Appendix D

Natural Resources Report

Natural Resources and Wetland Determination Report for the Hess Tioga Gas Plant to Tioga Rail Terminal Pipeline, Williams County, North Dakota

Prepared for

Hess Corporation

Prepared by

SWCA Environmental Consultants

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Natural Resources and Wetland Determination Report for the Hess Tioga Gas Plant to Tioga Rail Terminal Pipeline, Williams County, North Dakota

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1.0 INTRODUCTION

1.1 BACKGROUND

SWCA Environmental Consultants (SWCA) conducted natural resources field surveys in order to identify exclusion and avoidance areas as specified in North Dakota Administrative Code (NDAC) 69-06-08-02 on the behalf of Hess Corporation (Hess), for the proposed Hess Tioga Gas Plant to Tioga Rail Terminal produced product pipeline (pipeline) project. Hess proposes to construct a 3.62-mile-long pipeline to transport natural gas, un-odorized propane, and un-odorized butane from Hess's Tioga Gas Plant (TGP) to the Hess Tioga Rail Terminal (TRT) near Tioga, Williams County, North Dakota.

SWCA conducted field surveys, including reroutes, within a 350-foot-wide corridor on June 10, June 20, July 1, and September 8, 2011, to determine the potential presence and extent of wetlands and waterbodies, including jurisdictional waters of the U.S., commonly referred to as wetland and ordinary high water mark (OHWM) determinations, within the proposed survey area. Concurrently with the wetland determination, SWCA conducted a cursory threatened and endangered species survey and habitat assessment; a tree, sapling, and shrub enumeration survey; and a noxious weed survey. Site layout maps of the survey area and natural resource features identified during the field surveys are provided in Appendix A.

This report outlines the methodology used by SWCA's ecologists to complete each of the aforementioned surveys. Additionally, this report presents the results of the completed field surveys and regulatory recommendations to ensure compliance with the North Dakota Public Service Commission (NDPSC) and the U.S. Army Corps of Engineers (USACE) Nationwide Permit 12.

1.2 REGULATORY BACKGROUND

1.2.1 Clean Water Act, Section 404

Section 404 of the Clean Water Act prohibits the discharge of fill material into waters of the U.S., also known as jurisdictional waters, without a permit from the USACE.

1.2.2 USACE Nationwide Permit 12

The USACE Nationwide Permit 12 authorizes the construction of utility lines and associated facilities in waters of the U.S., provided the activity does not result in the permanent loss of greater than 0.5 acre of waters of the U.S., including wetlands.

Nationwide Permit 12 also authorizes the construction of access roads for utility lines, provided that the access road:

- does not result in the permanent loss of greater than 0.5 acre of waters of the U.S.;
- is constructed to the minimum width necessary;
- is constructed so that the length of the road minimizes any adverse effects to waters of the U.S.;
- is as near as possible to pre-construction contours and elevations; and

- is properly bridged or culverted when constructed above pre-construction contours.

If the access roads are used exclusively for construction purposes, they must be temporary and removed upon project completion.

Nationwide Permit 12 requires that the permittee submit a pre-construction notification prior to commencing construction if any of the following criteria are met.

- The activity involves mechanized land clearing in a forested wetland.
- A Section 10 permit is required to cross a navigable waterbody (Rivers and Harbors Act).
- The utility line exceeds 500 feet in length through any single crossing of a water of the U.S.
- The utility line is placed within a jurisdictional area (i.e., water of the U.S.) and it runs parallel to a stream bed that is within that jurisdictional area.
- Discharges result in the permanent loss of greater than 0.1 acre of waters of the U.S.
- Permanent access roads are constructed above grade in waters of the U.S. for a distance of more than 500 feet.
- Permanent access roads are constructed in waters of the U.S. with impervious materials.

1.2.3 USACE Regional Conditions

The USACE has published several regional conditions for projects operating under Nationwide Permits in North Dakota. The regional conditions apply to wetlands classified as "fens," waters adjacent to natural springs, the Missouri River, historic properties, and fish spawning areas.

2.0 METHODS

2.1 SURVEY AREA

Overall, northwest North Dakota is characterized by a moderate to cool climate, with cold, dry winters and mild to warm summers. Mean annual precipitation for the area is 14 to 16 inches (Bryce et al. 1998).

The proposed project is located in the Northwestern Glaciated Plains, which marks the westernmost extent of glacial activity (Bryce et al. 1998). The Northwestern Glaciated Plains have significant surface irregularity characteristic of a youthful morainal landscape, with hills and depressions and high concentrations of wetlands (Figure 1). Further, the proposed project is located in the Glaciated Dark Brown Prairie (level IV) ecoregion. This ecoregion has a well-defined drainage system and fewer wetlands compared to the more recently glaciated ecoregions to the east (Bryce et al. 1998). The proposed project area is located on gently rolling plains (Figure 2) and active agricultural fields containing planted tree shelterbelts (Figure 3).

Figure 1. Project area overview depicting general topography toward the eastern end of pipeline corridor, facing west.

Figure 2. Project area overview depicting general topography near the middle section of the pipeline corridor, facing east.

Figure 3. General topography and woody vegetation along the western portion of pipeline corridor, facing north.

The survey area is situated on the U.S. Geological Survey Tioga (1979) quadrangle, as shown in Appendix A. The survey area includes parcels in Sections 26, 27, 28, 34, and 35, Township (T) 157 North (N), Range (R) 95 West (W) (see Appendix A).

2.2 PRE-FIELD REVIEW

Prior to conducting field surveys, SWCA reviewed the U.S. Fish and Wildlife Service (USFWS) threatened and endangered species list for Williams County, North Dakota (USFWS 2011). Additionally, SWCA reviewed applicable National Wetland Inventory data as well as preliminary National Weather Service (NWS) climatic data.

2.3 WETLANDS

SWCA ecologists conducted wetland determinations, within the survey area, based on the principles and guidelines provided in the *1987 Corps of Engineers Wetlands Delineation Manual* (Manual) (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Great Plains Region Version 2.0* (Supplement) (USACE 2010). According to the Manual and Supplement, an area is a wetland if three mandatory wetland indicators are present in a given area, with special exceptions. These criteria include the presence of hydrophytic vegetation, wetland hydrology, and hydric soils. Wetland determination worksheets outlining these indicators are shown in Appendix C. All wetlands and waterbodies geographically referenced within the survey area during field survey are depicted on the site layout maps in Appendix A.

2.3.1 Hydrophytic Vegetation

Ecologists recorded all plants within the vegetative community based on the respective stratum each species occupied. A tree is defined by the Supplement to be a woody-stemmed plant with a trunk diameter at breast height (DBH) of equal to or greater than 3 inches, regardless of height. The sapling and shrub stratum is defined by the Supplement to be composed of woody-stemmed plants with a trunk DBH of less than 3 inches, regardless of height. The herbaceous stratum includes all non-woody-stemmed plants regardless of height. Finally, the woody vine stratum includes all woody-stemmed vines, regardless of diameter.

SWCA recorded the binomial scientific name and percent cover of all plants within a 30-foot radius for the tree stratum, a 15-foot radius for the sapling/shrub stratum, a 5-foot radius for the herbaceous stratum, and a 30-foot radius for the woody vine stratum. SWCA ecologists noted each plant species' respective USFWS indicator status (i.e., upland [UPL], facultative upland [FACU], facultative [FAC], facultative wetland [FACW], and obligate [OBL]). In some instances the size and shape of the vegetative sampling plot was manipulated to better encompass each wetland or upland area, though the overall area assessed remained unchanged. SWCA also noted and geospatially referenced all populations of North Dakota state- or county-listed noxious weeds identified within the survey area.

2.3.2 Wetland Hydrology

A wetland was determined to contain wetland hydrology if at least one primary indicator or at least two secondary indicators of wetland hydrology were present, as defined by the Manual

and Supplement. Common hydrologic indicators include the presence of surface water, high water table, soil saturation, water marks on trees or other objects, sediment deposits, water-stained leaves, and oxidized rhizospheres on living roots.

2.3.3 Hydric Soil

Ecologists recorded detailed notes regarding soil profiles including the hue, value, and chroma (i.e., color) of the soil (using Munsell Soil Color Charts); the depth and extent of that soil color within the entire soil profile; the concentration of any redoximorphic features including concentrations or depletions; and the texture of the soil at each depth where a color change was observed. Soil pits were excavated to a depth of 18 inches at each data point. Common hydric soil indicators of the Northern Great Plains sub-region include the presence of hydrogen sulfide gas within the soil pit (A4), redox depressions (F8), and depleted matrix (F3) (USACE 2010).

2.4 WATERBODIES

Waterbodies (i.e., ponds, creeks, streams, rivers) were identified by the presence of an OHWM. Common identifiable indicators of an OHWM include evidence of a clear, natural line visible on the bank; shelving; changes in soil characteristics; the destruction of terrestrial vegetation; the presence of litter and debris; and watermarks on structures that are inundated during normal high water conditions. The OHWM typically represents the potential limits of the USACE jurisdiction. Please note that the USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

SWCA classified streams as perennial, intermittent, or ephemeral based on field observations. During a typical year, a perennial stream contains flowing water year-round and the water table is located above the stream bed. Groundwater is the primary water source for stream flow while precipitation runoff is supplemental. Ecologists classified streams that showed significant flow during the field survey.

An intermittent stream has flowing water for only portions of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

2.5 TREE, SAPLING, AND SHRUB COUNT

SWCA ecologists determined the total number of trees, saplings, and shrubs present within the survey area by employing several different techniques depending on the type of woody vegetation habitat (i.e., forested upland, shrubland, or planted windbreak) encountered and the overall extent of each habitat within the right-of-way (ROW). The boundary of all forested upland, shrubland, and shelterbelt habitat was geographically referenced using a Trimble GeoXT series handheld global positioning system (GPS) unit. In forested upland and

shrubland habitat, SWCA counted or estimated the number of all naturally occurring woody stemmed vegetation with a diameter at breast height (DBH) of 1 inch or greater. In shelterbelt areas, all woody stemmed vegetation was inventoried via direct count, regardless of trunk DBH. Ecologists taxonomically identified all recorded individuals to the species level within each habitat type.

2.6 WILDLIFE INCLUDING THREATENED AND ENDANGERED SPECIES

Information regarding the presence of threatened or endangered species, which may occur within the survey area, was obtained from the USFWS list of threatened and endangered species by North Dakota county (USFWS 2011). This document does not represent a comprehensive survey, but rather acknowledges the past and/or current presence of listed species. The lack of discovery of threatened or endangered species does not signify their non-existence within the area, but only that no primary (e.g., actual sightings or auditory indicators) or secondary indications (e.g., scat, feathers, fur, etc.) of these species were recorded.

SWCA completed a cursory survey for all listed species and suitable habitat potentially impacted by construction activities within survey area. A line-of-sight survey for raptor species was also conducted for a distance of approximately 0.5 mile with the aid of binoculars. Unique wildlife habitats were closely inspected on foot. Additionally, SWCA characterized suitable threatened and endangered species habitat encountered during the field survey. SWCA ecologists noted all wildlife observed during the field survey. Wildlife sightings can involve primary observations (i.e., actual sighting of an animal) or secondary observations (i.e., observation of scat, tracks, or fur deposits).

2.7 MAPPING

The boundaries of each wetland, waterbody, woody vegetation habitat area, and noxious weed assemblage were geographically recorded using a Trimble GeoXT GPS unit. The aforementioned GPS unit is capable of recording geographic data with sub-meter accuracy. SWCA used Universal Transverse Mercator Zone 13 North as the projected coordinate system and North American Datum 1983 as the datum. ArcGIS v10.0 was used to analyze collected features, calculate areas, and generate the maps provided in Appendix A. Please note that all data collected using the GPS unit, and displayed on the attached maps, are for review purposes only and do not represent a professional civil survey.

3.0 RESULTS

3.1 VEGETATION

SWCA ecologists identified four general types of vegetative communities within the survey area. These vegetative communities were classified as herbaceous upland, shrubland and forested upland woody vegetation, cropland, and palustrine emergent (PEM) wetland. PEM wetlands are characterized by the presence of herbaceous hydrophytic and/or submerged aquatic macrophytes.

Vegetation communities met the hydrophytic vegetation criterion for wetlands if greater than 50% of plant species recorded at a give datapoint had an indicator status of FAC, FACW, or OBL. The upland communities failed to meet at least one of the three assessed wetland criteria.

SWCA ecologists observed and recorded the presence of Canada thistle (*Cirsium arvense*) at two locations within the survey area. SWCA ecologists also observed and recorded the presence of leafy spurge (*Euphorbia esula*) at one location comprised of two individual plants. Canada thistle and leafy spurge are listed as noxious weeds in the state of North Dakota and Williams County (North Dakota Century Code 4.1-47-02).

3.1.1 Herbaceous Upland

Herbaceous upland communities occurring throughout the survey area consisted of non-wetland areas dominated by non-woody vegetation such as grasses and forbs. Common species encountered during the field surveys included smooth brome (*Bromus inermis*), western wheatgrass (*Pascopyrum smithii*), Kentucky bluegrass (*Poa pratensis*), prairie cordgrass (*Spartina pectinata*), common reed (*Phragmites australis*), cattail (*Typha spp.*), common yarrow (*Achillea millefolium*), and white sagebrush (*Artemisia ludoviciana*).

3.1.2 Shrubland and Forested Upland Communities

The field survey found shrubland communities occurring throughout the survey area consisted of upland areas dominated by woody-stemmed vegetation including downy hawthorn (*Crataegus mollis*), Russian olive (*Elaeagnus angustifolia*), silverberry (*Elaeagnus commutata*), chokecherry (*Prunus virginiana*), silver buffaloberry (*Shepherdia argentea*), and western snowberry (*Symphoricarpos occidentalis*).

Forested upland vegetation consisted of green ash (*Fraxinus pennsylvanica*), Siberian elm (*Ulmus pumila*), boxelder (*Acer negundo*), peachleaf willow (*Salix amygdaloides*), and ponderosa pine (*Pinus ponderosa*).

3.1.3 Cropland

Cultivated cropland land cover comprised most of the surveyed area.

3.1.4 PEM Wetland

The field study confirmed the presence of six PEM wetlands totaling approximately 3.63 acres. The wetlands were found to consist of herbaceous, non-woody vegetation such as

sedges, spike-rushes, grasses, and forbs, although some woody vegetation was present but not dominant. Common species found within these communities include big bluestem (*Andropogon gerardii*), smooth brome, fringed brome (*Bromus ciliatus*), woolly sedge (*Carex pellita*), creeping spikerush (*Eleocharis palustris*), foxtail barley (*Hordeum jubatum*), mountain rush (*Juncus arcticus*), wild mint, Kentucky bluegrass, smartweed (*Polygonum* sp.), dock (*Rumex* sp.), bulrush (*Schoenoplectus* sp.), prairie cordgrass, and cattail (*Typha* sp.).

3.2 HYDROLOGY

Wetland communities observed during the determination effort displayed at least one primary or two secondary indicators of wetland hydrology, as defined by the Manual and Supplement. Upland communities either failed to display hydrologic indicators or failed to meet the hydrophytic vegetation criterion. Common indicators of wetland hydrology observed during field surveys include Surface Water (A1), Saturation (A3), Algal Mat or Crust (B4), and Inundation Visible on Aerial Imagery (B7).

According to NWS preliminary climatological data for Williston, North Dakota, 11.99 inches of precipitation were recorded from 1 May through 30 September 2011 (Table 1). This amount is 2.96 inches above normal for this time period.

Table 1. Monthly Recorded Rainfall at NWS Williston, North Dakota.

Month	2011 Recorded Precipitation (inches)	Average Precipitation (inches)	Difference (inches)
May 2011	5.28	1.88	3.40
June 2011	1.86	2.36	-0.50
July 2011	2.34	2.28	0.06
August 2011	1.65	1.45	0.20
September 2011	0.86	1.06	-0.20
Total	**11.99**	**9.03**	**2.96**

Source: National Oceanic and Atmospheric Administration 2011

3.3 WETLANDS

SWCA recorded six PEM wetlands within the 350-foot-wide survey area, totaling approximately 3.63 acres (Table 2). In total, approximately 0.804 acre of PEM wetland is proposed to be temporarily impacted within the 70-foot-wide construction ROW. See Appendix B for representative photographs of wetlands.

Table 2. PEM Wetland Acreage within the Survey Area.

Feature ID	USACE Jurisdiction*	Total PEM Size (acres)	Temporarily Impacted Area within 70-foot-wide ROW (acres)	Length of Required Crossing (feet)
NRAWET1	Jurisdictional	0.206	0.060	31.40
NRAWET2	Jurisdictional	0.216	0.000	0.000

Feature ID	USACE Jurisdiction*	Total PEM Size (acres)	Temporarily Impacted Area within 70-foot-wide ROW (acres)	Length of Required Crossing (feet)
NRAWET4	Jurisdictional	1.200	0.442	185.00
NRAWET5	Jurisdictional	1.660	0.166	98.74
NRAWET6	Isolated	0.008	0.008	16.82
NRAWET7	Isolated	0.340	0.128	79.81

* The USACE has the final authority on the jurisdictional status of a waterbody.

3.4 WATERBODIES

The survey area is within the Town of Tioga watershed (Hydrologic unit code [HUC] 10101011402), which is within the Paulson Creek watershed (HUC 101010114) within the Lake Sakakawea watershed (HUC 1010101).

SWCA identified one perennial waterbody (NRASTR1) during the field survey. The measured length of stream within the 70-foot-wide construction ROW is approximately 112.50 feet. Approximately 0.08 acre of this stream may be impacted by construction activities within the construction ROW. The perennial waterbody is considered to be jurisdictional due to the presence of an OHWM. Representative photographs of the waterbody delineated in the field are provided in Appendix B.

3.5 SOILS

Eight soil types are present within the construction ROW, based on U.S. Department of Agriculture - Natural Resources Conservation Service data (NRCS 2011). Table 3 lists all soil units within the construction ROW.

Table 3. NRCS Derived Soil Series Present within the Construction ROW.

Soil Types	Slopes (%)	Acres within 70-foot-wide ROW	Percent within Map Unit
Williams-Bowbells Loams	3–6	10.90	35.38
Zahl-Williams Loams	15–60	9.48	30.76
Williams-Zahl Loams	3–6	2.00	6.48
Williams-Bowbells Loams	0–3	5.14	16.67
Wildrose Silty Clay	0–2	1.30	4.21
Arnegard Loam	0–2	0.88	2.85
Appam Sandy Loam	0–6	0.67	2.19
Korchea-Divide Loams, Channeled	0–2	0.37	1.19
Williams-Zahl Loams	6–9	0.08	0.27

Source: NRCS 2011.

The following soil component descriptions represent the most prevalent soil series found within the survey area (NRCS 2011).

3.5.1 Appam

The Appam series consists of very deep, somewhat excessively drained soils that formed in glaciofluvial deposits. Permeability is moderately rapid in the upper part and very rapid in the substratum. These soils are on outwash plains and terraces and have slopes of 0 to 15 percent. Mean annual air temperature is about 41 degrees Fahrenheit (°F) and mean annual precipitation is about 14 inches. Soils are cropped to small grains, corn, and tame grass for hay and pasture. Native vegetation is needleandthread (*Hesperostipa comata*), prairie sandreed (*Calamovilfa longifolia*), prairie junegrass (*Koeleria macrantha*), and a wide variety of forbs.

3.5.2 Arnegard

The Arnegard series consists of very deep, well- or moderately well-drained soils that formed in calcareous loamy alluvium on upland swales, terraces, fans, and foot slopes. Permeability is moderate. Slopes range from 0 to 25 percent. Mean annual air temperature is 42°F, and mean annual precipitation is 14 inches. Most areas are cropped to spring wheat, oats, barley, and hay. Native vegetation is mid, tall, and short grasses such as western wheatgrass, green needlegrass (*Nasella viridula*), big bluestem, and blue grama (*Bouteloua gracilis*) (NRCS 2011).

3.5.3 Bowbells

The Bowbells series consists of very deep, well- and moderately well-drained soils formed in glacial till and alluvium from glacial till on glacial till plains and moraines. These soils have moderate permeability in the upper part and moderately slow or slow in the substratum. Slopes range from 0 to 9 percent. Mean annual precipitation is about 14 inches, and mean annual air temperature is about 42°F. Soils are cropped to small grains. Some areas are used for hay and pasture. Native vegetation species common to this soil type include green needlegrass, western wheatgrass, porcupinegrass (*Hesperostipa spartea*), and big bluestem (NRCS 2011).

3.5.4 Divide

The Divide series consists of very deep, somewhat poorly drained soils that formed in loamy sediment over sand and gravel. Permeability is moderate over rapid or very rapid. These soils are on slightly depressed areas in outwash plains, floodplains, terraces, and interbeach areas and have slope ranging from 0 to 3 percent. Mean annual air temperature is 39°F, and mean annual precipitation is 17 inches. Divide soils are cropped to wheat and other small grains, hay, and some pasture. Native vegetation species consist of big bluestem, little bluestem (*Schizachyrium scoparium*), prairie junegrass, green needlegrass, western wheatgrass, bearded wheatgrass (*Elymus caninus*), and a variety of forbs.

3.5.5 Korchea

The Korchea series consists of very deep, well-drained, moderately permeable soils that formed in stratified alluvium. These soils are on floodplains and low stream terraces and have

slopes ranging from 0 to 6 percent. Mean annual air temperature is 42°F, and mean annual precipitation is 15 inches. Soils are cropped to small grains, hay, and corn. Some are irrigated. They are also used for range and pasture. Native vegetation is needle and thread, green needlegrass, western wheatgrass, a variety of forbs and a few shrubs.

3.5.6 Wildrose

The Wildrose series consists of very deep, well-drained, slowly permeable soils that formed in glaciolacustrine deposits. These soils are on lake plains and have slopes of 0 to 6 percent. Mean annual temperature is approximately 41°F, and mean annual precipitation is approximately 14 inches. Soils are cropped to small grain, flax, corn, hay, or pasture. Common native vegetation species are green needlegrass, western wheatgrass, blue grama, side-oats grama (*Bouteloua curtipendula*), and little bluestem (NRCS 2011).

3.5.7 Williams

The Williams series consists of very deep, well-drained, moderately slow or slowly permeable soils formed in calcareous glacial till. These soils are on glacial till plains and moraines and have slopes of 0 to 35 percent. Mean annual air temperature is about 40°F, and mean annual precipitation is about 14 inches. Cultivated areas are used for growing small grains, flax, corn, hay, or pasture. Native vegetation species common to this soil type include western wheatgrass, needleandthread, blue grama, green needlegrass, and prairie junegrass (NRCS 2011).

3.5.8 Zahl

The Zahl series consists of very deep, well-drained, moderately slow or slowly permeable soils that formed in calcareous glacial till. These soils are on glacial till plains, moraines, and valley side slopes and have slopes of 1 to 60 percent. Mean annual air temperature is 40°F, and mean annual precipitation is 14 inches. The native vegetation species most common to this soil type are little bluestem, western wheatgrass, and needle and thread (NRCS 2011).

3.6 TREE, SAPLING, AND SHRUB COUNT

During SWCA's field survey, 17 naturally occurring forested upland and shrubland areas were geographically referenced within the survey area. Table 4 summarizes the number of trees estimated to be impacted by the project as currently proposed. The NDPSC requires a 2:1 post- to pre-construction mitigation for all trees, saplings, and shrubs impacted during the construction of the proposed pipeline. Therefore, SWCA estimates approximately 10 two-year-old sapling individuals may need to be replanted in order to fulfill the 2:1 mitigation requirement.

Table 4. Tree, Sapling, and Shrub Count.

Woody Vegetation (WV) ID	Species	Type	Number of Trees		Estimated Mitigation Commitment
			350-foot-wide Survey Corridor	50-foot-wide Construction ROW	
NRAWV1	*Crataegus mollis*	Shrub	15	0	0
NRAWV2	*Crataegus mollis*	Shrub	402	0	0
NRAWV3	*Crataegus mollis*	Shrub	309	0	0
NRAWV4	*Prunus virginiana*	Shrub	30	0	0
NRAWV5	*Ulmus pumila*	Tree Row	71	0	0
NRAWV6	*Prunus virginiana*	Shrub	14	0	0
NRAWV7	*Caragana arborescens*	Shrub	42	4	8
NRAWV8	*Salix amygdaloides*	Tree	5	0	0
NRAWV9	*Salix amygdaloides*	Tree	4	1	2
NRAWV10	*Lonicera* sp. *Ulmus pumila* *Eleagnus angustifolia*	Tree Row	6 10 14	0 0 0	0
NRAWV11	*Caragana arborescens* *Fraxinus pennsylvanica*	Tree Row	14 11	0 0	0
NRAWV12	*Caragana arborescens*	Tree Row	2	0	0
NRAWV13	*Acer negundo*	Tree	1	0	0
NRAWV14	*Shepherdia argentea*	Shrub	51	0	0
NRAWV15	*Fraxinus pennsylvanica* *Ulmus pumila*	Tree Row	20 4	0	0 0
NRAWV16	*Pinus ponderosa*	Tree Row	24	0	0
NRAWV17	*Ulmus pumila*	Tree Row	83	0	0
TOTAL			**1,132**	**5**	**10**

3.7 WILDLIFE

SWCA conducted a cursory threatened and endangered species survey concurrently with the wetland determination. Ecologists did not observe any primary (i.e., actual sighting) or secondary (tracks, scat, fur) indication of the presence of threatened or endangered species.

The project, as proposed, would have no impact on black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*), interior least tern (*Sterna antillarum*), piping plover (*Charadrius melodus*), whooping crane (*Grus americana*), designated critical habitat for piping plover (*Charadrius melodus*), and pallid sturgeon (*Scaphirhynchus albus*).

3.7.1 Endangered Species Act

3.7.1.1 Black-footed Ferret (*Mustela nigripes*)

Federal Status: Endangered
Affects Determination: No Effect

Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily due to range-wide decimation of the prairie dog (*Cynomys* sp.) ecosystem (Kotliar et al. 1999). They have been listed by the USFWS as endangered since 1967, and have been the object of extensive re-introduction programs (USFWS 2010a). Ferrets inhabit extensive prairie dog complexes of the Great Plains, typically composed of several smaller colonies in proximity to one another that provide a sustainable prey base. The *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (USFWS 1989) states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres in size, and towns of this dimension may be important for ferret recovery efforts (USFWS 1988a). Prairie dog towns of this size were not observed during the field survey. In addition, this species has not been observed in the wild for more than 20 years. Therefore, the proposed project would have **no effect** on this species.

3.7.1.2 Gray Wolf (*Canis lupus*)

Federal Status: Endangered
Affects Determination: No Effect

The gray wolf, listed as endangered in the United States in 1978, was believed extirpated from North Dakota in the 1920s and 1930s, with only sporadic reports from the 1930s to present (Licht and Huffman 1996; USFWS 1978). The presence of wolves in most of North Dakota consists of occasional dispersing animals from Minnesota and Manitoba (Licht and Fritts 1994; Licht and Huffman 1996). Most documented gray wolf sightings within western North Dakota are believed to be young males seeking to establish territory (Hagen et al. 2005). The Turtle Mountain region of north-central North Dakota provides marginal habitat that may be able to support a very small population of wolves. The closest known pack of wolves is the Minnesota population located approximately 17 miles (28 kilometers [km]) from the northeast corner of North Dakota.

The gray wolf uses a variety of habitats that support a large prey base, including montane and low-elevation forests, grasslands, and desert scrub (USFWS 2010b). Due to a lack of forested habitat and distance from Minnesota and Manitoba populations, as well as the troubled relationship between humans and wolves and their vulnerability to being shot in open habitats (Licht and Huffman 1996), the re-establishment of gray wolf populations in North Dakota is unlikely. Additionally, habitat fragmentation may further act as a barrier against wolf recolonization in western North Dakota. Therefore, the proposed project would have **no effect** on the gray wolf.

3.7.1.3 Whooping Crane (*Grus americana*)

Federal Status: Endangered
Affect Determination: No Effect

The whooping crane was listed as endangered in 1970 in the United States by the USFWS and in 1978 in Canada. Historically, population declines were caused by shooting and destruction of nesting habitat in the prairies from agricultural development. Current threats to the species include habitat destruction, especially suitable wetland habitats that support breeding and nesting, as well as feeding and roosting during their fall and spring migration (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007).

The July 2010 total wild population was estimated at 383 (USFWS 2010c). There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, where approximately 83% of the wild nesting sites occur (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007; USFWS 2010c). Williams County, including the project area, is within the primary migratory flyway of whooping cranes.

Whooping cranes probe the soil subsurface with their bills for foods on the soil or vegetation substrate (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Whooping cranes are omnivores and foods typically include agricultural grains, as well as insects, frogs, rodents, small birds, minnows, berries, and plant tubers. The largest amount of time during migration is spent feeding in harvested grain fields (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Studies indicate that whooping cranes use a variety of habitats during migration, in addition to cultivated croplands, and generally roost in small palustrine (marshy) wetlands within 0.6 mile (1 km) of suitable feeding areas (Howe 1987, 1989). Whooping cranes have been recorded in riverine habitats during their migration, with eight sightings along the Missouri River in North Dakota (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007:18). In these cases, they roost on submerged sandbars in wide, unobstructed channels that are isolated from human disturbance (Armbruster 1990).

Suitable whooping crane foraging habitat (i.e., cultivated cropland) was observed within the survey area. However, due to construction timing constraints and the overall length/ construction period associated with the pipeline, the project would have **no effect** on whooping crane.

3.7.1.4 Piping Plover (*Charadrius melodus*)

Federal Status: Threatened
Affect Determination: No Effect

The piping plover is a small shorebird which breeds only in three geographic regions of North America: the Atlantic Coast, the Northern Great Plains, and the Great Lakes. Piping plover populations were federally listed as threatened and endangered in 1985, with the Northern Great Plains and Atlantic Coast populations listed as threatened, and the Great Lakes population listed as endangered (USFWS 1985a).

Plovers in the Great Plains make their nests on open, sparsely vegetated sand or gravel beaches adjacent to alkali wetlands, and on beaches, sand bars, and dredged material islands

of major river systems (USFWS 2002, 2010d). The shorelines of lakes of the Missouri River constitute significant nesting areas for the bird. Piping plovers nest on the ground, making shallow scrapes in the sand, which they line with small pebbles or rocks (USFWS 1988b). Anthropogenic alterations of the landscape along rivers and lakes where piping plover nest have increased the number and type of predators, subsequently decreasing nest success and chick survival (USFWS 2002, 2010d). The birds fly south by mid to late August to areas along the Texas coast and Mexico (USFWS 2002). The Northern Great Plains population has continued to decline despite federal listing, with population estimates of 1,500 breeding pairs in 1985 reduced to fewer than 1,100 in 1990. Low survival of adult birds has been identified as a factor (Root et al. 1992). Current conservation strategies include identification and preservation of known nesting sites, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 1988b, 2010d).

A suitable shoreline habitat for breeding and nesting plovers does not occur within the project area and the Missouri River is a minimum of 37.5 miles (60.35 km) away from the survey area. It is unlikely but possible that migrating plovers may traverse the survey area during their migration. Therefore, the proposed project will have **no effect** on piping plovers

3.7.1.5 Designated Critical Habitat of Piping Plover

Affect Determination: No Effect

The USFWS has designated critical habitat for the Great Lakes and Northern Great Plains populations of piping plover (USFWS 2002). Designated critical habitat for the piping plover includes 183,422 acres and 1,207.5 river miles of habitat along the shoreline of Lake Sakakawea in Williams County, North Dakota (USFWS 2002).

Since the proposed project would not modify, alter, disturb, or affect the shoreline of Lake Sakakawea or the Missouri River, **no effect** to designated critical habitat of the piping plover would occur.

3.7.1.6 Interior Least Tern (*Sterna antillarum*)

Federal Status: Endangered
Affect Determination: No effect

The interior population of the least tern is listed as endangered by the USFWS (1985b). This bird is the smallest member of the gull and tern family, measuring approximately 9 inches in length. Terns remain near flowing water, where they feed by hovering over and diving into standing or flowing water to catch small fish (USFWS 2010e).

The interior population of least terns breeds in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems, where they nest in small colonies. From late April to August, terns nest in a shallow hole scraped in an open sandy area, gravel patch, or exposed flat and bare sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. The adults continue to care for chicks after they hatch. Least terns in North Dakota will often be found sharing sandbars with the piping plover, a threatened species (USFWS 2010e).

Census data indicate over 8,000 least terns in the interior population. In North Dakota, the least tern is found mainly on the Missouri River from Garrison Dam south to Lake Oahe, and

on the Missouri and Yellowstone rivers upstream of Lake Sakakawea (USFWS 1990a, 2010e). Approximately 100 pairs breed in North Dakota (USFWS 2010e). Details of their migration are not known, but their winter range is reported to include the Gulf of Mexico and Caribbean Islands (USFWS 1990a, 2010e).

Loss of suitable breeding and nesting habitat for terns has resulted from dam construction and river channelization on major rivers throughout the Mississippi, Missouri, and Rio Grande river systems. River and reservoir changes have led to reduced sandbar formation and other shoreline habitats for breeding, resulting in population declines. In addition, other human shoreline disturbances affect the species (USFWS 1990a). Critical habitat has not been designated for the species (USFWS 2010e). Current conservation strategies include identification and avoidance of known nesting areas, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 2010e).

Suitable shoreline habitat for breeding and nesting terns does not occur in the survey area, and the Missouri River is a minimum of 37.5 miles (60.35 km) away from the survey area. It is unlikely that terns would visit the upland or wetland habitats present in the survey area. Therefore, the proposed project will have **no effect** on endangered least terns.

3.7.1.7 Pallid Sturgeon (*Scaphirhynchus albus*)

Federal Status: Endangered
Affect Determination: No effect

The pallid sturgeon was listed as endangered in 1990 in the United States by the USFWS (1990b). The primary factor leading to the decline of this species is the alteration of habitat through river channelization, creation of impoundments, and alteration of flow regimes (USFWS 1990b). These alterations within the Missouri River have blocked movements to spawning, feeding, and rearing areas; destroyed spawning habitat; altered flow conditions which can delay spawning cues; and reduced food sources by lowering productivity (USFWS 2007a). The fundamental elements of pallid sturgeon habitat are defined as the bottom of swift waters of large, turbid, free-flowing rivers with braided channels, dynamic flow patterns, flooding of terrestrial habitats, and extensive microhabitat diversity (USFWS 1990b).

The pallid sturgeon populations occur in the Missouri River below Fort Peck Dam to the headwaters of Lake Sakakawea and the lower Yellowstone River up the confluence of the Tongue River, Montana (USFWS 2007a). This population consists of approximately 136 wild adult pallid sturgeon (USFWS 2007a). Hatchery-reared sturgeon have also been stocked since 1998. The pallid sturgeon has been found to utilize the 15.5 miles (25 km) of riverine habitat that would be inundated by Lake Sakakawea at full pool (Bramblett 1996 per USFWS 2007a). Larval pallid sturgeons have also been found to drift into Lake Sakakawea. While the majority of pallid sturgeons are found in the headwaters of Lake Sakakawea, North Dakota Game and Fish have caught and released pallid sturgeon in nets set in 80 to 90 feet of water between the New Town and Van Hook area. Based on this information, pallid sturgeon could be found throughout Lake Sakakawea (personal communication, email from Steve Krentz, Pallid Sturgeon Project Lead, U.S. Fish and Wildlife Service, to Mike Cook, Aquatic Ecologist, SWCA Environmental Consultants, September 3, 2010).

Suitable habitat for pallid sturgeon is not present in the survey area in North Dakota, and Lake Sakakawea is a minimum of 37.5 miles (60.35 km) away from the project area. However, tributaries to the Missouri River are found within the project area. Potential pollution occurring as a result of construction activities, hydrostatic testing, and pipeline operations are concerns for downstream populations of endangered pallid sturgeon. Activities associated with the proposed project are not anticipated to adversely affect water quality and subsequently the pallid sturgeon. Therefore, the proposed project will have **no effect** on pallid sturgeon.

3.7.1.8 Sprague's Pipit (*Anthus spragueii*)

Federal Status: Candidate
Affect Determination: No Impact

The Sprague's pipit is a small passerine, 10 to 15 centimeters in length, endemic to the Northern Great Plains (USFWS 2010f). The Sprague's pipit requires large tracts of native prairie habitat, unplowed, throughout their life cycle. Because native grasslands are disturbance-dependent, Sprague's pipit prefers grassland habitats that are regularly disturbed. The frequency of disturbance required for habitat maintenance depends on how quickly grasses grow to an intermediate height (4 to 12 inches) following a disturbance event.

In North Dakota, Sprague's pipit has been found in areas of moderate grazing. Sprague's pipits are sensitive to patch size and avoid edges between grasslands and other habitat features (USFWS 2010f). They may avoid non-grassland features including roads, trails, oil wells, croplands, woody vegetation, and wetlands. The Sprague's pipit is reported to stay up to 350 m away from anthropogenic features such as roads, oil wells, and wind turbines (USFWS 2010f). The USFWS has estimated that each new oil well and associated road in North Dakota results in potential impacts to approximately 51 acres of pipit habitat due to avoidance and habitat fragmentation (USFWS 2010f). Because of increasing habitat fragmentation, especially by energy development, throughout the Sprague's pipit range, and the loss of native prairie habitat, the Sprague's pipit was listed as a Candidate Species under the Endangered Species Act (ESA) in 2010 (USFWS 2010f).

In North Dakota, Sprague's pipit breeds throughout the state except for the easternmost counties. During the breeding season they prefer large patches of well drained, open native grassland with a minimum size of 358.3 acres (range = 170 to 776 acres). They have not been observed in areas smaller than 71.6 acres on their breeding grounds (USFWS 2010f).

Native prairie habitat with grasses of intermediate height does occur within the project area. However, the habitat within and surrounding the project area has been previously disturbed by agriculture, roads, and oil and gas development. The proposed project is unlikely to directly affect habitat due to lack of adequate patch sizes required by the Sprague's pipit for breeding grounds in the immediate project area. Therefore, the proposed project **will have no impact on** Sprague's pipit.

3.7.2 Migratory Bird Treaty Act / Bald and Golden Eagle Protection Act

3.7.2.1 Bald Eagle (*Haliaeetus leucocephalus*)

Federal Status: Delisted in 2007; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

Effects of Project: No impact

The bald eagle feeds on fish and carrion and typically roosts in large trees near a water source. Bald eagle nesting habitat is typically any mature stands of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes, or any significant body of water. Bald eagles are uncommon in North Dakota and are usually observed along the Missouri River (Gomes n.d.) and Yellowstone River. Bald eagles frequently migrate through the grassland habitats; however, no bald eagles or nests were observed during the field surveys. Suitable nesting and roosting habitat is not available within the project area in North Dakota. The proposed project would have **no impact** on this species at this time.

3.7.2.2 Golden Eagle (*Aquila chrysaetos*)

Federal Status: Unlisted; protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

Effects of Project: No impact

Golden eagles nest on steep cliff faces and in large cottonwood trees along intermittent creeks. Golden eagles have been documented near the project area year-round; however, the majority of golden eagles migrate. The breeding season for golden eagles is from mid-March through late July. No individual or nesting golden eagles were observed during field surveys.

3.7.3 Wildlife Observed

During the field survey, SWCA ecologists observed various wildlife species which utilize wetlands and other habitat within the survey area (Table 5). Common wildlife species may be affected both directly via incidents with construction equipment or indirectly through the temporary fragmentation of habitat as a result of construction activities. Migratory birds are protected by the Migratory Bird Treaty Act (16 United States Code 703 et seq.) which prohibits the "take" of individuals and nests.

Table 5. Wildlife Observed during Field Surveys at the Proposed Pipeline Route.

Common Name	Scientific Name	Observation Type	Comments
Gray partridge	*Perdix perdix*	Primary	
Killdeer	*Charadrius vociferus*	Primary	
Upland sandpiper	*Bartramia longicauda*	Primary	
Wilson's phalarope	*Phalaropus tricolor*	Primary	
Mourning dove	*Zenaida macroura*	Primary	Nest observed
Least flycatcher	*Empidonax minimus*	Primary	
Western kingbird	*Tyrannus verticalis*	Primary	

Common Name	Scientific Name	Observation Type	Comments
Eastern kingbird	*Tyrannus tyrannus*	Primary	
Horned lark	*Eremophila alpestris*	Primary	
Yellow warbler	*Dendroica petechia*	Primary	
Clay colored sparrow	*Spizella pallida*	Primary	Nest observed
Song sparrow	*Melospiza melodia*	Primary	
Western meadowlark	*Sturnella neglecta*	Primary	
Red-winged blackbird	*Agelaius phoeniceus*	Primary	
Common grackle	*Quiscalus quiscula*	Primary	
Brown-headed cowbird	*Molothrus ater*	Primary	

4.0 CONCLUSIONS AND RECOMMENDATIONS

1. SWCA ecologists recorded approximately 3.63 acres of wetlands within the survey area.
2. In total, approximately 0.804 acre of PEM wetland *may* be temporarily impacted by construction activities.
3. SWCA ecologists recorded approximately 0.290 acre of perennial stream within the survey area.
4. Approximately 0.08 acre of perennial stream would be impacted if open cut/ trenching methods are utilized.
5. SWCA estimates 5 individuals may be impacted. Therefore, approximately 10 two-year-old saplings may need to be replanted to fulfill the 2:1 mitigation requirement.
6. According to the recommendations of the North Dakota Forest Service (NDFS), tree species selection for replacement should be accomplished through collaboration with a reputable area nursery. This will allow for species to be selected based on various factors including species hardiness and area soil type (personal communication, telephone conversation between Tom Claeys, Forestry and Fire Management Team Leader, NDFS, and Michael Cook, Ecologist, SWCA, December 7, 2009).
7. According to the recommendations of the NDFS, non-native species are permitted and to an extent recommended for planting as they may be more resistant to known tree pathogens in the area (personal communication, telephone conversation between Tom Claeys, Forestry and Fire Management Team Leader, NDFS, and Michael Cook, Ecologist, SWCA, December 7, 2009).
8. Three areas containing state listed noxious weeds were recorded during the field survey.
9. No threatened or endangered species were observed during the field survey. The known species which occur in Williams County are not likely to be detrimentally impacted by construction activities.

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APPENDIX A
Vicinity Maps and Site Layout Maps

Legend

- TGP to TRT Final Alignment
- Original Centerline Survey Area
- Rerouted Survey Area
- Noxious Weeds
- Woody Vegetation
- Noxious Weeds
- Stream
- Woody Vegetation
- Noxious Weeds
- Wetland
- Woody Vegetation

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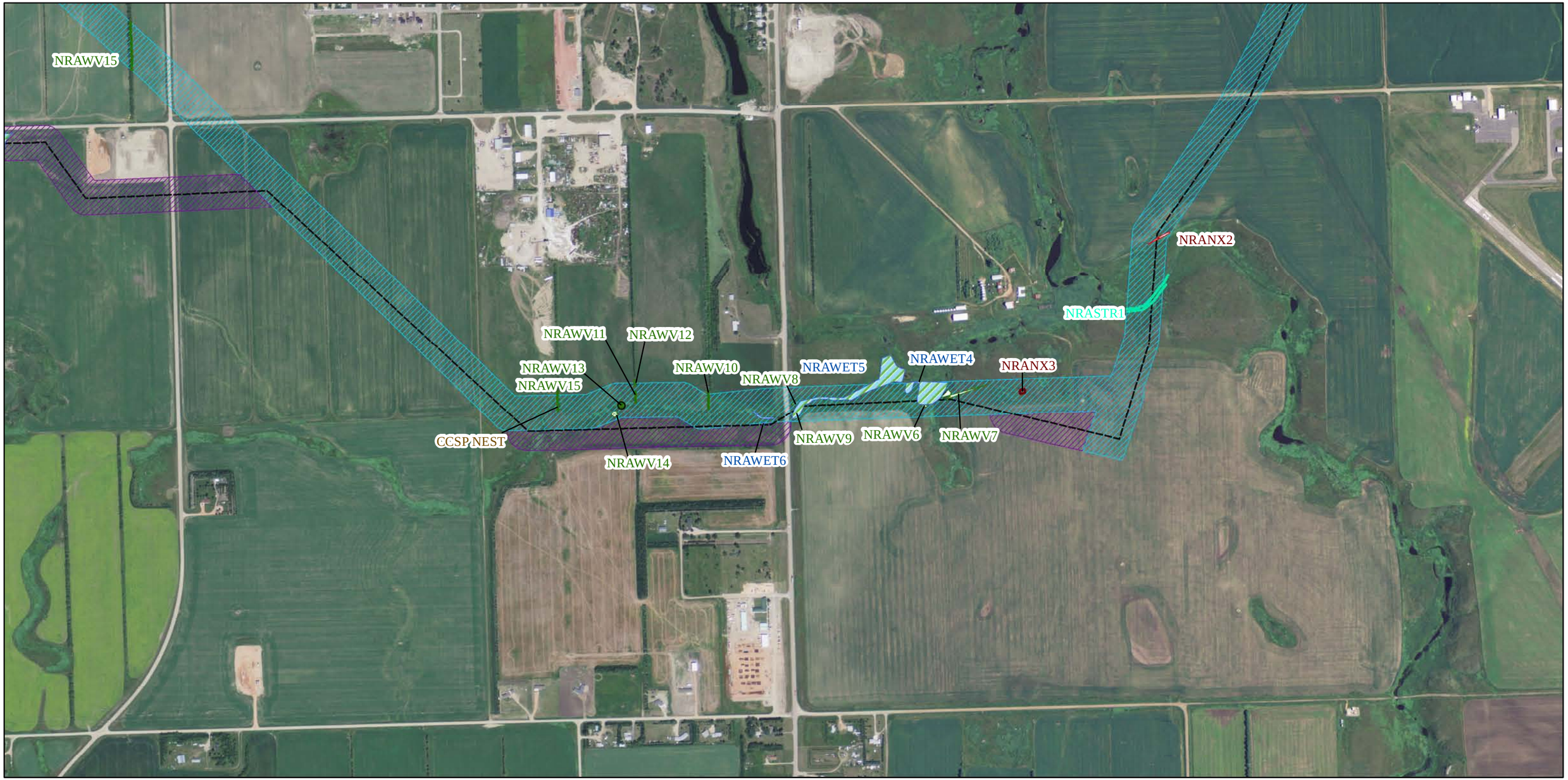
Kilometers
0 0.5 1

Miles
0 0.25 0.5

Base Map: NAIP 1-meter Aerial Imagery
Source: ND GIS Hub
Quadrangle: Tioga (1979)
Township/Range: Township 157N Range 95W
Williams County, North Dakota

N

NAD 1983 UTM Zone 13N



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APPENDIX B
Photographs of Project Area Corridor

Photo 1: View from NRAWET1, facing west.

Photo 2: View from NRAWET1, facing north.

Photo 3: View from NRAWET1, facing east.

Photo 4: View from NRAWET1, facing south.

Photo 5: Overview of NRASTR1, facing south.

Photo 6: Overview of NRAWET4, facing southeast.