fill is less than 10,000 square feet. Northern proposes to install redundant silt fence to protect the wetland.
¹ Wetland Classification based on Cowardin, Classification of Wetlands and Deepwater Habitats: PSS1B – Palustrine Scrub-Shrub– seasonally saturated (Shrub-Carr), PEM1A - Palustrine Emergent – temporarily flooded (Wet Meadow), PEM1B - Palustrine Emergent – seasonally saturated (wet meadow), PEM1C - Palustrine Emergent – persistent - seasonally flooded (Shallow Marsh), PEM1Bf - Palustrine Emergent – farmed (Farmed Wetland)						

APPENDIX C
Section 2.55(a) and Blanket Certificate Facilities

**Northern Natural Gas Section 255(a) Projects That Would be Constructed Coincident With
Northern Lights 2021 Expansion Project**

§ 2.55(a) facilities		(b) Justification for regulatory authority	(c) Project Description	(d) Located within right of way (§ 2.55(a))	(e) Total estimated project cost
Facility ¹	County and State				
Anoka MN #1 TBS	Anoka, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Increase pipe size downstream of regulation and at the station outlet assembly. Construct new regulator building.	Yes	\$716,083
Blue Earth MN #1 TBS	Fa ribault, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Replace existing piping downstream of regulation, through the meter bypass line, with larger piping.	Yes	\$439,569
Brainerd MN #1 TBS	Crow Wing, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Replace 4-inch-diameter piping downstream of regulators with 12-inch-diameter piping.	Yes	\$386,426
Centerville MN #1 TBS	Anoka, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Replace regulators and complete minor pipe modifications. Replace the current heater, as it will be undersized for the new firm flow rate.	Yes	\$89,962
Coates MN #1 TBS	Farmington, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Remove the station heater and relief valve and replace with a larger heater and new relief valve. In addition, Complete small piping modifications.	Yes	\$372,720
Cold Spring MN #1 TBS	Stearns, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Replace 75% trim with 100% trim. Replace 3-inch-diameter relief valve with 4-inch-diameter relief valve	Yes	\$53,745

§ 2.55(a) facilities		(b) Justification for regulatory authority	(c) Project Description	(d) Located within right of way (§ 2.55(a))	(e) Total estimated project cost
Facility ¹	County and State				
Dayton MN #1 TBS	Wright, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Remove 8-inch-diameter pipe and components, from the regulators to the below-grade tee, and replace with 10-inch-diameter pipe and components. Shorten upstream regulator piping. Install larger building.	Yes	\$343,384
Lastrup MN #1 TBS	Morrison, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Install larger heater with three-valve bypass.	Yes	\$319,770
Mondovi TBS	Buffalo, WI	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Replace 3-inch-diameter piping downstream of regulation with 4-inch-diameter piping.	Yes	\$135,428
Montrose/Waverly TBS	Wright, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Replace one-inch-diameter pipe and regulators between the regulator inlet and outlet valves with new two-inch-diameter regulators, two-inch-diameter upstream and three-inch-diameter downstream pipe. Install new heater.	Yes	\$484,892
Sleepy Eye MN #1 TBS	Brown, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Upsize piping downstream of regulation through meter bypass.	Yes	\$470,781
Carlton Compressor Station	Carlton, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Installation of piping at the Carlton yard (160 feet of 20-inch-diameter piping associated with valves and fittings) in preparation for installing a measurement meter	Yes	Not Reported
St. Michael MN #1 TBS	Wright, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Install new water bath heater with three valve bypass, new regulator trim, relief valve, stopple with temporary skid bypass and pipe modifications.	Yes	\$1,254,526

§ 2.55(a) facilities		(b) Justification for regulatory authority	(c) Project Description	(d) Located within right of way (§ 2.55(a))	(e) Total estimated project cost
Facility ¹	County and State				
Hugo compressor station modifications	Washington, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Enable Hugo to compress north to south and branch lines. Include control valve across station block to allow flow from south to north if branch line volume exceeds north suction supply.	Yes	\$2,014,000
Elk River Remote Control-Princeton to Buffalo regulator modification	Sherburne, MN	Pursuant to § 2.55(a)(1), modification of appurtenant facilities to ensure reliability	Replace the Princeton to Elk River regulator and add remote pressure set point control. Primary remote control will be backpressure/inlet pressure set point with a minimum outlet pressure override set point.	Yes	\$799,718
Elk River Remote	Sherburne, MN	Pursuant to § 2.55(a)(1), Control-Princeton to St Michael	Install a boundary meter on the Princeton to St Michael tie-over. modification of appurtenant facilities to ensure reliability	Yes	
¹ The project is not contingent on the Northern Lights 2021 Expansion Project. Northern asserts that the projects listed here would be used and useful individually and would be required in time to meet customer demand.					

**Northern Natural Gas Blanket Certificate Projects That Would be Constructed Coincident With
Northern Lights 2021 Expansion Project**

Automatic Blanket ¹		(b) Justification for regulatory authority ²	(c) Project Description	(d) Total estimated project cost
Facility	County and State			
Anoka MN #1A TBS	Anoka, MN	Pursuant to § 157.211(a), modification of delivery point	Replace existing metering with a Coriolis meter upstream of the heater, upsize piping downstream of regulator to 8-inch diameter, replace trim in existing regulators and remove existing meter run piping.	\$590,413
Blaine MN #1 TBS	Anoka, MN	Pursuant to § 157.211(a), modification of delivery point	Install a heater, two regulators, a relief valve, and a high pressure meter. Complete piping modifications and install larger piping after regulation through the delivery point. Install two new buildings to house the new equipment.	\$1,363,783
Blaine MN #1A TBS	Anoka, MN	Pursuant to § 157.211(a), modification of delivery point	Install a heater, two regulators, a relief valve, and a high pressure meter. Install new piping, a new hot tap and three new buildings.	\$1,420,505
Buffalo MN #1 TBS	Wright, MN	Pursuant to § 157.211(a), modification of delivery point	Replace existing meters with new upstream Coriolis meter. Complete associated piping modifications.	\$258,584
Delano MN #1B TBS	Wright, MN	Pursuant to § 157.211(a), modification of delivery point	Relocate existing TBS and install a new unregulated station including new property, hot tap, meter, communications and associated piping.	\$811,000
East Farmington TBS	Polk, WI	Pursuant to § 157.211(a), modification of delivery point	Relocate existing TBS and install 1,000 feet of 2-inch-diameter pipeline. New station will consist of 2-inch-diameter station inlet piping, heater, regulator with relief valve and 4-inch-diameter station outlet piping.	\$99,628
Redwing MN #1 TBS	Goodhue, MN	Pursuant to § 157.211(a), modification of delivery point	Replace the existing heater with new heater and existing meters with an upstream meter.	\$688,724
St. Michael MN #1A TBS	Wright, MN	Pursuant to § 157.211(a), modification of delivery point	Install new, larger hot taps to feed the station, a new water bath heater, new station piping, regulators, relief stack and metering.	\$1,391,653
4 Waterville MN #1 TBS	Le Sueur, MN	Pursuant to § 157.211(a), modification of delivery point	Upsize piping downstream of regulation, replacing existing meter and install new EFM equipment.	\$391,566

¹ These projects are not contingent on the Northern Lights 2021 Expansion Project. Northern asserts that the projects would be used and useful individually and would be required in time to meet customer demand.

² Pursuant to the automatic provisions of its blanket certificate granted in Docket No. CP82-401-000.

APPENDIX D

**Federally and State-listed Species Potentially
Occurring in the Vicinity of the Project**

APPENDIX D: Federally and State-listed Species Potentially Occurring in the Project Area

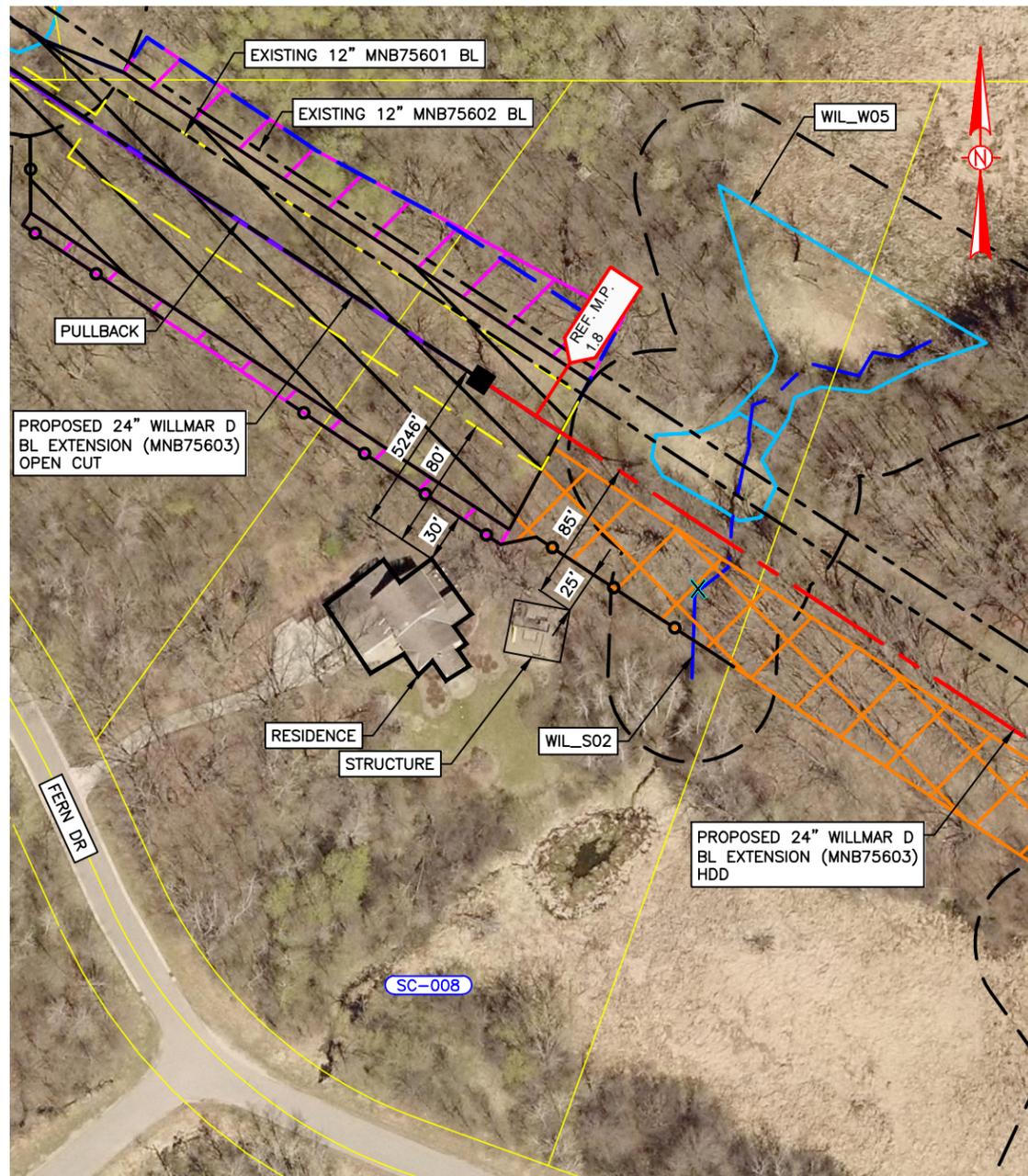
Common Name	Scientific Name	Federal Status	State Status	County	Project Component	Habitat Description	Suitable Habitat Present/ Effect Determination
Reptiles/Amphibians							
Blanding's turtle	<i>Emydoidea blandingii</i>	-	Threatened	Scott, Dakota	Willmar D Branch Line Extension	Wetland habitat including marsh and ponds, and upland habitat with sandy or open area uplands for nesting. Nesting may occur on residential property or agriculture land	Potential habitat is present in the Project area. No significant impact.
				Scott, Dakota	Pierz Compressor Station and Interconnect/ Viking Interconnect		Potential wetland habitat to the south and potential upland habitat present in the Project area. No significant impact.
Mammals							
Canada lynx	<i>Lynx canadensis</i>	Threatened	-	Carlton	Carlton Interconnect Loop	Moist, cool boreal spruce-fir forests with stable population of snowshoe hares and snow cover for four months out of the year	In USFWS designated range, and potential habitat present but made less suitable by fragmentation and human presence. May affect, but not likely to adversely affect.
				Pine	Hinckley Compressor Station		Suitable habitat does not occur. No effect.
Gray wolf	<i>Canis lupus</i>	Threatened	-	Carlton	Carlton Interconnect Loop	Woodland, forest and grassland; prefers large areas of contiguous forest and stable prey populations	In USFWS designated range; lack of quality habitat due to fragmentation and human presence and is unlikely to occur. No effect.
				Pine	Hinckley Compressor Station		
				Morrison	Pierz Compressor Station/Viking Interconnect		
Northern long eared bat	<i>Myotis septentrionalis</i>	Threatened	Threatened	Scott, Dakota	Willmar D Branch Line Extension	Winter habitat includes large caves and mines. Summer habitat includes tree cavities and crevices, loose bark of live or dead trees.	Potential habitat is present in the Project area. May affect, but not likely to adversely affect.
				Carlton	Carlton Interconnect Loop		Potential habitat is present in the Project area, but no tree clearing would occur. May affect, but not likely to adversely affect.
				Pine	Hinckley Compressor Station		No potential habitat in the Project area, and no tree clearing would occur. No effect.

				Morrison	Pierz Compressor Station/Viking Interconnect		No potential habitat in the Project area, and no tree clearing would occur. No effect.
Birds							
Piping plover	<i>Charadrius melodus</i>	Endangered	Endangered	Carlton	Carlton Interconnect Loop	Sandy beaches with areas of pebble substrate and little or no vegetation	No potential habitat is present in the Project area. No effect.
Plants							
Prairie bush clover	<i>Lespedeza leptostachya</i>	Threatened	Threatened	Scott, Dakota	Willmar D Branch Line Extension	North, northeast or northwest facing mesic to dry-mesic prairie slopes, or on upper slopes of prairie bluffs	The Project area does not include suitable habitat No effect.
Clams							
Black sandshell	<i>Ligumia recta</i>	-	Special concern	Pine	Hinckley Compressor Station	Riffle and run areas of medium to large rivers where substrates are dominated by sand or gravel.	No potential habitat in the Project area. No impact
Creek heelsplitter	<i>Lasmigona compressa</i>	-	Special concern	Pine	Hinckley Compressor Station	Creeks, small rivers, and upstream of large rivers in sand, fine gravel, and mud substrates.	No potential habitat in the Project area. No impact
				Morrison	Pierz Compressor Station and Interconnect/Viking Interconnect		
Elktoe	<i>Alasmidonta marginata</i>	-	Threatened	Pine	Hinckley Compressor Station	Medium to large rivers with sand and gravel substrates and moderate to fast velocities	No potential habitat is in the Project area. No impact
Fluted- shell	<i>Lasmigona costata</i>	-	Threatened	Pine	Hinckley Compressor Station	Medium to large rivers with gravel substrates, areas with swift current and at least 0.6 meter of water	No potential habitat is in the Project area. No impact

Mucket	<i>Actinonaias ligamentina</i>	-	Threatened	Pine	Hinckley Compressor Station	Medium to large rivers with substrates of coarse sand and gravel.	No potential habitat is in the Project area. No impact
Invertebrate							
Rusty Patched Bumble Bee	<i>Bombus affinis</i>	Endangered	-	Scott, Dakota	Willmar D Branch Line Extension	Over wintering habitat includes upland forest and woodland. Nesting habitat includes upland grassland and shrubland and upland forest and woodland edges. Foraging habitats include upland grassland, shrubland, forest and woodland, palustrine wetlands excluding ponds and some vegetation that is not natural or semi-natural like gardens.	Potential habitat is present in the Project area. No rusty patched bumble bees were observed within the Project area during the presence/absence surveys. May affect, but not likely to adversely affect.

APPENDIX E
Residential Construction Drawings

RESIDENTIAL PLAN - SC-008

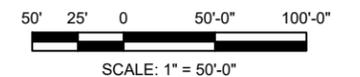


LEGEND	
	PROPOSED WILLMAR D BL EXTENSION (MNB75603) HDD
	PROPOSED WILLMAR D BL EXTENSION (MNB75603) OPEN CUT
	PULLBACK
	EXISTING BRANCH LINE
	PROPERTY LINE
	WETLAND LOCATIONS
	WETLAND/STREAM BUFFER
	STREAM
	SAFETY FENCE
	HDD ENTRY/EXIT
	RESIDENCE
	LANDOWNER PROPERTY
	TEMPORARY ACCESS ROAD
	TEMP. WORKSPACE
	EXTRA TEMP. WORKSPACE
	PROJECT PERMANENT ROW
	EXISTING PERMANENT ROW
	TEMPORARY CLEAR SPAN BRIDGE

NOTES:

- NORTHERN WILL NOTIFY LANDOWNERS BY PHONE CALL AND CERTIFIED MAILING 10 DAYS IN ADVANCE OF CONSTRUCTION.
- NORTHERN WILL MINIMIZE THE DURATION OF OPEN TRENCH AND CONSTRUCTION DISTURBANCE TIME NEAR THE RESIDENCES (ANTICIPATE ONE TO TWO WEEKS). THE TRENCH WITHIN RESIDENTIAL AREAS WILL BE SECURED WITH SAFETY FENCING AT THE END OF EACH DAY OF CONSTRUCTION. VEHICLE SPEEDS WILL BE RESTRICTED ON THE ROW TO 10 MILES PER HOUR IN THE VICINITY OF THE RESIDENCES.
- THE EDGE OF THE CONSTRUCTION WORKSPACE WILL BE FENCED WITH SAFETY FENCING EXTENDING A MINIMUM OF 100 FEET EITHER SIDE OF THE RESIDENCE. FENCING WILL REMAIN IN PLACE UNTIL FINAL CLEANUP IS COMPLETE.
- THE CONSTRUCTION WORKSPACE WILL BE REGULARLY WATERED TO CONTROL FUGITIVE DUST EMISSIONS.
- RESIDENTIAL ACCESS WILL NOT BE IMPACTED AND WILL BE UNRESTRICTED THROUGHOUT CONSTRUCTION.
- RESIDENTIAL UTILITIES WILL BE LOCATED PRIOR TO CONSTRUCTION AND ALL UTILITY SERVICES WILL BE MAINTAINED THROUGHOUT CONSTRUCTION.
- TOPSOIL WILL BE SEGREGATED FROM AREAS TO BE EXCAVATED OR GRADED AND STOCKPILED FOR REDISTRIBUTION DURING RESTORATION.
- NO MATURE TREES OR LANDSCAPING WILL BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORKSPACE UNLESS NECESSARY FOR THE SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENT.
- ALL LAWN AND LANDSCAPE AREAS WILL BE RESTORED IN THE CONSTRUCTION WORKSPACE IMMEDIATELY AFTER CLEANUP OPERATIONS, OR AS SPECIFIED IN LANDOWNER AGREEMENTS, CONSISTENT WITH THE REQUIREMENTS OF THE PLAN.

PLAN
SCALE : 1"=50'



INTERNAL INFORMATION
DISTRIBUTION/COPIES LIMITED TO
PROJECT NEEDS

FIGURE: RCP1

NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D
A	ISSUED FOR REVIEW	JM	7/22/20	ED	GC

**PRELIMINARY
DRAWING**
**DO NOT USE FOR
CONSTRUCTION**

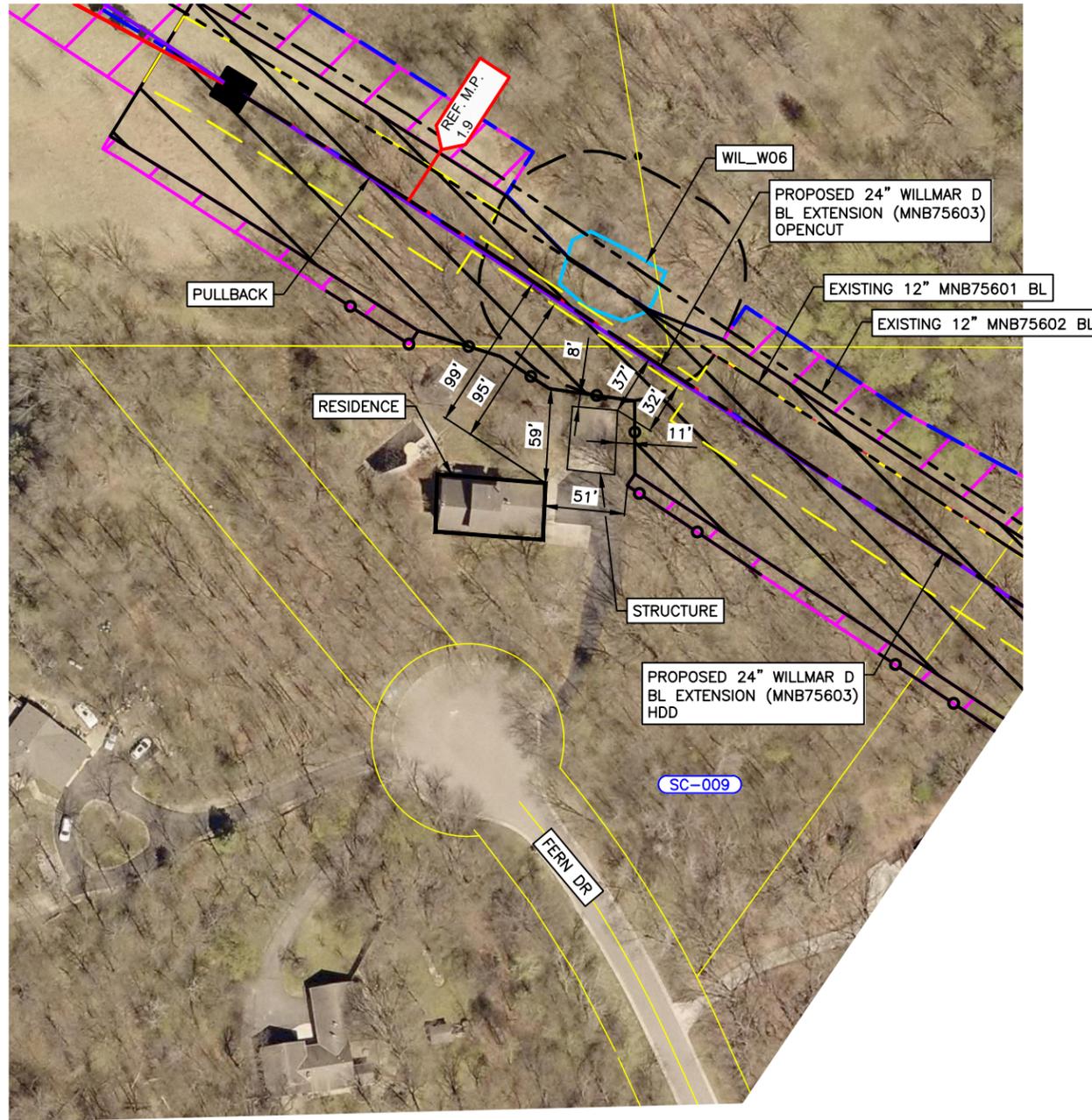
STATUS	CHECKED		APPROVED	
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FAC. CODE:	N/A	REL. W.O.:	N/A
PLF:	N/A	CONST. YR.:	2021
STA#:	N/A	PC#:	N/A
DESIGN:	TH	DATE:	7/21/20
DRAWN:	JM	DATE:	7/21/20
ASBUILT:			
FILE NO.:	N/A		
SCALE:	1"=100'		

PROPOSED 24"
WILLMAR D BRANCH LINE EXTENSION
RESIDENTIAL PLAN - SC-008
SEC 27, T114N, R21W
SCOTT COUNTY, MINNESOTA

PROJECT NO.
DWG. NO.
SC-008

RESIDENTIAL PLAN - SC-009

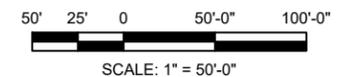


LEGEND	
	PROPOSED WILLMAR D BL EXTENSION (MNB75603) HDD
	PROPOSED WILLMAR D BL EXTENSION (MNB75603) OPEN CUT
	PULLBACK
	EXISTING BRANCH LINE
	PROPERTY LINE
	WETLAND LOCATIONS
	WETLAND/STREAM BUFFER
	SAFETY FENCE
	HDD ENTRY/EXIT
	RESIDENCE
	LANDOWNER PROPERTY
	TEMP. WORKSPACE
	EXTRA TEMP. WORKSPACE
	PROJECT PERMANENT ROW
	EXISTING PERMANENT ROW

NOTES:

- NORTHERN WILL NOTIFY LANDOWNERS BY PHONE CALL AND CERTIFIED MAILING 10 DAYS IN ADVANCE OF CONSTRUCTION.
- NORTHERN WILL MINIMIZE THE DURATION OF OPEN TRENCH AND CONSTRUCTION DISTURBANCE TIME NEAR THE RESIDENCES (ANTICIPATE ONE TO TWO WEEKS). THE TRENCH WITHIN RESIDENTIAL AREAS WILL BE SECURED WITH SAFETY FENCING AT THE END OF EACH DAY OF CONSTRUCTION. VEHICLE SPEEDS WILL BE RESTRICTED ON THE ROW TO 10 MILES PER HOUR IN THE VICINITY OF THE RESIDENCES.
- THE EDGE OF THE CONSTRUCTION WORKSPACE WILL BE FENCED WITH SAFETY FENCING EXTENDING A MINIMUM OF 100 FEET EITHER SIDE OF THE RESIDENCE. FENCING WILL REMAIN IN PLACE UNTIL FINAL CLEANUP IS COMPLETE.
- THE CONSTRUCTION WORKSPACE WILL BE REGULARLY WATERED TO CONTROL FUGITIVE DUST EMISSIONS.
- RESIDENTIAL ACCESS WILL NOT BE IMPACTED AND WILL BE UNRESTRICTED THROUGHOUT CONSTRUCTION.
- RESIDENTIAL UTILITIES WILL BE LOCATED PRIOR TO CONSTRUCTION AND ALL UTILITY SERVICES WILL BE MAINTAINED THROUGHOUT CONSTRUCTION.
- TOPSOIL WILL BE SEGREGATED FROM AREAS TO BE EXCAVATED OR GRADED AND STOCKPILED FOR REDISTRIBUTION DURING RESTORATION.
- NO MATURE TREES OR LANDSCAPING WILL BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORKSPACE UNLESS NECESSARY FOR THE SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENT.
- ALL LAWN AND LANDSCAPE AREAS WILL BE RESTORED IN THE CONSTRUCTION WORKSPACE IMMEDIATELY AFTER CLEANUP OPERATIONS, OR AS SPECIFIED IN LANDOWNER AGREEMENTS, CONSISTENT WITH THE REQUIREMENTS OF THE PLAN.

PLAN
SCALE: 1"=50'



INTERNAL INFORMATION
DISTRIBUTION/COPIES LIMITED TO
PROJECT NEEDS

FIGURE: RCP1

NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D
A	ISSUED FOR REVIEW	JM	7/22/20	ED	GC

**PRELIMINARY
DRAWING**
**DO NOT USE FOR
CONSTRUCTION**

STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

FAC. CODE:	N/A	REL. W.O.:	N/A
PLF:	N/A	CONST. YR:	2021
STA#:	N/A	PC#:	N/A
DESIGN:	TH	DATE:	7/21/20
DRAWN:	JM	DATE:	7/21/20
ASBUILT:			
FILE NO.:	N/A		
SCALE:	1"=100'		

PROPOSED 24"
WILLMAR D BRANCH LINE EXTENSION
RESIDENTIAL PLAN - SC-009
SEC 27, T114N, R21W
SCOTT COUNTY, MINNESOTA

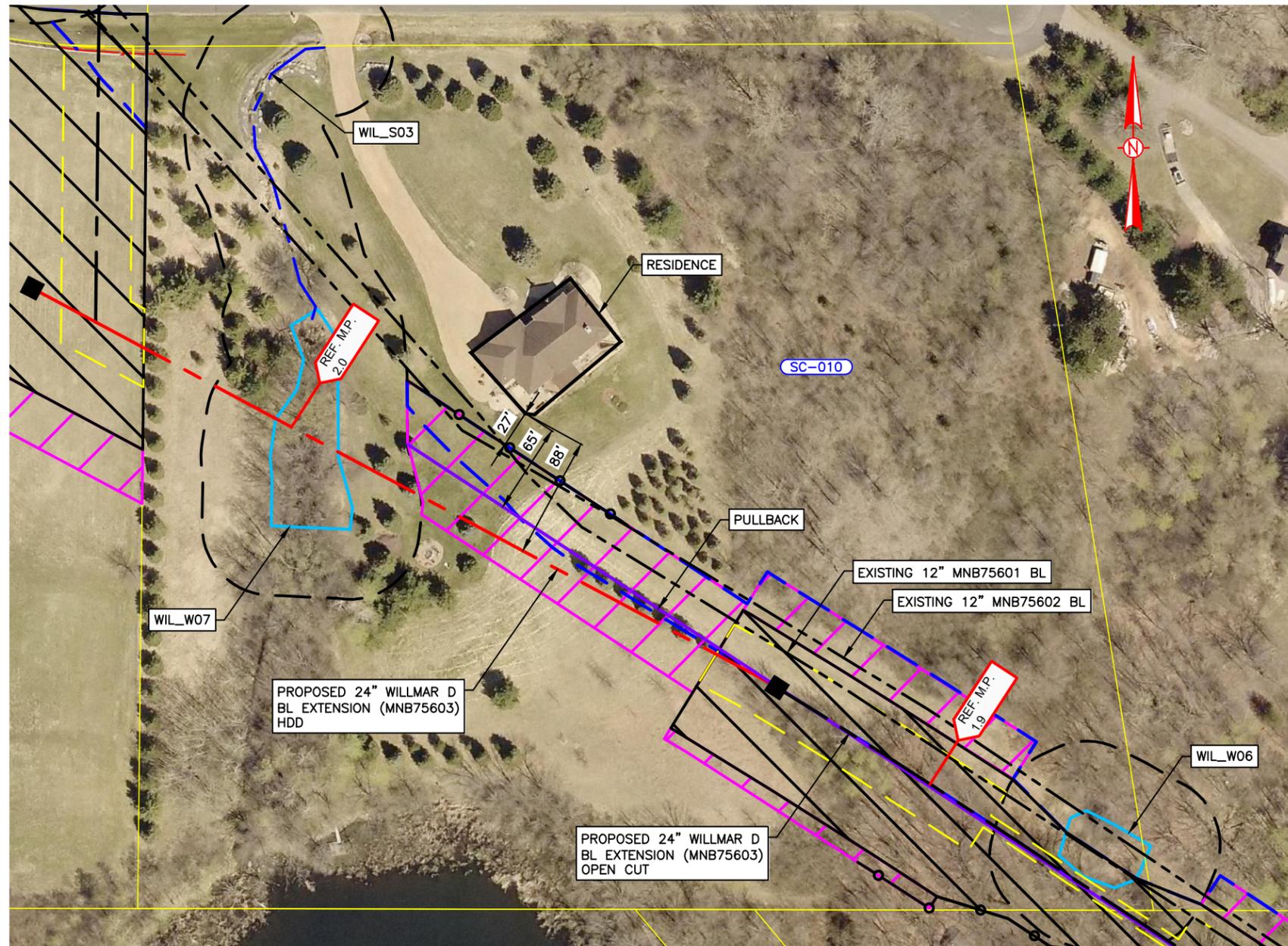


PROJECT NO.

DWG. NO.
SC-009



RESIDENTIAL PLAN - SC-010

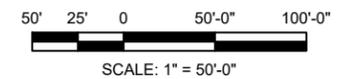


LEGEND	
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	PROPOSED WILLMAR D BL EXTENSION (MNB75603) OPEN CUT
	PULLBACK
	EXISTING BRANCH LINE
	PROPERTY LINE
	WETLAND LOCATIONS
	WETLAND/STREAM BUFFER
	STREAM
	SAFETY FENCE
	HDD ENTRY/EXIT
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	TEMP. WORKSPACE
	EXTRA TEMP. WORKSPACE
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PLAN
SCALE: 1"=50'



INTERNAL INFORMATION
DISTRIBUTION/COPIES LIMITED TO
PROJECT NEEDS

FIGURE: RCP1

NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D
A	ISSUED FOR REVIEW	JM	7/22/20	ED	GC

**PRELIMINARY
DRAWING**
DO NOT USE FOR
CONSTRUCTION

STATUS	CHECKED		APPROVED	
	BY	DATE	BY	DATE
PRELIM				
BID				
CONST.				

FAC. CODE:	N/A	REL. W.O.:	N/A
PLF:	N/A	CONST. YR:	2021
STA#:	N/A	PCM#:	N/A
DESIGN:	TH	DATE:	7/21/20
DRAWN:	JM	DATE:	7/21/20
ASBUILT:			
FILE NO.:	N/A		
SCALE:	1"=100'		

**PROPOSED 24"
WILLMAR D BRANCH LINE EXTENSION
RESIDENTIAL PLAN - SC-010
SEC 27, T114N, R21W
SCOTT COUNTY, MINNESOTA**



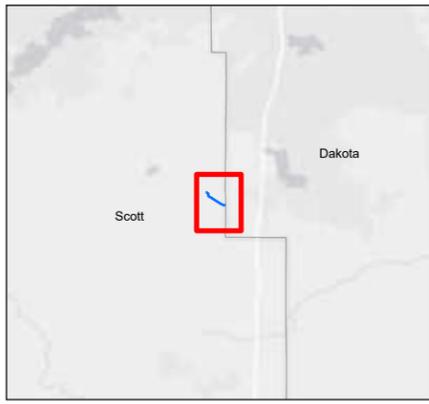
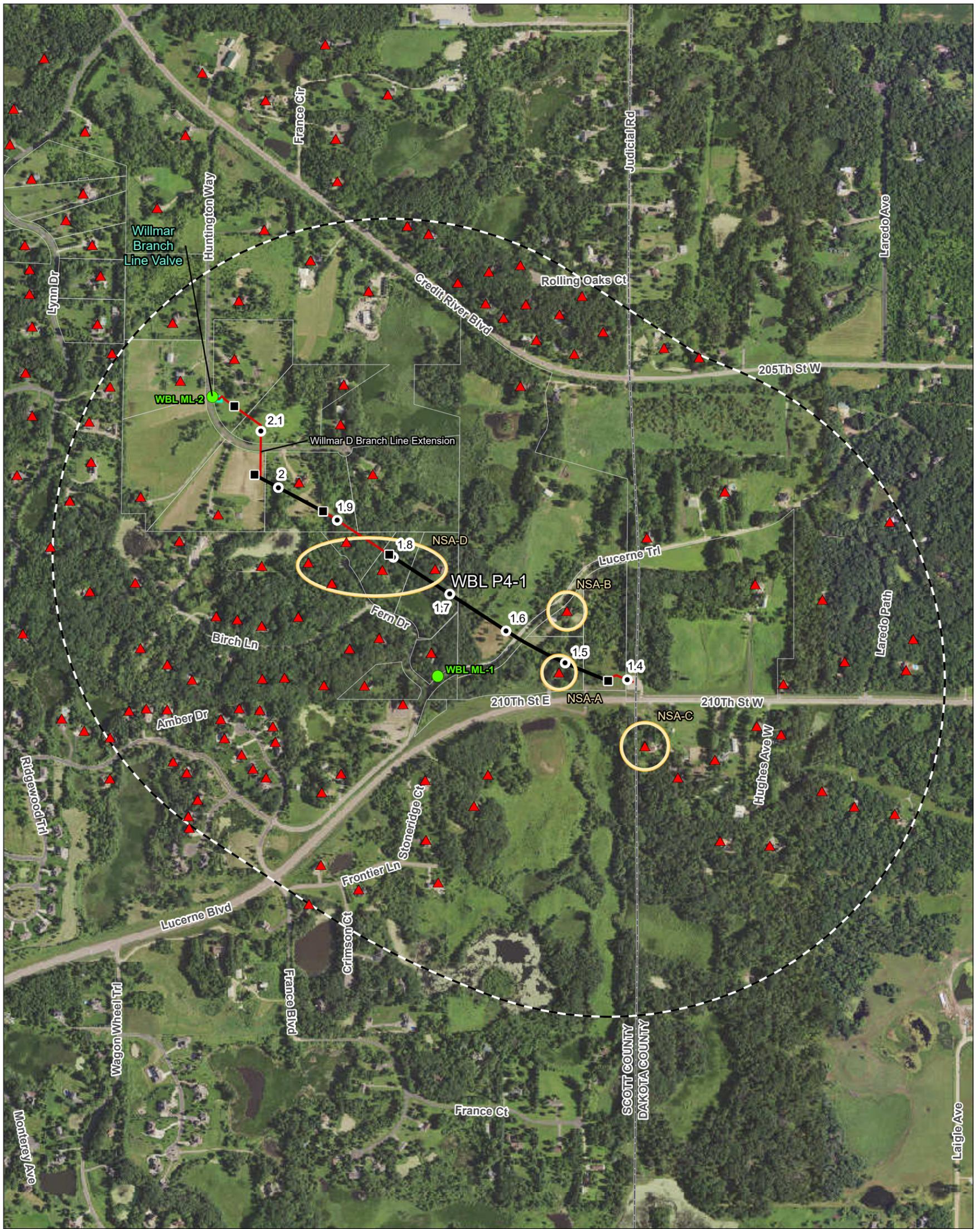
PROJECT NO.

DWG. NO.
SC-010





APPENDIX F
Noise-Sensitive Area Maps for the Project



- Legend**
- Proposed Centerline
 - HDD Segment
 - Half-Mile Buffer
 - Proposed Facility
 - HDD Bore Entry/Exit
 - ▲ Noise Sensitive Area (NSA)
 - Sound Monitoring Location
 - NSA Designated Area
 - Parcel Boundary

Notes

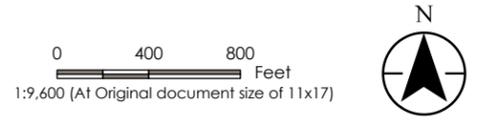
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2. Data Sources Include: Stantec, NNG, USGS, NADS
3. Orthophotography: 2019 NAIP

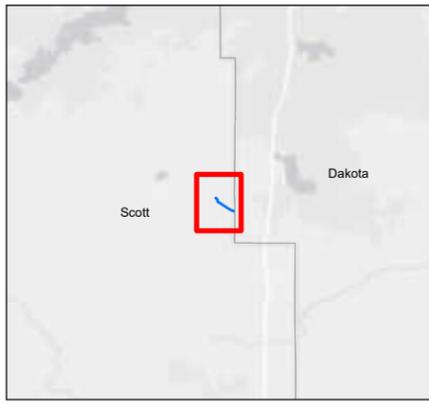
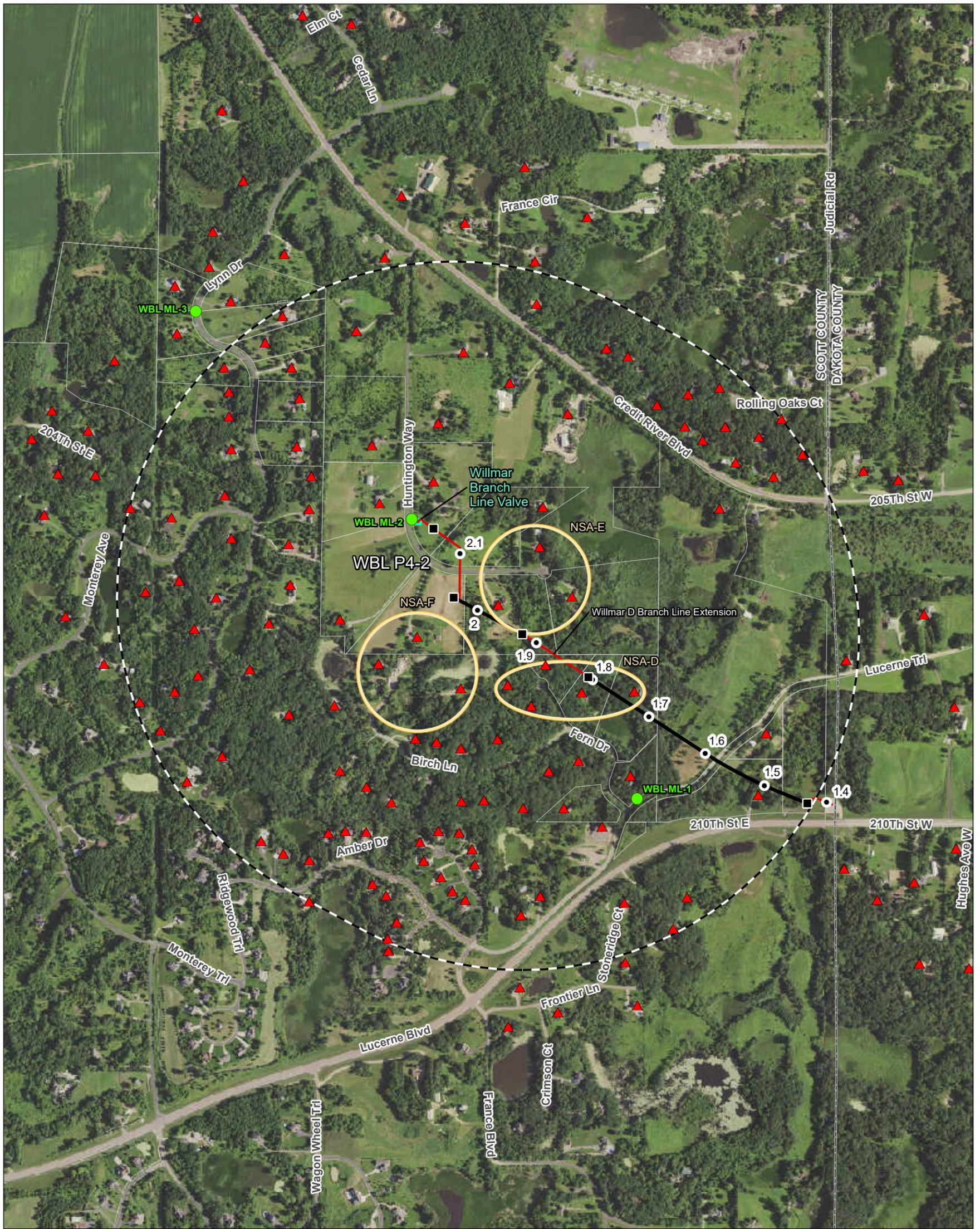
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Figure No. **1-8**
 Title **Approximate Locations with Noise Sensitive Areas WBL P4-1**

Client/Project
 Northern Natural Gas Company
 Northern Lights 2021 Expansion Project
 Willmar D Branch Line Extension

Project Location 172607658
 Scott & Dakota Co., MN Prepared by SF on 2020-03-24
 Technical Review by JM on 2020-04-02
 Independent Review by SK on 2020-07-01





- Legend**
- Proposed Centerline
 - HDD Segment
 - Half-Mile Buffer
 - Proposed Facility
 - HDD Bore Entry/Exit
 - ▲ Noise Sensitive Area (NSA)
 - Sound Monitoring Location
 - NSA Designated Area
 - Parcel Boundary

Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources Include: Stantec, NNG, USGS, NADS
3. Orthophotography: 2019 NAIP

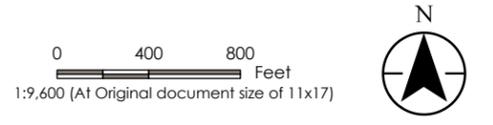
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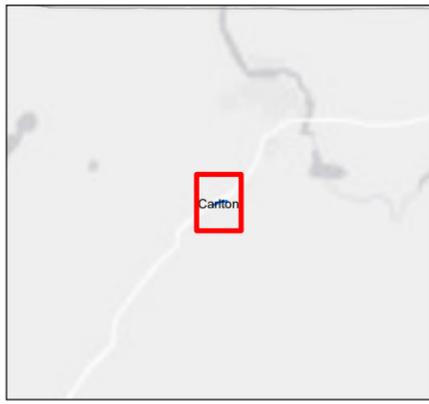
Figure No. **1-8**
 Title **Approximate Locations with Noise Sensitive Areas WBL P4-2**

Client/Project
 Northern Natural Gas Company
 Northern Lights 2021 Expansion Project
 Willmar D Branch Line Extension

Project Location
 Scott & Dakota Co., MN

172607658
 Prepared by SF on 2020-03-24
 Technical Review by JM on 2020-04-02
 Independent Review by SK on 2020-07-01





- Legend**
- Proposed Centerline
 - HDD Segment
 - Half-Mile Buffer
 - Proposed Facility
 - HDD Bore Entry/Exit
 - ▲ Noise Sensitive Area (NSA)
 - Sound Monitoring Location
 - NSA Designated Area
 - Parcel Boundary

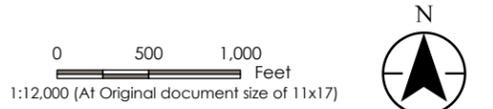
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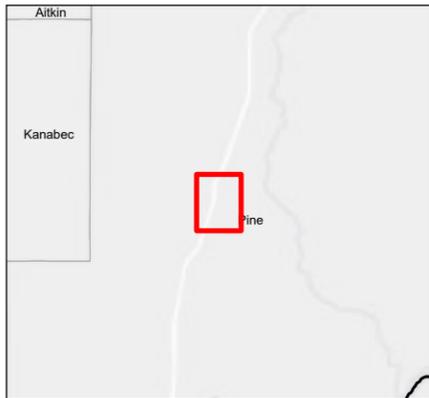
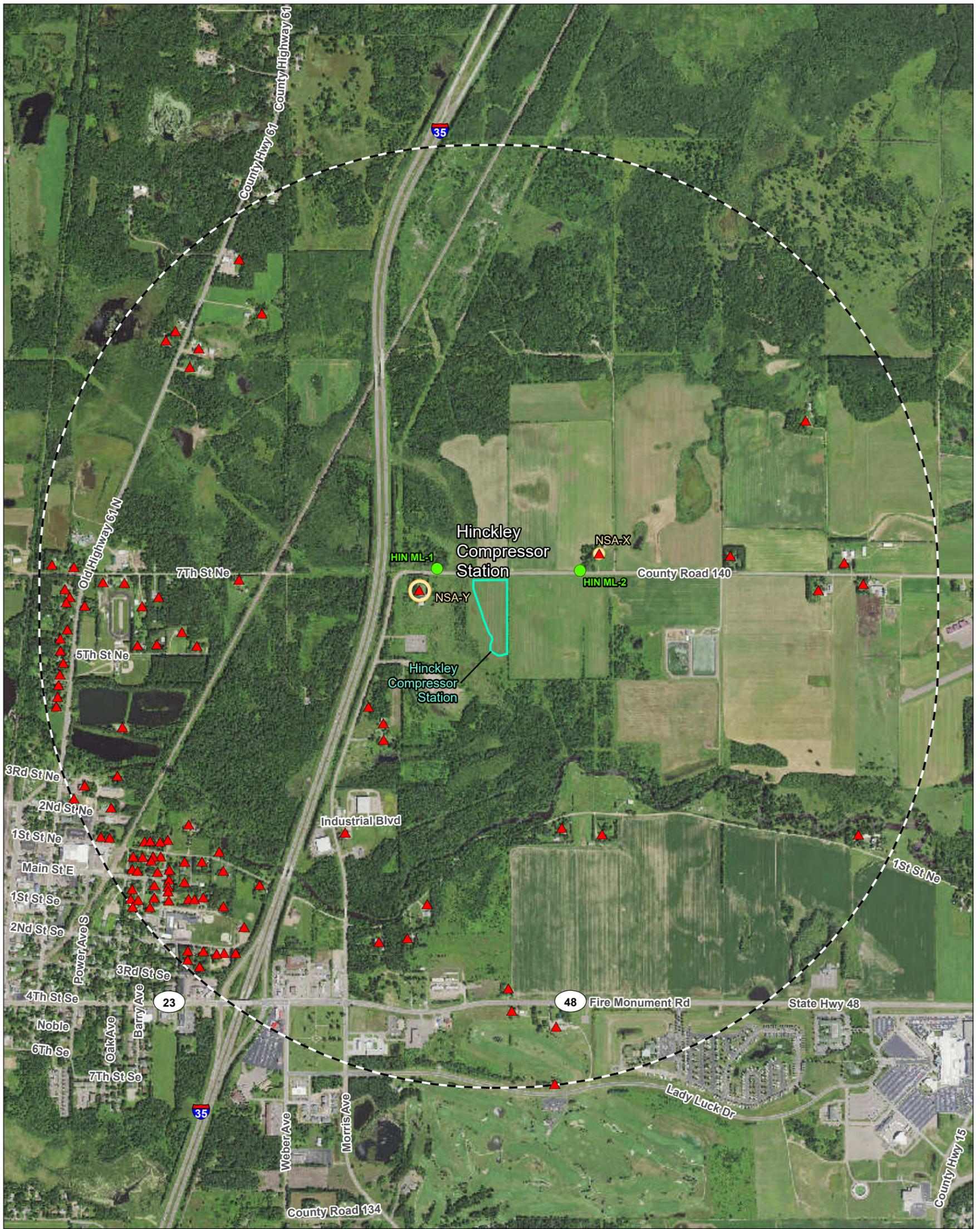
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Figure No. **1-8**
 Title **Approximate Locations with Noise Sensitive Areas CIL P4-1**

Client/Project
 Northern Natural Gas Company
 Northern Lights 2021 Expansion Project
 Carlton Interconnect Loop

Project Location
 Carlton Co., MN





- Legend**
- Proposed Centerline
 - HDD Segment
 - Half-Mile Buffer
 - Proposed Facility
 - HDD Bore Entry/Exit
 - ▲ Noise Sensitive Area (NSA)
 - Sound Monitoring Location
 - NSA Designated Area
 - Parcel Boundary

Notes

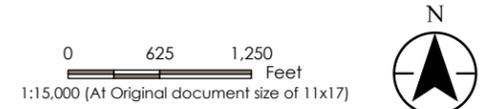
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2. Data Sources Include: Stantec, NNG, USGS, NADS
3. Orthophotography: 2019 NAIP

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Figure No. **1-8**
 Title **Approximate Locations with Noise Sensitive Areas Hinckley Compressor**

Client/Project
 Northern Natural Gas Company
 Northern Lights 2021 Expansion Project
 Hinckley Compressor Station

Project Location 172607658
 Pine Co., MN Prepared by SF on 2020-03-24
 Technical Review by JM on 2020-04-02
 Independent Review by SK on 2020-07-01





- Legend**
- Proposed Centerline
 - HDD Segment
 - Half-Mile Buffer
 - Proposed Compressor Station Expansion
 - HDD Bore Entry/Exit
 - ▲ Noise Sensitive Area (NSA)
 - Sound Monitoring Location
 - NSA Designated Area
 - Parcel Boundary

Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources Include: Stantec, NNG, USGS, NADS
3. Orthophotography: 2019 NAIP

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Figure No. **1-8**
 Title **Approximate Locations with Noise Sensitive Areas Pierz Compressor Station**

Client/Project
 Northern Natural Gas Company
 Northern Lights 2021 Expansion Project
 Pierz Compressor Station and Interconnect

Project Location 172607658
 Morrison Co., MN Prepared by SF on 2020-03-24
 Technical Review by JM on 2020-04-02
 Independent Review by SK on 2020-07-01

