APPENDIX H

Wetlands and Other Waters Delineation Report

Part 1 of 2

WETLAND AND WATERBODY DELINEATION REPORT

HVDC MODERNIZATION PROJECT

MINNESOTA POWER

Prepared by:

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYM AND ABBREVIATION LIST

EPA	U.S. Environmental Protection Agency
ESRI	Environmental Systems Research Institute
GPS	Global Positioning System
HVDC	high-voltage direct current
Merjent	Merjent, Inc.
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
PEM	palustrine emergent
Project	Minnesota Power HVDC Modernization Project
PUB	palustrine unconsolidated bottom
SSURGO	Soil Survey Geographic Database
Survey Area	1609-acre survey area
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WETS	NRCS Climate Analysis for Wetlands

1.0 INTRODUCTION

Minnesota Power is proposing to construct the high-voltage direct current (HVDC) Modernization Project (Project) in Oliver County, North Dakota. The Project involves modernizing and upgrading the Company's existing HVDC terminals, located near the existing Center HVDC Substation in Center, North Dakota. This proposed Project will require the construction of a new HVDC terminal, the new Nelson Lake substation, and new transmission line segments to interconnect into the local electric grid (see Figure 1). The proposed Project is regulated by the North Dakota Public Service Commission and Oliver County.

Merjent, Inc. (Merjent) conducted field surveys for wetlands and other surface waters for the Project in September 2022 and August 2023. The Project survey area (Survey Area) was provided by Minnesota Power and includes approximately 1,609 acres. Other surface water features identified include, but are not limited to, streams, ponds, and lakes. The purpose of this report is to document the findings from the field survey effort. This report and the results of the surveys will be used to support Project design and permitting.

2.0 METHODS

The field survey was conducted on September 5, 8, 9, and 12, 2022, and August 1, 4, and 6, 2023. Only a portion of the Survey Area will be developed; however, the Survey Area represents all areas where development could occur. Final design has not been completed.

Wetlands, which are defined by the presence of hydrophytic vegetation, wetland hydrology, and hydric soils indicators, as observed under normal circumstances, were assessed using the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory, 1987).

For stream features, the ordinary high water mark (OHWM), width, substrate, and flow are recorded, along with the OHWM indicators found within the data sheets. The OHWM is the result of indicators observed in the field (Gabrielle et. al., 2022). Streams are defined as any linear waterway otherwise referred to as, but not limited to, streams, creeks, rivers, or other local designations. Streams are characterized by a continuous bed and bank, bounded by observed and defined OHWM indicators.

Open waterbodies are defined as non-linear features that permanently hold water deeper than approximately six feet and of enough duration to preclude most aquatic vegetation or other wetland characteristics. These features include those commonly referred to as, but not limited to, ponds, lakes, or reservoirs. These features commonly have wetland fringe, which is assessed independently.

Under non-normal circumstances, indicators for a feature may be obscured, fully or in part. In those cases, additional data and context may be needed in using best professional judgement to define the most appropriate extents and attributes for these features. For example, recurring farming activities in agricultural fields have the potential to obscure wetland vegetation indicators that otherwise may develop under normal circumstances if farming activities cease, and indicators of hydric soil and wetland hydrology are present.

2.1 DESKTOP REVIEW METHODS

The following processes and procedures were followed to determine the potential presence of wetlands or other surface water features within the Survey Area prior to the site visit.

2.1.1 Previous Survey Review

When available, reviewing previous surveys can give biologists direct insight for current site conditions, providing them with an expectation of what features may be present and what site factors may influence how the site is assessed.

2.1.2 Background Data Review

Prior to the survey, Merjent's biologists reviewed available desktop resources to identify suspected surface water features, which advised the development and execution of the field investigation.

2.1.2.1 Topography

The United States Geological Survey (USGS) topographic map (USGS, 2019) shows general landscape relief in relation to municipal, private, and public landmarks such as towns, railroads, and roadways. It is useful in determining general locations of large surface water features and surface water flow across a landscape context within and surrounding the survey area.

2.1.2.2 Soil Survey

Merjent reviewed the Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture (USDA) Soil Survey Geographic Database (SSURGO) (Soil Survey Staff, 2019) soils inventory prior to the field survey. SSURGO data describes the soils series for the Survey Area and surrounding landscape. Attributes within each soils series can provide evidence for potential wetlands, most commonly the Hydric Soils classification attribute. While historical land use and common drainage practices have led to many of these areas no longer supporting any remaining indication of wetland conditions, hydric soils series are still useful in determining areas with which to focus survey efforts.

2.1.2.3 Mapped Water Resources

A desktop review was completed using the following surface water datasets ahead of field survey.

The National Wetlands Inventory (NWI; United States Fish and Wildlife Service [USFWS], 2021) is a nation-wide data set that was developed to remotely identify potential wetland areas.

The USGS National Hydrography Dataset (NHD; USGS, 2004) is the most up-to-date and comprehensive nationwide dataset for rivers, streams, canals, lakes, ponds, coastline, dams, and stream gages. While originally developed by the U.S. Environmental Protection Agency (EPA) and USGS, it is now maintained and updated by multiple regulatory bodies.

2.1.3 Current, Historic, and High-Resolution Aerial Imagery

Aerial imagery provides site-wide observations within the context of the surrounding landscape. It is useful in estimating locations and extents of surface water features, especially in non-forested areas. Historic and recent imagery can be used to observe a site during different conditions, such as spring, summer, and fall, or wet, normal, and dry circumstances. A comparison of imagery is also useful in determining impacts or disturbances to a site through time that may affect the current locations and extents of surface water features. Merjent uses aerial imagery from a variety of sources including Environmental Systems Research Institute (ESRI) (ESRI, various), Google Earth™, and the National Agriculture Imagery Program (USDA, various).

2.1.4 Recent Climatic Conditions and Precipitation Data

The NRCS Climate Analysis for Wetlands (WETS) Tables were reviewed before commencing the field survey. WETS Tables define the normal range for monthly precipitation over a representative period of time (USDA, no date). Antecedent precipitation data provide useful context for determining features and their extents.

2.2 FIELD SURVEY METHODS

Merjent delineated wetlands based on the methods described in the USACE Wetland Delineation Manual (Environmental Laboratory, 1987) and the applicable Regional Supplement to the Corps of Engineers Wetland Delineation Manual. For this Project, the Great Plains Regional Supplement was used (USACE, 2010). Merjent delineated streams in accordance with the USACE National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams (Gabrielle et. al., 2022). Biologists completed data forms at representative data points during the field survey within or near the wetland and stream areas to document indicators, or lack thereof, for each suspected feature. Biologists identified vegetative communities according to the Cowardin (Cowardin et al., 1979) classification system.

Potential resources identified during the desktop review were visited in the field. A data form was completed at each desktop identified potential resource to confirm the absence or presence of the resource. In areas of upland associated with hydric soils or linear stream features, representative photos were taken of upland conditions. In areas of upland conditions within NWI-mapped features, a data point and photos were taken, and a Wetland Determination Data Form was prepared to document upland conditions, unless the area was significantly sloped or otherwise obviously upland; in those circumstances, representative photos may have been deemed sufficient.

2.2.1 Feature Naming

Features identified in associated figures and appendices are named in the following manner:

- Wetlands (w01, w02, etc.)
- Streams (s01, s02, etc.)
- Open waters (o01, o02, etc.)
- Wetland determination data points (dp01, dp02, etc.)
- Stream data points (sp01, sp02, etc.)
- Photo points (pp001, pp002, etc.)

Features are named consecutively as encountered in the field and may not follow a linear or spatial order.

2.2.2 Site Photographs

Photographs in Appendix A provide a visual representation of wetlands and other surface water features, as well as general site conditions at the time of survey. Photos are geospatially referenced by their associated photo point location and presented with direction taken (e.g., “pp001 view West,” “pp002 view Northeast”). Photo point locations are depicted on the wetland delineation figure (see Figure 5).

Representative photos were taken for each feature identified in the field. Site photos were collected throughout the Survey Area to demonstrate upland and transitional conditions.

2.2.3 Wetland Determination Data Forms

Wetland Determination Data Forms were completed during field survey as written documentation of how representative data point locations meet or do not meet each of the wetland criteria (see

Appendix B). Plant species nomenclature followed the Regional Wetland Plant List (USACE, 2020). Hydric soils were identified using the methods outlined in Field Indicators of Hydric Soils in the United States, Version 8.2 (USDA-NRCS, 2018).

2.2.4 Rapid Ordinary High Water Mark Field Identification Data Sheets

The Rapid OHWM Field Identification Data Sheets (Gabrielle et. al., 2022; see Appendix C) were completed during field survey as written documentation of what indicators of the potential OHWM were observed, and how they are applied in determining the OHWM.

This data sheet was developed for the sole purpose of identifying the OHWM of linear features, and it does not apply to open waterbodies such as lakes or ponds.

2.2.5 Other Surface Water Connections

While often not considered as regulated features, surface water connections such as culverts, upland swales or drainages, and upland road ditches may at times direct surface water to or from regulated features within the Survey Area, particularly during extreme flow events. To the extent practicable and relevant, Merjent mapped these surface water connections to aid in explaining surface water connectivity across the Survey Area.

2.2.6 Limitations of Survey Data

Merjent surveyed all data point locations and boundaries of wetlands, streams, and open waterbodies using Global Positioning System (GPS) technology capable of sub-meter accuracy. While these surveys provide reasonably accurate and industry-standard spatial data, they do not provide the same level of accuracy as a professional land survey.

Feature boundaries were not flagged during the field survey.

3.0 RESULTS

3.1 DESKTOP REVIEW RESULTS

3.1.1 Previous Survey Review

Merjent is unaware of previous wetland or waterbody surveys, or other associated regulatory reviews conducted of the Survey Area; therefore, previous site data is not available for review and inclusion in this report.

3.1.2 Background Data Review

3.1.2.1 Topography

The USGS topographic map (see Figure 2) shows a landscape of rolling hills (USGS, 2019). Within the Survey Area, the landscape slopes down toward streams and upland drainages that convey water south to Nelson Lake. Square Butte Creek originates northwest of Nelson Lake and flows through Nelson Lake to the southeast, and eventually outlets to the Missouri River.

3.1.2.2 Soil Survey

The NRCS soil map of the Survey Area (see Figure 3) identifies 26 soil types, none of which are classified as hydric, as shown in Table 3.1.2-1 below (Soil Survey Staff, 2019).

TABLE 3.1.2-1

Mapped Soil Units

Symbol	Description	Hydric Soil Unit?	Acres
E0415A	Belfield-Daglum complex, 0 to 2 percent slopes	No	13.09
E0454B	Daglum-Rhoades complex, 0 to 6 percent slopes	No	3.04
E0515C	Rhoades-Daglum complex, 6 to 9 percent slopes	No	6.47
E0814B	Grail-Farland silt loams, 2 to 6 percent slopes	No	14.70
E1333D	Vebar-Cohagen fine sandy loams, 9 to 15 percent slopes	No	16.02
E1625B	Vebar-Parshall fine sandy loams, 3 to 6 percent slopes	No	0.52
E2107A	Arnegard loam, 0 to 2 percent slopes	No	18.00
E2107B	Arnegard loam, 2 to 6 percent slopes	No	19.44
E2439C	Sen-Janesburg silt loams, 6 to 9 percent slopes	No	19.52
E2607D	Amor-Werner loams, 9 to 15 percent slopes	No	27.76
E2609C	Amor-Werner-Farnuf loams, 6 to 9 percent slopes	No	155.71
E2651F	Werner-Amor-Arnegard loams, 9 to 50 percent slopes	No	44.39
E2747D	Werner-Chama-Sen silt loams, 9 to 15 percent slopes	No	233.08
E2765C	Sen-Werner loams, 6 to 9 percent slopes	No	9.01
E3527A	Williams-Bowbells loams, 0 to 3 percent slopes	No	6.02
E3527B	Williams-Bowbells loams, 3 to 6 percent slopes	No	276.43
E3531C	Williams loam, 6 to 9 percent slopes	No	381.83
E3555D	Zahl-Williams loams, 9 to 15 percent slopes	No	189.63
E3725B	Flaxton-Williams loams, 3 to 6 percent slopes	No	10.54
E3733B	Flaxton-Williams complex, 3 to 6 percent slopes	No	9.79
E3733C	Flaxton-Williams complex, 6 to 9 percent slopes	No	29.77
E3733D	Flaxton-Williams complex, 9 to 15 percent slopes	No	0.80
E3755A	Temvik-Wilton silt loams, 0 to 3 percent slopes	No	19.72
E3763B	Temvik-Wilton-Williams silt loams, 3 to 6 percent slopes	No	59.63
E4139A	Korchea-Fluvaquents complex, channeled, 0 to 2 percent slopes, frequently flooded	No	42.49
E4999	Water	No	1.70
TOTAL			**1,609.10**

Note: Source: Soil Survey Staff, 2019

3.1.2.3 Mapped Water Resources

The hydrology map of the Survey Area (see Figure 4) shows approximately 22.12 acres of NWI identified wetlands within the Survey Area as shown in Table 3.1.2-2 below. The NWI identified wetlands and water resources within the Survey Area are typically associated with NHD identified streams that flow north to south through the Survey Area to Nelson Lake. The NHD identified streams occur within the low-lying areas visible on the topographic map.

TABLE 3.1.2-2

Mapped NWI Features

Symbol	Description	Acres
L1UBGh	Lacustrine, Limnetic, Unconsolidated Bottom, Intermittently Exposed, Diked/impounded	5.10
PABFh	Palustrine, Aquatic Bed, Semi permanently Flooded, Diked/impounded	1.29
PABFx	Palustrine, Aquatic Bed, Semi permanently Flooded, Excavated	0.79
PEM1A	Palustrine, Emergent, Persistent, Temporary Flooded	0.62
PEM1C	Palustrine, Emergent, Persistent, Seasonally Flooded	7.58
R4SBC	Riverine, Intermittent, Stream Bed, Seasonally Flooded	6.26
R5UBH	Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded	0.48
TOTAL		**22.12**

Note: Source: USFWS, 2021

3.1.3 Recent Climatic Conditions and Precipitation Data

Merjent compared recent precipitation data with historic precipitation data from a 30-year dataset (1993 to 2022 and 1994 to 2023) from a nearby WETS weather station (New Salem 5NW, ND) to determine if normal hydrologic and climatic conditions were present on-site during field delineations. The WETS analysis was conducted separately for each of the two mobilizations. When compared, the observed precipitation data from three months prior to the field delineations indicated normal precipitation conditions at the time of the field delineations for both the 2022 and 2023 field delineations (see Tables 3.1.3-1 and 3.1.3-2 below).

TABLE 3.1.3-1

WETS Analysis – September 2022

		Long-term rainfall records (1993-2022)							
New Salem 5NW, ND	Month	<30%	Mean	>30%	Actual	Condition	Condition Value[a]	Weight	Value X Weight
3rd Prior Month	Jun	2.28	3.21	3.80	1.64	Dry	1	1	1
2nd Prior Month	Jul	1.82	2.92	3.52	5.28	Wet	3	2	6
1st Prior Month	Aug	1.11	2.20	2.69	1.22	Normal	2	3	6
Sum									**13**
Conditions on Site[b]									**Normal**

[a] 1 = Dry; 2 = Normal; 3 = Wet

[b] If sum equals: 6 to 9 = prior period has been drier than normal; 10 to 14 = prior period has been normal; 15 to 18 = prior period has been wetter than normal

TABLE 3.1.3-2

WETS Analysis – August 2023

	Long-term rainfall records (1994-2023)								
New Salem 5NW, ND	Month	<30%	Mean	>30%	Actual	Condition	Condition Value[a]	Weight	Value X Weight
3rd Prior Month	May	1.53	2.60	3.15	1.51	Dry	1	1	1
2nd Prior Month	Jun	2.28	3.22	3.82	4.34	Wet	3	2	6
1st Prior Month	Jul	1.80	2.67	3.19	2.89	Normal	2	3	6
Sum:									**13**
Conditions on Site[b]:									**Normal**

[a] 1 = Dry; 2 = Normal; 3 = Wet

[b] If sum equals: 6 to 9 = prior period has been drier than normal; 10 to 14 = prior period has been normal; 15 to 18 = prior period has been wetter than normal

3.2 FIELD SURVEY RESULTS

On September 5, 8, 9, and 12, 2022, and August 1, 4, and 6, 2023, Merjent biologist Adam Weishair evaluated site conditions and determined boundaries of wetlands and other surface water features.

Land use within the Survey Area is a mix of hay fields, upland meadows, mowed grassy areas, and crop fields.

Weather at the times of survey was favorable and did not impair observations. All portions of the Survey Area were accessible.

3.2.1 Uplands

Uplands within the Survey Area are hay fields, upland meadows, mowed grassy areas, and crop fields. The crop fields are planted with soybeans (*Glycine max*).

Species commonly observed in the dense herbaceous stratum of the hay fields include little false bluestem (*Schizachyrium scoparium*), common snowberry (*Symphoricarpos albus*), blue grama (*Bouteloua gracilis*), narrowleaf purple coneflower (*Echinacea angustifolia*), western Canada goldenrod (*Solidago lepida*), and Kentucky blue grass (*Poa pratensis*).

The upland meadows have a dense herbaceous stratum that commonly includes common snowberry, smooth brome (*Bromus inermis*), and Canadian thistle (*Cirsium arvense*).

The mowed grassy areas have a dense herbaceous stratum that includes smooth brome, black medick (*Medicago sativa*), western Canada goldenrod, field bindweed (*Convolvulus arvensis*), and Kentucky blue grass.

3.2.2 Wetlands

Merjent identified 25 discrete wetlands or wetland complexes totaling 38.87 acres within the Survey Area according to the Cowardin (Cowardin et al., 1979) wetland classification system (see Table 3.2.2-1 below, and Figure 5). Representative photographs of the wetlands are provided in

Appendix A. More detailed information for the associated data points is found in the wetland determination data forms in Appendix B.

TABLE 3.2.2-1

Summary of Delineated Wetlands

Wetland ID	Cowardin Classification[a]	Total Acreage within Survey Area[b]
w01	PEM	0.50
w02	PEM	0.09
w03	PEM	14.96
w04	PEM	0.02
w05	PEM	0.09
w06	PEM	0.09
w07	PEM	9.67
w08	PEM	1.44
w09	PEM	0.07
w10	PEM	0.08
w11	PEM	0.36
w12	PEM	1.41
w12	PUB	0.39
w13	PEM	0.50
w14	PEM	0.12
w15	PEM	2.38
w16	PEM	0.45
w17	PEM	2.29
w18	PEM	0.89
w19	PEM	0.93
w20	PEM	0.32
w21	PEM	0.03
w22	PEM	0.49
w23	PEM	0.30
w24	PEM	0.05
w25	PEM	0.95
Total:		**38.87**

[a] Source: Cowardin et al., 1979; PEM = palustrine emergent; PUB = palustrine unconsolidated bottom

[b] Note: delineated wetlands may extend outside of Survey Area.

3.2.2.1 Palustrine Emergent

Palustrine emergent (PEM) wetlands (38.48 acres) are the dominant wetland community that occurs within the Survey Area. They are associated with streams and drainage swales throughout the Survey Area. These wetlands have a dense herbaceous stratum commonly vegetated with narrow-leaf cattail (*Typha angustifolia*), field meadow-foxtail (*Alopecurus pratensis*), freshwater cord grass (*Spartina pectinata*), reed canary grass (*Phalaris arundinacea*), needle spike-rush (*Eleocharis acicularis*), broad-leaf cattail (*Typha latifolia*), dark-green bulrush (*Scirpus atrovirens*), and Canadian goldenrod (*Solidago canadensis*).

The soils in the palustrine emergent wetlands consistently meet the hydric soil criterion for Redox Dark Surface (F6).

Primary indicators of wetland hydrology commonly observed include Surface Water (A1), Saturation (A3), Water Marks (B1), Sediment Deposits (B2), Inundation Visible on Aerial Imagery (B7), Water-stained Leaves (B9), and Salt Crust (B11). Secondary indicators of wetland hydrology commonly observed include Surface Soil Cracks (B6), Sparsely Vegetated Concave Surface (B8), Drainage Patterns (B10), Saturation Visible on Aerial Imagery (C9), Geomorphic Position (D2), and FAC-neutral Test (D5).

3.2.2.2 Palustrine Unconsolidated Bottom

One palustrine unconsolidated bottom (PUB) wetland (0.39 acre) was identified within the Survey Area. It is surrounded by a PEM wetland community. The PUB wetland portion appears to have been formed by the installation of an embankment to collect surface runoff. The PUB wetland is visible on aerial imagery and appears to be continuously inundated since 1997. No earlier aerial images were available. The constructed embankment separates wetland w12 from wetland w13. A representative data point was not recorded in this wetland due to the depth of the water. The area was defined as a PUB community because it is a non-tidal wetland with a water depth less than 2 meters (6.6 feet) and less than 30% vegetative cover (Cowardin 1979).

3.2.3 Naturally Problematic and Significantly Disturbed Datapoints

Naturally Problematic and Significantly Disturbed datapoints are those by which indicators of, or lack thereof, wetland conditions are obscured, and additional context may be needed in making accurate determinations. Commonly encountered Naturally Problematic conditions include hardpan, natural cobble or gravel, bedrock, and a dominance of upland and/or facultative upland plant species. Significantly Disturbed conditions relate specifically to the obscuring of indicators caused by anthropogenic influence or recent, catastrophic natural disturbances. Commonly encountered Anthropogenic Significantly Disturbed conditions include row crop agriculture, forestry practices, and site clearing or grading. Natural Significantly Disturbed conditions can include dam breaches or other major flooding and storm-related blowdown.

Depending upon site conditions and access to similar nearby features, varying approaches may be used in making final determinations. If possible, a similar, nearby feature that is determined not to be Naturally Problematic or Significantly Disturbed can be evaluated and used as reference for evaluating the target feature. In these cases, topography, proximity to target feature, size, and relation to other, nearby surface water features are considered. Where not possible, a conservative assumption may be made, and the feature is assumed to meet the anticipated indicators under normal circumstances. Additional desktop review after survey may also be used and can be helpful, especially in agricultural settings.

Data points dp13, dp14, dp26, dp27, and dp28 were recorded either above or below dams constructed to create small reservoirs. Hydrology, and thus vegetation, is manipulated above and below the dams creating significantly disturbed conditions. Merjent biologists identified wetland boundaries and communities adjacent to the dams using the observable conditions present at the time of the delineation to inform best professional judgement in determining the greatest extent of wetland areas.

3.2.4 Streams

Merjent identified four streams totaling 9,778 linear feet within the Survey Area (see Table 3.2.4-1 below, and Figure 5). Representative photographs of the streams are provided in Appendix A. The completed Rapid OHWM Field Identification Data Sheets are provided in Appendix C.

TABLE 3.2.4-1

Summary of Delineated Streams

Stream ID	Name	OHWM[a] Width (feet)	Substrate	Flow Regime	Size (linear feet) within Survey Area
s01	UNT[b] to Square Butte Creek	2	Silt, clay, mud	Ephemeral	1,380
s02	UNT to Square Butte Creek	1	Silt, clay, mud	Ephemeral	4,425
s03	UNT to Square Butte Creek	2	Silt, clay, mud	Ephemeral	3,430
s04	UNT to Square Butte Creek	3	Silt, clay, mud	Intermittent	543
TOTAL					**9,778**

[a] OHWM = ordinary high water mark
[b] UNT = unnamed tributary

3.2.4.1 Stream s01

Stream s01 (1,380 linear feet) is an ephemeral stream located in the south-central portion of the Survey Area. It is an unnamed tributary to Square Butte Creek joining southeast of Nelson Lake approximately 0.83-mile south of the survey area (see Figure 2). The stream receives surface water from overland runoff which accumulates in a series of adjacent, riparian, wetlands before it outlets to wetland w19. An earthen dam on the south end of wetland w19 separates wetland w19 from wetland w18 and thus separating stream s01 from stream s04; however, an area of rill erosion is evident around the east side of the dam in aerial images, suggesting that surface water is able to flow from stream s01 to stream s04 during high water events (see Figure 5). The USGS topography map and NHD both identify streams s01 and s04 as a single stream (see Figure 2 and Figure 4, respectively).

Stream s01 has an OHWM width of two feet and an OHWM depth of one foot. The OHWM was determined by a combination of observations including an abrupt change in slope on both banks just above the OHWM, scouring below the OHWM, and transition from hydrophytic graminoids to non-hydrophytic graminoids just below the OHWM.

3.2.4.2 Stream s02

Stream s02 (4,425 linear feet) is an ephemeral stream that flows from the north-central boundary of the Survey Area south into Nelson Lake. Nelson Lake in turn is connects with Square Butte Creek. Stream s02 extends north of the Survey Area via a series of wetland swales and ephemeral channels. It is associated with the wetland w07, a PEM wetland, for its entire extent within the Survey Area. The defined bed and banks of stream s02 are no longer visible at its southern terminus north of Nelson Lake (open water body o01). Wetland w07 provides hydrologic connectivity between the southern terminus of stream s02 and a bay on Nelson Lake (see Figure 5).

Stream s02 has an OHWM width of one foot and an OHWM depth of one foot. The OHWM was determined by a combination of observations including an abrupt change in slope on both banks just above the OHWM, scouring below the OHWM, and transition from bare channel to graminoids just below the OHWM.

3.2.4.3 Stream s03

Stream s03 (3,430 linear feet) is an ephemeral stream that flows north to south through the westernmost portion of the Survey Area. It outlets to Nelson Lake approximately 0.16-mile southeast of where it crosses the Survey Area boundary. It is associated with riparian wetland w15, a PEM wetland, for its entire extent within the Survey Area (see Figure 5).

Stream s03 has an OHWM width of two feet and an OHWM depth of one foot. The OHWM was determined by a combination of observations including an abrupt change in slope on both banks just above the OHWM, scouring below the OHWM, and transition from bare channel to graminoids just below the OHWM.

3.2.4.4 Stream s04

Stream s04 (543 linear feet) is an intermittent stream located in the south-central portion of the Survey Area flowing south across the southern boundary of the Survey Area. It is an unnamed tributary to Square Butte Creek joining southeast of Nelson Lake approximately 0.83-mile south of the survey area (see Figure 2). The stream receives surface water from overland runoff which accumulates in a series of adjacent, riparian, wetlands. An earthen dam on the south end of wetland w19 separates wetland w19 from wetland w18 and thus, separating stream s01 from stream s04; however, an area of rill erosion is evident around the east side of the dam in aerial images, suggesting that surface water is able to flow from stream s01 to stream s04 during high water events (see Figure 5). The USGS topography map and NHD both identify streams s01 and s04 as a single stream (see Figure 2 and Figure 4, respectively).

Stream s04 has an OHWM width of three feet and an OHWM depth of six inches. The OHWM was determined by a combination of observations including an abrupt change in slope on both banks just above the OHWM, scouring below the OHWM, and transition from bare channel to graminoids just below the OHWM.

3.2.5 Open Waterbodies

Merjent identified one open waterbody, Nelson Lake, within the Survey Area (see Figure 5). The Survey Area intersects Nelson Lake at two areas for a total of 16.26 acres. South Butte Creek flows through Nelson Lake from the northwest to southeast and outlets to the Missouri River approximately 13.12 miles southeast of the project area.

3.2.6 Other Surface Water Resources Identified

No other surface water resources were identified within the Survey Area.

4.0 SUMMARY AND CONCLUSION

Merjent performed a delineation of wetlands and other surface water features for the HVDC Modernization Project in Oliver County, North Dakota.

Based on the field survey and review of desktop resources, it is our professional opinion that 25 wetlands totaling 38.87 acres, four streams totaling 9,778 linear feet, and one open waterbody totaling 16.26 acres exist within the 1,609.10-acre Survey Area. No other surface water features were identified within the Survey Area. This report represents our best professional judgment based on our local knowledge and experience.

5.0 DISCLAIMER

The survey results described in this report represent the physical conditions encountered at the time the field survey was performed. In addition, the surveys were performed using regulatory guidance and scientific methods in effect and current at the time. If regulatory frameworks or technical guidance change in the future, some additional survey work or modifications to the survey report may be required.

6.0 LITERATURE CITED

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Figure 1

Project Location

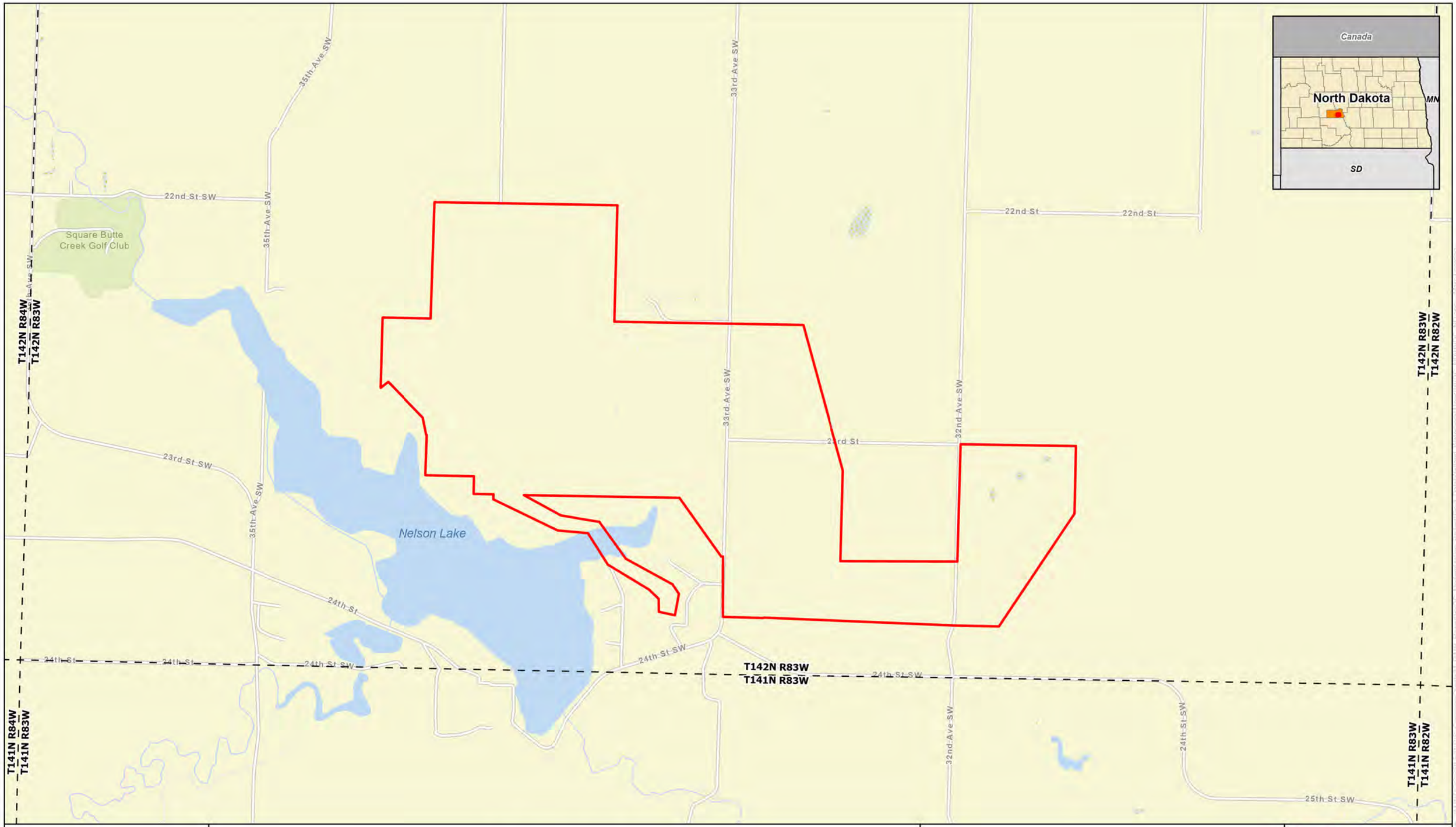

Figure 1: Project Location
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Figure 2

Topography

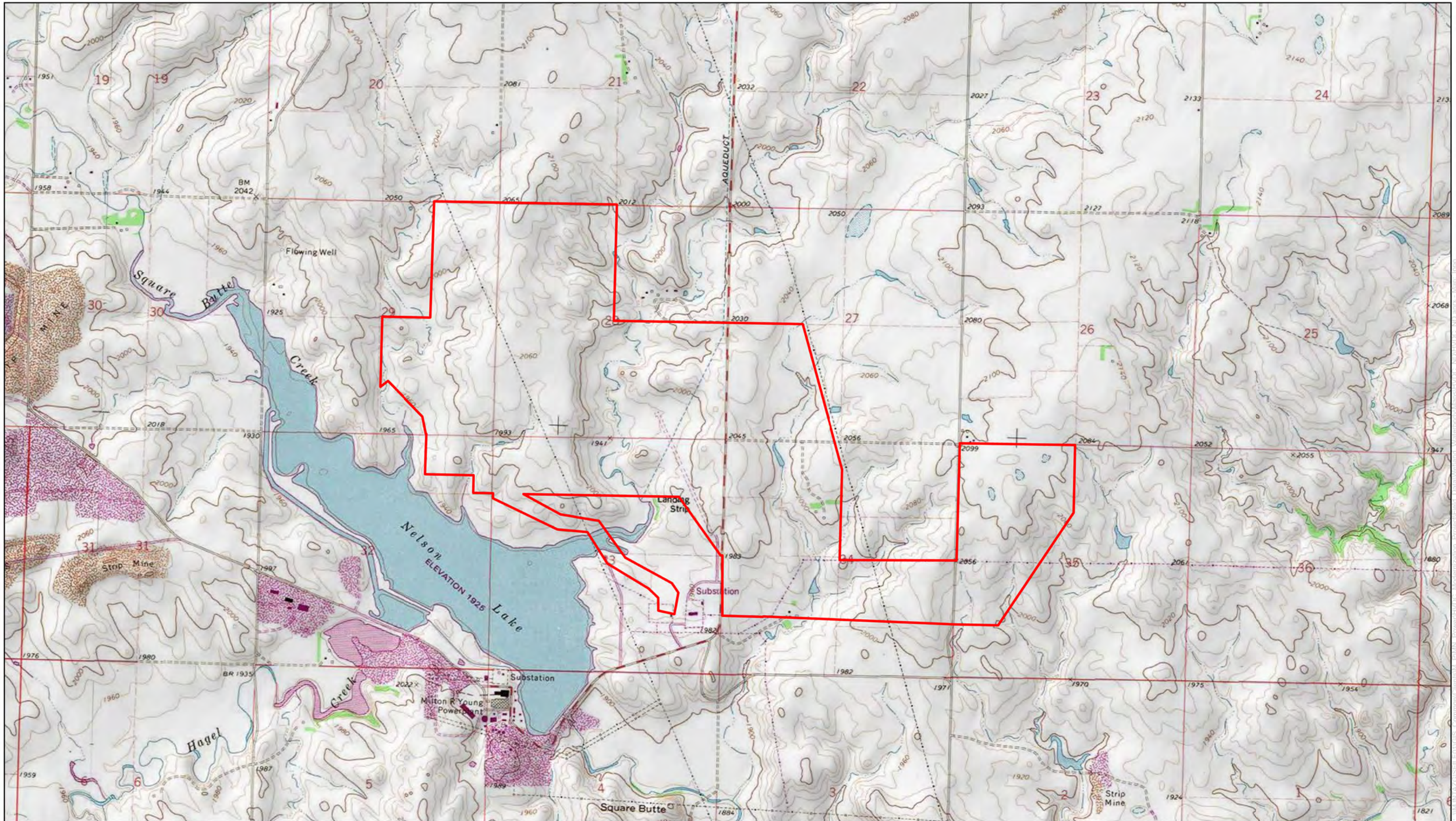

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Figure 2: Topography
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area

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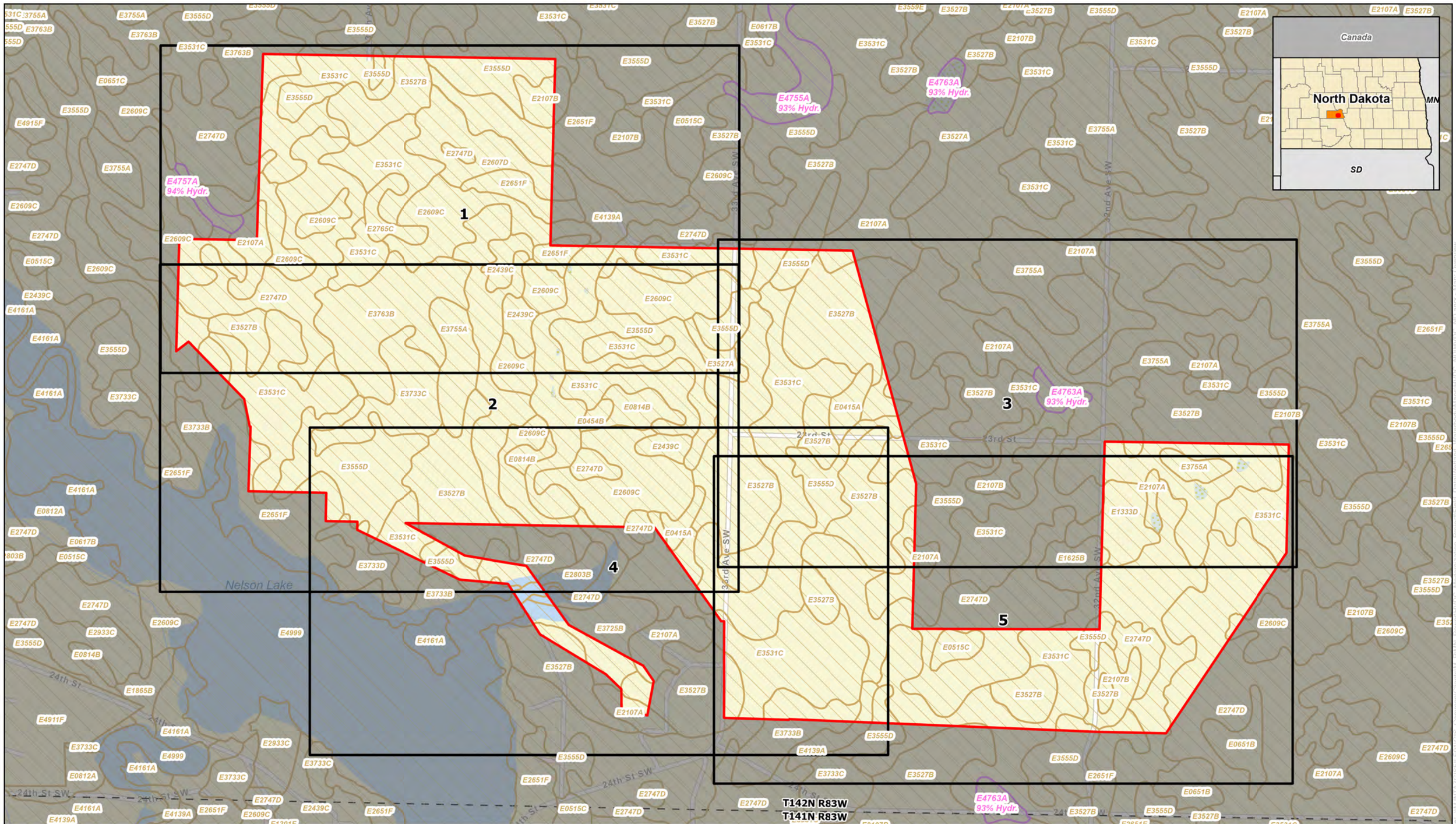
Figure 3

SSURGO Soil Type



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Project Overview
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

- Survey Area
- Page Extent
- Non-Hydric Soil
- Hydric Soil

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Figure 3: SSURGO Soil Type
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
Non-Hydric Soil
Hydric Soil

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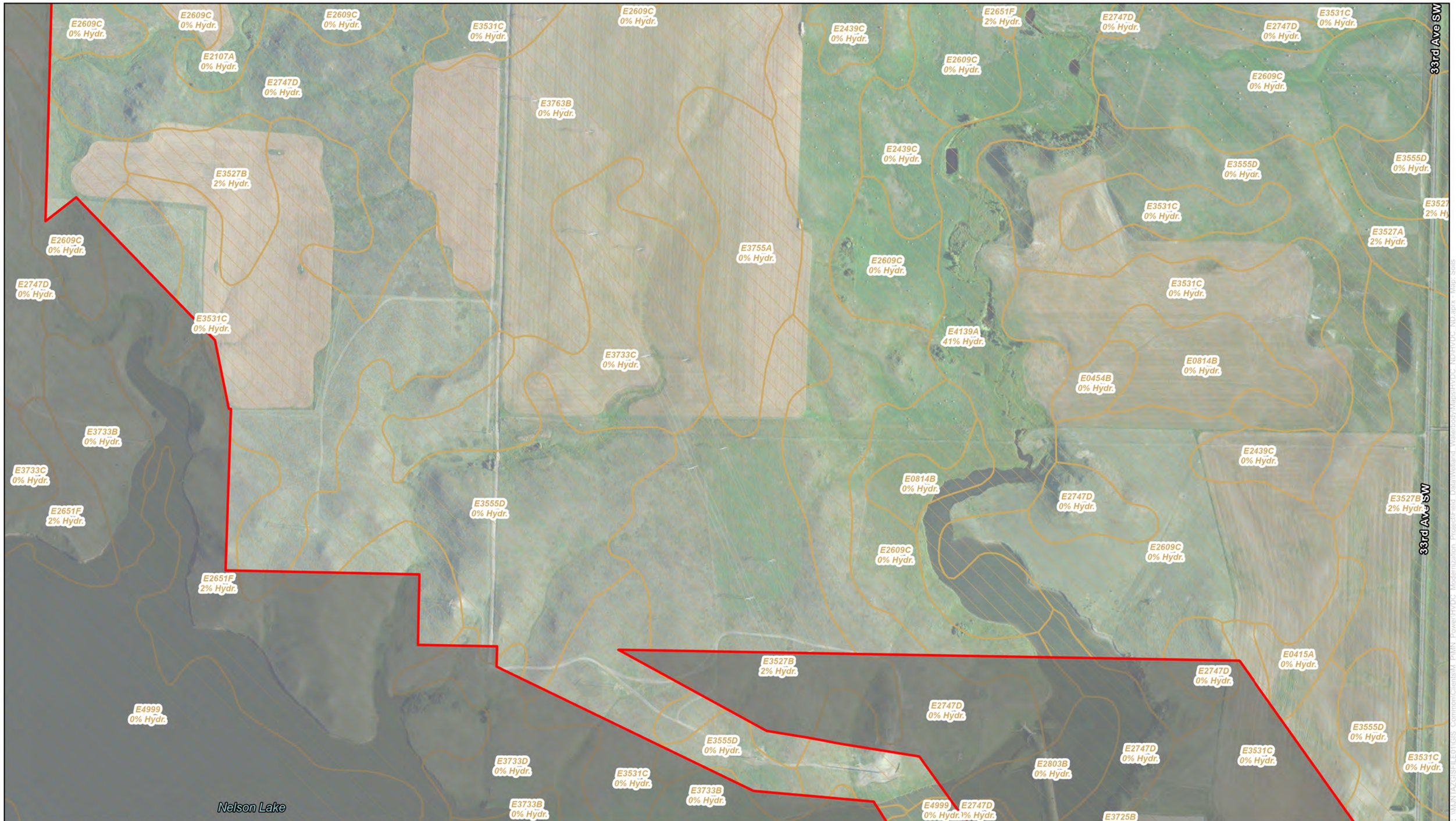

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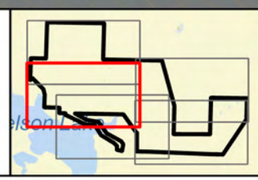

Figure 3: SSURGO Soil Type
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
Non-Hydric Soil
Hydric Soil

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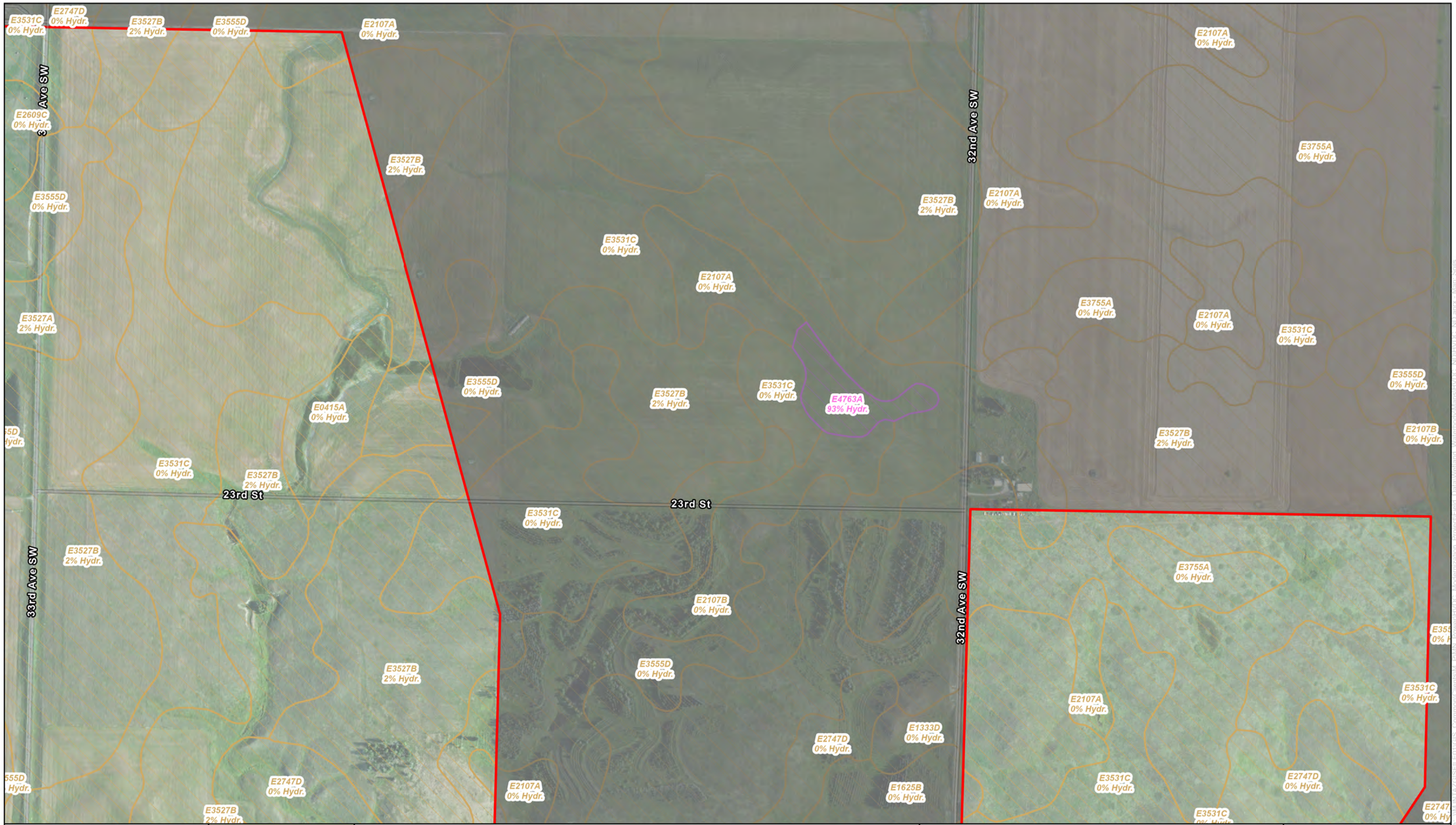

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Figure 3: SSURGO Soil Type
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
Non-Hydric Soil
Hydric Soil

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Figure 3: SSURGO Soil Type
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
Non-Hydric Soil
Hydric Soil

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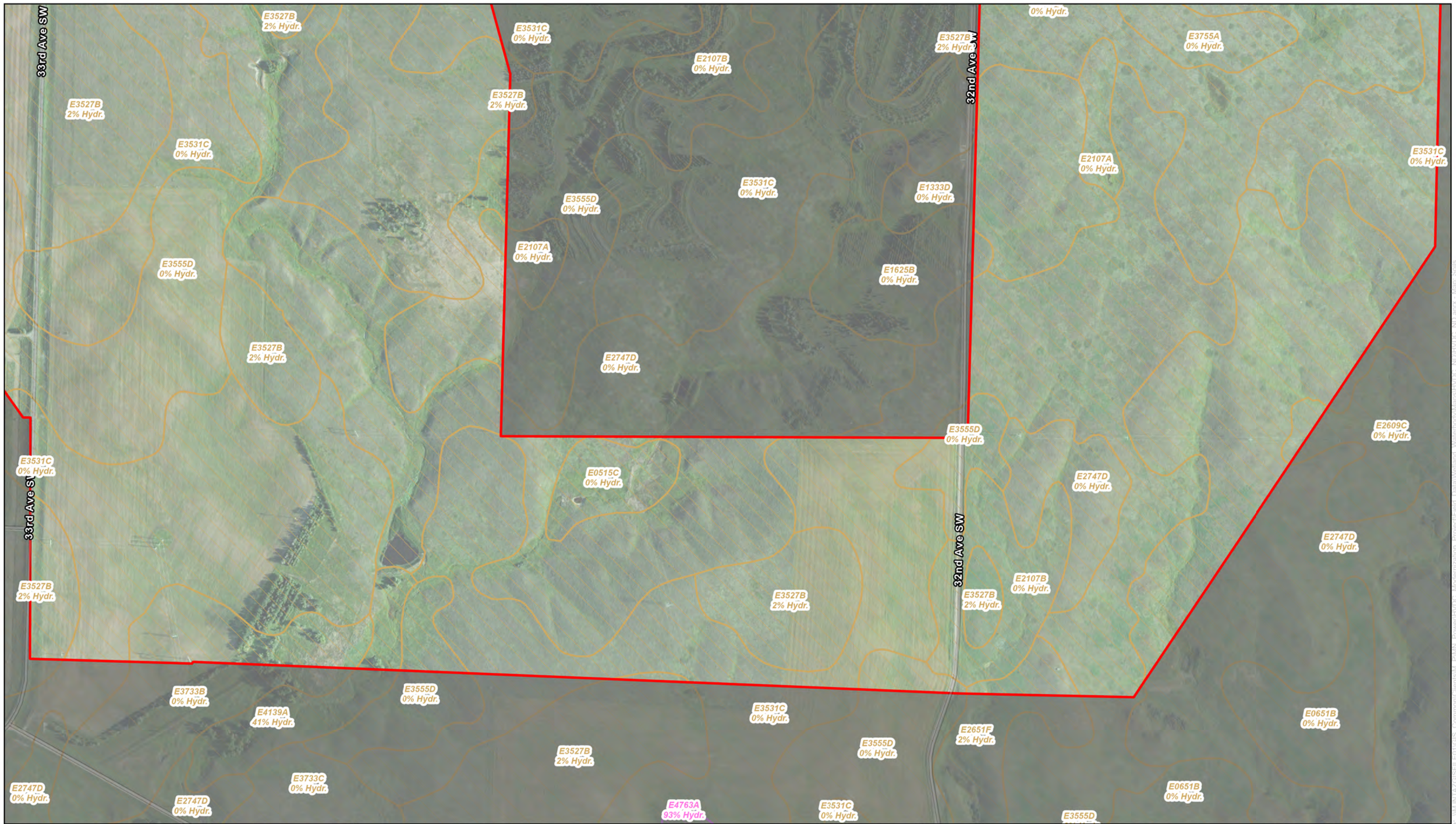

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Figure 3: SSURGO Soil Type
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
Non-Hydric Soil
Hydric Soil

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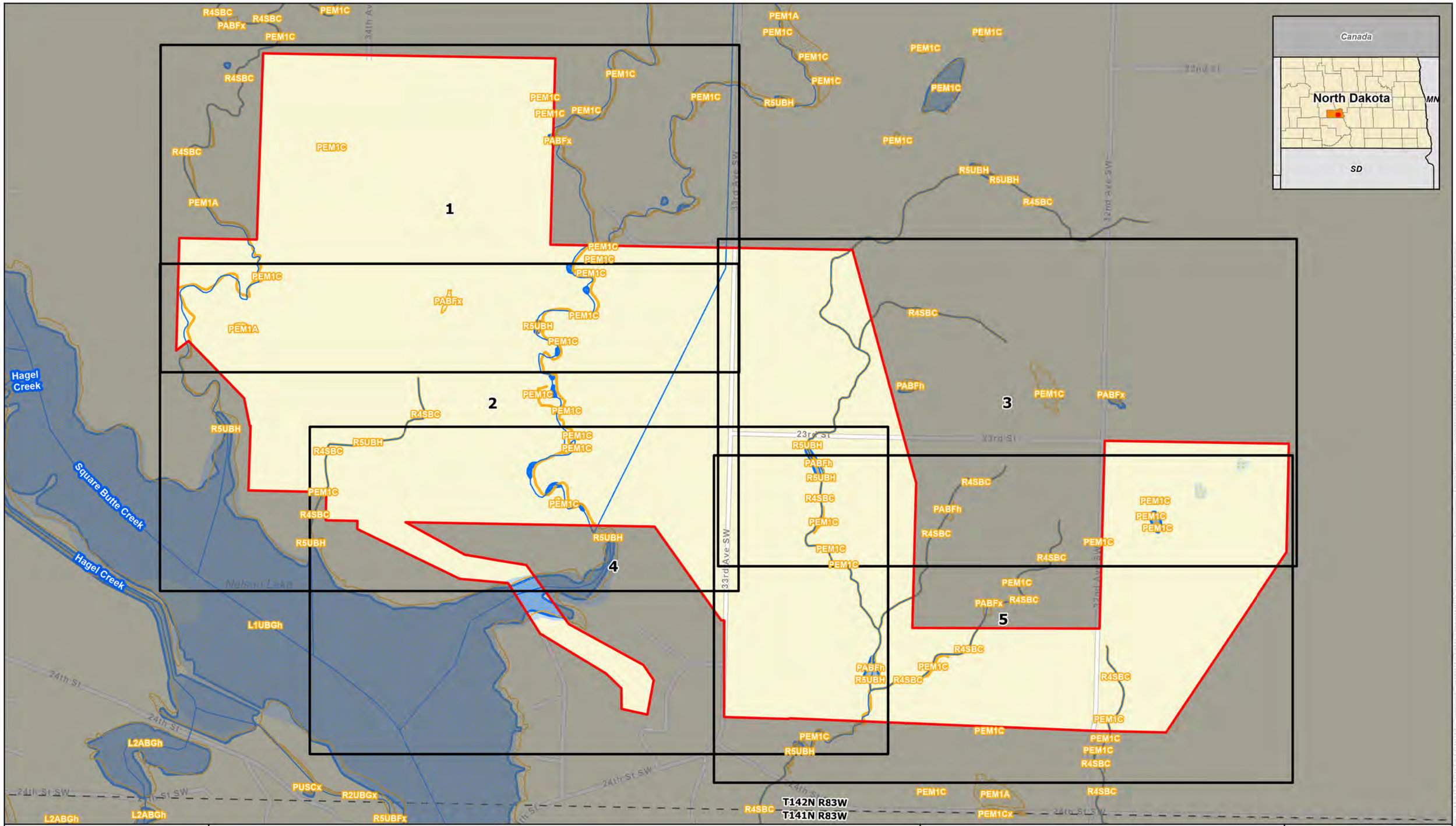
Figure 4

Hydrology



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Project Overview
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
Page Extent
Mapped Waterbody (NHD)
Mapped Wetland (NWI)
Mapped Waterway (NHD)

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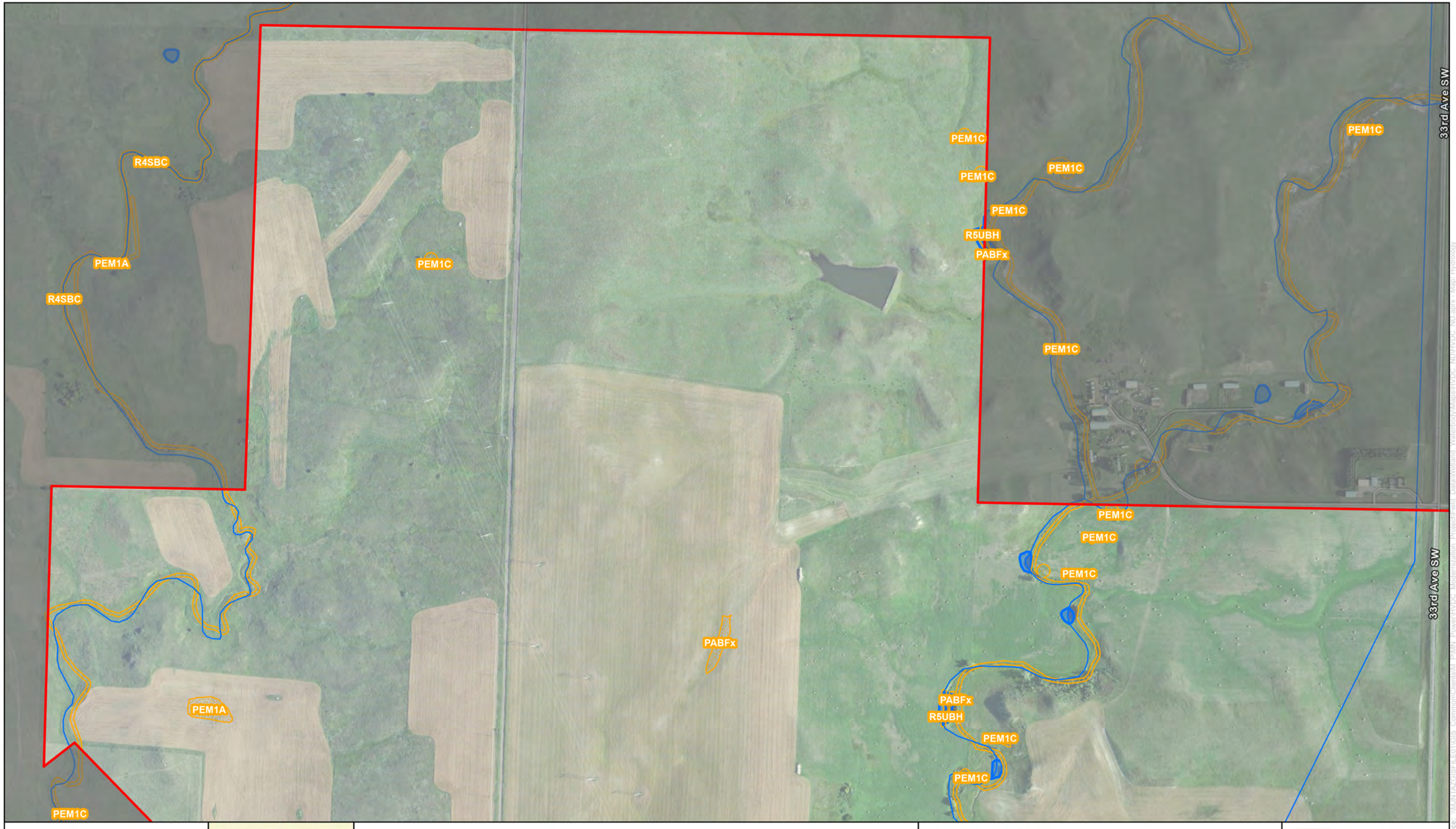

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Figure 4: Hydrology
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

- Survey Area
- Mapped Waterway (NHD)
- Mapped Waterbody (NHD)
- Mapped Wetland (NWI)

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Date: (11/7/2023)

PEM1A
PEM1C
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PABFx
R4SBC
PEM1C
PEM1C
PEM1C
PABFx
R5UBH
PEM1C
PEM1C
PEM1C
PEM1C
PEM1C
PEM1C
PEM1C
PEM1C
PEM1C
PEM1C
R4SBC
R5UBH
L1UBGh
L1UBGh
Square Butte Creek
Nelson Lake
33rd Ave SW
33rd Ave SW

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Figure 4: Hydrology
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
Mapped Waterway (NHD)
Mapped Waterbody (NHD)
Mapped Wetland (NWI)

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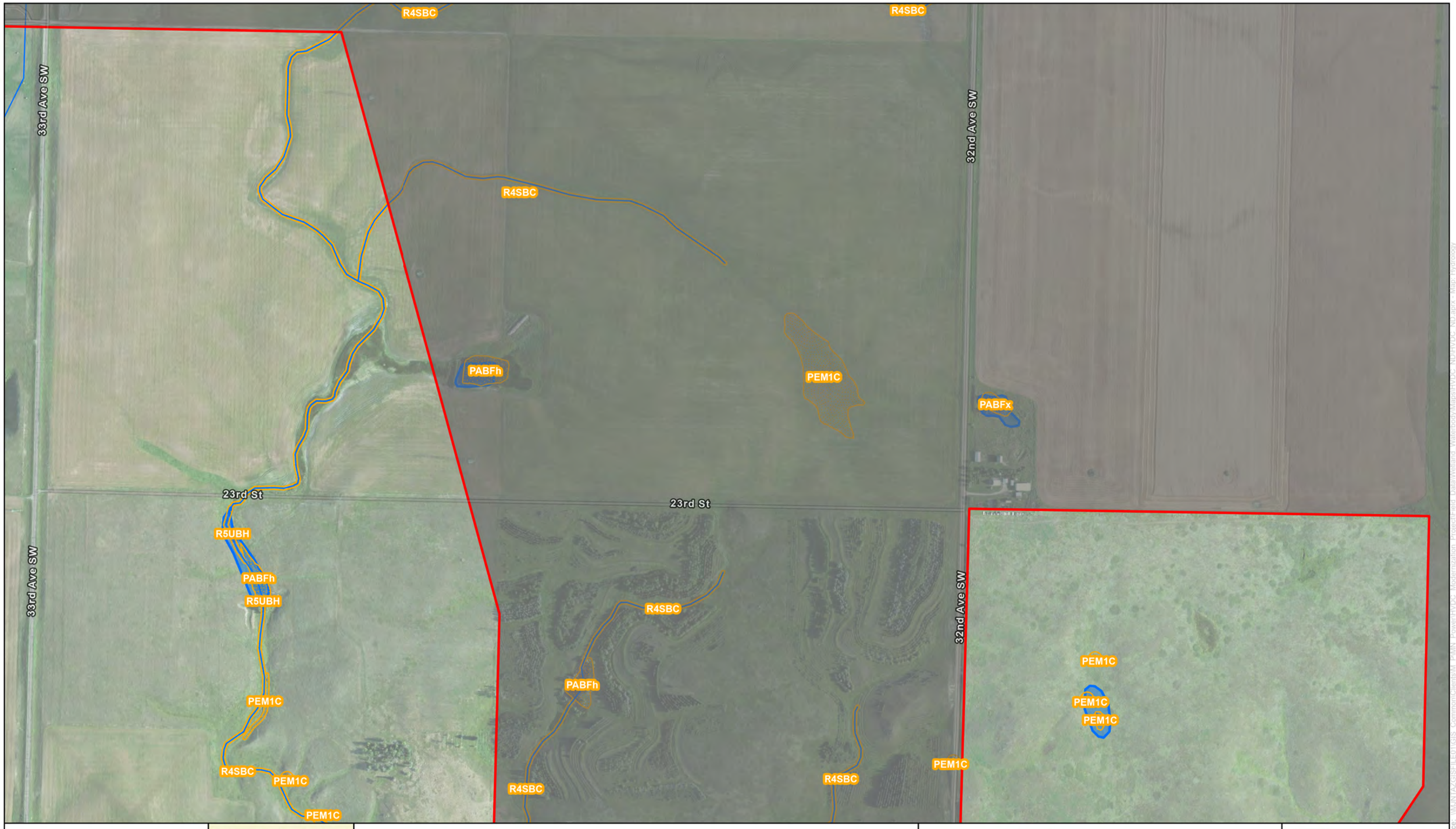

Figure 4: Hydrology
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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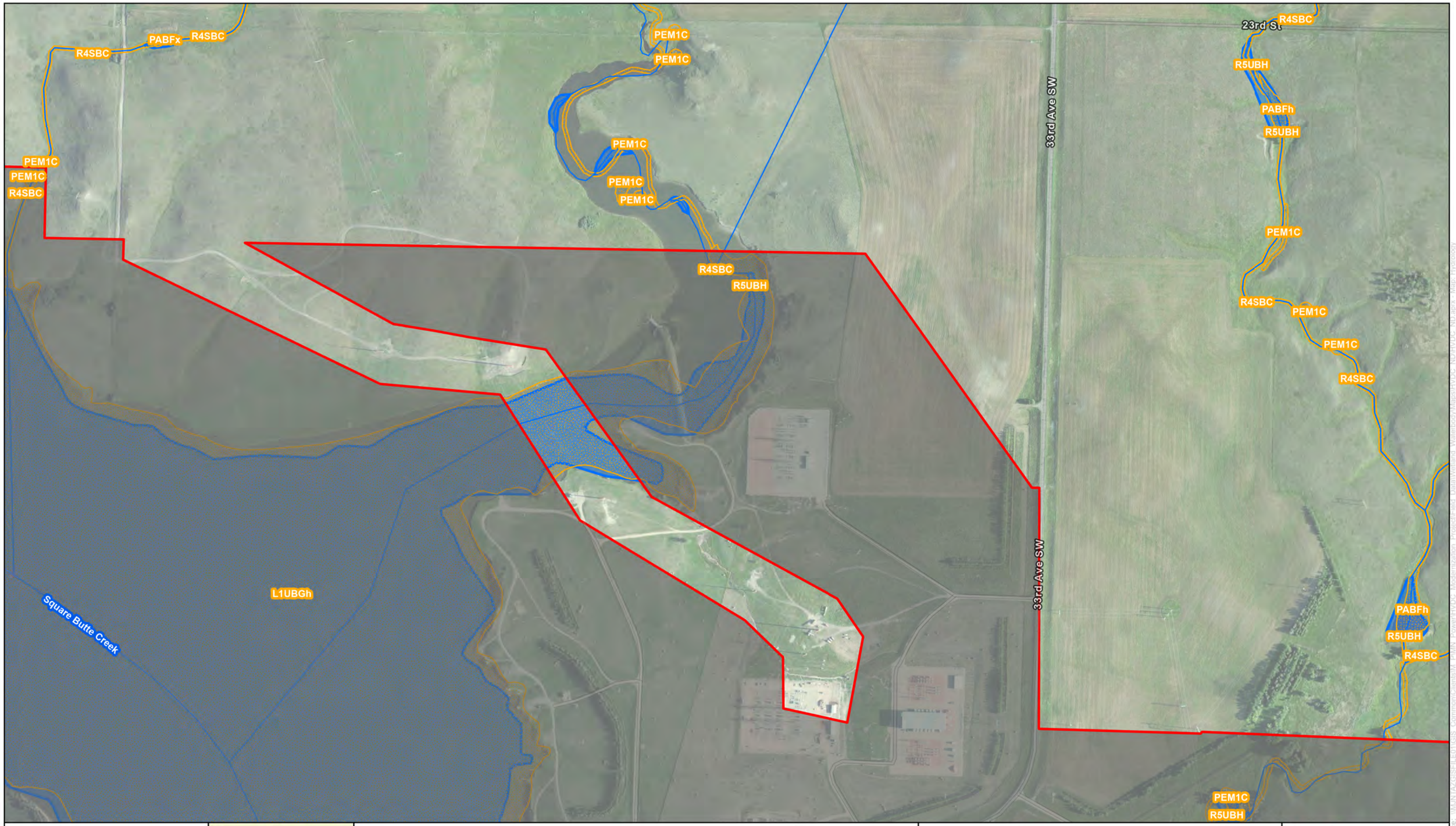

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Figure 4: Hydrology
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
Mapped Waterway (NHD)
Mapped Waterbody (NHD)
Mapped Wetland (NWI)

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Figure 4: Hydrology
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
Mapped Waterway (NHD)
Mapped Waterbody (NHD)
Mapped Wetland (NWI)

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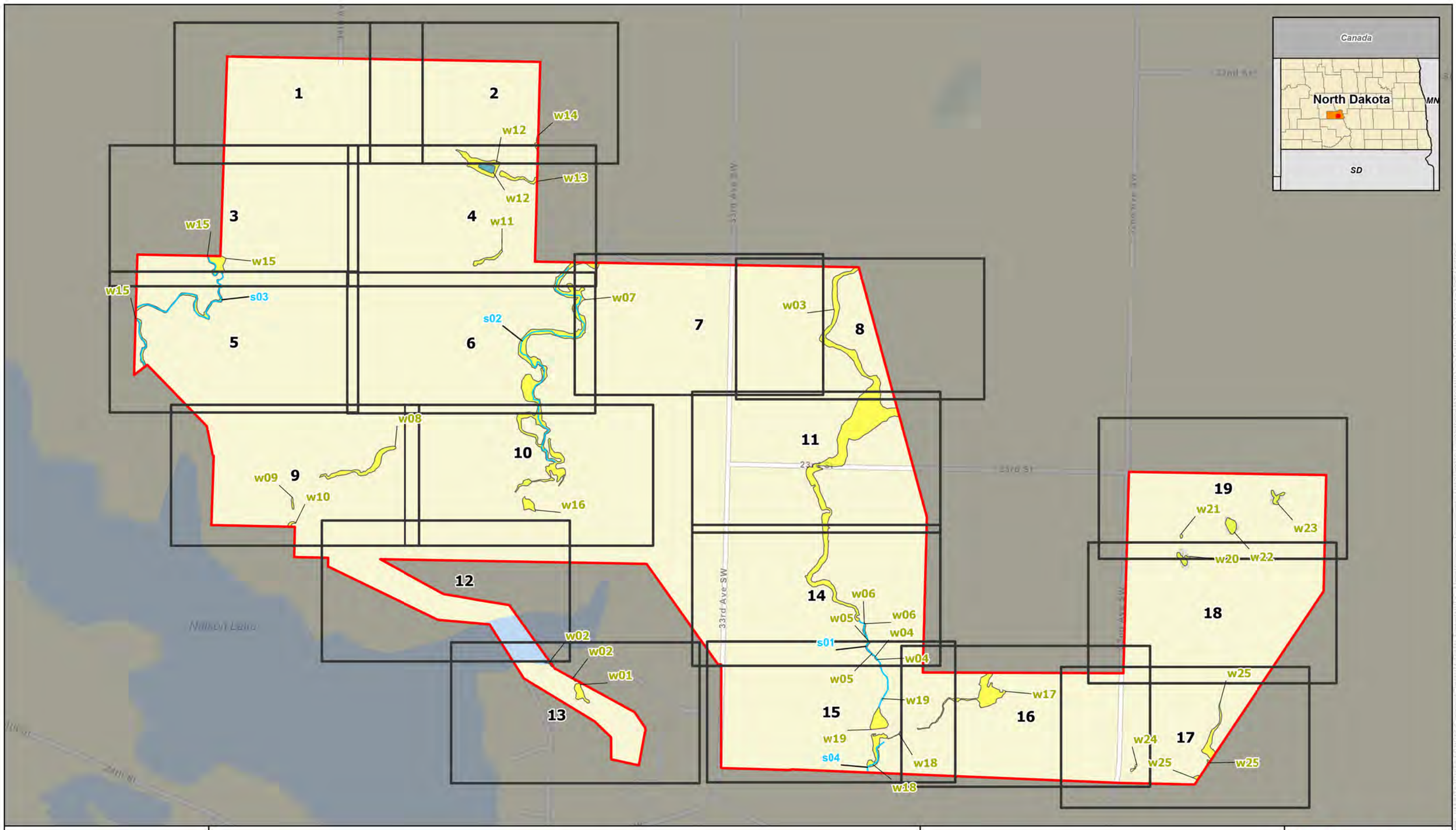
Figure 5

Wetland Delineation



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Project Overview
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
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Delineated PEM Wetland
Delineated PUB Wetland
Delineated Waterway

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Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

- Survey Area
- Photo Point
- Wetland Data Point
- Stream Data Point
- Delineated Waterway
- Delineated Waterbody
- Delineated PEM Wetland
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Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
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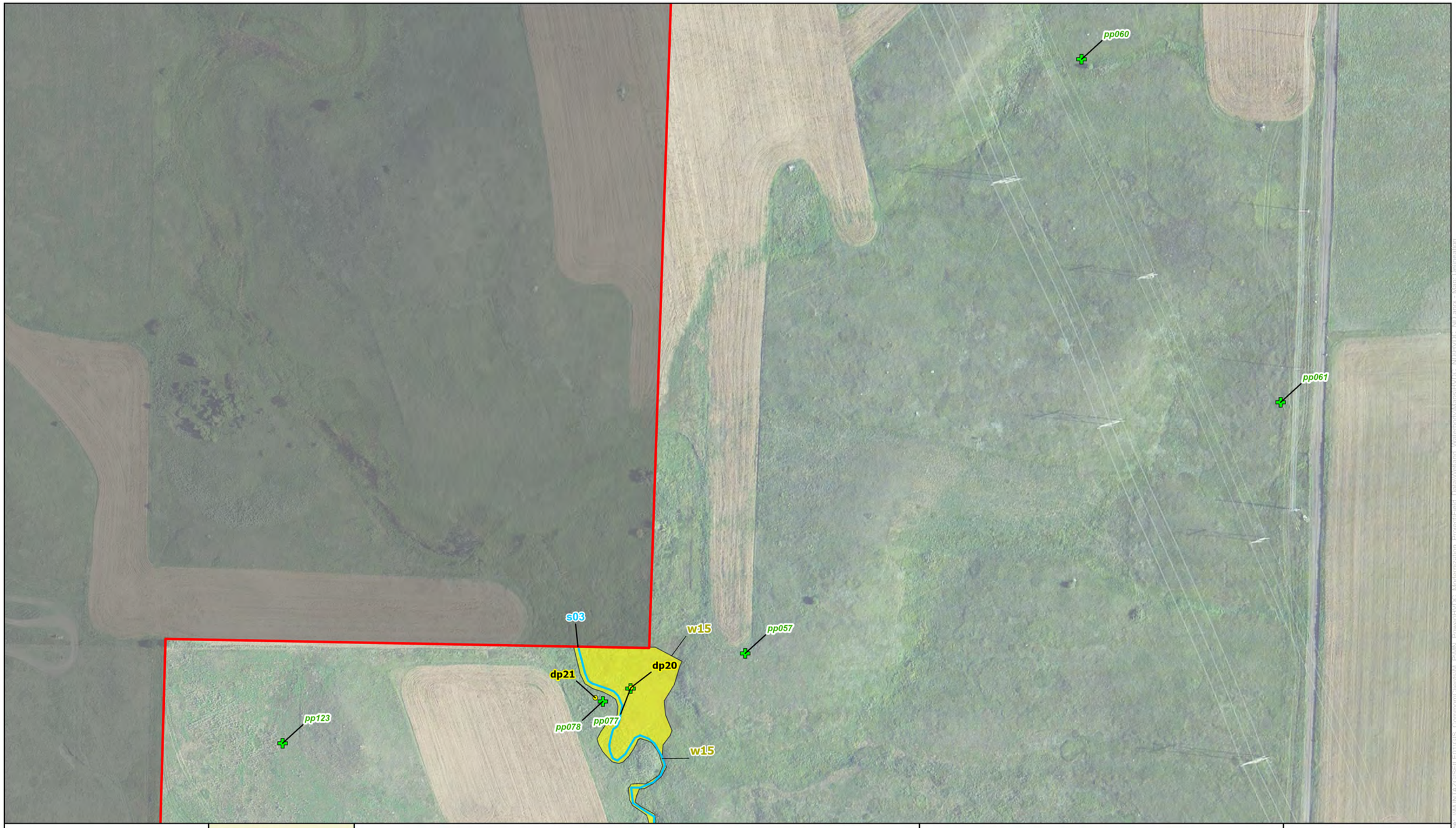

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Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
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Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
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For Environmental Review Purposes Only

Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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For Environmental Review Purposes Only

Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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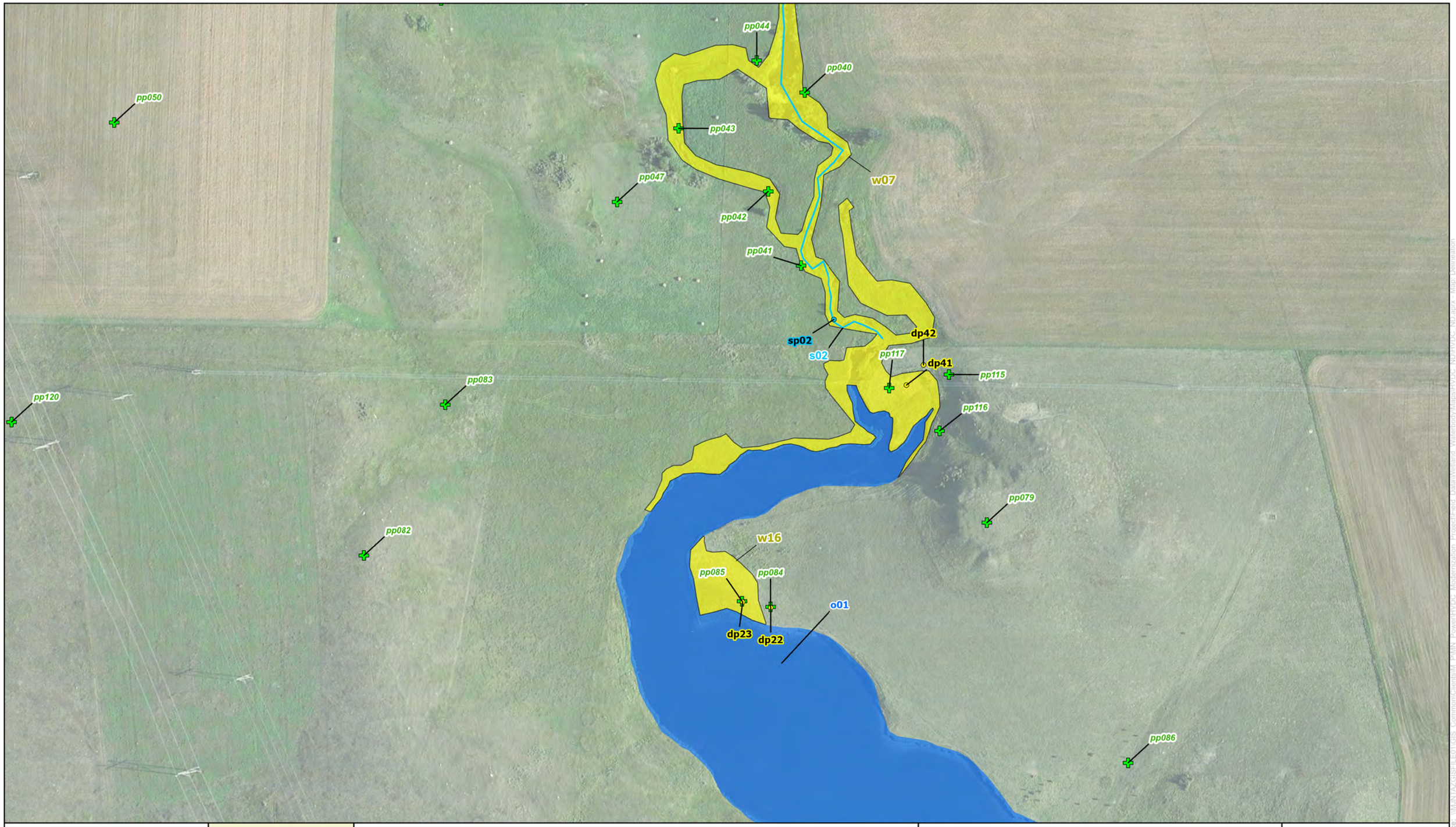

Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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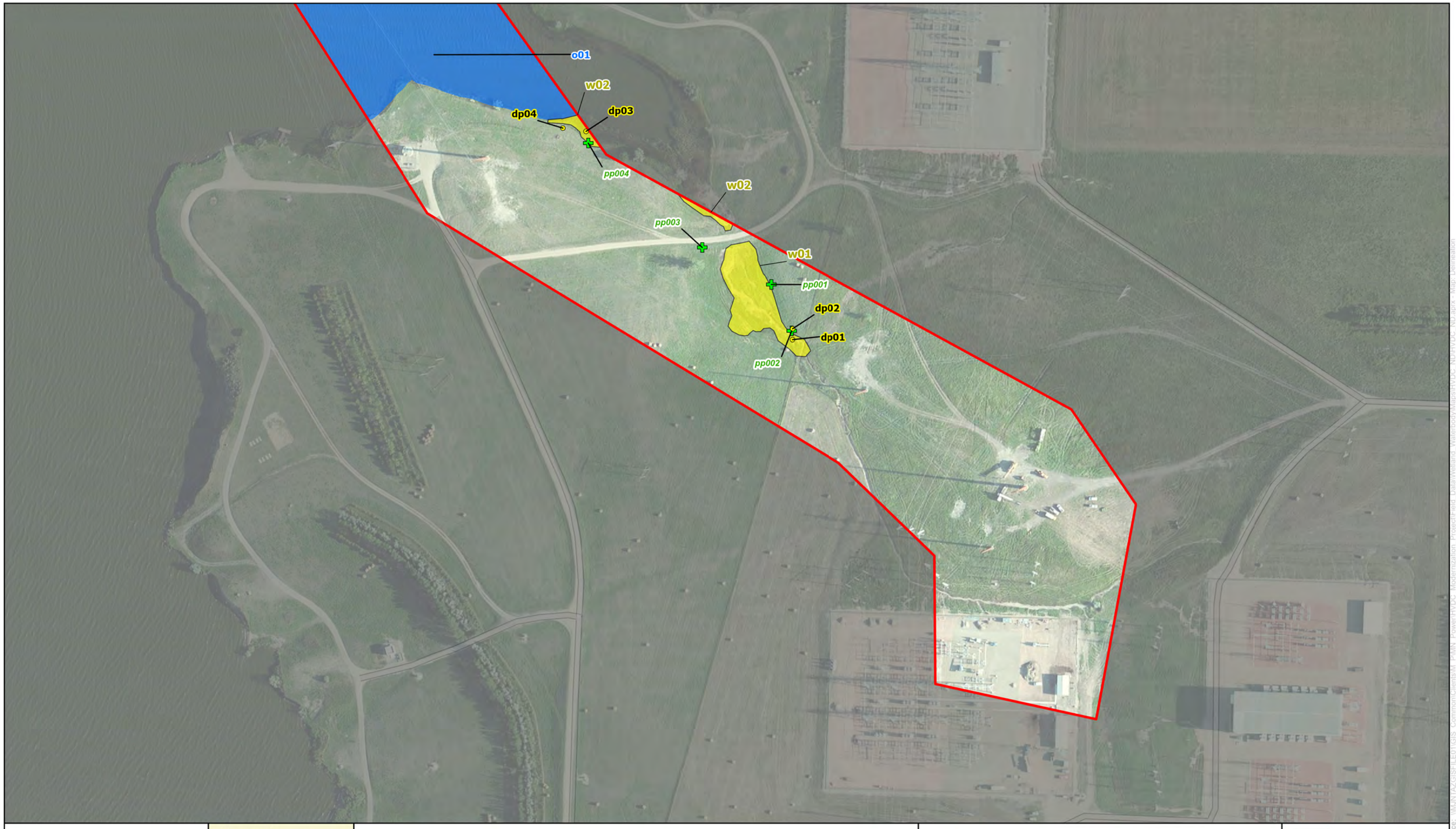

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Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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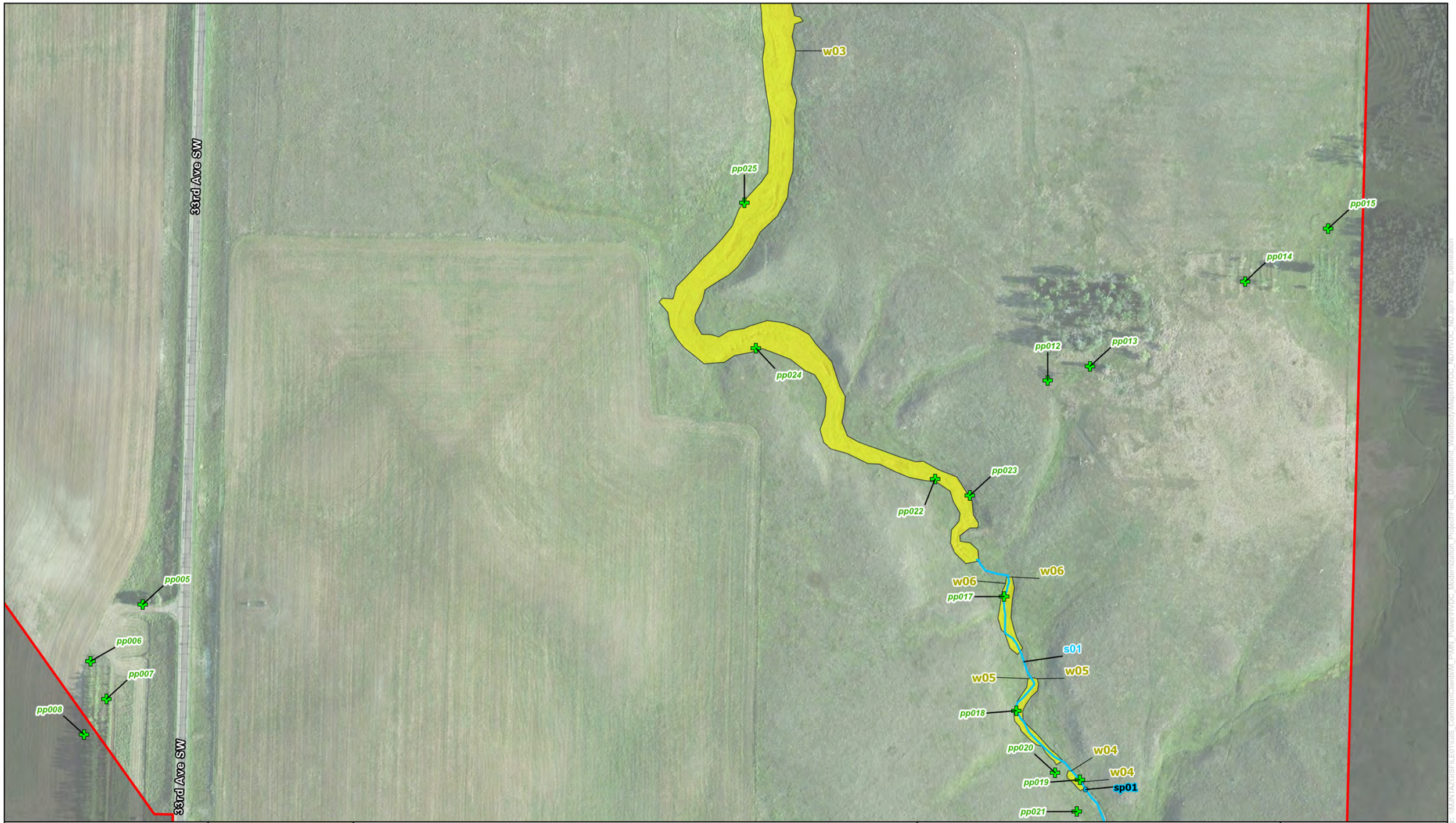
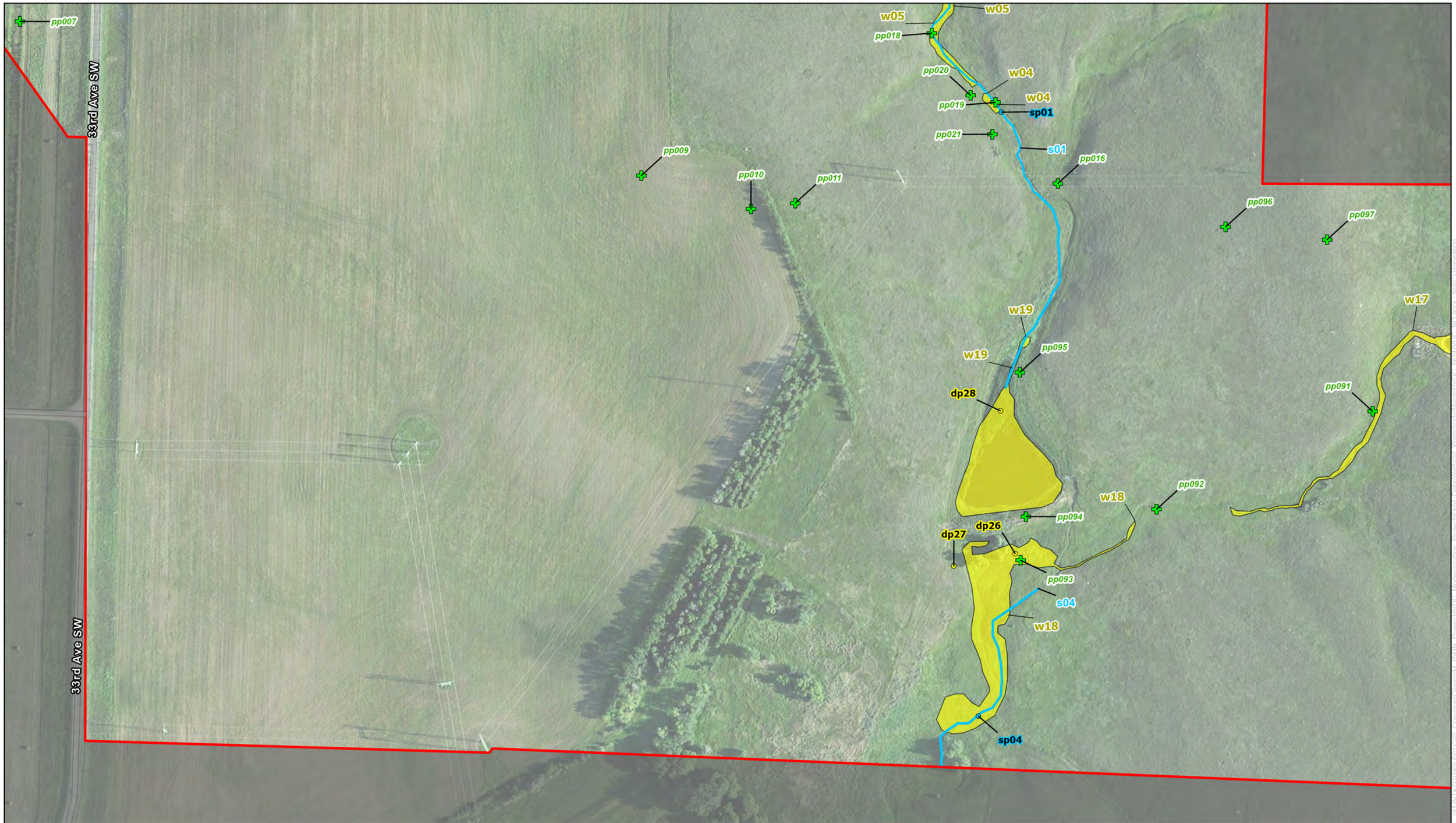


Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Source: \\MUNTAGISFILE01\GIS_Common\Clients\M_P\MN_PowerHVDC_Modernization_Project\Field_Data\Wetland_Waterbody\Maps\HVDC_ND\HVDC_ND.aprx - Map: Delineation
Date: (11/7/2023)



0 100 200
Feet

N W E S

For Environmental Review Purposes Only

Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

- Survey Area
- Photo Point
- Wetland Data Point
- Stream Data Point
- Delineated Waterway
- Delineated Waterbody
- Delineated PEM Wetland
- Delineated PUB Wetland

merjent

minnesota power
AN ALLETE COMPANY

Source: \\MUNTAC\GIS\FILE01\GIS_Common\Clients\M_P\MN_PowerHVDC_Modernization_Project\Field_Data\Wetland_Waterbody

Date: (11/7/2025)

pp096
pp097
pp098
w17
dp24
pp090
dp25
pp099
pp091
pp092
pp088
pp089
pp087
w24
pp110
pp111
dp36
dp37
32nd Ave SW
32nd Ave SW

0 100 200
Feet

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W E
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For Environmental Review Purposes Only

Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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Photo Point
Wetland Data Point
Stream Data Point
Delineated Waterway
Delineated Waterbody
Delineated PEM Wetland
Delineated PUB Wetland

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minnesota power
AN ALLETE COMPANY

Source: \\MUNTAGIS\PROJECTS\Common\Clients\MP_PWR_PowerHVDC_Modernization_Project\Field_Data\Wetland_Data\Wetland_Waterbody\Maps\HVDC_ND_WD.aprx - Map: Delineation
Date: (11/7/2023)

0 100 200
Feet

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For Environmental Review Purposes Only

Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

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- Delineated Waterbody
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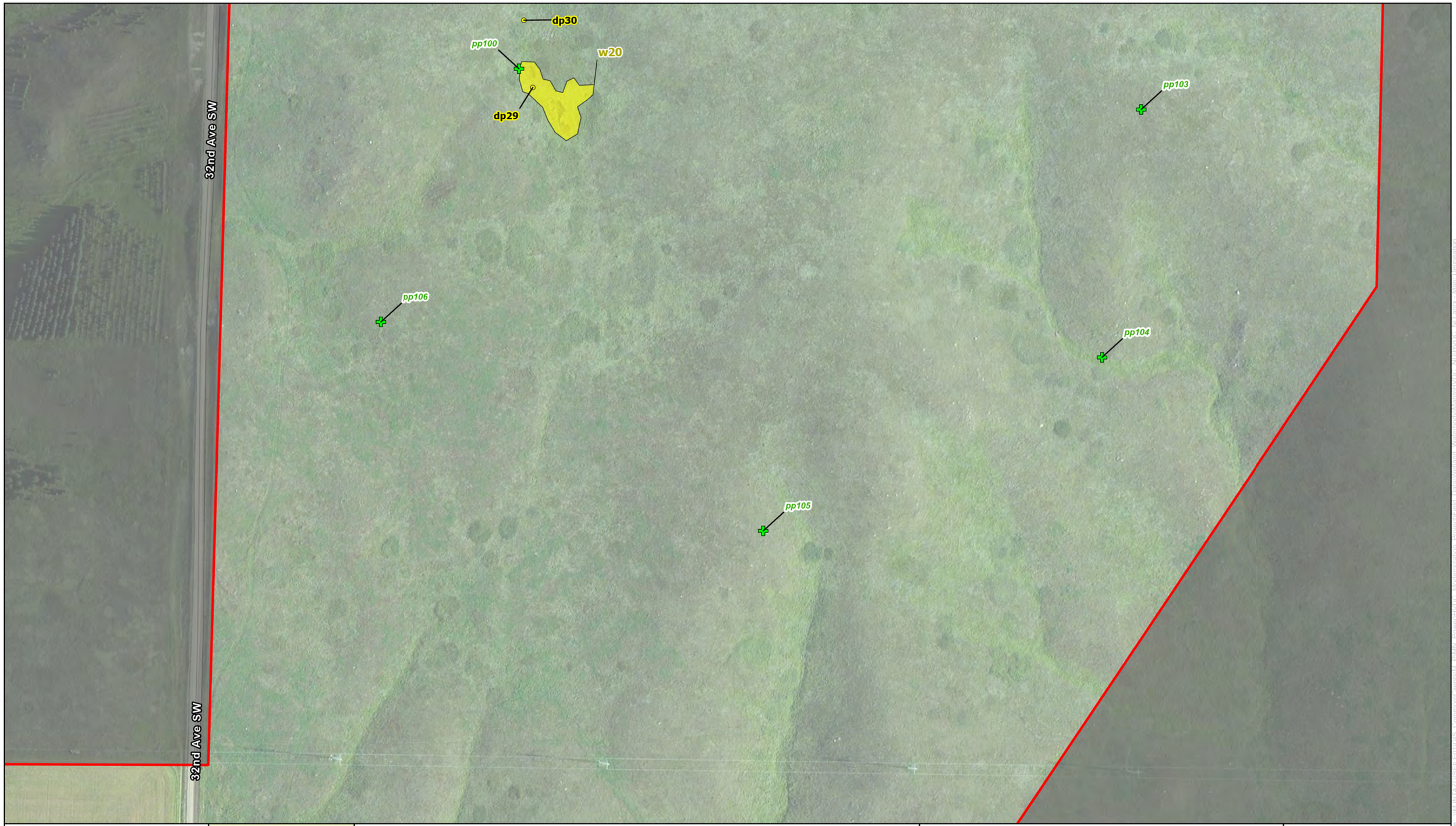
minnesota power
AN ALLETE COMPANY

Source: \\MJN1AZGIS\FILE01\GIS_Common\Clients\M_P\MN_PowerHVDC_Modernization_Project\Field_Data\Wetland_Waterbody\Maps\HVDC_ND.mxd - Waterbody Maps - Map Delineation
Date: (11/7/2023)



0 100 200
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For Environmental Review Purposes Only

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minnesota power
AN ALLETE COMPANY

Source: \\MJN1AZGISFILE01\GIS_Common\Clients\M_P\MN_PowerHVDC_Modernization_Project\Field_Data\wetland_Waterbody\Maps\HVDC_ND.MXD - Map: Delineation
Date: (11/7/2023)

32nd Ave SW

pp107

w23

dp34

dp35

pp108

pp102

w22

dp32

dp33

pp109

w21

dp31

pp101

dp30

pp100

dp29

w20

0 100 200
Feet

N
W E
S

For Environmental Review Purposes Only

Figure 5: Wetland Delineation
HVDC Modernization Project
Minnesota Power
Oliver County, North Dakota

Survey Area
Photo Point
Wetland Data Point
Stream Data Point
Delineated Waterway
Delineated Waterbody
Delineated PEM Wetland
Delineated PUB Wetland

merjent

minnesota power
AN ALLETE COMPANY

Source: \\MJNTAGIS\FILE01\GIS_Common\Clients\M_P\MN_PowerHVDC_Modernization_Project\Field_Data\Wetland_Waterbody\Maps\HVDC_ND.mxd - Map Delineation
Date: (11/7/2023)

Appendix A

Survey Photographs

[REDACTED]

Appendix B

Wetland Determination Data Forms –

Great Plains Region

[REDACTED]

Appendix C

Rapid OHWM Field Identification Data Sheets

[REDACTED]