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DEPARTMENT OF TRANSPORTATION

District 7 Wetland Mitigation Bank

Harlan County, Nebraska

Draft Site Development Plan

NDOT Project No. MISC-STWD (1093)
NDOT Control No. 71216

September 2021

olsson®

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1. PROJECT OVERVIEW AND OBJECTIVES

1.1 Project Summary and Location

The Nebraska Department of Transportation (NDOT) is proposing to construct a wetland mitigation bank southwest of Orleans and south of Nebraska Highway 89 (N-89) in NDOT District 7 (Figure 1). The wetland mitigation bank site (Site) is located in Section 21, Township 2 North, Range 19 West of Harlan County, Nebraska at approximately 40.122995° latitude, -99.471144° longitude. The Site is located in 8-digit Hydrologic Unit Code (HUC) 10250009 – Harlan County Reservoir Watershed and the Central Great Plains – Rolling Plains and Breaks (Environmental Protection Agency) EPA Level IV Ecoregion (Figure 2). The Site includes approximately 70 acres of a United States Army Corps of Engineers (USACE)-owned property and consists of agricultural land, a hay field, a managed grassland, and riparian woodlands. The Site is bordered by the Republican River along the western boundary with agricultural fields to the north, south, and east. Overall, the Site is relatively flat with the eastern half draining southeast towards the downstream portion of the Republic River floodplain (Figure 3a and 3b).

Following construction, and prior to any project mitigation debiting, the proposed mitigation bank Site design is expected to result in:

- Approximately 2.00 acres of wetland enhancement to existing Palustrine Emergent Temporarily or Seasonally (PEMA/C) Floodplain Depressional (FD) wetlands.
- Approximately 55.22 acres of wetland establishment. Established wetlands are expected to primarily be PEMA/C FD wetlands.
- Approximately 3.41 acres of wetland restoration in farmed areas as PEMA/C FD wetlands.
- Approximately 8.59 acres of upland buffer

It is anticipated that wetland hydrology would be established and maintained by groundwater sources. The proposed bank would not have a direct surface water connection to the Republican River. The elevations of the Site would be modified to promote wetland development based upon groundwater elevations. Excess soil removed from the Site will be used to improve USACE access roads and/or stockpiled at a designated location identified by the USACE. Roadway improvement areas and the stockpile location are shown on Figure 3a and 3b. The project would improve approximately 4.7 miles of roadway and stockpile material across an area approximately 11.7 acres in size.

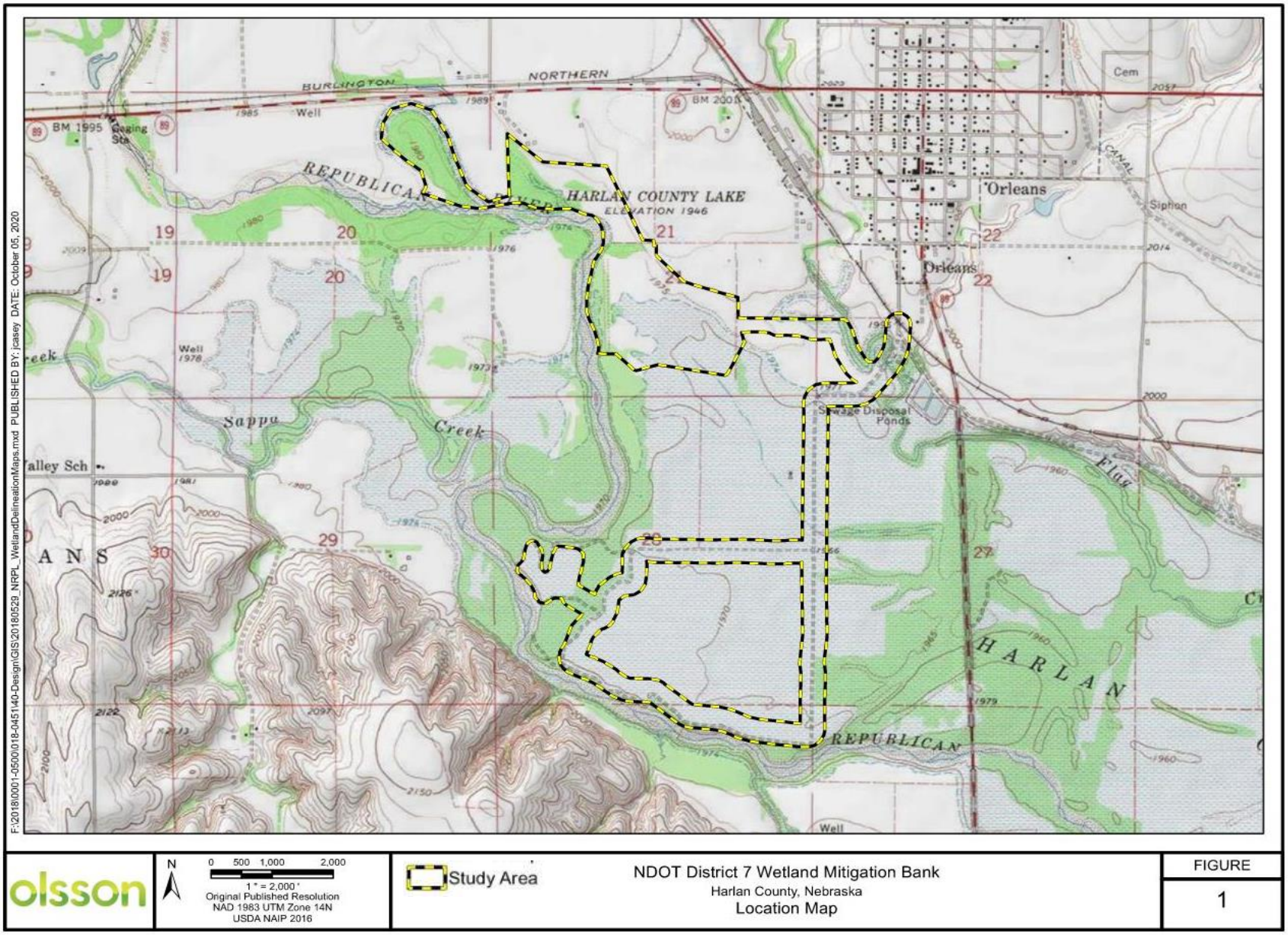

Figure 1. Location Map

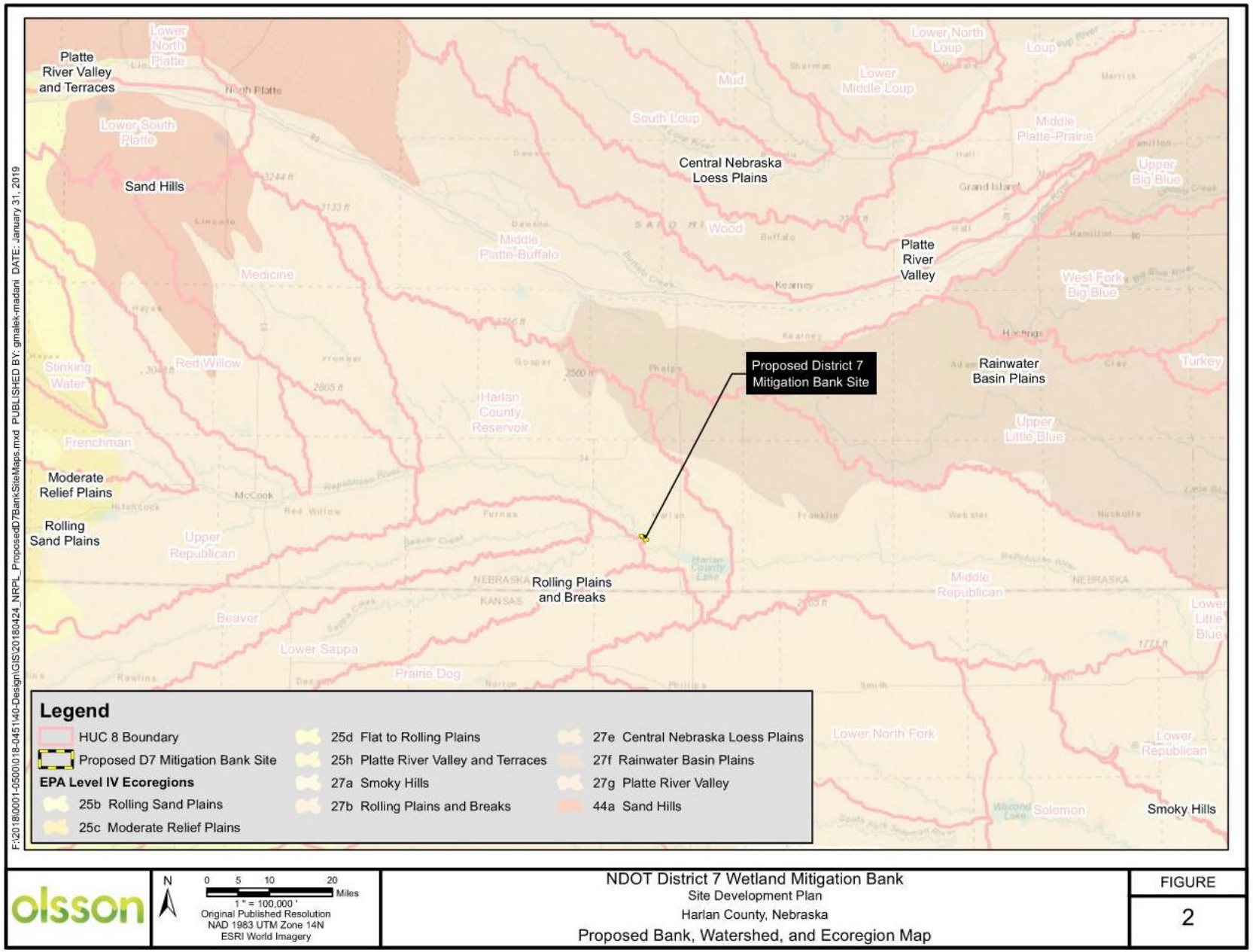

Figure 2. Proposed Bank, Watershed, and Ecoregion Map

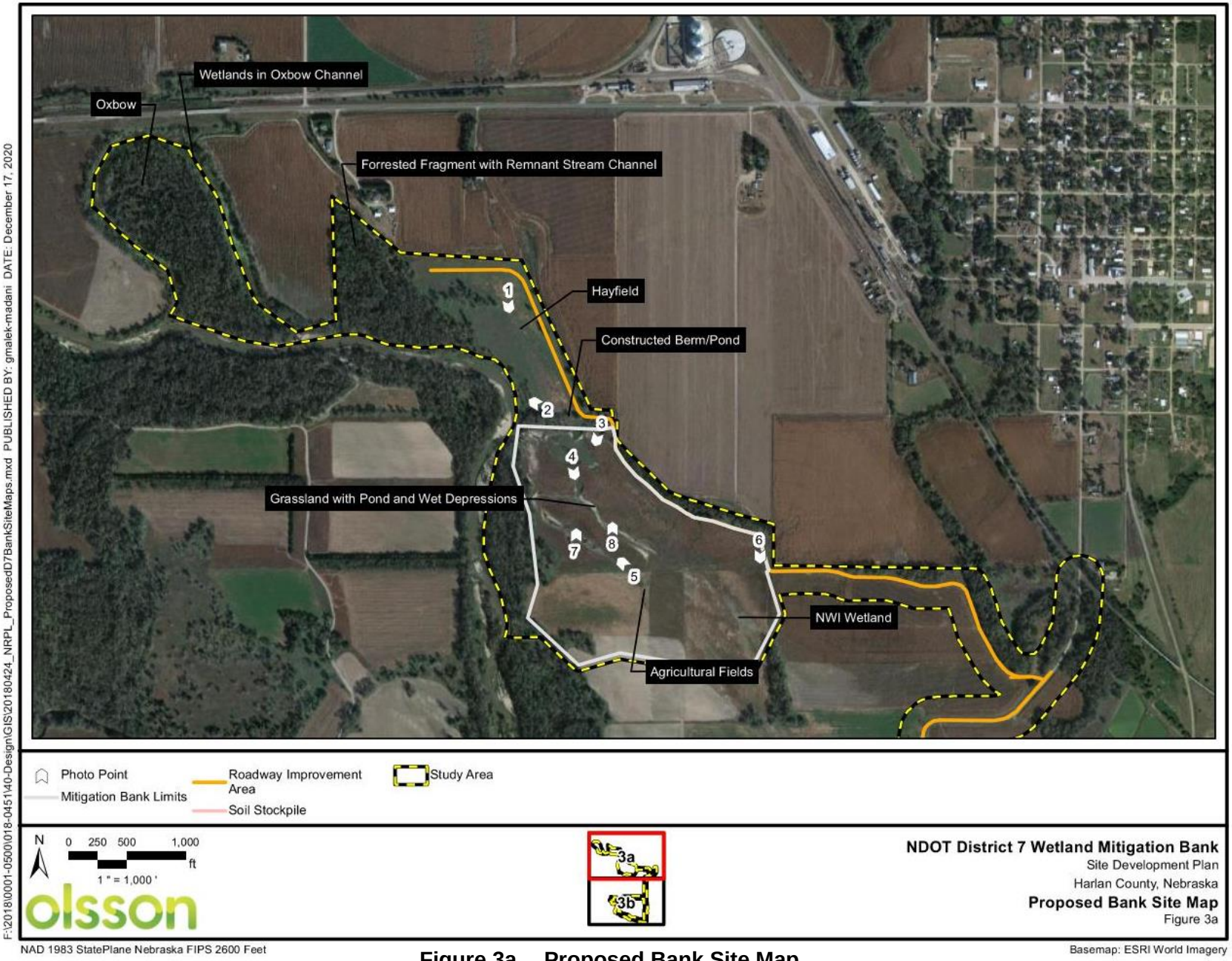

Figure 3a. Proposed Bank Site Map

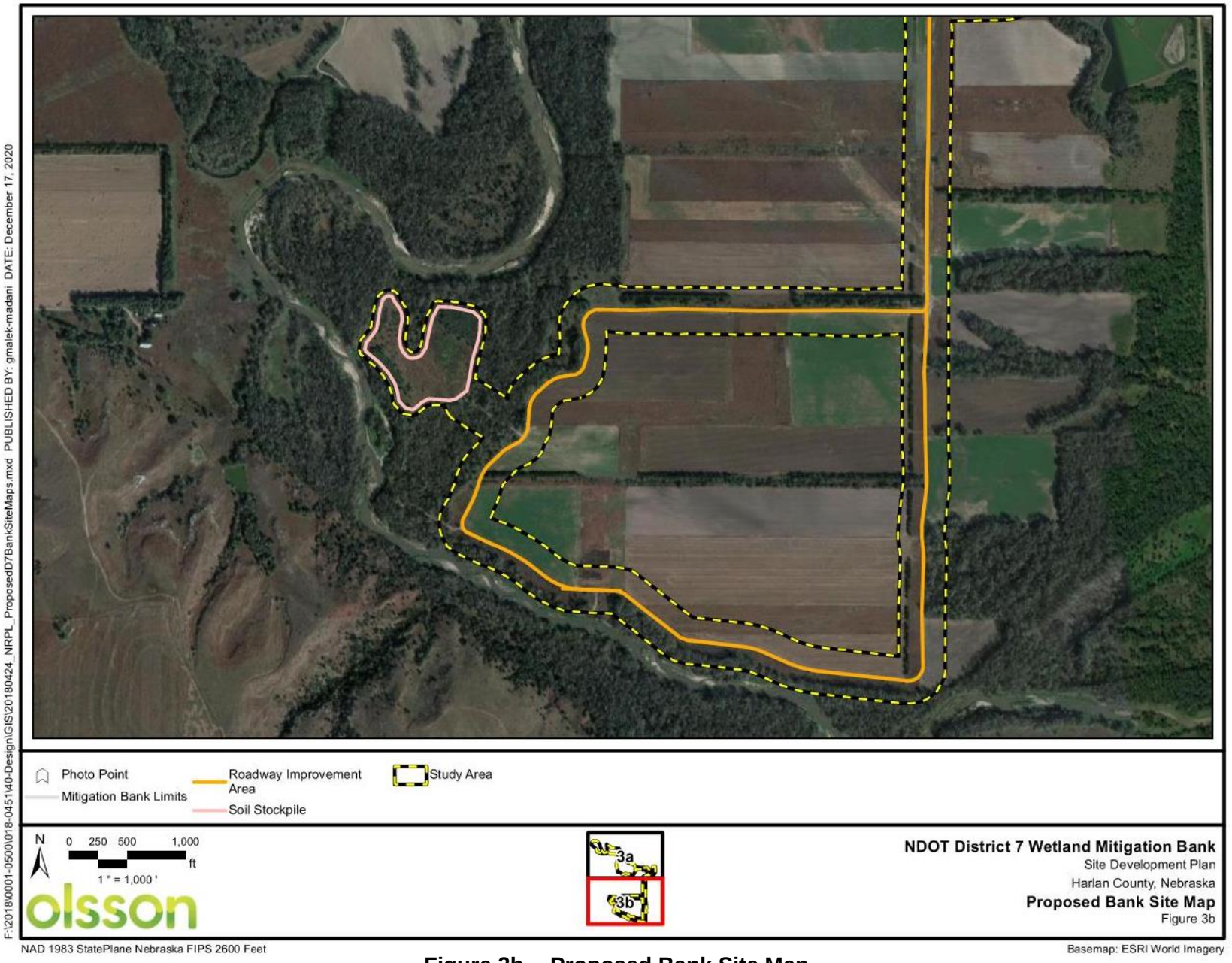

Figure 3b. Proposed Bank Site Map

1.2 Project Background

Due to unavoidable wetland impacts for future planned state roadway improvement projects, NDOT anticipates a shortage of available wetland mitigation bank credits. In 2015, NDOT completed a needs assessment to identify areas of the state that would be most deficient in wetland mitigation credits (NDOT 2015). The needs assessment compared the credit availability of existing NDOT wetland banks by service area versus the anticipated wetland impacts from projects identified in the NDOT State Transportation Improvement Plan (STIP). The study indicated four locations with immediate wetland credit deficiencies, including NDOT District 7. NDOT District 7 includes 13 counties in southwestern Nebraska. Based upon the expected location and quantity of future wetland impacts, the Harlan County Reservoir Watershed (HUC) 10250009) was identified as a preferred bank location providing a service area that could meet the needs of NDOT within this region of Nebraska. Much of this region of Nebraska is not currently served by any wetland mitigation bank. The needs assessment (NDOT 2015) projected wetland impacts within the proposed service area to range between 5-10 acres over a 20-year period. The vast majority of these impacts are assumed to be emergent wetlands located in roadside ditches based upon an analysis of previous projects within the service area combined with remote sensing modeling data.

A desktop selection study was completed in 2017 to identify potential mitigation bank sites within the watershed. The study identified 16 suitable privately-owned properties and ranked each based upon several qualitative and quantitative criteria. Additionally, field reconnaissance and GIS remote sensing techniques were used to identify areas throughout the watershed capable of supporting wetlands. These techniques were also used to locate potential new bank sites and evaluate previously identified sites (Figure 4). Concurrent with these investigations, federal, state, and local resource agencies, non-profit organizations, and other local watershed resources were informally engaged to aid in the identification of a suitable bank sites and/or project partners.

The sum of these efforts resulted in the identification of the proposed bank Site that is part of the Harlan County Lake USACE (Kansas City District) property. Coordination with the Harlan County Lake USACE office, USACE Kansas City District office, and the USACE Omaha District Regulatory office is on-going. Preliminary details regarding the proposed bank Site were presented to the Interagency Review Team (IRT) on May 8, 2018, along with a Site visit on June 5, 2018. In addition, a project update presentation was made at an NDOT interagency meeting on October 6, 2020.

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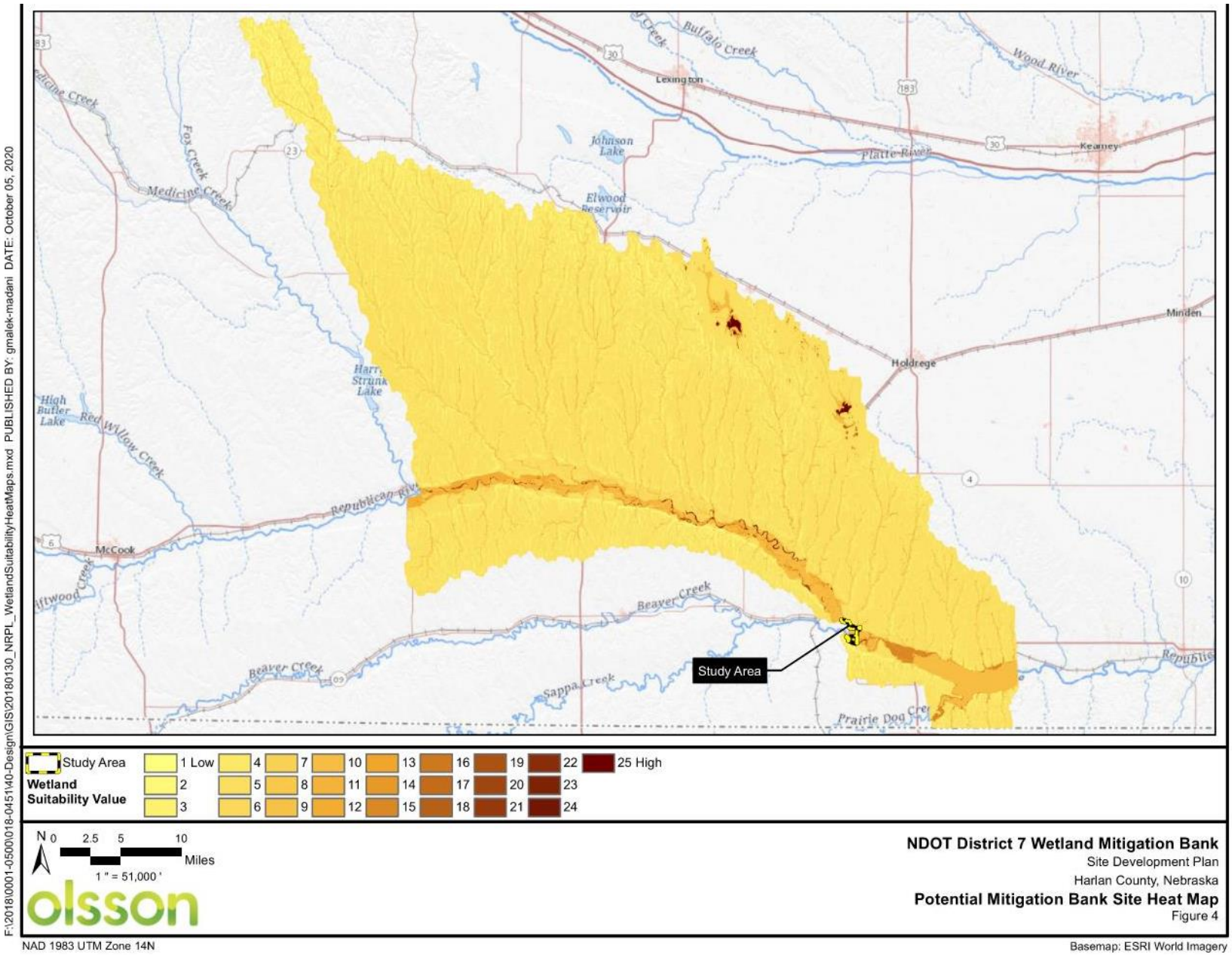

Figure 4. Potential Mitigation Bank Site Heat Map

1.3 Site Selection Factors

The following factors were considered when selecting this proposed Site to be included in the NDOT mitigation banking system:

Landscape Position and Elevation

Overall, the Site is generally flat, with the eastern portion of the Site (hayfield, seeded grassland, and agricultural fields; Figures 3a and 3b) decreasing slightly in elevation moving from north to south along the Republican River. Elevations throughout the Site are approximately 3-6 feet (ft) above the Republican River channel (1,973-1,978 ft above sea level [asl]), with elevations in wet linear depressions throughout the Site at approximately the same elevation as the Republican River channel (1,970-1,972 ft asl) (Figure 1). Other elevational changes throughout the Site are minor, or were constructed (constructed berm, pond, linear depressions).

Available Hydrology

The Site is entirely contained with the historic floodplain of the Republican River. Evidence of overland flow across parts of the Site during out-of-bank high water events can be seen on historic aerial imagery (1950 shown in Figures 5a and 5b, 1973 shown in Figure 6a and 6b) and was confirmed through personal communication with Harlan County Lake USACE Staff. Linear depressions throughout the Site have a subsurface hydrologic connection. Excavation throughout the Site would enhance and expand the subsurface hydrology connection as a primary hydrology source. Based upon surface water regulations regarding the watershed (Republican River Compact Final Settlement Stipulation 2002), there would be no direct surface water connection to the Republican River; however, naturally occurring overland flow from high-water events would provide a secondary source of hydrology. Additional information regarding Site hydrology can be found in Section 2.7 and 3.1.

Technical Feasibility and Sustainability

It is anticipated that the proposed bank location provides ample groundwater hydrology to support an emergent wetland system. It is unlikely the Site would require water control structures or other engineered elements to sustain a functional wetland system. The Site would be regraded, and the elevation lowered, to decrease the depth of groundwater, thereby promoting the development of groundwater-supported wetland communities. Elevational changes required to promote wetland hydrology have been determined by on-Site groundwater well data collected over 2018-2019 (see Section 2.7 and 3.1). In terms of long-term stability, operation and maintenance requirements are assumed to be minimal.

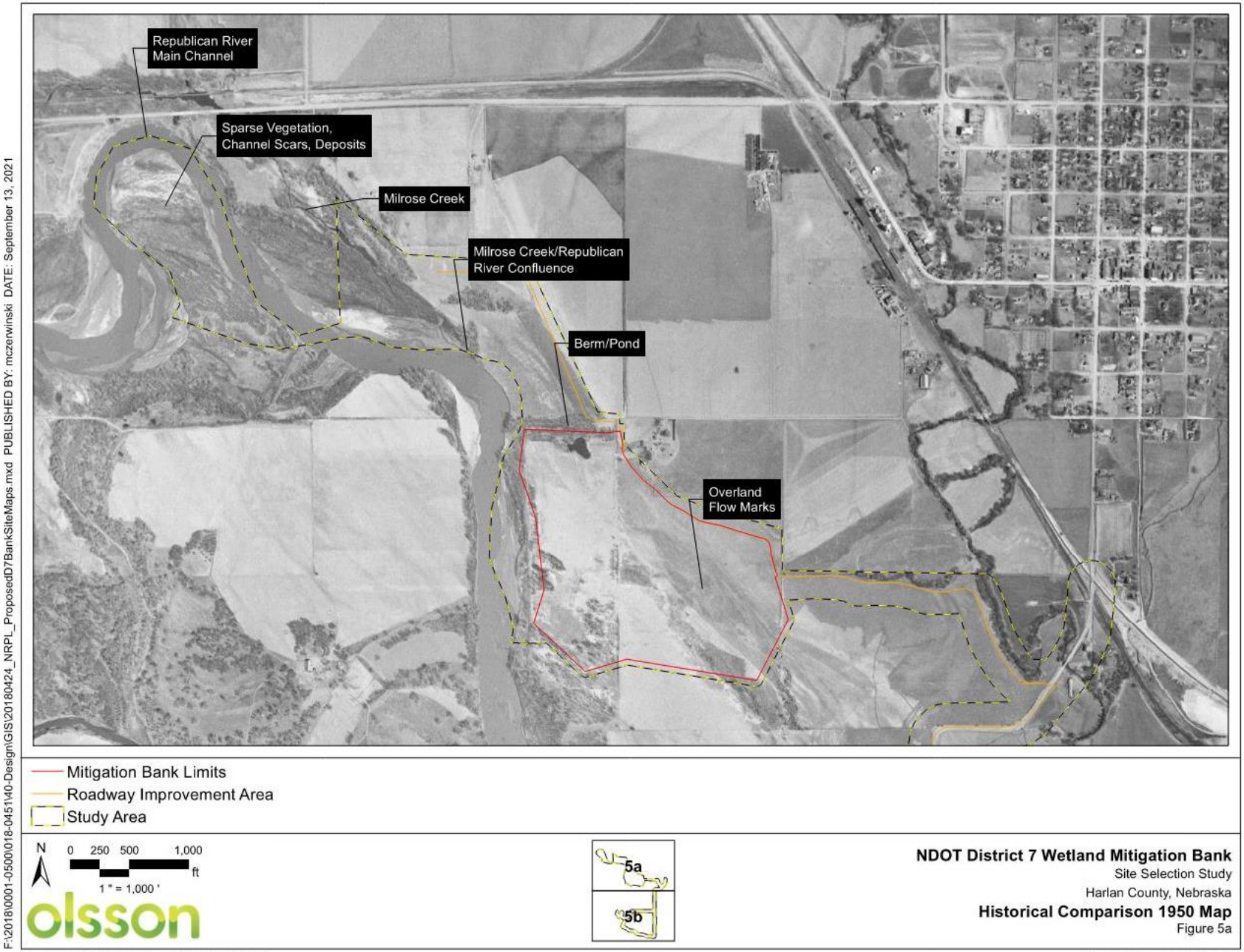

Figure 5a. Historical Comparison 1950 Map

Figure 5b. Historical Comparison 1950 Map

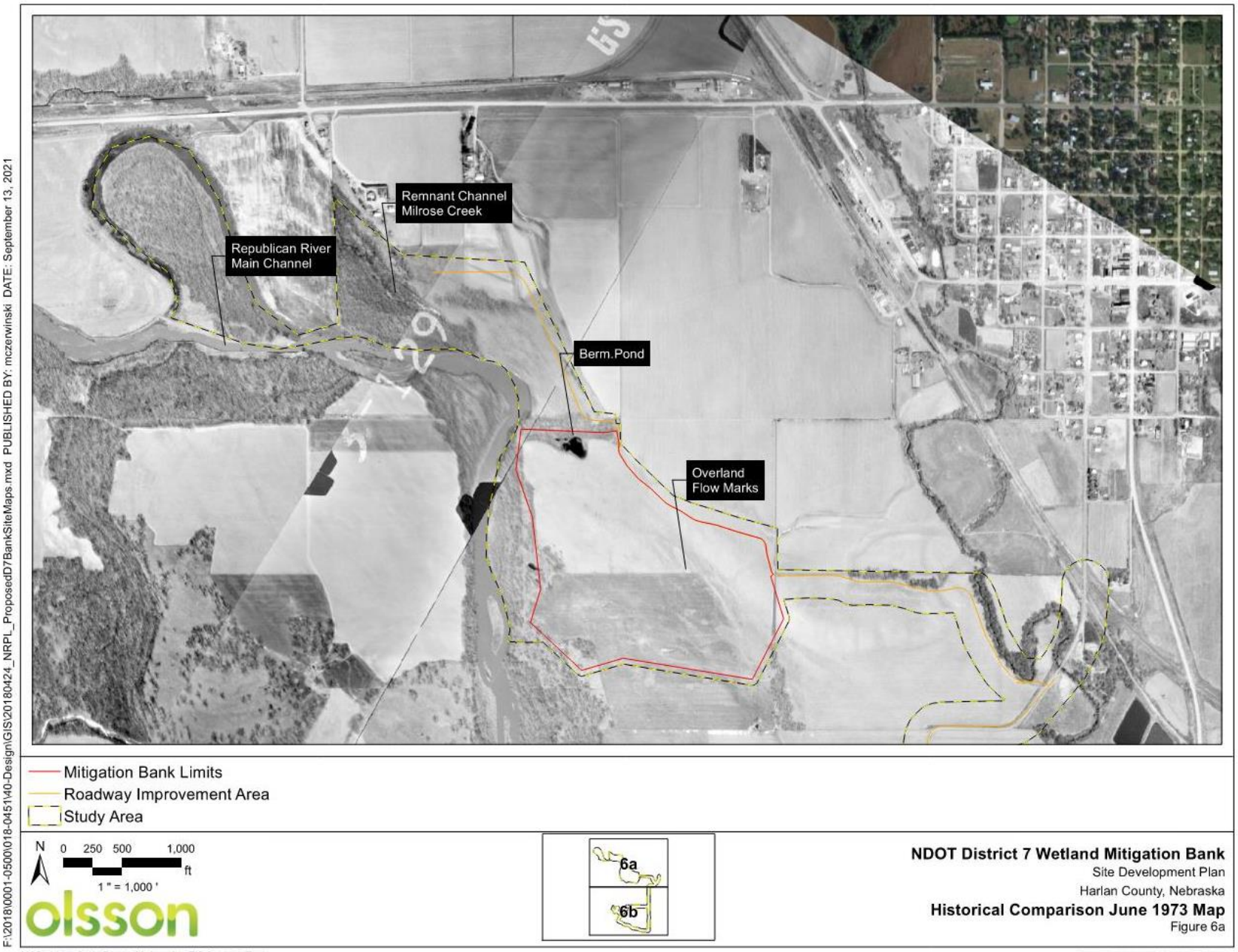

Figure 6a. Historical Comparison 1973 Map

Figure 6b. Historical Comparison 1973 Map

Ability to Support Desired Wetland and Watershed Functions

The proposed bank would support emergent wetland vegetation and associated shallow water habitat that would support aquatic life. The bank would also provide watershed functions such as flood control and nutrient and sediment management. The Site is also nested within the Republican River floodplain and is part of an extensive ecological complex complete with oxbow channels, riparian corridors, floodplain depressional wetlands, forested remnants, and native upland grasslands and shrublands. The proposed bank would contribute to the ecological complexity and diversity of the region and watershed.

Site Availability

The Site is currently owned and managed by the USACE as part of the Harlan County Lake reservoir. The Harlan County Lake USACE intends to allow NDOT to use the Site for wetland mitigation under a real estate license, with the USACE retaining ownership. The Harlan County Lake USACE has expressed interest in developing wetland habitats on their property to enhance habitat quality and diversity across the Site. Section 7.0 outlines the roles and responsibilities of NDOT and the Harlan County Lake USACE regarding the operation and maintenance of the proposed bank.

Site Constraints

Initial coordination with the Harlan County Lake USACE and Kansas City USACE have indicated that a real estate license would be issued allowing NDOT to use federal lands for the purposes of wetland mitigation. Unlike a conservation easement or other instrument that could be applied in perpetuity, the real estate license would be issued for a set timeframe (10-15 years) with the option for renewal. More permanent methods of Site protection would not be allowed on Federal lands and this alternative agreement would need to be approved by the USACE Omaha District Regulatory office and the IRT.

In addition, the wetland mitigation bank would need to permit public access and allow activities (e.g., hunting and fishing) consistent with that allowed across the entire Harlan County Lake USACE property.

1.4 Purpose, Goals, and Objectives

The primary purpose of the proposed bank is to provide certified wetland mitigation credits available to compensate for planned and future unavoidable wetland impacts resulting from NDOT projects. The bank is needed to support the future transportation infrastructure needs of the public that often results in unavoidable impacts to waters of the United States requiring compensatory mitigation in accordance with 33 CFR 332. The proposed bank is intended to be used for NDOT projects only.

The goals and corresponding objectives of this Draft Site Development Plan are as follows:

Goal No. 1: Enhance, establish, and restore self-sustaining PEMA/C FD wetlands. Site-specific objectives are as follows:

- Enhance approximately 2.00 acres of existing wetland as PEMA/C FD wetlands.
- Establish approximately 55.22 acres of new PEMA/C FD wetland.
- Restore approximately 3.41 acres of farmed wetland areas as PEMA/C FD wetlands.

Goal No. 2: Establish a consistent upland buffer surrounding the aquatic resources. Specific objectives include creating an upland buffer with a mix of native herbaceous species.

- Establish a 50-foot buffer (approximately 8.59 acres) of upland buffer surrounding the mitigation bank wetlands. The upland buffer would act to filter sediment and agricultural contaminants prior to surface water runoff reaching the restored wetland areas and would act as a barrier to invasion by potential unwanted plant species.

1.5 Geographic Service Area

The geographic service area (GSA) is the geographic region in which a mitigation bank is authorized to provide compensatory mitigation required by USACE permits. The following are the guidelines set forth in NDOT's Umbrella Mitigation Banking Agreement (NDOT 2017) for GSA establishment:

"In general, the GSA for a site will consist of the portion of the HUC 8 containing the site and portions of adjacent HUC 8s to the site that are located in the same EPA Eco-Region Level IV as the site. No consideration will be given to the area where the EPA Eco-Region Level IV extends across the boundary of the HUC 6 containing the bank. However, sites located near river confluences with adjacent HUC 6 boundaries may be reviewed by USACE for consideration to the method. Any portion of an adjacent HUC 8 that is not located within the boundary of the EPA Eco-Region Level IV containing the bank site will not be considered part of the service area. The Site Development Plan will provide the proposed GSA boundary based on this methodology with refinements to Level IV Ecoregion boundaries based on more detailed landscape or on-site information. The rationale for this approach is to take into account for the scale at which the Level IV Ecoregions were developed as compared to actual landscapes."

The proposed bank is located in the HUC 10250009 – Harlan County Watershed and the Central Great Plains – Rolling Plains and Breaks EPA Level IV Ecoregion (Figure 2).

Based on these guidelines, the GSA for the proposed bank includes the following geographic areas:

- Harlan County reservoir HUC 8 watershed (10250009) within the Central Great Plains – Rolling Plains and Breaks EPA Level IV Ecoregion

- Middle Republican HUC 8 watershed (10250016) within the Central Great Plains – Rolling Plains and Breaks EPA Level IV Ecoregion
- Beaver HUC 8 watershed (10250014) within the Central Great Plains – Rolling Plains and Breaks EPA Level IV Ecoregion
- Upper Republican HUC 8 watershed (10250004) within the Central Great Plains – Rolling Plains and Breaks EPA Level IV Ecoregion
- Medicine HUC 8 watershed (10250008) within the Central Great Plains – Rolling Plains and Breaks EPA Level IV Ecoregion

The extent of the proposed service area for the proposed bank is shown on Figure 7.

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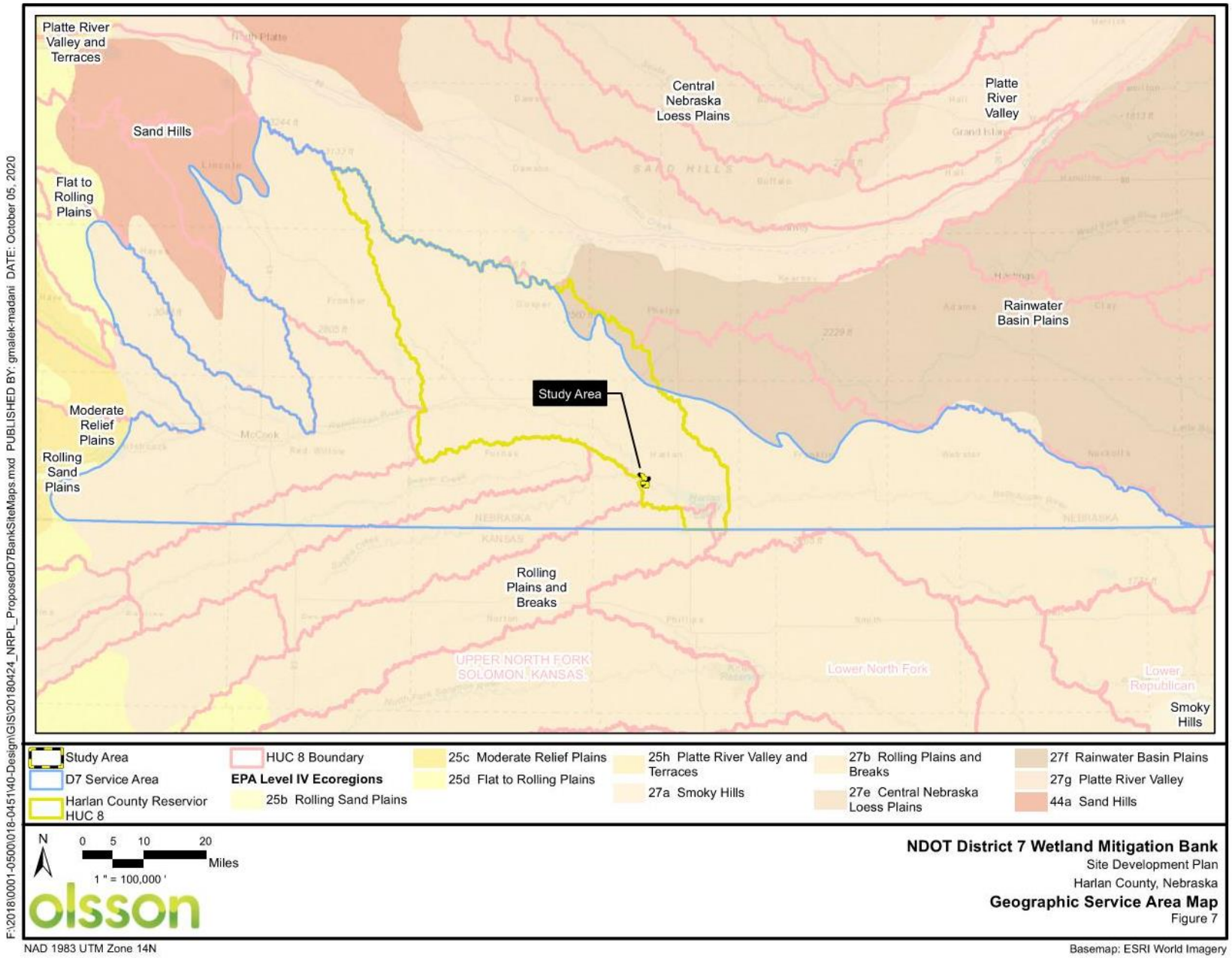


Figure 7. Geographic Service Area Map

1.6 Financial Assurances

Pending an approved real estate license granting NDOT use of the Harlan County Lake USACE property; responsibilities of each party are assumed to be as follows:

NDOT would be responsible for all tasks associated with Site development, construction, maintenance, management, and approval. These tasks include those listed in Section 3.0 Construction Work Plan, Section 4.0 Performance Standards, Section 5.0 Monitoring Requirements, Section 6.0 Contingency Plans and Remedial Actions, and Section 7.0 Long-Term Management Provisions. NDOT would provide adequate funding for these tasks. NDOT is a governmental unit with taxing authority and the financial capability to implement mitigation banking. Thus, NDOT has access to the necessary financial resources to fund Site development needs, including long-term management and unforeseen events. A letter regarding funding is provided in Appendix I. Total construction costs are expected to be approximately $2.8 million. The exact maintenance/management costs are not known at this time, but NDOT would expect to spend $5,000 to $10,000 annually for maintenance and monitoring during the 5-year monitoring period. For the life cycle of a bank this size, estimates for total maintenance and management costs would likely be under $200,000.

The Harlan County Lake USACE would be responsible for ownership of the Site and the overall management and long-term basic maintenance of their property according to Title 36 – Rules and Regulations Governing Public Use of Corps of Engineers Water Resources Development Projects. The Harlan County Lake USACE currently owns and would continue to own the property, maintain full control of the property, and manage the property based upon their responsibilities as property owner within the guidelines set forth and allowed by this Site Development Plan and the real estate provisions, unless the property is deemed needed for other federal uses. The Harlan County Lake USACE would be responsible for securing adequate funding for normal operation and maintenance of their property based upon their responsibilities as property owner. These USACE responsibilities are separate from the NDOT responsibilities outlined within this Site Development Plan specific to development, construction, maintenance, management, and approval of the bank, and are related to everyday USACE operation, maintenance, and management of the Harlan County Lake USACE property itself. The Harlan County Lake USACE is a governmental unit with financial capability and resources to successfully implement long-term management of their property. Furthermore, the Harlan County Lake USACE currently manages approximately 31,000 acres, include the proposed bank location.

NDOT and the Harlan County Lake USACE would provide appropriate documentation of its long-term management plan regarding bank management and maintenance to the USACE Regulatory Branch (Omaha District) and the IRT. A draft long-term management plan is included in Appendix H.

1.7 Real Estate Provisions for Bank Protection

The Harlan County Lake USACE would maintain sole ownership of the wetland mitigation bank. NDOT and the Harlan County Lake USACE would establish a real estate license or similar instrument, granting NDOT use of the property for wetland mitigation purposes. The real estate license and supporting documents will outline the conditions of NDOT's use and protections afforded to the proposed bank's wetland functions (by deterring development or practices that could handicap its functionality) prior to the release of credits for mitigation purposes. NDOT and the Harlan County Lake USACE shall submit the draft real estate license to USACE Regulatory Branch (Omaha District) for review. NDOT and the Harlan County Lake USACE shall also provide copies of the signed agreement and the executed real estate document to USACE Regulatory Branch (Omaha District) upon execution.

Note: NDOT has coordinated extensively with the Harlan County Lake USACE, the USACE Kansas City District Office, and the USACE Regulatory Branch (Omaha District) regarding a real estate instrument. A real estate license is the ONLY real estate instrument available on federal property.

The following outlines the general requirements of the real estate license and supporting documents, or similar instrument:

- There shall be no construction or placement of structures or mobile homes, fences, signs, billboards or other advertising material, or other structures, whether temporary or permanent, on the land.
- There shall be no tilling, draining, excavating, dredging, mining, drilling or removal of topsoil, loam, peat, sand, gravel, rock, minerals, or other materials.
- There shall be no building of roads or paths for vehicular or pedestrian travel or any change in the topography of the land aside from those depicted in the approved mitigation plan.
- There shall be no removal, destruction, or cutting of trees or plants, spraying with biocides, insecticides, or pesticides, grazing of animals, farming, tilling of soil, or other agricultural activity aside from those activities included in the approved management plan. Management activities are acceptable upon approval from the USACE. Noxious weed control is allowed but must be documented in monitoring.
- There shall be no operation of all-terrain vehicles or any other type of motorized vehicle on the land, except for pre-existing access or constructed access in the approved mitigation plan. All-terrain vehicles may be used for maintenance and monitoring by Harlan County Lake USACE staff.
- Public access would be maintained, with limited vehicle access as previously discussed. Activities such as hunting and fishing would continue to be allowed according to the rules and regulations outlined by the Harlan County Lake USACE. The area is open to all forms of public hunting and fishing permitted by the NGPC to include all permits, bag limits, and fishing and hunting regulations. This is consistent with all other areas of Harlan County Lake USACE lands. Special regulations or changes are handled on a case-by-case basis

and are communicated with NGPC annually and are posted on permits, websites, local signage, and agency websites.

- The real estate license, or similar instrument, may be changed, modified or revoked only upon written approval of the District Engineer of the USACE Regulatory Branch (Omaha District) to assure compliance with wetland mitigation bank requirements.
- The length and terms of the agreement are limited to that allowed by Harlan County Lake USACE and USACE Kansas City District, with the expectation that the agreement would be renewed in perpetuity, barring any conflicting federal need for an alternative use of the Site.

It is anticipated that these conditions would be incorporated into the final real estate license or supporting management plan. Being the grantor of the real estate license, the Harlan County Lake USACE and USACE Kansas City District have ultimate authority to enforce the provisions and requirements of the real estate license.

1.8 Implementation Schedule

Construction would not commence until a Final Site Development Plan, Long-Term Management Plan, and Real Estate Agreement (real estate license or similar instrument) have been approved by the appropriate parties (USACE Regulatory Branch [Omaha District], the Harlan County Lake USACE, USACE Kansas City District and NDOT).

Final certification of the wetland mitigation bank credits would not be requested until the USACE Regulatory Branch (Omaha District) verifies that the bank meets all bank performance standards. Once the USACE Regulatory Branch (Omaha District) determines that all bank performance standards have been met, wetland mitigation bank credits would be requested for wetlands that have shown consistent establishment, enhancement, or restoration at the bank.

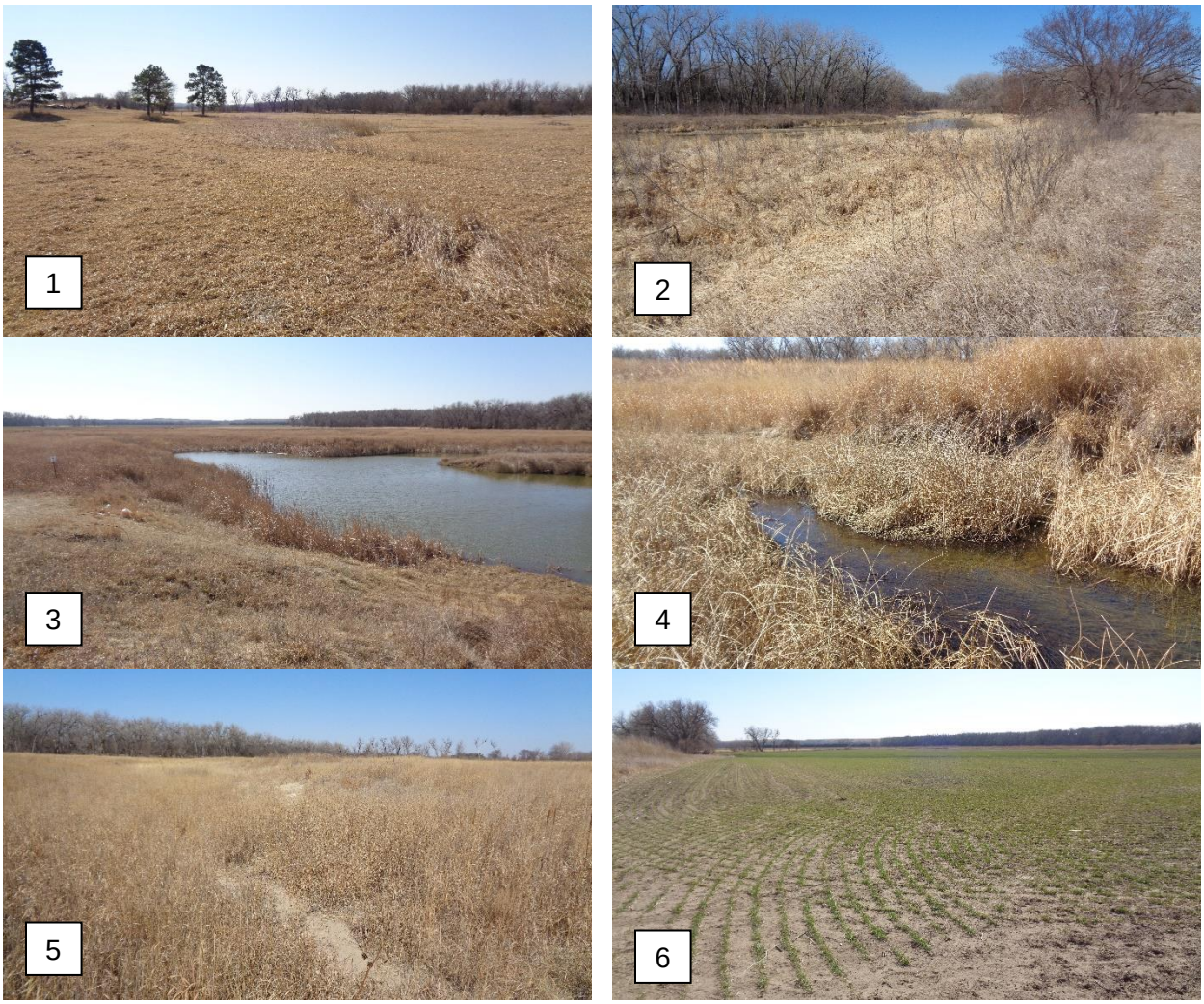
2. BASELINE DESCRIPTION OF MITIGATION BANK

2.1 General overview

The proposed bank is in Harlan County, Nebraska approximately 0.75 miles southwest of the City of Orleans (Figures 1 and 3a) at approximately 40.122995° latitude, -99.471144°longitude. The Site is near NE HWY 89 and can be accessed via a two-track road from South Republican Avenue just outside the southern boundary of Orleans. The Site is located upstream of Harlan County Lake Reservoir and is within the historic floodplain of the Republican River (Figures 1 and 3a).

The Site is approximately 70 acres in size and is located on property that is owned by the USACE (Figure 3a). The western boundary of the Site abuts the Republican River for approximately 0.35 miles in length (Photograph 2). The northern boundary of the Site abuts both USACE owned property and privately owned land that is currently planted in row crops or hayed. A constructed berm is located at the northern boundary of the Site. South of the berm is a 45-acre area consisting of a forested patch abutting the Republican River transitioning to a seeded grassland

(dominated by *Panicum virgatum*). The grassland contains a pond and some linear depressions that have developed into wetlands (*Phragmites sp., Carex sp., Schoenoplectus sp*.) (Photograph 3, 4, & 5). South of the seeded grassland are two agricultural fields totaling approximately 30 acres in size with some shallow linear depressions (Photograph 6). These depressions lead into a mapped National Wetlands Inventory (NWI) Palustrine Emergent Temporary Flooded (PEMA) wetland located at the southeast corner of the bank that is currently farmed (Figure 3a).



Photographs 1-6: Photograph locations are shown on Figure 3a. (1) Hayfield looking south from north of the proposed bank. (2) Looking northwest toward the floodplain bench of the Republican River. (3) Pond and seeded grassland looking south from a constructed berm. (4) Wetland depression located within the seeded grassland looking south. (5) wetland depression in seeded grassland looking northwest. (6) Agricultural field at the southeastern corner of the project looking south toward mapped NWI wetland location.

2.2 Bank History

The Site is in the Central Great Plains – Rolling Plains and Breaks EPA Level IV Ecoregion (Figure 2). This ecoregion was "historically a mixed grass prairie. Today, a mosaic of cropland agriculture

and rangeland occurs throughout the region. Soils are silty, well drained, deep, and moderately permeable; formed in loess on uplands" (Chapman et. al. 2001). The Site characteristics appear to align with Western Great Plains Floodplain and/or Western Great Plains Saline Depression Wetlands Ecological Systems as described in Rolfsmeier and Steinauer (2010), both of which are known to occur within the Rolling Plains and Breaks EPA Level IV Ecoregion and are thought occur within the Republican River system. Potential evidence of saline or alkaline soil conditions was observed within some of the linear depressions within the seeded grassland near the eastern portion of the bank (Photograph 7 & 8).

Photographs 7 & 8: Possible salt crust or saline conditions found in the linear depressions within the seeded grassland. Photograph locations are shown on Figure 3a.

A review of historical imagery (Figures 5a & 5b) shows Milrose Creek previously flowed into the study area from the north, originally running through the forested fragment south of NE HWY 83 before reaching the Republican River near the hayfield located just north of the proposed Site (Figure 5a). Prior to 1973, a berm and diversion channel were built to redirect Milrose Creek into the oxbow channel immediately south of NE HWY 83 (Figure 6a). The remnant stream channel identified in the forested fragment east of the oxbow was the original path of Milrose Creek (Figure 3a).

The constructed berm and pond toward the northern edge of the Site are present dating back to at least 1950 (Figure 5a). Discussion with Harlan County Lake USACE staff indicates that the berm was most likely constructed to redirect flood waters, preventing out-of-bank Republican River flows from running to the southeast across the adjacent seeded grassland and agricultural fields. Channel scars and flow lines are visible in these areas (Figure 3a, 5a, and 6a).

2.3 Aquatic Resources

Wetlands within the study area were delineated using the comprehensive method detailed in the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Great Plains Version 2.0 (March 2010) (Appendix A). Wetland areas were classified according to Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) and associated Nebraska Wetland Subclasses (LeGrange 2010). The wetland delineation report is included in Appendix A. Please note that the wetland delineation report

included in Appendix A assessed a study area that includes the proposed mitigation bank location (Site), road improvement areas, and spoil stockpile location. Desktop resources including NWI and National Hydrography Dataset information mapped across the study area and within the Site are included in Figure 8.

It was determined that eight wetlands, totaling 5.59 acres, currently exist within or directly adjacent to the Site (See Table 1, Figure 9, and the wetland delineation report included in Appendix A). Two of the wetlands were identified as Palustrine Emergent Temporarily Flooded (PEMA) wetlands, and six as Palustrine Emergent Temporarily/Seasonally Flooded (PEMA/C) wetlands. One open water was also identified (1.31 acres; Table 2). Open water features within the proposed mitigation bank Site location were previously excavated areas that have developed into small ponds. Emergent wetlands within the mitigation bank Site were primarily dominated by an unknown bulrush (*Scirpus sp.*), switchgrass (*Panicum virgatum*), foxtail barley (*Hordeum jubatum*), narrowleaf cattail (*Typha angustifolia*), softstem bulrush (*Schoenoplectus tabernaemontani*), common reed (*Phragmites australis*). These wetlands were primarily located in low areas supported by groundwater. See Figures 2A-2S in Appendix A for detailed wetland delineation maps.

No stream channels were identified within the proposed mitigation bank Site. The proposed mitigation bank Site is adjacent to the east bank of the Republican River. There were also no wetlands or stream channels identified in road improvement areas or excess spoil stockpile areas.

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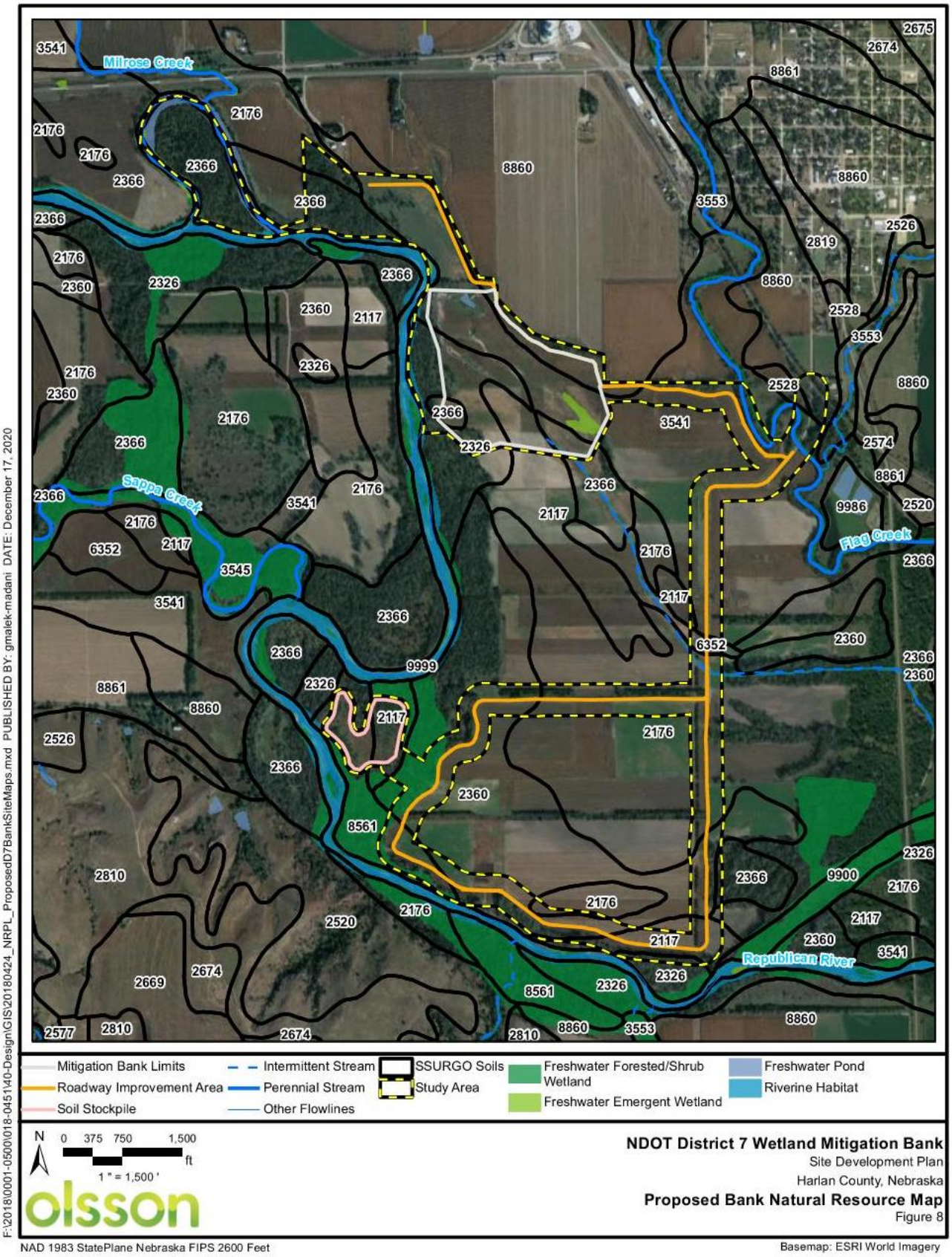

Figure 8. Proposed Bank Natural Resource Map

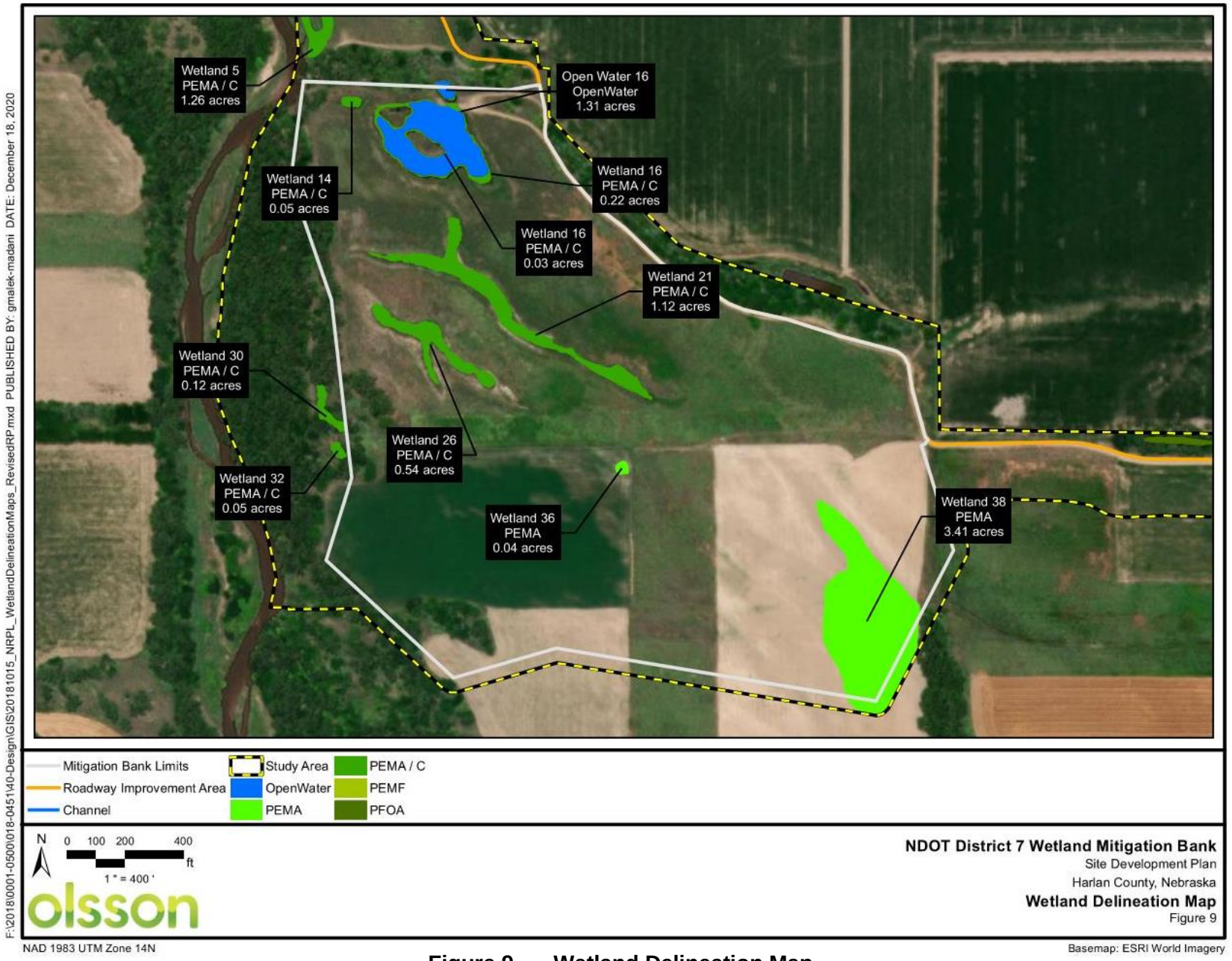

Figure 9. Wetland Delineation Map

Table 1. Delineated Wetlands Within or Adjacent to the Proposed Mitigation Bank Footprint (Site)

Wetland ID	Wetland Classification[3] (Cowardin | Nebraska Subclass)	Area (acres)
14	PEMA/C | Floodplain Depression	0.05
16	PEMA/C | Floodplain Depression	0.26
21	PEMA/C | Floodplain Depression	1.12
26	PEMA/C | Floodplain Depression	0.54
30	PEMA/C | Floodplain Depression	0.12
32	PEMA/C | Floodplain Depression	0.05
36	PEMA | Floodplain Depression	0.04
38	PEMA | Floodplain Depression	3.41
Totals		**5.59**

Table 2. Other Water Resources Within the Proposed Mitigation Bank Footprint (Site)

Open Water ID	Type	Area (acres)
16	Open Water	1.31

2.4 Protected Species

Consultation with U.S. Fish and Wildlife Service (USFWS) and the Nebraska Game and Parks Commission (NGPC) is on-going. USFWS and NGPC have been given opportunity to comment on the proposed bank as part of the IRT involvement. To date, informal consultation with USFWS and NGPC has indicated that construction of the wetland mitigation bank "May Affect, Not Likely to Adversely Affect" the federally-listed whooping crane and northern long-eared bat with implementation of conservation conditions (Appendix B).

An active bald eagle nest is located just north of the Site. Construction would not be allowed to occur during February and March to avoid disturbance of eagles during this critical nest initiation timeframe, and to allow trees to leaf-out, which would provide further screening from project activities. Construction activities would also not occur within 330 feet of the nest if found to be active at the time of construction.

Tree clearing is not anticipated; however, NDOT would follow protocols and procedures that have been outlined in an Avian Protection Plan to reduce conflicts between construction of NDOT projects and the laws governing migratory birds should unanticipated tree clearing be required.

NDOT requested Early Coordination under the Fish and Wildlife Conservation Act. Responses were received from USFWS and NGPC expressing no objection with NDOT's proposed avoidance and minimization plan regarding bald eagle nests and no additional comments regarding the proposed wetland mitigation bank Site (Appendix B).

Please note that protected species coordination included in Appendix B does not include an evaluation of the roadway and spoil stockpile locations. Updated coordination will be provided when available.

2.5 Cultural Resources

A desktop review of currently available data from the National Register of Historic Places (NRHP) and the Nebraska State Historic Preservation Office (SHPO) identified four registered historic properties and structures in Harlan County, NE. Details for the properties can be found in Table 3. The project is not anticipated to impact any of these registered historic properties. There were also no publicly documented archeological sites present within the Site.

Table 3. Registered Historic Properties, Harlan County, Nebraska

Name on Historic Register	Location	Distance from Project
Alma City Auditorium and Sale Barn	614 Main Street, Alma	5.8 miles
Prairie Dog Creek Bridge	Township Road H, 8.5 miles south of Orleans	8.1 miles
Sappa Creek Bridge	County Road D, 2 miles east of Stamford	3.6 miles
Turkey Creek Bridge	County Road 722, 2 miles southwest of Ragan	13.6 miles

Beyond a preliminary desktop review, a standing structures and archeological evaluation was conducted by NDOT. In addition, tribal coordination was coordinated by the USACE Kansas City District. The field evaluations and tribal coordination resulted in a determination of "no historic properties affected". Both the SHPO and USACE Kanas City District concurred with this determination. Cultural resource documentation and coordination is included in Appendix B.

2.6 Soils

According to the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database for Harlan County, Nebraska, there are five mapped soil types within the Site. Table 4 lists the soils mapped within the

boundaries of the Site, including whether or not they are considered hydric. Mapped soil locations for the larger study area including the roadway improvement areas are shown on Figure 8.

Established wetlands which will be counted towards mitigation credits will primarily be located in the Hobbs and McCook silt loams, occasionally flooded; and Inavale fine sandy loam, 0 to 3 percent slopes. These soil map units currently support existing wetlands on Site or generally have the potential to support wetland habitat.

The Hobbs and McCook silt loams, occasionally flooded map unit has a high available water capacity of about 11.9 to 12.5 or greater. This means that the soil map unit is capable of holding high amounts of water for plant use. The soil map unit also has a moderately high to high ability to transmit water which would allow for groundwater hydrology to move easily through the soil. Along with the occasional flooding frequency, this soil map unit is likely to support adequate hydrology for the development of wetlands.

The Inavale fine sandy loam, 0 to 3 percent slopes and Mujor Loamy fine sand, rarely flooded map units also have a high capacity to transmit water which means groundwater can easily move up the soil profile into the root zone. Although the available water capacity is low, the soils should still be sufficient in supporting wetland hydrology due to the availability of ground water moving through the Site before reaching the Republican River.

Overall, the soils within the Site currently support wetland characteristics and with minor excavation, should form hydric conditions and be sufficient in supporting wetland hydrology and hydrophytic vegetation. A geotechnical investigation of the Site was completed in October 2018 to obtain Site specific soil and groundwater data. In general, soils across the Site are characterized by a 3-inch topsoil layer on top of a cohesive allium layer 3-6 feet in depth comprised of sandy silt or silt with sand and were described as soft to firm, light gray or dark brown and moist containing varying amounts of fine to coarse sand. Cohesionless alluvium extending to a depth of 3 to 15 feet, comprised fine to coarse sand with varying amounts of silt and were described as loose to medium dense, light yellowish brown or dark gray and dry to wet. The geotechnical investigation is included in Appendix C.

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Table 4. Mapped Soils

Map Unit Symbol	Map Unit Name	Hydric Rating[1]	Hydrological Soil Group[2]
2117	McCook sand, occasionally flooded	0	B
2326	Inavale fine sandy loam, 0 to 3 percent slopes	1	A
2366	Munjor loamy fine sand, rarely flooded	1	A
3541	Hobbs and McCook silt loams, occasionally flooded	1	B
8860	Hord and Hall silt loams, 0 to 1 percent slopes	1	B

[1] This rating indicates the percentage of map units that meets the criteria for hydric soils.

[2] Group A soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission. Group B soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained, or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

2.7 Hydrology

Existing hydrology is limited due to the flatness of the Site's topography. There are no stream channels or Republican River tributaries running through the Site (see Section 3.1 for additional hydrology information). There is evidence that parts of the Site may receive out-of-bank flow from the Republican River during heavy precipitation and high-flow events. The Site is located within the 100-year floodplain of the Republican River and the USACE Harlan County Dam flood storage area (Figure 10). Wet areas are limited to the excavated pond, excavated linear wetlands, and a farmed wetland area. Hydrology in the excavated pond and wetlands appear to be primarily supported by groundwater.

Five piezometers were installed as part of the geotechnical investigation completed in October 2018. The piezometers were located within and adjacent to the Site to monitor groundwater depth and seasonal fluctuations to inform design of the wetland mitigation bank. Initial October 2018 groundwater levels across the Site ranged from 3.5 to 6 feet below surface. Location of the piezometers in relation to the proposed Site boundary is included in Figures 12 and 13. The geotechnical investigation is included in Appendix C. Groundwater depth data across the Site over the 2019 growing season is presented in Figure 11. Overall, groundwater water depth across the was found to fluctuate seasonally, with depth to groundwater increasing over the growing season. Spring depth to groundwater generally ranged from 0.5 to 4.5 feet below the surface, while fall and winter depth to groundwater ranged from 3 to 6.5 feet below the surface.

Figure 10. FEMA 100-yr Floodplain Map

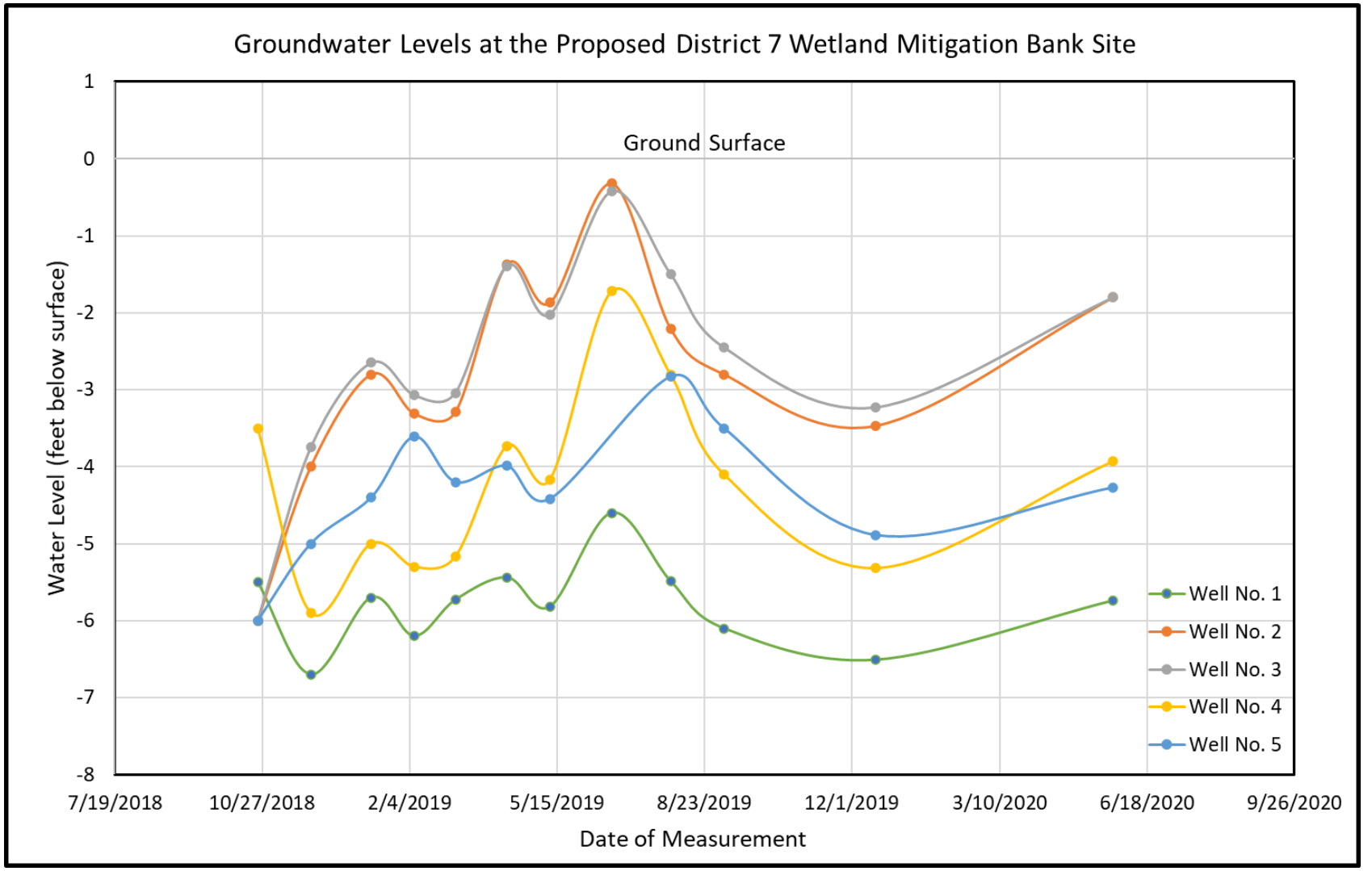

Figure 11. 2018-2020 Piezometer Groundwater Depths Across the District 7 Wetland Mitigation Bank Site

2.8 Vegetation

Vegetation observed across the study area includes:

- crop and hay fields including alfalfa, soybeans, and *Bromus inermis* (smooth brome grass);
- managed native grasslands primarily dominated by Panicum virgatum (switchgrass), Schizachyrium scoparium (little bluestem), Helianthus annuus (common sunflower),
- *Desmanthus illinoensis* (Illinois bundleflower) and other native herbs and graminoids; emergent wetlands dominated *Phalaris arundinacea (*reed canarygrass*), Typha angustifolia (*narrow leaf cattail*),* and *Schoenoplectus tabernaemontani* (softstem bulrush); and
- wooded riparian areas along the Republican River and oxbow dominated by *Populus deltoides* (Eastern cottonwood)*, Fraxinus pennsylvanica* (green ash)*, Juniperus, virginiana* (Eastern red cedar)*, Morus rubra* (red mulberry)*,* and *Ulmus spp.* (elm species)**.**

Additional information regarding vegetation observed and encountered across the study area can be found in the attached wetland delineation report (Appendix A).

3. CONSTRUCTION WORK PLAN

In general, the construction work plan consists of excavating soils and altering the elevation to promote wetland hydrology using available groundwater at the Site.

As previously discussed, work at the Site is expected to:

- Enhance approximately 2.00 acres of existing PEMA/C FD wetland areas as PEMA/C FD wetlands.
- Establish approximately 55.22 acres of new PEMA/C FD wetlands.
- Restore approximately 3.41 acres of farmed PEMA FD wetland areas as PEMA/C FD wetlands.
- Establish approximately 8.59 acres of upland buffer surrounding the mitigation bank wetlands. The upland buffer would act to filter sediment and agricultural contaminants prior to surface water runoff reaching the restored wetland areas and would act as a barrier to invasion by potential unwanted plant species.

Detailed construction drawings including refined wetlands acreages and habitat type, elevations, upland buffer locations, and seeding details are include in Appendix D (Sheets J13 and J16).

Constructing the proposed wetland mitigation bank will require the relocation of excavated soils that will be removed from the Site. Excavation activities within the Site will require removal of approximately 223,225 cubic yards of material to achieve the desired elevations to promote wetland development and maintain wetland habitat over time. Excess soil removed from the Site will be used to improve USACE access roads and/or stockpiled at a designated location identified

by the USACE. Roadway improvement areas and the stockpile location are shown on Figures 3a and 3b. The project would improve approximately 4.7 miles of roadway and stockpile material across an area approximately 11.7 acres in size. Specific engineering details regarding the roadway improvement and spoil location are included in Appendix D. Excavation and earth moving activities would be conducted with heavy machinery including bulldozers and scrapers. Scrapers would primarily be used to remove and relocate material from the Site to the proposed roadway improvement areas and designated spoil material stockpile location.

3.1 Hydrology

A preliminary water budget analysis was completed for the eastern half of the study area, including the hayfield, seeded grassland, and agricultural fields (Appendix E). On-Site and off-Site surface runoff appear to be insufficient to develop an extensive wetland complex, only supporting an estimated three acres of wetland. NDOT also assumes that a modified inlet, directing flow from the Republican River during high-water events into the Site, would not be permitted due to surface-water use restrictions along the Republican River. As a result, any created, restored, or enhanced wetland will be primarily supported by groundwater. Average depth to groundwater across the Site is approximately 4-5 feet based upon published data sources. This depth generally coincides with initial groundwater observations made in the field (See geotechnical investigation in Appendix C) and piezometer data collected from 2018 to 2020 as shown in Figure 11. Although soils are sandy across the Site and have limited water holding capacity, previously excavated areas have developed into wetland habitats throughout the Site.

To inform engineering design, piezometer data was analyzed to estimate the groundwater surface depth throughout the Site. Estimated groundwater elevations across the Site, based upon the piezometer data, are shown in Figure 12. Groundwater elevations throughout the Site range from approximately 1970 feet above sea level (asl) at the north end of the Site to 1968 feet asl at the south end of the Site.

Post-construction grading and elevations were developed to intercept groundwater throughout the Site to create multiple hydrology scenarios with some areas graded to elevations below the expected groundwater levels, and other areas graded to elevations between 0-24 inches above the expected groundwater surface. Post-construction depth to groundwater is shown on Figure 13. Variations in elevations through the Site were developed to promote the establishment of diverse mosaic of wetland microhabitats and plant communities. Certain areas would potentially be inundated with 12-18 inches of water at certain times of the year, while other areas would never be inundated but would have adequate subsurface hydrology to promote wetland development. Final grading and elevations were determined to create slow gradual transitions with regards to available hydrology across the site, with the intention of developing a diverse mosaic of wetland habitats.

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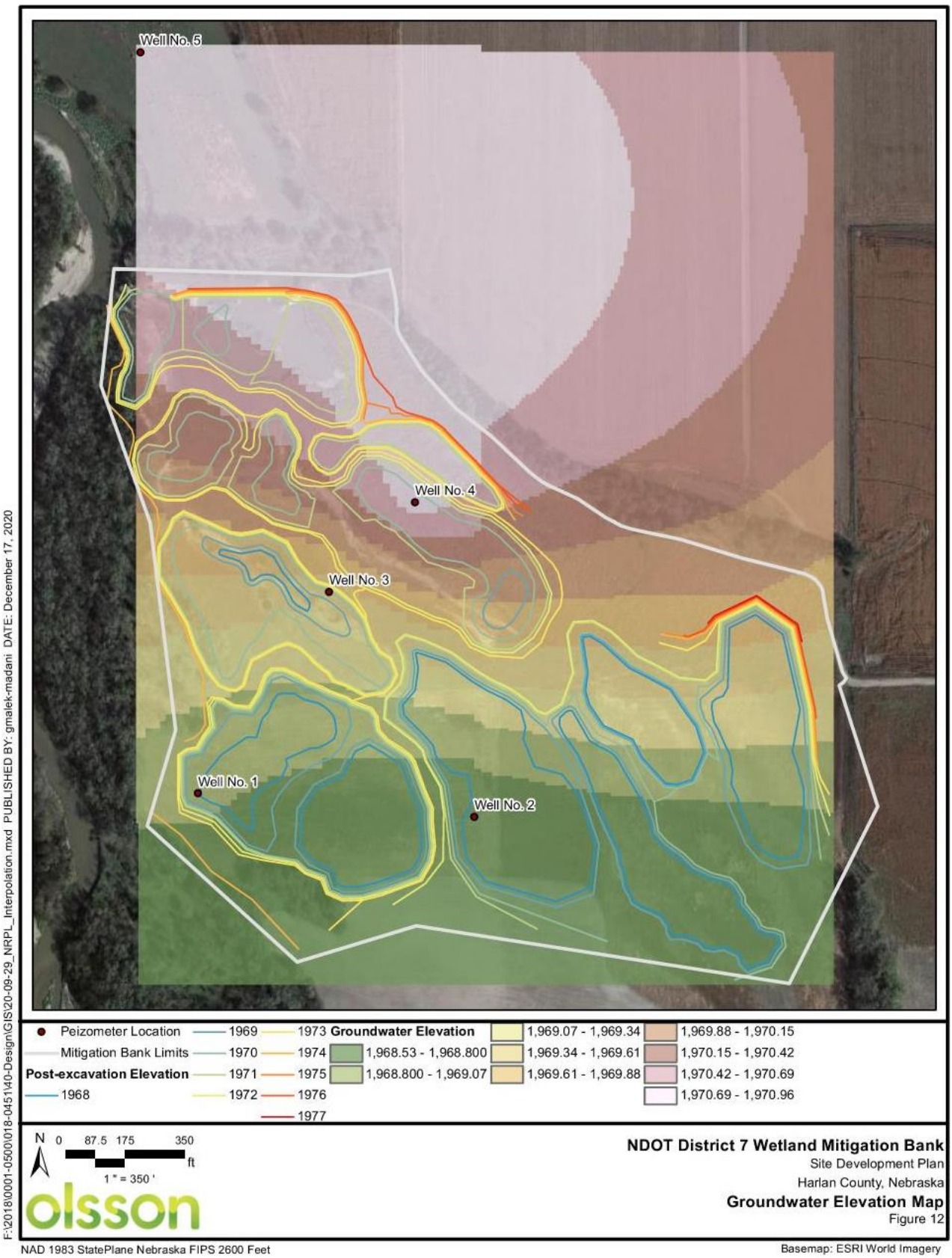

Figure 12. Groundwater Elevation Map

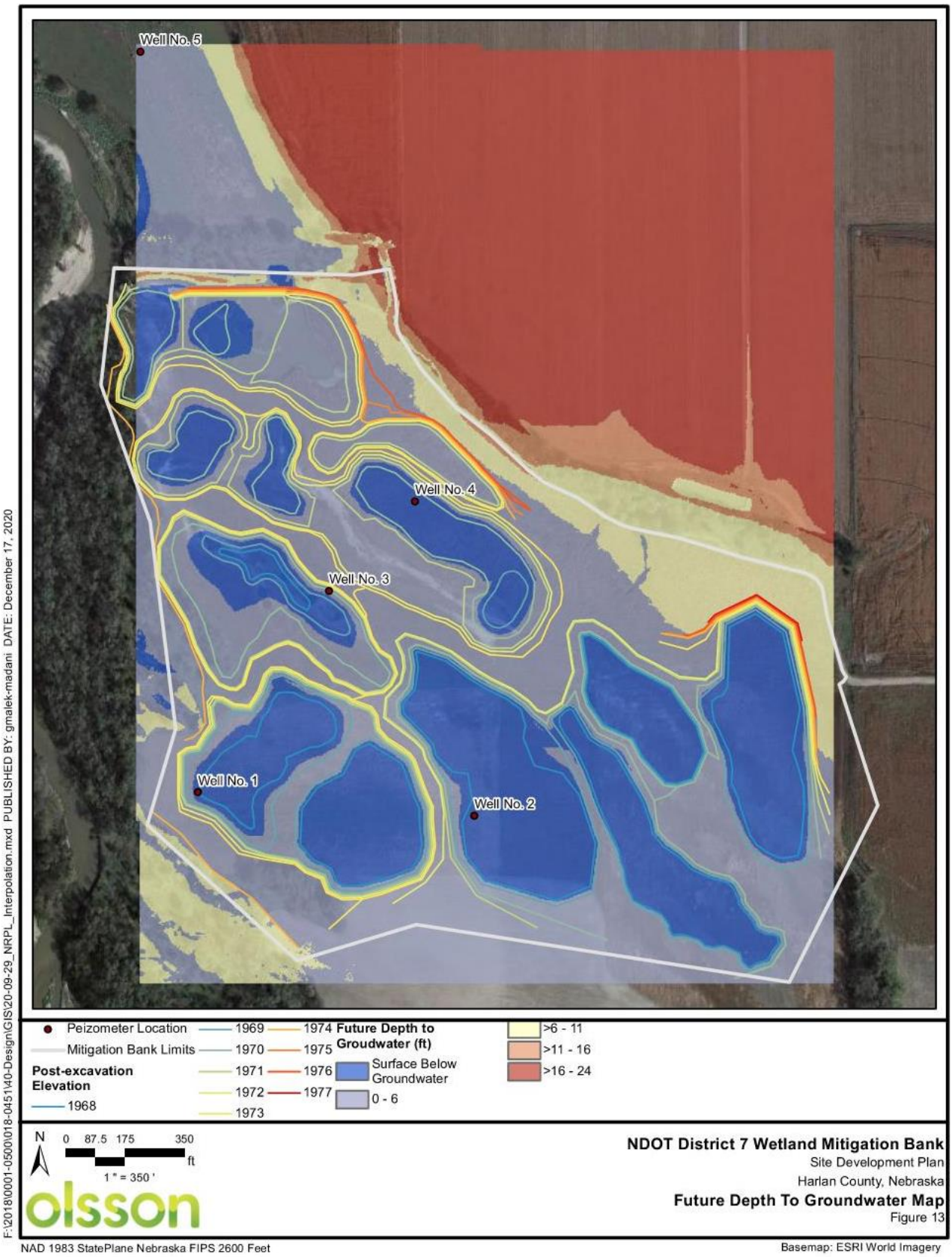

Figure 13. Future Depth to Groundwater Map

In addition to primarily being supported by groundwater, the Site is expected to received secondary surface water inputs from the Republican River. The Site is entirely located within the 100-year floodplain of the Republican River and is located within the flood storage area of the USACE Harlan County Dam (Figure 10). A hydrology model (Appendix F), developed to assess potential impacts or changes to the USACE Harlan County Dam flood pool and floodplain, estimates that the Site is expected to receive out-of-bank flows from the Republican River from the 2-year or greater storm event. Please note, these expected post-construction surface water inputs are not due to the construction of any water conveyance structure or modifications of the Republican River riverbank topography or elevations. In addition, the expected post-construction flood frequency of the Site is identical to the expected pre-construction flood frequency of the Site. As a result, the proposed work will not change the overall surface water dynamics with respect to the Republican River.

3.2 Soils

Detailed soils information is discussed in Section 2.6 and in the geotechnical report included in Appendix C. Soils within the Site generally have a high capacity to transmit water which means groundwater can easily move up the soil profile into the root zone.

Excavation activities would include topsoil segregation. Topsoils across the Site would be stripped and stockpiled. The stockpiled topsoils would be redistributed across the Site to achieve the final desired elevations. Redistributing topsoils across the Site will help to promote conditions conducive to successful vegetation establishment. Because the soils on Site have previously been in agricultural production and/or the existing wetlands on Site contain a mixture of *Phalaris arundinacea, Typha angustifolia,* and *Phragmites australis,* all current and established wetlands within the mitigation Site will have the top six inches of soil turned over and treated with Habitat® herbicide to kill off the existing seed bank prior to reusing these topsoils across the Site.

3.3 Vegetation

Establishment of desirable hydrophytes would be facilitated by large-scale seeding across the Site. Species selected for the wetland and upland buffer seed mixes include species consistent with those described in Western Great Plains Floodplain and/or Western Great Plains Saline Depression Wetlands Ecological Systems as described in Rolfsmeier and Steinauer (2010), and native wetland species that have demonstrated successful establishment is previous wetland mitigation sites. It is also anticipated that additional wetland species would establish within the proposed bank through natural recruitment. Proposed seed mixes are included in Appendix G. Specific application rates will be developed in coordination with the supplier. Approximately 61.94 acres will be seeded with the wetland seed mix, and 8.59 acres will be seeded with the upland buffer seed mix. As seeding plan can be found on Sheet J13 in Appendix D.

Seeding and plantings for wetland areas will include the following species:

- Calamagrostis canadensis (bluejoint)
- *Distichlis spicata* (inland saltgrass)

- *Carex pellita* (woolly sedge)
- *Carex brevior* (short-beaked sedge)
- Carex nebraskensis (Nebraska sedge)
- Carex vulpinoidea (fox sedge)
- Eleocharis palustris (spikerush)
- Sagittaria latifolia (arrowhead)
- *Aster novea-angliae* (New England aster)

Seeding and plantings for upland buffer areas will include the following species:

- *Elymus canadensis* (Canada wildrye)
- *Pascopyrum smithii* (western wheatgrass)
- *Elymus trachycaulus* (slender wheatgrass)
- *Elymus lanceolatus* (thickspike wheatgrass)
- Sorghastum nutans (Indiangrass)
- Schizachyrium scoparium (little bluestem)
- *Spartina pectinata* (prairie cordgrass)
- Panicum virgatum (switchgrass)
- Calamovilfa longifolia (prairie sandreed)
- Sporobolus cryptandrus (sand dropseed)
- *Dalea purpurea* (purple prairie clover)
- *Rudbekia hirta* (blackeyed susan)
- *Ascelpias syriaca* (common milkweed)
- *Aster novea-angliae* (New England aster)
- Verbena hastata (blue vervain)
- *Liatris pycnostachya* (thickspike gayfeather)

Control of invasive and noxious vegetative species will be one of the primary determinants in the success of the mitigation bank. During the wetland delineation invasive species such as *Phalaris arundinacea, Typha angustifolia,* and the noxious *Phragmites australis* were determined to be present. Existing wetlands abutting the established wetlands will be inspected for these species and those existing wetlands will be treated to kill of the existing vegetation through excavation/grading and then soil treatment in which the soil will be turned over and treated with Habitat® herbicide to kill off the seed bank as previously described in Section 3.2.

3.4 Construction Timing

Construction is anticipated to commence in late 2021 or early 2022. Timing of construction may be dependent upon the timing and length of USACE agricultural leases on Site. Construction would commence in such a way as to minimize conflict with lease agreements and would be dependent upon lease length and/or ability to shift lease agreements to other parcels as coordinated by the Harlan County Lake USACE. The construction schedule would also be dependent on obtaining environmental clearances and necessary permits required by the

USFWS, NGPC, SHPO, USACE, Nebraska Department of Environmental and Energy (NDEE), and other state and federal agencies as needed.

3.5 Impacts to Aquatic Resources

The grading limits associated with Site improvements would temporarily impact 2.00 acres of PEMA/C FD wetlands, 1.31 acres of open water, and 3.41 acres of farmed PEMA FD wetlands. Temporary impacts to these areas would include topsoil removal, soil treatment for invasive species, grading, and reseeding activities. No permanent impacts to wetlands or other waters are anticipated due to any project activities including the wetland mitigation bank construction, roadway construction, and soil stockpiling.

Wetlands and other waters temporarily impacted by Site construction are listed in Tables 1 and 2 and shown on Figure 9. Wetlands and waters within the Site are anticipated to redevelop into wetlands and open water habitat based upon the grading and seeding plans provided (See Sheets J13 and J16 in Appendix D). Please note that Wetland 30 and 32 listed in Table 1 are just outside of the proposed footprint of the wetland mitigation bank. No temporary or permanent Impacts to these wetlands (0.17 acres in total) are anticipated.

PEMA/C FD wetlands and open water areas temporarily impacted would be enhanced by removing unwanted, invasive, and noxious species that are currently present on Site. Post-construction seeding of these areas is expected to increase species diversity within the existing wetland areas and create more stable and invasion-resistant wetland communities nested within a larger wetland complex. Furthermore, farmed PEMA FD wetlands temporarily impacted by the project would be removed from agriculture and restored with a native mix of hydrophytic species.

Roadway improvement and stockpiling soil will not result in any impact to wetlands, streams, or other aquatic resources. The locations of the roadway improvement and stockpile area are shown on Figures 3a and 3b. Specifics regarding the limits of construction regarding these improvements is included in the engineering plan set provided in Appendix D.

The wetland delineation for the Site, roadway improvement areas, and soil stockpile location is included in Appendix A.

3.6 Restoration and Enhancement to Existing Aquatic Resources

Existing aquatic resources would ultimately benefit from efforts to improve, restore, and enhance hydrology and species diversity across the Site. Existing aquatic resources will benefit from:

- removal of invasive and unwanted species,
- establishment of a diverse native species mix across the Site,
- establishment of a large wetland complex capable of buffering small- and large-scale disturbances resulting in increased stability and resistance to invasion, and
- increases in overall wetland function.

4. PERFORMANCE STANDARDS FOR WETLAND MITIGATION

Performance standards at the proposed bank would be based on yearly expectations that indicate the Site is trending towards success. Specifically, performance standards for the proposed bank are as follows:

4.1 Emergent Wetland Vegetation

- Wetland Vegetation Dominance: Wetland vegetation dominance, defined as a vegetation community where more than 50% of all dominant plant species across all strata are rated obligate ("OBL"), facultative wet ("FACW"), or facultative ("FAC"), using the vegetation sampling procedures as described in the appropriate regional supplement to the Corps of Engineers Wetland Delineation Manual, must be achieved in designated wetland areas by Year 5; and
- Aerial Cover Vegetative Standards:
    - In year one, a minimum of 50% of the mitigation site shall be vegetated (either by planted or volunteer plants) by native (FAC or wetter) species.
    - By the end of year two, a minimum of 60% of the mitigation site shall be vegetated (either by planted or volunteer plants) by native (FAC or wetter) species.
    - By the end of year three, a minimum of 70% of the mitigation site shall be vegetated (either by planted or volunteer plants) by native (FAC or wetter) species.
    - By the end of year five and each monitoring year thereafter, a minimum of 85% of the mitigation site shall be vegetated (either by planted or volunteer plants) by native (FAC or wetter) species.
    - Volunteer species should support functions consistent with the project design goals; and
- Non-Native and Invasive Species: If non-native or invasive species are present, no more than 10% of relative plant cover over the entire bank Site shall be made up by non-native or invasive species, with no individual colony greater than or equal to 5% of relative plant cover. Native status will be based on the Natural Resources Conservation Service Plants Database.

4.2 Wetland Hydrology

Wetland hydrology indicators defined in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0) are expected to be observed in created wetlands and would be used to evaluate the establishment of the wetland areas. Groundwater measurements will also be collected during annual monitoring events to evaluate groundwater levels throughout the site as compared to pre-construction groundwater elevations to assess annual fluctuations.

4.3 Wetland Soils

Hydric soils may take more than 10 years to develop; therefore, they may not be used for determining success of the wetlands; however, the presence or development of hydric soils will be evaluated at sample point locations to help assess site success or failure.

4.4 Upland Buffer

- Aerial Cover Vegetative Standards:
    - In year one, a minimum of 50% of the upland buffer shall be vegetated (either by planted or volunteer plants) by native species.
    - By the end of year two, a minimum of 60% of the upland buffer shall be vegetated (either by planted or volunteer plants) by native species.
    - By the end of year three, a minimum of 70% of the upland buffer shall be vegetated (either by planted or volunteer plants) by native species.
    - By the end of year five and each monitoring year thereafter, a minimum of 85% of the upland buffer shall be vegetated (either by planted or volunteer plants) by native species.
    - Volunteer species should support functions consistent with the project design goals
- Non-Native and Invasive Species: If non-native or invasive species are present, no more than 10% of relative plant cover over the entire bank Site shall be made up by non-native or invasive species, with no individual colony greater than or equal to 5% of relative plant cover. Native status will be based on the Natural Resources Conservation Service Plants Database.

5. MONITORING REQUIREMENTS AND PLAN

5.1 Responsible Parties

NDOT is responsible for annual monitoring and reporting. NDOT reserves the right to employ an outside contractor to perform this action.

5.2 Data Collection, Assessment Tools and Methodologies

To accurately document Site development, NDOT would implement its standard wetland mitigation monitoring practices. NDOT's standard mitigation monitoring practices adhere to the standards and practices set forth in Regulatory Guidance Letter 08-03 (USACE 2008). Specifically, annual monitoring would consist of vegetation community, hydrology, and wetland boundary mapping along sampling transects. Along the transects, sampling points would be established to document the vegetation, soil, and hydrology specific to each sampling point. Proposed monitoring transects are shown on Figure 14 at the end of Section 5.2. Transects run east to west across the Site every 200 feet. Exact sample point locations along the transects would be established during the first monitoring event to specifically demarcate habitat,

vegetation, wetland/upland, or elevational transitions observed. Vegetative communities not crossed by transects would be noted and included in the annual monitoring reports. Additionally, the transects would facilitate the documentation of transitions between upland and wetland areas and among wetland types. The established transects would be used throughout the necessary monitoring period to document a chronology of changes in the amounts and types of wetlands that develop. Additionally, ground-level Site photographs would be taken at regular intervals from common locations.

Wetland monitoring would include Global Positioning System (GPS) mapping of the wetland vegetation communities, hydrology documentation, observation of changes in soil characteristics, and collection of ground-level Site photos taken at regular intervals from common locations.

Annual monitoring reports of the wetland mitigation bank would be submitted to USACE, Nebraska Regulatory Office, to ensure that the Site is developing properly. Wetland monitoring reports would be performed according to the following procedure:

- Monitoring reports shall be done following Part IV Section E (Comprehensive Determinations) of the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory January 1987).
- A set of as-built plans would serve as a baseline for future monitoring, with locations marked for observation photos.
- Photos taken at observation points, showing all representative areas of the bank, would be taken at least once a year during the growing season.
- Annual monitoring reports would be due on December 31 of the monitored years.
- If the proposed bank is considered to be failing at any time, NDOT would coordinate with USACE Regulatory Branch (Omaha District) and implement corrective action.

The following sections detail each monitoring procedure.

Ground-level Photography

The following steps would be used for the procedure:

- Select permanent photo points during the first monitoring visit. A sufficient number of points would be selected to document bank design characteristics.
- Record photo point designation and orientation.
- Document the location, number, and orientation of each photo. Photos would be taken at each monitoring visit.

In addition to the permanent photo point locations, additional photos would be taken to support other notable conditions, such as erosion control, remedial actions, and additional activities. Location and orientation of these photos would be recorded and noted as additional locations to visit in subsequent monitoring events.

Photographs would be used as qualitative and supportive documentation to show that hydrology and vegetation permit conditions have been met. In addition, a multiple-year sequence of photographs shows development of vegetative communities.

The annual monitoring reports would contain the following: aerial photographs that show the location and orientation of all photos, and a supporting document that contains photos for all permanent photo point locations as well as any additional photos.

Hydrology Determination

The following steps would be used for the procedure at each established sample point:

- Document the presence of primary hydrology indicators at hydrology sample points and through visual observation of inundation and/or saturation, watermarks, drift lines, sediment deposits, and drainage patterns.
- Document secondary hydrology indicators at each hydrology sample point, including oxidized root channels in the upper 12 inches, water-stained leaves, and the FAC-Neutral test.
- Map hydrology sample points and the wetland hydrology boundaries on as-built plans or aerial photographs while in the field.
- Document groundwater levels from both sample point soil pits and previously established monitoring wells.

The hydrology data gathered would be used to identify and map the hydrologic conditions at the mitigation bank. On-Site hydrology data would be collected to provide an inventory of hydrology indicators present throughout the mitigation bank, with data recorded at each hydrology sample point.

The result of the hydrology determination would be documented on as-built plans or aerial photographs with the wetland hydrology boundary indicated.

Soils Determination

The following steps would be used for the procedure:

- Locate soil sample locations in each mapped or observed soil type. In addition, the points should be located across the gradient from wetland to upland.
- Give each soil sample location a permanent designation (e.g., S1, S2, etc.).
- Identify the location of all soils sample locations on as-built plans or aerial photographs. If the sample locations are found to be inadequate, they can be moved but reasons for the relocations would be provided.
- Dig a pit or take a soil sample with a soil probe at each soil sample location.
- Describe and record data on the profile, including a description of soil texture, soil color, presence of redox features, and thickness of each horizon. It is important to describe the

soil profile immediately after completion of construction but prior to inundation. This would allow for documentation of any changes in soils as a result of bank construction.
- If necessary, sample additional locations to define where the hydric soil characteristics begin or end.

The soils data gathered can be used for both evaluating Site suitability for wetland creation and documenting hydric soil development. When evaluating the development of soils, it is important that the initial post-construction condition be documented prior to inundation or saturation conditions. This would provide the baseline data needed for making comparison with future samples. Any changes in the profile descriptions would be compared and documented. In particular, changes in the abundance, size, and contrast of redox features would be noted.

The result of the soils determination would be documented in the annual monitoring report, with sample locations shown on as-built plans or aerial photographs.

Vegetation Evaluation

The comprehensive method from the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory January 1987) would be used for determining plant communities at the bank. The method is outlined below.

- Collect vegetation data at sample point locations established throughout the site.
- Characterize each plant community at each sample point by visually determining percent cover and recording the dominant species for the herbaceous, tree, shrub, and woody vine layers. The 2018 National Wetland Plant List (USACE 2018) would be used to determine the indicator status for each species. In addition, document the aerial coverage of bare soil.
- Determine and document whether hydrophytic vegetation is present using the 50:20 Rule.
- Note any significant non-dominant, invasive, or colonizing species that provide additional evidence that the community is, or is not, developing into a hydrophytic plant community.
- Determine what areas of emergent plant communities have achieved 80 percent canopy cover. Map these areas on aerial photographs.

Wetland Boundary Delineation

The wetland boundaries are determined based on the presence of hydrology and hydrophytic vegetation as per the collected sample point data using the comprehensive method from the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory January 1987). This determination would use the data collected from the hydrology and vegetation procedures to delineate and map the wetland boundary. The boundary would be based on overlaying the hydrology and vegetation maps. Hydric soils can take many years to form. If changes in hydrology have occurred so recently as to not allow hydric soils to develop and if wetland hydrology and vegetation are present, the area would be considered a wetland. Soil data would be used for supplemental information only and would not be used in determining wetland boundaries.

The following steps would be used for this procedure:

- Determine the wetland boundary in accordance with standard wetland delineation criteria (Environmental Laboratory January 1987)).
- Classify the wetlands according to Cowardin et al. (1979) and Nebraska Wetland Subclass (NGPC 2010).
- Measure the area of each wetland type.
- Record the wetland types and areas.
- Determine the areas that meet or exceed the performance standards.

The final product of this procedure would be a map showing the wetland boundaries, established transects and sample point locations, wetland types, and acres that meet the performance standards.

Mitigation Bank Monitoring Report

Annual monitoring reports would be submitted to the USACE Regulatory Branch (Omaha District) to document Site development. Annual monitoring will be documented in a written report that will be provided to the USACE for distribution to all members of the IRT for review by December 31 of each monitoring year. Monitoring reports would identify both the amount and type of wetlands that develop at the proposed bank by mapping and describing wetland hydrology and vegetation. By interpreting the data included in the monitoring report, NDOT and USACE would determine whether Site development is adequate and whether the bank's performance standards are being met. Lastly, the monitoring report would provide NDOT and USACE sufficient information to determine whether corrective actions are necessary.

The USACE, in consultation with the IRT, may also revise monitoring requirements to account for remedial measures and/or adaptive management.

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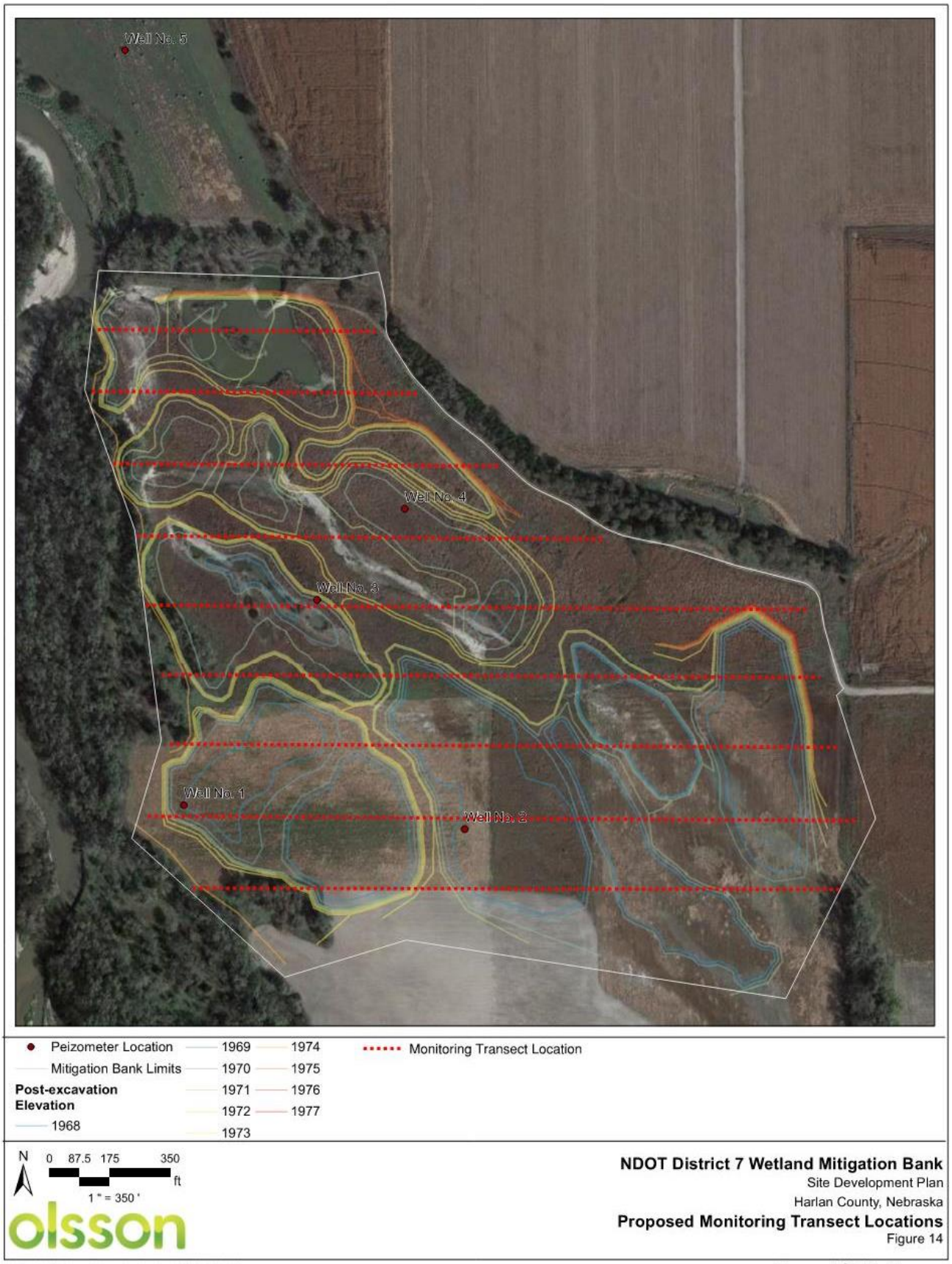

Figure 14. Proposed Monitoring Transect Locations

6. CONTINGENCY PLANS AND REMEDIAL ACTIONS

If, during the monitoring period, it is determined that the proposed bank is failing to meet conditions described in all applicable Section 404 Permits and the Final Site Development Plan, NDOT would evaluate potential causes for failure and would take appropriate corrective measures to assure that the bank meets the permit conditions. Potential corrective actions may include modification of Site grading and elevations, or additional seeding. If the bank continues to fail to meet the requirements of the permits after corrective measures have been implemented, NDOT would seek an alternative site.

If monitoring activities identify potential problems, the USACE would be promptly notified and advised of potential remedial actions. In the event of unanticipated site conditions or changes of conditions beyond the control of NDOT, a contingency plan, developed under consultation with USACE, would be placed into effect. The contingency would include the following guidelines as appropriate:

- If vegetative cover by desirable species, is less than 70 percent by Year 3, the site will be reseeded with a mix of species similar or comparable to the original seeding in coordination with USACE.
- If hydrology does not develop as anticipated by Year 3, USACE will be consulted to determine if remedial action would correct the situation, or if an alternative mitigation site must be identified.
- NDOT will coordinate with USACE should NDOT be precluded from performing monitoring, maintenance, or management activities by forces beyond the control of the NDOT to determine remedial and future actions needed.
- If the site is damaged by flooding, NDOT would evaluate the post-flood conditions of the site and coordinate with USACE to determine if a restoration plan or remedial actions are needed to restore the function of the site.

In the event that NDOT fails to implement necessary remedial actions within 30 calendar days after notification by USACE or another authorizing agency, or within an established time frame agreed upon by USACE, the IRT (acting through the Chair) would notify NDOT and the appropriate authorizing agency(ies) and would recommend appropriate remedial actions. Should NDOT fail to comply with agency requests regarding the implementation of remedial actions, the use of credits may be suspended.

7. LONG-TERM MANAGEMENT PROVISIONS

The operational life of the bank would terminate under the following conditions: 1) compensatory mitigation credits have been exhausted; 2) banking activity is voluntarily terminated with a USACE approved written notice from NDOT; 3) it has been determined that the bank is functionally mature

and/or self-sustaining; and 4) the USACE and/or other Federal Government entity requires an alternate use for the site.

The Harlan County Lake USACE would maintain sole ownership of the bank. As previously described in Section 1.7, NDOT and the Harlan County Lake USACE would establish a real estate license, or similar instrument, protecting the bank's wetland functions (by deterring development or practices that could handicap its functionality) prior to the release of credits for mitigation purposes. No credits from the bank would be sold or made available to other parties through the long-term management phase of the bank. NDOT would be responsible for corrective actions needed to assure the bank's functionality and the overall long-term management of the bank itself to assure wetland function; however, long-term management of the property would be the responsibility of the Harlan County Lake USACE based upon Title 36 – Rules and Regulations Governing Public Use of Corps of Engineers Water Resources Development Projects. A draft Long-Term Management Plan with provisions agreed upon by both NDOT and the Harlan County Lake USACE is included in Appendix H.

In the unlikely scenario that the Federal Government needs to utilize the site for other purposes, NDOT would be required to replace the wetland acres and credits at a new location in coordination with the USACE.

8. CREDIT PRODUCTION

NDOT would not request final certification of the wetland mitigation bank until USACE Regulatory Branch (Omaha District) has verified that the bank meets all bank performance standards. At which time that USACE determines that all bank performance standards have been met; wetland mitigation bank credits would be requested for surplus wetland mitigation credits that have shown consistent establishment at the bank. A draft ledger in included in Appendix J.

8.1 Expected Certified Wetland Credit Production

Final certified wetland credits would be calculated based upon ratios established in the NDOT Umbrella Mitigation Banking Agreement (NDOT 2017) as shown in Table 5. The anticipated wetland bank credits shown in Table 5 below represent the total credits expected to be available for mitigation after the bank has been certified. Table 5 also includes proposed credit production ratios regarding different types of mitigation that would be present at the bank. The wetland credit production rations presented in Table 5 would be applied to the actual wetland acreages present in the bank after monitoring and USACE and IRT certification is complete.

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Table 5. Final Certified Wetland Credit Production Ratios

Type of Mitigation	Credit Production Ratio	Anticipated Acres of Mitigation at Site	Anticipated Final Certified Wetland Bank Credits
PEMA/C FD Restoration	1:1	3.41	3.41
PEMA/C FD Enhancement	3:1	2.00	0.67
PEMA/C FD Establishment	1:1	55.22	55.22
Upland Buffer	4:1	8.59	2.15
TOTAL		69.22	61.45

8.2 Pre-Certification Credit Availability

Pre-crediting (in terms of authorizing credits following Final Site Development Plan approval or construction completion) is only applicable to the proposed bank prior to final certification by the USACE and IRT. Pre-crediting may be applied to 30 percent of the planned mitigation as listed in Table 5, plus surplus mitigation wetlands identified that satisfy Wetland Delineation Manual and Regional Supplement wetland criteria, but that are pending certification from the Nebraska Interagency Review Team (IRT). A general schedule of credit availability, including allowable pre-crediting, is provided in Table 6. Partial bank certification is allowable, at the discretion of the IRT. Credit ratios are based on the threshold, or minimum, ratios defined by USACE (August 2005). Pre-certification credit availability would be applied to varying degrees based upon the developmental stage of the bank as indicated in Table 6 (i.e. Site Development Plan approval, completion of construction, etc.). Pending final certification of the bank, final credits would be calculated based upon the criteria presented in Table 5 to account for actual acreage of wetland established and approved at the end of the monitoring process. Pre-certification credits used as mitigation to offset impacts would be debited at the pre-certification ratios discussed in Section 8.3 and presented in Table 7.

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Table 6. Pre-Certification Schedule of Credit Availability

Status of Mitigation Bank	Pre-Certification Percentages of Available Credits Released	Cumulative Percentage of Available Pre-Certified Credits Released
Wetland Credits		
Final Site Development Plan approved	5%[1]	5%
Construction completed	10%[1]	15%
1987 Corps of Engineers Wetlands Delineation Manual criteria met / After Year 1 goals are met	15%[2]	30%
Site Meeting Performance Standards	100%[3]	100%

Source: USACE August 2005.
Notes:
[1] Based on total anticipated credits presented in Table 5.
[2] Based on total wetland acreage meeting established performance standards.
[3] Based on total wetland acreage meeting established performance standards; partial certification is allowable.

8.3 Compensation Ratios

Compensation ratios for wetland credits are detailed in NDOT's Umbrella Mitigation Banking Agreement (NDOT 2017). Compensation ratios and associated credit debiting from the bank would follow the protocols contained therein. Compensation ratios, which identify how much of the bank would be used to compensate for project-related impacts, would be determined by USACE Regulatory Branch (Omaha District) during the Section 404 permitting process. Debiting ratios are ultimately determined by USACE, but would be based on two criteria:

Criteria 1: Cowardin Classification - In-kind replacement of impacted wetlands at a mitigation bank based on Cowardin Classification (Cowardin et. al. 1979).

Criteria 2: Nebraska Wetland Subclass - In-kind replacement of impacted wetlands at a mitigation bank based on Nebraska wetlands per hydro-geomorphic subclass as defined in the Wetland Program Plan for Nebraska (NGPC 2010).

Proposed certified and pre-certified wetland mitigation debit ratios are presented in Table 7.

Table 7. Wetland Mitigation Debit Ratios

Criteria	Certified Bank Debiting Ratio	Pre-Certification Debiting Ratio
Two criteria present (all in-kind replacement)	1:1	1:5:1
One of two criteria present (in-kind for one criteria)	2:1	3:1
No criteria present (all out-of-kind replacement)	4:1	6:1

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U.S. Geological Survey (USGS). National Hydrography Dataset (NHD) of Harlan County, Nebraska.

Appendix A

Wetland Delineation Report

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

District 7 Mitigation Bank

Wetland Delineation Report

Project Number: MISC-STWD(1093)
Control Number: 00986

Harlan County, Nebraska

Prepared for: Nebraska Department of Transportation

Prepared by:

Olsson, Inc.
601 P Street, Suite 200
Lincoln, NE 68508

October 2020

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Section 1 - Introduction

Summary

This report provides the results of a wetland delineation completed for a potential mitigation bank site located in Harlan County, Nebraska. The site visits were conducted on May 21 and 22, 2018, by Kris Davenport and Madison Leonard and on May 25, 2020, by Tony Baumert of Olsson, Inc. (Olsson).

The Nebraska Department of Transportation (NDOT) project would consist of developing a United States Army Corps of Engineers (USACE) owned site into a potential mitigation bank to service the Republican River watershed area for future NDOT projects. The study area was determined by the USACE-owned property boundaries.

This wetland delineation report discusses the existing resources reviewed prior to completion of fieldwork activities, the methods used to delineate wetlands found along the project area, and the results of the wetland delineation. Figures (Appendix A), WETS Analysis (Appendix B), USACE wetland determination data forms (Appendix C), and photographs (Appendix D) detailing resources are also included in this report.

Wetlands were identified within swales, abutting channels, farm fields, and depressions. Twelve wetlands, one open water, and one stream channel were identified during the site visits.

Section 2 - Wetland/Water Resources Delineation Methods

Review of Existing Resources

Several existing resources were reviewed as part of the evaluation process. These included:

- Aerial Imagery 2018 Microsoft Corporation and its data suppliers (Figures 2A-2S).
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS). 2018. Soil Data Mart. Hydric Soils List for Harlan County, Nebraska Tabular Data Version: 8.
- USDA-NRCS Soil Survey Geographic database (SSURGO). 2018. Digital Soils Data for Harlan County, Nebraska Spatial Data Version: 2.
- U.S. Fish and Wildlife Service (USFWS). National Wetlands Inventory (NWI) Digital Polygon Data, Nebraska Continental U.S.
- U.S. Geological Survey (USGS). 2018. Digital Raster Graphic of Harlan County, Nebraska (USGS topographic map) (Appendix A, Figure 1).
- USGS. National Hydrography Dataset (NHD) of Harlan County, Nebraska.

Wetland Climate Tables (WETS) Analysis

A USDA handbook (USDA 2012) was used in the desktop review of the May 24, 2020 study area to help determine where potential wetlands may be present in agricultural settings. As part of the analysis, WETS were completed to determine the years in which National Agriculture Imagery Program (NAIP) aerials were taken during what were considered periods of normal precipitation. The NAIP aerials for normal years were then reviewed for signs of wetland hydrology in the agricultural fields. Based on the WETS analysis, NAIP aerials were taken under normal conditions in 2006, 2007, 2009, 2012, 2014, and 2016 (Appendix B). Possible hydrology indicators such as saturation and inundation in each aerial image were then outlined and overlaid on each other. Areas where these outlines overlapped in majority years were then used to determine areas that may have wetland hydrology depressant. These areas vary in size and location from year to year.

Delineation Methods

The delineation was completed on May 21 and 22, 2018 by Kris Davenport and Madison Leonard and on May 24, 2020, by Tony Baumert of Olsson. All conditions described in the following sections represent conditions at the time of the field investigation.

Routine Wetland Determination Data Forms (Great Plains Region – Version 2.0) were completed for areas with potential wetlands. These forms document the presence (or absence) of hydrophytic vegetation, hydric soils, and wetland hydrology according to guidelines established by the USACE and described in the Regional Supplement to the USACE Wetlands Delineation Manual: Great Plains Region (Version 2.0, 2010), and the USACE Wetlands Delineation Manual (1987).

Sample points and photograph locations were transferred to digital aerial photography (Appendix A, Figures 2A-2S). These figures are included in Appendix A. Appendix B includes USACE Wetland Determination Data Forms and Appendix C includes photographs documenting site conditions for each sample point.

Section 3 - Delineation Results

Olsson identified three Palustrine Emergent Temporarily Flooded (PEMA) wetlands, seven PEMA/ Seasonally Flooded (C) wetlands, and Palustrine Emergent Semi-permanently Flooded (PEMF) wetland, and one Palustrine Forested Temporarily Flooded (PFOA) wetland. Olsson also identified one open water. The total acreage of identified wetlands is approximately 18.60 acres and the total acreage of open water is 1.31 acres. Flag Creek, a named perennial channel was identified. Flag Creek is approximately 2,032 feet within the study area. Details about the wetlands and open water can be found in Table 1 and Table 2.

Table 1. Delineated Wetlands

Wetland ID	Sample ID	Figure	Wetland Classification[3] (Cowardin | Nebraska Subclass)	Area (acres)	Possibly Non-jurisdictional[1,2]
1	1a - 1d	2A - 2C	PEMF | RF	10.71	
5	5a - 5d	2B - 2E	PEMA / C | RC	1.26	
7	7a, 7b	2C	PEMA | FD	0.67	
14	14	2E	PEMA / C | FD	0.05	
16	16a, 16b	2E	PEMA / C | FD	0.26	
21	21a - 21d	2E - 2G	PEMA / C | FD	1.12	
26	26a - 26c	2E - 2F	PEMA / C | FD	0.54	
30	30	2F	PEMA / C | FD	0.12	
32	32	2F	PEMA / C | FD	0.05	
36	36	2F - 2G	PEMA | FD	0.04	
38	38a, 38b	2G	PEMA | FD	3.41	
84	84a	2G - 2H	PFOA | FD	0.37	

[1]All wetlands are assumed jurisdictional under Section 404 of the Clean Water Act, unless a USACE Jurisdictional Determination is received indicating otherwise.
[2]All wetlands indicated as "Possibly Non-Jurisdictional" are discussed in Section 4.
[3]FD – Floodplain Depression, RC – Riverine Channel, RF – Riverine Floodplain, PEMA – Palustrine Emergent Temporarily Flooded, PEMA / C – Palustrine Emergent Temporarily / Seasonally Flooded, PEMF – Palustrine Emergent Semi-permanently Flooded, PFOA – Palustrine Forested Temporarily Flooded.

Table 2. Other Water Resources

Water ID	Figure	Type	Size	Possibly Non-jurisdictional[1,2]
16	2E	Open Water	1.31 acres	
Flag Creek	2H – 2I	Perennial	2,032 feet	

Section 4 – Discussion

Problematic Areas:

Several areas along the project alignment met the hydrophytic vegetation criterion, but did not meet the criteria for hydric soils and either had no hydrology indicators or only one secondary hydrology indicator. Sample points 12, 17, 23, 29, and 35 were collected in fields, on top of berms, on slopes of embankments, and within floodplains that displayed dominant hydrophytic vegetation, but due to a lack of hydric soils and sufficient hydrology indicators these areas were determined to be upland.

The following areas did not meet the criteria for hydric soil indicators, therefore the problematic hydric soils procedure described in the Great Plains Region USACE Delineation Manual, Chapter 5, pages 112-114, was used to evaluate soils and determine if these areas have hydric soils. At sample points 7a and 7b the soils were determined to meet the criteria for problematic hydric soils, as indicators of hydrophytic vegetation and hydrology were present. These areas are in a landscape position that is likely to collect or concentrate water (Part 3a concave), therefore the soils in this area should be considered hydric due to being recently developed wetlands (Part 4b4).

Wetland 38 is an NWI wetland located in an agricultural field. Sample points 38a and 38b indicated hydric soil was present, but the area lacked hydrophytic vegetation and sufficient hydrology indicators. However, past aerial photographs also showed evidence of saturation within the NWI wetland. Due to the presence of hydric soils and the disturbance from farming practices this area was considered a wetland.

Jurisdictional and Possibly Non-Jurisdictional Wetlands and Waters:

Wetlands 1, 5, and 7 either abut or drain via a swale to the Republican River, a relatively permanent water (RPW). Wetlands 14, 30, 32, 36, are wetlands located within depressions adjacent to the Republican River. Wetland 16 abuts an open water feature that is a man-made impoundment and Wetlands 21 and 26 are wetlands that developed after the areas were left idle to build roadway embankments that are used to access the site. Wetland 84 is adjacent to Flag Creek, which flows to the Republican River. These wetlands are likely jurisdictional due to their adjacent location to the Republican River, a RPW.

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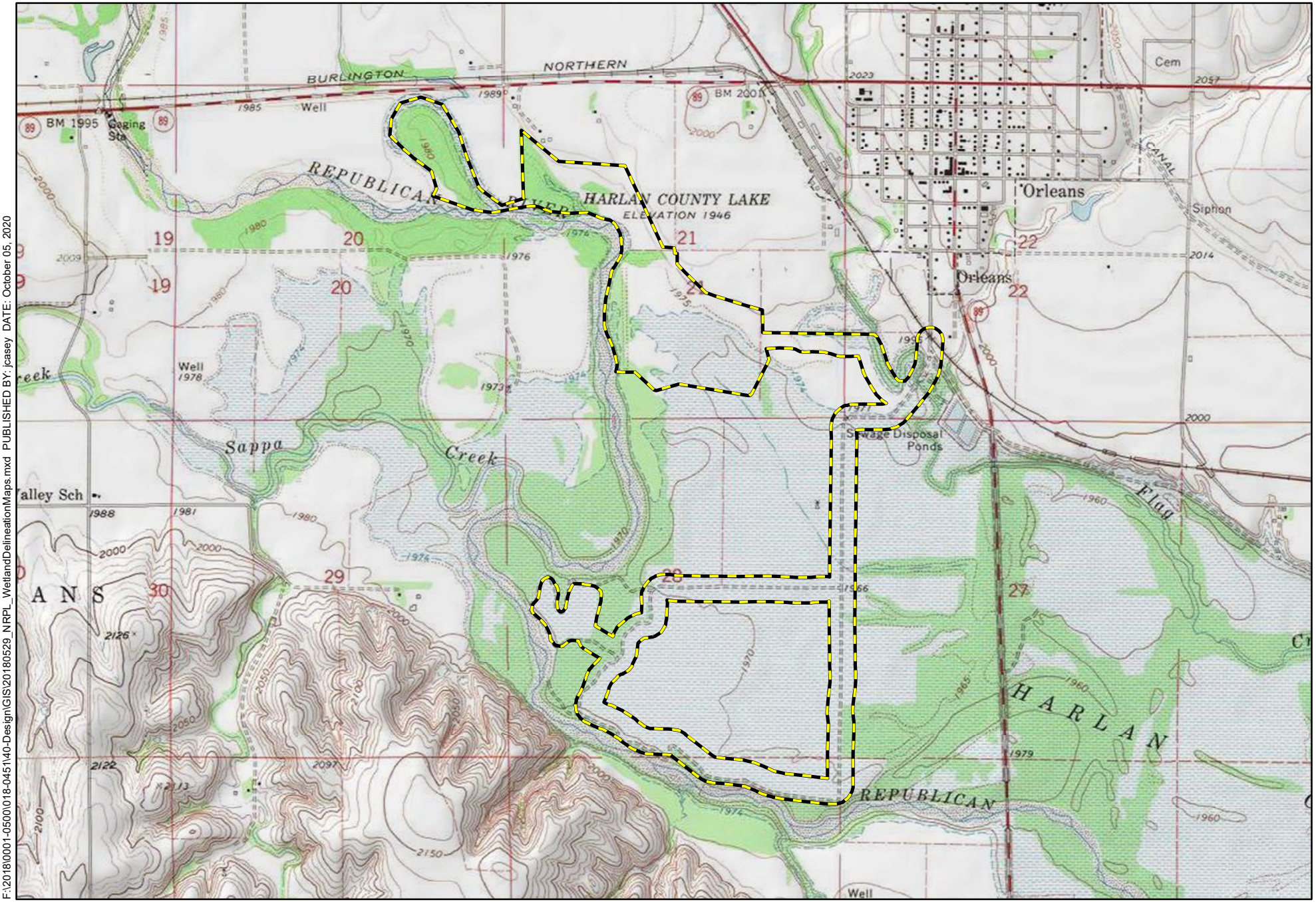

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olsson

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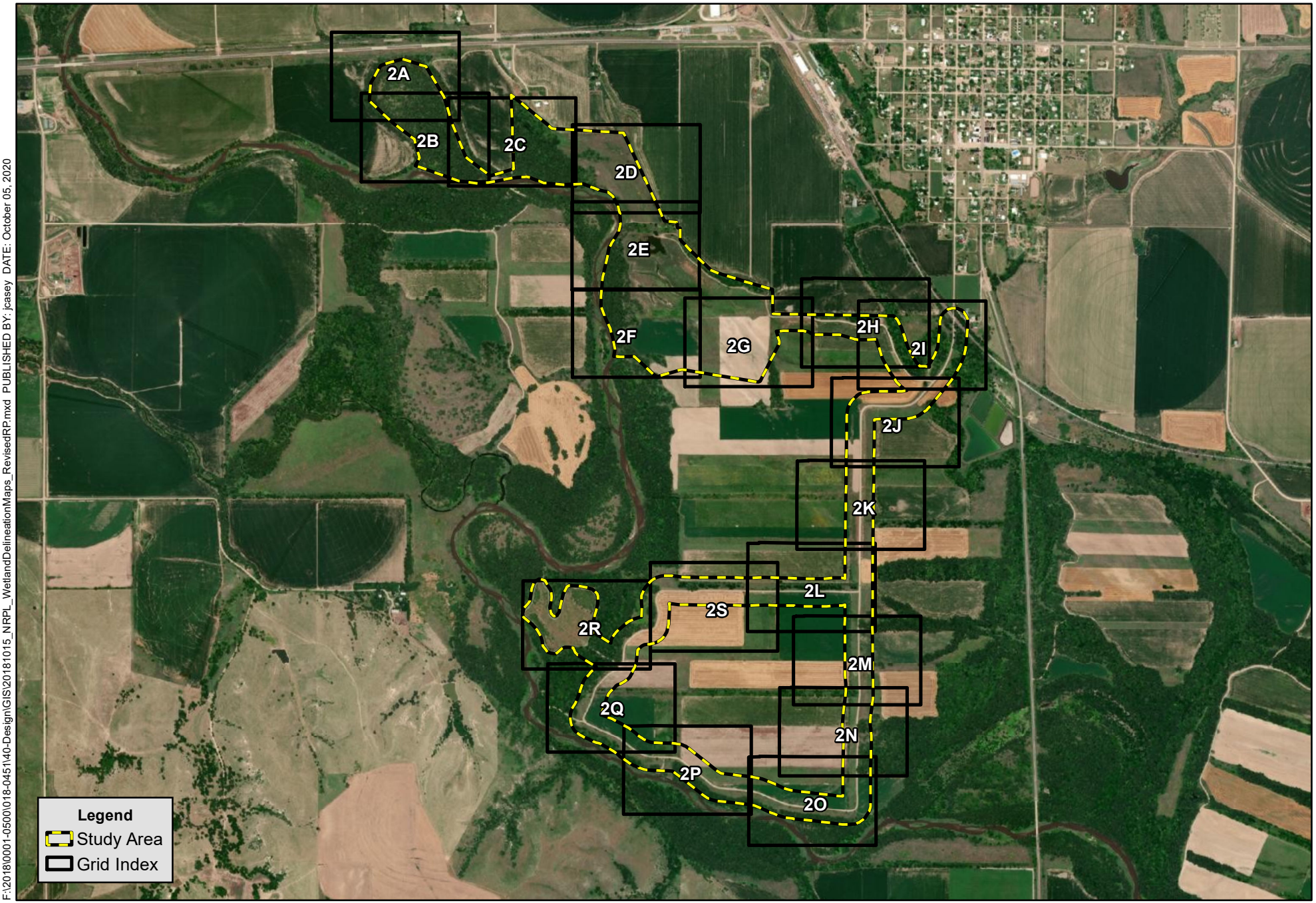
1 " = 2,000 '
Original Published Resolution
NAD 1983 UTM Zone 14N
USDA NAIP 2016

NDOT District 7 Wetland Mitigation Bank
Harlan County, Nebraska
Location Map

FIGURE
1



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1 " = 1,848 '

Original Published Resolution

NAD 1983 UTM Zone 14N

ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank

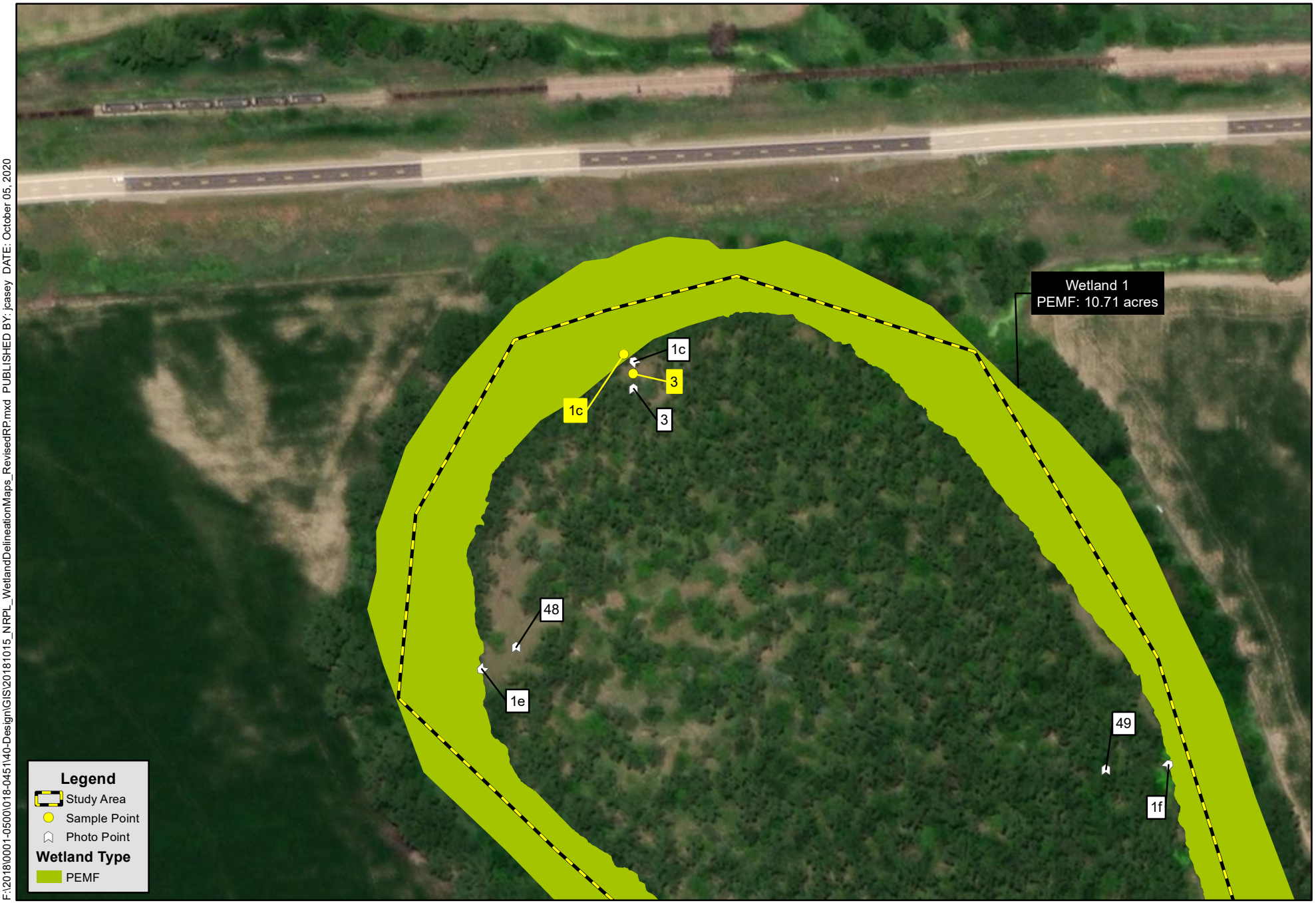
Site Selection Study

Harlan County, Nebraska

Wetland Delineation Index Map

FIGURE

2



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1 " = 182 '
Original Published Resolution
NAD 1983 UTM Zone 14N
ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank
Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2A

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1 " = 182 '

Original Published Resolution

NAD 1983 UTM Zone 14N

ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank

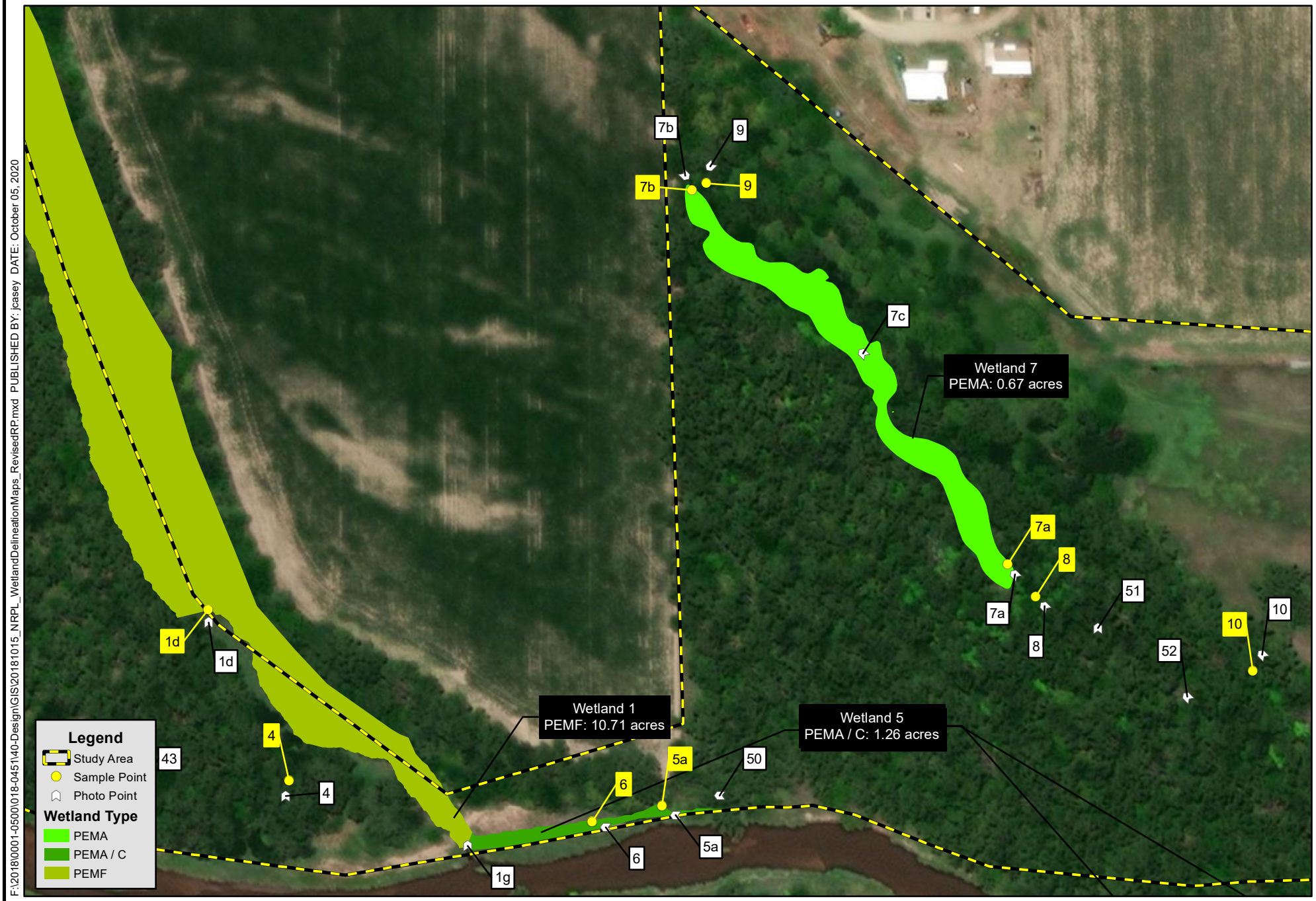
Site Selection Study

Harlan County, Nebraska

Wetland Delineation Detail Map

FIGURE

2B



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1 " = 182 '
Original Published Resolution
NAD 1983 UTM Zone 14N
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NDOT District 7 Wetland Mitigation Bank
Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2C

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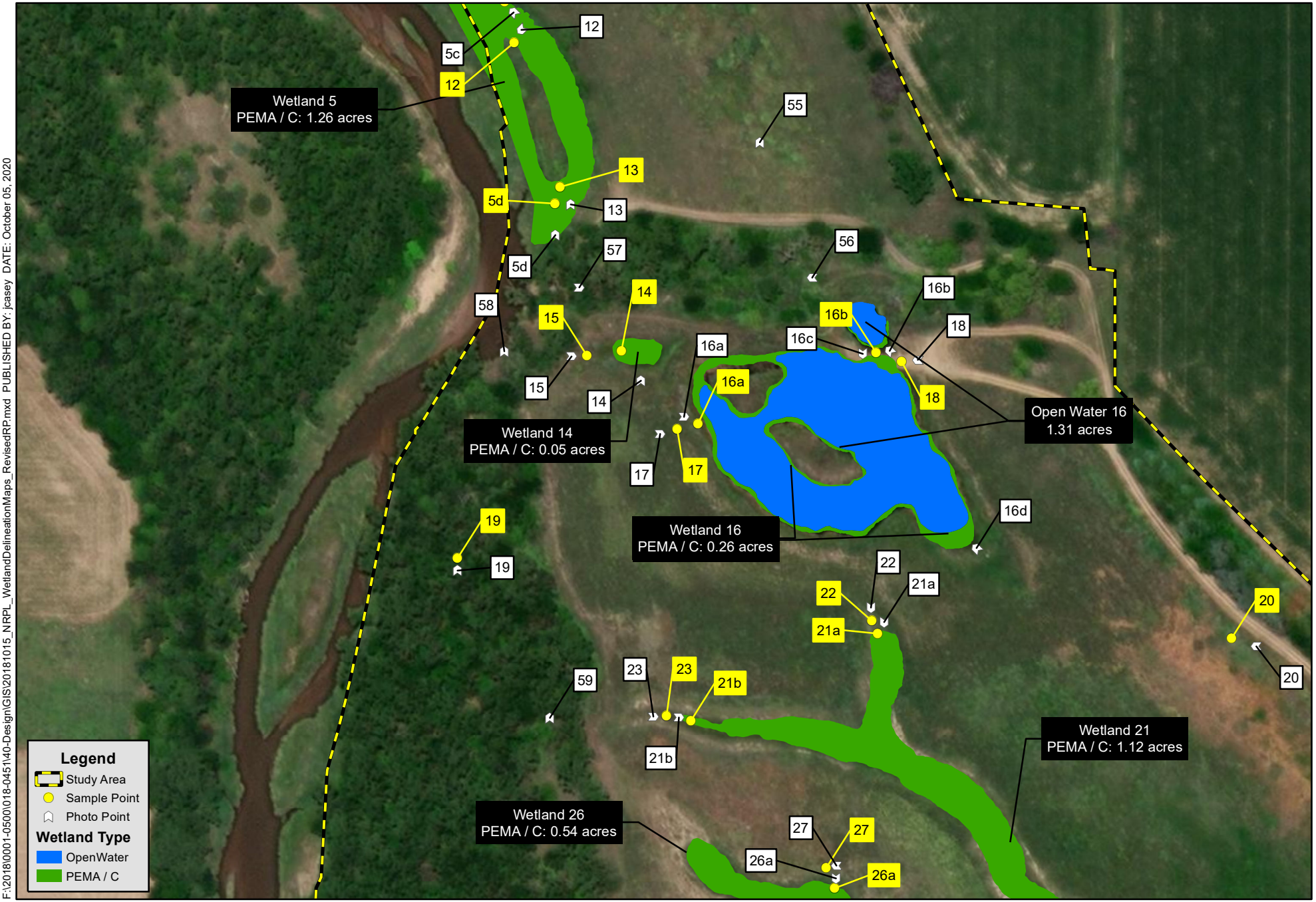
Site Selection Study

Harlan County, Nebraska

Wetland Delineation Detail Map

FIGURE

2D



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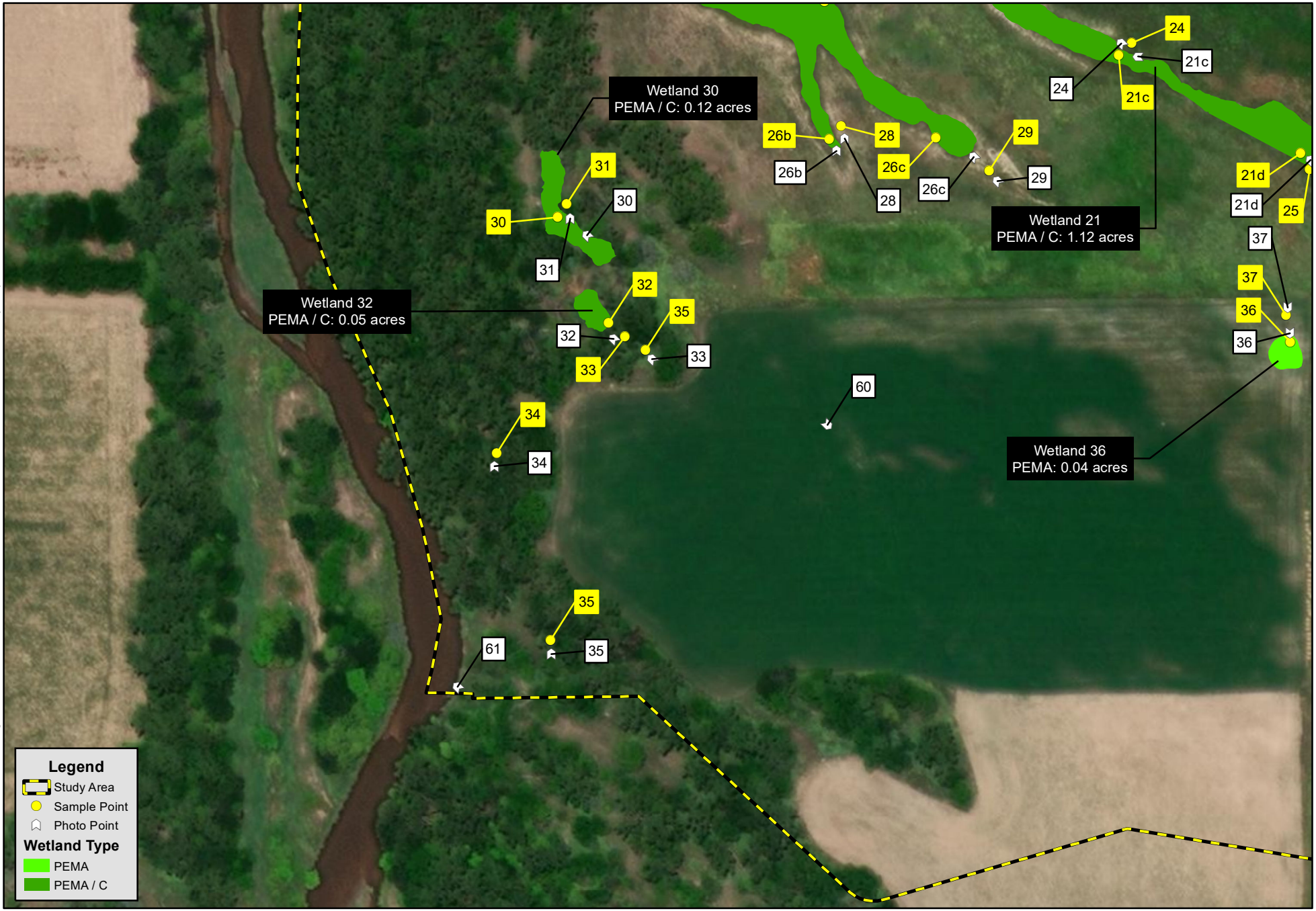
NDOT District 7 Wetland Mitigation Bank
Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2E



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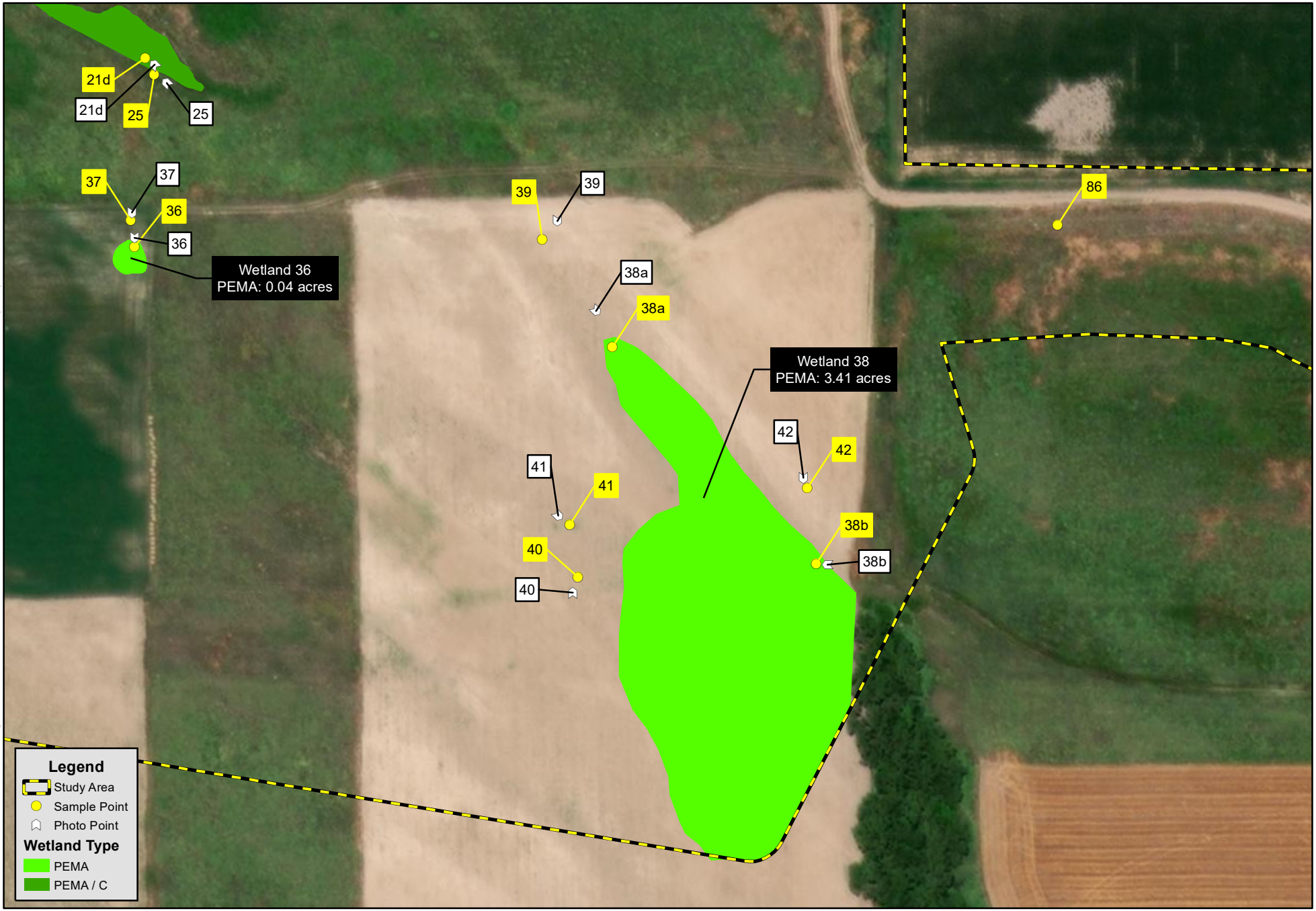
NDOT District 7 Wetland Mitigation Bank
Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2F



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NDOT District 7 Wetland Mitigation Bank

Site Selection Study

Harlan County, Nebraska

Wetland Delineation Detail Map

FIGURE

2G

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1 " = 183 '
Original Published Resolution
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ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank
Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
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1 " = 183 '

Original Published Resolution
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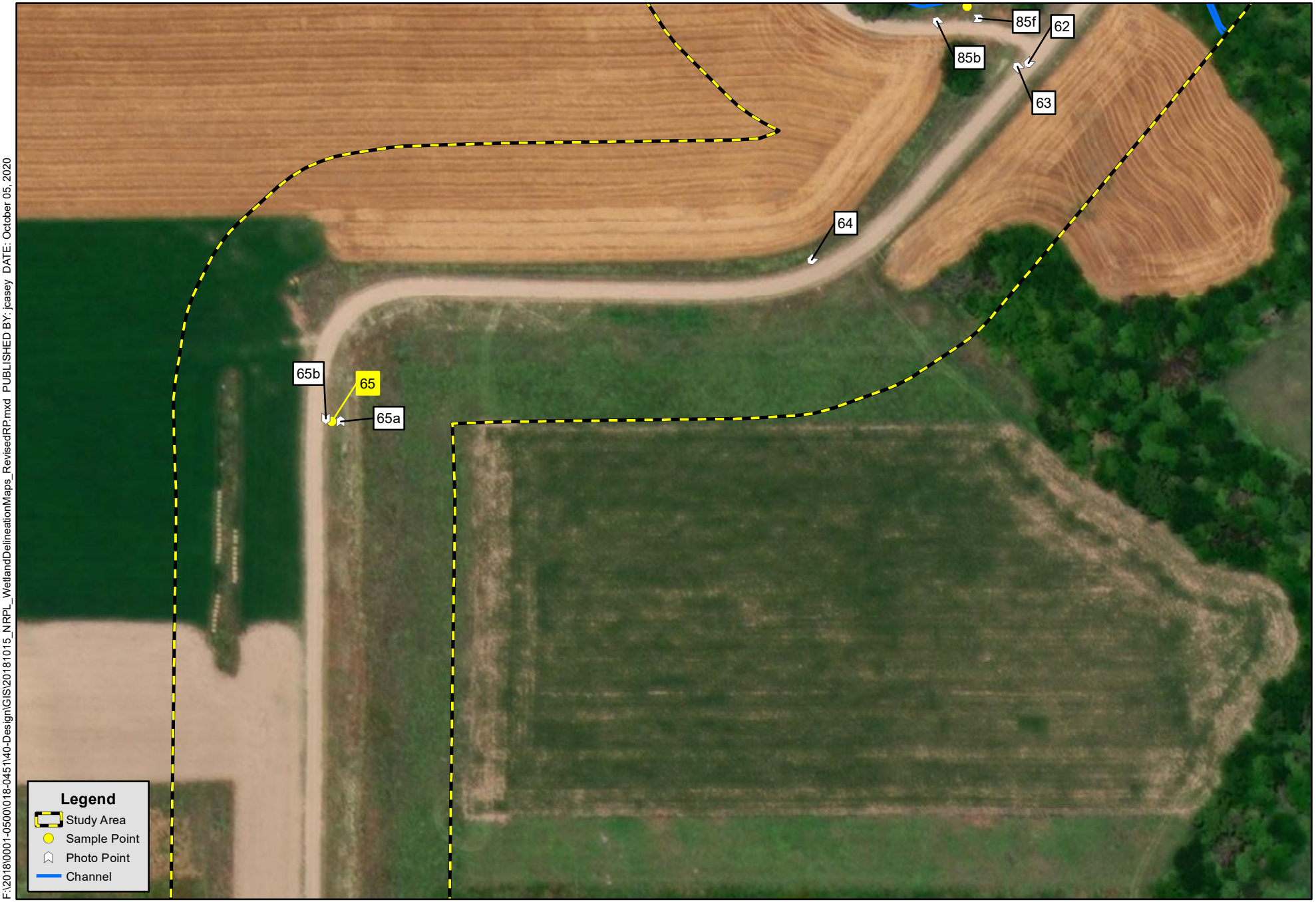
Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2I



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Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2J

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Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2K

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1 " = 183 '
Original Published Resolution
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NDOT District 7 Wetland Mitigation Bank
Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2L

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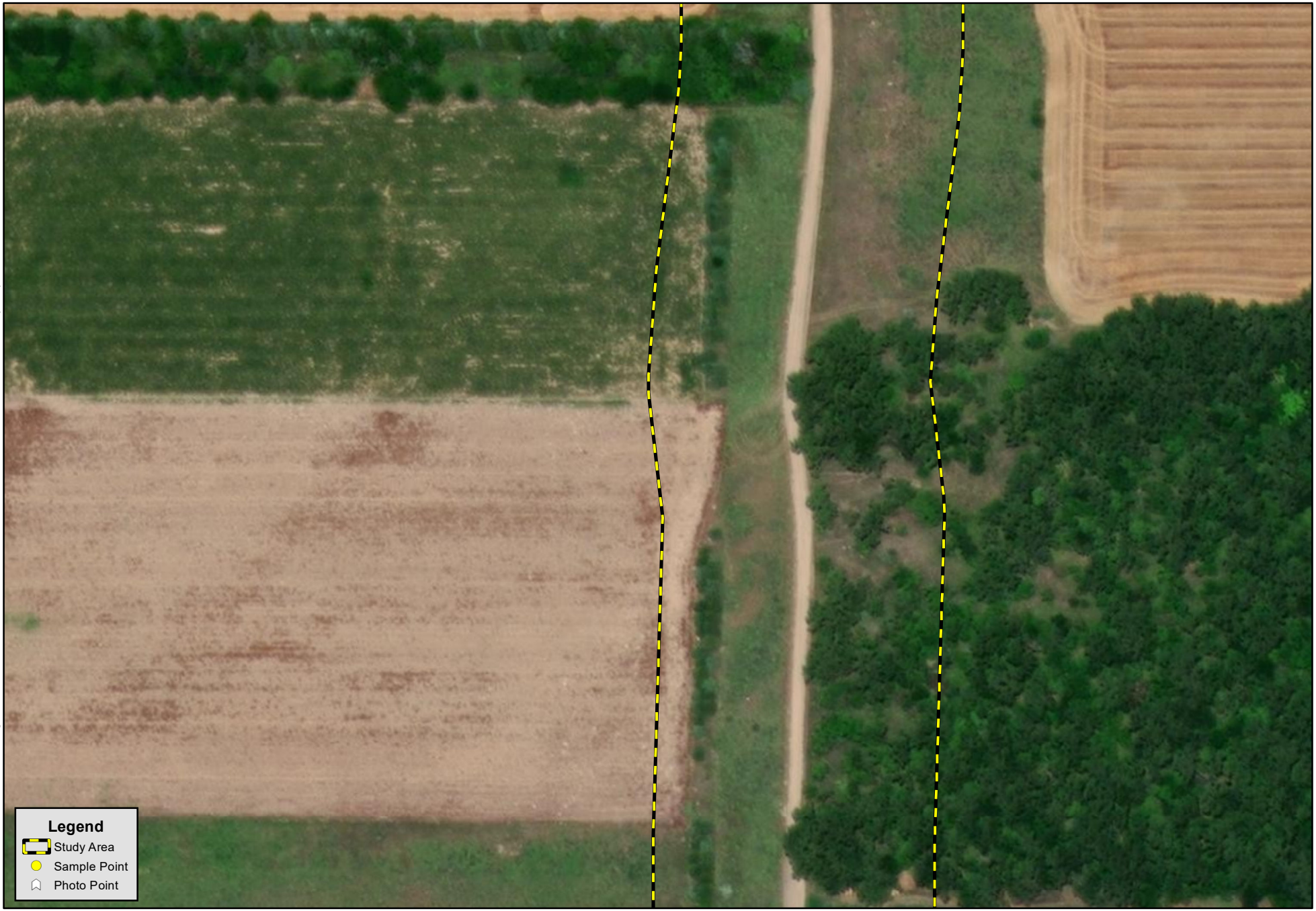
NDOT District 7 Wetland Mitigation Bank
Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2M



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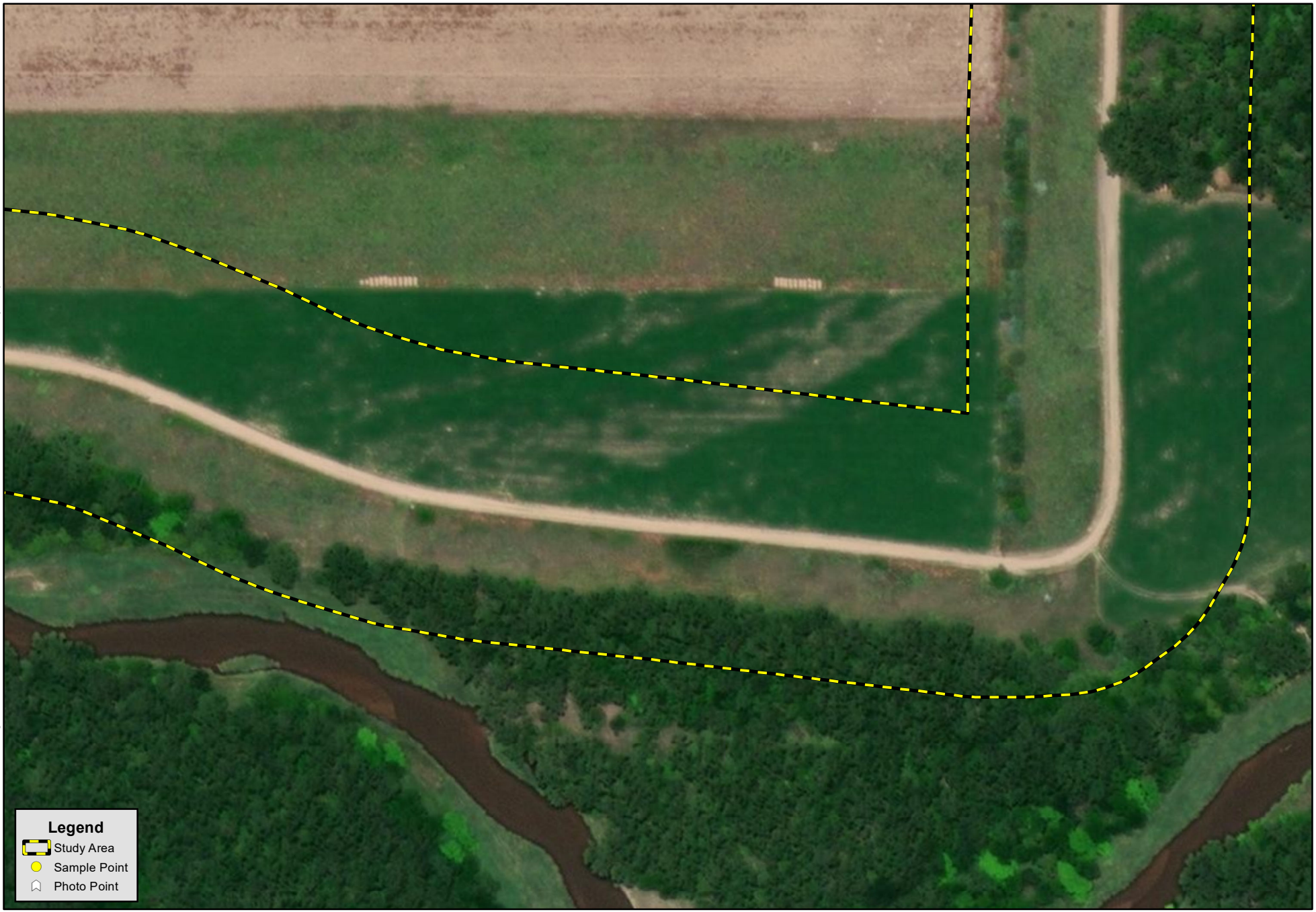
1 " = 183 '
Original Published Resolution
NAD 1983 UTM Zone 14N
ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank
Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2N



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1 " = 183 '
Original Published Resolution
NAD 1983 UTM Zone 14N
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NDOT District 7 Wetland Mitigation Bank
Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2O

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1 " = 183 '

Original Published Resolution

NAD 1983 UTM Zone 14N

ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank

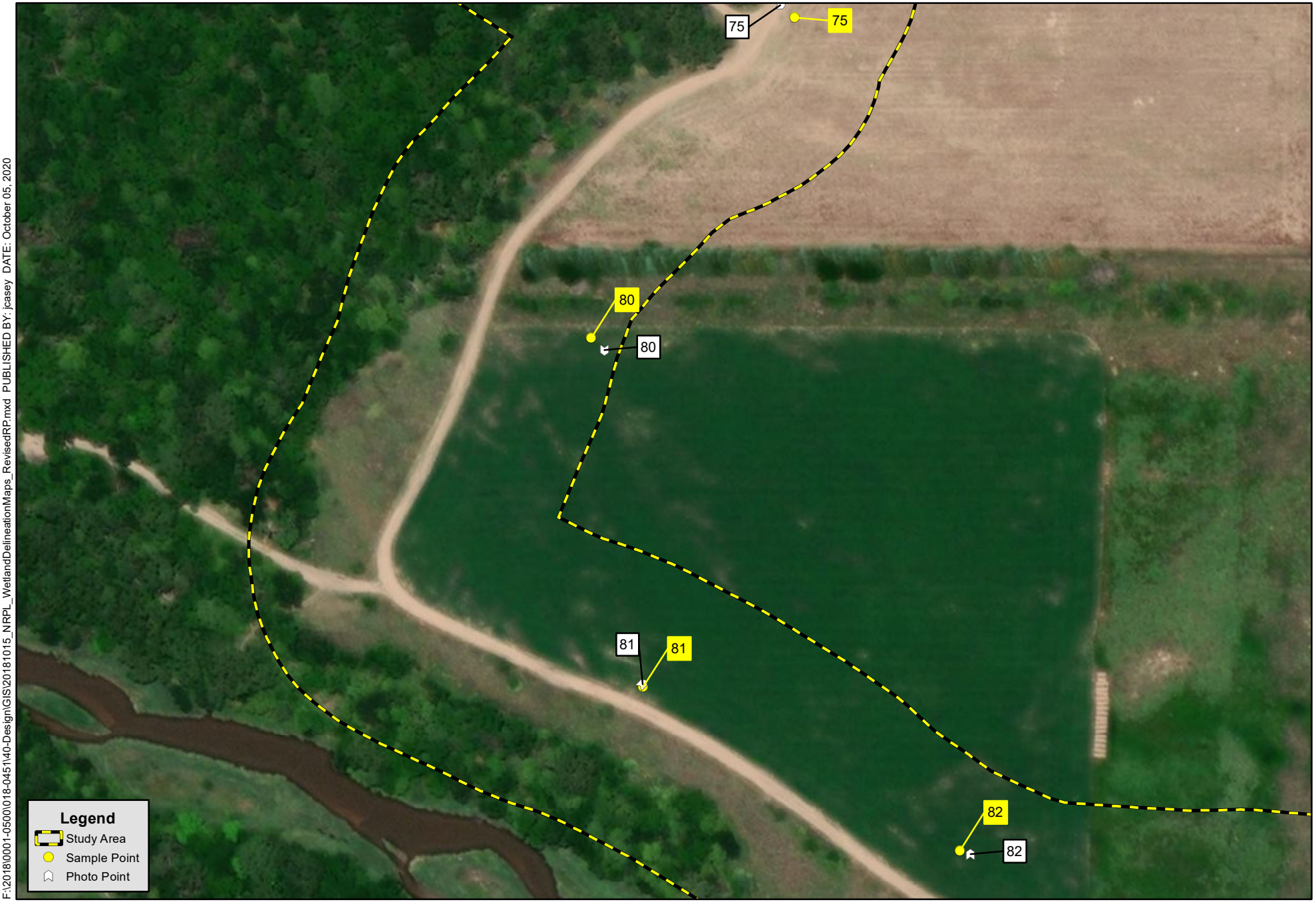
Site Selection Study

Harlan County, Nebraska

Wetland Delineation Detail Map

FIGURE

2P



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1 " = 183 '
Original Published Resolution
NAD 1983 UTM Zone 14N
ESRI World Imagery

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Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2Q

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1 " = 183 '
Original Published Resolution
NAD 1983 UTM Zone 14N
ESRI World Imagery

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Site Selection Study
Harlan County, Nebraska
Wetland Delineation Detail Map

FIGURE
2R

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0 45 90 180

1 " = 183 '

Original Published Resolution

NAD 1983 UTM Zone 14N

ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank

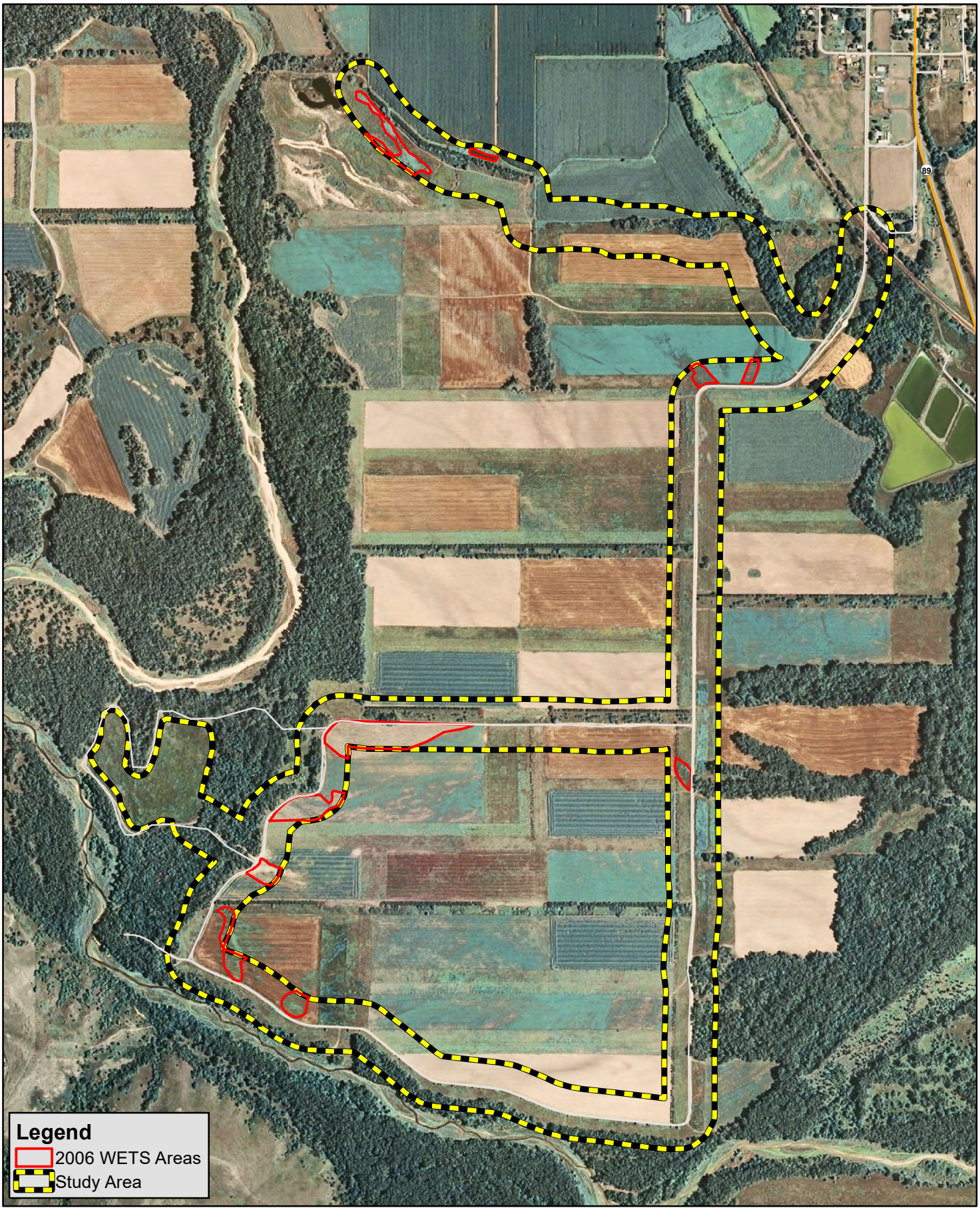
Site Selection Study

Harlan County, Nebraska

Wetland Delineation Detail Map

FIGURE

2S



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N

0 245 490 980

1 " = 1,013 '

Original Published Resolution

NAD 1983 UTM Zone 14N

ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank

Site Selection Study

South Central Nebraska

2006 WETS Map

FIGURE

1

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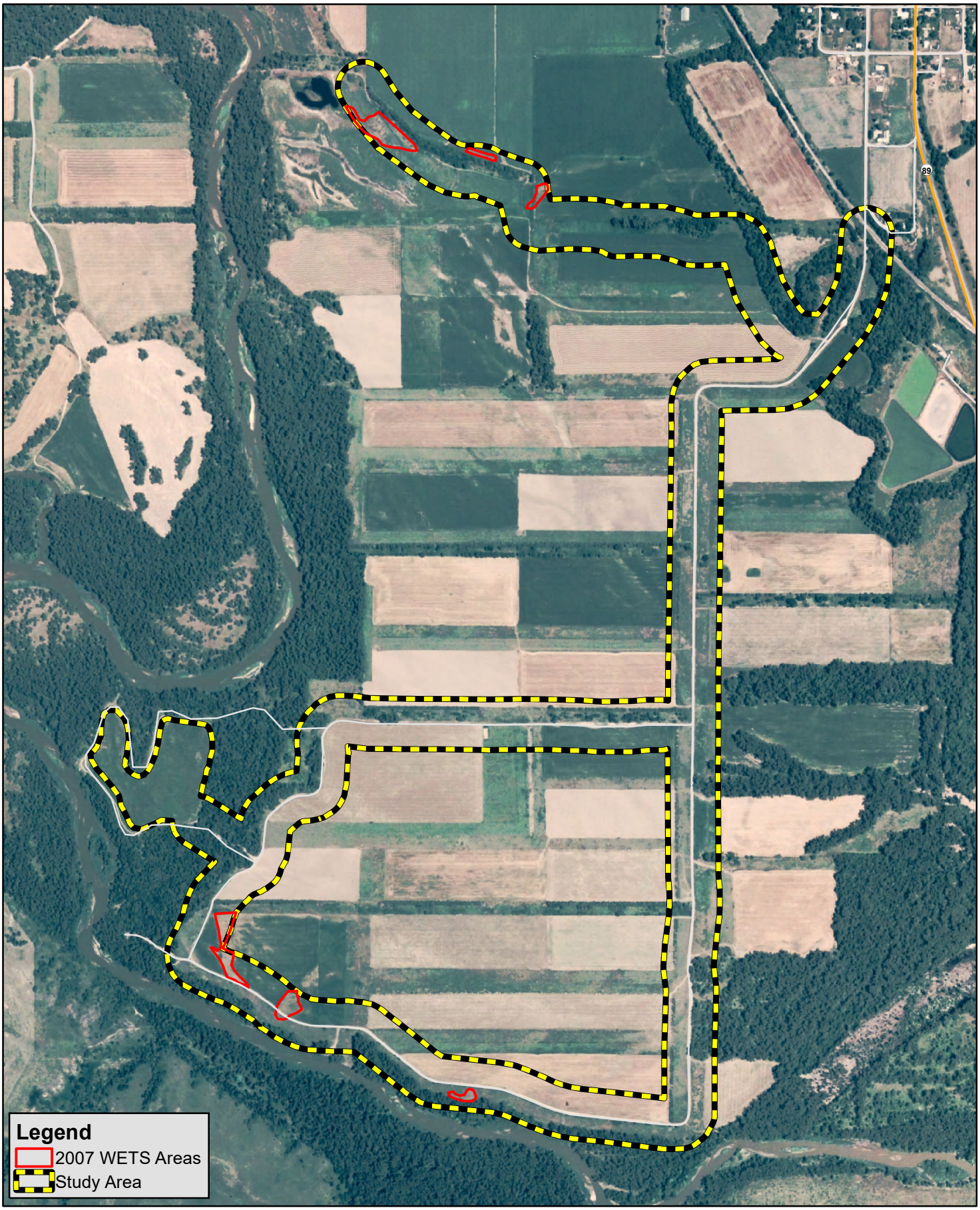

olsson

N

0 245 490 980

1 " = 1,013 '

Original Published Resolution

NAD 1983 UTM Zone 14N

ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank

Site Selection Study

South Central Nebraska

2007 WETS Map

FIGURE

2

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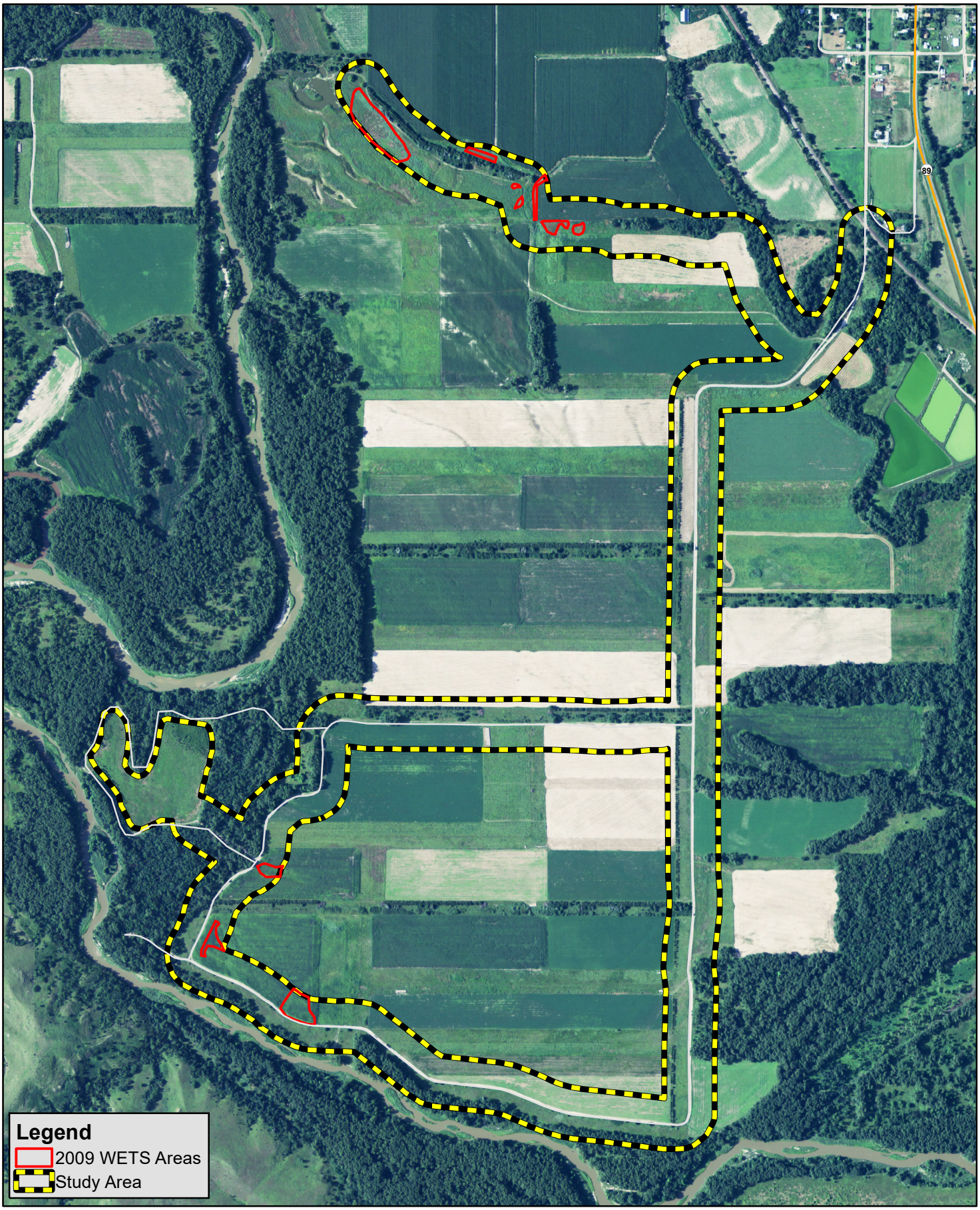

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N

0 245 490 980

1 " = 1,013 '

Original Published Resolution

NAD 1983 UTM Zone 14N

ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank

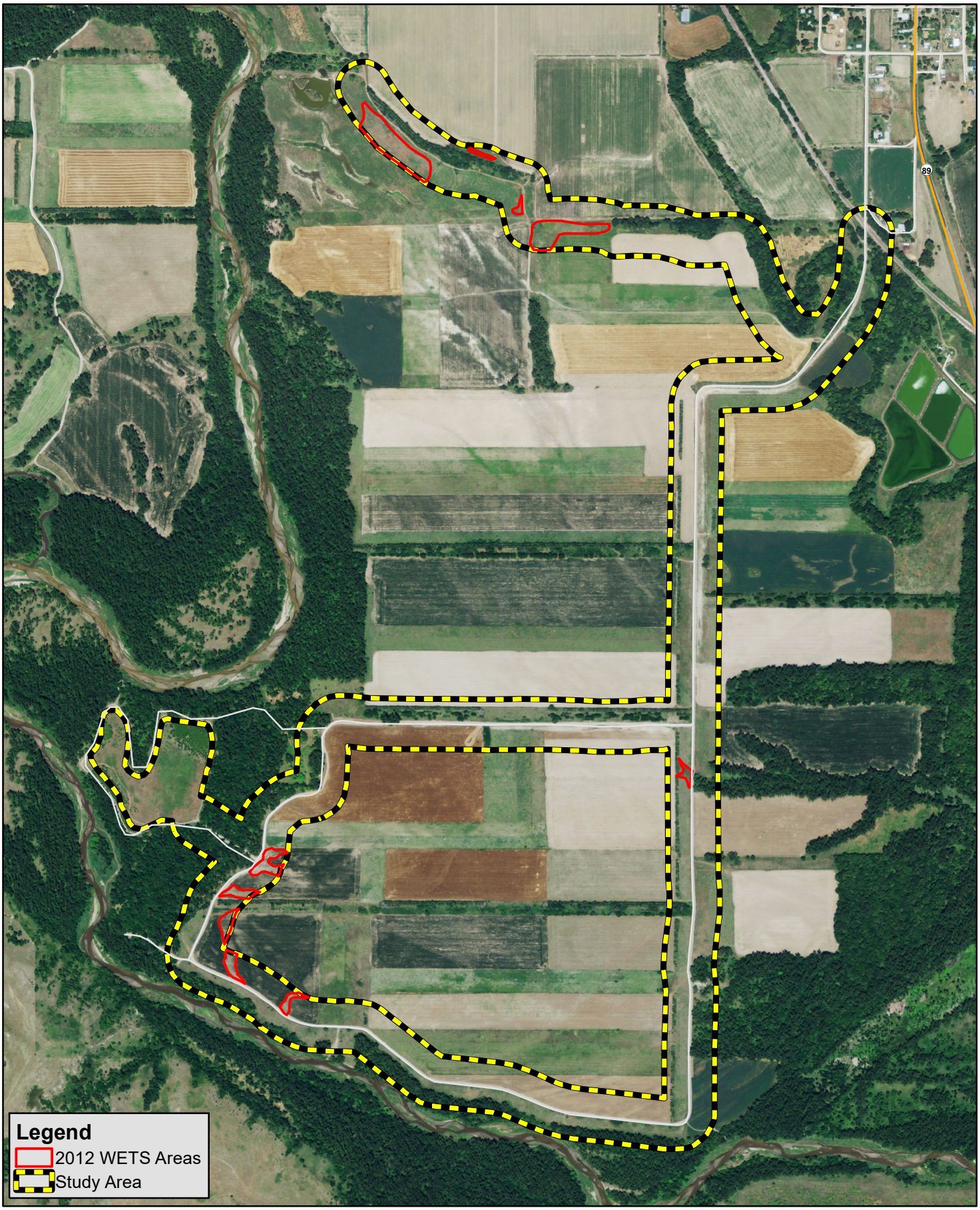
Site Selection Study

South Central Nebraska

2009 WETS Map

FIGURE

3



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N

0 245 490 980

1 " = 1,013 '

Original Published Resolution

NAD 1983 UTM Zone 14N

ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank

Site Selection Study

South Central Nebraska

2012 WETS Map

FIGURE

4

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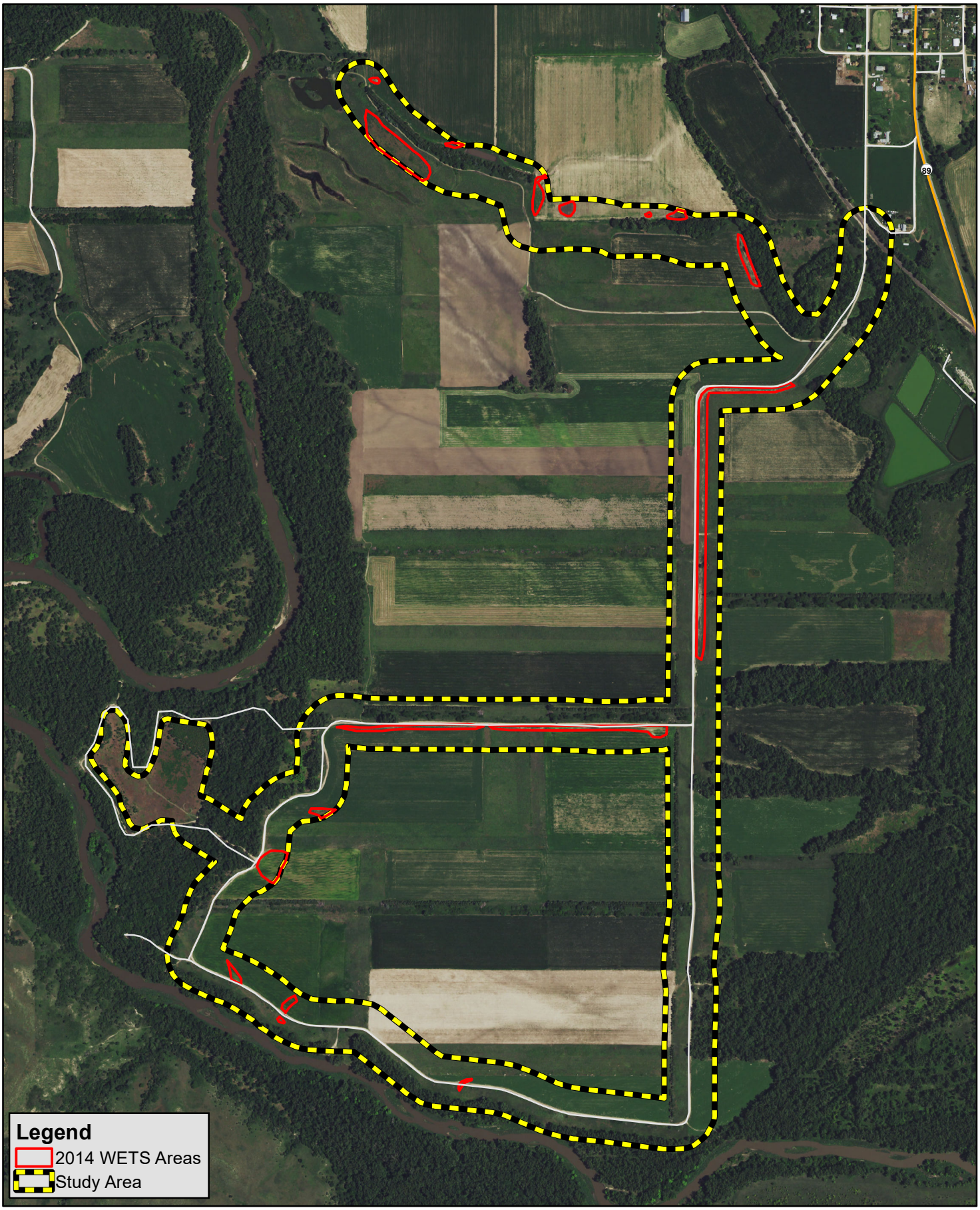

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1 " = 1,013 '

Original Published Resolution

NAD 1983 UTM Zone 14N

ESRI World Imagery

NDOT District 7 Wetland Mitigation Bank

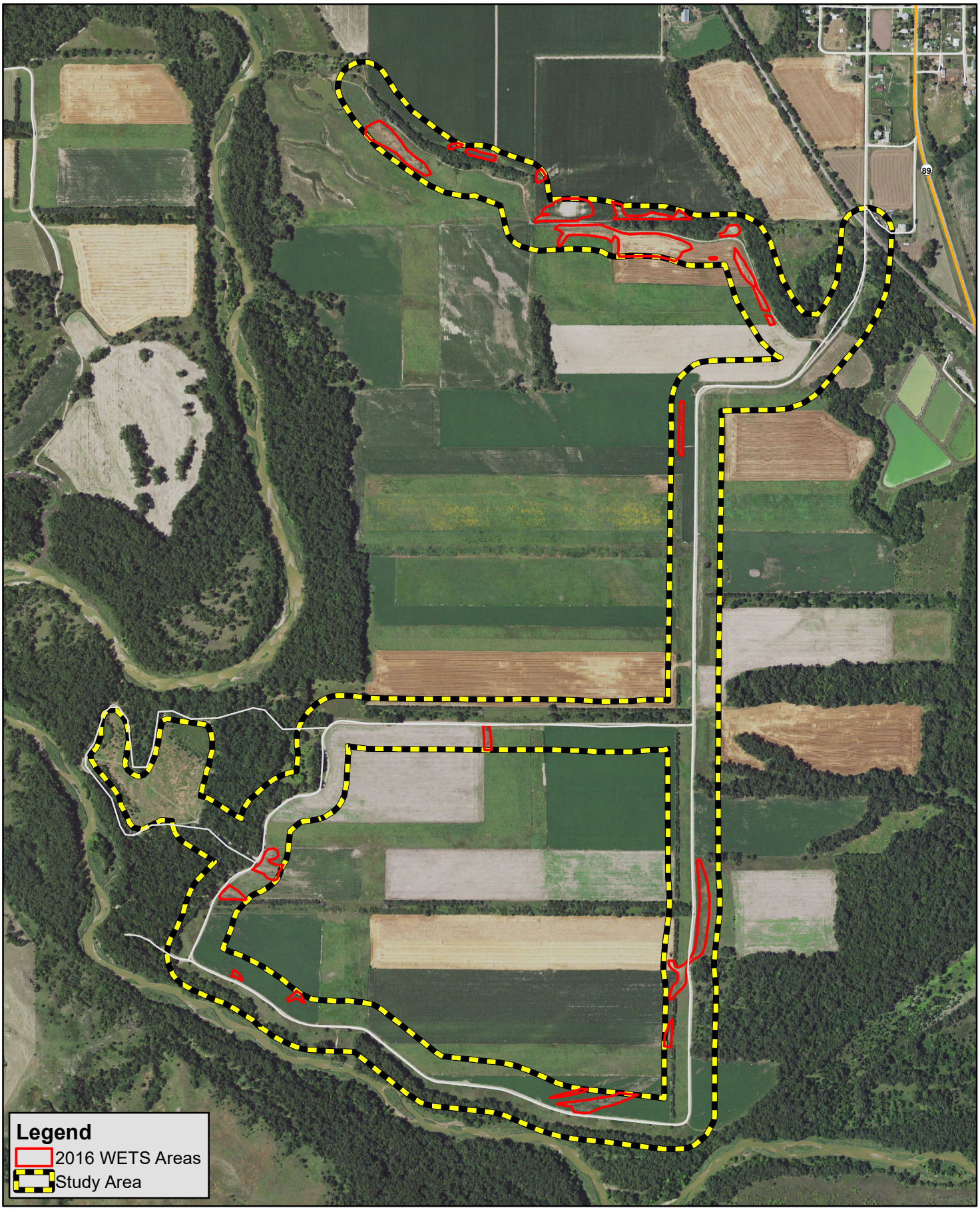
Site Selection Study

South Central Nebraska

2014 WETS Map

FIGURE

5



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1 " = 1,013 '

Original Published Resolution

NAD 1983 UTM Zone 14N

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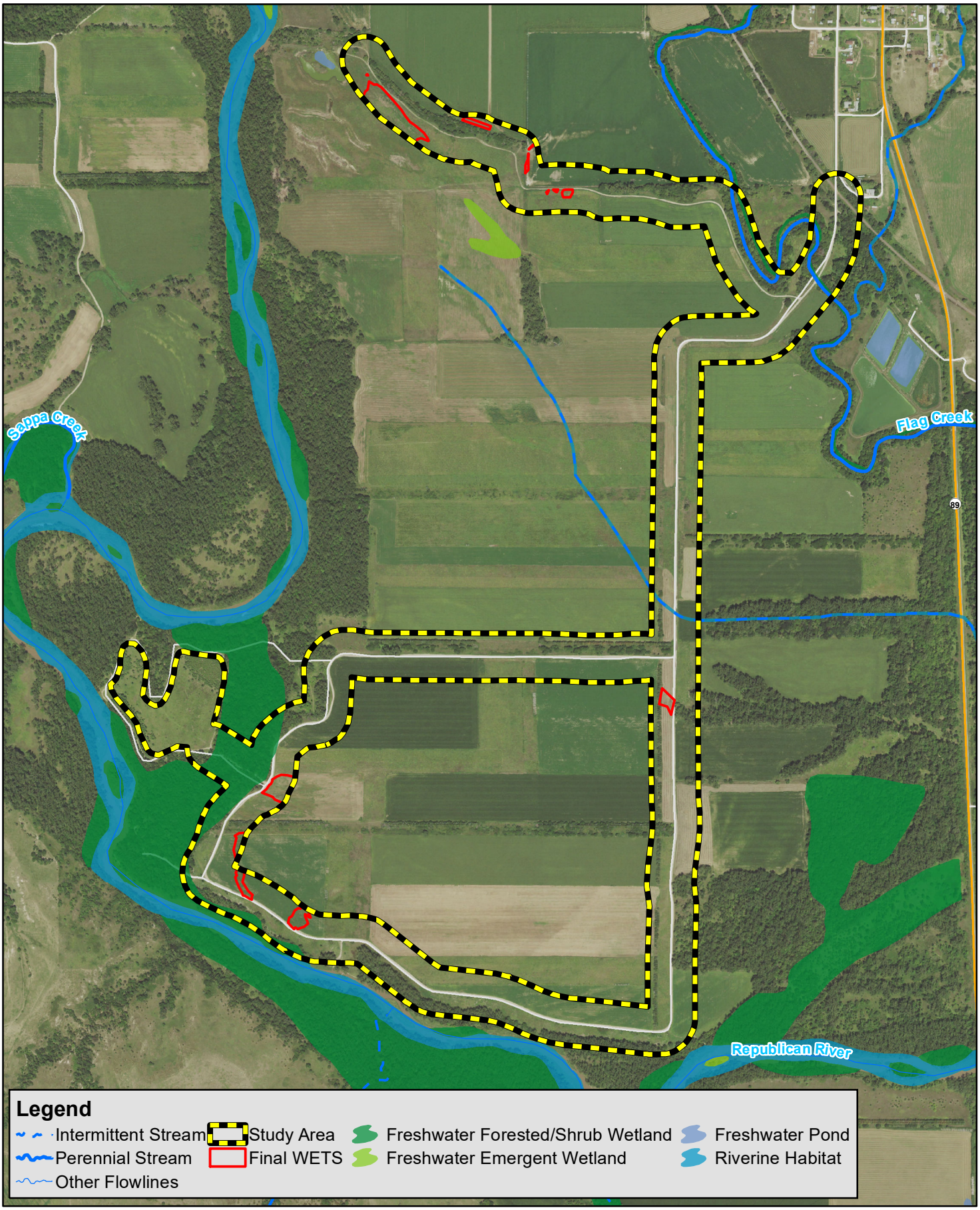
Site Selection Study

South Central Nebraska

2016 WETS Map

FIGURE

6



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0 260 520 1,040

1 " = 1,083 '

Original Published Resolution

NAD 1983 UTM Zone 14N

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NDOT District 7 Wetland Mitigation Bank

Site Selection Study

South Central Nebraska

Desktop Review Results Map

FIGURE

7

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **1a**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S51, T2N, R19W**

Landform (hillslope, terrace, etc.): **Oxbow** Local relief (concave, convex, none): **concave** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.1281** Long: **-99.4844** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **PSSC**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 1 is a Palustrine Emergent Semipermanently Flooded (PEMF) wetland in an oxbow of the Republican River.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Fraxinus pennsylvanica*	15	X	FAC
2.			
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phalaris arundinacea*	55	X	FACW
2. *Bromus inermis*	15		UPL
3. *Solidago canadensis*	15		FACU
4. *Galium aparine*	10		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 5%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is $\leq 3.0^1$

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Photo 1a

SOIL

Sampling Point: **1a**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR3/1	97	10YR5/6	3	C	M	SCL	Sandy Clay Loam
8-25	10YR6/3	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches) _____		
Water Table Present?	Yes _____	No X	Depth (inches) _____		
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches) _____	**Wetland Hydrology Present?**	**Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **1b**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S51, T2N, R19W**

Landform (hillslope, terrace, etc.): **Oxbow** Local relief (concave, convex, none): **concave** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.1297** Long: **-99.4853** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **PEM1F**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes X No ____**
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 1 is a PEMF wetland in an oxbow of the Republican River.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix amygdaloides*	15	X	FACW
2.			
3.			
4.			
5.			
	15 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Typha angustifolia*	75	X	OBL
2. *Scirpus atrovirens*	25	X	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: Photo 1b

SOIL

Sampling Point: **1b**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** __

Remarks: No pit dug due to inundation, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No __ Depth (inches) 15

Water Table Present? Yes __ No X Depth (inches) __

Saturation Present? Yes __ No X Depth (inches) __

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** __

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **1c**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S51, T2N, R19W**

Landform (hillslope, terrace, etc.): **Oxbow** Local relief (concave, convex, none): **concave** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.132** Long: **-99.4857** Datum: **UTM83**

Soil Map Unit Name: **2176 - McCook loam, occasionally flooded** NWI classification: **PABF**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes X No ____**
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 1 is a PEMF wetland in an oxbow of the Republican River.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Typha angustifolia*	95	X	OBL
2. *Scirpus atrovirens*	5		OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: Photo 1c

SOIL

Sampling Point: **1c**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** __

Remarks: No pit dug due to inundation, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No __ Depth (inches) 17

Water Table Present? Yes __ No __ Depth (inches) __

Saturation Present? Yes __ No __ Depth (inches) __

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** __

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **1d**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S51, T2N, R19W**

Landform (hillslope, terrace, etc.): **Oxbow** Local relief (concave, convex, none): **concave** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.1284** Long: **-99.4818** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **PABF**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 1 is a PEMF wetland in an oxbow of the Republican River.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix amygdaloides*	5	X	FACW
2.			
3.			
4.			
5.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Typha angustifolia*	85	X	OBL
2. *Scirpus atrovirens*	15		OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 1d

SOIL

Sampling Point: **1d**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR2/1	100					SCL	Sandy Clay Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Water

Depth (inches): 5

Hydric Soil Present? **Yes** X **No** __

Remarks: Water table present, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes __	No X	Depth (inches) __		
Water Table Present?	Yes X	No __	Depth (inches) 5		
Saturation Present? (includes capillary fringe)	Yes X	No __	Depth (inches) 0	**Wetland Hydrology Present?**	**Yes** X **No** __

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **2**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S51, T2N, R19W**

Landform (hillslope, terrace, etc.): **Center of Oxbow** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1297** Long: **-99.4852** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for sample point (SP) 1b

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juniperus virginiana*	30	X	UPL
2. *Populus deltoides*	15	X	FAC
3. *Fraxinus pennsylvanica*	10		FAC
4.			
5.			
	55	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Poa compressa*	15	X	FACU
2. *Chenopodium album*	15	X	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 70%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 2

SOIL

Sampling Point: **2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR3/1	100					SCL	Sandy Clay Loam
10-25	10YR5/2	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **3**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S51, T2N, R19W**

Landform (hillslope, terrace, etc.): **Center of Oxbow** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1319** Long: **-99.4856** Datum: **UTM83**

Soil Map Unit Name: **2176 - McCook loam, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 1c

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juniperus virginiana*	45	X	UPL
2. *Populus deltoides*	25	X	FAC
3.			
4.			
5.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Poa compressa*	15	X	FACU
2. *Bromus inermis*	15	X	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 70%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 3

SOIL

Sampling Point: **3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR3/1	100					SCL	Sandy Clay Loam
10-25	10YR5/2	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches) ____	
Water Table Present?	Yes ____	No X	Depth (inches) ____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches) ____	**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **4**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S51, T2N, R19W**

Landform (hillslope, terrace, etc.): **Oxbow** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1277** Long: **-99.4813** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 1d

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus rubra*	15	X	FACU
2. *Ulmus americana*	15	X	FAC
3. *Populus deltoides*	15	X	FAC
4. *Morus rubra*	15	X	FACU
5.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	20	X	UPL
2. *Agastache nepetoides*	20	X	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	40	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 60%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x 1 =	____
FACW species	____	x 2 =	____
FAC species	____	x 3 =	____
FACU species	____	x 4 =	____
UPL species	____	x 5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 4

SOIL

Sampling Point: **4**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR3/1	100					SCL	Sandy Clay Loam
7-25	10YR5/2	100					Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches) ____	
Water Table Present?	Yes ____	No X	Depth (inches) ____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches) ____	**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **5a**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Low terrace** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1276** Long: **-99.4794** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes X No ____**
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 5 is a Palustrine Emergent Temporarily Flooded / Seasonally Flooded (PEMA/C) wetland abutting the Republican River.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phalaris arundinacea*	85	X	FACW
2. *Spartina pectinata*	15		FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: Photo 5a

SOIL

Sampling Point: **5a**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-9	10YR2/1	50					SCL	Sandy Clay Loam
	10YR4/2	50						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Water

Depth (inches): 9

Hydric Soil Present? **Yes** X **No** ___

Remarks: Water table present, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches) ___		
Water Table Present?	Yes X	No ___	Depth (inches) 9		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches) 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **5b**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Swale** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1273** Long: **-99.4757** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes X No ____**
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 5 is a PEMA/C wetland in a swale.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phalaris arundinacea*	95	X	FACW
2. *Urtica dioica*	5		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: Photo 5b

SOIL

Sampling Point: **5b**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-15	10YR2/2	80					SCL	Sandy Clay Loam
	Gley15/N	20						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Water

Depth (inches): 15

Hydric Soil Present? **Yes** X **No** __

Remarks: Water table present, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- X Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes __	No X	Depth (inches) __		
Water Table Present?	Yes X	No __	Depth (inches) 15		
Saturation Present? (includes capillary fringe)	Yes X	No __	Depth (inches) 0	**Wetland Hydrology Present?**	**Yes** X **No** __

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **5c**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Berm** Local relief (concave, convex, none): **concave** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1267** Long: **-99.4738** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 5 is a PEMA/C wetland abutting the Republican River.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus rubra*	15	X	FACU
2.			
3.			
4.			
5.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Sambucus nigra*	10	X	FAC
2. *Salix interior*	5	X	FACW
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 5')			
1. *Phalaris arundincea*	100	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Photo 5c

SOIL

Sampling Point: **5c**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-15	10YR3/1	90					SCL	Sandy Clay Loam
	10YR4/2	10						
6-16	10YR4/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Water table

Depth (inches): 16

Hydric Soil Present? **Yes** X **No** __

Remarks: Water table present, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- X Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes __	No X	Depth (inches) __		
Water Table Present?	Yes X	No __	Depth (inches) 16		
Saturation Present? (includes capillary fringe)	Yes X	No __	Depth (inches) 0	**Wetland Hydrology Present?**	**Yes** X **No** __

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **5d**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Adjacent river** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1259** Long: **-99.4736** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes X No ____**
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 5 is a PEMA/C wetland abutting the Republican River.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phalaris arundinacea*	85	X	FACW
2. *Panicum virgatum*	10		FAC
3. *Typha angustifolia*	5		OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is $\leq$3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: Photo 5d

Salix interior growing in patches along the terrace outside of the sample point plot, but not high enough cover to be considered a scrub-shrub wetland.

SOIL

Sampling Point: **5d**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR2/1	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Water

Depth (inches): 3

Hydric Soil Present? **Yes** X **No** __

Remarks: Water table present, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes	__	No	X	Depth (inches) __
Water Table Present?	Yes	X	No	__	Depth (inches) 3
Saturation Present? (includes capillary fringe)	Yes	X	No	__	Depth (inches) 0

Wetland Hydrology Present? **Yes** X **No** __

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **6**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Terrace** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1276** Long: **-99.4798** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 5a

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	70	X	UPL
2. *Elymus canadensis*	15		FACU
3. *Verbascum thapsus*	10		UPL
4. *Asclepias syriaca*	5		UPL
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 6

SOIL

Sampling Point: **6**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	10YR4/1	80					Sandy Loam	
	10YR3/1	20						
5-30	10YR6/3	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches) ____	
Water Table Present?	Yes ____	No X	Depth (inches) ____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches) ____	**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **7a**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Swale** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1286** Long: **-99.4777** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 7 is a PEMA wetland in a swale.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Morus rubra*	5	X	FACU
2. *Populus deltoides*	5	X	FAC
3. *Fraxinus pennsylvanica*	5	X	FAC
4.			
5.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phalaris arundinacea*	95	X	FACW
2. *Parthenocissus quinquefolia*	5		FACU
3. *Galium aparine*	5		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	105	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is $\leq$3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 7a

SOIL

Sampling Point: **7a**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR2/2	100					SCL	Sandy Clay Loam
8-22	10YR5/2	100					SCL	Sandy Clay Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: The procedure described in the Great Plains Region USACE Delineation Manual, Chapter 5, page 112-114, was used to evaluate soils to determine the area was a wetland. The soils at this site meet the criteria for problematic hydric soils, as indicators of hydrophytic vegetation and hydrology are present. The area is located in a landscape position that is likely to collect or concentrate water (Part 3a concave). The following indicator(s) of problematic hydric soils is present, Part 4b4 Recently Developed Wetland; therefore, the soils in this area should be considered hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches) ___		
Water Table Present?	Yes X	No ___	Depth (inches) 22		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches) 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **7b**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Swale** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1301** Long: **-99.4793** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 7 is a PEMA wetland in a swale.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phalaris arundinacea*	95	X	FACW
2. *Galium aparine*	5		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 7b

SOIL

Sampling Point: **7b**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-9	10YR2/1	100					SCL	Sandy Clay Loam
9-30	10YR2/1	70					SCL	Sandy Clay Loam
	10YR5/2	30						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: The procedure described in the Great Plains Region USACE Delineation Manual, Chapter 5, page 112-114, was used to evaluate soils to determine the area was a wetland. The soils at this site meet the criteria for problematic hydric soils, as indicators of hydrophytic vegetation and hydrology are present. The area is located in a landscape position that is likely to collect or concentrate water (Part 3a concave). The following indicator(s) of problematic hydric soils is present, Part 4b4 Recently Developed Wetland; therefore, the soils in this area should be considered hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? Yes ___ No X Depth (inches) ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **8**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Swale** Local relief (concave, convex, none): **concave** Slope (%): **2-3**

Subregion (LRR): **H** Lat: **40.1285** Long: **-99.4775** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 7a.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Asimina triloba*	10	X	FACU
2. *Fraxinus pennsylvanica*	10	X	FAC
3. *Populus deltoides*	10	X	FAC
4. *Morus rubra*	10	X	FACU
5. *Ulmus americana*	5		FAC
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Asimina triloba*	10	X	FACU
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: 5')			
1. *Galium aparine*	5	X	UPL
2. *Bromus inermis*	5	X	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	10	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 90%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 29% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 8

SOIL

Sampling Point: **8**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR2/2	100					SCL	Sandy Clay Loam
12-25	10YR5/2	100					SCL	Sandy Clay Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **9**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Top of swale** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1301** Long: **-99.4792** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 7b.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis occidentalis*	20	X	FACU
2. *Populus deltoides*	15	X	FAC
3. *Ulmus americana*	5		FAC
4.			
5.			
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Morus rubra*	15	X	FACU
2.			
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	50	X	UPL
2. *Laportea canadensis*	30	X	FAC
3. *Cannabis sativa*	10		UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 9

SOIL

Sampling Point: **9**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR3/1	100					Sandy Loam	
4-25	10YR4/1	80					Sandy Loam	
	10YR3/1	20						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **10**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Slope of swale** Local relief (concave, convex, none): **convex** Slope (%): **1-3**

Subregion (LRR): **H** Lat: **40.1282** Long: **-99.4764** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X		
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X		

Remarks: This swale used to be Milrose Creek, but no longer has a bed and bank or an OHWM and was determined to not be a channel.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	15	X	FAC
2. *Fraxinus pennsylvanica*	15	X	FAC
3. *Ulmus rubra*	15	X	FACU
4.			
5.			
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Cornus drummondii*	5	X	FAC
2. *Morus rubra*	5	X	FACU
3. *Juniperus virginiana*	5	X	UPL
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 5')			
1. *Galium aparine*	15	X	FACU
2. *Parthenocissus quinquefolia*	15	X	FACU
3. *Bromus inermis*	15	X	UPL
4. *Agastache nepetoides*	15	X	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	60	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 40%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 3 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 30% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 10

SOIL

Sampling Point: **10**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR3/1	70					SCL	Sandy Clay Loam
	10YR4/1	30						
12-30	10YR3/1	70					SCL	Sandy Clay Loam
	10YR4/1	30						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **11**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Top of bank** Local relief (concave, convex, none): **none** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.1274** Long: **-99.4757** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 5b.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis occidentalis*	15	X	FACU
2. *Fraxinus pennsylvanica*	15	X	FAC
3. *Populus deltoides*	15	X	FAC
4.			
5.			
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	95	X	UPL
2. *Rosa arkansana*	5		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 11

SOIL

Sampling Point: **11**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR3/1	70					SCL	Sandy Clay Loam
	10YR4/1	30						
12-30	10YR3/1	70					SCL	Sandy Clay Loam
	10YR4/1	30						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **12**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Berm** Local relief (concave, convex, none): **convex** Slope (%): **2**

Subregion (LRR): **H** Lat: **40.1265** Long: **-99.4738** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X		

Remarks: This area displayed hydrophytic vegetation, but due to lack of hydric soils and sufficient hydrology indicators, this area was determined to be upland.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Sambucus nigra*	5	X	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phalaris arundincea*	90	X	FACW
2. *Urtica dioica*	10		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Photo 12

SOIL

Sampling Point: **12**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR3/1	80					Sandy Loam	
	10YR4/2	20						
5-30	10YR5/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches) ____	
Water Table Present?	Yes ____	No X	Depth (inches) ____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches) ____	**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **13**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Berm** Local relief (concave, convex, none): **none** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.126** Long: **-99.4735** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor loamy fine sand, rarely flooded** NWI classification: **PEM1C**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 5d.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Acer negundo*	5	X	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus tectorum*	60	X	UPL
2. *Solidago canadensis*	20	X	FACU
3. *Carduus nutans*	15		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 5%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 13

SOIL

Sampling Point: **13**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	10YR3/1	70					Sandy Loam	
	10YR4/2	30						
5-30	10YR5/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **14**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.125258** Long: **-99.473236** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 14 is a PEMA/C wetland in a depression.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Scirpus sp.*	90	X	OBL
2. *Panicum virgatum*	10		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 14

SOIL

Sampling Point: **14**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR4/2	80					Sandy Loam	
	10YR2/1	20						
8-16	10YR4/2	95	10YR5/6	5	C	M	Sand	
16-25	10YR4/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? Yes ___ No X Depth (inches) ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **15**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Hillslope** Local relief (concave, convex, none): **convex** Slope (%): **2**

Subregion (LRR): **H** Lat: **40.1253** Long: **-99.4734** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 14.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	75	X	UPL
2. *Panicum virgatum*	25	X	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	75	x 5 =	375
Column Totals:	100 (A)		450 (B)

Prevalence Index = B/A = 4.50

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 15

SOIL

Sampling Point: **15**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR5/1	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **16a**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Pond** Local relief (concave, convex, none): **concave** Slope (%): **2-3**

Subregion (LRR): **H** Lat: **40.125** Long: **-99.4728** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 16 is a PEMA/C wetland abutting a pond.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Typha angustifolia*	40	X	OBL
2. *Panicum virgatum*	40	X	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is $\leq$3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 16a

SOIL

Sampling Point: **16a**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: No pit dug due to standing water, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches) 15

Water Table Present? Yes ___ No ___ Depth (inches) ___

Saturation Present? Yes ___ No ___ Depth (inches) ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **16b**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Pond** Local relief (concave, convex, none): **concave** Slope (%): **2**

Subregion (LRR): **H** Lat: **40.1253** Long: **-99.4719** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 16 is a PEMA/C wetland abutting a pond.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Typha angustifolia*	70	X	OBL
2. *Eleocharis sp.*	30	X	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is $\leq$3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 16b

SOIL

Sampling Point: **16b**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR4/1	100					Sand	
3-18	Gley1 5/N	60					Sand	
	10YR4/2	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- X Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Water

Depth (inches): 18

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches) ___		
Water Table Present?	Yes X	No ___	Depth (inches) 18		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches) 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **17**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Field** Local relief (concave, convex, none): **none** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.125** Long: **-99.4729** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 16a. This area displayed dominant facultative vegetation, but due to the lack of hydric soils and sufficient hydrology indicators, this area was determined to be upland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Panicum virgatum*	75	X	FAC
2. *Ambrosia artemisiifolia*	15		FACU
3. *Solidago canadensis*	5		FACU
4. *Melilotus officinalis*	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Photo 17

SOIL

Sampling Point: **17**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-30	10YR3/2	50					SCL	Sandy Clay Loam
	10YR4/1	50						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **18**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Hillslope** Local relief (concave, convex, none): **convex** Slope (%): **6**

Subregion (LRR): **H** Lat: **40.1253** Long: **-99.4718** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 16b.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus tectorum*	30	X	UPL
2. *Schizachyrium scoparium*	30	X	FACU
3. *Ambrosia psilostachya*	10		FACU
4. *Chamaecrista fasciculata*	10		FACU
5. *Conyza canadensis*	10		FACIU
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 18

SOIL

Sampling Point: **18**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR3/2	60					Sandy Loam	
	10YR4/1	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **19**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Floodplain** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1245** Long: **-99.474** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X		
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X		

Remarks: This area displayed facultative vegetation, but did not pass the dominance test. Due to a lack of all three wetland criteria, the area was determined to be upland.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus rubra*	25	X	FACU
2. *Populus deltoides*	20	X	FAC
3. *Ulmus americana*	10		FAC
4.			
5.			
	55	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	50	X	UPL
2. *Agastache nepetoides*	25	X	FACU
3. *Panicum virgatum*	15		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 19

SOIL

Sampling Point: **19**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR3/1	75					Sandy Loam	
	10YR4/2	25						
6-30	10YR4/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches) ____	
Water Table Present?	Yes ____	No X	Depth (inches) ____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches) ____	**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/22/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **20**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Hillslope** Local relief (concave, convex, none): **convex** Slope (%): **2**

Subregion (LRR): **H** Lat: **40.1242** Long: **-99.4701** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: The area displayed dominant facultative vegetation but not pass the Prevalence Index Worksheet. This area was determined to be upland due to a lack of all three wetland criteria.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Urtica dioica*	50	X	FAC
2. *Helianthus annuus*	25	X	FACU
3. *Panicum virgatum*	15		FAC
4. *Cannabis sativa*	10		UPL
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	65	x 3 =	195
FACU species	25	x 4 =	100
UPL species	10	x 5 =	50
Column Totals:	100 (A)		345 (B)

Prevalence Index = B/A = 3.45

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 20

SOIL

Sampling Point: **20**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR3/1	65					SCL	Sandy Clay Loam
	10YR4/1	35						
7-30	10YR4/2	80					Loamy Sand	
	10YR3/1	20						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **21a**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **2**

Subregion (LRR): **H** Lat: Long: **-99.4719** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 21 is a PEMA/C wetland in a depression.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Panicum virgatum*	60	X	FAC
2. *Schoenoplectus tabernaemontani*	25	X	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 15%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is $\leq$3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 21a

SOIL

Sampling Point: **21a**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks: No pit dug due to standing water, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches) _____

Water Table Present? Yes _____ No _____ Depth (inches) _____

Saturation Present? Yes _____ No _____ Depth (inches) _____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **21b**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **2**

Subregion (LRR): **H** Lat: **40.1239** Long: **-99.4729** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 21 is a PEMA/C wetland in a depression.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Schoenoplectus tabernaemontani*	65	X	OBL
2. *Panicum virgatum*	20	X	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 15%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is $\leq$3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 21b

SOIL

Sampling Point: **21b**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR4/2	80					Sandy Loam	
	10YR2/1	20						
4-20	10YR4/2	90	10YR5/6	10	C	M	Sand	
20-30	10YR4/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? Yes ___ No X Depth (inches) ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **21c**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.123** Long: **-99.4706** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes X No ____**
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 21 is a PEMA/C wetland in a depression. A smaller portion of the wetland sat at a higher elevation than the surrounding area, but was considered part of the wetland due to the presence of hydric soils.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	10	X	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Schoenoplectus tabernaemontani*	40	X	OBL
2. *Panicum virgatum*	40	X	FAC
3. *Ambrosia psilostachya*	10		FACU
4. *Solidago canadensis*	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 5%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: Photo 21c

A small patch of *Populus deltoides* saplings was located within the wetland, but did not contain enough absolute cover to be considered a scrub-shrub wetland.

SOIL

Sampling Point: **21c**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	10YR4/2	80					Sandy Loam	
	10YR2/1	20						
5-18	10YR4/2	90	10YR5/6	10	C	M	Sand	
18-25	10YR4/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? Yes ___ No X Depth (inches) ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **21d**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1226** Long: **-99.4697** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 21 is a PEMA/C wetland in a depression. A smaller portion of the wetland sat at a higher elevation than the surrounding area, but was considered part of the wetland due to the presence of hydric soils.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	10	X	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Schoenoplectus tabernaemontani*	45	X	OBL
2. *Panicum dichotomiflorum*	15		FAC
3. *Ambrosia psilostachya*	10		FACU
4. *Panicum virgatum*	10		FAC
5. *Eleocharis sp.*	5		OBL
6.			
7.			
8.			
9.			
10.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 15%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Photo 21d

SOIL

Sampling Point: **21d**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR4/2	80					Sandy Loam	
	10YR2/1	20						
4-20	10YR4/2	90	10YR5/6	10	C	M	Sand	
20-30	10YR4/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? Yes ___ No X Depth (inches) ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **22**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Hillslope** Local relief (concave, convex, none): **convex** Slope (%): **2**

Subregion (LRR): **H** Lat: **40.1243** Long: **-99.4719** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 21a. This area displayed dominant facultative vegetation, but due to lack of hydric soils and sufficient hydrology indicators this area was determined to be upland.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Panicum virgatum*	60	X	FAC
2. *Desmanthus illinoensis*	10		FACU
3. *Solidago canadensis*	10		FACU
4. *Schizachyrium scoparium*	10		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is $\leq 3.0^1$
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Photo 22

SOIL

Sampling Point: **22**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR4/2	70					Sandy Loam	
	10YR3/2	30						
10-25	10YR5/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **23**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Slope** Local relief (concave, convex, none): **convex** Slope (%): **2**

Subregion (LRR): **H** Lat: **40.1239** Long: **-99.473** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 21b. This area displayed dominant facultative vegetation, but due to lack of hydric soils and sufficient hydrology indicators this area was determined to be upland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Panicum virgatum*	75	X	FAC
2. *Solidago canadensis*	10		FACU
3. *Ambrosia psilostachya*	5		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Photo 23

SOIL

Sampling Point: **23**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR5/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches) ____	
Water Table Present?	Yes ____	No X	Depth (inches) ____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches) ____	**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **24**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Hillslope** Local relief (concave, convex, none): **convex** Slope (%): **3**

Subregion (LRR): **H** Lat: **40.1231** Long: **-99.4706** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **#N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 21c. This area displayed dominant facultative vegetation, but due to lack of hydric soils and sufficient hydrology indicators this area was determined to be upland.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Panicum virgatum*	75	X	FAC
2. *Desmanthus illinoensis*	15		FACU
3. *Chamaecrista fasciculata*	5		FACU
4. *Ambrosia psilostachya*	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Photo 24

SOIL

Sampling Point: **24**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR4/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **25**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Hillslope** Local relief (concave, convex, none): **convex** Slope (%): **4**

Subregion (LRR): **H** Lat: **40.1226** Long: **-99.4697** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 21d.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Panicum virgatum*	40	X	FAC
2. *Desmanthus illinoensis*	25	X	FACU
3. *Solidago canadensis*	15		FACU
4. *Ambrosia psilostachya*	10		FACU
5. *Helianthus annuus*			FACU
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	90 (A)		320 (B)

Prevalence Index = B/A = 3.56

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 25

SOIL

Sampling Point: **25**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR5/2	100					Sand	Gravel in pit

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **26a**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1232** Long: **-99.4721** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 26 is a PEMA/C wetland in a depression.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phragmites australis*	90	X	FACW
2. *Schoenoplectus tabernaemontani*	10		OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 26a

SOIL

Sampling Point: **26a**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: No pit dug due to standing water, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches)	5	
Water Table Present?	Yes ___	No ___	Depth (inches)	___	
Saturation Present? (includes capillary fringe)	Yes ___	No ___	Depth (inches)	___	**Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **26b**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1227** Long: **-99.4721** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 26 is a PEMA/C wetland in a depression.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phragmites australis*	60	X	FACW
2. *Schoenoplectus tabernaemontani*	35	X	OBL
3. *Panicum virgatum*	5		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is $\leq$3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 26b

SOIL

Sampling Point: **26b**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	10YR3/1	70					Clay Loam	
	10YR4/1	30						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Water

Depth (inches): 5

Hydric Soil Present? **Yes** X **No** __

Remarks: Water table present, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes __	No X	Depth (inches) __		
Water Table Present?	Yes X	No __	Depth (inches) 5		
Saturation Present? (includes capillary fringe)	Yes X	No __	Depth (inches) 0	**Wetland Hydrology Present?**	**Yes** X **No** __

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **26c**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1227** Long: **-99.4715** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 26 is a PEMA/C wetland in a depression.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phragmites australis*	80	X	FACW
2. *Schoenoplectus tabernaemontani*	20	X	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 26c

SOIL

Sampling Point: **26c**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** __

Remarks: No pit dug due to standing water, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No __ Depth (inches) 4

Water Table Present? Yes __ No __ Depth (inches) __

Saturation Present? Yes __ No __ Depth (inches) __
(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** __

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **27**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Hillslope** Local relief (concave, convex, none): **convex** Slope (%): **3**

Subregion (LRR): **H** Lat: **40.1233** Long: **-99.4722** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 26a.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Panicum virgatum*	40	X	FAC
2. *Elymus canadensis*	20	X	FACU
3. *Schizachyrium scoparium*	20	X	FACU
4. *Solidago canadensis*	5		FACU
5. *Melilotus officinalis*	5		FACU
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 27

SOIL

Sampling Point: **27**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR5/1	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **28**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Hillslope** Local relief (concave, convex, none): **convex** Slope (%): **3-4**

Subregion (LRR): **H** Lat: **40.1227** Long: **-99.472** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 26b.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Schizachyrium scoparium*	60	X	FACU
2. *Solidago canadensis*	15		FACU
3. *Ambrosia psilostachya*	10		FACU
4. *Panicum virgatum*	5		FAC
5. *Bromus trectorum*	5		UPL
6. *Verbascum thapsus*	5		UPL
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 28

SOIL

Sampling Point: **28**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR5/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **29**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Slope** Local relief (concave, convex, none): **convex** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1226** Long: **-99.4713** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **#N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 26c. This area displayed dominant facultative vegetation, but due to the lack of hydric soils and sufficient hydrology indicators, this area was determined to be upland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Panicum virgatum*	60	X	FAC
2. *Solidago canadensis*	15		FACU
3. *Elymus canadensis*	10		FACU
4. *Schizachyrium scoparium*	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x 1 =	____
FACW species	____	x 2 =	____
FAC species	____	x 3 =	____
FACU species	____	x 4 =	____
UPL species	____	x 5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Photo 29

SOIL

Sampling Point: **29**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR5/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **30**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1224** Long: **-99.4735** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wetland 30 is a PEMA/C wetland in a depression.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	10	X	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phragmites australis*	60	X	FACW
2. *Phalaris arundinacea*	20	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 30

SOIL

Sampling Point: **30**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** __

Remarks: No pit dug due to standing water, soils are assumed hydric due to the presence of hydrophytic vegetation and sufficient hydrology indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No __ Depth (inches) 6

Water Table Present? Yes __ No __ Depth (inches) __

Saturation Present? Yes __ No __ Depth (inches) __
(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** __

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **31**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Hillslope** Local relief (concave, convex, none): **convex** Slope (%): **3**

Subregion (LRR): **H** Lat: **40.1224** Long: **-99.4734** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **#N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 30.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Morus rubra*	10	X	FACU
2. *Elaeagnus angustifolia*	10	X	FACU
3.			
4.			
5.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Juniperus virginiana*	5	X	UPL
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5')			
1. *Bromus tectorum*	100	X	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 31

SOIL

Sampling Point: **31**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR3/2	70					Sandy Loam	Gravel in pit
	10YR4/1	30						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **32**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **2-3**

Subregion (LRR): **H** Lat: **40.122** Long: **-99.4732** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes X No ____**
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 32 is a PEMA/C wetland in a depression.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phragmites australis*	100	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: Photo 32

SOIL

Sampling Point: **32**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR3/2	80	10YR5/6	5	C	M	SCL	Sandy Clay Loam
	10YR4/1	15						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches) ___		
Water Table Present?	Yes X	No ___	Depth (inches) 20		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches) 5	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area was slightly concave, but not enough to hold water.

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **33**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Hillslope** Local relief (concave, convex, none): **convex** Slope (%): **3-4**

Subregion (LRR): **H** Lat: **40.1219** Long: **-99.473** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 32.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Morus rubra*	10	X	FACU
2. *Populus deltoides*	10	X	FAC
3.			
4.			
5.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Elaeagnus angustifolia*	10	X	FACU
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: 5')			
1. *Bromus tectorum*	90	X	UPL
2. *Bromus inermis*	10		UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 33

SOIL

Sampling Point: **33**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-25	10YR3/2	75					SCL	Sandy Clay Loam
	10YR4/1	25						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **34**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Floodplain** Local relief (concave, convex, none): **none** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.1215** Long: **-99.4738** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor fine sandy loam, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: This area displayed hydrophytic vegetation, but did not pass the dominance test. Due to a lack of all three wetland criteria, the area was determined to be upland.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis occidentalis*	35	X	FACU
2. *Ulmus rubra*	25	X	FACU
3. *Populus deltoides*	10		FAC
4.			
5.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Carex vesicaria*	100	X	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 34

SOIL

Sampling Point: **34**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-30	10YR4/2	60					Loamy Sand	
	10YR5/1	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches) ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **35**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Floodplain** Local relief (concave, convex, none): **none** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.1207** Long: **-99.4735** Datum: **UTM83**

Soil Map Unit Name: **2366 - Munjor fine sandy loam, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X		

Remarks: This area displayed facultative vegetation, but due to a lack of hydric soils and sufficient hydrology indicators, the area was determined to be upland.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	20	X	FAC
2. *Fraxinus pennsylvanica*	15	X	FAC
3.			
4.			
5.			
	35	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus tectorum*	100	X	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Photo 35

SOIL

Sampling Point: **35**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-14	10YR4/1	100					Loamy Sand	
14-25	10YR4/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **36**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **concave** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1219** Long: **-99.4698** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes X No ____**
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Wetland 36 is a PEMA wetland in a depression.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Medicago sativa*	15	X	UPL
2. *Panicum virgatum*	15	X	FAC
3. *Hordeum jubatum*	10	X	FACW
4. *Melilotus officinalis*	5		FACU
5. *Thlaspi arvense*	5		FACU
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 50%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: Photo 36

SOIL

Sampling Point: **36**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR4/2	97	10YR5/6	3	C	PL	Loamy Sand	
10-15	10YR5/2	98	10YR5/6	2	C	PL		
15-30	10YR5/2	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches) ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area was slightly concave, but not enough to hold water.

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **37**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Field** Local relief (concave, convex, none): **none** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.122** Long: **-99.4698** Datum: **UTM83**

Soil Map Unit Name: **2326 - Inavale fine sandly loam, 0 to 3 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Out point for SP 36.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Medicago sativa*	70	X	UPL
2. *Panicum virgatum*	10		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 37

SOIL

Sampling Point: **37**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-30	10YR4/1	100					Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches) ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area was slightly concave, but not enough to hold water.

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **38a**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Field** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1215** Long: **-99.4674** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **PEMA1**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X		
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Wetland 38 is a NWI wetland in an agricultural field. This area was determined to be a wetland based on the presence of hydric soils.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Triticum aestivum*	100	X	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 38a

SOIL

Sampling Point: **38a**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR3/1	100					Clay Loam	
4-11	10YR3/1	72	10YR5/6	3	C	M	SCL	Sandy Clay Loam
	10YR4/1	25						
11-20	10YR3/2	75					SCL	Sandy Clay Loam
	10YR4/2	25						
20-30	10YR3/2	60					Sandy Loam	
	10YR4/1	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** __

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes __ No X Depth (inches) __

Water Table Present? Yes __ No X Depth (inches) __

Saturation Present? Yes __ No X Depth (inches) __

(includes capillary fringe)

Wetland Hydrology Present? **Yes** __ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **38b**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Field** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1207** Long: **-99.4663** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **PEM1A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Wetland 38 is a NWI wetland in an agricultural field. This area was determined to be a wetland based on the presence of hydric soils.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Triticum aestivum*	100	X	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Photo 38b

SOIL

Sampling Point: **38b**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR3/1	100					SCL	Sandy Clay Loam
6-10	10YR4/2	98	10YR5/6	2	C	M	Loamy Sand	
10-15	10YR4/2	50					SCL	Sandy Clay Loam
	10YR3/2	50						
15-18	10YR3/2	100					Clay Loam	
18-28	10YR3/2	50					SCL	Sandy Clay Loam
	10YR4/1	45	10YR1/9.5	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches) ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **39**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Field** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.122** Long: **-99.4677** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Outpoint for SP 38a.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Triticum aestivum*	100	X	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 39

SOIL

Sampling Point: **39**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR3/1	70					SCL	Sandy Clay Loam
	10YR4/1	30						
8-12	10YR3/1	70					Sandy Loam	
	10YR4/1	30						
12-30	10YR3/1	50					Sandy Loam	
	10YR4/2	50						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches) ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **40**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Field** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1206** Long: **-99.4675** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Outpoint for Wetland 38.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Triticum aestivum*	100	X	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Photo 40

SOIL

Sampling Point: **40**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-30	10YR3/1	60					Sandy Loam	
	10YR4/1	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **41**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression in field** Local relief (concave, convex, none): **concave** Slope (%): **1-2**

Subregion (LRR): **H** Lat: **40.1209** Long: **-99.4676** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **PEM1A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Out point for SP 38b. This area is shown as a wetland on the NWI map, but due to a lack of all three wetland criteria, the area was determined to be upland.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Triticum aestivum*	95	X	UPL
2. *Xanthium strumarium*	5		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Photo 41

SOIL

Sampling Point: **41**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-30	10YR3/2	70					Sandy Loam	
	10YR4/1	20						
	10YR5/2	10						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches) ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **42**

Investigator(s): **Madison Leonard and Kris Davenport** Section, Township, Range: **S21, T2N, R19W**

Landform (hillslope, terrace, etc.): **Field** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.121** Long: **-99.4664** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Outpoint for SP 38b.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Triticum aestivum*	100	X	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: Photo 42

SOIL

Sampling Point: **42**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-9	10YR3/1	100					Loam	
9-30	10YR3/2	70					Sandy Loam	
	10YR4/3	30						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches) ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/26/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **65**

Investigator(s): **Tony Baumert** Section, Township, Range: **S27, T2N, R19W**

Landform (hillslope, terrace, etc.): **ditch** Local relief (concave, convex, none): **concave** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1181** Long: **-99.4612** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Wet depression in roadside ditch. Heavy rains in previous days

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus tectorum*	35	X	UPL
2. *Bromus inermis*	15	X	UPL
3. *Conyza canadensis*	15	X	FACU
4. *Panicum virgatum*	10		FAC
5. *Helianthus annuus*	10		FACU
6.			
7.			
8.			
9.			
10.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 15%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: **65**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 4/1	40	10YR 5/4	20	C	M	Sandy Loam	not saturated
	10YR 4/2	40					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: No water in the pit. Soils not saturated but standing water present in ditch due to heavy rains. Although this does not technically meet depleted matrix it is close and due to the high concentrations of redox we assumed the soils were hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches) ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Standing water present, but likley due to recent heavy rains. No evidence of typical or frequent ponding. Standing water not included as a hydrology indicator in this scenario.

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/26/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **72**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **field** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1112** Long: **-99.4675** Datum: **UTM83**

Soil Map Unit Name: **2176 - McCook loam, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Pooling water in ag field. Not identified in the WETS analysis.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Helianthus annuus*	2	X	FACU
2. *Bromus tectorum*	2	X	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	4 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 96%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

Only other vegetation was planted alfalfa

SOIL

Sampling Point: **72**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR4/2	20					Sandy Loam	
	10YR4/1	80						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches) ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Some standing water in field due to recent heavy rains. The area was not identified as an area of concern during the WETS analysis. Standing water not included as a hydrology indicator.

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/28/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **74**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **ditch/depression** Local relief (concave, convex, none): **concave** Slope (%): **0-2**

Subregion (LRR): **H** Lat: **40.1090** Long: **-99.4736** Datum: **UTM83**

Soil Map Unit Name: **2360 - Munjor fine sandy loam, rarely flooded** NWI classification: **FW Forested/Shrub**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Roadside ditch and depression extending into woods. No standing water or evidene of ponding.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	100	X	UPL
2. *Poa pratensis*	12		FACU
3. *Juniperus virginiana*	5		UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	117 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

Vegetation extending into the woods includes smooth brome, honeysuckle, and cedar.

SOIL

Sampling Point: **74**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	10YR4/2	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/28/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **75**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **field** Local relief (concave, convex, none): **flat** Slope (%): **0.1**

Subregion (LRR): **H** Lat: **40.1083** Long: **-99.4735** Datum: **UTM83**

Soil Map Unit Name: **2360 - Munjor fine sandy loam, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: WETS location. No indication of wetland, ponding, etc.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Medicago sativa*	100	X	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

100% alfalfa. No stunting or yellowing. No other colonizers.

SOIL

Sampling Point: **75**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20+	10YR3/1	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No drainage or ponding evidence. No erosion, depressions, or cutting.

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/28/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **76**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **Depression** Local relief (concave, convex, none): **Concave** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1090** Long: **-99.4750** Datum: **UTM83**

Soil Map Unit Name: **2360 - Munjor fine sandy loam, rarely flooded** NWI classification: **FW Forested/Shrub**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Open wooded depression on both sides of access road. Looks like old scour holes from past flood events. Checked multiple low depressions in this area. All were the same.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	20	X	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Juniperus virginiana*	4		UPL
2.			
3.			
4.			
5.			
	4 = Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	80	X	UPL
2. *Toxicodendron radicans*	12		FACU
3. *Parthenocissus quinquefolia*	8		FACU
4. *Lonicera sp.*	4		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	104 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	24	x 3 =	72
FACU species	20	x 4 =	80
UPL species	84	x 5 =	420
Column Totals:	128 (A)		572 (B)

Prevalence Index = B/A = 4.47

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

Canopy dominated by green ash. No other hydrophytic species in understory. Other depressions nearby included Bromus tectorum, Rumex obtusifolia, and Gallium sp. in addition to those species listed above. No visible hydrophytic patches or indications any of the depression were wet at all.

SOIL

Sampling Point: **76**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR3/1	100					Loam	lots of roots
4-14	10YR4/1	50					Sandy Loam	
	10YR5/2	50					Sandy Loam	
14-20+	10YR3/1	80					Sandy Loam	
	10YR5/2	20						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks: Soils the same on both sides of the road. No redox found in multiple pits.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators. No ponding or standing water even with recent rains.

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/28/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **80**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **Field** Local relief (concave, convex, none): **none** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.1070** Long: **-99.4745** Datum: **UTM83**

Soil Map Unit Name: **2360 - Munjor fine sandy loam, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: WETS area. Alfalfa field.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus tectorum*	95	X	UPL
2. *Brassica sp.*	5		UPL-FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

Little alfalfa in this location, but thick with Bromus tectorum.

SOIL

Sampling Point: **80**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR3/2	100					Sandy Loam	
6-12	10YR5/2	100					Sand	
12-20+	10YR3/1	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches) ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/28/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **81**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **Field** Local relief (concave, convex, none): **none** Slope (%): **0**

Subregion (LRR): **H** Lat: **40.1057** Long: **-99.4742** Datum: **UTM83**

Soil Map Unit Name: **8561 - Platte and McCook soils** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: WETS area. Alfalfa field.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus tectorum*	50	X	UPL
2. *Medicago sativa*	30	X	UPL
3. *Brassica sp.*	20	X	UPL-FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

Some alfalfa in this location, but thick with Bromus tectorum.

SOIL

Sampling Point: **81**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR3/2	100					Sandy Loam	
6-12	10YR5/2	100					Sand	
12-20+	10YR3/1	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches) ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/28/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **82**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **Field** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1050** Long: **-99.4726** Datum: **UTM83**

Soil Map Unit Name: **2360 - Munjor fine sandy loam, rarely flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: WETS area. Alfalfa field.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus tectorum*	85	X	UPL
2. *Brassica sp.*	5		UPL-FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

Little alfalfa in this location, but thick with Bromus tectorum.

SOIL

Sampling Point: **82**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR3/2	100					Sandy Loam	
6-12	10YR5/2	100					Sand	
12-20+	10YR3/1	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches) ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/28/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **83**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **depression** Local relief (concave, convex, none): **concave** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1103** Long: **-99.4615** Datum: **UTM83**

Soil Map Unit Name: **2176 - McCook loam, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: WETS area.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus tectorum*	40	X	UPL
2. *Galium aparine*	20	X	FACU
3. *Brassica sp.*	18	X	UPL-FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	78 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 22%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

Depression along roda side. Sits within a swale that extends east and west.

SOIL

Sampling Point: **83**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR3/1	100					SCL	
6-12	10YR3/1	100					Clay Loam	
12-20+	10YR3/1	75					Clay Loam	
	10YR3/2	25					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/24/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **84a**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **depression** Local relief (concave, convex, none): **concave** Slope (%): **0-2**

Subregion (LRR): **H** Lat: **40.1221** Long: **-99.4612** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Wet forested depression receiving field runoff.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	45	X	FAC
2. *Celtis occidentalis*	15	X	FACU
3. *Ulmus americana*	15	X	FAC
4.			
5.			
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Phalaris arundinacea*	25	X	FACW
2. *Spartina pectinata*	10	X	FACW
3. *Bromus inermis*	10	X	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	45	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 55%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: **84a**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR3/1	85	10YR5/6	15	C	M	Sandy Loam	
8-12	10YR3/2	98	10YR5/6	2	C	M	Sandy Loam	
12-20+	10YR3/2	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? Yes ___ No X Depth (inches) ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wet depression adjacent to agricultural fields

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/24/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **84b**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **Clearing** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1220** Long: **-99.4606** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Outpoint for SP 84a.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	25	X	UPL
2. *Panicum virgatum*	18	X	FAC
3. *Bromus tetorum*	18	X	UPL
4. *Brassica sp.*	15		UPL-FACU
5. *Urtica dioica*	8		FAC
6. *Cannabis sativa*	9		UPL
7.			
8.			
9.			
10.			
	93 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 7%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

Open area between forested patches. Somewhat disturbed by vehicles. Open patches of sand/dirt.

SOIL

Sampling Point: **84b**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR3/1	100					Sandy Loam	
7-20+	10YR3/1	70					SCL	
	10YR4/1	30					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/21/2018**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **85**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **Clearing/Channel Bank** Local relief (concave, convex, none): **none** Slope (%): **0-1**

Subregion (LRR): **H** Lat: **40.1197** Long: **-99.4580** Datum: **UTM83**

Soil Map Unit Name: **3541 - Hobbs and McCook silt loams, occasionally flooded** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Channel 85. Perennial channel. All fringe, banks, and top of banks areas include upland vegtation near the roadays.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	100	X	UPL
2. *Brassica sp.*	10		UPL-FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

SOIL

Sampling Point: **85**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-9	10YR3/1	100					Sandy Loam	
9-20+	10YR3/2	70					SCL	
	10YR4/3	30					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Fauna (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes ___ No X Depth (inches) ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches) ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Determination Data Form - Great Plains Region

Project/Site: **NDOT District 7 Proposed Mitigation Bank** City/County: **Harlan County** Sampling Date: **5/24/2020**

Applicant/Owner: **Nebraska Department of Transportation** State: **NE** Sampling Point: **86**

Investigator(s): **Tony Baumert** Section, Township, Range: **S28, T2N, R19W**

Landform (hillslope, terrace, etc.): **Roadside/Field** Local relief (concave, convex, none): **none** Slope (%): **0-2**

Subregion (LRR): **H** Lat: **40.1220** Long: **-99.4651** Datum: **UTM83**

Soil Map Unit Name: **8860 - Hord and Hall silt loams, 0 to 1 percent slopes** NWI classification: **N/A**

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Upland area near roadside identified in WETS. Not in Ag.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bromus inermis*	30	X	UPL
2. *Panicum virgatum*	30	X	FAC
3. *Urtica dioica*	20	X	FAC
4. *Helianthus annuus*	10		FACU
5. *Cannabis sativa*	10		UPL
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

Mix of FAC species. Dry sandy roadside area.

SOIL

Sampling Point: **86**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR3/1	70					SCL	
	10YR4/1	30					SCL	
8-20+	10YR4/2	70					Sandy Loam	
	10YR3/1	30					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR F**)
- __ 1 cm Muck (A9) (**LRR F, G, H**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- __ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR I, J**)
- __ Coast Prairie Redox (A16) (**LRR F, G, H**)
- __ Dark Surface (S7) (**LRR G**)
- __ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Aquatic Fauna (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Dry-Season Water Table (C2)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- __ Presence of Reduced Iron (C4)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ FAC-Neutral Test (D5)
- __ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches) ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 1a** Photo Direction: North Description: View of Wetland 1 (Palustrine Emergent Semi-permanently Flooded [PEMF]) associated with sample point (SP) 1a within an oxbow of the Republican River. The red line represents the wetland boundary. (Figure 2B)	

Project Name: D7 Mitigation Bank **Photo: 1b** Photo Direction: Southwest Description: View of Wetland 1 (PEMF) associated with SP 1b within an oxbow of the Republican River. (Figure 2B)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 1c** Photo Direction: Northwest Description: View of Wetland 1 (PEMF) associated with SP 1c within an oxbow of the Republican River. (Figure 2A)	

Project Name: D7 Mitigation Bank **Photo: 1d** Photo Direction: North Description: View of Wetland 1 (PEMF) associated with SP 1d within an oxbow of the Republican River. (Figure 2B/2C)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 1e** Photo Direction: Southwest Description: View of Wetland 1 (PEMF) within an oxbow of the Republican River. (Figure 2A/2B)	

Project Name: D7 Mitigation Bank **Photo: 1f** Photo Direction: Northeast Description: View of Wetland 1 (PEMF) within an oxbow. (Figure 2A/2B)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 1g** Photo Direction: North Description: View of Wetland 1 (PEMF) and standing water. (Figure 2C)	

Project Name: D7 Mitigation Bank **Photo: 2** Photo Direction: Southwest Description: View of the upland area associated with out point SP 2 on top of the oxbow embankment. (Figure 2B)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 3** Photo Direction: North Description: View of the upland area associated with out point SP 3 on top of the oxbow embankment. (Figure 2A)	

Project Name: D7 Mitigation Bank **Photo: 4** Photo Direction: North Description: View of the upland area associated with out point SP 4 on top of the oxbow embankment. (Figure 2B/2C)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 5a** Photo Direction: West Description: View of Wetland 5 (Palustrine Emergent Temporarily Flooded / Seasonally Flooded [PEMA / C]) associated with SP 5a abutting the Republican River. (Figure 2C)	

Project Name: D7 Mitigation Bank **Photo: 5b** Photo Direction: Northwest Description: View of Wetland 5 (PEMA / C) associated with SP 5b within a swale. This swale was previously connected to Milrose Creek, but no longer has bed and bank or an OHWM. (Figure 2D)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 5c** Photo Direction: Northwest Description: View of Wetland 5 (PEMA / C) associated with SP 5c abutting the Republican River. (Figure 2D/2E)	

Project Name: D7 Mitigation Bank **Photo: 5d** Photo Direction: North Description: View of Wetland 5 (PEMA / C) associated with SP 5d abutting the Republican River. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 5e** Photo Direction: West Description: View of Wetland 5 (PEMA / C) located outside of the study area abutting the Republican River. (Figure 2C)	

Project Name: D7 Mitigation Bank **Photo: 5f** Photo Direction: North Description: View of Wetland 5 (PEMA / C) within a swale. This swale was previously connected to Milrose Creek, but no longer has bed and bank or an OHWM. (Figure 2D)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 5g** Photo Direction: Northwest Description: View of Wetland 5 (PEMA / C) abutting the Republican River. (Figure 2D)	

Project Name: D7 Mitigation Bank **Photo: 5h** Photo Direction: Northwest Description: View of Wetland 5 (PEMA / C) abutting the Republican River. (Figure 2D)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 6** Photo Direction: West Description: View of the upland area associated with out point SP 6. (Figure 2C)	

Project Name: D7 Mitigation Bank **Photo: 7a** Photo Direction: Northwest Description: View of Wetland 7 (PEMA) associated with SP 7a within a swale. This swale was previously connected to Milrose Creek, but no longer has bed and bank or an OHWM. (Figure 2C)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 7b** Photo Direction: Southeast Description: View of Wetland 7 (PEMA) associated with SP 7b within a swale. This swale was previously connected to Milrose Creek, but no longer has bed and bank or an OHWM. (Figure 2C)	

Project Name: D7 Mitigation Bank **Photo: 7c** Photo Direction: Northwest Description: View of Wetland 7 (PEMA) within a swale. This swale was previously connected to Milrose Creek, but no longer has bed and bank or an OHWM. (Figure 2C)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 8** Photo Direction: Northwest Description: View of the upland area associated with out point SP 8. (Figure 2C)	

Project Name: D7 Mitigation Bank **Photo: 9** Photo Direction: Southwest Description: View of the upland area associated with out point SP 9. (Figure 2C)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 10** Photo Direction: Northwest Description: View of the upland area associated with out point SP 10. (Figure 2C/2D)	

Project Name: D7 Mitigation Bank **Photo: 11** Photo Direction: Northwest Description: View of the upland area associated with out point SP 11. (Figure 2D)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 12** Photo Direction: Southwest Description: View of the upland area associated with out point SP 12. This area displayed dominant hydrophytic vegetation, but due to lack of hydric soils and sufficient hydrology indicators, this area was determined to be upland. (Figure 2D/2E)	

Project Name: D7 Mitigation Bank **Photo: 13** Photo Direction: North Description: View of the upland area associated with out point SP 13. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 14** Photo Direction: North Description: View of Wetland 14 (PEMA / C) associated with SP 14 within a depression. (Figure 2E)	

Project Name: D7 Mitigation Bank **Photo: 15** Photo Direction: East Description: View of the upland area associated with out point SP 15. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 16a** Photo Direction: East Description: View of Wetland 16 (PEMA / C) associated with SP 16a abutting Open Water 16. (Figure 2E)	

Project Name: D7 Mitigation Bank **Photo: 16b** Photo Direction: Northwest Description: View of Wetland 16 (PEMA / C) associated with SP 16b abutting Open Water 16. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 16c** Photo Direction: South Description: View of Wetland 16 (PEMA / C) associated with SP 16c abutting Open Water 16. (Figure 2E)	

Project Name: D7 Mitigation Bank **Photo: 16d** Photo Direction: Northwest Description: View of Wetland 16 (PEMA / C) abutting Open Water 16. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 17** Photo Direction: East Description: View of the upland area associated with out point SP 17. This area displayed dominant facultative vegetation, but due to lack of hydric soils and sufficient hydrology indicators, this area was determined to be upland. (Figure 2E)	

Project Name: D7 Mitigation Bank **Photo: 18** Photo Direction: West Description: View of the upland area associated with out point SP 18. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 19** Photo Direction: North Description: View of the upland area associated with SP 19. This area displayed facultative vegetation, but did not pass the dominance test. This area was determined to be upland due to a lack of all three wetland criteria. (Figure 2E)	

Project Name: D7 Mitigation Bank **Photo: 20** Photo Direction: West Description: View of the upland area associated with SP 20. The area displayed dominant facultative vegetation but not pass the Prevalence Index Worksheet. This area was determined to be upland due to a lack of all three wetland criteria. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 21a** Photo Direction: South Description: View of Wetland 21 (PEMA / C) associated with SP 21a within a depression. (Figure 2E)	

Project Name: D7 Mitigation Bank **Photo: 21b** Photo Direction: East Description: View of Wetland 21 (PEMA / C) associated with SP 21b within a depression. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 21c** Photo Direction: West Description: View of Wetland 21 (PEMA / C) associated with SP 21c within a depression. (Figure 2F)	

Project Name: D7 Mitigation Bank **Photo: 21d** Photo Direction: Northwest Description: View of Wetland 21 (PEMA / C) associated with SP 21d within a depression. (Figure 2F)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 22** Photo Direction: South Description: View of the upland area associated with out point SP 22. (Figure 2E)	

Project Name: D7 Mitigation Bank **Photo: 23** Photo Direction: East Description: View of the upland area associated with out point SP 23. This area displayed dominant facultative vegetation, but due to lack of hydric soils and sufficient hydrology indicators, this area was determined to be upland. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 24** Photo Direction: Northwest Description: View of the upland area associated with out point SP 24. (Figure 2F)	

Project Name: D7 Mitigation Bank **Photo: 25** Photo Direction: Northwest Description: View of the upland area associated with out point SP 25. (Figure 2G)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 26a** Photo Direction: South Description: View of Wetland 26 (PEMA / C) associated with SP 26a within a depression. (Figure 2E/2F)	

Project Name: D7 Mitigation Bank **Photo: 26b** Photo Direction: North Description: View of Wetland 26 (PEMA / C) associated with SP 26b within a depression. (Figure 2F)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 26c** Photo Direction: Northwest Description: View of Wetland 26 (PEMA / C) associated with SP 26c within a depression. (Figure 2F)	

Project Name: D7 Mitigation Bank **Photo: 27** Photo Direction: West Description: View of the upland area associated with out point SP 27. (Figure 2E/2F)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 28** Photo Direction: North Description: View of the upland area associated with out point SP 28. (Figure 2F)	

Project Name: D7 Mitigation Bank **Photo: 29** Photo Direction: Northwest Description: View of the upland area associated with out point SP 29. This area displayed dominant facultative vegetation, but due to lack of hydric soils and sufficient hydrology indicators, this area was determined to be upland. (Figure 2F)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 30** Photo Direction: Northwest Description: View of Wetland 30 (PEMA / C) associated with SP 30 within a depression. (Figure 2F)	

Project Name: D7 Mitigation Bank **Photo: 31** Photo Direction: North Description: View of the upland area associated with out point SP 31. (Figure 2F)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 32** Photo Direction: Northwest Description: View of Wetland 32 (PEMA / C) associated with SP 32 within a depression. (Figure 2F)	

Project Name: D7 Mitigation Bank **Photo: 33** Photo Direction: Northwest Description: View of the upland area associated with out point SP 33. (Figure 2F)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 34** Photo Direction: North Description: View of the upland area associated with SP 34. The area displayed dominant faculatative vegetation but did not pass the dominance test. Due to a lack of hydric soils and sufficient hydrology indicators, the area was determined to be upland. (Figure 2F)	

Project Name: D7 Mitigation Bank **Photo: 35** Photo Direction: North Description: View of the upland area associated with SP 35. This area displayed facultative vegetation, but due to a lack of hydric soils and sufficient hydrology indicators, the area was determined to be upland. (Figure 2F)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 36** Photo Direction: South Description: View of Wetland 36 (PEMA) associated with SP 36 within a depression. (Figure 2F/2G)	

Project Name: D7 Mitigation Bank **Photo: 37** Photo Direction: South Description: View of the upland area associated with out point SP 37. (Figure 2F/2G)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 38a** Photo Direction: Southeast Description: View of Wetland 38 (PEMA) associated with SP 38a within an agricultural field. (Figure 2G)	

Project Name: D7 Mitigation Bank **Photo: 38b** Photo Direction: West Description: View of Wetland 38 (PEMA) associated with SP 38b within an agricultural field. (Figure 2G)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 39** Photo Direction: South Description: View of the upland area associated with out point SP 39. (Figure 2G)	

Project Name: D7 Mitigation Bank **Photo: 40** Photo Direction: North Description: View of the upland area associated with out point SP 40. (Figure 2G)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 41** Photo Direction: Southeast Description: View of the upland area associated with out point SP 41. (Figure 2G)	

Project Name: D7 Mitigation Bank **Photo: 42** Photo Direction: South Description: View of the upland area associated with out point SP 42. (Figure 2G)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 43** Photo Direction: North Description: View of the upland area within the center of the oxbow of the Republican River. (Figure 2B/2C)	

Project Name: D7 Mitigation Bank **Photo: 44** Photo Direction: East Description: View of the upland bank along the Republican River. (Figure 2B)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 45** Photo Direction: East Description: View of the upland bank along the Republican River. (Figure 2B)	

Project Name: D7 Mitigation Bank **Photo: 46** Photo Direction: Northeast Description: View of the upland area within the center of the oxbow of the Republican River. (Figure 2B)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 47** Photo Direction: South Description: View of the upland area within the center of the oxbow of the Republican River. (Figure 2B)	

Project Name: D7 Mitigation Bank **Photo: 48** Photo Direction: North Description: View of the upland area within the center of the oxbow of the Republican River. (Figure 2A/2B)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 49** Photo Direction: North Description: View of the upland area within the center of the oxbow of the Republican River. (Figure 2A/2B)	

Project Name: D7 Mitigation Bank **Photo: 50** Photo Direction: West Description: View of the upland wooded area adjacent the Republican River. (Figure 2C)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 51** Photo Direction: North Description: View of the upland swale that was previously connected to Milrose Creek, but no longer has bed and bank or an OHWM. (Figure 2C)	

Project Name: D7 Mitigation Bank **Photo: 52** Photo Direction: Northwest Description: View of the upland wooded area adjacent to the swale that was previously connected to Milrose Creek. (Figure 2C)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 53** Photo Direction: West Description: View of upland area in an idle field near the northeast corner of the study area. (Figure 2D)	

Project Name: D7 Mitigation Bank **Photo: 54** Photo Direction: West Description: View of upland area in an idle field near the northeast corner of the study area. (Figure 2D)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 55** Photo Direction: North Description: View of upland area in an idle field near the northeast corner of the study area. (Figure 2D/2E)	

Project Name: D7 Mitigation Bank **Photo: 56** Photo Direction: West Description: View of an upland wooded swale that drains to the Republican River. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 57** Photo Direction: East Description: View of an upland wooded swale that drains to the Republican River. (Figure 2E)	

Project Name: D7 Mitigation Bank **Photo: 58** Photo Direction: North Description: View of the Republican River. (Figure 2E)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 59** Photo Direction: North Description: View of the upland wooded riparian area along the Republican River. (Figure 2E)	

Project Name: D7 Mitigation Bank **Photo: 60** Photo Direction: Southeast Description: View of an upland idle field near the southwest corner of the study area. (Figure 2F)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 61** Photo Direction: Northwest Description: View of the Republican River. (Figure 2F)	

Project Name: D7 Mitigation Bank **Photo: 62** Photo Direction: Southwest Description: View of the access road that will be improved. Heavy rains in the previous days left standing water throughout the study area. (Figure 2I/)2J	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 63** Photo Direction: Northwest Description: View of the access road that will be improved. Heavy rains in the previous days left standing water throughout the study area. (Figure 2I/2J)	

Project Name: D7 Mitigation Bank **Photo: 64** Photo Direction: Southwest Description: View of an upland ditch along roadway dominated by *Bromus inermis*. (Figure 2J)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 65a** Photo Direction: North Description: View of upland road ditch and SP 65. Sample point collected due to some standing water in the ditch due to recent rains. (Figure 2J)	

Project Name: D7 Mitigation Bank **Photo: 65b** Photo Direction: South Description: View of upland road ditch and SP 65. Sample point collected due to some standing water in the ditch due to recent rains. (Figure 2J)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 66** Photo Direction: North Description: View of the upland ditch north of a field access drive. (Figure 2K)	

Project Name: D7 Mitigation Bank **Photo: 67** Photo Direction: South Description: View of the upland ditch south of a field access drive. (Figure 2K)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 68** Photo Direction: West Description: View of an upland area adjacent to the roadway at and NWI. The area is dominated by *Bromus inermis*, *Panicum virgatum*, *Bromus tectorum*, and *Brassica sp*. (Figure 2L)	

Project Name: D7 Mitigation Bank **Photo: 69** Photo Direction: East Description: View of an \upland area adjacent to the roadway at an NWI. The area is dominated by *Bromus inermis*, *Panicum virgatum, Bromus tectorum*, and *Brassica sp*. (Figure 2L)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo:70** Photo Direction: North Description: View of a low water crossing at an NWI. (Figure 2L)	

Project Name: D7 Mitigation Bank **Photo: 71** Photo Direction: Northwest Description: View of a recently disturbed area along the roadway. (Figure 2L)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 72** Photo Direction: West Description: View of SP 72 and a wet area in an alfalfa field. This area was not identified in the WETS analysis. Hydric soils were not found at this location. (Figure 2S)	

Project Name: D7 Mitigation Bank **Photo: 73** Photo Direction: Northwest Description: View of wet depression location northwest of the roadway near a forested NOW wetland. The forested areas in this location had multiple depressions (presumably old scour holes from flood events). Most of these locations were dry, despite recent heavy rains. No hydric soils or hydrophytic plant species were found at these locations. (Figure 2R)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 74** Photo Direction: West Description: View of SP 74, taken adjacent to the roadway near a WETS area and a forested NWI wetland. This area was an upland dominated by *Bromus inermis*. (Figure 2R)	

Project Name: D7 Mitigation Bank **Photo: 75** Photo Direction: East Description: View of SP 75, taken adjacent to the roadway in a WETS area. This area was an upland dominated by alfalfa with no hydric soils. (Figure 2R)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 76a** Photo Direction: South Description: View of SP 76 with a forested NWI. This location was determined to be an upland. (Figure 2R)	

Project Name: D7 Mitigation Bank **Photo: 76b** Photo Direction: North Description: View of SP 76 with a forested NWI. This location was determined to be an upland. (Figure 2R)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 77** Photo Direction: Southwest Description: View of the proposed spoil waste location. This area was an upland area dominated by upland grasses and colonizing cedars. (Figure 2R)	

Project Name: D7 Mitigation Bank **Photo: 78** Photo Direction: North Description: View of the proposed spoil waste location. This areas was an upland area dominated by upland grasses and colonizing cedars. (Figure 2R)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 79** Photo Direction: Northwest Description: View of a depression within a mapped forested NWI. The location was found to be an upland with no hydric soils or hydrophytic vegetation. (Figure 2R)	

Project Name: D7 Mitigation Bank **Photo: 80** Photo Direction: South Description: View of SP 80, taken adjacent to the roadway in a WETS area. This area was an upland dominated by *Bromus tectorum* within an alfalfa field. (Figure 2Q)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 81** Photo Direction: Northeast Description: View of SP 81, taken adjacent to the roadway in a WETS area. This area was an upland dominated by *Bromus tectorum* and alfalfa. (Figure 2Q)	

Project Name: D7 Mitigation Bank **Photo: 82** Photo Direction: North Description: View of SP 82, taken adjacent to the roadway in a WETS area. This area was an upland dominated by *Bromus tectorum* within an alfalfa field. (Figure 2Q/2P)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 83** Photo Direction: South Description: View of SP 83, and upland roadside dominated by *Bromus tectorum.* This location was identified as a potential wetland in the WETS analysis. (Figure 2M/2L)	

Project Name: D7 Mitigation Bank **Photo: 84** Photo Direction: Northeast Description: View of SP 84 and Wetland 84 in a forested depression north of the roadway. This area was dominated by *Fraxinus pennsylvanica, Celtis occidentalis, Bromus inermis,* and *Phalaris arundinacea*. (Figure 2H/2I)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 85a** Photo Direction: Southeast Description: View of Channel 85, a perennial channel near the northeast corner of the study area. (Figure 2H/2I)	

Project Name: D7 Mitigation Bank **Photo: 85b** Photo Direction: Northwest Description: View of Channel 85, a perennial channel near the northeast corner of the study area. Fringe vegetation was upland in nature, dominated by *Bromus inermis*. (Figure 2I/2J)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 85c** Photo Direction: Northeast Description: View of Channel 85 and SP 85. This location was an upland with a perennial channel near the northeast corner of the study area. Fringe vegetation was upland in nature, dominated by *Bromus inermis*. (Figure 2I)	

Project Name: D7 Mitigation Bank **Photo: 85d** Photo Direction: West Description: View of Channel 85 at a low water crossing. Fringe vegetation was upland in nature, dominated by *Bromus inermis* and *Brassica sp*. (Figure 2I)	

Delineation Report Photo Log

Project Name: D7 Mitigation Bank **Photo: 85E** Photo Direction: East Description: View of Channel 85 at a low water crossing. Fringe vegetation was upland in nature, dominated by *Bromus inermis* and *Brassica sp*. (Figure 2I)	

Project Name: D7 Mitigation Bank **Photo: 85F** Photo Direction: East Description: View of SP 85 above the stream channel. The location was dominated by *Bromus inermis* and *Brassica sp*. (Figure 2J)	

Appendix B

Agency Coordination

From: Tapp, Jessica
To: Wray, Matthew T CIV USARMY CENWO (USA)
Cc: Sjolie, Shannon; Marinovich, Melissa; LaGrange, Ted
Subject: [Non-DoD Source] RE: 2021-00330-WEH--NDOT--D7 Mitigation Site
Date: Wednesday, March 31, 2021 11:34:27 AM

Matt,

I have reviewed the draft site plan and have one comment:

River otter is no longer a listed species, and thus needs no conservation conditions. Any specific concerns or conservation conditions related to this species can be removed from the site plan.

Thanks,

Jessica L. Tapp, CWB®
Environmental Analyst II
Planning & Programming Division
Nebraska Game & Parks Commission
2200 N. 33rd Street | Lincoln, NE 68503
Office: (402) 471-5554
Email: jessica.tapp@nebraska.gov

From: Wray, Matthew T CIV USARMY CENWO (USA) <Matt.T.Wray@usace.army.mil>
Sent: Monday, March 1, 2021 1:30 PM
To: Stansberry, Brooke <brooke_stansberry@fws.gov>; Tapp, Jessica <Jessica.tapp@nebraska.gov>; LaGrange, Ted <ted.lagrange@nebraska.gov>; Pauley, Dane <dane.pauley@nebraska.gov>; Eliodora Chamberlain (chamberlain.eliodora@epa.gov) <chamberlain.eliodora@epa.gov>; Marinovich, Melissa <melissa.marinovich@nebraska.gov>; Nelson, Ritch - NRCS, Lincoln, NE <ritch.nelson@usda.gov>
Cc: Lawrence, Karen L CIV (USA) <Karen.L.Lawrence@usace.army.mil>; Moeschen, John L CIV USARMY CENWO (USA) <John.L.Moeschen@usace.army.mil>
Subject: 2021-00330-WEH--NDOT--D7 Mitigation Site

All,

NDOT has submitted the D7 Mitigation Site draft site plan located on at the upper end of Harlan County Reservoir. The site plan is located in RIBITS under “Cyber Repository”. Please provide me any comments you might have by March 31, 2021. Thanks.

Matthew T. Wray
Environmental Resources Specialist
Omaha District--Nebraska Regulatory Office
8901 South 154th Street, Suite 2
Omaha, Nebraska 68138
Office--(402) 896-0896

Fax--(402) 896-0997
E-Mail--Matt.T.Wray@usace.army.mil

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

Biological Assessment NDOT PQS Memorandum

Project Name: **District 7 Wetland Mitigation Bank** Project Number: **MISC-D7(1007)**
Control Number: **71216**

The biological assessment final approval on: **10/9/2018**

Date of Project Description used for this review: 8/13/2018

Threatened and Endangered Species Effect Determination:

☐ The Project(s) will have "No Effect" to all state or federally listed species or their designated critical habitat (CE Level 1).

☒ A "May Affect, Not Likely to Adversely Affect" determination is made for the following species/critical habitat with the conservation conditions listed below: **northern long-eared bat, river otter, whooping crane**

- ☐ This BA did NOT require further consultation with the resource agencies.
- ☒ This BA required further consultation with the resource agencies (CE Level 2).

  USFWS Concurrence Date: NA

  NGPC Concurrence Date: 9/7/2018

- ☐ Unique conservation conditions were developed and are included below (CE Level 3).

☐ A "May Affect, Likely to Adversely Affect" determination is made for the following species/critical habitat with the conservation conditions listed below: (CE Level 3).

Additional Coordination with Other Tribal or Federal Agencies:

Description of Coordination:

Bald and Golden Eagle Protection Act:

An active bald eagle nest is located on the proposed site. NDOT will mark the nest location as an Environmentally Sensitive Area on the E-sheets to ensure the contractor stays out of this area during construction. Construction will not be allowed to occur during February and March to avoid disturbance of eagles during this critical nest initiation timeframe, and to allow trees to leaf-out, which would provide further screening from project activities. The NDOT Project Manager and Contractor will be made aware of the nest's location and instructed to avoid prolonged activity in this area, if possible. While tree-clearing activities will be taking place far enough away from the nest location, NDOT will also be implementing the following conservation conditions and Bald Eagle Protocol to ensure there are no impacts to this nest.

In an effort to minimize disturbance at the Eagle Nest Location:

- Work will not occur between February 1st and March 31st.
- No construction will occur within 330 feet of the eagle nest.

Migratory Bird Treaty Act:

NDOT has developed an Avian Protection Plan (APP) to reduce conflicts between construction of NDOT projects and the laws governing migratory birds. This procedure is designed to protect and conserve avian populations and reduce avian conflicts through changes in project scheduling (i.e. tree clearing outside of primary nesting period), increased migratory bird surveys, and changes in project construction timelines. NDOT will utilize its APP to reduce conflicts with migratory birds on this project.

Fish and Wildlife Coordination Act:

A request for Early Coordination under the Fish and Wildlife Coordination Act was sent to the USFWS and NGPC on 8/29/2018. The USFWS responded on 9/17/2018 and the NGPC responded 10/2/2018 that they had no objections with NDOT's proposed avoidance and minimization plan for the active eagle nest on the project, and no additional comments on the proposed wetland mitigation site.

General Conservation Conditions

Changes in Project Scope. If there is a change in the project scope, the project limits, or environmental commitments, the NDOT Environmental Section must be contacted to evaluate potential impacts prior to implementation. Environmental commitments are not subject to change without prior written approval from the NDOT Environmental Section. (District Construction, Contractor)

Threatened and Endangered Species. The Contractor shall reference the Nebraska Game and Parks Commission website for a reference of federal and state listed species that may occur in the project vicinity prior to starting project construction. These guidance documents can be found at:

- http://agcne.org/member-portal/
- http://outdoornebraska.gov/naturalheritageprogram/

If federal or state listed species are observed during construction, stop work and contact the NDOT Environmental Section to determine action required prior to resuming work. (NDOT Environmental, District Construction, Contractor)

Refueling. Refueling will be conducted within the confines of the paved roadway surface or within the boundaries of an approved stockpile/staging site. (Contractor)

Restricted Activities. The following project activities shall, to the extent possible, be restricted to between the beginning and ending points of the project, within the right-of-way designated on the project plans.

- Borrow sites
- Construction debris waste disposal areas
- Asphalt plants
- Haul roads
- Stockpiling areas
- Staging areas
- Material storage sites

Any project related activities that occur outside of the project limits (includes the paved surface and within 12 inches of the paved surface) must be environmentally cleared/permitted with the Nebraska Game and Parks Commission as well as any other appropriate agencies by the contractor and those clearances/permits shall be submitted to the District Construction Project Manager prior to the start of the above listed project activities. The contractor shall submit a NDOT Plant Site/Stockpile Site Request Identification and Evaluation Form (DR Form 56) and/or a Borrow Site/Waste Site Request Identification and Evaluation Form (DR Form 119) as appropriate, and include information such as an aerial photo showing the proposed activity site, a plan-sheet or drawing showing the location and dimensions of the activity site, ground photos showing the existing conditions at the proposed activity site, etc. The contractor must receive notice of acceptance from NDOT, prior to starting the above listed project activities. These project activities cannot adversely affect state and/or federally listed species or designated critical habitat. Fill cannot be placed in Wetland, Stream or other Waters of the U.S without authorization. (NDOT Environmental, District Construction, Contractor)

Waste/Debris. Construction waste/debris will be disposed of in areas or a manner which will not adversely affect state and/or federally listed species and/or designated critical habitat. (Contractor)

Ground Disturbance Activities. No ground disturbing activities are allowed in association with this project, outside of the footprint of the paved area and the necessary soil disturbance to taper an earth shoulder for a roadway beveled edge (would occur within 12 inches of the existing surfaced roadway).

Northern Long-Eared Bat:

NLEB-1 Tree clearing, bridge deck joint replacements over the bridge deck, bridge removal activities will not occur between June 1st – July 31st to avoid impacts to the northern long-eared bat maternity roosting period. (NDOT Environmental, Construction, Contractor)

OR

NLEB-2 If tree clearing, bridge deck joint replacement over the bridge deck, or removal of bridge structures occurs during the northern long-eared bat maternity roosting period (June 1st – July 31st), NDOT personnel will perform surveys prior to the start of these activities at the following locations: **entire project** . If the species is absent, work may proceed. If the species is found, NDOT Environmental Section will consult with the USFWS, NGPC, and FHWA prior to the start of construction. (NDOT Environmental, Construction, Contractor)

River Otter:

RO-1 A qualified biologist will survey according to protocol no more than 10 days prior to construction. If no active den sites are found, then the project can proceed. If active den sites are found, NDOT Environmental Section will notify the District and will consult with the USFWS, NGPC, and FHWA. If species are present, the District will notify the Contractor to stop work within 1/2 mile of the active den until NDOT Environmental completes consultation. (NDOT Environmental, District Construction, Contractor)

Whooping Crane:

WC-1 Construction activities will not occur during Whooping Crane migration periods. (Spring migration: March 6 – April 29; and fall migration: October 9 – November 15). (NDOT Environmental, Construction, Contractor)

OR

WC-2 If construction activities occur during Whooping Crane migration periods (Spring migration: March 6 – April 29; and fall migration: October 9 – November 15), NDOT trained personnel, or a qualified biologist, will conduct surveys according to protocol at the following locations: **entire project**. **(prior to the start of daily construction activities)**. If species are present the District will notify the Contractor to stop work within 1/2 mile of the whooping crane and follow the protocol to determine when work can resume **(also not initiate work if species is found in the morning survey)**. Options for resuming work may include but are not limited to (NDOT Environmental, Construction, Contractor):

- Construction activities are limited to the hours from 10:00 a.m. to 4:00 p.m. (CST) during the migration period, unless morning survey indicates Whooping Cranes are not present.
- If a whooping crane is observed during the survey within ½ mile of the project, but departs the area (further than ½ mile from the project) then work can resume. Document this departure according to protocol.

NDOT PQS Reviewer

10/9/2018
Date

This(These) Project(s) has(have) been reviewed under the programmatic agreement entitled Programmatic Agreement Among the Federal Highway Administration, U.S. Fish and Wildlife Service, Nebraska Department of Transportation, and Nebraska Game and Parks Commission for the Determination of Effects to State and Federal Listed Species From the Federal-Aid Highway Program (January 2017) and meet stipulations included in this agreement.

The State has determined that this project has no significant impact(s) on the environment and that there are no unusual circumstances as described in 23 CFR 771.117(b). As such, the project is categorically excluded from the requirements to prepare an environmental assessment or environmental impact statement under the NEPA. The State has been assigned, and hereby certifies that it has carried out, the responsibility to make this determination pursuant to 23 U.S.C. §326 and a Memorandum of Understanding dated September 5, 2018, executed between FHWA and the State

NEBRASKA
GAME PARKS

2200 N. 33rd St. • P.O. Box 30370 • Lincoln, NE 68503-0370 • Phone: 402-471-0641

September 7, 2018

Zach Cunningham
Nebraska Department of Roads
1500 Highway 2
Lincoln, Nebraska 68509-4759

Re: District 7 wetland Bank, MISC-D7(1007), 71216, Harlan County, Nebraska

Dear Ms. Cunningham:

Please make reference to your letter dated August 27, 2018. This letter is in response to your request for concurrence regarding this project's potential impacts to endangered and threatened species in Harlan County, Nebraska. As we understand it, the project involves the construction of a wetland mitigation bank, and other associated activities as outlined in your letter. We have completed our review of the proposed project under Neb. Rev. Stat. § 37-807 (3) of the Nongame and Endangered Species Conservation Act and we offer the following comments.

This project is within the range of the federally and state-listed endangered **Whooping Crane** (*Grus americana*); the federally and state-listed threatened **Northern Long-Eared Bat** (*Myotis septentrionalis*); and the state-listed threatened **River Otter** (*Lontra canadensis*). Habitat for **Whooping Crane, Northern Long-Eared Bat,** and **River Otter** does exist within or near the project area.

Nebraska Department of Roads has agreed to implement conservation conditions in order to avoid impacts to **Whooping Crane, Northern Long-Eared Bat,** and **River Otter**. Based on the information provided, we concur the proposed project "May Affect but is Not Likely to Adversely Affect" **Whooping Crane, Northern Long-Eared Bat,** and **River Otter** and will have "No Effect" on all other state-listed endangered or threatened species. This concurrence is based on a review of the material you sent, aerial photographs, and our Nebraska Natural Heritage Database. If the proposed project is changed or new information regarding endangered or threatened species becomes available, then this concurrence is no longer valid and further consultation with the Nebraska Game and Parks Commission will be necessary.

For an assessment of potential impacts to habitats and species protected under federal wildlife laws, including federally listed, candidate or proposed endangered or threatened species, please contact Eliza Hines (eliza_hines@fws.gov), Nebraska Field Office, U.S. Fish and Wildlife Service, 9325 South Alda Road, Wood River, NE 68883.

Thank you for the opportunity to comment. If you have any questions or need additional information, please feel free to contact me at (402) 471-5554 or michael.bernhardt@nebraska.gov.

Sincerely,

Michael Bernhardt
Environmental Analyst
Planning and Programming Division

ec: Eliza Hines, USFWS
Brooke Stansberry, USFWS

Updated 12/9/2014

Bald Eagle Fact Sheet

Bald Eagles (*Haliaeetus leucocephalus*) are very large, brown raptors that utilize the mature, forested areas along the major river systems in Nebraska. Nets are typically built near rivers, lakes and reservoirs and are most often in large cottonwood trees. Nests are constructed with large sticks and can become 8 feet across and 12 feet deep. A breeding pair will often return to the same nest and add new material each year.

Adult Bald Eagle

Bald Eagle in Flight

Bald Eagle Nest

The bald eagle gained protection under the Bald and Golden Eagle Protection Act in the Federal Register on June 8, 1940. This Act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

Golden Eagle (*Haliaeetus leucocephalus*)
Order: *Accipitriformes*
Family: *Accipitridae*
Status: Protected by the Bald and Golden Eagle Protection Act

Description: L 35" W 80". Sexes similar, but females are about 25% larger than males. Adults readily identified by white head and tail, large yellow bill. Feet are also yellow. Juveniles are mostly dark, with blotchy white patches. Require four or five years to reach full adult plumage.

Habitat: Wooded river corridors and larger lakes/sandpits with the presence of large cottonwoods for nesting/roosting. Solitary trees have been used for nesting, but are associated with prime fishing locations. Eagles may establish winter roosts miles from foraging areas. In Nebraska, some communal roost sites can have as many as 100 eagles.

Status/Range: Bald eagles can be found statewide in Nebraska, and are present throughout the year as they both breed and winter here. Wintering eagle numbers fluctuate, as there are often few locations that provide adequate resources for eagles during winter.

Call: Weak staccato of chirping whistles, "*kleek kik ik ik ik*".

Similar Species: Immature bald eagles can be mistaken for golden eagles or turkey vultures.

Bald Eagle Survey Protocol
Nebraska Game and Parks Commission

Background

Bald eagles **(***Haliaeetus leucocephalus*) utilize the mature, forested areas along the major river systems in Nebraska. Eagles are present throughout the year in Nebraska as they both breed and winter in Nebraska. Nest building activity may begin as early as December. Nests are typically built near rivers, lakes and reservoirs and in Nebraska are most often in large cottonwood trees, although bald eagles use other types of trees nationwide. The nests are constructed with large sticks and lined with leaves and grasses. A breeding pair will often return to the same nest and add new material each year. Nests can become 8 feet across and 12 feet deep. Nesting activities begin with egg laying which occurs as early as February. Fledging takes place when the young are approximately 10 – 11 weeks old, however the young remain near the nest and are dependent on the adults for food for at least another 6 weeks. In Nebraska, the nesting season continues through August.

The bald eagle southward migration begins as early as October and the wintering period extends from December through March. Breeding pairs may stay at their nest site year round if food is available. Eagles are often most numerous from late February through early March, when wintering numbers are supplemented by migrants that wintered further south. All migrants that breed elsewhere typically leave by late March. Wintering eagle numbers fluctuate from year to year, but birds typically concentrate in areas with large open water where food is available and form winter roosts. In Nebraska, there are often few locations that provide adequate resources for eagles during the winter. Protection of these areas is important, as relocation during the winter may impact survival. Roosts may be in deciduous or coniferous trees, but in Nebraska, most are in cottonwood trees. Eagles may establish winter roosts miles from the foraging areas (Keister et al. 1985). Winter roosting may assist with finding resources (Knight and Knight 1983) and pair bond formation. In Nebraska, some communal roost sites can have as many as 100 eagles (Nebraska Game and Parks Commission 1993).

Purpose

Eagle surveys are designed to ensure awareness and resolution to any potential conflicts between bald eagle and potentially disruptive human activities. To document the presence or absence of bald eagles and their activities, two types of surveys are recommended: nest surveys and winter roost surveys. These should be considered when a disturbance will occur within 0.5 miles of areas of suitable habitat for bald eagles.

Nest Surveys

Bald eagle nests are usually conspicuous and distinctive, but it must be stressed that nests can be well concealed and very difficult to see, particularly when trees have foliage. Nest surveys should complete a full inspection of potential trees for bald eagle nests within 0.5 miles of the project in areas considered suitable habitat. Transects should be recorded using GPS. In addition to nests, any bald eagles observed during the survey and their behavior should be noted. Potential nests should be observed from a distant location that does not disturb the eagles to confirm the presence or absence of eagles. Nest surveys are to be conducted by a qualified

biologist. Results of surveys and transect locations should be sent to the Nebraska Game and Parks Commission and US Fish and Wildlife Service.

If construction will begin between February 1 and April 15, a nest survey must be completed at least 1 but not more that 14 days prior to construction. If construction will begin between April 15 and October 1, a nest survey completed in March is sufficient, as nests will likely already be constructed if nesting will occur that year. However a nest survey may be completed anytime during this timeframe, as long as it is completed prior to construction. If bald eagles are nesting in the area, consultation with NGPC and USFWS will be required, so it is in the project proponent's best interest to complete the survey and notify the agencies as early as possible.

(See timing diagram page 3)

Winter Roost Surveys:

For the purposes of avoiding adverse impacts to wintering bald eagles, two types of roosts are defined. *Transitory roosts* are defined as 3 or more eagles, within 100 meters of each other, for at least 2 nights in an area with no previous knowledge of winter communal roosting. *Communal roosts* are defined as 6 or more eagles in a small area for extended periods of time or used for multiple years. Communal roosts in Nebraska are monitored, so typically their existence will be known and conservation measures established prior to construction.

If construction will be occurring in an area near suitable habitat (near open water with large trees present) where there is no prior knowledge of a communal roost site and construction will be occurring between October 1 and January 31 winter roost surveys are necessary. Winter roost surveys should begin at least 1 day prior to the first date of construction. Winter roost surveys should be conducted daily at dawn as the eagles are likely to leave the roost to forage within the first hour of daylight (depending on weather conditions). These surveys need only be conducted in the area of active construction, not the entire project area. Surveys may be completed by a trained individual using appropriate binoculars or spotting scope. Survey reports should be submitted weekly to the Nebraska Game and Parks Commission and US Fish and Wildlife Service. Evidence of a roost should be reported immediately.

Please note, eagles seen soaring over a construction site should be watched to observe potential nesting or roosting, but construction does not need to terminate due to soaring behavior.

(See timing diagram page 3)

References

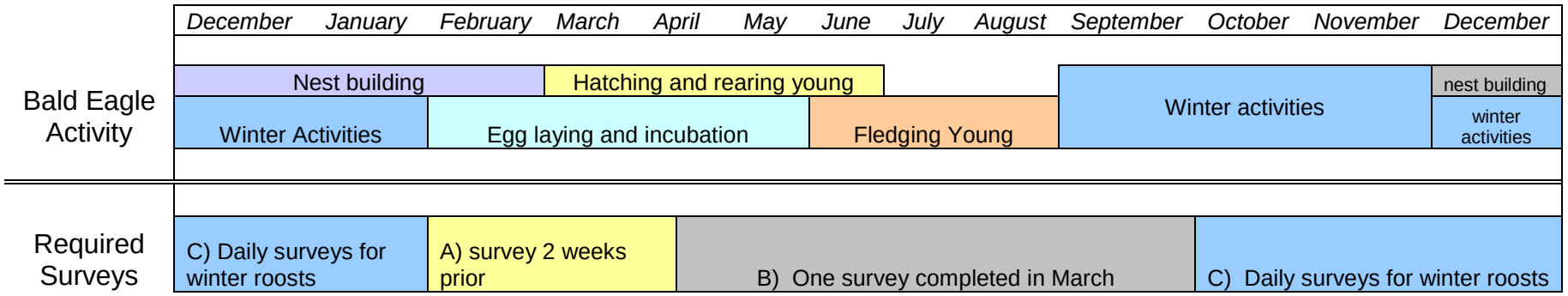
Buehler, D.A. 2000. Bald Eagle (*Haliaeetus leucocephalus*), In The Birds of North America, No. 506 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Keister, G. P., Jr., R. G. Anthony and H. R. Holbo. A model of energy consumption in bald eagles: An evaluation of night communal roosting. The Wilson Bulletin. 97(2): 148-160

Knight, S. K. and R. L. Night. 1983. Aspects of food finding by wintering bald eagles. The Auk 100: 477-484.

Nebraska Game and Parks Commission. 1993. Nebraska's threatened and endangered species: Bald eagle. Nebraska Game and Parks Commission, Lincoln, Nebraska.

Bald Eagle Survey Recommendations
Timing Diagram
Standard Protocol prepared by NE Game and Parks Commission
January-07



A) Projects starting between February 1 to April 15 must have a nest survey completed 1-14 days prior to the start of construction
B) Projects starting between April 15 to October 1 need a nest survey completed as early as March, or before project begins
C) Projects starting between October 1 and December need daily winter roost surveys completed

NOTE: Surveys are only necessary in areas where the disturbance is near suitable eagle habitat

Timing of eagle activity references:

Draft National Bald Eagle Management Guidelines, US Fish and Wildlife Service, 2006,

Buehler, D.A. 2000. Bald Eagle (*Haliaeetus leucocephalus*), In The Birds of North America, No. 506 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Nebraska Game and Parks Commission. 1993. Nebraska's threatened and endangered species: Bald eagle. Nebraska Game and Parks Commission, Lincoln, Nebraska.

From:	Cunningham, Zach
To:	Stansberry, Brooke; Bernhardt, Michael
Cc:	Yerdon, Roger
Subject:	Early Coordination under Fish and Wildlife Coordination Act for: District 7 Wetland Bank, MISC-D7(1007), 71216
Date:	Wednesday, August 29, 2018 2:15:19 PM
Attachments:	Exhibit A - Location Map.pdf Exhibit B.PDF 17-Bald Eagle Fact Sheet and Protocol.pdf

Brooke and Michael,

NDOT is requesting early coordination/technical assistance under the Fish and Wildlife Coordination Act for the project: District 7 Wetland Bank, MISC-D7(1007), 71216. This is a State Funds Only project. No Federal Funds are involved. Roger Yerdon is the Wetland PM on this project.

NDOT has selected a site for construction of a wetland bank in District 7. This site is located approximately one mile southwest of the west corporate limits of the Village of Orleans in Harlan County, Sections 20, and 21, Township 2N, Range 19W on property owned by the US Army Corps of Engineers. A location and bank design map are attached.

Project Description

This project is located approximately one mile southwest of the west corporate limits of the Village of Orleans in Harlan County in Sections 20, and 21, Township 2N, Range 19W.

The improvements on this project consist of construction of a wetland mitigation bank site in district 7.

Scope Details:

Relocation of utilities may be required.

Project surveying and staking will be required.

Grading will be required.

Clearing and grubbing/tree removal will be required.

Areas disturbed during construction will be stabilized utilizing methods of erosion control as shown in the Storm Water Pollution Prevention Plan (SWPPP).

The project does appear to have a “Zone A” floodplain within the project study area; therefore, a floodplain permit will be required from Harlan County.

The project will be located on US Army Corps of Engineers (USACE) owned property an agreement with the USACE will be required.

Threatened & Endangered Species

The biological assessment for this project has been sent to the NGPC for review and concurrence.

NDOT is proposing to implement conservation conditions for the northern long-eared bat, river otter, and whooping crane to ensure there are no adverse impacts to listed species. The project, as proposed would result in a **"May Affect, Not Likely to Adversely Affect"** determination for the **northern long-eared bat, river otter, and whooping crane** and will have "No Effect" to all other state-listed species or associated habitat.

Bald and Golden Eagle Protection Act

An active bald eagle nest is located on the proposed site. NDOT will mark the nest location as an Environmentally Sensitive Area on the 2W (now called E-sheets) to ensure the contractor stays out of this area during construction. Construction will not be allowed to occur during February and March to avoid disturbance of eagles during this critical nest initiation timeframe, and to allow trees to leaf-out, which would provide further screening from project activities. The NDOT Project Manager and Contractor will be made aware of the nest's location and instructed to avoid prolonged activitiy in this area, if possible. While tree clearing activities will be taking place far enough away from the nest location, NDOT will also be implementing the following conservation conditions and Bald Eagle Protocol to ensure there are no impacts to this nest.

In an effort to minimize disturbance at the Eagle Nest Location:

- Work will not occur between February 1st and March 31st.
- No construction will occur within 330 feet of the eagle nest.

Wetland/Stream Channel Impacts

NDOT is planning on permitting the construction of this site under a US Army Corps of Engineers Nationwide 27 permit. A wetland delineation was completed for this project on May 21 and 22, 2018, however impact totals are not known at this time. Roger Yerdon will be coordinating wetland impacts with the US Army Corps of Engineers.

NDOT respectfully requests your comments on the construction of this wetland mitigation bank.

Zach Cunningham
Highway Environmental Biologist
Nebraska Department of Roads
1500 Highway 2
P.O. Box 94759
Lincoln, NE 68509-4759
Phone: 402-479-4464
E-mail: zach.cunningham@nebraska.gov

Cunningham, Zach

From: Stansberry, Brooke <brooke_stansberry@fws.gov>
Sent: Monday, September 17, 2018 2:17 PM
To: Cunningham, Zach
Cc: Bernhardt, Michael; Yerdon, Roger; Grell, Carey
Subject: Re: [EXTERNAL] Early Coordination under Fish and Wildlife Coordination Act for: District 7 Wetland Bank, MISC-D7(1007), 71216

Follow Up Flag: Follow up
Flag Status: Flagged

FWS-NE: 2018-363

Zach and Roger,

Thank you for the August 29, 2018, emailed Technical Assistance request and project information regarding the proposed District 7 Compensatory Wetland Mitigation Bank.

Endangered Species Act
Our ESA consultation will be with the lead federal agency (U.S. Army Corps of Engineers); however, with the proposed conservation conditions for whooping crane, northern long-eared bat, and state listed river otter, the Service agrees that the project is unlikely to adversely impact these species.

Bald and Golden Eagle Protection Act
The Service has no issues with the proposed bald eagle minimization and avoidance plan for the onsite eagle nest, and we appreciate this coordination and the continued assurances from NDOT to protect trust resources.

Wetland Mitigation
We have no additional comments at this time regarding the proposed wetland mitigation site; however, we do look forward to reviewing the draft site plan in the future for the proposed wetland mitigation bank via our regular participation with the Interagency Review Team and the U.S. Army Corps of Engineers.

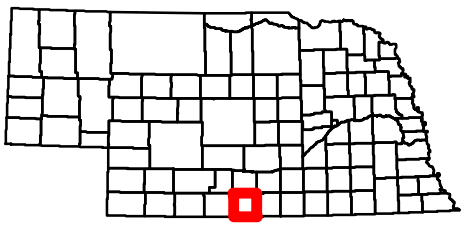
Sincerely,
Brooke

Brooke Stansberry
Fish and Wildlife Biologist
Nebraska Field Office
U.S. Fish and Wildlife Service
9325 B South Alda Road
Wood River, Nebraska 68883
Cell: 308-379-8554
Brooke_Stansberry@fws.gov

NEBRASKA
DEPARTMENT OF TRANSPORTATION

Proposed Harlan County Wetland Mitigation Bank Site

Control No. 71216



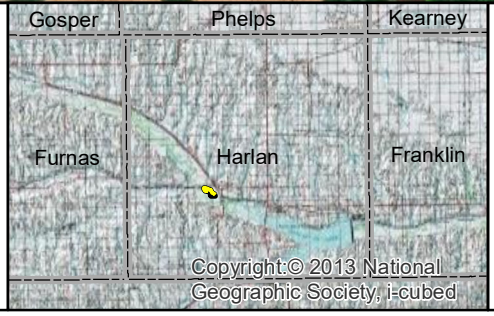
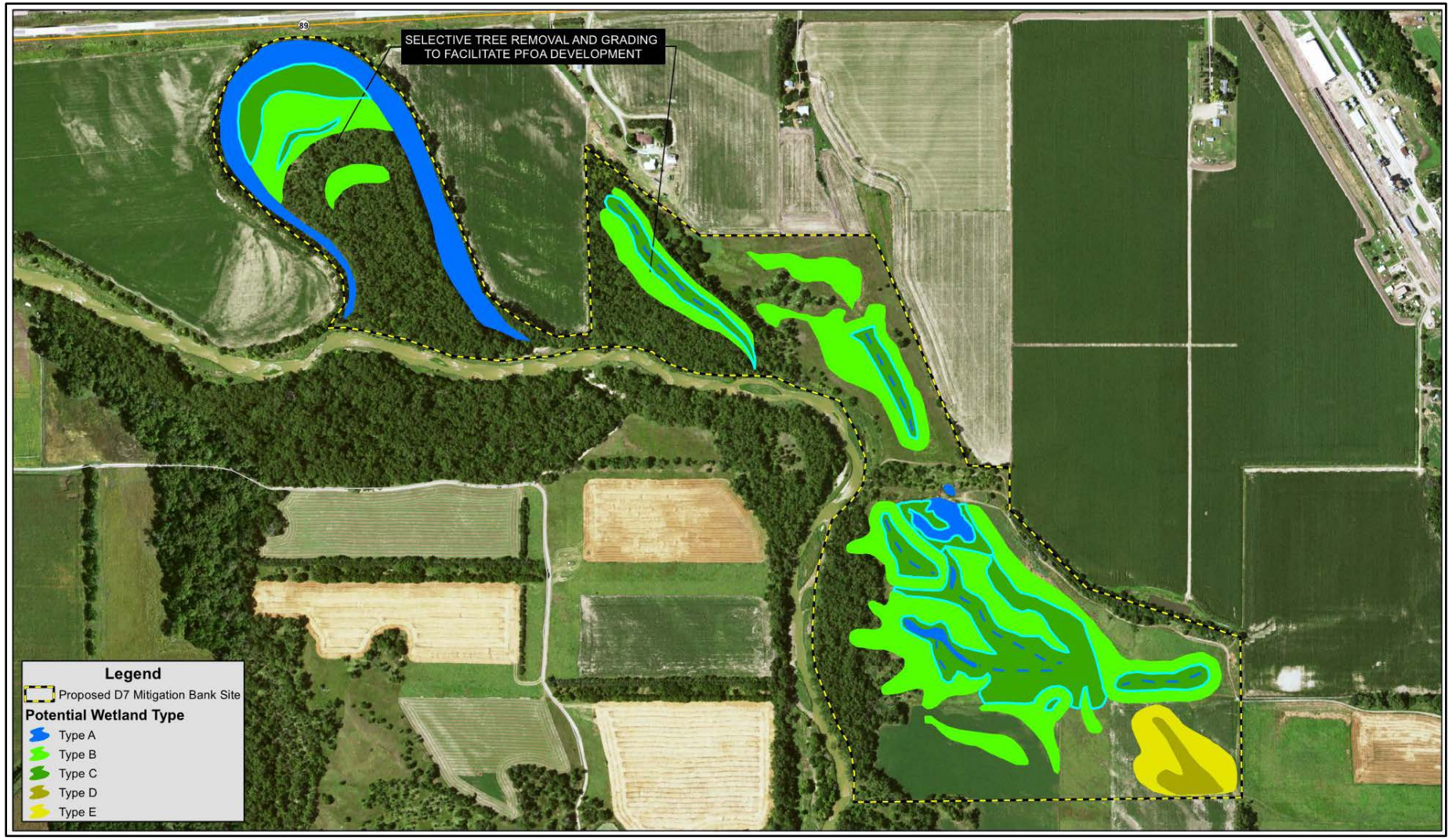


Exhibit A - Location Map

ProposedD7MitigationBankSite

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

Proposed Harlan County Wetland Mitigation Bank Site
Control No. 71216
Exhibit B



NEBRASKA
DEPARTMENT OF TRANSPORTATION

Section 106 Tier II PQS Memo – No Historic Properties Affected
State Funds Only

Control No:	71216	**Project No:**	MISC-D7(1007)	**Project Name:**	District 7 Wetland Bank
Date of Project Description:			August 13, 2018	**Project Location:**	Harlan County

NDOT PQS Project Effects Determination:	No Historic Properties Affected		
NDOT PQS Signature:	Katie D Turner	**Date:**	9/3/2019

Tribal Consultation (leave blank if not applicable):

THPO/ Tribes	Correspondence Sent (date)	THPO/Tribal Response (date)	Comments
Otoe-Missouria Tribe of Oklahoma	7/31/2019	9/1/2019	The 30-day Section 106 consultation period ended without the USACE receiving comments from the tribe.
Pawnee Nation of Oklahoma	7/31/2019	7/31/2019	The tribe indicated that the project location is within 7 miles of several Pawnee archeological site. The tribe indicated the project will not adversely affect the cultural landscape of the Pawnee Nation. Notice to proceed was given; however, if unanticipated discoveries are made they must be immediately reported to the Pawnee Nation.
Ponca Tribe of Indians of Oklahoma	7/31/2019	9/1/2019	The 30-day Section 106 consultation period ended without the USACE receiving comments from the tribe.
Ponca Tribe of Nebraska	7/31/2019	9/1/2019	The 30-day Section 106 consultation period ended without the USACE receiving comments from the tribe.
Northern Cheyenne Tribe	7/31/2019	8/29/2019	The tribe has determined the project will have 'NO EFFECT.' The tribe defers any additional cultural resource concerns to the nearest tribe, which may consist of additional site visits, surveys, and/or avoidance areas.
Cheyenne-Arapaho Tribe	7/31/2019	9/1/2019	The 30-day Section 106 consultation period ended without the USACE receiving comments from the tribe.
Mescalero-Apache Tribe	7/31/2019	9/1/2019	The 30-day Section 106 consultation period ended without the USACE receiving comments from the tribe.

Note: Tribal consultation for the above referenced project was completed by the U.S. Army Corps of Engineers (USACE) – Kansas City District.

CLG Consultation (leave blank if not applicable):

CLG	Correspondence Sent (date)	CLG Response (date)	Comments

Other Consulting Parties	Correspondence Sent (date)	Response (date)	Comments
SHPO	7/30/2019	8/6/2019	The SHPO concurred with the project effects determination of *No Historic Properties Affected*. The SHPO must be notified of any unanticipated discoveries, including cultural or human remains.
USACE – Kansas City District	7/29/2019	7/30/2019	The USACE-Kansas City District concurred with the NRHP eligibility recommendations and the project effects determination. Any changes to the project must be communicated to the USACE – Kansas City District.

Area of Potential Effects (APE)
The area of potential effects (APE) for archeological and architectural/structural properties and the level of effort for this undertaking were developed in consultation with the USACE. The APE was chosen to adequately identify any historic properties that, if present, may be potentially altered given the scale and scope of this undertaking. In order to accommodate any potential minor changes to the undertaking that may occur during continued project development, the archeological APE includes the entire boundaries of the proposed wetland bank where construction

activities will occur. The vertical depth of the archeological APE extends generally from 6-feet below the existing ground surface to twelve-feet beneath the existing ground surface to account for ground leveling activities. The architectural/structural APE includes the entire boundaries of the proposed wetland bank and, in order to evaluate potential effects to adjacent farmsteads, parcels located adjacent to the boundaries of the proposed wetland bank.

APE considered is consistent with 36 CFR 800.16(d) – (Y/N): Yes

Summary of Archeological Investigations

An archeological evaluation was completed by History Nebraska Highway Archeologist Karen Steinauer and Archeological Technician Talon O'Connor in May 2019. A review of the Nebraska State Historical Society Cultural Resources Geographic Information System (NCRGIS) archeological resources database and historic maps indicates there are no previously recorded archeological sites present within the APE. Background research indicates that two areas adjacent to the APE have been previously archeologically surveyed for unrelated undertakings (Moore 1988; Chada 2006).

Geomorphology and Survey Methodology

A review of the Nebraska Buried Sites GIS resource indicated that the potential for the APE to include deeply buried cultural deposits ranged from low potential, to variable potential, to high potential. The Nebraska Buried Sites GIS resource was developed by History Nebraska's Highway Archeology Program and Dr. Rolfe D. Mandel, Director and State Geologist-Kansas Geological Society. The resource is meant to function as a tool to help determine the likelihood of deeply buried cultural deposits potentially contained within a given landform. This resources is not meant to be utilized without field investigations which are required to determine the presence or absence of deeply buried cultural deposits. For the purpose of the 2019 field investigation a deeply buried site constitutes as a site located on a landform containing deposits dating from the Holocene and terminal Pleistocene which is discovered below the typical maximum depth of excavation for a standard shovel test pit excavated on the same landform.

As the Nebraska Buried Sites GIS resource indicated that portions of the proposed wetland mitigation site have the potential to contain deeply buried cultural deposits and the depth of disturbance associated with proposed construction activities will vary across the site, the survey methodology for this undertaking was developed through consultation with Dr. Mandel. A review of available geotechnical data, prepared for the current undertaking, in correlation with available soil data resulted in the determination that the Nebraska Buried Sites GIS resource was incorrect regarding the potential for the APE to contain deeply buried cultural deposits. Dr. Mandel indicated that the majority of the APE is located on a modern landform and therefore has no potential to contain deeply buried cultural deposits. Dr. Mandel also indicated that the extreme eastern portion of the site, which was indicated to have a high potential to contain deeply buried cultural deposits by the Nebraska Buried Sites GIS resource, has relatively low potential to contain buried cultural deposits as the landform largely dates to the Historic age and consists of coarse-grained alluvium deposited in a high-energy depositional environment. Furthermore, Dr. Mandel noted that if the extreme eastern portion of the site contained buried soils the soils would be weakly developed and would contain turn-of-the-century to modern cultural deposits. In consideration of this information Dr. Mandel recommended there was no need for deep archeological testing such as trenching within the APE.

The development of the undertaking's survey methodology was also designed to avoid disturbing an active bald eagle's nest located within the proposed boundaries of the wetland mitigation site. Through consultation with NDOT's Threatened and Endangered Species specialist the following conservation conditions were observed by all survey personnel: no survey work was conducted between February 1 and March 31 and no survey work was completed within a 330-foot buffer surrounding the nest. During the completion of archeological survey it was noted that the 330-foot buffer has been disturbed by the construction of an artificial berm on which the active eagle's nest is situated. No additional survey work is required within the 330-foot buffer.

As a result of these consultations, the survey methodology for the undertaking consisted of intensive pedestrian survey of linear transects spaced 20-meters apart across the entire APE, excluding the 330-foot buffer surrounding the bald eagle's nest. Additionally, a total of seven shovel test pits were excavated in the far eastern portion of the APE (outside of the 330-foot eagle's nest buffer) to verify the absence of deeply buried cultural deposits. Soils displaced through the excavation of the shovel test pits, measuring 35-centimeters in diameter, were dry screened through one quarter inch screens. Shovel test pits were excavated to depths ranging from forty-centimeters below the existing ground surface to seventy-five-centimeters below the existing ground surface. Some of the shovel test pits were extended through the use of a probe to depths ranging from fifty-centimeters below the existing ground surface to ninety-seven-centimeters below the existing ground surface.

Survey Results

As a result of these intensive survey methodologies one new archeological site was discovered and five areas with historic debris were noted. Newly recorded archeological site 25HN198 was recorded based on the observation of a concentration of rubble on the eastern end of the man-made berm containing the active eagles nest. Site 25HN198 is located on the eastern edge of the 330-foot conservation buffer established around the active eagle's nest. Site 25HN198 consisted of fragments of concrete, structural brick, formed concrete block, corrugated tin, metal grating, and a blue enamelware pot filled with concrete. Steinauer noted that these materials appear to be in secondary context and are likely associated with a non-extant circa 1921 farmstead. The actual location of the farmstead was not identified; however, Steinauer identified a

farmstead located outside of the APE for the current undertaking on a 1950 aerial image. As the materials associated the farmstead were discovered in a secondary context site 25HN198 is not recommended eligible for inclusion in the National Register of Historic Places (NRHP) due to a lack of physical integrity and a lack of NRHP significance.

The five areas of light, diffuse historic period artifact debris appear to be in a secondary context and are less than one hundred years in age. Per SHPO guidelines the five areas of artifact debris were not assigned site numbers. The SHPO guidelines indicate that historic Euro-American isolated finds (e.g., beer cans, bottles, machinery fragments, etc.) will not be assigned site numbers if the item is less than one hundred years in age and is clearly in a secondary inducted context (e.g., stream-eroded, artificially moved, etc.). Such sites will not be given site site status (Nebraska State Historic Preservation Office National Historic Preservation Act Archeological Properties Section 106 Guidelines 2006: 22-23). Steinauer indicated that the amount of previous disturbance not associated with the current undertaking (creation of the berm, dike construction, and flooding episodes) and the existing wetlands hindered the determination of origin for the artifact debris. The artifact debris areas may be associated with a non-extant second circa 1921 farmstead located beyond the APE's southern boundary or they may have been deposited from other unknown locations during flooding events. As the five areas of artifact debris lack physical integrity and/or NRHP significance, they are not recommended eligible for inclusion in the NRHP. There are no archeological historic properties present within the APE.

Summary of Architectural / Structural Investigations

An architectural/structural evaluation was completed by History Nebraska Preservation Associate Megan Hilger in October 2018. Hilger investigated the undertaking using the Nebraska State Historic Preservation office (SHPO) inventory and site files, the Harlan County Assessor's web page, Google Earth aerial imagery, a Harlan County plat map (dated 1903), and other primary and secondary resources. Background research indicates there are no previously recorded architectural or structural historic properties present within the APE. Hilger performed a desktop assessment of the APE and evaluated all properties identified as meeting the SHPO Historic Resources Survey Manual Criteria for survey and guidelines set forth in the 1991 National Park Service Bulletin 15: *How to Apply the National Register Criteria for Evaluation* (NPS Bulletin 15). These criteria include, but are not limited to, properties that are 50 years old or older, and are in their original location; and which possess sufficient physical integrity to convey NRHP significance. The properties that met the above criteria were evaluated using the guidelines set forth in the NPS Bulletin 15. All surveyed properties were evaluated to determine NRHP eligibility. The investigation resulted in the identification of three previously unrecorded properties within the APE. None of the properties within the APE met the survey requirements stipulated in the SHPO Historic Resources Survey Manual criteria and were therefore not evaluated for their potential NRHP eligibility. There are no architectural or structural historic properties present within the APE.

Historic Properties Identified Within APE (leave blank if none):

Archeological Site	ROW Needed? (Specify Type & Amount)	Architectural Property	ROW Needed? (Specify Type & Amount)

Sensitive Areas (leave blank if none):

	MM - MM		MM – MM

This/these Sensitive Area(s) shall be indicated on project plans. No grading or project activities, including but not limited to, working, staging, borrowing, stockpiling, or storing material and/or equipment, shall occur within the boundary of the Sensitive Area(s).

Provide narrative to support *no historic property affected* finding

As no archeological or architectural/structural historic properties were discovered as a result of cultural resources surveys completed in support of this undertaking, no historic properties will be affected by the undertaking as proposed.

This undertaking has been reviewed under the programmatic agreement entitled *Programmatic Agreement Among the Federal Highway Administration, the Nebraska State Historic Preservation Officer, the Advisory Council on Historic Preservation and the Nebraska Department of Roads to Satisfy the Requirements of Section 106 for the Federal Aid Highway Program in the State of Nebraska (July 2015), as amended, and meets the requirements to be considered a Tier II project. As a state funded only project, this project has been processed according to the letter agreement between NESHPO and NDOT (dated 10/15/2018).*

Project Name: District 7 Wetland Bank
Project No.: MISC-D7(1007)
Control Number: 71216
Date: 8/13/2018

Project Description:
This project is located approximately one mile southwest of the west corporate limits of the Village of Orleans in Harlan County in Sections 20, and 21, Township 2N, Range 19W.

The improvements on this project consist of construction of a wetland mitigation bank site in District 7.

Scope Details:

- Relocation of utilities may be required.
- Project surveying and staking will be required.
- Grading will be required.
- Areas disturbed during construction will be stabilized utilizing methods of erosion control as shown in the Storm Water Pollution Prevention Plan (SWPPP).
- The project does appear to have a “Zone A” floodplain within the project study area; therefore, a floodplain permit will be required from Harlan County.
- The project will be located on US Army Corps of Engineers (USACE) owned property an agreement with the USACE will be required.

Turner, Katie

From: Powell, Gina S CIV USARMY CENWK (US) <Gina.S.Powell@usace.army.mil>
Sent: Tuesday, July 30, 2019 8:20 AM
To: Turner, Katie
Subject: RE: 71216_MISC-D7(1007)_District 7 Wetland Bank (UNCLASSIFIED)

Follow Up Flag: Follow up
Flag Status: Completed

Katie,
The Corps concurs with your finding of no historic properties found in the survey area.

I will get those tribal letters with the report attached out today, if I can find all the current addresses.

Gina

From: Meade, Timothy M CIV (USA)
To: Turner, Katie
Subject: RE: 71216_MISC-D7(1007)_District 7 Wetland Bank (UNCLASSIFIED)
Date: Monday, July 29, 2019 3:58:59 PM

CLASSIFICATION: UNCLASSIFIED

Hi Katie,

I reviewed the report and transmittal letter you sent. In my opinion, the work was fully adequate to identify historic properties in the area of potential effect (APE). We also concur with your recommendations that site 25HN198 is not eligible for inclusion in the National Register of Historic Places and your finding of "no historic properties affected" for the entire APE. Therefore, we have no objection to the undertaking in terms of NHPA compliance. However, should project plans change and additional or different areas on Corps-owned lands at Harlan County Lake impacted, the Corps will need to review these changes to determine if they were to have possible impacts to historic properties.

Please let me know if you need anything else,

Tim

-----Original Message-----
From: Turner, Katie [mailto:katie.turner@nebraska.gov]
Sent: Monday, July 29, 2019 2:42 PM
To: Meade, Timothy M CIV (USA) <Timothy.M.Meade@usace.army.mil>
Subject: [Non-DoD Source] 71216_MISC-D7(1007)_District 7 Wetland Bank

Mr. Meade:

Please find attached for your review the documents prepared in support of the above referenced project: the SHPO consultation letter and the Section 106 Project Package. The Section 106 Project Package includes: the project location map; the project description; the archeological evaluation (the archeological report); the architectural/structural evaluation (the architectural/structural report); and a letter agreement between NDOT and SHPO regarding the processing of state funded only projects. These attachments have been sent to Gina Powell under separate cover.

As no historic properties were identified as a result of cultural resources surveys completed in support of this undertaking the Nebraska Department of Transportation is recommending a finding of no historic properties affected. As you review the provided information please do not hesitate to contact me if you have questions regarding this information.

Sincerely,

Katie Turner

Cultural Resources Manager / Section 106 Specialist

Project Development

Nebraska Department of Transportation

1500 Highway 2 | Lincoln, Nebraska | 68509

Katie.Turner@nebraska.gov <mailto:Katie.Turner@nebraska.gov> | 402-479-3514

dot.nebraska.gov <Blockedhttps://www.dot.nebraska.gov/> | Twitter <Blockedhttps://twitter.com/NebraskaDOT>

CLASSIFICATION: UNCLASSIFIED

History NEBRASKA

Preserving the past. Building the future.

Katie Turner
Cultural Resources Manager / Section 106 Specialist
Project Development
Nebraska Department of Transportation
1500 Highway 2
Lincoln, Nebraska 68509

August 6, 2019

RE: HP# 1907-509-01; Survey# 19-0154; *Archeological Investigation: MISC-D7(1007) – District 7 Wetland Bank - Control Number: 71216, Harlan County, Nebraska.*

Dear Ms. Turner:

Thank you for submitting the cultural resource survey report for the above referenced project for Nebraska State Historic Preservation Office (NeSHPO) review and comment under Section 106 of the National Historic Preservation Act of 1966, as amended in 2014 (Title 54 U.S.C. § 306108 [formerly 16 U.S.C. § 470f]), and its implementing regulations at 36 CFR§800.

This report, submitted by State Archeology Office on behalf of Nebraska Department of Transportation, documents the results of a cultural resources survey conducted prior to the construction of wetland mitigation bank site in NDOT's District 7 located west of Orleans, Nebraska.

The report documents that one new historic period archeological site (25HN198) and five areas of historic debris were identified in the area of potential effect. However, based on the information provided, these historic properties are not listed or considered eligible for listing on the National Register of Historic Places. Thus, the Nebraska State Historic Preservation Office concurs with the determination that "***No Historic Properties Affected***" is appropriate for this undertaking and the project should proceed as planned.

However, there is the possibility that currently buried or otherwise obscured cultural or human remains may be discovered during the undertaking. If any such discovery is made or if the project area becomes expanded in any way, please contact this office immediately for further instruction.

Be advised that this opinion does not necessarily reflect that of any Native American Tribes that might have an interest in the area, nor does it to pertain to Traditional Cultural Properties, if they exist in the area.

If required, please submit this letter to the project's lead federal agency to fulfill the statutory obligation of Section 106 consultation with the Nebraska State Historic Preservation Office. Should you have any questions regarding this determination, please contact this office by phone at 402-471-2609 or by email at John.Rissetto@Nebraska.Gov.

Sincerely,

John Rissetto, Ph.D.
Preservation Archeologist

PLEASE NOTE ADDRESS CHANGE
1500 R Street
Lincoln, Nebraska
68508-1651
P: 402.471.4787

NEBRASKA

Good Life. Great Journey.

DEPARTMENT OF TRANSPORTATION

History Nebraska
RECEIVED
JUL 31 2019
NE State Historic
Preservation Office

HP# 1907-509-01
County HN
STR ARCH X
Date

Survey # 19-0154

July 30, 2019

Ms. Jill Dolberg
Deputy State Historic Preservation Officer
History Nebraska
P.O. Box 82254
Lincoln, Nebraska 68508

RE: NDOT Project District 7 Wetland Bank, MISC-D7(1007), CN 71216

Dear Ms. Dolberg:

The Nebraska Department of Transportation (NDOT) proposes to construct the above referenced project on property owned by the U.S. Army Corps of Engineers – Kansas City District (USACE). The USACE is the lead federal agency and NDOT is submitting this documentation for your review and concurrence on their behalf. The USACE has determined that this state funded project is a federal undertaking. The project is located in Harlan County approximately one mile southwest of the western corporate limits of the Village of Orleans (Enclosure 1). Due to USACE involvement, the proposed project is a federal undertaking that must be reviewed under Section 106 of the National Historic Preservation Act, as amended (36 CFR Part 800) which requires federal agencies to consider and consult about the effects of proposed projects on historic properties. The USACE has identified the following tribes as consulting parties and will complete tribal consultation: the Otoe-Missouria Tribe of Oklahoma; the Pawnee Nation of Oklahoma; the Ponca Tribe of Indians of Oklahoma; the Ponca Tribe of Nebraska; the Northern Cheyenne Tribe; the Cheyenne-Arapaho Tribe; and the Mescalero-Apache Tribe.

An evaluation of the potential of cultural resources, both archeological and architectural/structural, is included below [and in enclosures]. Please review this documentation as required under Section 106 of the National Historic Preservation Act of 1966 as amended and implementing regulations at 36 CFR Part 800.

Project Description Summary

The proposed project is located approximately one mile southwest of the western corporate limits of the Village of Orleans in Harlan County in Sections 20 and 21, Township 2N, Range 19W. As previously stated, the project will be located on property owned by the USACE. The improvements on this project consist of the construction of a wetland mitigation bank site to service NDOT's District 7. Proposed construction activities associated with the construction of the wetland mitigation bank site will primarily involve the excavation of soils to alter the surface elevation of the site. The depth of excavation will be variable across the site and is dependent on the existing topography of the site in relation to groundwater. Based on existing groundwater data, excavation depths for this project are not anticipated to be greater than six-feet below the existing ground surface. Excavation activities may involve the use of mechanized scrapers and other heavy machinery. Soils displaced during the completion of excavation activities may be stockpiled and relocated on site, or will be transported off site as needed. Additional proposed construction activities for this project will include grading, clearing and grubbing. The proposed project may require tree removal. Upon completion of these construction activities the site will be seeded with a native seed mixture. A copy of the project description is included as Enclosure 2.

Area of Potential Effects (APE)

The area of potential effects (APE) for archeological and architectural/structural properties and the level of effort for this undertaking were developed in consultation with the USACE. The APE was chosen to adequately identify any historic properties that, if present, may be potentially altered given the scale and scope of this undertaking. In order to accommodate any potential minor changes to the undertaking that may occur during continued project

Kyle Schneweis, P.E., Director
Department of Transportation
1500 Highway 2
PO Box 94759
Lincoln, NE 68509-4759
OFFICE 402-471-4567 FAX 402-479-4325
NDOT.ContactUs@nebraska.gov
dot.nebraska.gov

development, the archeological APE includes the entire boundaries of the proposed wetland bank where construction activities will occur. The vertical depth of the archeological APE extends generally from 6-feet below the existing ground surface to twelve-feet beneath the existing ground surface to account for ground leveling activities. The architectural/structural APE includes the entire boundaries of the proposed wetland bank and, in order to evaluate potential effects to adjacent farmsteads, parcels located adjacent to the boundaries of the proposed wetland bank. Maps depicting the APEs are included in Enclosures 3 and 4.

Archeological Evaluation
An archeological evaluation was completed by History Nebraska Highway Archeologist Karen Steinauer and Archeological Technician Talon O'Connor in May 2019. A review of the Nebraska State Historical Society Cultural Resources Geographic Information System (NCRGIS) archeological resources database and historic maps indicates there are no previously recorded archeological sites present within the APE. Background research indicates that two areas adjacent to the APE have been previously archeologically surveyed for unrelated undertakings (Moore 1988; Chada 2006).

Geomorphology and Survey Methodology
A review of the Nebraska Buried Sites GIS resource indicated that the potential for the APE to include deeply buried cultural deposits ranged from low potential, to variable potential, to high potential. The Nebraska Buried Sites GIS resource was developed by History Nebraska's Highway Archeology Program and Dr. Rolfe D. Mandel, Director and State Geologist-Kansas Geological Society. The resource is meant to function as a tool to help determine the likelihood of deeply buried cultural deposits potentially contained within a given landform. This resources is not meant to be utilized without field investigations which are required to determine the presence or absence of deeply buried cultural deposits. For the purpose of the 2019 field investigation a deeply buried site constitutes as a site located on a landform containing deposits dating from the Holocene and terminal Pleistocene which is discovered below the typical maximum depth of excavation for a standard shovel test pit excavated on the same landform.

As the Nebraska Buried Sites GIS resource indicated that portions of the proposed wetland mitigation site have the potential to contain deeply buried cultural deposits and the depth of disturbance associated with proposed construction activities will vary across the site, the survey methodology for this undertaking was developed through consultation with Dr. Mandel. A review of available geotechnical data, prepared for the current undertaking, in correlation with available soil data resulted in the determination that the Nebraska Buried Sites GIS resource was incorrect regarding the potential for the APE to contain deeply buried cultural deposits. Dr. Mandel indicated that the majority of the APE is located on a modern landform and therefore has no potential to contain deeply buried cultural deposits. Dr. Mandel also indicated that the extreme eastern portion of the site, which was indicated to have a high potential to contain deeply buried cultural deposits by the Nebraska Buried Sites GIS resource, has relatively low potential to contain buried cultural deposits as the landform largely dates to the Historic age and consists of coarse-grained alluvium deposited in a high-energy depositional environment. Furthermore, Dr. Mandel noted that if the extreme eastern portion of the site contained buried soils the soils would be weakly developed and would contain turn-of-the-century to modern cultural deposits. In consideration of this information Dr. Mandel recommended there was no need for deep archeological testing such as trenching within the APE.

The development of the undertaking's survey methodology was also designed to avoid disturbing an active bald eagle's nest located within the proposed boundaries of the wetland mitigation site. Through consultation with NDOT's Threatened and Endangered Species specialist the following conservation conditions were observed by all survey personnel: no survey work was conducted between February 1 and March 31 and no survey work was completed within a 330-foot buffer surrounding the nest. During the completion of archeological survey it was noted that the 330-foot buffer has been disturbed by the construction of an artificial berm on which the active eagle's nest is situated. No additional survey work is required within the 330-foot buffer.

As a result of these consultations, the survey methodology for the undertaking consisted of intensive pedestrian survey of linear transects spaced 20-meters apart across the entire APE, excluding the 330-foot buffer

Kyle Schneweis, P.E., Director
Department of Transportation
1500 Highway 2
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Lincoln, NE 68509-4759
OFFICE 402-471-4567 FAX 402-479-4325
NDOT.ContactUs@nebraska.gov
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surrounding the bald eagle's nest. Additionally, a total of seven shovel test pits were excavated in the far eastern portion of the APE (outside of the 330-foot eagle's nest buffer) to verify the absence of deeply buried cultural deposits. Soils displaced through the excavation of the shovel test pits, measuring 35-centimeters in diameter, were dry screened through one quarter inch screens. Shovel test pits were excavated to depths ranging from forty-centimeters below the existing ground surface to seventy-five-centimeters below the existing ground surface. Some of the shovel test pits were extended through the use of a probe to depths ranging from fifty-centimeters below the existing ground surface to ninety-seven-centimeters below the existing ground surface.

Survey Results

As a result of these intensive survey methodologies one new archeological site was discovered and five areas with historic debris were noted. Newly recorded archeological site 25HN198 was recorded based on the observation of a concentration of rubble on the eastern end of the man-made berm containing the active eagles nest. Site 25HN198 is located on the eastern edge of the 330-foot conservation buffer established around the active eagle's nest. Site 25HN198 consisted of fragments of concrete, structural brick, formed concrete block, corrugated tin, metal grating, and a blue enamelware pot filled with concrete. Steinauer noted that these materials appear to be in secondary context and are likely associated with a non-extant circa 1921 farmstead. The actual location of the farmstead was not identified; however, Steinauer identified a farmstead located outside of the APE for the current undertaking on a 1950 aerial image. As the materials associated the farmstead were discovered in a secondary context site 25HN198 is not recommended eligible for inclusion in the National Register of Historic Places (NRHP) due to a lack of physical integrity and a lack of NRHP significance.

The five areas of light, diffuse historic period artifact debris appear to be in a secondary context and are less than one hundred years in age. Per SHPO guidelines the five areas of artifact debris were not assigned site numbers. The SHPO guidelines indicate that historic Euro-American isolated finds (e.g., beer cans, bottles, machinery fragments, etc.) will not be assigned site numbers if the item is less than one hundred years in age and is clearly in a secondary inducted context (e.g., stream-eroded, artificially moved, etc.). Such sites will not be given site site status (Nebraska State Historic Preservation Office National Historic Preservation Act Archeological Properties Section 106 Guidelines 2006: 22-23). Steinauer indicated that the amount of previous disturbance not associated with the current undertaking (creation of the berm, dike construction, and flooding episodes) and the existing wetlands hindered the determination of origin for the artifact debris. The artifact debris areas may be associated with a non-extant second circa 1921 farmstead located beyond the APE's southern boundary or they may have been deposited from other unknown locations during flooding events. As the five areas of artifact debris lack physical integrity and/or NRHP significance, they are not recommended eligible for inclusion in the NRHP. There are no archeological historic properties present within the APE (Enclosure 3).

Architectural/Structural Evaluation

An architectural/structural evaluation was completed by History Nebraska Preservation Associate Megan Hilger in October 2018. Hilger investigated the undertaking using the Nebraska State Historic Preservation office (SHPO) inventory and site files, the Harlan County Assessor's web page, Google Earth aerial imagery, a Harlan County plat map (dated 1903), and other primary and secondary resources. Background research indicates there are no previously recorded architectural or structural historic properties present within the APE. Hilger performed a desktop assessment of the APE and evaluated all properties identified as meeting the SHPO Historic Resources Survey Manual criteria for survey and guidelines set forth in the 1991 National Park Service Bulletin 15: *How to Apply the National Register Criteria for Evaluation* (NPS Bulletin 15). These criteria include, but are not limited to, properties that are 50 years old or older, and are in their original location; and which possess sufficient physical integrity to convey NRHP significance. The properties that met the above criteria were evaluated using the guidelines set forth in the NPS Bulletin 15. All surveyed properties were evaluated to determine NRHP eligibility.

The investigation resulted in the identification of three previously unrecorded properties within the APE. None of the properties within the APE met the minimum survey requirements stipulated in the SHPO Historic Resources Survey Manual criteria and are not NRHP eligible due to a lack of physical integrity and/or significance. There are no architectural or structural historic properties present within the APE (Enclosure 4).

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Assessing Project Effects
As no archeological or architectural/structural historic properties were discovered as a result of cultural resources surveys completed in support of this undertaking, no historic properties will be affected by the undertaking as proposed.

Project Effects Recommendation
On behalf of the USACE, NDOT recommends that no historic properties will be affected by the undertaking as proposed. The USACE concurred with the NRHP eligibility recommendations and with the recommended project effects determination on July 29, 2019 and July 30, 2019 (Enclosure 6). By letter agreement with your office (SHPO concurrence 10/15/18; Enclosure 5), this NDOT state funded only project has been reviewed under the stipulations of the programmatic agreement entitled *Programmatic Agreement Among the Federal Highway Administration, the Nebraska State Historic Preservation Officer, the Advisory Council on Historic Preservation and the Nebraska Department of Roads to Satisfy the Requirements of Section 106 for the Federal Aid Highway Program in the State of Nebraska* (July 2015), as amended, and meets the requirements to be considered a Tier II Project. Tier II projects result in a project effects determination of *no historic properties effected.*

On behalf of USACE, NDOT recommends a finding of *no historic properties affected* and respectfully requests SHPO concurrence with the above NRHP eligibility recommendations and with this recommended project effects determination. If you have any questions regarding this information, please do not hesitate to contact me.

Sincerely,

Katie D Turner

Katie Turner
NDOT Cultural Resources Manager/Section 106 Specialist
(402) 479 – 3514
Katie.turner@nebraska.gov

CONCUR:

030 Jill Dolberg, Deputy State Historic Preservation Officer — Date 8/6/2019

cc: Timothy Meade, Archeologist, U.S. Army Corps of Engineers – Kansas City District
Gina Powell, Archeologist, U.S. Army Corps of Engineers – Kansas City District

Enclosures
1. Project Location Map
2. Project Description
3. Archeological Evaluation
4. Architectural/Structural Evaluation
5. SHPO Letter Agreement (dated 10/15/2018)
6. USACE – Kansas City District Project Concurrence (dated 7/29/2019 and 7/30/2019)

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Turner, Katie

From: Powell, Gina S CIV USARMY CENWK (US) <Gina.S.Powell@usace.army.mil>
Sent: Wednesday, July 31, 2019 11:15 AM
To: Turner, Katie
Subject: Tribal emails

Katie,
For your records, I sent this email today with the report attached to each of the 8 tribes we discussed before.

Dear Sendee:
Archeologists working for the Nebraska Department of Transportation (NDOT) recently completed a reconnaissance cultural resources survey with limited shovel testing at Harlan County Lake, a U.S. Corps of Engineers, Kansas City District (Corps) reservoir in Harlan County, Nebraska. Proposed ground disturbance in the Area of Potential Effect (APE) will result in a wetlands mitigation bank for District 7 of NDOT (Project MISC-D7 [1007]). A wetland mitigation bank is a site where wetlands are restored, created, or enhanced for the express purpose of providing compensatory mitigation in advance of unavoidable impacts to wetlands or other aquatic resources. The project is approximately 113 acres and is located one mile west of the village of Orleans, Harlan County, in Sections 20 and 21, Township 2N, Range 19W. This letter is to inform your Tribe of the proposed undertaking and ask for your review and comment.
Geomorphological background studies indicated that most of the project area was recent alluvium so surface reconnaissance was sufficient to find cultural resources. The only exception was the terrace edge along the eastern edge of the APE that had a slight chance of buried deposits. Six shovel tests failed to located significant subsurface cultural resources. Surface survey located six low-density historic trash scatters and one site, also a historic trash scatter. The site, 25HN198, was not deemed to be eligible for the National Register of Historic Places. The report has been sent to the Nebraska State Historic Preservation Office with a request for concurrence.
As no eligible cultural resource sites were identified within the APE, the Corps has made the preliminary determination that the proposed project will have no effect on historic properties. However, should your Tribe have information on any cultural resource that may be affected by the proposed project of which we may be unaware, we would take such information into account for our final determination of effect.
Please contact me at (816) 389-2320 or Gina.S.Powell@usace.army.mil if you have any questions on need additional information. We respectfully request that you provide any input or information your Tribal Government may have by September 1, 2019.

Sincerely,

Gina S. Powell, Archeologist
U.S. Army Corps of Engineers, Kansas City District
601 E. 12th Street
Kansas City, MO 64106
Phone: 816-389-2320

Pawnee Nation of Oklahoma

Wednesday, July 31, 2019

Gina S. Powell
Archaeologist
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

RE: Section 106 Consultation and Review on:
District 7 Wetland Bank
MISC-D7 (1007)
Sections 20 & 21, Township 2 North, Range 19 West
Harlan County, Nebraska

Dear Ms. Powell,

The Pawnee Nation Office of Historic Preservation has received the information and materials requested for our Section 106 Review and Consultation. Consultation with the Pawnee Nation is required by Section 106 of the National Historic Preservation Act of 1966 (NHPA), and 36 CFR Part 800.

Given the information provided, you are hereby notified that the proposed project/s is within 7 miles of several Pawnee archaeological sites but will not adversely affect the cultural landscape of the Pawnee Nation. Therefore, in accordance with 36 CFR 800.4(d) (1), you may proceed with your proposed projects. However, please be advised that additional undiscovered properties could be encountered, and they must be immediately reported to us under both the NHPA and NAGPRA regulations.

This information is provided to assist you in complying with 36 CFR Part 800 for Section 106 Consultation procedures. Should you have questions, please do not hesitate to contact me at jreed@pawneenation.org or by phone at 918-762-2180 ext 220. Thank you for your time and consideration.

Sincerely,
Matt Reed
Historic Preservation Officer
Pawnee Nation of Oklahoma

Historic Preservation Office
Matt Reed
Phone: 918.762.2180 Fax: 918.762.3662
E-mail: jreed@pawneenation.org
P.O. Box 470
Pawnee, Oklahoma 74058

Turner, Katie

From: Powell, Gina S CIV USARMY CENWK (US) <Gina.S.Powell@usace.army.mil>
Sent: Friday, August 30, 2019 9:09 AM
To: Turner, Katie
Subject: FW: [Non-DoD Source] RE: Section 106 Survey, Harlan County Lake, Consultation

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Reply from Northern Cheyenne.

-----Original Message-----
From: Teanna Limpy [mailto:teanna.limpy@cheyennenation.com]
Sent: Thursday, August 29, 2019 7:07 PM
To: Powell, Gina S CIV USARMY CENWK (US) <Gina.S.Powell@usace.army.mil>
Subject: [Non-DoD Source] RE: Section 106 Survey, Harlan County Lake, Consultation

Gina,
I have reviewed the information provided via email on July 31, 19, regarding the propose wetlands mitigation bank for District 7 in NDOT in Harlan County Lake, Nebraska. Our office has determined that this project will have 'NO EFFECT'. However, we defer any additional cultural resource concerns to the nearest tribe, which may consist of additional site visits, surveys, and/or avoidance areas. Please feel free to contact me, if you have further questions regarding this correspondence.

Respectfully,

Teanna Limpy, THPO
Tribal Historic Preservation Office
Northern Cheyenne Tribe
14 E. Medicine Lodge Drive
P.O. Box 128
Lame Deer, MT. 59043
Work: (406) 477-4839/4838
Cell: (406) 850-7691

-----Original Message-----
From: Powell, Gina S CIV USARMY CENWK (US) [mailto:Gina.S.Powell@usace.army.mil]
Sent: Wednesday, July 31, 2019 8:49 AM
To: teanna.limpy@cheyennenation.com
Subject: Section 106 Survey, Harlan County Lake, Consultation

Dear Ms. Limpy:
Archeologists working for the Nebraska Department of Transportation (NDOT) recently completed a reconnaissance cultural resources survey with limited shovel testing at Harlan County Lake, a U.S. Corps of Engineers, Kansas City District (Corps) reservoir in Harlan County, Nebraska. Proposed ground disturbance in the Area of Potential Effect (APE) will result in a wetlands mitigation bank for

District 7 of NDOT (Project MISC-D7 [1007]). A wetland mitigation bank is a site where wetlands are restored, created, or enhanced for the express purpose of providing compensatory mitigation in advance of unavoidable impacts to wetlands or other aquatic resources. The project is approximately 113 acres and is located one mile west of the village of Orleans, Harlan County, in Sections 20 and 21, Township 2N, Range 19W. This letter is to inform your Tribe of the proposed undertaking and ask for your review and comment.

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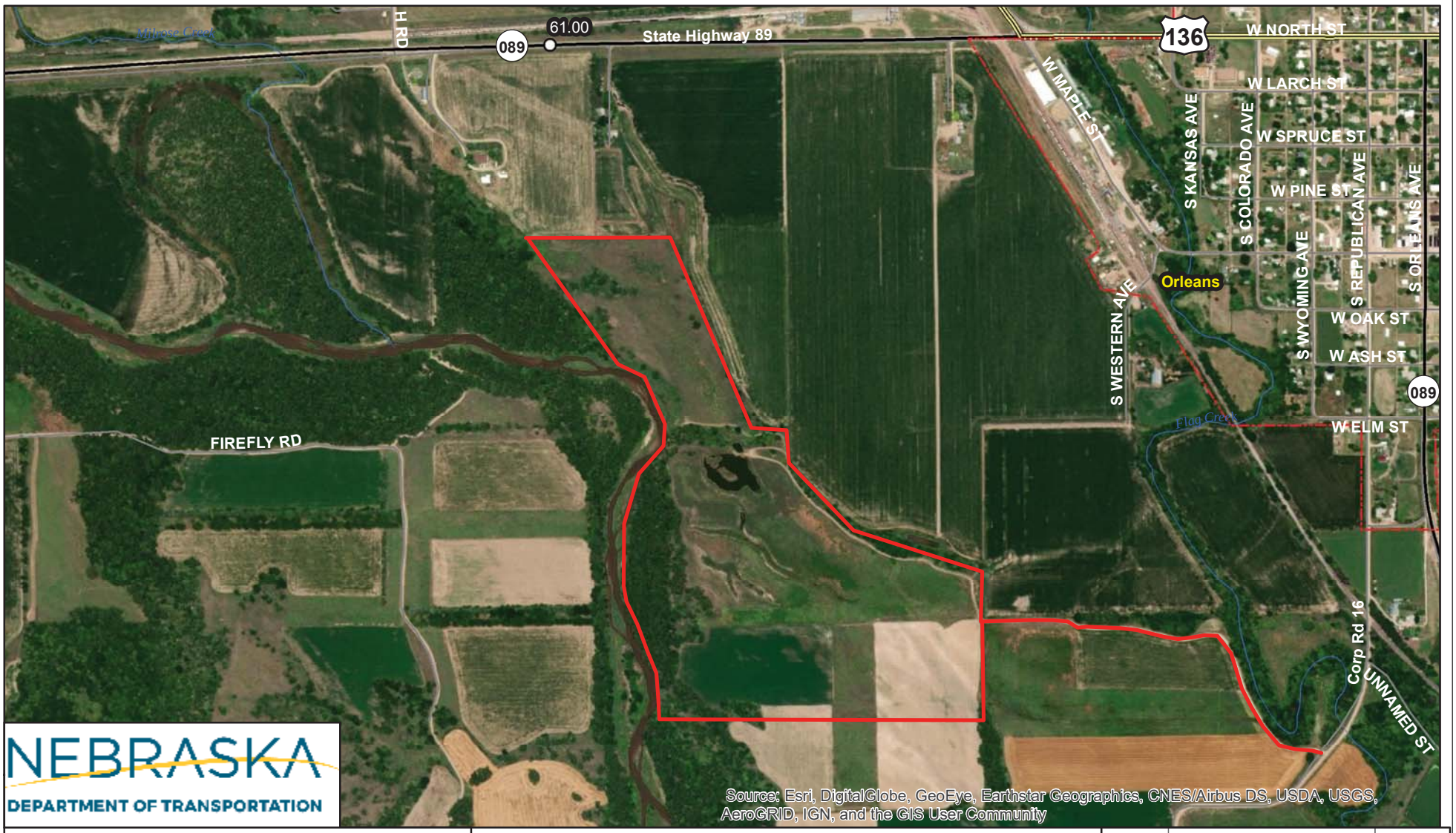
Surface survey located six low-density historic trash scatters and one site, also a historic trash scatter. The site, 25HN198, was not deemed to be eligible for the National Register of Historic Places. The report has been sent to the Nebraska State Historic Preservation Office with a request for concurrence.

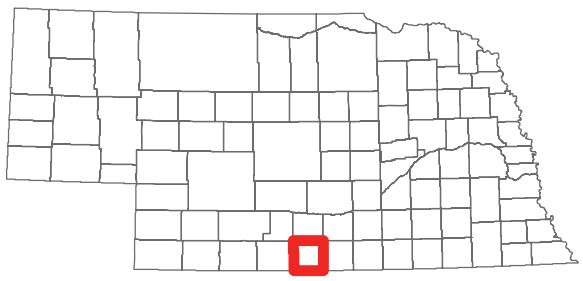
As no eligible cultural resource sites were identified within the APE, the Corps has made the preliminary determination that the proposed project will have no effect on historic properties. However, should your Tribe have information on any cultural resource that may be affected by the proposed project of which we may be unaware, we would take such information into account for our final determination of effect.
Please contact me at (816) 389-2320 or Gina.S.Powell@usace.army.mil if you have any questions on need additional information. We respectfully request that you provide any input or information your Tribal Government may have by September 1, 2019.

Sincerely,

Gina S. Powell, Archeologist
U.S. Army Corps of Engineers, Kansas City District
601 E. 12th Street
Kansas City, MO 64106
Phone: 816-389-2320

Enclosure 1





District 7 Wetland Bank

Control No. 71216

Project No. MISC-D7(1007)

0 0.1 0.2 0.4 Miles

N W E S

Gosper	Phelps	Kearney
Furnas	Harlan	Franklin

Enclosure 2

Project Name: District 7 Wetland Bank
Project No.: MISC-D7(1007)
Control Number: 71216
Date: 8/13/2018

Project Description:
This project is located approximately one mile southwest of the west corporate limits of the Village of Orleans in Harlan County in Sections 20, and 21, Township 2N, Range 19W.

The improvements on this project consist of construction of a wetland mitigation bank site in District 7.

Scope Details:

- Relocation of utilities may be required.
- Project surveying and staking will be required.
- Grading will be required.
- Areas disturbed during construction will be stabilized utilizing methods of erosion control as shown in the Storm Water Pollution Prevention Plan (SWPPP).
- The project does appear to have a “Zone A” floodplain within the project study area; therefore, a floodplain permit will be required from Harlan County.
- The project will be located on US Army Corps of Engineers (USACE) owned property an agreement with the USACE will be required.

History NEBRASKA ARCHEOLOGY Nebraska State Historical Society

State Archeology Office

Project Survey Summary

Control Number: 71216

Project Number: MISC-D7(1007) **Project Name:** District 7 Wetland Bank

County: Harlan **Nearest Water:** Republican River

Legal Description:

Portions of Section 21-T2N-R19W and of the SW¼ SW¼ Section 22-T2N-R19W

APE Description (Add Maps):

DIRECT: Horizontal APE- Within boundaries required for construction activities related to development of wetland mitigation site;
Vertical APE- generally 6 ft. below present ground surface for ground leveling which may increase to 12 ft. beneath isolated high points or mounds.

INDIRECT: No secondary or cumulative effects reasonably foreseeable.

Maps Used: USGS 7.5' topographic map (Orleans, Alma SW quads), GLO maps, plat map (Orleans TWP- Ogle 1903, 1921), aerials (1950, 1966, 1973), Google Earth Imagery, Soil Survey of Harlan County map 1930, 2019).

Project Character (Attach Project Description):

New Construction of Wetland Mitigation Bank,
Project Description dated August 13, 2018

Project Length/Area: .86 mile (NE/SE) / 113 acre

Survey Length/Area: 1.2 miles (NE/SE) / 152.8 acre

Detour? ☒ No ☐ Yes, without Constr. Activities ☐ Yes, w/ Constr. Activities

Date(s) of Archeological Survey: May 1-3 & 14-15, 2019

Name(s) of Survey Personnel: Karen Steinauer and Talon O'Connor

Person-Hours of Fieldwork: 47.0

Ground Cover (%-Visibility)

See Continuation 1.

Survey Interval/Provisions:

20 meter linear transects, except in Tract 4 where 30 meter zig-zag transects were used to accommodate opportunistic exposures. Inspection of stream bank.

Rationale for Non-surveyed Areas:

Entire APE surveyed except for 330 foot buffer around bald eagle's nest which is situated on an artificial berm.

Results of Survey:

☐ **No Archeological Resources Discovered**

☒ **Site(s) Discovered** Site Numbers: 25HN198

☐ **Other** (explain)

Project Effect Determination for Archeology

☒ **No Historic Properties Affected:** ☒ None Present ☐ Present but Not Affected

☐ **No Adverse Effect**

☐ **Adverse Effect**

Are Further Archeological Investigations Warranted? ☐ Yes ☒ No

Is THPO Consultation Recommended by Sponsor Agency? ☒ Yes ☐ No **List Tribes:** As determined by USACE.

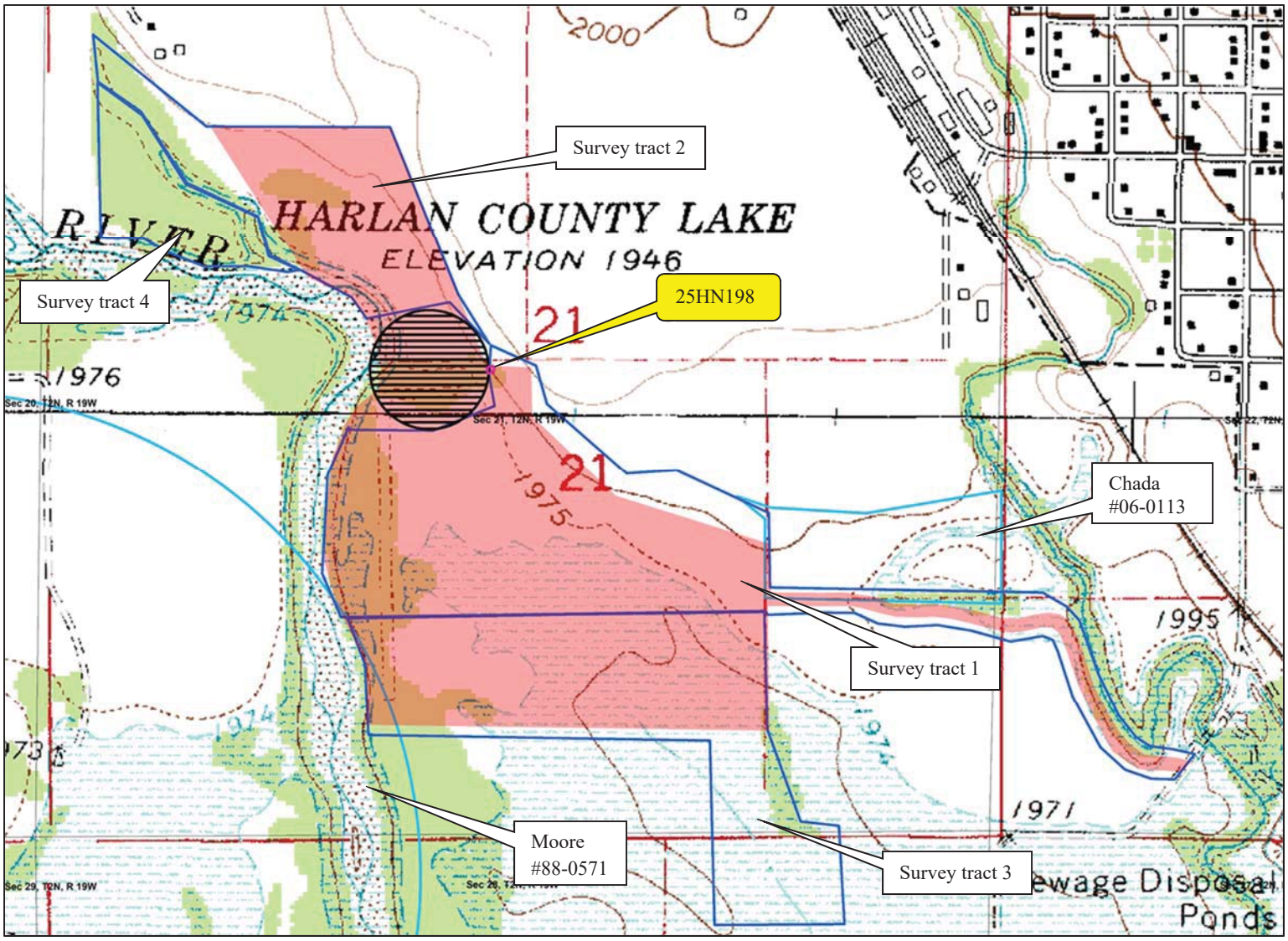
Stipulations/Exceptions to Survey Results: Evaluate Buried Cultural Remains if Encountered.

Comments:

In addition, seven shovel tests were placed along northeastern edge of APE. See Continuation 2.
No artifacts were collected.
23HN198 is recommended not eligible for the NRHP. See Continuation 3.
Two areas adjacent to APE previously surveyed by Moore #88-0571 and Chada #06-0113.

Prepared by: Karen A. Steinauer **Date:** May 20, 2019

Enclosure 3. CN 71216 District 7 Wetland Mitigation Bank — Archeological APE and Survey Map



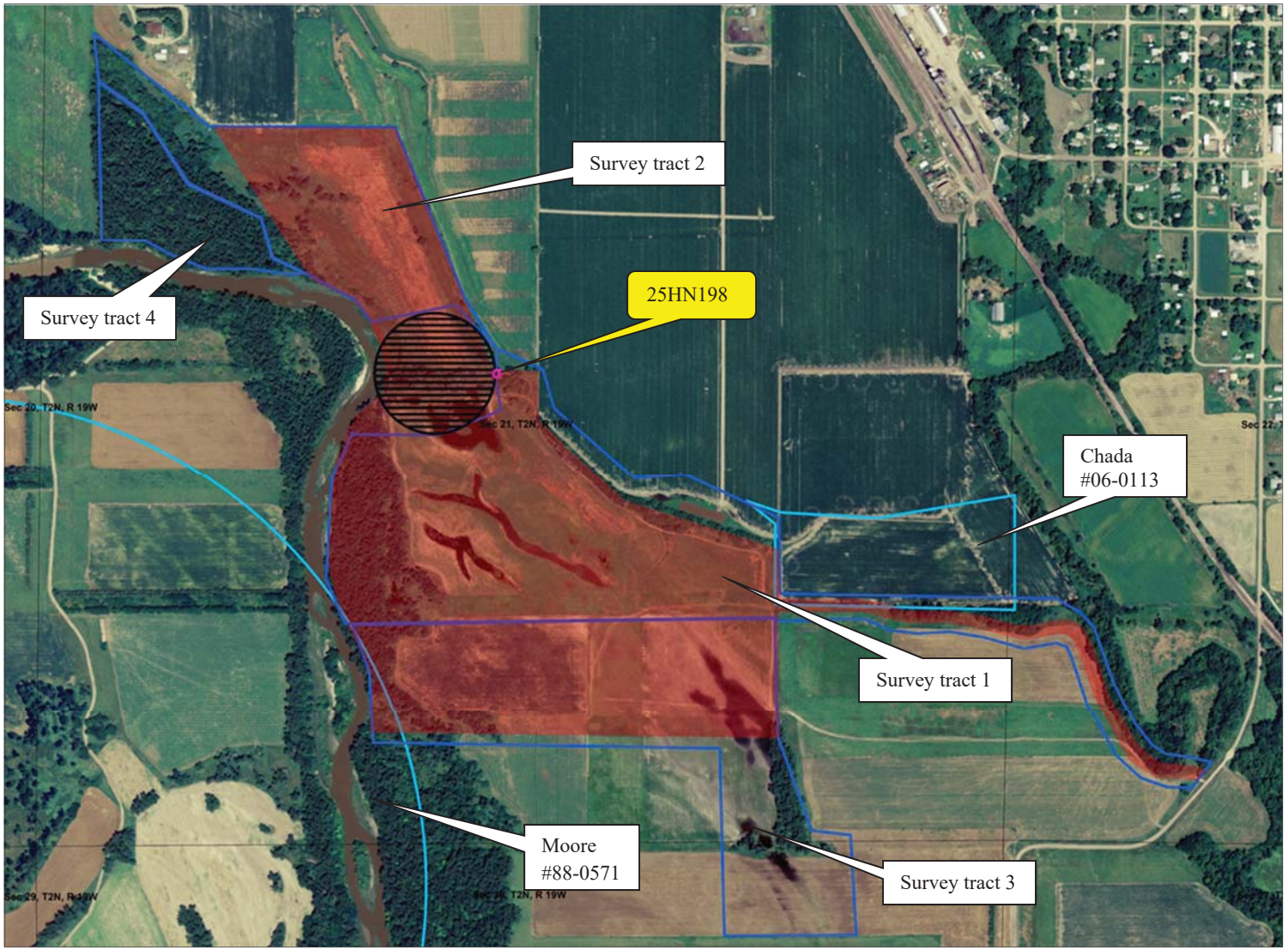
Project Location and Area of Potential Effects (APE)

Bald Eagle Buffer Zone

Archeological Survey Tract, 2019

Previous Archeological Surveys

Enclosure 3. CN 71216 District 7 Wetland Mitigation Bank — Archeological APE and Survey Map



Project Location and Area of Potential Effects (APE)

Bald Eagle Buffer Zone

Archeological Survey Tract, 2019

Previous Archeological Surveys

N

History NEBRASKA
Nebraska State Historical Society

State Archeology Office
Project Survey Summary Continuation Sheet

CN: 71216
Project: District 7 Wetland Mitigation Bank, MISC-D7(1007)

Survey Tract	Legal Description	Ground Cover/ Visibility	Nearest Water
1	NE¼ SW¼ Sec 21-T2N-R19W and the SE¼ Sec 21-T2N-R19W and the SW¼ SW¼ Sec 22-T2N-R19W	90% grasses/trees (0-25%), 6% tilled (75-100%), 4% row crop (25-50%).	Republican River
2	NW¼ Sec 21-T2N-R19W	100% grasses/trees (0-25%).	Republican River
3	SE¼ SW¼ Sec 21-T2N-R19W and the SE¼ Sec 21-T2N-R19W and the NE¼ Sec 28-T2N-R19W	60% grasses/trees (0-25%). 40% alfalfa (25-50%).	Republican River
4	NW¼ Sec 21-T2N-R19W	100% grasses/trees (0-25%).	Republican River

History NEBRASKA
Nebraska State Historical Society

State Archeology Office
Project Survey Summary Continuation Sheet

CN: 71216
Project: District 7 Wetland Mitigation Bank, MISC-D7(1007)

Shovel Test Pit (STP)	Depth (below surface)	Material Recovered	Comments
1	48cm	Sterile	0 – 23cmbs 10YR 5/2 sandy loam 23-48cmbs 10YR 6/3 clay with concretions Appeared disturbed.
2	40cm Extended to 50cm with Oakfield ¾" soil probe	Sterile	0-23cmbs 10YR 4/2 sandy clay 23-50cmbs 10YR 5/3 silty clay with numerous soft concretions
3	48cm Extended to 78cm with probe	1 flat glass fragment at approx. 25cmbs	0-78cmbs 10YR 6/3 uniform, sandy loam
4	47cm Extended to 80cm with probe	Coal fragment and green plastic fragment on surface	0-80cmbs 10YR 6/3 uniform, sandy loam
5	0-52cm Extended to 56cmwith probe	Sterile	0-30cmbs 10YR 3/2 silty clay loam 30-52cmbs 10YR 5/3 mottled clay loam with concretions
6	0-75cm Extended to 97cm with probe	Sterile	0-97cmbs 10YR 4/2 uniform, silty loam with few small sand pebbles Appeared to be slope wash from adjacent field on north.
7	0-50cm Extended to 63cm with probe	Worn small ungulate tooth in 0-20cmbs	0-20cmbs 10YR 5/3 silty clay loam 20-50cmbs 10YR 4/1 silty clay 50-63cmbs 10YR 6/2 silty clay

Size: 35cm diameter
Excavated in Levels: No
Screened: ¼ inch dry screen
Excavators: Karen Steinauer & Talon O'Connor
Date: May 2 and May 15, 2019

History NEBRASKA
Nebraska State Historical Society

Highway Archeology Program
Project Survey Summary Continuation Sheet

CN: 71216
Project: District 7 Wetland Bank, MISC-D7(1007)

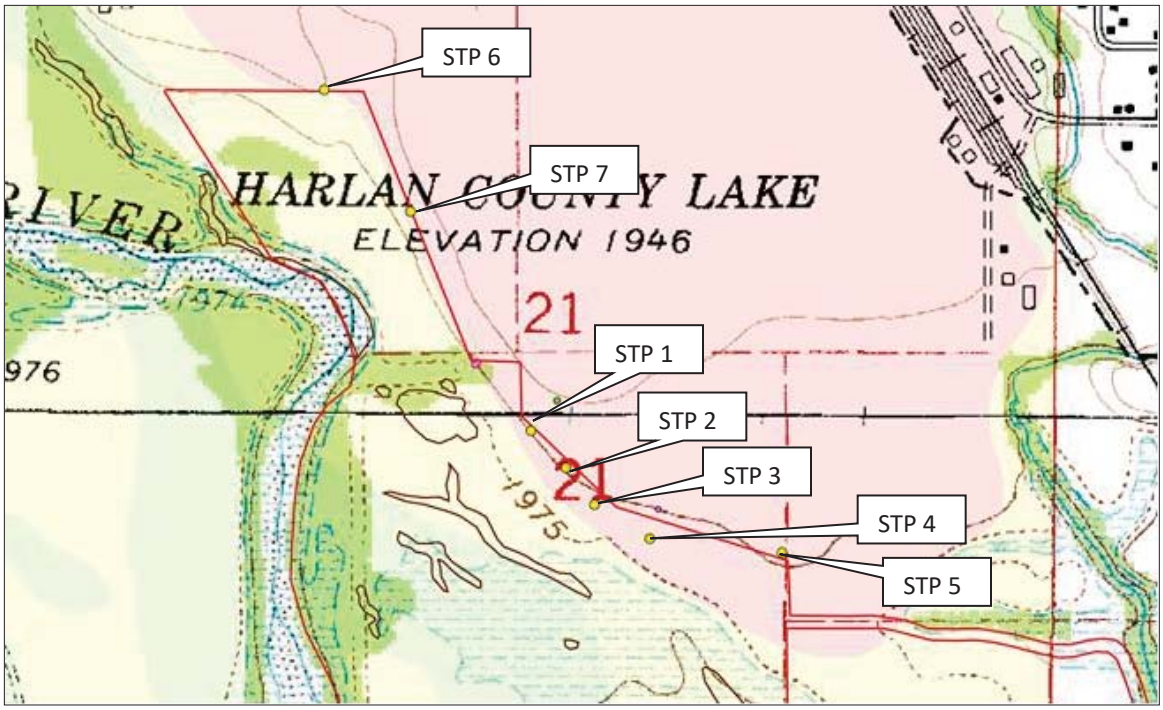
Methodology/ Geomorphology

A standard pedestrian survey at 20 meter linear transects was conducted of the Area of Potential Effects (APE) for this undertaking. The entire tract was surveyed except for a 330 foot buffer around a berm near its center where bald eagles were nesting (See Continuation 1). This survey methodology was determined after consultation with geomorphologist Dr. Rolfe D. Mandel, Director and State Geologist- Kansas Geological Survey who provided an assessment of the landforms within the APE. Upon review of the APE boundary, vertical APE map, wetland delineation map, proposed shovel test intervals map, NDOT Buried Soils map, USDA Soil Survey map, 1950 aerial imagery, the Geotechnical Exploration report, and LiDar imagery, Dr. Mandel concluded that most of the area of the mitigation site is in the floodplain and therefore modern. The extreme eastern edge of the parcel has relatively low potential for buried cultural deposits and is in a disturbed environment. Deep testing for buried deposits was not warranted and at most, turn-of-the-century to present resources could be expected to be encountered.

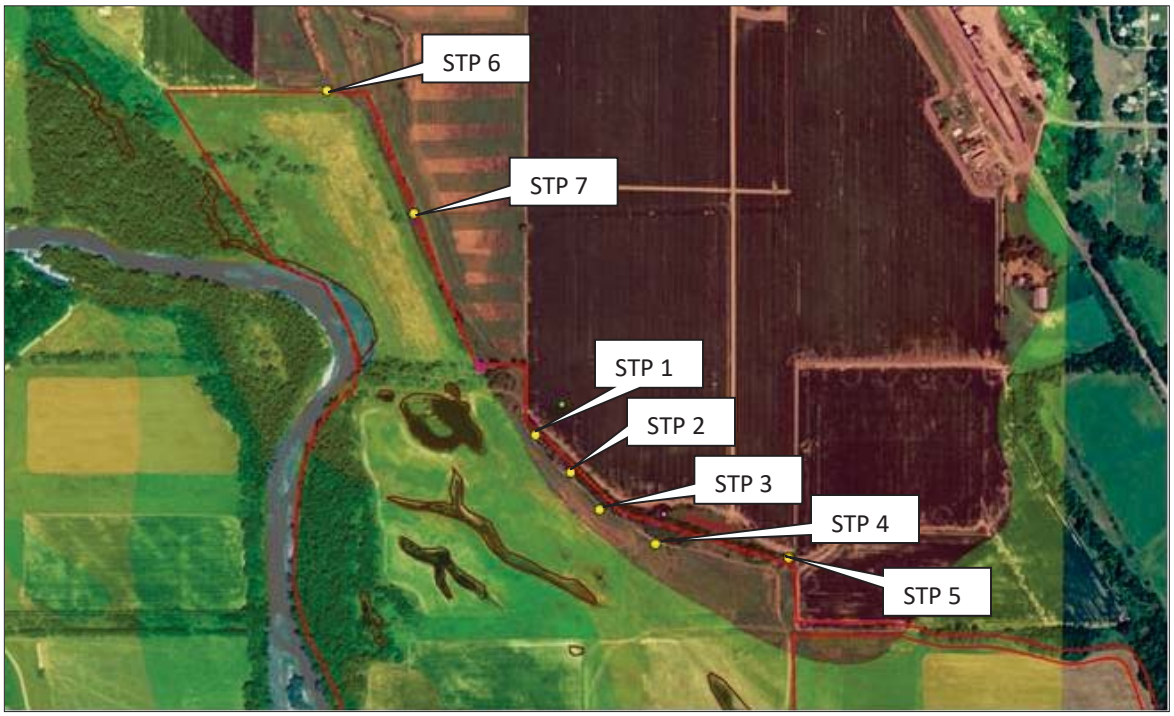
> Tony Layzell and I looked at the location of the proposed 167 acre wetland mitigation site on the Republican Southwest of Orleans in Harlan County, Nebraska. We have determined that most if not all of the mitigation site is on the T-0a floodplain. Valley fill beneath the T-0a surface is modern and, therefore, has no potential for buried cultural deposits. The extreme eastern portion of the site may be associated with the T-0b floodplain, but the T-0b fill has relatively low potential for buried cultural deposits because (1) it is largely early Historic in age, (2) it mostly consists of coarse-grained alluvium that was deposited in a high-energy depositional environment, and (3) it rarely has buried soils, and where buried soils occur, they are weakly developed (A-C profile). In sum, we see no need for deep archaeological testing in the proposed wetland mitigation site. (Rolfe Mandel to Rob Bozell, Personal Communication April 10, 2019)

Seven shovel test pits (STP) were excavated in the far eastern portion of the site to confirm these recommendations (See Continuation 2). The STP were placed within the area that a buried soils predictive model showed as having high probability for containing deeply buried sites. All of the shovel tests were negative for cultural materials except for a fragment of flat glass in STP 3 which was adjacent to a wash out. No buried soils were noted (See Continuation 2) and soil profiles observed were generally consistent with the Hord and Hall silt loams or Hobbs and McCook silt loams identified on the 2019 USDA NRCS Web Soil Survey Map (Previously classified as Bridgeport very fine sandy loam and Cass very fine sandy loam, respectively- Soil Survey 1930). Visually it was apparent that the majority of the APE was situated on the floodplain and considerably lower than the eastern adjacent terrace which is currently farmed. STP 5 and 6 were placed in the sloped margin between the two landforms while the remainder of the STP were on the edge of the floodplain.

George Davis, Jr., who grew up on the farmstead adjacent to the APE on the north, related that the mitigation area has been modified over time. The berm on which the bald eagles are nesting is artificial and in need of stabilization. It had previously "floated away" during one flood episode. Also, the man-made dike running parallel to the river has affected the course of the river which used to be out of its banks every Memorial Day.



Shovel test locations with terrace with high probability for deeply buried sites shaded in red.



Shovel test locations with terrace with high probability for deeply buried sites shaded in red. Actual terrace edge appears cut back from that depicted by predictive model.

Site Evaluation

One site, 25HN198, was recorded during survey of the APE and five areas with historic debris were noted.

25HN198

This site was recorded based on the observation of a concentration of rubble on the east end of a man-made berm containing fragments of concrete, structural brick (hard red with three holes), formed concrete block, corrugated tin, metal grating, and a blue enamelware pot filled with concrete. It appeared the materials had been moved there, and are likely associated with a non-extant ca. 1921 farmstead approximately 100 yards to the southeast which appears on 1950 aerial imagery (See: Plat map of Orleans TWP- Geo. A Ogle 1921; Soil Survey map of Harlan County 1921; www.historicaerials.com). The actual location of the farmstead was not determined. This site is recommended not eligible for listing on the National Register of Historic Places (NRHP) due to a lack of physical integrity and significance. The site, containing remnants of a typical twentieth century farmstead, is in a secondary context, and does not have the potential to yield important information that will enhance our understanding of history.

Five areas with light, diffuse artifact scatters were noted but not assigned site numbers as per NeSHPO guidelines (NHPA Archeological Properties Section 106 Guidelines 2017:22-23). As these artifacts/objects appeared to be in a natural-secondary context and/or not older than circa 100 years, they would provide information of minimal anthropological/archeological value.

Area 1- Along the edge of a delineated wetland, fragments of crockery (1), thick flat glass (2), and bottle glass (5) were observed.

Area 2- Crockery (3). Two fragments in two-track driveway, the other in wash-out from field adjacent to APE near farm dugout (both near fence line).

Area 3- One fragment appearing to be vitrified brick along the edge of a delineated wetland.

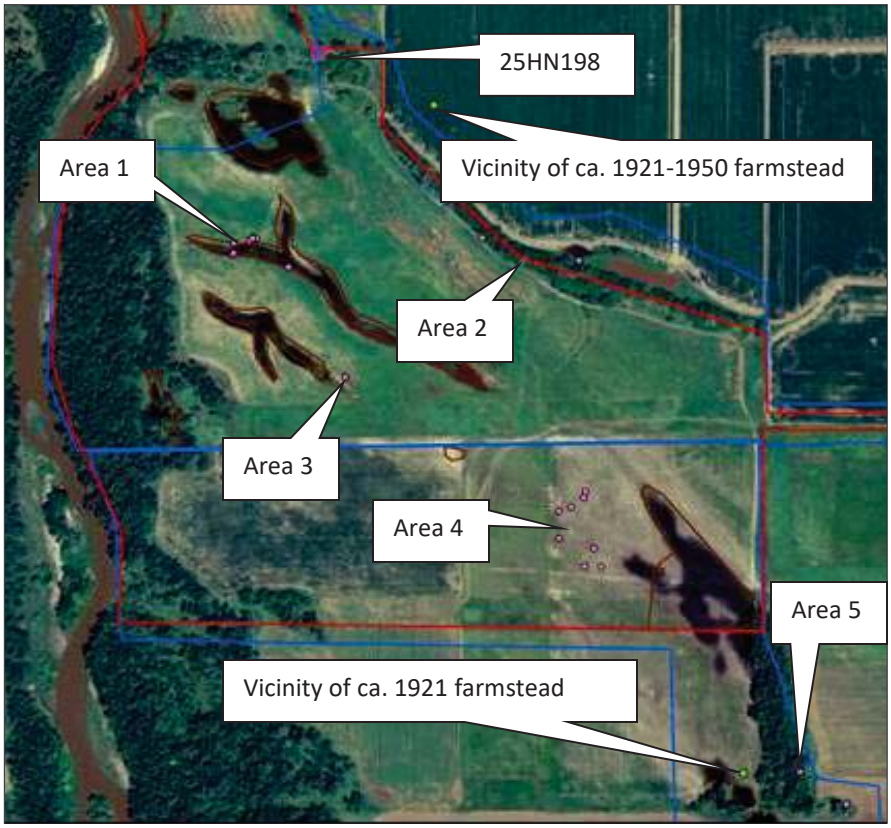
Area 4- Fragments of Perforated iron (1), coal (1), brick (3), bottle glass (2), porcelain insulator (1) observed.

Area 5- Remnants of two iron wheeled (hay) wagons, one with hoist/pulley mechanism, in treed area outside of APE.

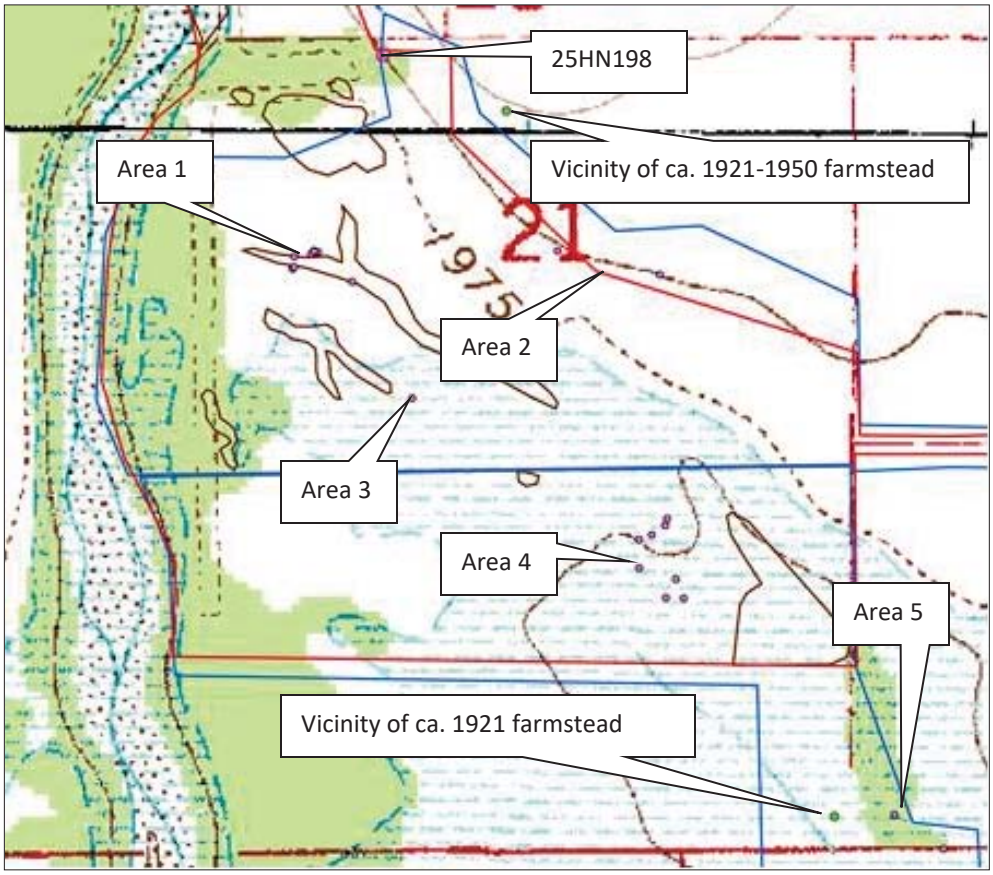
Due to the amount of disturbance caused by earthmoving activities in creation of the berm, dike, present wetland areas, and from floodwaters, an association of the above-described artifacts with their origin could not be determined. An effort was made to locate the ca.1921 farmstead southeast of and outside of the APE, but it appears to have been destroyed or inundated by wetlands with only the wagon remains noted in the tree line (Area 5). Aside from these objects, the remaining artifacts in Areas 1-4 may have washed in from the vicinity of Area 5, site 25HN198, or brought from elsewhere with river floodwaters.

Summary

There are no historic archeological properties present in the APE of this undertaking.



Artifacts/objects found in natural-secondary context (Areas 1-5).



Artifacts/objects found in natural-secondary context (Areas 1-5).

History NEBRASKA

Archeological Site Form

1. Site Number: 25HN198 **2. Site Name:**

3. Project: District 7 Wetland Mitigation Bank, MISC-D7(1007)

4. Survey Agency/Co.: History Nebraska (a.k.a NSHS) **5. Field Number:** R051509A FN 1

6. Sponsor/Contract Agency: NDOT **7. County:** Harlan

8. (•) **New Site** ( ) **Previously Known Site**

9. USGS Quad. Map: Orleans **NAD:** ( ) **1927** ( ) **1983**

10. Legal Description:

QUARTER/HALF SECTIONS	SECTION	TOWNSHIP	RANGE
NE¼ NE¼ NE¼ SW¼	21	2N	19W

☐ See Comments/Continuation Sheet for more legal description.

11. Site Size (m^2): 116.23 **12. Min. Elevation (ft.):** 1975 **13. Max. Elevation (ft.):** 1990

14. Descriptive Site Type:

- ☒ **Surface**
- ☐ **Buried Features/Cultural Layers**
- ☐ **Cave/Rock Shelter**
- ☐ **Unknown**
- ☐ **Other**

15. Functional Site Type:

- ☐ **Burial(s)**
- ☒ **Habitation**
- ☐ **Transport**
- ☐ **Unknown**
- ☐ **Other**
- ☐ **Ceremonial/Religious**
- ☐ **Extraction/Processing**
- ☐ **Defensive**

16. Cultural Context. Choose general context(s) and specific affiliation(s) from pull-down menus; if more than one selection is needed from a pull-down menu, type additional specific cultural affiliations in the space provided below.

- ☐ **Paleoindian**
- ☐ **Archaic**
- ☐ **Woodland**
- ☐ **Central Plains**
- ☐ **Coalescent**
- ☐ **Oneota**
- ☐ **Western NE Protohistoric**
- ☐ **Caddoan Villagers**
- ☐ **Sedentary Siouan Villagers**
- ☐ **Equestrian Nomads**
- ☐ **Reservation Native American**
- ☒ **Euro-American** EA-FAR = Farm/Ranch
- ☐ **Non-specific Ceramic**
- ☐ **Non-specific Late Prehist./Protohistoric**
- ☐ **Unknown Prehistoric**
- ☐ **Other Ethnic Historic**
- ☐ **Unknown Historic**
- ☐ **Unknown**

additional cultural affiliation(s):

17. Features:

	No.		No.
☐ **Mounds**		☐ **Rock Outlines/Concentrations**	
☐ **Depressions**		☐ **Historic Standing/Collapsed Buildings, Structures or Objects**	
☐ **Stains**		☐ **Historic Foundations**	
☐ **Petroglyphs**		☐ **Transport**	
☐ **Petrographs**		☐ **Unknown**	
☐ **Middens**		☐ **Other**	

Site Number: 25HN198

18. Artifacts:

Observed	Collected*		Observed	Collected*	
☐	☐	Chipped Stone Tools	☐	☐	Worked Shell
☐	☐	Chipped Stone Debris	☒	☐	Historic Artifacts
☐	☐	Ground Stone	☐	☐	Faunal Remains
☐	☐	Natural Stone Tools	☐	☐	Floral Remains
☐	☐	Fire-Cracked Rock	☐	☐	Human Bone
☐	☐	Other Lithic Debris	☐	☐	Burned Earth
☐	☐	Rim Sherds	☐	☐	Daub
☐	☐	Body Sherds	☐	☐	Other
☐	☐	Worked Bone	☐	☐	Isolated Item

*** The NSHS does not automatically curate artifacts collected in Nebraska.**

19. Site Work Status (check all that apply):

- ☒ Reported
- ☒ Surveyed
- ☒ Photographed
- ☐ Sketch Mapped
- ☐ Instrument Mapped
- ☒ Mapped with GPS
  - Make/Model: Trimble Juno 3B
  - Differentially Corrected? ◉ yes ○ no
- ☐ Soil Cored/Probed
- ☐ Tested (pits/posthole/backhoe)
- ☐ Remote Sensing
- ☐ Excavated Partially
- ☐ Excavated Completely
- ☐ Surface Collected (uncontrolled)
- ☐ Surface Collected (controlled)
- ☐ Other

20. Present Condition: ○ Undisturbed ○ Disturbed ◉ Destroyed

21. Site Impacts:

Past	Present	Future		Past	Present	Future	
☒	☒	☒	Water Erosion	☐	☐	☐	Recreation
☐	☐	☐	Wind Erosion	☒	☒	☐	Construction
☐	☐	☐	Animal Activity	☐	☐	☐	Agriculture
☐	☐	☐	Vandalism	☐	☐	☐	Other

22. Investigator's Impression of National Register Status: ○ Potentially Eligible ◉ Not Eligible ○ Unevaluated/Unknown

23. SHPO Determination of National Register Status: ○ On Register ○ Eligible ○ Not Eligible

24. Informant:

Address:

25. Owner of Site:

- ☒ Private (Name/Address if known)
- ☐ State (Agency)
- ☐ Federal (Agency)
- ☐ Other

Site Number: 25HN198

26. Information Collected and Stored:

- ☒ **A digital copy of this site form (including a map of the site location and a shapefile if created) will be sent to: trisha.nelson@nebraska.gov.**
- ☐ **It is understood that the History Nebraska does not automatically accept artifacts collected nor all records generated from archeological investigations in Nebraska.**
- ☒ **Reports in need of SHPO review have been or will be submitted to NESHPO.**
- ☐ **Artifacts were collected and are currently stored:**
- ☒ **Photos/digital images were created and are currently stored:** History Nebraska (NSHS)
- ☐ **Additional maps were created and are currently stored:**
- ☐ **Additional written records were created and are currently stored:**

27. Report Reference(s):

28. Comments:

A pile of rubble was observed on the east end of a man-made berm containing fragments of concrete, structural brick (hard red with three holes), formed concrete block, corrugated tin, metal grating, and a blue enamelware pot filled with concrete. It appeared the materials were in a secondary context having been moved there, and are likely associated with a non-extant ca. 1921 farmstead approximately 100 yards to the southeast which appears on historic maps and 1950 aerial imagery (Plat map of Orleans TWP- Geo. A Ogle 1921; Soil Survey map of Harlan County 1921; www.historicaerials.com). The actual location of the farmstead was not determined.

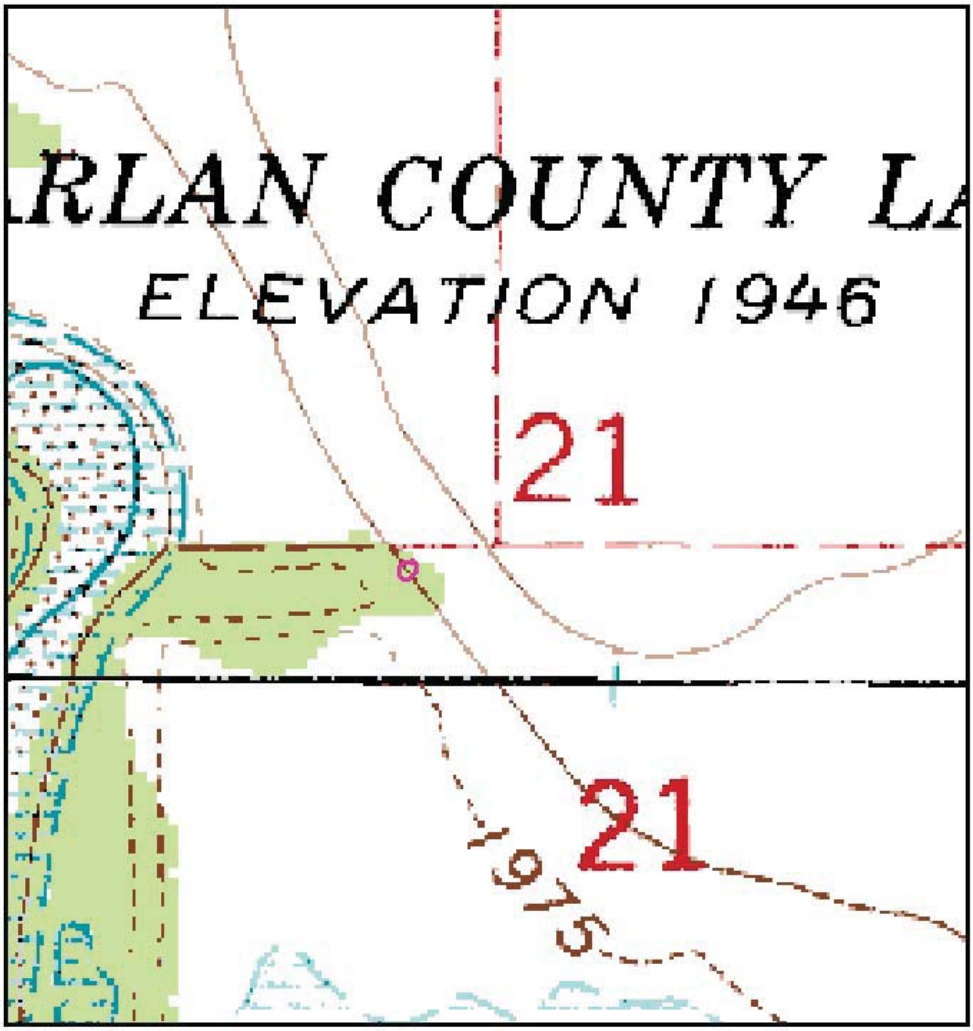
☐ See Comments/Continuation Sheet for more comments.

29. Survey Conducted by: Karen A. Steinauer, Talon D. O'Connor **Survey Date:** 5/15/2019

30. Form Completed by: Karen A. Steinauer **Date:** 5/30/2019

Site Number: 25HN198

31. A map of the site location, preferably on a 7.5 minute U.S.G.S topographic map, must be included. Use the space provided below to insert an image file or attach a separate map sheet.
Additional images and/or detailed site maps can also be attached.
If the site location was mapped with a GPS, please send the resulting shapefile(s) to trisha.nelson@nebraska.gov.



Print with a .pdf creator and/or Save As site number.pdf and submit to: trisha.nelson@nebraska.gov

Phone: 402-471-4760

History Nebraska
1500 R St.
Lincoln, NE
68508
history.nebraska.gov

History NEBRASKA
Nebraska State Historical Society

Comments/Continuation Sheet

Site Number: 25HN198

25HN198-1. Site Overview, looking northwest (May 15, 2019 by K. Steinauer with Pentax WG III).

88-571

Final Report

A Cultural Resources Sample Survey in the Harlan County Lake Project Lands West of U. S. Highway 183 Harlan County, Nebraska

Purchase Order DACW41-83-M-0005

Prepared for U. S. Army Corps of Engineers
Kansas City District

By

American Resources Group, Ltd.
Carbondale, Illinois

Author
Kurt R. Moore

Contributors
Jerry J. Moore
Jonathan A. Bloom

Principal Investigator
Michael J. McNerney

Cultural Resources
Management Report #70

1988

Results of an Archeological Pedestrian Survey of Lands Considered for Inclusion and Water Right Transfers Within the Frenchman-Cambridge Irrigation District, Furnas, Harlan, Hitchcock and Red Willow Counties, Cambridge, Meeker-Driftwood, and Red Willow Units, Frenchman-Cambridge Division, Pick-Sloan Missouri Basin Program, Nebraska

prepared by

Nebraska-Kansas Area Office
Resource Management Group
Bill R. Chada, Area Archeologist

NEBRASKA
DEPARTMENT OF TRANSPORTATION

Architectural/Structural Investigations
Project Summary

Control Number 71216 Project Number MISC-D7(1007) Survey Date n/a

Project Name District 7 Wetland Bank Project Location Harlan

Recommendation of Effect Regarding Architectural/Structural Historic Properties No Historic Properties Affected

Project Description Date 8/13/18 Project Description Attached ☐ Yes ☑ No

Architectural/Structural Resources Area of Potential Effects (APE):

The architectural/structural APE includes the entire boundaries of the proposed wetland bank. The architectural/structural APE also includes parcels located adjacent to the boundaries of the proposed wetland bank in order to evaluate potential affects to adjacent farmsteads.

Are architectural/structural resources present within the APE? ☐ No ☑ Yes

Background Resources Consulted: ☑ NHRSI/NRHP files ☐ Post-1945 Exceptional Bridges ☑ Historic Maps
☐ Historic Bridge Inventory ☐ Local/State Historical Society ☑ Other: Harlan Platmaps (1903)

List Maps, Etc. Google Earth, Harlan County Assessor

File Search: List NRHP Listed or Previously Recommended NRHP Eligible Properties (Use NHRSI # and Common Name if applicable)

List Applicable Historic Context(s):

Current NRHP Listed and NRHP Eligible Architectural Resources Evaluation(s) and Recommendations (use continuation sheets as necessary):

FN# Property location NHRSI #
Property Name NRHP Criteria: ☐ A ☐ B ☐ C ☐ D
NRHP Significance Level of Significance: Local
Extant / Non-Extant
Aspects of Integrity Present: ☐ Location ☐ Setting ☐ Feeling ☐ Association ☐ Design ☐ Materials ☐ Workmanship
Verbal Boundary Description

FN# Property location NHRSI #
Property Name NRHP Criteria: ☐ A ☐ B ☐ C ☐ D
NRHP Significance Level of Significance
Extant / Non-Extant
Aspects of Integrity Present: ☐ Location ☐ Setting ☐ Feeling ☐ Association ☐ Design ☐ Materials ☐ Workmanship
Verbal Boundary Description

Are Historic or Post-1945 Exceptional Bridges Present within the APE? ☑ No ☐ Yes - If yes, please list bridges (structure no. / name) below.

Architectural Resources Effects Finding:

☐ No Adverse Effect ☐ Adverse Effect ☑ No Historic Properties Affected

☑ No Architectural Historic Properties Present within the APE

☐ Architectural Historic Properties Present within APE but would not be affected

Basis for Effects Finding:

None of the properties within the APE met the necessary standards of integrity or exceptional significance under Criterion A, B, or C for NRHP eligibility or NESHPO survey.

Attachments ☑ Architectural Resources APE map ☐ USGS Map/Resources Map ☐ NHRSI form(s) ☑ Other

Additional Information/Comments:

Relative to Historic Properties and Based Upon the attached NDOR Project Description:

Is Temporary Easement Required? ☐ No ☐ Yes - If yes, please describe below. ☐ Undetermined

Is Permanent Easement Required? ☐ No ☐ Yes – If yes, please describe below. ☐ Undetermined

Is Right of Way Required? ☐ No ☐ Yes – If yes, please describe below. ☐ Undetermined

Construction Commitment / Sensitive Area: ☑ No ☐ Yes

If Yes, detail here:

Consultant Megan Hilger Digitally signed by Megan Hilger DN: cn=Megan Hilger, o=Nebraska State Historical Society, ou=Highway Archeology Program, email=megan.hilger@nebraska.gov, c=US Date: 2018.10.18 12:59:18 -05'00' 10/18/18

Signature Date

STANDING STRUCTURES SECTION 106 COMPLIANCE REPORT
APE MAPS

Megan Hilger, Preservation Associate
Nebraska Highway Archeology Program
October 2018

Project Name: District 7 Wetland Bank
Project No.: MISC-D7(1007)
Control No.: 71216
Harlan County, Nebraska

Note: The architectural/structural survey and evaluation was completed prior to a reduction in the boundaries of the wetland mitigation site. Therefore, the project site boundaries shown in the above map are larger than the boundaries shown in Enclosures 1 and 3. The APE for architectural/structural properties encompasses the revised boundaries of the wetland mitigation site.

STANDING STRUCTURES SECTION 106 COMPLIANCE REPORT
GREEN DOT PROPERTIES/DOES NOT MEET MINIMUM SURVEY REQUIREMENTS

Megan Hilger, Preservation Associate
Nebraska Highway Archeology Program
October 2018

Project Name: District 7 Wetland Bank
Project No.: MISC-D7(1007)
Control No.: 71216
Harlan County, Nebraska

NeHRSI#/FN#	Property Name/Type	Address	Date of Construction ca	Reason for Survey Exclusion
FN1	House	10886 N-89, Rural	1945	Lacks integrity of design
FN2	House	10834 N-89, Rural	1947	Lacks exceptional significance under Criterion A, B, or C
FN3	House	71091 Fence Post Rd, Rural	1920	Lacks integrity of materials

Enclosure 5

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

October 15, 2018

Jill Dolberg
Deputy State Historic Preservation Officer
History Nebraska
PO Box 82554
Lincoln, NE 68508

Dear Ms. Dolberg:

In 2015, your office entered into a programmatic agreement entitled *Programmatic Agreement among the Federal Highway Administration, the Nebraska State Historic Preservation Officer, the Advisory Council on Historic Preservation, and the Nebraska Department of Roads* to satisfy the Requirements of Section 106 for the Federal-Aid Highway Program in the State of Nebraska* (the Section 106 PA). The Section 106 PA was amended in September 2018, following Nebraska Department of Transportation's (NDOT) assumption of Federal Highway Administration (FHWA) responsibilities within NEPA classes of action that are classified as Categorical Exclusions (CEs) in a process referred to as CE Assignment.

With this letter, NDOT is notifying you of our intent to process transportation projects which involve State Funds Only under the Section 106 PA, as amended.

Following the Section 106 process for State Funds Only projects ensures that NDOT meets all state and federal regulations, and allows NDOT maximum flexibility regarding project funding options while adhering to the 2014 Cooperative Agreement between our agencies.

NDOT requests State Historic Preservation Office (SHPO) concurrence regarding NDOT's intent to process State Funds Only projects using the stipulations of the Section 106 PA.

NDOT takes its responsibility to environmental stewardship seriously and we look forward to continued collaboration with your office.

Sincerely,

Jason A. Jurgens
Highway Environmental Section Manager

Jill Dolberg — 10-15-2018

SHPO Concurrence — Date

Kyle Schneweis, P.E., Director
Department of Transportation
1500 Highway 2
PO Box 94759
Lincoln, NE 68509-4759
OFFICE 402-471-4567 FAX 402-479-4325
NDOT.ContactUs@nebraska.gov
dot.nebraska.gov

Enclosure 6

From: Meade, Timothy M CIV (USA)
To: Turner, Katie
Subject: RE: 71216_MISC-D7(1007)_District 7 Wetland Bank (UNCLASSIFIED)
Date: Monday, July 29, 2019 3:58:59 PM

CLASSIFICATION: UNCLASSIFIED

Hi Katie,

I reviewed the report and transmittal letter you sent. In my opinion, the work was fully adequate to identify historic properties in the area of potential effect (APE). We also concur with your recommendations that site 25HN198 is not eligible for inclusion in the National Register of Historic Places and your finding of "no historic properties affected" for the entire APE. Therefore, we have no objection to the undertaking in terms of NHPA compliance. However, should project plans change and additional or different areas on Corps-owned lands at Harlan County Lake impacted, the Corps will need to review these changes to determine if they were to have possible impacts to historic properties.

Please let me know if you need anything else,

Tim

-----Original Message-----
From: Turner, Katie [mailto:katie.turner@nebraska.gov]
Sent: Monday, July 29, 2019 2:42 PM
To: Meade, Timothy M CIV (USA) <Timothy.M.Meade@usace.army.mil>
Subject: [Non-DoD Source] 71216_MISC-D7(1007)_District 7 Wetland Bank

Mr. Meade:

Please find attached for your review the documents prepared in support of the above referenced project: the SHPO consultation letter and the Section 106 Project Package. The Section 106 Project Package includes: the project location map; the project description; the archeological evaluation (the archeological report); the architectural/structural evaluation (the architectural/structural report); and a letter agreement between NDOT and SHPO regarding the processing of state funded only projects. These attachments have been sent to Gina Powell under separate cover.

As no historic properties were identified as a result of cultural resources surveys completed in support of this undertaking the Nebraska Department of Transportation is recommending a finding of no historic properties affected. As you review the provided information please do not hesitate to contact me if you have questions regarding this information.

Sincerely,

Katie Turner

Cultural Resources Manager / Section 106 Specialist

Project Development

Nebraska Department of Transportation

1500 Highway 2 | Lincoln, Nebraska | 68509

Katie.Turner@nebraska.gov <mailto:Katie.Turner@nebraska.gov> | 402-479-3514

dot.nebraska.gov <Blockedhttps://www.dot.nebraska.gov/> | Twitter <Blockedhttps://twitter.com/NebraskaDOT>

CLASSIFICATION: UNCLASSIFIED

Turner, Katie

From: Powell, Gina S CIV USARMY CENWK (US) <Gina.S.Powell@usace.army.mil>
Sent: Tuesday, July 30, 2019 8:20 AM
To: Turner, Katie
Subject: RE: 71216_MISC-D7(1007)_District 7 Wetland Bank (UNCLASSIFIED)

Follow Up Flag: Follow up
Flag Status: Completed

Katie,
The Corps concurs with your finding of no historic properties found in the survey area.

I will get those tribal letters with the report attached out today, if I can find all the current addresses.

Gina

NEBRASKA
DEPARTMENT OF TRANSPORTATION

Supplemental Section 106 PQS Memo

To: **Jacob Smith, NDOT NEPA Specialist**

From: **Katie Turner, Section 106 Specialist** Katie D Turner

cc:

Date: **March 31, 2020**

Re: **71216_MISC-D7(1007)_District 7 Wetland Bank**

The above referenced *state funds only* project was processed as a Tier II on September 3, 2019 with a project effects determination of *no historic properties affected*. There are no Section 106 Sensitive Areas or construction commitments associated with this project. The U.S. Army Corps of Engineers – Kansas City District (USACE), which is the lead federal agency, concurred with the project effects determination on July 30, 2019. The Nebraska State Historic Preservation Office (SHPO) concurred with the project effects determination on August 6, 2019. Tribal consultation was completed by the USACE with the following tribes: Otoe-Missouria Tribe of Oklahoma; Pawnee Nation of Oklahoma; Ponca Tribe of Indians of Oklahoma; Ponca Tribe of Nebraska; Norther Cheyenne Tribe; Cheyenne-Arapaho Tribe; and the Mescalero-Apache Tribe.

Since this project was originally processed continued project planning resulted in the decision that the high volume of excess soil removed from the boundaries of the proposed wetland mitigation site will be utilized to complete the following: construct a new access road; complete improvements to three existing access roads; and construct a spoil/waste area (Enclosure 1). The proposed construction activities associated with the access road work and the spoil/waste area may include the following: clearing and grubbing; placement of excess soils; grading the excess soils to flatten and shape the soils as needed; installation of temporary and permanent erosion control materials; and seeding and mulching. A single culvert, a pipe located at a field entrance, may also be constructed as part of the access road work. Potential construction activities associated with the construction of the culvert may include: scarifying the existing ground surface in the location where the culvert will be constructed; placing the culvert pipe; and placing excess soil over the pipe. No new ground disturbance, aside from the potential scarifying associated with the culvert construction, is anticipated to complete the access road work and to construct the spoil/waste area.

The majority of the access road work and the entire spoil/waste area extends beyond the Area of Potential Effects (APE) originally considered for archeological properties. Additionally, portions of the access road work extends beyond the APE originally considered for architectural/structural properties. Maps depicting both the archeological and architectural/structural APEs originally considered for this project are included as Enclosure 2. In order to accommodate these additional construction activities both of the APEs were expanded. The expanded archeological APE extends approximately 50-feet beyond the centerline of the access roads in addition to extending approximately 100-feet beyond the boundaries of the spoil/waste area. The expanded architectural/structural APE includes the portion of the access road work which extends beyond the original architectural/structural APE to the south. Maps depicting the expanded APEs are included as Enclosure 3.

Archeological Evaluation
The archeological APE was expanded by NDOT Professionally Qualified Staff (PQS) Katie Turner in March 2020 to encompass the areas where the new access road will be constructed, where the roadway improvement activities will occur, and where the spoil/waste area will be constructed (Enclosure 3, page 1). Through consultation with Timothy Meade, archeologist with the USACE, it was determined that no additional archeological evaluations or field surveys are required for the expanded APE as proposed construction activities will entail the placement and grading of fill material on a landform with low potential to contain significant archeological properties. Therefore no additional archeological investigations were completed within the expanded APE. There are no archeological historic properties present within the expanded APE (Enclosure 3, page 1).

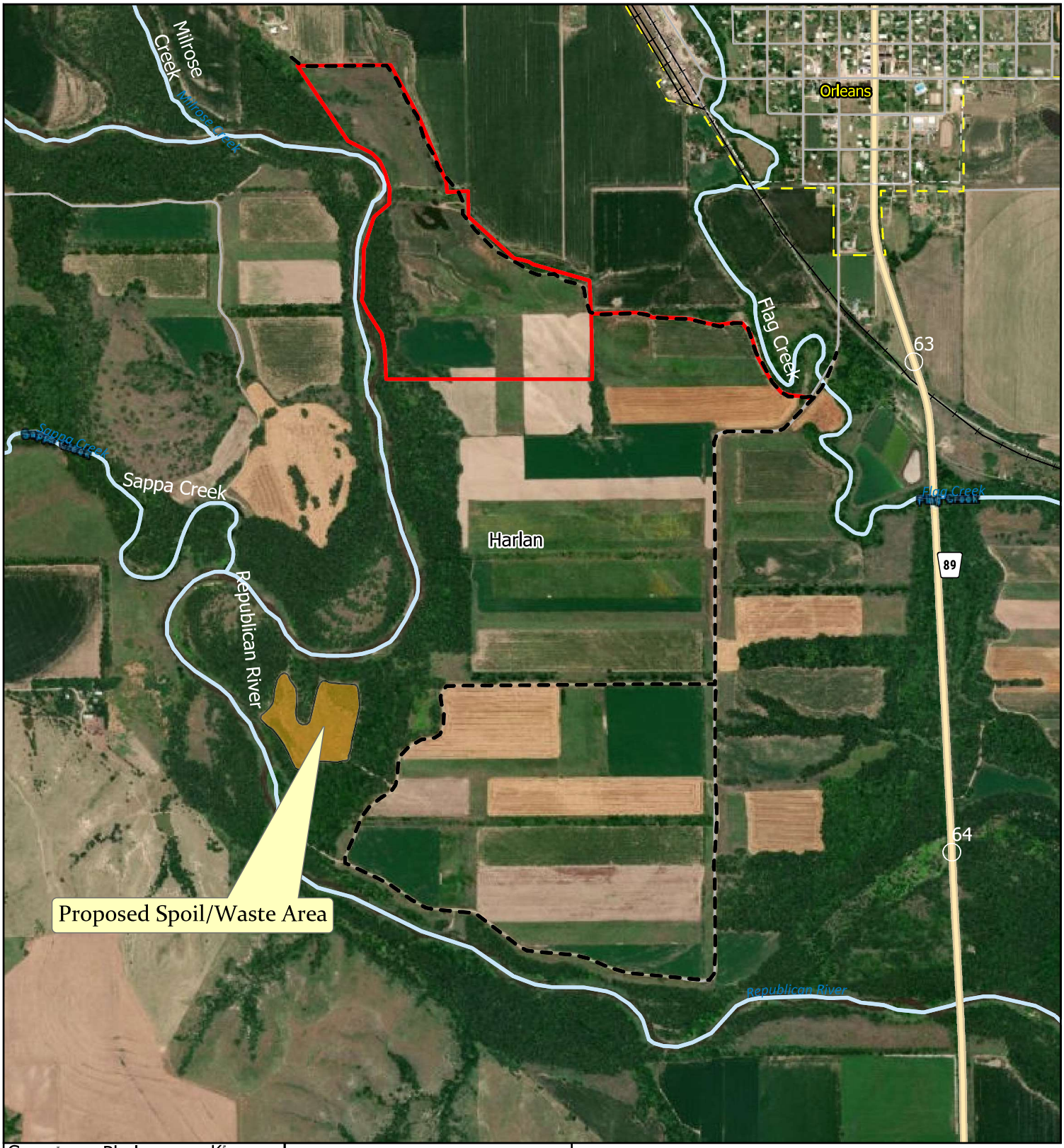
Architectural/Structural Evaluation
The architectural/structural APE was expanded by NDOT PQS Katie Turner in March 2020 to encompass the portion of the roadway improvements which extend outside of the APE originally considered (Enclosure 3, page 2). PQS Turner investigated the expanded APE through a desktop assessment utilizing Nebraska State Historic Preservation Office (SHPO) inventory and site files and the Harlan County Assessor's web page. Background research did not identify any previously recorded architectural or structural historic properties within the expanded APE. Turner confirmed that there are no architectural or structural properties located within the expanded APE. Therefore there are no architectural or structural historic properties present within the expanded APE (Enclosure 3, page 2).

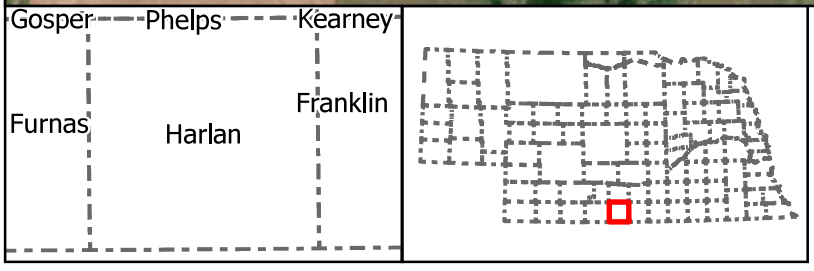
The SHPO and the USACE both concurred that the addition of these construction activities to this project will not result in a change from the original project effects determination. The SHPO concurrence was received on March 27, 2020 (Enclosure 4) and the USACE concurrence was received on March 30, 2020 (Enclosure 5). The original project effects determination of *no historic properties affected* remains appropriate.

NEBRASKA
DEPARTMENT OF TRANSPORTATION

Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

Enclosure 1





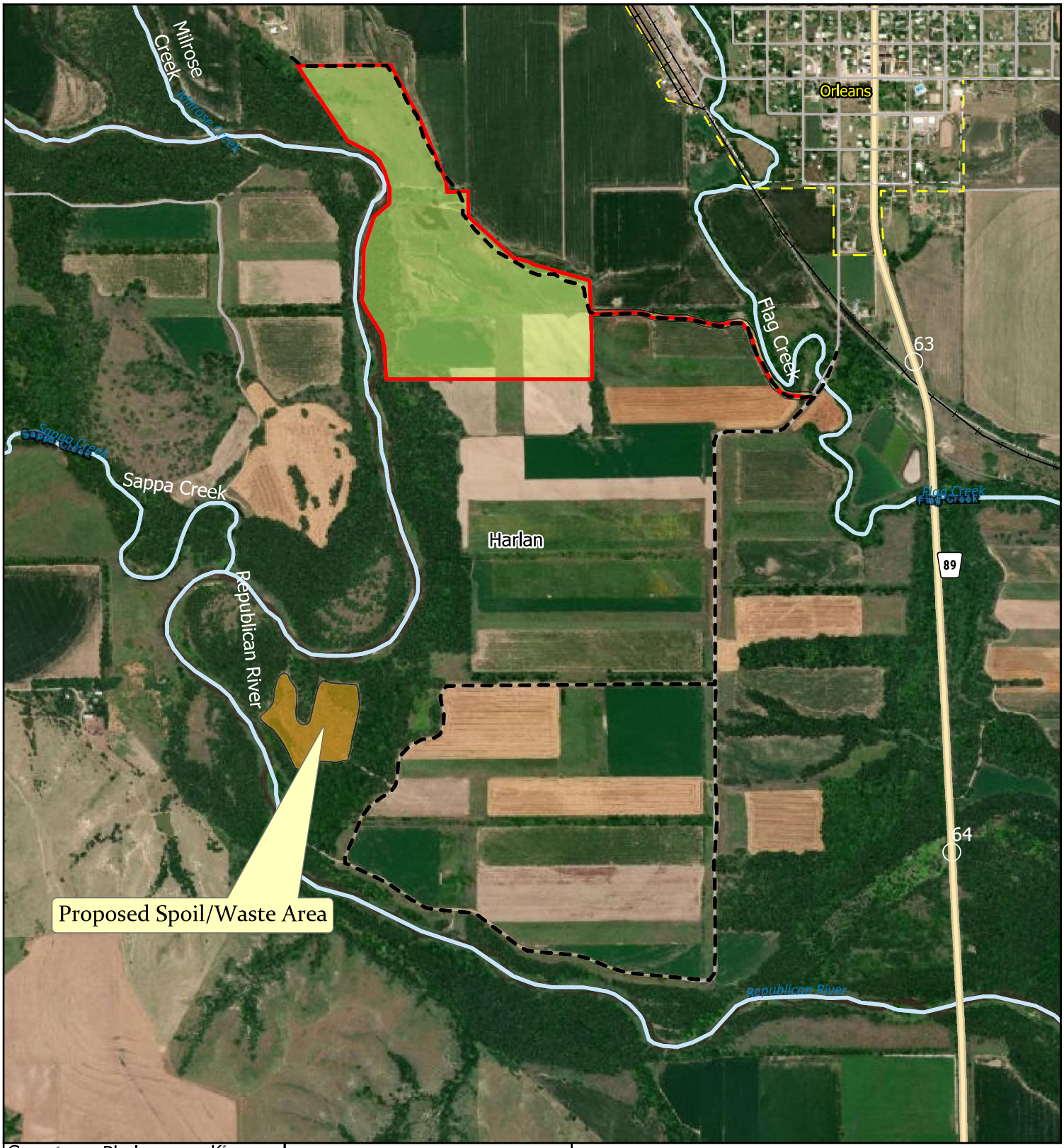
Wetland Bank Boundaries
Proposed Access Road Work

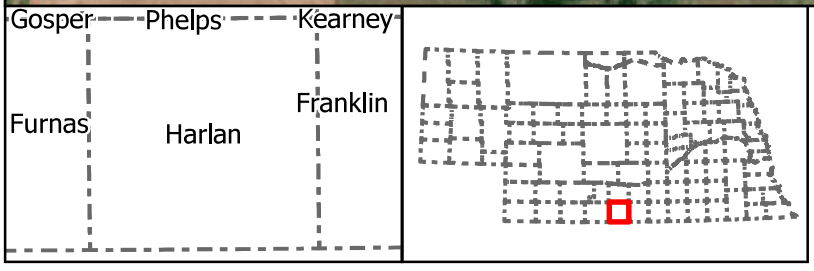
0 0.23 0.45 0.9 1.35 1.8
Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

Enclosure 2



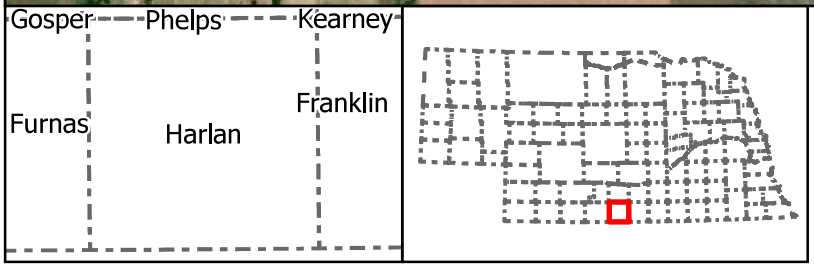


Wetland Bank Boundaries
Proposed Access Road Work
Original Archeological APE

0 0.23 0.45 0.9 1.35 1.8
Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)



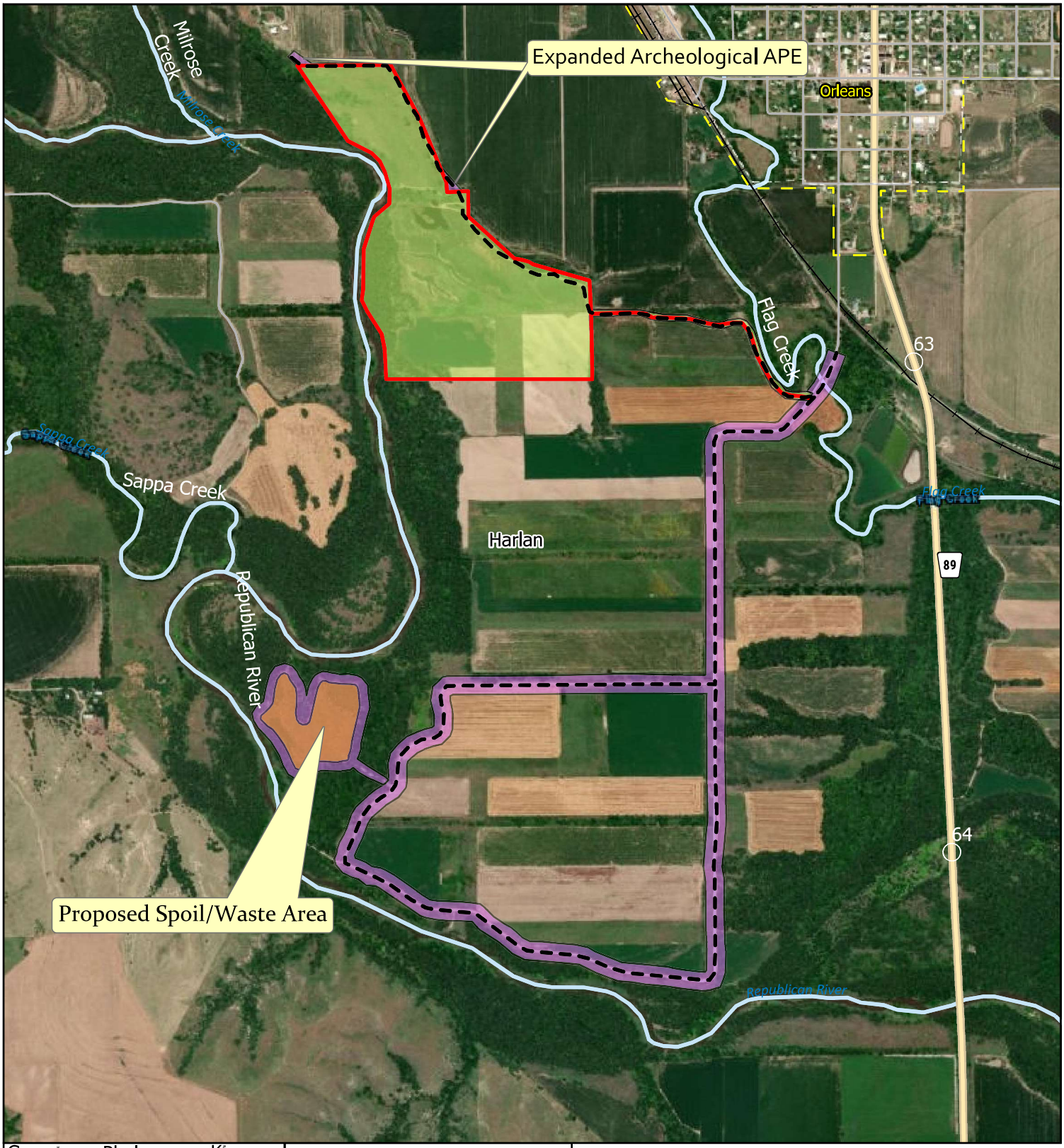
Wetland Bank Boundaries
Proposed Access Road Work
Original Architectural/Structural APE

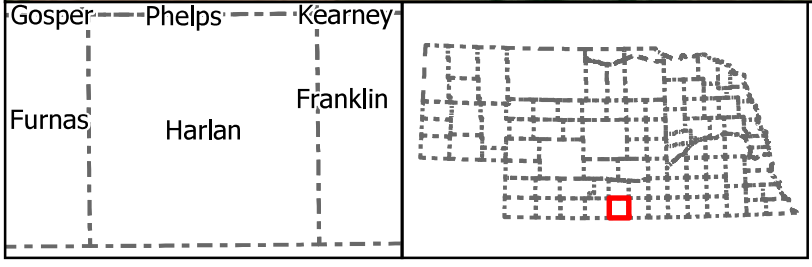
0 0.28 0.55 1.1 1.65 2.2
Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

Enclosure 3



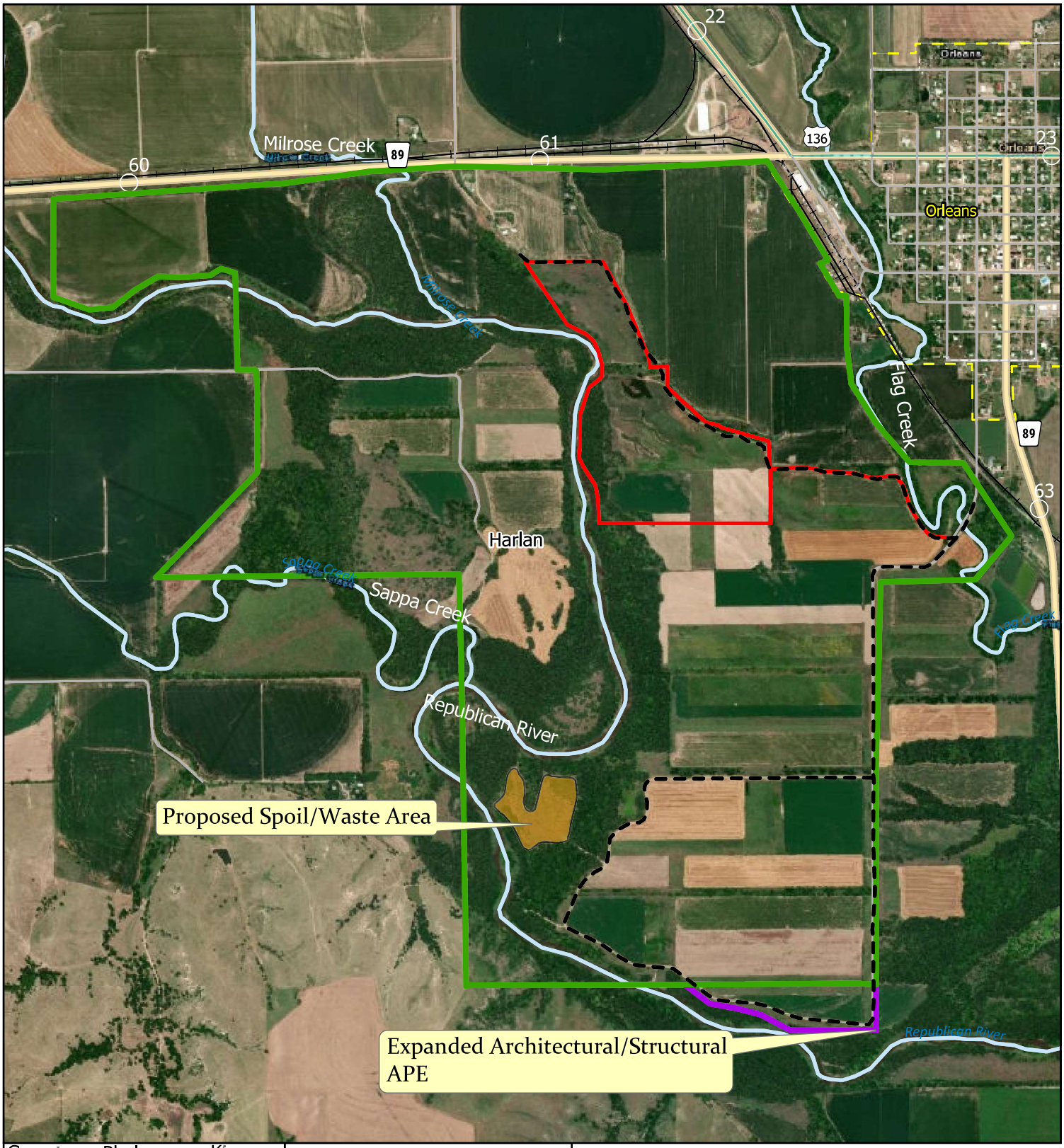


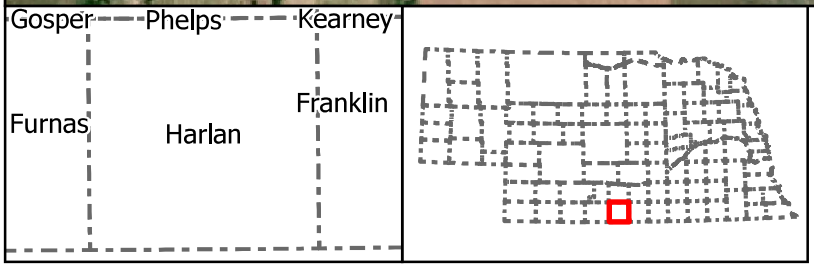
Wetland Bank Boundaries
Proposed Access Road Work
Original Archeological APE
Expanded Archeological APE

0 0.23 0.45 0.9 1.35 1.8
Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)





Wetland Bank Boundaries
Proposed Access Road Work
Original Architectural/Structural APE
Expanded Architectural/Structural APE

0 0.28 0.55 1.1 1.65 2.2
Miles

Enclosure 4

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

History Nebraska
RECEIVED
MAR 23 2020
NE State Historic
Preservation Office

March 23, 2020

Ms. Jill Dolberg
Deputy State Historic Preservation Officer
History Nebraska
P.O. Box 82265
Lincoln, Nebraska 68508

RE: HP# 1907-509-01; Survey# 19-0154
NDOT Project District 7 Wetland Bank, MISC-D7(1007), CN 71216
Section 106 Supplemental Evaluation

Dear Ms. Dolberg:

As you may remember, the Nebraska Department of Transportation (NDOT) proposes to construct a wetland mitigation bank using state funds only and in cooperation with the United States Army Corps of Engineers (USACE) in Harlan County. USACE is the lead federal agency and NDOT is re-initiating consultation with your office on their behalf.

Your office concurred with National Register of Historic Places (NRHP) eligibility determinations and on a project effects determination of *no historic properties affected* in August 2019 (Enclosure 1). Since then, continued project planning resulted in the decision that the high volume of excess soil removed from the boundaries of the proposed wetland mitigation site will be utilized to complete the following: construct a new access road; complete improvements to three existing access roads; and construct a spoil/waste area. A map depicting the locations of the access road work and the spoil/waste area is included as Enclosure 2.

The proposed construction activities associated with the access road work and the spoil/waste area may include the following: clearing and grubbing; placement of excess soils; grading the excess soils to flatten and shape the soils as needed; installation of temporary and permanent erosion control materials; and seeding and mulching. A single culvert, a pipe located at a field entrance, may also be constructed as part of the access road work. Potential construction activities associated with the construction of the culvert may include: scarifying the existing ground surface in the location where the culvert will be constructed; placing the culvert pipe; and placing excess soil over the pipe. No new ground disturbance, aside from the potential scarifying associated with the culvert construction, is anticipated to complete the access road work and to construct the spoil/waste area.

The majority of the access road work and the entire spoil/waste area extends beyond the Area of Potential Effects (APE) originally considered for archeological properties. Additionally, portions of the access road work extends beyond the APE originally considered for architectural/structural properties. Maps depicting both the archeological and architectural/structural APEs originally considered for this project are included as Enclosure 3. In order to accommodate these additional construction activities both of the APEs were expanded. The expanded archeological APE extends approximately 50-feet beyond the centerline of the access roads in addition to extending approximately 100-feet beyond the boundaries of the spoil/waste area. The expanded architectural/structural APE includes the portion of the access road work which extends beyond the original architectural/structural APE to the south. Maps depicting the expanded APEs are included as Enclosure 4.

Archeological Evaluation
The archeological APE was expanded by NDOT Professionally Qualified Staff (PQS) Katie Turner in March 2020

Kyle Schneweis, P.E., Director
Department of Transportation
MAILING ADDRESS
PO Box 94759
Lincoln, NE 68509-4759
PHYSICAL ADDRESS
1500 Highway 2
Lincoln, NE 68502
PHONE 402-471-4567
EMAIL NDOT.ContactUs@nebraska.gov
dot.nebraska.gov

to encompass the areas where the new access road will be constructed, where the roadway improvement activities will occur, and where the spoil/waste area will be constructed (Enclosure 4, page 1). Through consultation with Timothy Meade, archeologist with the U.S. Army Corps of Engineers – Kansas City District (USACE), it was determined that no additional archeological evaluations or field surveys are required the expanded APE as proposed construction activities will entail the placement and grading of fill material on a landform with low potential to contain significant archeological properties. Therefore no additional archeological investigations were completed within the expanded APE. There are no archeological historic properties present within the expanded APE (Enclosure 4, page 1).

Architectural/Structural Evaluation
The architectural/structural APE was expanded by NDOT PQS Katie Turner in March 2020 to encompass the portion of the roadway improvements which extend outside of the APE originally considered (Enclosure 4, page 2). PQS Turner investigated the expanded APE through a desktop assessment utilizing Nebraska State Historic Preservation Office (SHPO) inventory and site files and the Harlan County Assessor's web page. Background research did not identify any previously recorded architectural or structural historic properties within the expanded APE. Turner confirmed that there are no architectural or structural properties located within the expanded APE. Therefore there are no architectural or structural historic properties present within the expanded APE (Enclosure 4, page 2).

Project Effects Determination
No historic properties were identified within the expanded APE. On behalf of USACE, NDOT recommends that the project effects determination of *no historic properties affected* remains appropriate. By letter agreement with your office (SHPO concurrence 10/15/2018; Enclosure 5), this NDOT state funded only project has been reviewed under the stipulations of the programmatic agreement entitled *Programmatic Agreement Among the Federal Highway Administration, the Nebraska State Historic Preservation Officer, the Advisory Council on Historic Preservation, and the Nebraska Department of Roads to Satisfy the Requirements of Section 106 for the Federal Aid Highway Program in the State of Nebraska* (July 2015), as amended, and meets the requirements to be considered a Tier II project. Tier II projects result in a project effects determination of *no historic properties affected*.

NDOT respectfully requests SHPO concurrence with these determinations. If you have any questions regarding this information please do not hesitate to contact me.

Sincerely,

Katie Turner

Katie Turner
Cultural Resources Manager/Section 106 Specialist
Katie.turner@nebraska.gov
(402) 479 - 3514

CONCUR:

Jill Dolberg, Deputy State Historic Preservation Officer — Date 3/27/2020

cc: Timothy Meade, Archeologist, U.S. Army Corps of Engineers – Kansas City District

Enclosures

Enclosure 5

Turner, Katie

From: Meade, Timothy M CIV (USA) <Timothy.M.Meade@usace.army.mil>
Sent: Monday, March 30, 2020 4:48 PM
To: Turner, Katie
Subject: RE: 71216_MISC-D7(1007)_District 7 Wetland Bank

Follow Up Flag: Follow up
Flag Status: Flagged

Katie,

Thanks, that's all I need.

Tim

From: Turner, Katie <katie.turner@nebraska.gov>
Sent: Monday, March 30, 2020 10:02 AM
To: Meade, Timothy M CIV (USA) <Timothy.M.Meade@usace.army.mil>
Subject: [Non-DoD Source] RE: 71216_MISC-D7(1007)_District 7 Wetland Bank

Tim,

The Nebraska SHPO provided their concurrence to the Nebraska Department of Transportation (NDOT) on March 27, 2020 regarding the proposed updates to the above referenced project. The SHPO concurrence letter and the associated Section 106 Project Package are attached for your records. Please let me know if you require a letter from NDOT summarizing the updates to the project and denoting SHPO concurrence. Also, please let me know if you have any questions.

Kind Regards,

Katie Turner
Cultural Resources Manager / Section 106 Specialist
Project Development
Nebraska Department of Transportation
1500 Highway 2 | Lincoln, Nebraska | 68509
Katie.Turner@nebraska.gov | 402-479-3514
dot.nebraska.gov | Twitter

From: Meade, Timothy M CIV (USA) <Timothy.M.Meade@usace.army.mil>
Sent: Tuesday, March 17, 2020 10:38 AM
To: Turner, Katie <katie.turner@nebraska.gov>
Subject: RE: 71216_MISC-D7(1007)_District 7 Wetland Bank

Hi Katie,

I looked over the spoil placement area on our GIS maps. As you, noted nothing shows up. Based on your description a simple letter to SHPO with a recommendation of o effect will suffice. Please cc me on the letter and provide me a copy of the SHPO response.

Thanks,

Tim

From: Turner, Katie <katie.turner@nebraska.gov>
Sent: Tuesday, March 17, 2020 9:41 AM
To: Meade, Timothy M CIV (USA) <Timothy.M.Meade@usace.army.mil>
Subject: [Non-DoD Source] 71216_MISC-D7(1007)_District 7 Wetland Bank

Tim,

See attached kmz

Katie Turner
Cultural Resources Manager / Section 106 Specialist
Project Development
Nebraska Department of Transportation
1500 Highway 2 | Lincoln, Nebraska | 68509
Katie.Turner@nebraska.gov | 402-479-3514
dot.nebraska.gov | Twitter

NEBRASKA
DEPARTMENT OF TRANSPORTATION

Supplemental Section 106 PQS Memo

To: **Jacob Smith, NDOT NEPA Specialist**

From: **Katie Turner, Section 106 Specialist** Katie D Turner

cc:

Date: **April 14, 2021**

Re: **71216_MISC-D7(1007)_District 7 Wetland Bank**

The above referenced project was originally processed as a Tier II on September 3, 2019 with a project effects determination of *no historic properties affected*. The U.S. Army Corps of Engineers – Kansas City (USACE), which is the lead federal agency, concurred with the project effects determination of July 30, 2019. The Nebraska State Historic Preservation Office (SHPO) concurred with the project effects determination on August 6, 2019. Tribal consultation was completed by the USACE with the following tribes: Otoe-Missouria Tribe of Oklahoma; Pawnee Nation of Oklahoma; Ponca Tribe of Indians of Oklahoma; Ponca Tribe of Nebraska; Northern Cheyenne Tribe; Cheyenne-Arapaho Tribe; and the Mescalero-Apache Tribe. There are no Section 106 Sensitive Areas or construction commitments associated with this project.

The completion of a Section 106 supplemental evaluation in March 2020 did not result in a change from the original project effects determination. The USACE concurred on the supplemental evaluation on March 30, 2020. The SHPO concurred on the supplemental evaluation on March 27, 2020.

Since the completion of the supplemental evaluation in March 2020, a review of the project's design plans demonstrated that portions of the project's limits of construction extend beyond the Area of Potential Effects (APE) previously considered for this project (Enclosure 1 and 2). Therefore, the APE for both archeological and architectural/structural resources was expanded accordingly by NDOT PQS Katie Turner in March 2021 (Enclosures 3 and 5).

Archeological Evaluation

Construction activities to be completed within the expanded archeological APE will primarily involve the excavation of soils to alter the surface elevation of the site. The depth of excavation will be variable and is dependent on the existing topography in relation to groundwater. Based on existing groundwater data, excavation depths for this project are not anticipated to be greater than six-feet below the existing ground surface. Excavation activities may involve the use of mechanized scrapers and other heavy machinery. Soils displaced during the completion of construction activities will be placed along access roads and/or deposited in a spoil/waste area. Additional proposed construction activities which may be completed within the expanded archeological APE will include clearing and grubbing, placement of excess soils, grading the excess soils to flatten and shape the soils as needed, installation of temporary and permanent erosion control materials, and seeding

and mulching. Tree removal may be required within the expanded limits of construction.

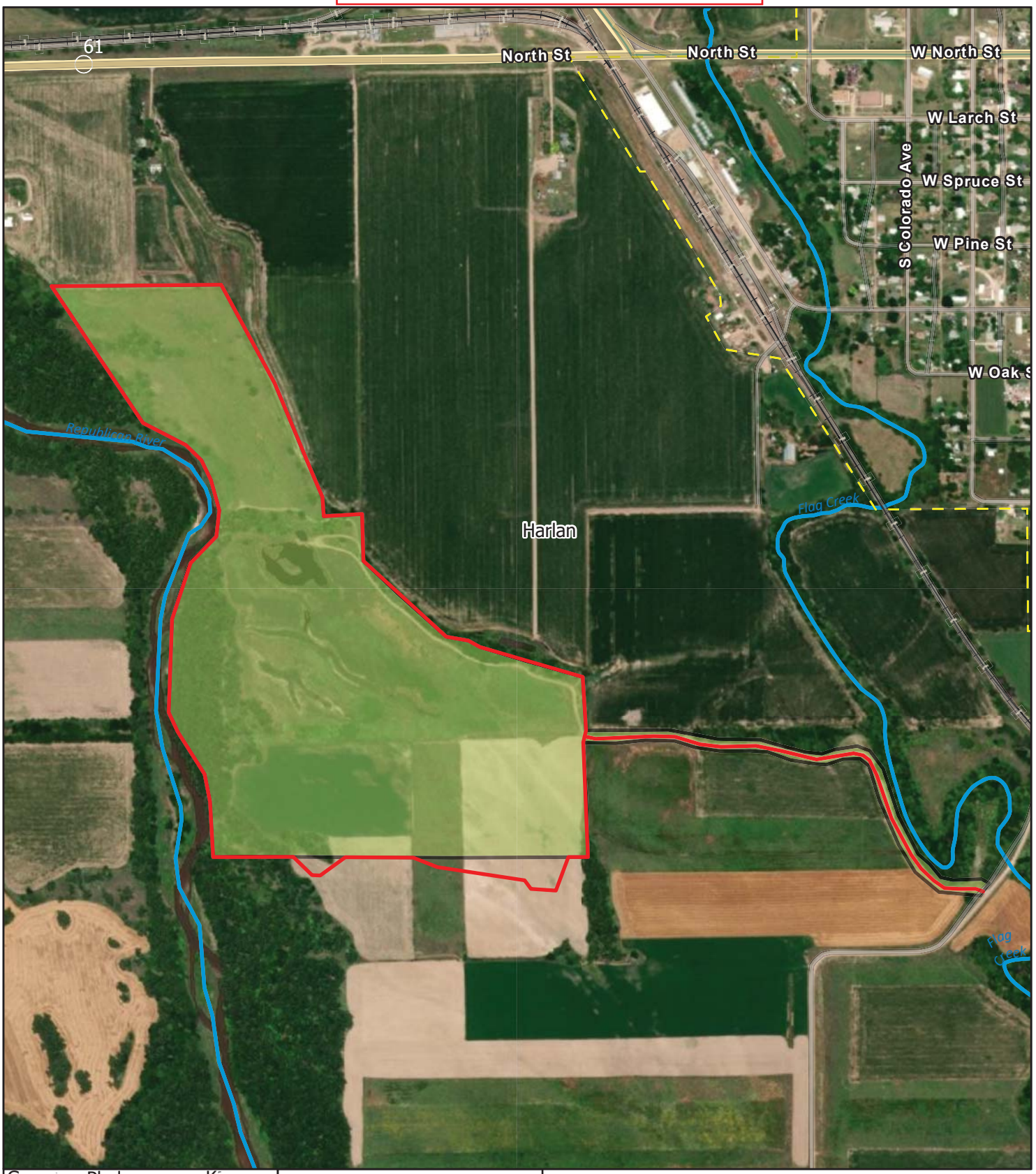
Relying on Steinauer's 2019 archeological report, PQS Turner completed a supplemental evaluation of the expanded archeological APE in March 2021 (Enclosure 3). Turner's evaluation indicated that the majority of the expanded APE was archeologically surveyed with negative results in 2019 (Enclosure 4). Regarding the unsurveyed portion of the expanded APE located along the southern half of the proposed mitigation bank boundaries, the absence of cultural materials discovered during the 2019 archeological survey of the adjacent landform coupled with the very hydraulically active nature of the landform indicates that the expanded APE has very low potential to contain significant archeological resources (sites). Additionally, the proposed construction activities to be completed within the expanded APE located near the spoil area will entail the placement and grading of fill material on a landform that also has low potential to contain significant archeological sites. Therefore, no additional archeological evaluations or field surveys are recommended for the expanded APE. Timothy Meade, archeologist with the U.S. Army Corps of Engineers – Kansas City District (USACE), concurred with this recommendation on April 7, 2021. There are no archeological historic properties present within the expanded APE.

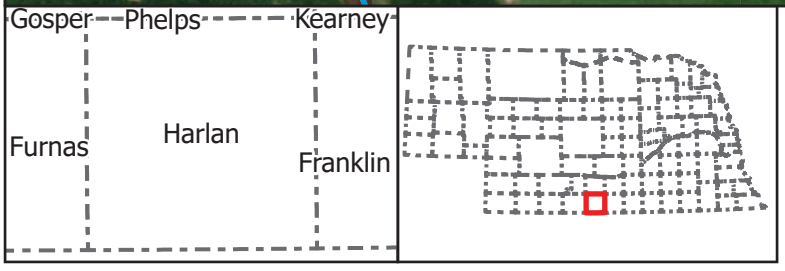
Architectural/Structural Investigations
Construction activities which will be completed within the expanded architectural/structural APE will include the following: clearing and grubbing; placement of excess soils; grading the excess soils to flatten and shape the soils as needed; installation of temporary and permanent erosion control materials; and seeding and mulching.

Relying on Hilger's 2018 architectural/structural report, PQS Turner completed a supplemental evaluation of the expanded architectural/structural APE in March 2021 (Enclosure 5). Turner's evaluation indicated that the parcels contained within the expanded APE were evaluated by Hilger in 2018. Therefore, no additional architectural/structural evaluations or field surveys are recommended for the expanded APE. Timothy Meade, archeologist with the U.S. Army Corps of Engineers – Kansas City District (USACE), concurred with this recommendation on April 7, 2021. There are no architectural or structural historic properties present within the expanded APE.

The USACE and SHPO both concurred that the original project effects determination remains appropriate. The USACE concurred on the supplemental evaluation on April 7, 2021 (Enclosure 6). The SHPO concurred on the supplemental evaluation on April 14, 2021 (Enclosure 7). The original project effects determination of *no historic properties affected* remains appropriate.

Enclosure 1 - Original Archeological APE





Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

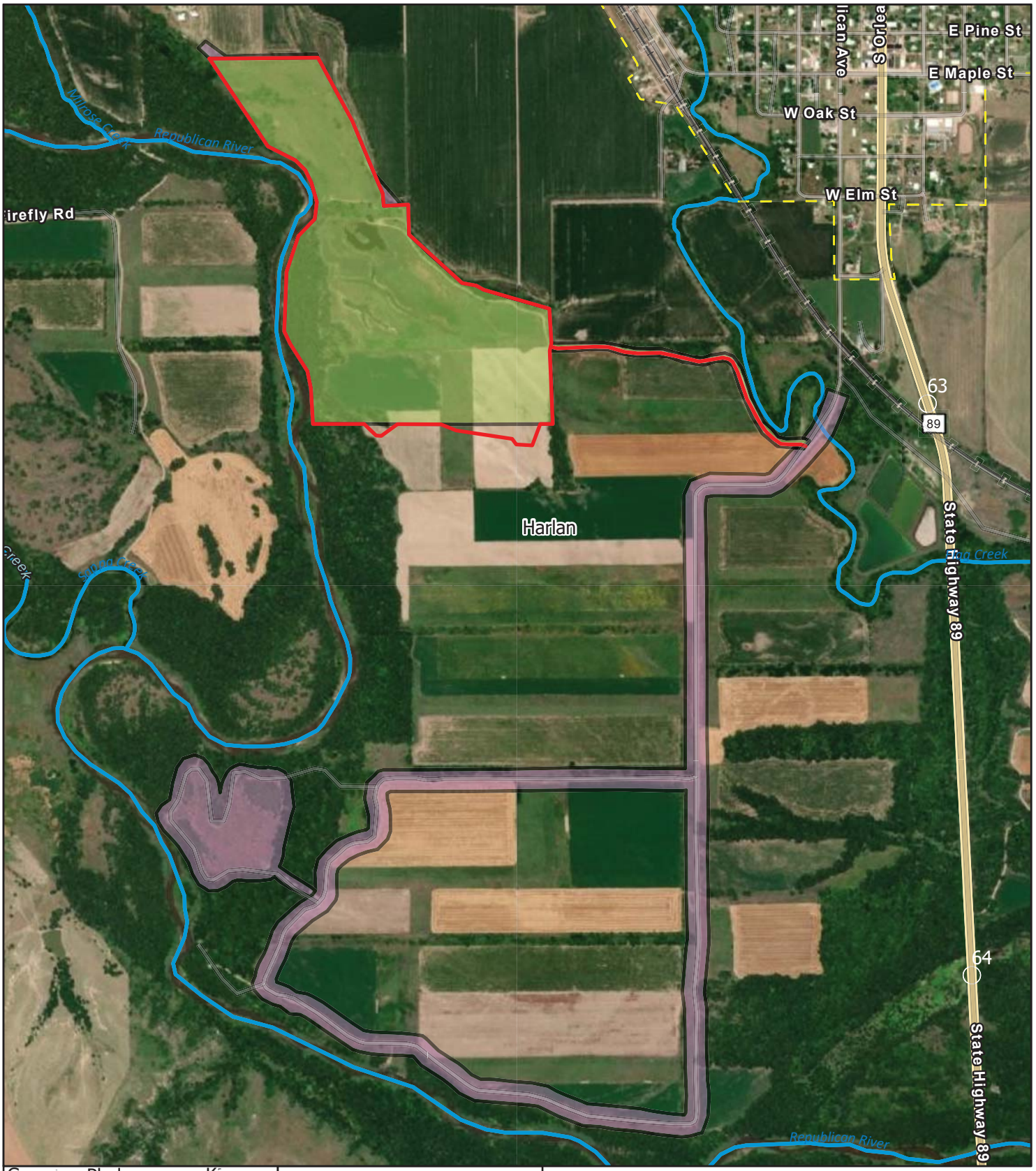
Mitigation Bank Boundaries
Orleans Corporate Limits
Original Archeological APE

0 0.07 0.15 0.3 0.45 0.6 Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

N W E S

2020 Expanded Archeological APE



Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

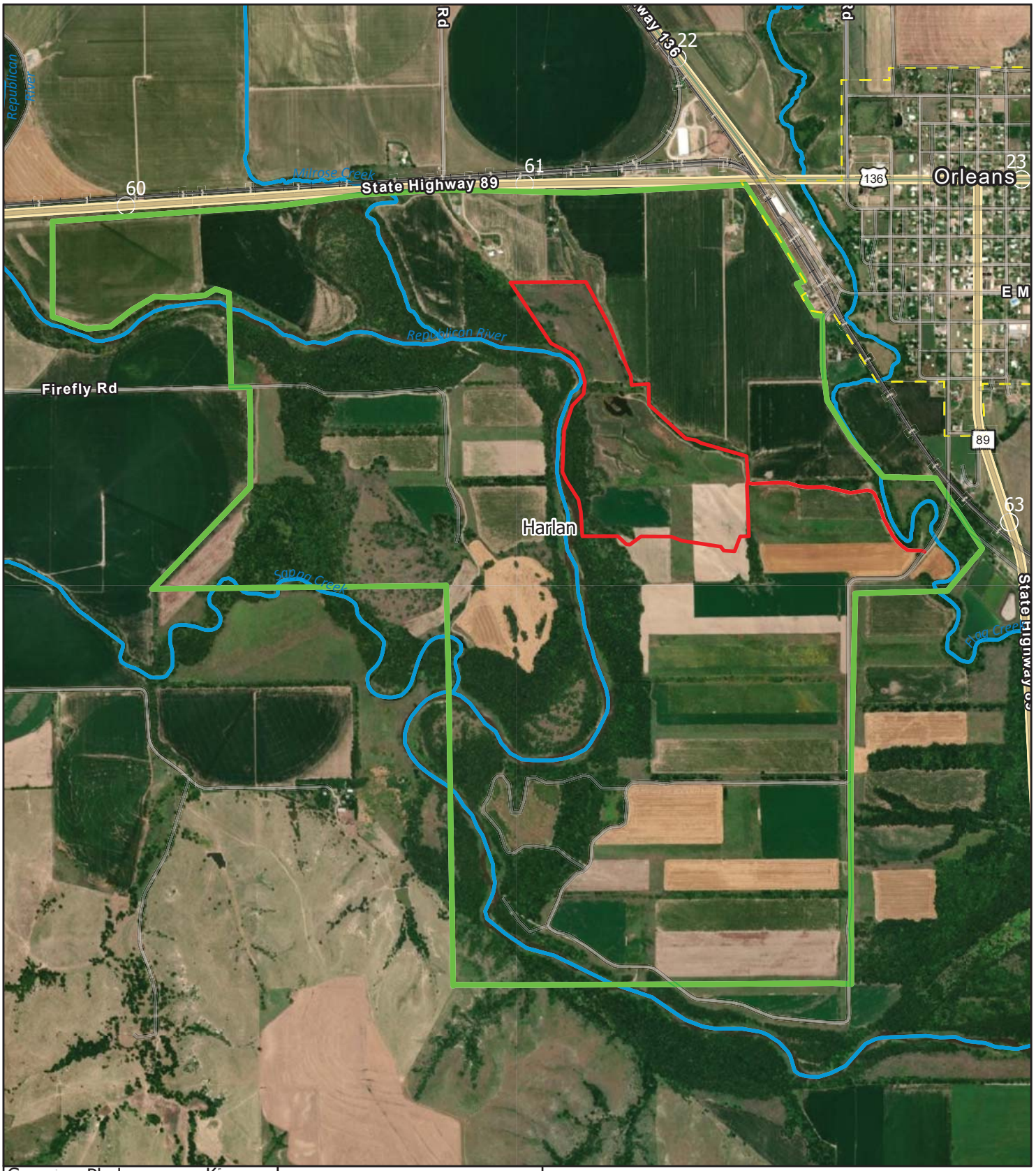
- Mitigation Bank Boundaries
- Orleans Corporate Limits
- Original Archeological APE
- 2020 Expanded Archeological APE

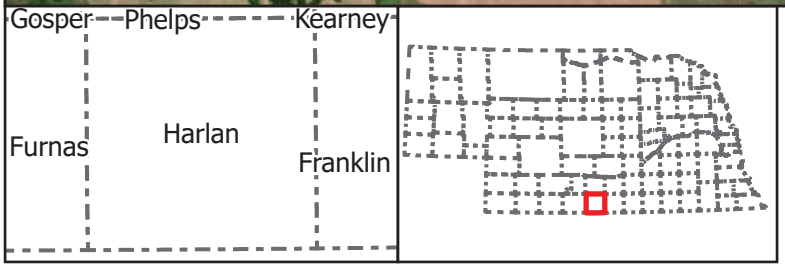
0 0.13 0.25 0.5 0.75 1 Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

N W E S

Enclosure 2 - Original Architectural/Structural APE





Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

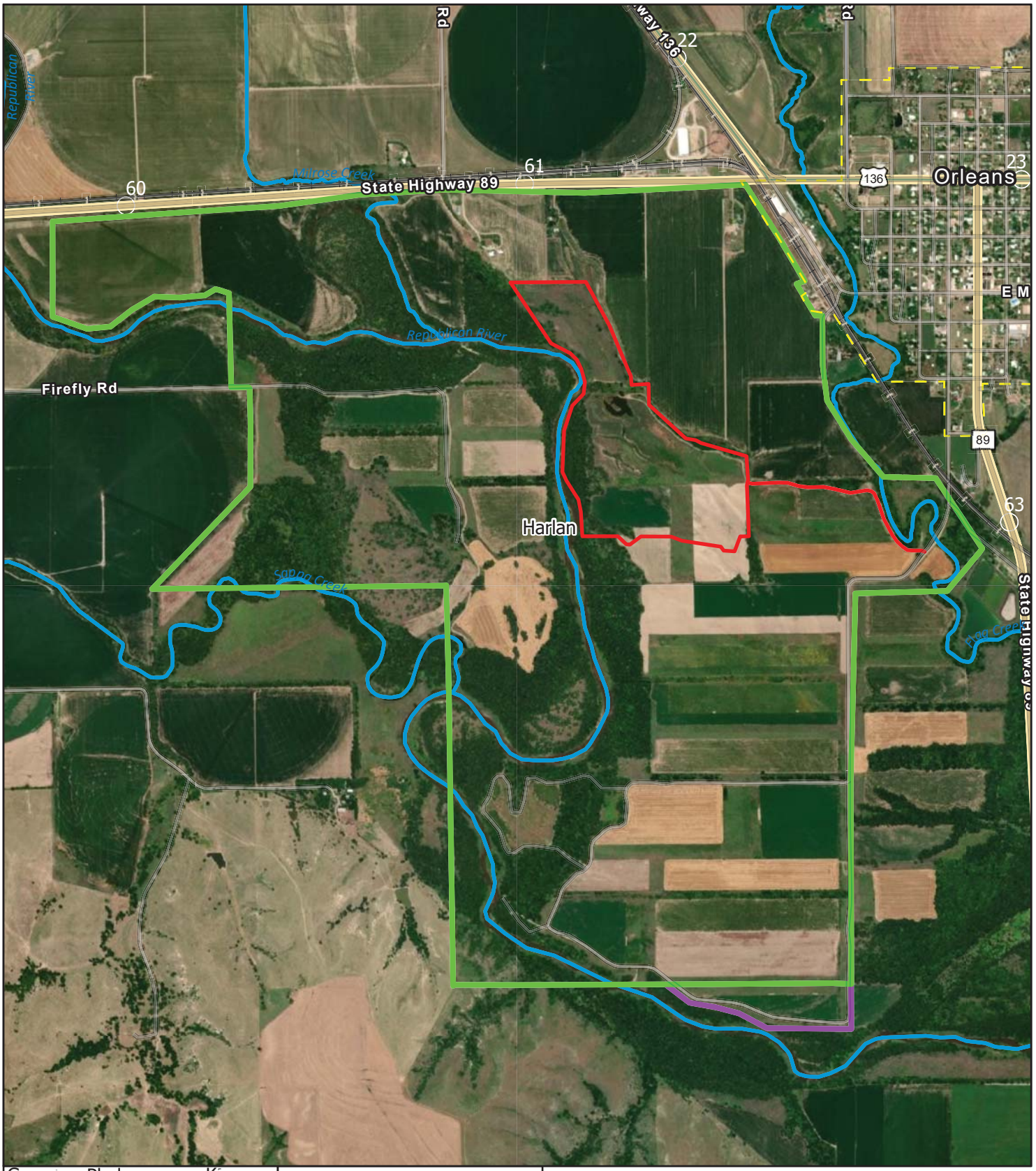
- Mitigation Bank Boundaries
- Orleans Corporate Limits
- Original Architectural APE

0 0.17 0.35 0.7 1.05 1.4 Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

N W E S

2020 Expanded Architectural/Structural APE



Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

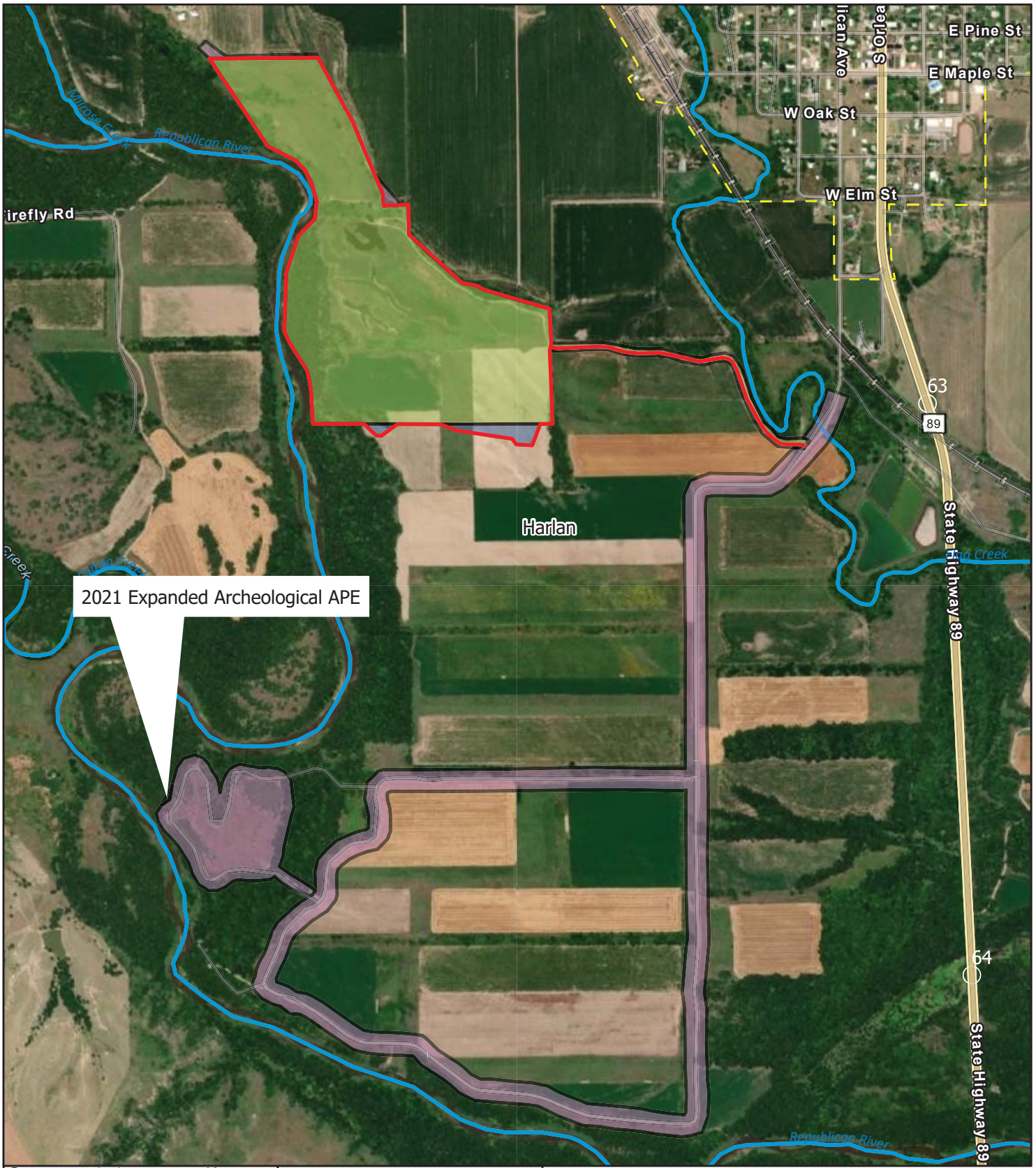
- Mitigation Bank Boundaries
- Orleans Corporate Limits
- Original Architectural APE
- 2020 Expanded Architectural/Structural APE

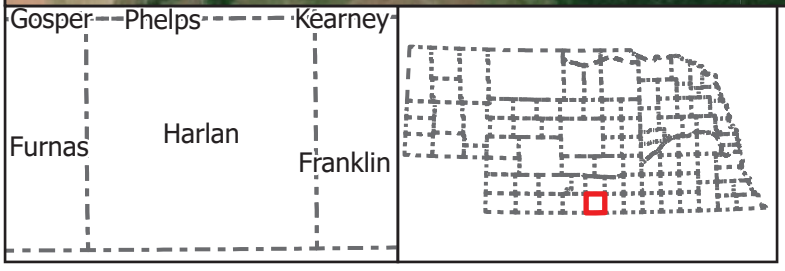
0 0.17 0.35 0.7 1.05 1.4 Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

N W E S

Enclosure 3





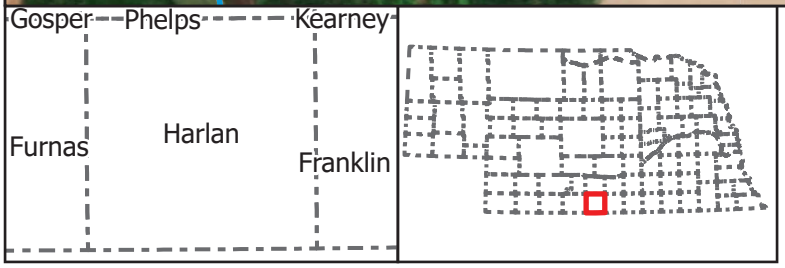
Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

- Mitigation Bank Boundaries
- Orleans Corporate Limits
- Original Archeological APE
- 2020 Expanded Archeological APE
- 2021 Expanded Archeological APE

0 0.13 0.25 0.5 0.75 1 Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

N W E S



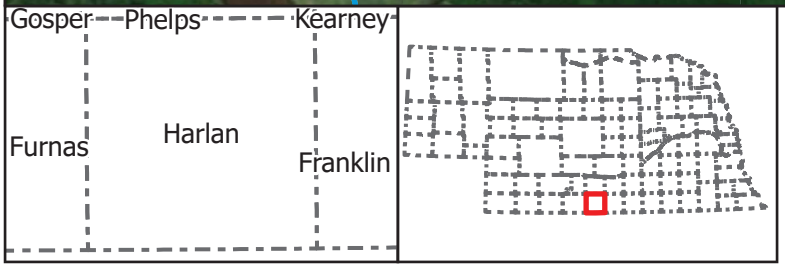
Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

- Mitigation Bank Boundaries
- Original Archeological APE
- 2021 Expanded Archeological APE

0 0.04 0.07 0.15 0.22 0.3 Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

N W E S



Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

2020 Expanded Archeological APE

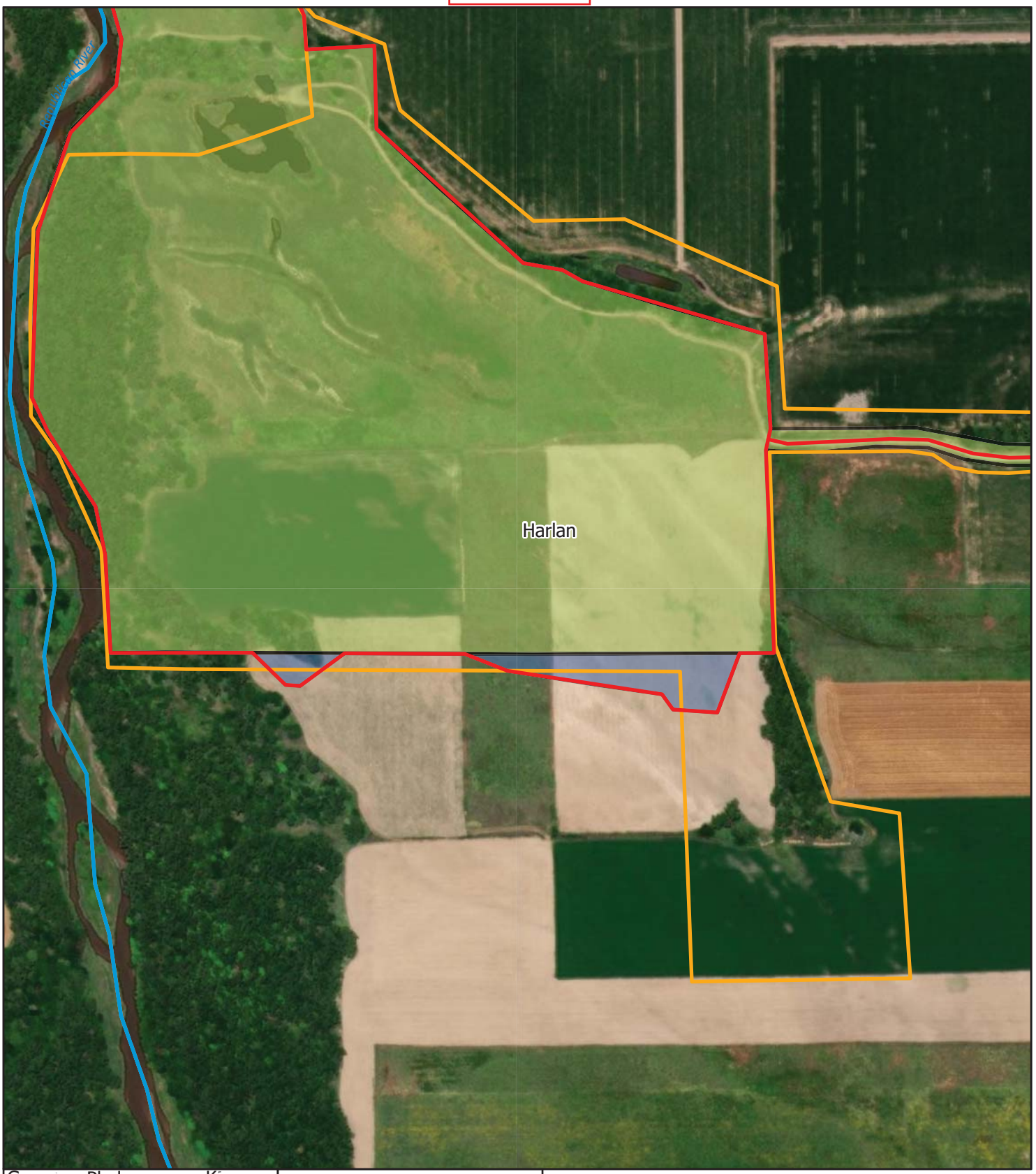
2021 Expanded Archeological APE

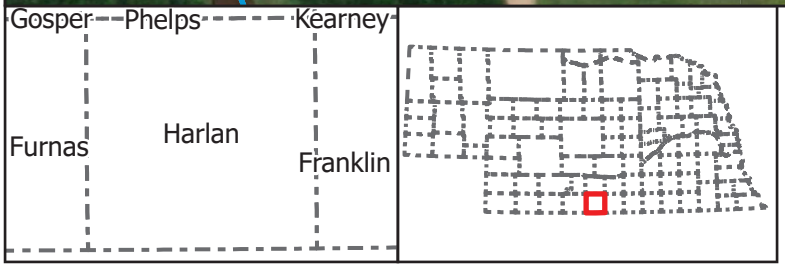
0 0.02 0.04 0.07 0.11 0.14 Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

N W E S

Enclosure 4





Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

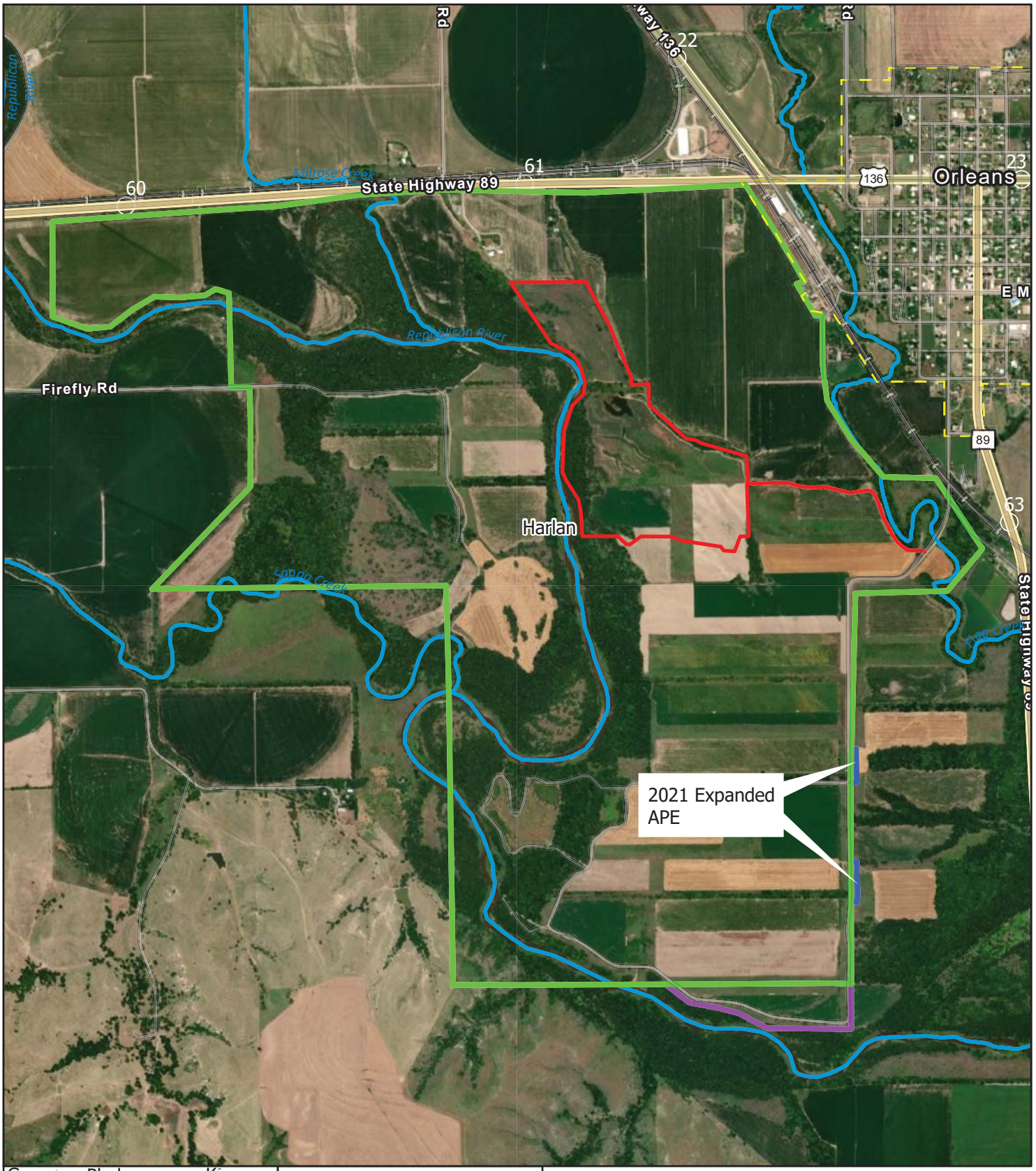
- Mitigation Bank Boundaries
- Original Archeological Survey Area
- Orleans Corporate Limits
- 2021 Expanded Archeological APE
- Original Archeological APE

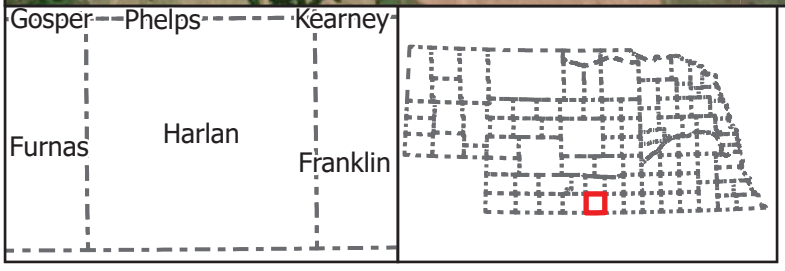
0 0.04 0.09 0.18 0.27 0.36 Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

N W E S

Enclosure 5





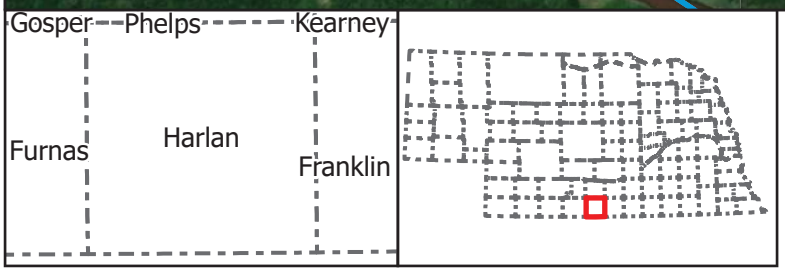
Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

- Mitigation Bank Boundaries
- Orleans Corporate Limits
- Original Architectural APE
- 2020 Expanded Architectural/Structural APE
- 2021 Expanded Architectural/Structural APE

0 0.17 0.35 0.7 1.05 1.4 Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

N W E S



Project Name: District 7 Wetland Bank
Control No.: 71216
Project No.: MISC-D7(1007)

- Original Architectural APE
- 2020 Expanded Architectural/Structural APE
- 2021 Expanded Architectural/Structural APE

0 0.04 0.09 0.18 0.27 0.36 Miles

NEBRASKA
DEPARTMENT OF TRANSPORTATION

N W E S

Enclosure 6

Turner, Katie

From: Meade, Timothy M CIV (USA) <Timothy.M.Meade@usace.army.mil>
Sent: Wednesday, April 7, 2021 4:29 PM
To: Turner, Katie
Subject: RE: NDOT Proposed District 7 Wetland Bank (MISC-D7(1007), CN 71216) - Supplemental Evaluation

Follow Up Flag: Follow up
Flag Status: Flagged

Hello Katie,

Thank you for the information. I reviewed the contents of your e-mail and did a double check against our GIS database and concur with your recommendations that no additional field surveys would be required for the expanded APE because of the conditions mentioned in the e-mail and 2019 and 2020 consultations. As such, the Corps has made a determination of no historic properties affected.

If you need anything else, let me know.

Sincerely,

Tim

From: Turner, Katie <katie.turner@nebraska.gov>
Sent: Monday, April 5, 2021 3:18 PM
To: Meade, Timothy M CIV (USA) <Timothy.M.Meade@usace.army.mil>
Subject: [Non-DoD Source] NDOT Proposed District 7 Wetland Bank (MISC-D7(1007), CN 71216) - Supplemental Evaluation

Mr. Meade:

As you may recall, the Nebraska Department of Transportation (NDOT) proposes to construct a wetland mitigation bank using only state funds in cooperation with the United States Army Corps of Engineers (USACE) in Harlan County. Your office concurred with a project effects determination of *no historic properties affected* on July 30, 2019. The Nebraska State Historic Preservation Office (SHPO) concurred with a project effects determination of *no historic properties affected* on August 6, 2019. Tribal consultation was completed by your office with the following tribes: Otoe-Missouria Tribe of Oklahoma; Pawnee Nation of Oklahoma; Ponca Tribe of Indians of Oklahoma; Ponca Tribe of Nebraska; Northern Cheyenne Tribe; Cheyenne-Arapaho Tribe; and the Mescalero-Apache Tribe. A supplemental evaluation completed in March 2020 did not result in a change from the original project effects determination. The SHPO concurred on the supplemental evaluation on March 27, 2020.

Since the completion of the supplemental evaluation in March 2020, a review of the project's design plans demonstrated that portions of the project's limits of construction (LOCs) extend beyond the Area of Potential Effects (APE) considered previously for this project. The attachment titled "Proposed LOCs" shows the project's limits of construction as currently proposed. The attachment titled "Previous APEs" shows the archeological and architectural/structural APEs previously considered for this project. This attachment includes

the APE originally evaluated for this project in addition to the expanded APE evaluated in 2020 during the supplemental evaluation.

As part of an ongoing supplemental evaluation, NDOT proposes to expanded the archeological APE and the architectural/structural APE to accommodate the project's limits of construction as currently proposed. The attachment titled "2021 Expanded APEs" includes maps showing the proposed APE expansions.

Archeological Expansion
Construction activities to be completed within the expanded archeological APE will primarily involve the excavation of soils to alter the surface elevation of the site. The depth of excavation will be variable and is dependent on the existing topography in relation to groundwater. Based on existing groundwater data, excavation depths for this project are not anticipated to be greater than six-feet below the existing ground surface. Excavation activities may involve the use of mechanized scrapers and other heavy machinery. Soils displaced during the completion of construction activities will be placed along access roads and/or deposited in a spoil/waste area. Additional proposed construction activities which may be completed within the expanded archeological APE will include clearing and grubbing, placement of excess soils, grading the excess soils to flatten and shape the soils as needed, installation of temporary and permanent erosion control materials, and seeding and mulching. Tree removal may be required within the expanded limits of construction.

Relying on Steinauer's 2019 archeological report, NDOT Professionally Qualified Staff (PQS) Katie Turner completed a review of the expanded archeological APE in March 2021. Turner's review indicated that the majority of the expanded APE was archeologically surveyed with negative results in 2019 (see attachment titled "2019 Archeological Survey Area"). Regarding the unsurveyed portion of the expanded APE located along the southern half of the proposed mitigation bank boundaries, the absence of cultural materials discovered during the 2019 archeological survey completed of the adjacent landform coupled with the very hydraulically active nature of the landform indicates that the expanded APE has very low potential to contain significant archeological resources (sites). Additionally, the proposed construction activities to be completed within the expanded APE located near the spoil area will entail the placement and grading of fill material on a landform that also has low potential to contain significant archeological sites. Therefore, NDOT respectfully recommends that no additional archeological evaluations or field surveys are required for the expanded APE.

Architectural/Structural Expansion
Construction activities which will be completed within the expanded architectural/structural APE will include the following: clearing and grubbing; placement of excess soils; grading the excess soils to flatten and shape the soils as needed; installation of temporary and permanent erosion control materials; and seeding and mulching.

Relying on Hilger's 2018 architectural/structural report, PQS Turner completed a review of the expanded architectural/structural APE in March 2021. Turner's review indicated that the parcels contained within the expanded APE were evaluated by Hilger in 2018. Therefore, NDOT respectfully recommends that no additional architectural/structural evaluations or field surveys are required for the expanded APE.

NDOT respectfully requests your concurrence with the recommendation that no additional evaluations or field surveys are required for the expanded APE. If you concur that no additional evaluations or field surveys are required for the expanded APE NDOT will draft a consultation letter to be sent to the SHPO that summarizes the current supplemental evaluation. NDOT will copy you on the SHPO consultation materials in addition to providing you with a copy of SHPO's concurrence/comments. If you have any questions regarding this information, please do not hesitate to contact me.

Sincerely,

Katie Turner

Cultural Resources Manager/Section 106 Specialist
NEBRASKA DEPARTMENT OF TRANSPORTATION
1500 Highway 2 | Lincoln, NE | 68509
402.479.3514 | katie.turner@nebraska.gov

Enclosure 7

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

History Nebraska
RECEIVED
APR 0 8 2021
NE State Historic
Preservation Office

April 8, 2021

Ms. Jill Dolberg
Deputy State Historic Preservation Officer
History Nebraska
P.O. Box 82265
Lincoln, Nebraska 68508

RE: HP# 1907-509-01; Survey# 19-0154
NDOT Project District 7 Wetland Bank, MISC-D7(1007), CN 71216
Section 106 Supplemental Evaluation

Dear Ms. Dolberg:

As you may recall, the Nebraska Department of Transportation (NDOT) proposes to construct a wetland mitigation bank using only state funds in cooperation with the United States Army Corps of Engineers (USACE) in Harlan County. The USACE is the lead federal agency and NDOT is re-initiating consultation with your office on their behalf.

Your office concurred with National Register of Historic Places (NRHP) eligibility determinations and on a project effects determination of *no historic properties affected* in August 2019 (Enclosure 1). Your office also concurred that the original project effects determination of *no historic properties affected* remained appropriate as a result of a supplemental evaluation that addressed the addition of access road work and a spoil/waste area to the project. Concurrence on the supplemental evaluation was received on March 27, 2020 (Enclosure 2).

The map included as Enclosure 3 shows the project's current limits of construction. Since the completion of the supplemental evaluation in March 2020, a review of the project's design plans demonstrated that portions of the project's limits of construction extend beyond the Area of Potential Effects (APE) previously considered for this project (Enclosures 4 and 5). Therefore, the APE for both archeological and architectural/structural resources was expanded accordingly by NDOT Professionally Qualified Staff (PQS) Katie Turner in March 2021. Maps depicting the expanded APEs are included as Enclosures 6 and 9.

Archeological Evaluation
Construction activities to be completed within the expanded archeological APE will primarily involve the excavation of soils to alter the surface elevation of the site. The depth of excavation will be variable and is dependent on the existing topography in relation to groundwater. Based on existing groundwater data, excavation depths for this project are not anticipated to be greater than six-feet below the existing ground surface. Excavation activities may involve the use of mechanized scrapers and other heavy machinery. Soils displaced during the completion of construction activities will be placed along access roads and/or deposited in a spoil/waste area. Additional proposed construction activities which may be completed within the expanded archeological APE will include clearing and grubbing, placement of excess soils, grading the excess soils to flatten and shape the soils as needed, installation of temporary and permanent erosion control materials, and seeding and mulching. Tree removal may be required within the expanded limits of construction.

Relying on Steinauer's 2019 archeological report, PQS Turner completed a supplemental evaluation of the expanded archeological APE in March 2021 (Enclosure 6). Turner's evaluation indicated that the majority of the expanded APE was archeologically surveyed with negative results in 2019 (Enclosure 7). Regarding the unsurveyed portion of the expanded APE located along the southern half of the proposed mitigation bank boundaries, the absence of cultural materials discovered during the 2019 archeological survey of the adjacent

John R. Selmer, P.E., Director
Department of Transportation
MAILING ADDRESS
PO Box 94759
Lincoln, NE 68509-4759
PHYSICAL ADDRESS
1500 Highway 2
Lincoln, NE 68502
PHONE 402-471-4567
EMAIL NDOT.ContactUs@nebraska.gov
dot.nebraska.gov

landform coupled with the very hydraulically active nature of the landform indicates that the expanded APE has very low potential to contain significant archeological resources (sites). Additionally, the proposed construction activities to be completed within the expanded APE located near the spoil area will entail the placement and grading of fill material on a landform that also has low potential to contain significant archeological sites. Therefore, no additional archeological evaluations or field surveys are recommended for the expanded APE. Timothy Meade, archeologist with the U.S. Army Corps of Engineers – Kansas City District (USACE), concurred with this recommendation on April 7, 2021 (Enclosure 8). There are no archeological historic properties present within the expanded APE.

Architectural/Structural Evaluation
Construction activities which will be completed within the expanded architectural/structural APE will include the following: clearing and grubbing; placement of excess soils; grading the excess soils to flatten and shape the soils as needed; installation of temporary and permanent erosion control materials; and seeding and mulching.

Relying on Hilger's 2018 architectural/structural report, PQS Turner completed a supplemental evaluation of the expanded architectural/structural APE in March 2021 (Enclosure 9). Turner's evaluation indicated that the parcels contained within the expanded APE were evaluated by Hilger in 2018. Therefore, no additional architectural/structural evaluations or field surveys are recommended for the expanded APE. Timothy Meade, archeologist with the U.S. Army Corps of Engineers – Kansas City District (USACE), concurred with this recommendation on April 7, 2021 (Enclosure 8). There are no architectural or structural historic properties present within the expanded APE (Enclosure 9).

Project Effects Determination
No historic properties were identified within the expanded APE. On behalf of the USACE, NDOT recommends that the original project effects determination of *no historic properties affected* remains appropriate. By letter agreement with your office (SHPO concurrence 10/15/2018; Enclosure 10), this NDOT state funded only project has been reviewed under the stipulations of the programmatic agreement entitled *Programmatic Agreement Among the Federal Highway Administration, the Nebraska State Historic Preservation Officer, the Advisory Council on Historic Preservation and the Nebraska Department of Roads to Satisfy the Requirements of Section 106 for the Federal Aid Highway Program in the State of Nebraska* (July 2015), as amended, and meets the requirements to be considered a Tier II project. Tier II projects result in a project effects determination of *no historic properties affected*.

NDOT respectfully requests SHPO concurrence with these determinations. If you have any questions regarding this information, please do not hesitate to contact me.

Sincerely,

Katie Turner
Cultural Resources Manager/Section 106 Specialist
Katie.turner@nebraska.gov
(402) 479 - 3514

CONCUR:

Jill Dolberg, Deputy State Historic Preservation Officer — Date 4/14/2021

cc: Timothy Meade, Archeologist, U.S. Army Corps of Engineers – Kansas City District

Enclosures

John R. Selmer, P.E., Director
Department of Transportation
MAILING ADDRESS
PO Box 94759
Lincoln, NE 68509-4759
PHYSICAL ADDRESS
1500 Highway 2
Lincoln, NE 68502
PHONE 402-471-4567
EMAIL NDOT.ContactUs@nebraska.gov
dot.nebraska.gov

Appendix C

Geotechnical Investigation

GEOTECHNICAL EXPLORATION REPORT

Project Name:

D7 Wetland Mitigation Study

Near Orleans, Nebraska

Prepared for:

Nebraska Department of Transportation

March 8, 2019

Olsson Project No. 018-0451

olsson

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   1.2. Project Information 1
2. Exploration and test procedures 2
   2.1. Field Exploration 2
   2.2. Laboratory Testing 3
3. Subsurface Conditions 4
   3.1. Subsurface Profile 4
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4. Report Limitations and Closure 6

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Table 2. Cohesive Alluvium Laboratory Test Results. 4
Table 3. Cohesionless Alluvium Laboratory Test Results. 5
Table 4. Groundwater Measurements. 5

APPENDICES

Appendix A: Site Location Plan, Boring Location Map

Appendix B: Symbols and Nomenclature, Boring Logs

Appendix C: Summary of Laboratory Test Results

Nebraska Department of Transportation
Attn: Roger Yerdon
PO Box 94759
Lincoln, Nebraska 68509

RE: Geotechnical Exploration
D7 Wetland Mitigation Study
Near Orleans, Nebraska
Olsson Project No. 018-0451

Dear Mr. Yerdon:

Olsson has completed the authorized geotechnical exploration for the above referenced project. The geotechnical exploration was conducted to evaluate physical characteristics of subsurface conditions with respect to design and construction of the project. The enclosed report summarizes the project characteristics as we understand them, presents the findings of the borings and laboratory tests and discusses the observed subsurface conditions.

We appreciate the opportunity to provide our geotechnical engineering services for this project. If you have any questions or need further assistance, please contact us at your convenience.

Respectfully submitted,
Olsson, Inc.

Sean A. Parks, MS, PE
Geotechnical Engineer
402.458.5900

Thomas C. Kettler Jr, PE
Geotechnical Engineer
402.458.5077

1. PROJECT UNDERSTANDING

1.1. Geotechnical Scope

This report presents the results of the geotechnical exploration performed for the proposed D7 Wetland Mitigation Study located southwest of Orleans, Nebraska.

The purpose of this exploration was to evaluate the subsurface conditions encountered at the site. Our scope of services generally included the following tasks:

- Perform visual site observations and review available information regarding general geologic conditions.
- Drill 5 soil test borings to a depth of 15 feet.
- Install 6 piezometers to depths ranging from 3 to 15 feet.
- Conduct visual classification and laboratory tests on the soil samples obtained during the site investigation.
- Prepare this Geotechnical Exploration Report containing the soil test boring logs and laboratory test results.

1.2. Project Information

The proposed wetland mitigation site will be located southwest of the town of Orleans, Nebraska, east of the Republican River. At the time of our field exploration, the site surface was comprised of grass vegetation and was accessible to a truck-mounted drilling rig. A site location plan is found in Appendix A.

2. EXPLORATION AND TEST PROCEDURES

2.1. Field Exploration

Our drill crew advanced five test borings for this exploration with a truck-mounted drilling rig using hollow-stem augers. Boring locations were selected by an ***Olsson*** geotechnical engineer and located in the field by the drill crew using a hand-held GPS unit. The approximate locations of the borings are shown on the Boring Location Map presented in Appendix A.

Each of the borings extended to depths 15 feet below site grade at the time of our exploration. Soil samples were obtained at the intervals indicated on the boring logs presented in Appendix B. Samples designated “U” samples on the boring logs were obtained by hydraulically advancing a thin-walled tube sampler. Soil samples designated “SS” samples were obtained with a split-spoon barrel sampler while performing Standard Penetration Tests (SPT). Recovered samples were sealed in containers, labeled, and protected for transportation to the laboratory for testing.

The drill crew prepared field boring logs during drilling operations. The field logs include drilling and sampling methods, sampling intervals, groundwater measurements, and general descriptions of the observed soil conditions. The final boring logs presented in Appendix B represent our engineering interpretation of the field logs based on visual classification and laboratory testing of the collected samples.

Six standpipe piezometers were constructed, one at each of the soil borings and the sixth in a field on the west side of Highway 89, approximately one mile south of Orleans, Nebraska. Piezometer installation data can be found in Table 1. The locations of the piezometers are shown on the boring location map in Appendix A.

Table 1. Piezometer Data.

Piezometer No.	Piezometer Depth (feet)	Base of Screen Depth (feet)	Top of Screen Depth (feet)
PZ-1	15.0	15.0	5.0
PZ-2	15.0	15.0	5.0
PZ-3	15.0	15.0	5.0
PZ-4	15.0	15.0	5.0
PZ-5	15.0	15.0	5.0
PZ-6	3.0	3.0	0

2.2. Laboratory Testing

The soils encountered in the borings were visually classified and described in general accordance with the Unified Soil Classification System (USCS). We also performed laboratory tests to evaluate the engineering properties of the recovered soil samples. The testing program included moisture content, Atterberg limits, and particle size. Laboratory test results are included on the soil boring logs presented in Appendix B and are summarized in Appendix C.

3. SUBSURFACE CONDITIONS

3.1. Subsurface Profile

The subsurface soils at this site comprised of cohesive and cohesionless alluvial deposits. The general characteristics of each soil stratum are summarized below, with more detailed descriptions provided on the boring logs in Appendix B.

Please note that the boring logs represent subsurface conditions at the specific boring locations at the time of our field exploration; variations may occur between or beyond the borings. The stratification lines shown on the logs represent the approximate boundary between material types. However, the transition between layers may be gradual. The depths referenced in the following paragraphs are relative to the site grade at the time of our exploration.

Surfacing and Topsoil

We encountered a 3-inch thick topsoil zone in each of the borings.

Cohesive Alluvium

We encountered cohesive alluvium in all borings except B-1, extending to a depth of 3 to 6 feet. Alluvium soils generally comprised sandy silt (ML) or silt with sand (ML) and were described as soft to firm, light gray or dark brown and moist containing varying amounts of fine to coarse sand.

Table 2. Cohesive Alluvium Laboratory Test Results.

USCS Classification	Moisture Content (%)	Dry Density (pcf)	Unconfined Strength (tsf)	Atterberg Limits			% Passing P200	SPT "N" Values (bpf)
				Liquid Limit (%)	Plastic Limit (%)	Plastic Index (%)		
ML	18.5 – 23.9	--	--	32	19	13	54.0 – 73.3	4 - 7

Cohesionless Alluvium

We encountered cohesionless alluvium in each of the borings, extending to a depth of 3 to 15 feet. Alluvium soils generally comprised fine to coarse sand with varying amounts of silt and were described as loose to medium dense, light yellowish brown or dark gray and dry to wet.

Table 3. Cohesionless Alluvium Laboratory Test Results.

USCS Classification	Moisture Content (%)	Dry Density (pcf)	Unconfined Strength (tsf)	Atterberg Limits			% Passing P200	SPT "N" Values (bpf)
				Liquid Limit (%)	Plastic Limit (%)	Plastic Index (%)		
SM, SP/SM, SP	0.8 – 22.3	--	--	--	--	--	1.8 – 25.8	4 - 13

3.2. Groundwater Summary

We encountered groundwater in our soil borings as summarized in Table 4 and as indicated on the boring logs presented in Appendix B.

Table 4. Groundwater Measurements.

Boring/ Piezometer No.	Ground-water Depth While Drilling (feet)	Groundwater After Drilling (feet)
B-1/PZ-1	5.5	6.0
B-2/PZ-2	6.0	6.0
B-3/PZ-3	6.0	6.0
B-4/PZ-4	3.5	6.0
B-5/PZ-5	6.0	6.0
PZ-6	0.5	0.5

The above groundwater measurements provide an indication of the on-site groundwater conditions at the time the borings were drilled but should not be construed to represent a permanent or absolute condition. Variations and uncertainties exist with relatively short-term water level observations in boreholes.

Groundwater levels will fluctuate with variations in precipitation, site grading, drainage, and adjacent land use. Perched groundwater conditions can also develop in seams of loose or granular soil. Long-term monitoring with the installed piezometers generally provides a more representative indication of the potential range of groundwater conditions.

4. REPORT LIMITATIONS AND CLOSURE

The laboratory results presented in this report are based on the samples obtained from our soil test borings and sampling procedures and the results of the laboratory testing program. The soil test borings represent a limited statistical sampling of subsurface soils and it is possible that conditions may be encountered during construction that are substantially different from those indicated by the soil test borings. In these instances, adjustments to design and construction may be necessary.

The scope of this exploration did not include any environmental assessment for the presence of wetlands and/or hazardous or toxic materials in the soil or groundwater on or near the site. Any statements in this report regarding odors, discoloration, or suspicious conditions are strictly for the information of our client.

This report of findings was prepared by the firm ***Olsson, Inc.*** under the direction of a Professional Engineer registered in the State of Nebraska. The results contained herein are based on generally accepted professional geotechnical engineering practice at the time of this report, within this geographic area. No other warranty is expressed or implied. This report has been prepared for the exclusive use of the ***Nebraska Department of Transportation*** for specific application to the proposed project.

We trust that this report will assist you in the design and construction of the proposed project. ***Olsson*** appreciates the opportunity to provide our services on this project and looks forward to working with you during construction and on future projects. Should you have any questions, please do not hesitate to contact us.

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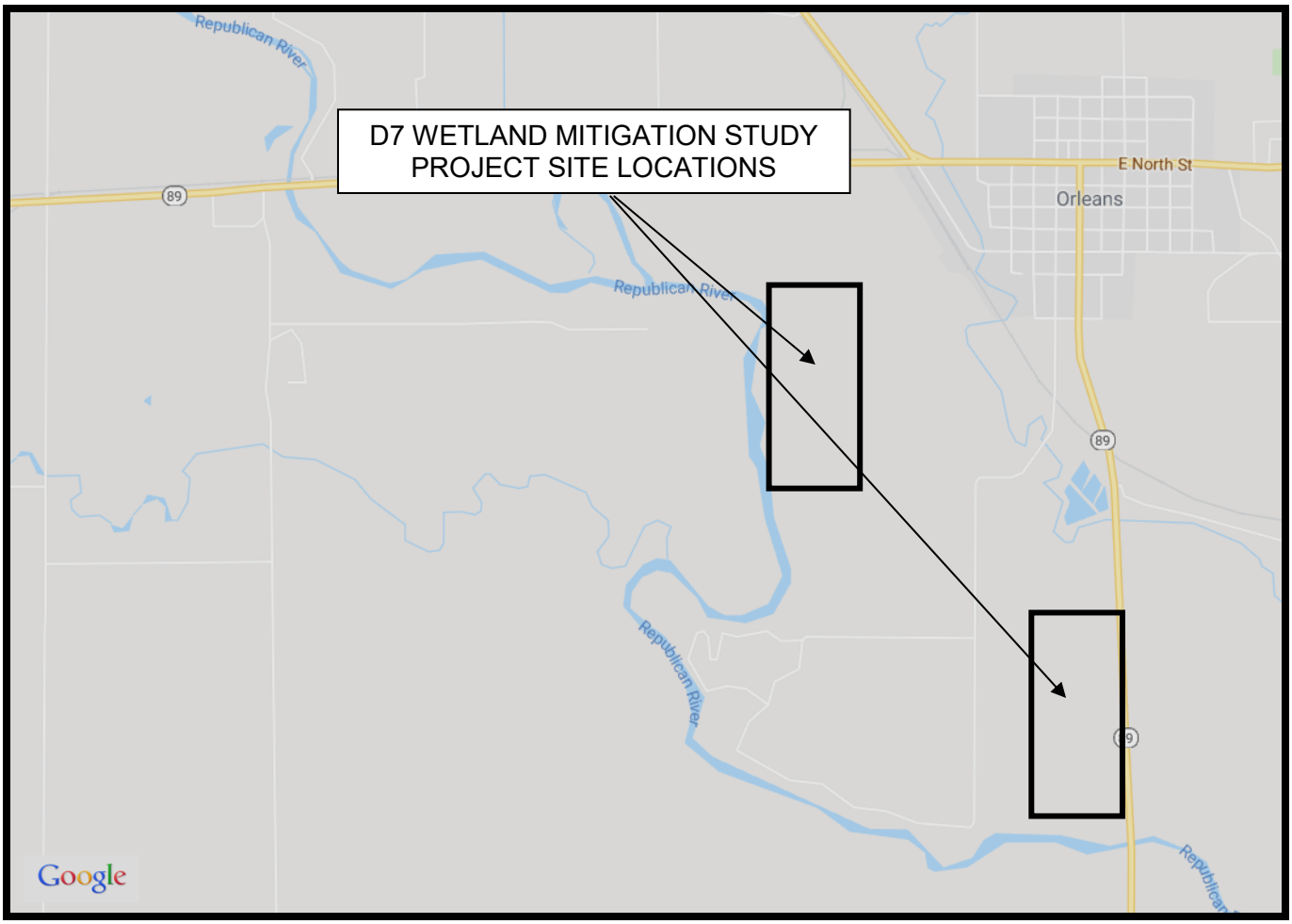
APPENDIX A

Site Location Plan

Boring Location Map



N

SITE LOCATION PLAN

D7 WETLAND MITIGATION STUDY
ORLEANS, NEBRASKA
OLSSON PROJECT NO. 018-0451

Drawing1.dwg
DATE:1/25/2019 USER:anguyen

LEGEND

SOIL BORING LOCATION

0 500 1000 2000
SCALE IN FEET

PROJECT: 018-0451

DATE: 01.25.19 | DRAWN BY:ALN

BORING LOCATION MAP
ORLEANS, NEBRASKA

olsson

3800 South 6th Street
Lincoln, NE 68502

TEL 402.474.6311
www.olsson.com

APPENDIX B

Symbols and Nomenclature
Boring Logs

SYMBOLS AND NOMENCLATURE

DRILLING NOTES

DRILLING AND SAMPLING SYMBOLS

SS:	Split-Spoon Sample (1.375" ID, 2.0" OD)	HSA:	Hollow Stem Auger	NE:	Not Encountered
U:	Thin-Walled Tube Sample (3.0" OD)	CFA:	Continuous Flight Auger	NP:	Not Performed
CS:	Continuous Sample	HA:	Hand Auger	NA:	Not Applicable
BS:	Bulk Sample	CPT:	Cone Penetration Test	% Rec:	Percent of Recovery
MC:	Modified California Sampler	WB:	Wash Bore	WD:	While Drilling
GB:	Grab Sample	RB:	Rock Bit	IAD:	Immediately After Drilling
SPT:	Standard Penetration Test Blows per 6.0"	PP:	Pocket Penetrometer	AD:	After Drilling

DRILLING PROCEDURES

Soil samples designated as "U" samples on the boring logs were obtained in using Thin-Walled Tube Sampling techniques. Soil samples designated as "SS" samples were obtained during Penetration Test using a Split-Spoon Barrel sampler. The standard penetration resistance 'N' value is the number of blows of a 140 pound hammer falling 30 inches to drive the Split-Spoon sampler one foot. Soil samples designated as "MC" were obtained in using Thick-Walled, Ring-Lined, Split-Barrel Drive sampling techniques. Recovered samples were sealed in containers, labeled, and protected for transportation to the laboratory for testing.

WATER LEVEL MEASUREMENTS

Water levels indicated on the boring logs are levels measured in the borings at the times indicated. In relatively high permeable materials, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels is not possible with only short-term observations.

SOIL PROPERTIES & DESCRIPTIONS

Descriptions of the soils encountered in the soil test borings were prepared using Visual-Manual Procedures for Descriptions and Identification of Soils.

PARTICLE SIZE

Boulders	12 in. +	Coarse Sand	4.75mm-2.0mm	Silt	0.075mm-0.005mm
Cobbles	12 in.-3 in.	Medium Sand	2.0mm-0.425mm	Clay	<0.005mm
Gravel	3 in.-4.75mm	Fine Sand	0.425mm-0.075mm		

COHESIVE SOILS

Consistency	Unconfined Compressive Strength (Qu) (tsf)
Very Soft	<0.25
Soft	0.25 – 0.5
Firm	0.5 – 1.0
Stiff	1.0 – 2.0
Very Stiff	2.0 – 4.0
Hard	> 4.0

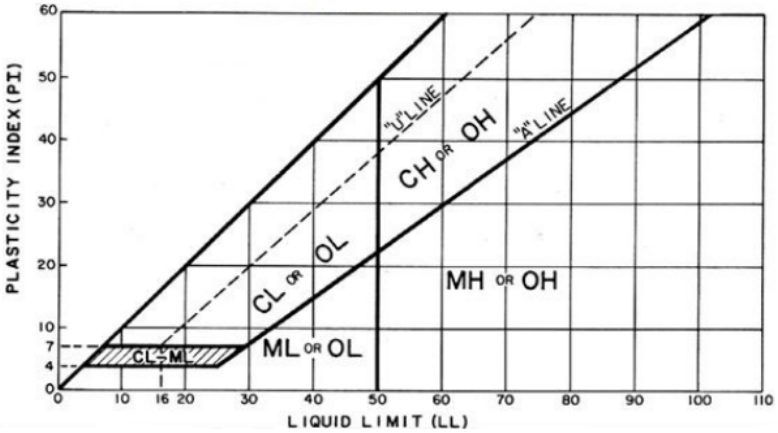
COHESIONLESS SOILS

Relative Density	'N' Value
Very Loose	0 – 3
Loose	4 – 9
Medium Dense	10 – 29
Dense	30 – 49
Very Dense	≥ 50

COMPONENT %

Description	Percent (%)
Trace	<5
Few	5 - 10
Little	15 - 25
Some	30 - 45
Mostly	50 - 100

PLASTICITY CHART



ROCK QUALITY DESIGNATION (RQD)

Description	RQD (%)
Very Poor	0 – 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 – 100

BOREHOLE REPORT NO. B-1

Sheet 1 of 1

PROJECT NAME	CLIENT
D7 Wetland Mitigation Study	Nebraska Department of Transportation
PROJECT NUMBER	**LOCATION**
018-0451	Orleans, Nebraska

ELEVATION (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
	TOPSOIL — ***0.3'***		0								
	ALLUVIUM										
	Silty sand (SM): Loose, light yellowish brown, dry, mostly fine sand, little silt			SS 1		2-2-2 N=4		0.8			P-200 = 23.7%
	Silty sand (SM): Loose, light yellowish brown, dry, mostly fine sand, little silt		5	SS 2		2-3-3 N=6					
	5.5'										
	Poorly graded sand with silt (SP/SM): Loose, light brown, wet, mostly medium-to-coarse sand, few silt			SS 3		3-4-5 N=9		13.5			P-200 = 9.8%
	8.0'										
	Poorly graded sand (SP): Loose, light brown, wet, mostly medium-to-coarse sand, trace silt		10	SS 4		3-3-4 N=7					
	Poorly graded sand (SP): Loose, light brown, wet, mostly medium-to-coarse sand, trace silt			SS 5		1-2-3 N=5		15.4			P-200 = 1.8%
	13.0'										
	Silty sand (SM): Loose, dark gray, wet, mostly fine to coarse sand, little silt, trace gravel		15	SS 6		0-3-3 N=6					
	15.0'										

BASE OF BORING AT 15.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ 5.5 ft
IAD	▼ Not Performed
AD	▼ 6.0ft after 24Hrs

OLSSON, INC.
3800 SOUTH 6TH STREET
LINCOLN, NEBRASKA 68502

STARTED:	10/23/18	FINISHED:	10/23/18
DRILL CO.:	OLSSON	DRILL RIG:	CME 75
DRILLER:	K. WHITLA	LOGGED BY:	C. MILLER
METHOD: HOLLOW STEM AUGER			

BOREHOLE REPORT NO. B-2

Sheet 1 of 1

PROJECT NAME	CLIENT
D7 Wetland Mitigation Study	Nebraska Department of Transportation
PROJECT NUMBER	**LOCATION**
018-0451	Orleans, Nebraska

Split Spoon

ELEVATION (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
	TOPSOIL — ***0.3'***		0								
	ALLUVIUM										
	Silt with sand (ML): Soft, light gray, moist, little fine sand			SS 1		2-2-2 N=4		23.9			P-200 = 73.3%
	3.5'										
	Silty sand (SM): Loose, light gray, moist, mostly fine to medium sand, few silt		5	SS 2		3-4-5 N=9		17.5			P-200 = 16.1%
	6.0'										
	Poorly graded sand with silt (SP/SM): Loose, light gray, wet, mostly medium sand, few silt			SS 3		2-3-4 N=7					
	Poorly graded sand with silt (SP/SM): Medium dense, light gray, wet, mostly medium sand, few silt		10	SS 4		3-5-5 N=10		12.3			P-200 = 6.7%
	Poorly graded sand with silt (SP/SM): Loose, light gray, wet, mostly medium sand, few silt			SS 5		3-4-4 N=8					
	Poorly graded sand with silt (SP/SM): Loose, light gray, wet, mostly medium sand, few silt			SS 6		3-3-2 N=5					
	15.0'		15								

BASE OF BORING AT 15.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ 6.0 ft
IAD	▼ Not Performed
AD	▼ 6.0ft after 24Hrs

OLSSON, INC.
3800 SOUTH 6TH STREET
LINCOLN, NEBRASKA 68502

STARTED:	10/23/18	FINISHED:	10/23/18
DRILL CO.:	OLSSON	DRILL RIG:	CME 75
DRILLER:	K. WHITLA	LOGGED BY:	C. MILLER
METHOD: HOLLOW STEM AUGER			

BOREHOLE REPORT NO. B-3

Sheet 1 of 1

PROJECT NAME: D7 Wetland Mitigation Study	CLIENT: Nebraska Department of Transportation
PROJECT NUMBER: 018-0451	LOCATION: Orleans, Nebraska

ELEVATION (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
	TOPSOIL 0.3'		0								
	ALLUVIUM										
	Silty sand (SM): Loose, light gray, moist, mostly fine-to-coarse sand, little silt			SS 1		2-2-3 N=5		22.3			P-200 = 25.8%
	3.0'										
	Sandy silt (ML): Firm, light gray, moist, some fine to coarse sand		5	SS 2		3-3-4 N=7		21.0			P-200 = 54.9%
	6.0'										
	Poorly graded sand with silt (SP/SM): Loose, light brown, wet, mostly fine-to-coarse sand, few silt			SS 3		3-4-4 N=8		15.4			P-200 = 7.0%
	Poorly graded sand with silt (SP/SM): Loose, light brown, wet, mostly fine-to-coarse sand, few silt		10	SS 4		2-4-4 N=8					
	Poorly graded sand with silt (SP/SM): Loose, light brown, wet, mostly fine-to-coarse sand, few silt			SS 5		4-2-3 N=5		15.9			P-200 = 11.7%
	Poorly graded sand with silt (SP/SM): Loose, light brown, wet, mostly fine-to-coarse sand, few silt			SS 6		1-2-3 N=5					
	15.0'		15								

BASE OF BORING AT 15.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ 6.0 ft
IAD	▼ Not Performed
AD	▼ 6.0ft after 24Hrs

OLSSON, INC.
3800 SOUTH 6TH STREET
LINCOLN, NEBRASKA 68502

STARTED:	10/24/18	FINISHED:	10/24/18
DRILL CO.:	OLSSON	DRILL RIG:	CME 75
DRILLER:	K. WHITLA	LOGGED BY:	C. MILLER
METHOD: HOLLOW STEM AUGER			

BOREHOLE REPORT NO. B-4

Sheet 1 of 1

PROJECT NAME	CLIENT
D7 Wetland Mitigation Study	Nebraska Department of Transportation
PROJECT NUMBER	**LOCATION**
018-0451	Orleans, Nebraska

Split Spoon

ELEVATION (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
	TOPSOIL 0.3'		0								
	ALLUVIUM										
	Sandy silt (ML): Firm, dark brown, moist, some fine to coarse sand			SS 1		5-3-3 N=6		18.5			P-200 = 54.0%
	▽ 3.5'										
	Silty sand (SM): Loose, light yellowish brown, wet, mostly fine to coarse sand, few silt		5	SS 2		3-3-4 N=7					
	▼										
	Silty sand (SM): Loose, light yellowish brown, wet, mostly fine to coarse sand, few silt			SS 3		3-3-4 N=7		17.9			P-200 = 16.1%
	Silty sand (SM): Medium dense, light yellowish brown, wet, mostly fine to coarse sand, few silt		10	SS 4		3-4-6 N=10					
	Silty sand (SM): Medium dense, light yellowish brown, wet, mostly fine to coarse sand, little silt			SS 5		3-5-7 N=12		16.7			P-200 = 24.8%
	Silty sand (SM): Medium dense, light yellowish brown, wet, mostly fine to coarse sand, little silt			SS 6		4-5-8 N=13					
	15.0'		15								

BASE OF BORING AT 15.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ 3.5 ft
IAD	▼ Not Performed
AD	▼ 6.0ft after 24Hrs

OLSSON, INC.
3800 SOUTH 6TH STREET
LINCOLN, NEBRASKA 68502

STARTED:	10/24/18	FINISHED:	10/24/18
DRILL CO.:	OLSSON	DRILL RIG:	CME 75
DRILLER:	K. WHITLA	LOGGED BY:	C. MILLER
METHOD: HOLLOW STEM AUGER			

BOREHOLE REPORT NO. B-5

Sheet 1 of 1

PROJECT NAME: D7 Wetland Mitigation Study

CLIENT: Nebraska Department of Transportation

PROJECT NUMBER: 018-0451

LOCATION: Orleans, Nebraska

Shelby Tube ■ Split Spoon ⊠

ELEVATION (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" N-VALUE	UNC. STR. (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/ REMARKS
	TOPSOIL 0.3'		0								
	ALLUVIUM										
	Sandy silt (ML): Firm, light gray, moist, some fine sand			U 1	CL			21.2		32/13	P-200 = 67.5%
	3.0'										
	Silty sand (SM): Loose, light yellowish brown, very moist, mostly fine to coarse sand, little silt		5	SS 2		3-3-4 N=7					
	Silty sand (SM): Loose, light yellowish brown, wet, mostly fine to coarse sand, little silt			SS 3		2-2-3 N=5		17.1			P-200 = 24.9%
	8.0'										
	Poorly graded sand with silt (SP/SM): Loose, light yellowish brown, wet, mostly fine to coarse sand, few silt		10	SS 4		1-2-3 N=5					
	Poorly graded sand with silt (SP/SM): Medium dense, light yellowish brown, wet, mostly fine to coarse sand, few silt			SS 5		4-6-7 N=13					
	Poorly graded sand with silt (SP/SM): Loose, light yellowish brown, wet, mostly fine to coarse sand, few silt 15.0'		15	SS 6		2-3-3 N=6		13.6			P-200 = 7.6%

BASE OF BORING AT 15.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ 6.0 ft
IAD	▼ Not Performed
AD	▼ 6.0ft after 24Hrs

OLSSON, INC.
3800 SOUTH 6TH STREET
LINCOLN, NEBRASKA 68502

STARTED:	10/23/18	FINISHED:	10/23/18
DRILL CO.:	OLSSON	DRILL RIG:	CME 75
DRILLER:	K. WHITLA	LOGGED BY:	C. MILLER
METHOD: HOLLOW STEM AUGER			

APPENDIX C

Summary of Laboratory Test Results

OLSSON, INC.
3800 SOUTH 6TH STREET
LINCOLN, NEBRASKA 68502

SUMMARY OF LABORATORY RESULTS

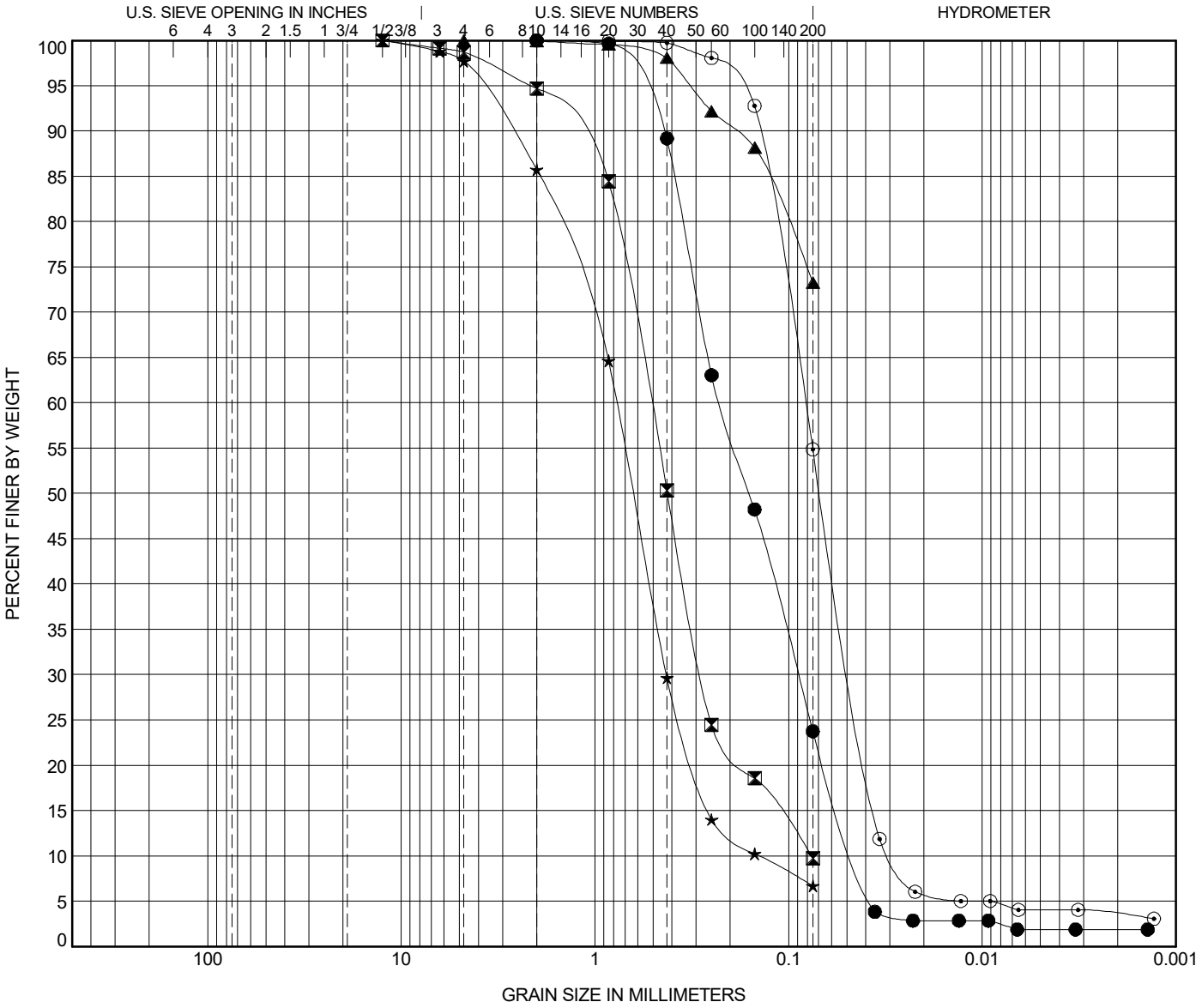
PROJECT NAME: D7 Wetland Mitigation Study
PROJECT NUMBER: 018-0451
CLIENT: Nebraska Department of Transportation
PROJECT LOCATION: Orleans, Nebraska

BORING NUMBER	SAMPLE I.D.	SAMPLE DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	VOID RATIO	SATURATION (%)	UNCONFINED STRENGTH (tsf)	STRAIN (%)	ATTERBERG LIMITS			P-200	USCS CLASS.
									LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX		
B-1	SS-1	1.0 - 2.5'	0.8									23.7	
B-1	SS-3	6.0 - 7.5'	13.5									9.8	
B-1	SS-5	11.0 - 12.5'	15.4									1.8	
B-2	SS-1	1.0 - 2.5'	23.9									73.3	
B-2	SS-2	3.5 - 5.0'	17.5									16.1	
B-2	SS-4	8.5 - 10.0'	12.3									6.7	
B-3	SS-1	1.0 - 2.5'	22.3									25.8	
B-3	SS-2	3.5 - 5.0'	21.0									54.9	
B-3	SS-3	6.0 - 7.5'	15.4									7.0	
B-3	SS-5	11.0 - 12.5'	15.9									11.7	
B-4	SS-1	1.0 - 2.5'	18.5									54.0	
B-4	SS-3	6.0 - 7.5'	17.9									16.1	
B-4	SS-5	11.0 - 12.5'	16.7									24.8	
B-5	U-1	1.0 - 2.5'	21.2						32	19	13	67.5	CL
B-5	SS-3	6.0 - 7.5'	17.1									24.9	
B-5	SS-6	13.5 - 15.0'	13.6									7.6	

OLSSON, INC.
3800 SOUTH 6TH STREET
LINCOLN, NEBRASKA 68502

GRAIN SIZE DISTRIBUTION

PROJECT NAME: D7 Wetland Mitigation Study
CLIENT: Nebraska Department of Transportation
PROJECT NUMBER: 018-0451
PROJECT LOCATION: Orleans, Nebraska



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

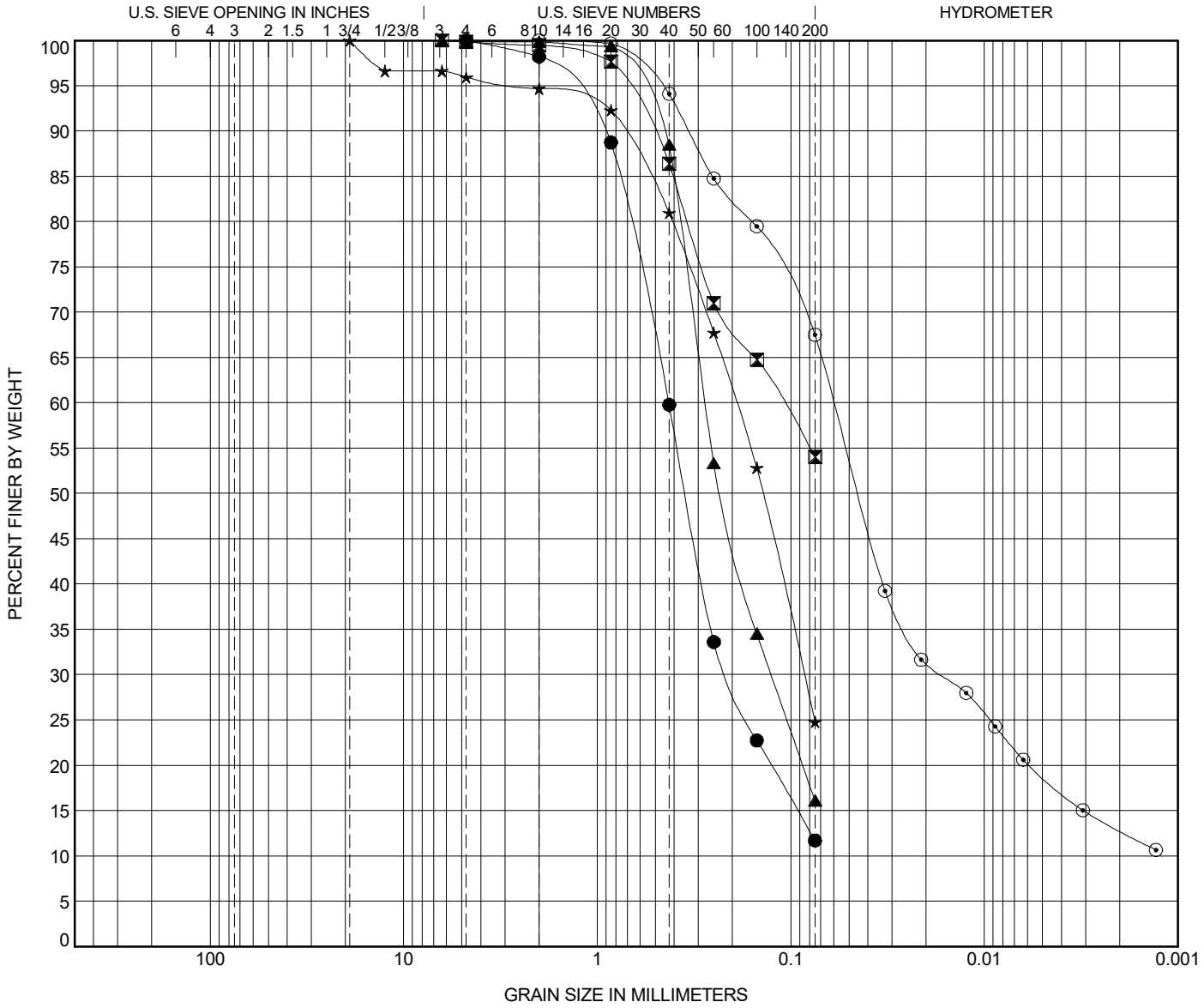
Boring No.	Sample ID	Depth (ft)	Classification	LL	PL	PI	Cc	Cu
● B-1	SS-1	1.0 - 2.5'	Silty sand (SM)				0.79	4.99
⊠ B-1	SS-3	6.0 - 7.5'	Poorly graded sand with silt (SP/SM)				1.99	6.76
▲ B-2	SS-1	1.0 - 2.5'	Silt with sand (ML)					
★ B-2	SS-4	8.5 - 10.0'	Poorly graded sand with silt (SP/SM)				1.65	5.41
⊙ B-3	SS-2	3.5 - 5.0'	Sandy silt (ML)				0.92	2.78

Boring No.	Sample ID	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-1	SS-1	2	0.225	0.09	0.045	0.0	76.3	21.9	1.9
⊠ B-1	SS-3	12.5	0.517	0.28	0.076	1.3	88.9	9.8	
▲ B-2	SS-1	4.75				0.0	26.7	73.3	
★ B-2	SS-4	12.5	0.775	0.428	0.143	2.3	91.0	6.7	
⊙ B-3	SS-2	2	0.082	0.047	0.03	0.0	45.1	50.8	4.0

OLSSON, INC.
3800 SOUTH 6TH STREET
LINCOLN, NEBRASKA 68502

GRAIN SIZE DISTRIBUTION

PROJECT NAME: D7 Wetland Mitigation Study
CLIENT: Nebraska Department of Transportation
PROJECT NUMBER: 018-0451
PROJECT LOCATION: Orleans, Nebraska



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

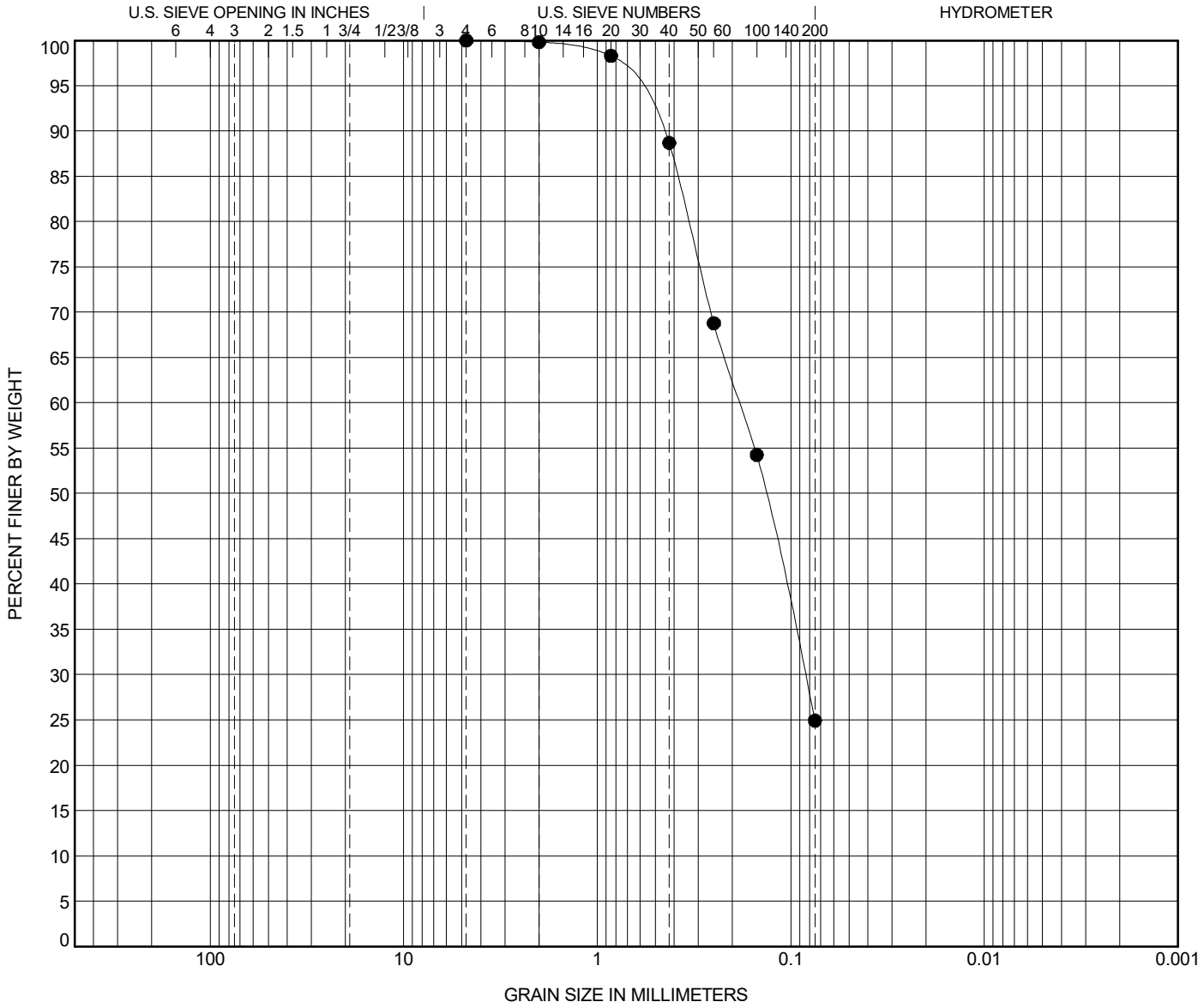
Boring No.	Sample ID	Depth (ft)	Classification	LL	PL	PI	Cc	Cu
● B-3	SS-5	11.0 - 12.5'	Poorly graded sand with silt (SP/SM)				1.55	6.33
⊠ B-4	SS-1	1.0 - 2.5'	Sandy silt (ML)					
▲ B-4	SS-3	6.0 - 7.5'	Silty sand (SM)					
★ B-4	SS-5	11.0 - 12.5'	Silty sand (SM)					
⊙ B-5	U-1	1.0 - 2.5'	Sandy silt (ML)	32	19	13		

Boring No.	Sample ID	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-3	SS-5	4.75	0.427	0.211		0.0	88.3	11.7	
⊠ B-4	SS-1	6.35	0.11			0.2	45.8	54.0	
▲ B-4	SS-3	6.35	0.276	0.127		0.1	83.8	16.1	
★ B-4	SS-5	19	0.192	0.085		4.1	71.2	24.8	
⊙ B-5	U-1	2	0.06	0.017		0.0	32.5	48.7	18.8

OLSSON, INC.
3800 SOUTH 6TH STREET
LINCOLN, NEBRASKA 68502

GRAIN SIZE DISTRIBUTION

PROJECT NAME: D7 Wetland Mitigation Study
CLIENT: Nebraska Department of Transportation
PROJECT NUMBER: 018-0451
PROJECT LOCATION: Orleans, Nebraska



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring No.	Sample ID	Depth (ft)	Classification	LL	PL	PI	Cc	Cu
● **B-5**	**SS-3**	**6.0 - 7.5'**	**Silty sand (SM)**					

Boring No.	Sample ID	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **B-5**	**SS-3**	**4.75**	**0.184**	**0.085**		**0.0**	**75.1**	**24.9**	

Appendix D

Preliminary Plan Set

ROADWAY DESIGN DIVISION.

File: 712160title.dgn Date: 15-MAR-2021 14:53 Computer: WS6272

olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	A1
◣ CONTROL NO. 71216		
▲ CONTROL NO.		
■ CONTROL NO.		

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

INDEX OF SHEETS

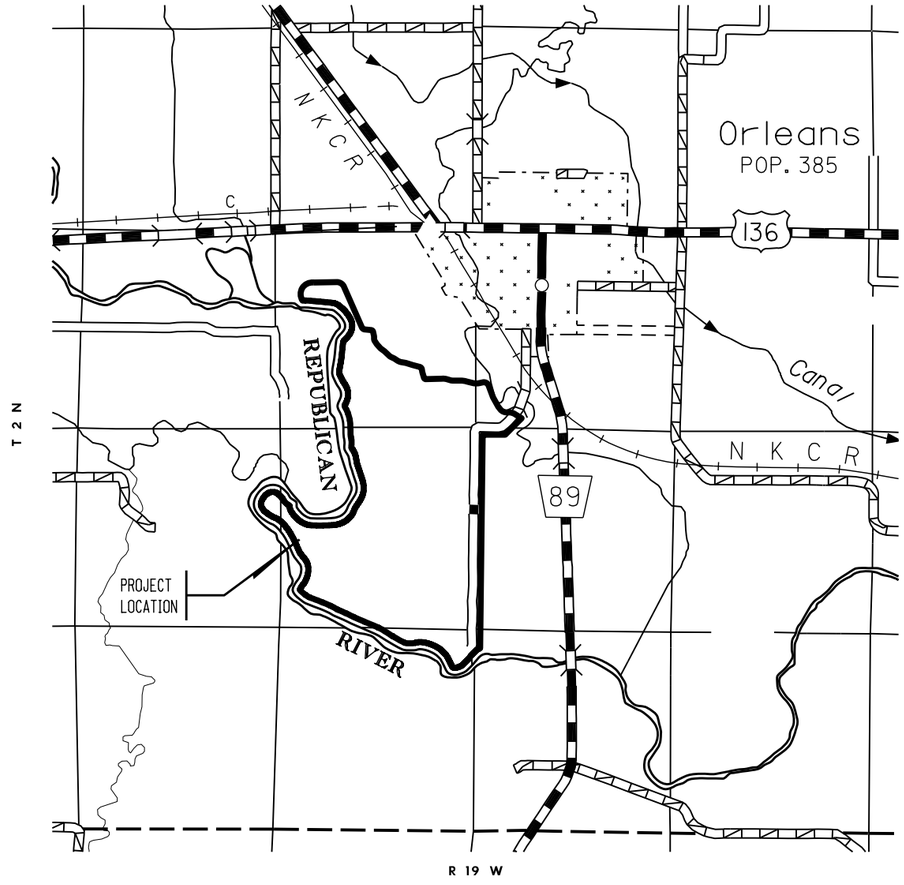
SHEET NO.	
A1	TITLE PAGE
B1	TYPICAL CROSS SECTIONS
E1 - E8	AERIAL PHOTO SHEETS
F1 - F6	HORIZONTAL ALIGNMENT & ORIENTATION
G1 - G2	GENERAL INFORMATION
J1 - J12	EROSION AND SEDIMENT CONTROL
J13	SEEDING
J14 - J16	CONTOURS
L1 - L14	PLAN AND PROFILE SHEETS
R1	DRAINAGE STRUCTURE CROSS SECTIONS
X1 - X37	CROSS SECTIONS

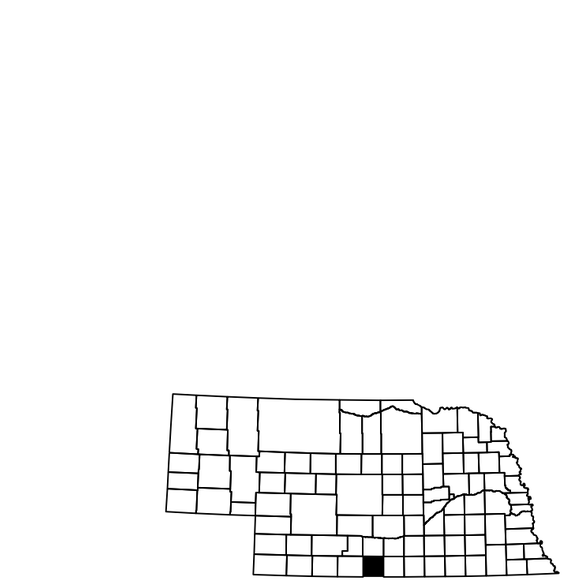
STATE OF NEBRASKA
DEPARTMENT OF TRANSPORTATION

FINAL DESIGN PLANS

DISTRICT 7 WETLAND BANK
HARLAN COUNTY

THE 2017 EDITION OF THE NEBRASKA STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS APPLY TO THIS PROJECT.





PROJECT TYPE

- ☐ 3R
- ☐ 3R w/SHOULDER WIDENING
- ☐ NEW RECONSTRUCTION
- ☒ FULL GRADING
- ☐ NEW ALIGNMENT

CONSULTANT PROJECT MANAGER: TONY BAUMERT
PHONE # 402-458-5669
CONSULTANT COORDINATOR: KIMBERLY BAKER
PHONE # 402-479-4544

CONVENTIONAL SIGNS

- FENCE R.O.W. OR WIRE
- GUARDRAIL
- TRAVELED WAY
- DIKE
- CULVERT
- POWER POLE
- TELEPHONE POLE
- MAILBOX
- RAILROAD TRACKS
- MARSH
- TREE - CONIFEROUS
- TREE - DECIDUOUS

R.O.W. LEGEND

- NEW CONTROLLED ACCESS
- PREVIOUS CONTROLLED ACCESS
- LIMITS OF CONSTRUCTION
- PREVIOUS R.O.W.
- NEW R.O.W.
- EXISTING PERMANENT EASEMENT
- TEMPORARY EASEMENT
- EXCESS TAKING
- PERMANENT EASEMENT
- EXISTING RAILROAD EASEMENT
- NEW RAILROAD PERMANENT EASEMENT
- NEW RAILROAD TEMPORARY EASEMENT

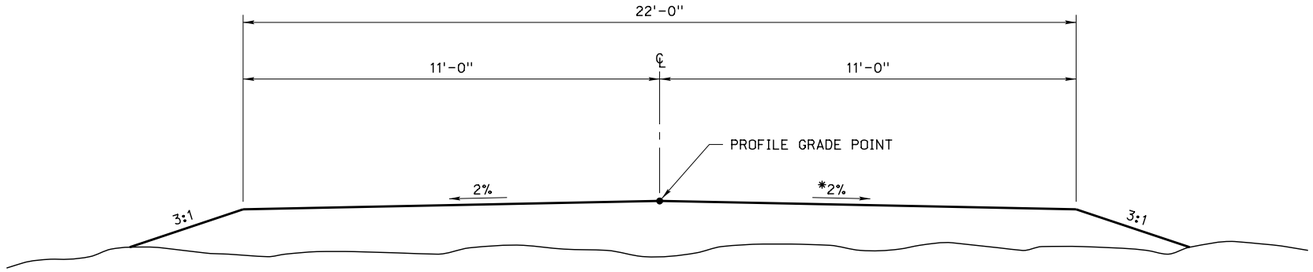
TENTATIVE LETTING: June 21, 2021

BALANCE FACTOR TO BE USED: 1.3

TOTAL NET LENGTH OF PROJECT: 23,763 FEET 4.50 MILES

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

TYPICAL CROSS SECTIONS

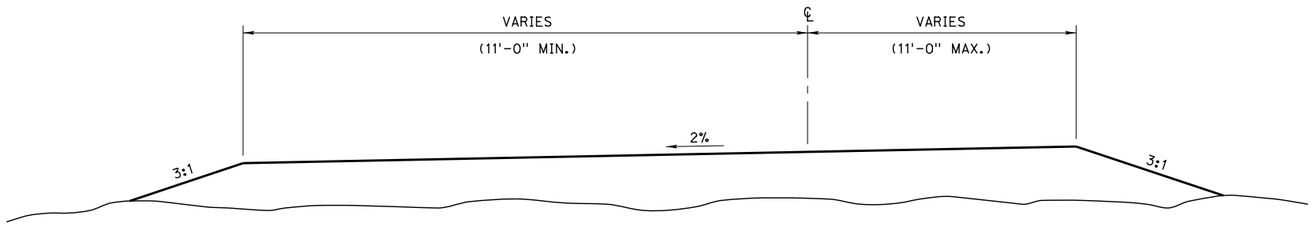


ROADS 1, 2 & 3 TYPICAL CROSS SECTION

STATION	TO	STATION
1019+00.00	-	1092+25.00
2000+00.00	-	2073+13.45
**3000+00.00	-	3070+28.36

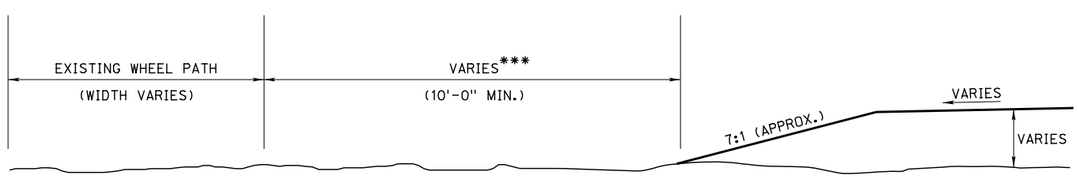
*SLOPE TO TRANSITION FROM CROWNED TO TANGENT BETWEEN STA 3070+00 AND STA 3070+28.36

**NO GRADE RAISE REQUIRED BETWEEN:
-STA 3047+50 AND STA 3049+40
-STA 3065+65 AND STA 3066+15



ROAD 3 TYPICAL CROSS SECTION

STATION	TO	STATION
3070+28.36	-	3072+34.00



ROAD 4 - SPOIL AREA

STATION	TO	STATION
4006+40.00	-	4016+70.00

***PLACEMENT OF WASTE IN RELATION TO EXISTING WHEEL PATH SHOULD MAINTAIN A 10' BUFFER TO ALLOW PLACEMENT OF EROSION CONTROL FEATURES.

ROADWAY DESIGN DIVISION
Computer: WS6272
Date: 15-MAR-2021 14:53
File: 712160ct01.dgn

ROADWAY DESIGN DIVISION.

Computer: WS6272

Date: 11-MAR-2021 18:10

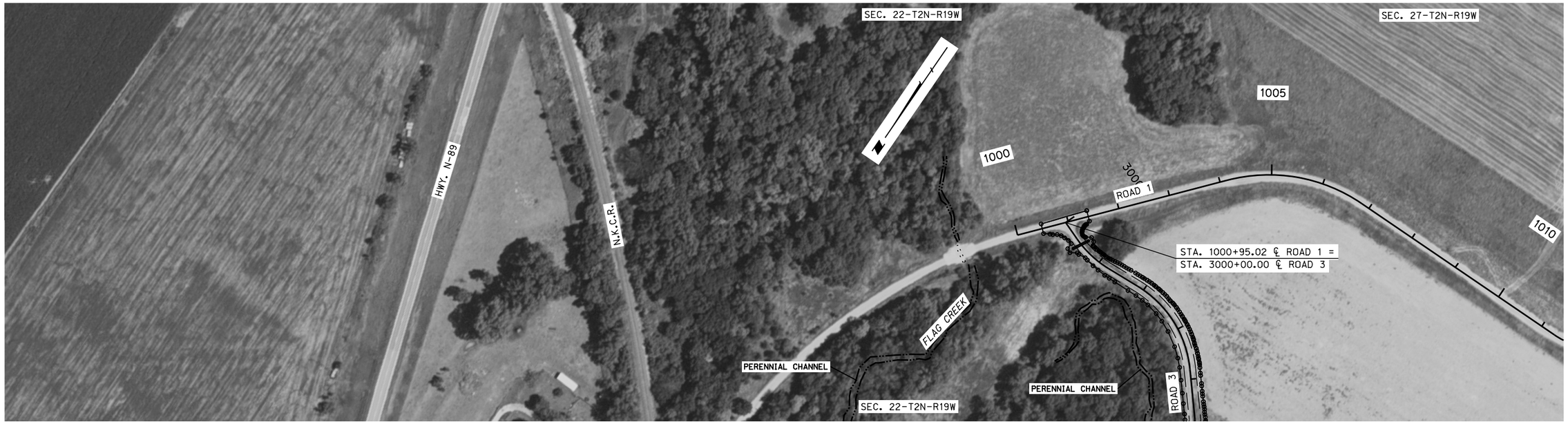
File: 712160cd01.dgn

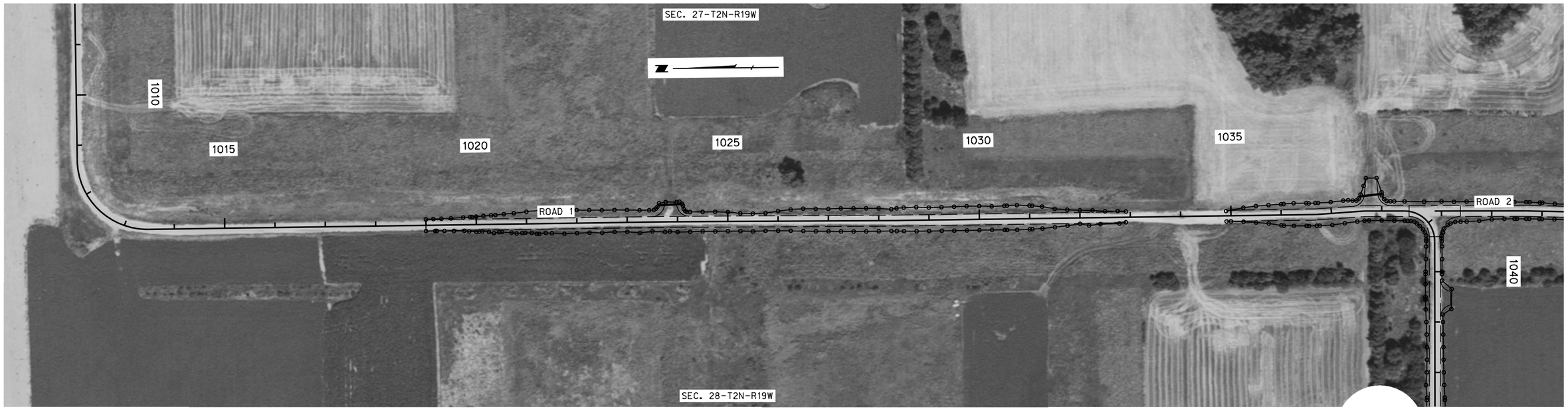
olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	E1
	C.N. 71216	

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

LEGEND

- SEN — SENSITIVE AREA - DO NOT ENTER
- HAZ — HAZARDOUS MATERIAL SITE
- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB
- IMPACTED WETLANDS
- TEMPORARY IMPACTED WETLANDS





DISTRICT 7 WETLAND BANK

HARLAN COUNTY

DATE: 2016
FLIGHT: NAIP

ROADWAY DESIGN DIVISION.

File: 712160cd02.dgn Date: 11-MAR-2021 18:11 Computer: WS6272

olsson

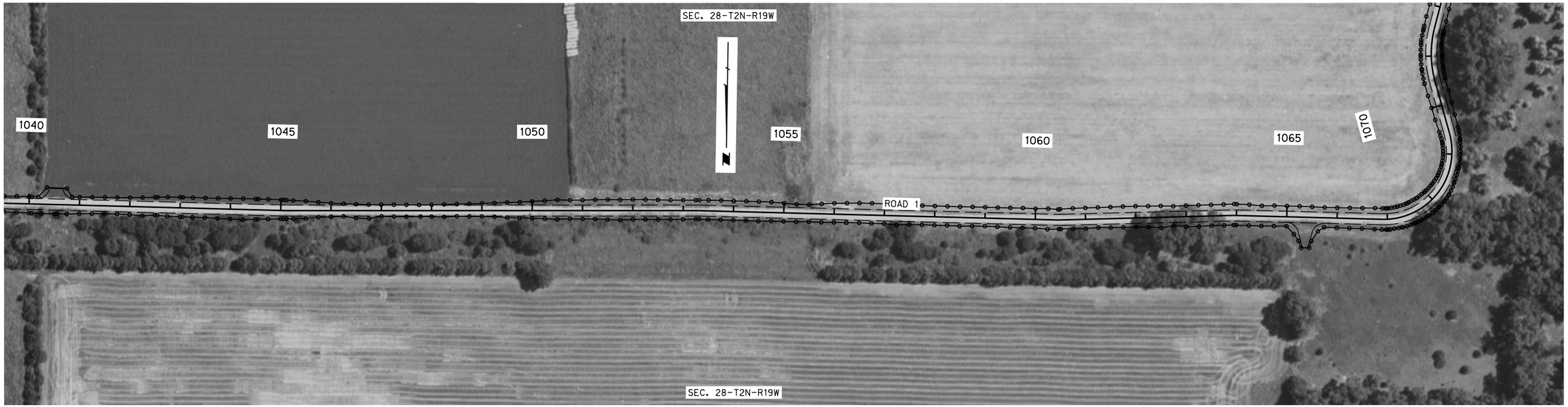
PROJECT NO.	SHEET NO.
MISC-D7(1007)	E2

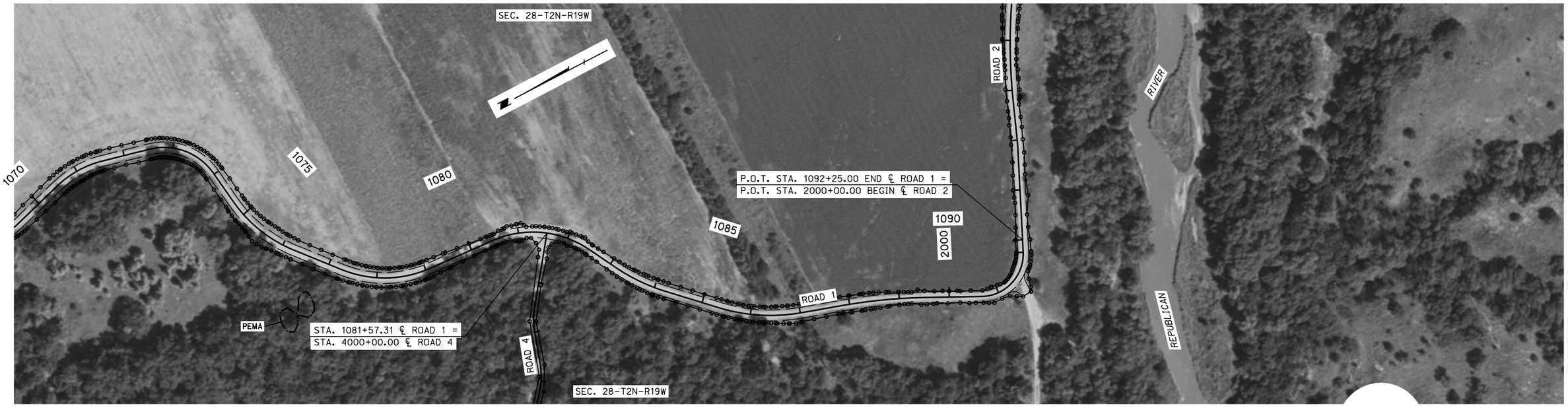
C.N. 71216

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

LEGEND

- SEN — SENSITIVE AREA - DO NOT ENTER
- HAZ — HAZARDOUS MATERIAL SITE
- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB
- IMPACTED WETLANDS
- TEMPORARY IMPACTED WETLANDS



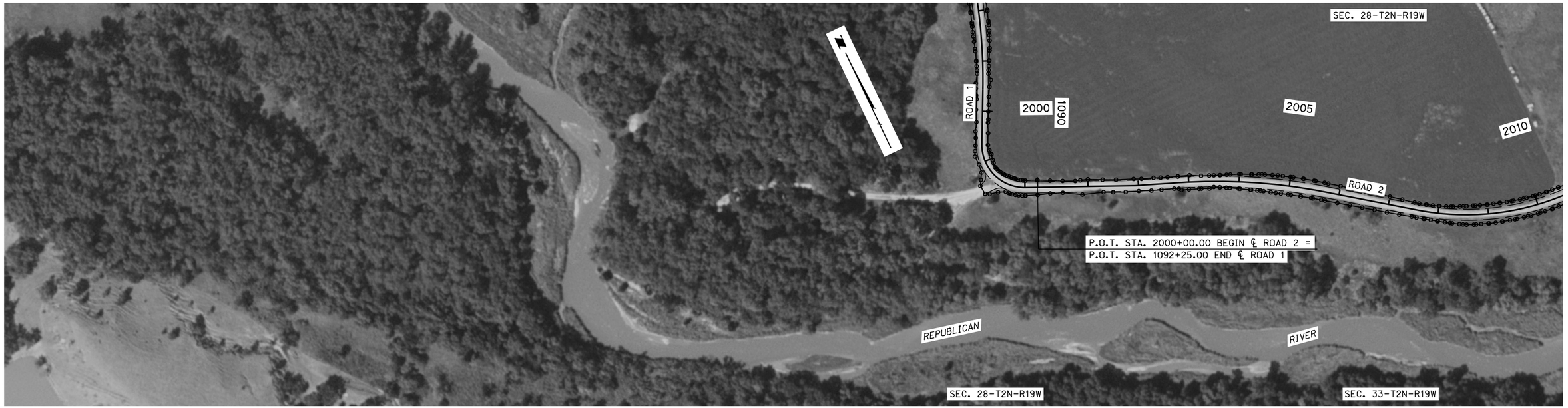


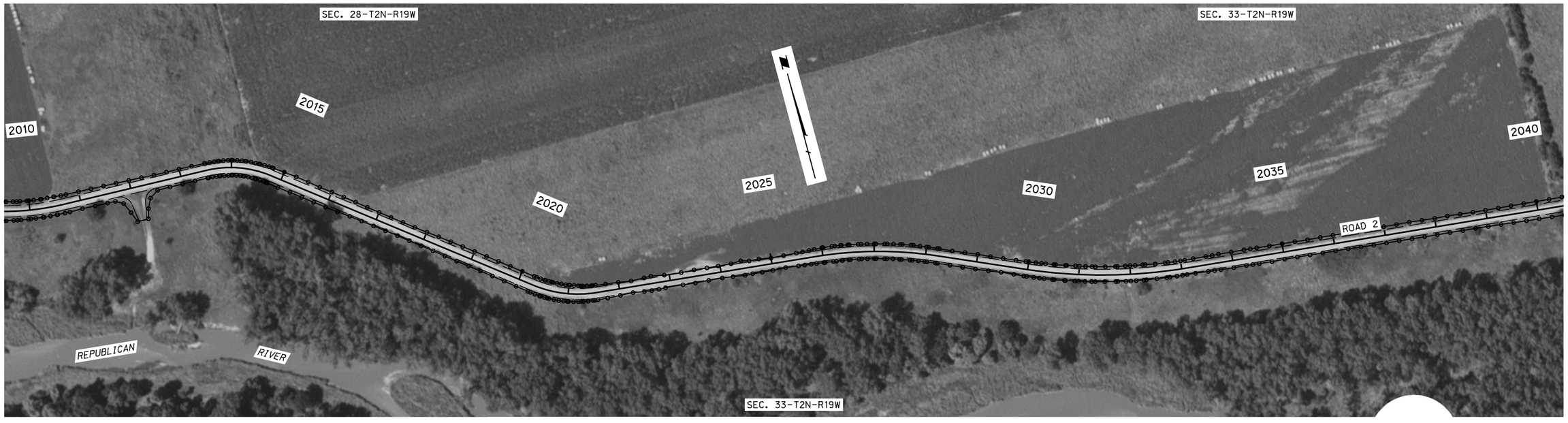
DATE: 2016
FLIGHT: NAIP

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

LEGEND

- SEN — SENSITIVE AREA - DO NOT ENTER
- HAZ — HAZARDOUS MATERIAL SITE
- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB
- IMPACTED WETLANDS
- TEMPORARY IMPACTED WETLANDS





DATE: 2016
FLIGHT: NAIP

ROADWAY DESIGN DIVISION.

Computer: WS6272
Date: 11-MAR-2021 18:12
File: 712160cd03.dgn

ROADWAY DESIGN DIVISION.

LEGEND

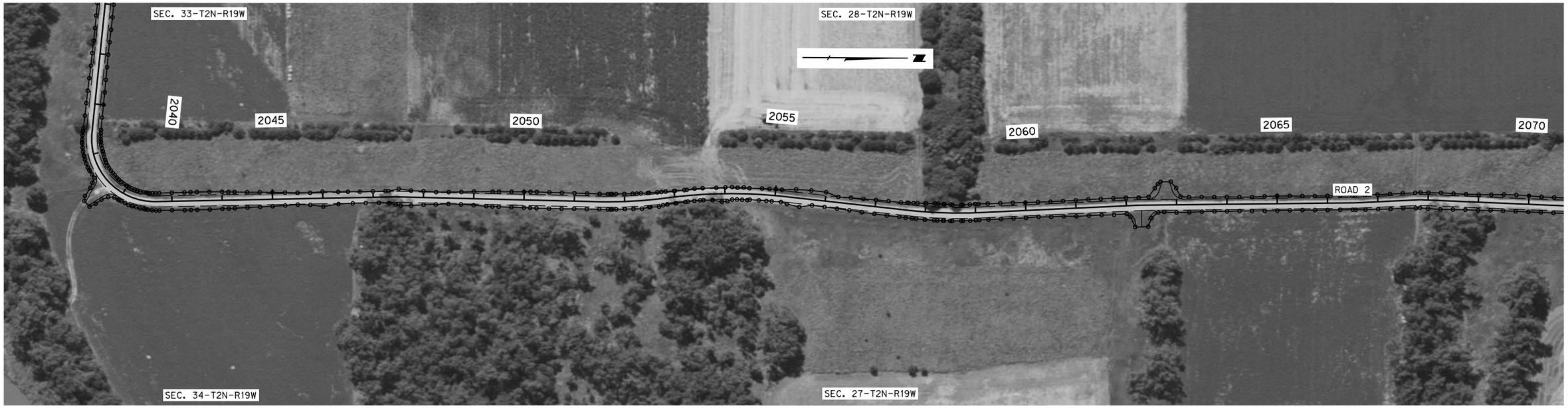
- SEN — SENSITIVE AREA - DO NOT ENTER
- HAZ — HAZARDOUS MATERIAL SITE
- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB
- IMPACTED WETLANDS
- TEMPORARY IMPACTED WETLANDS

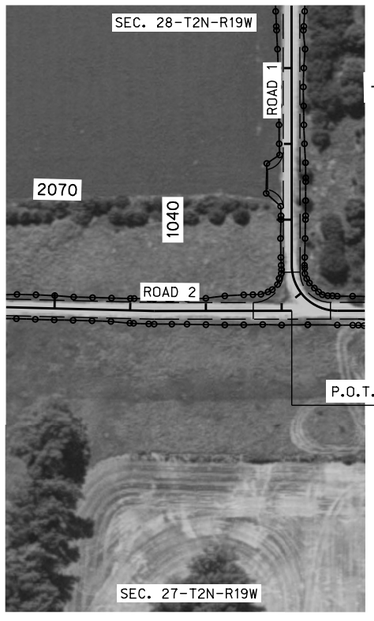
olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	E4

C.N. 71216

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE





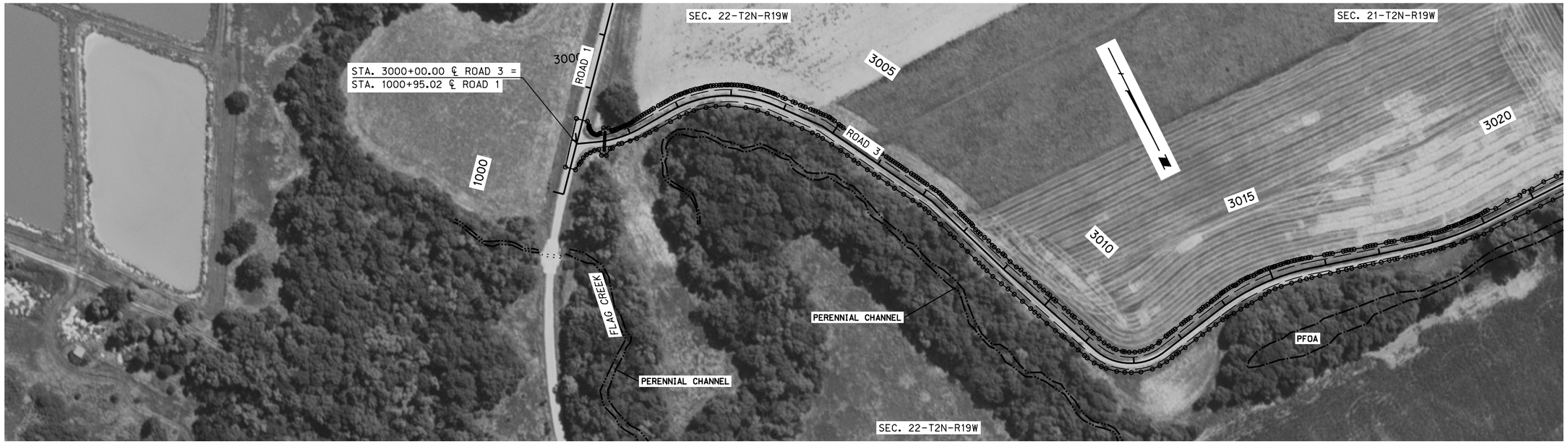
DATE: 2016
FLIGHT: NAIP

File: 712160cad04.dgn Date: 11-MAR-2021 18:13 Computer: WS6272

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

LEGEND

- SEN — SENSITIVE AREA - DO NOT ENTER
- HAZ — HAZARDOUS MATERIAL SITE
- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB
- IMPACTED WETLANDS
- TEMPORARY IMPACTED WETLANDS



DATE: 2016
FLIGHT: NAIP

ROADWAY DESIGN DIVISION.

Computer: WS6272
Date: 11-MAR-2021 18:14
File: 712160cd05.dgn

ROADWAY DESIGN DIVISION.

LEGEND

— SEN — SENSITIVE AREA - DO NOT ENTER
— HAZ — HAZARDOUS MATERIAL SITE
LIMITS OF CONSTRUCTION
WETLANDS - DO NOT DISTURB
IMPACTED WETLANDS
TEMPORARY IMPACTED WETLANDS

olsson | PROJECT NO. MISC-D7(1007) | SHEET NO. E6
C.N. 71216

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

DATE: 2016
FLIGHT: NAIP

File: 71216cad06.dgn Date: 11-MAR-2021 18:15 Computer: WS6272

ROADWAY DESIGN DIVISION.

File: 712160ca07.dgn Date: 11-MAR-2021 18:15 Computer: WS6272

LEGEND

- SEN — SENSITIVE AREA - DO NOT ENTER
- HAZ — HAZARDOUS MATERIAL SITE
- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB
- IMPACTED WETLANDS
- TEMPORARY IMPACTED WETLANDS

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	E7

C.N. 71216

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SEC. 28-T2N-R19W

REPUBLICAN RIVER

2005

1090

2000

0601

1085

4005

4010

4015

ROAD 4

STA. 4000+00.00 ℄ ROAD 4 =
STA. 1081+57.31 ℄ ROAD 1

1080

0801

1075

ROAD 1

PEMA

SEC. 28-T2N-R19W

REPUBLICAN RIVER

DATE: 2016
FLIGHT: NAIP

ROADWAY DESIGN DIVISION.

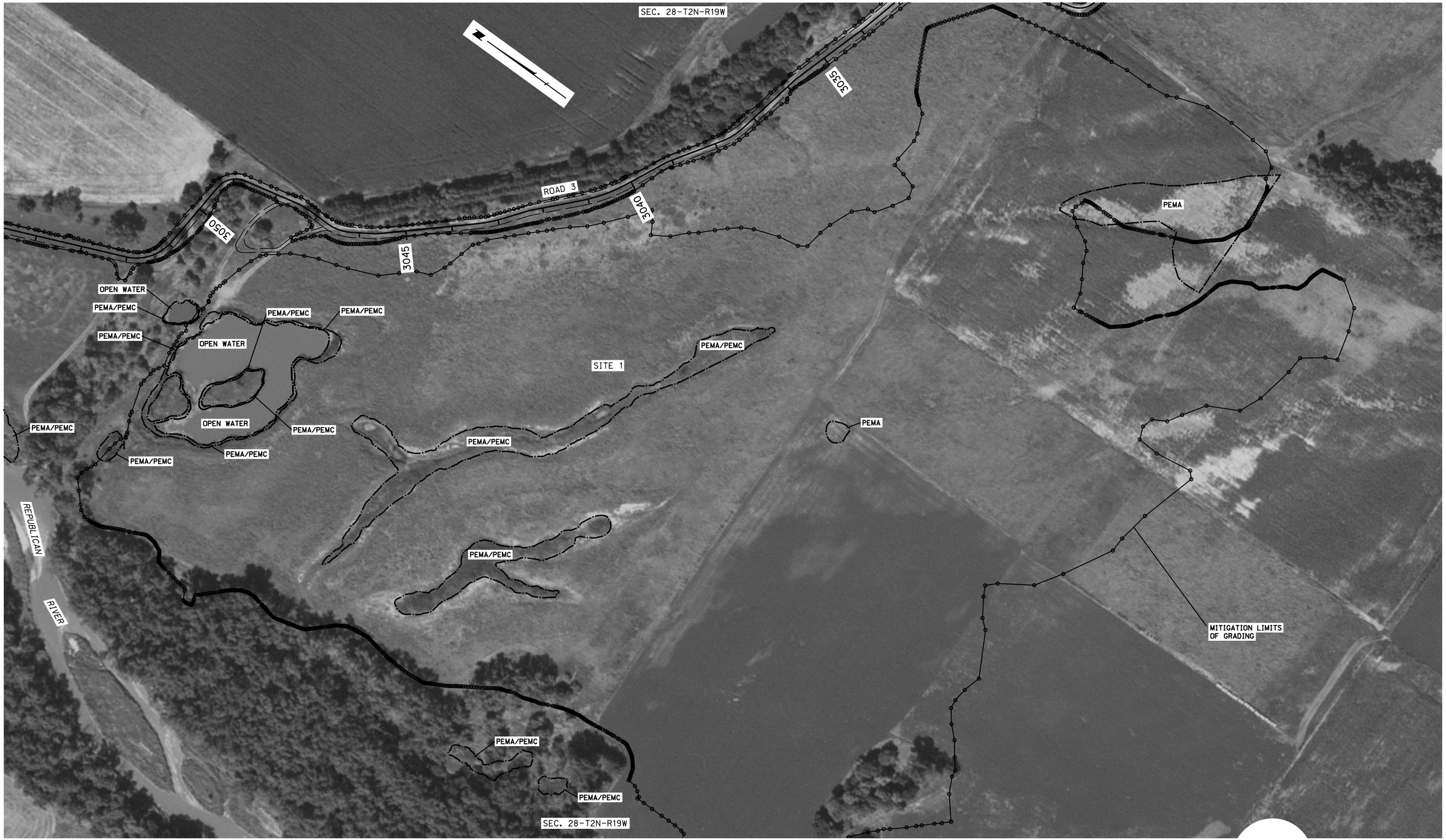
File: 712160ca08.dgn Date: 11-MAR-2021 18:16 Computer: WS6272

olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	E8
	C.N. 71216	

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

LEGEND

- SEN — SENSITIVE AREA - DO NOT ENTER
- HAZ — HAZARDOUS MATERIAL SITE
- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB
- IMPACTED WETLANDS
- TEMPORARY IMPACTED WETLANDS



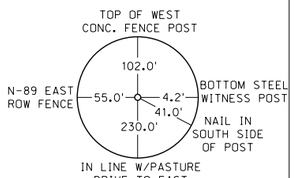
DATE: 2016
FLIGHT: NAIP

CONTROL POINT TIES & BENCH MARKS

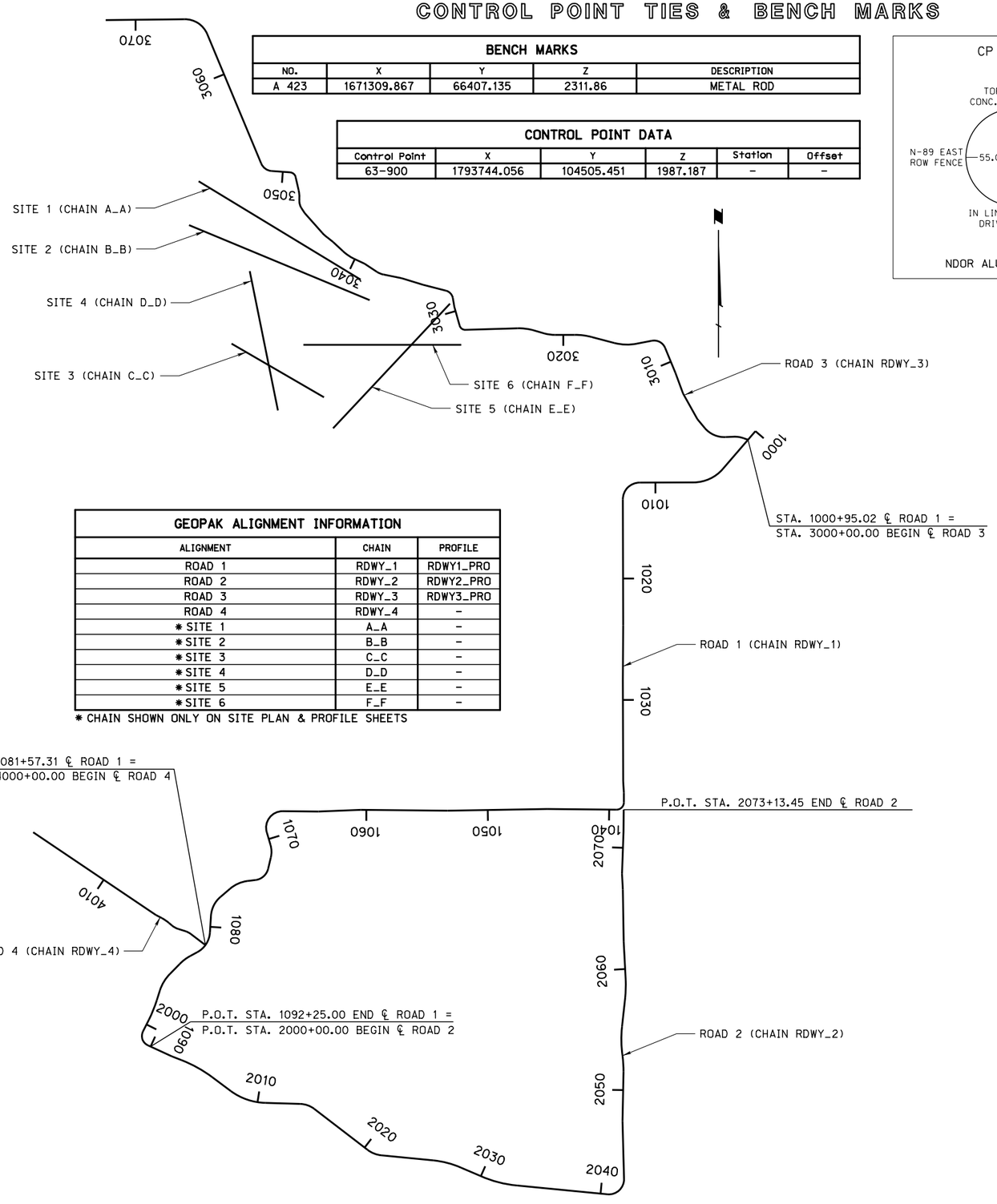
BENCH MARKS				
NO.	X	Y	Z	DESCRIPTION
A 423	1671309.867	66407.135	2311.86	METAL ROD

CONTROL POINT DATA					
Control Point	X	Y	Z	Station	Offset
63-900	1793744.056	104505.451	1987.187	-	-

CP 63-900



NDOR ALUM. CAP/CONC.



GEOPAK ALIGNMENT INFORMATION		
ALIGNMENT	CHAIN	PROFILE
ROAD 1	RDWY_1	RDWY1_PRO
ROAD 2	RDWY_2	RDWY2_PRO
ROAD 3	RDWY_3	RDWY3_PRO
ROAD 4	RDWY_4	-
* SITE 1	A_A	-
* SITE 2	B_B	-
* SITE 3	C_C	-
* SITE 4	D_D	-
* SITE 5	E_E	-
* SITE 6	F_F	-

* CHAIN SHOWN ONLY ON SITE PLAN & PROFILE SHEETS

DATUM INFORMATION

HORIZONTAL	VERTICAL
NAD 83 (1995)	NAVD 88

D.A.F. = 1.0001353

olsson | PROJECT NO. MISC-D7(1007) | SHEET NO. F1 | C.N. 71216

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROAD 1

Beginning chain RDWY_1 description
Feature: Mainline

Point 34 X 1,792,409.3278 Y 104,838.1214 Sta 1000+00.00

Course from 34 to PC RDWY_1_3 220° 49' 02.44" Dist 413.9357

Curve Data

Curve RDWY_1_3
P.I. Station 1005+57.49 X 1,792,044.9250 Y 104,416.2149
Delta = 49° 00' 00.00" (RT)
Degree = 18° 11' 20.89"
Tangent = 143.5538
Length = 269.3916
Radius = 315.0000
External = 31.1686
Long Chord = 261.2567
Mid. Ord. = 28.3622
P.C. Station 1004+13.94 X 1,792,138.7589 Y 104,524.8560
P.T. Station 1006+83.33 X 1,791,901.3719 Y 104,415.7573
C.C. X 1,791,900.3677 Y 104,730.7557
Back = 220° 49' 02.44"
Ahead = 269° 49' 02.44"
Chord Bear = 245° 19' 02.44"

Course from PT RDWY_1_3 to PC RDWY_1_6 269° 49' 02.44" Dist 445.4978

Curve Data

Curve RDWY_1_6
P.I. Station 1012+68.83 X 1,791,315.8771 Y 104,413.8908
Delta = 90° 00' 00.00" (LT)
Degree = 40° 55' 32.00"
Tangent = 140.0000
Length = 219.9115
Radius = 140.0000
External = 57.9899
Long Chord = 197.9899
Mid. Ord. = 41.0051
P.C. Station 1011+28.83 X 1,791,455.8764 Y 104,414.3371
P.T. Station 1013+48.74 X 1,791,316.3235 Y 104,273.8915
C.C. X 1,791,456.3227 Y 104,274.3378
Back = 269° 49' 02.44"
Ahead = 179° 49' 02.44"
Chord Bear = 224° 49' 02.44"

Course from PT RDWY_1_6 to 35 179° 49' 02.44" Dist 1,036.1601

Point 35 X 1,791,319.6267 Y 103,237.7367 Sta 1023+84.90

Course from 35 to 36 180° 19' 02.44" Dist 450.6946

Point 36 X 1,791,317.1304 Y 102,787.0490 Sta 1028+35.59

Course from 36 to 37 179° 49' 02.44" Dist 833.6746

Point 37 X 1,791,319.7881 Y 101,953.3786 Sta 1036+69.27

Course from 37 to 38 176° 34' 02.44" Dist 96.5429

Point 38 X 1,791,325.5686 Y 101,857.0090 Sta 1037+65.81

Course from 38 to PC RDWY_1_17 180° 34' 02.44" Dist 79.4834

Curve Data

Curve RDWY_1_17
P.I. Station 1039+05.29 X 1,791,324.1875 Y 101,717.5324
Delta = 90° 00' 00.00" (RT)
Degree = 95° 29' 34.68"
Tangent = 60.0000
Length = 94.2478
Radius = 60.0000
External = 24.8528
Long Chord = 84.8528
Mid. Ord. = 17.5736
P.C. Station 1038+45.29 X 1,791,324.7816 Y 101,777.5295
P.T. Station 1039+39.54 X 1,791,264.1904 Y 101,718.1265
C.C. X 1,791,264.7845 Y 101,778.1236
Back = 180° 34' 02.44"
Ahead = 270° 34' 02.44"
Chord Bear = 225° 34' 02.44"

HORIZONTAL ALIGNMENT & ORIENTATION

ROADWAY DESIGN DIVISION.

Computer: WS6272
Date: 15-MAR-2021 14:53
File: 712160ch01.dgn

DATUM INFORMATION

HORIZONTAL	VERTICAL
NAD 83 (1995)	NAVD 88

D.A.F. = 1.0001353

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

Computer: WS6272

Date: 15-MAR-2021 14:53

File: 712160ch02.dgn

ROAD 1

Course from PT RDWY_1_17 to 39 270° 34' 02.44" Dist 572.0065

Point 39 X 1,790,692.2119 Y 101,723.7905 Sta 1045+11.55

Course from 39 to 40 269° 04' 02.44" Dist 820.1834

Point 40 X 1,789,872.1372 Y 101,710.4402 Sta 1053+31.73

Course from 40 to 41 270° 34' 02.44" Dist 714.4148

Point 41 X 1,789,157.7574 Y 101,717.5143 Sta 1060+46.14

Course from 41 to 42 267° 34' 02.44" Dist 348.9688

Point 42 X 1,788,809.1031 Y 101,702.7022 Sta 1063+95.11

Course from 42 to PC RDWY_1_28 270° 34' 02.44" Dist 294.7985

Curve Data

Curve RDWY_1_28
P.I. Station 1068+72.35 X 1,788,331.8859 Y 101,707.4278
Delta = 107° 00' 00.00" (LT)
Degree = 42° 26' 28.75"
Tangent = 182.4420
Length = 252.1128
Radius = 135.0000
External = 91.9584
Long Chord = 217.0414
Mid. Ord. = 54.6989
P.C. Station 1066+89.91 X 1,788,514.3190 Y 101,705.6213
P.T. Station 1069+42.02 X 1,788,383.4966 Y 101,532.4380
C.C. X 1,788,512.9822 Y 101,570.6279
Back = 270° 34' 02.44"
Ahead = 163° 34' 02.44"
Chord Bear = 217° 04' 02.44"

Course from PT RDWY_1_28 to PC RDWY_1_31 163° 34' 02.44" Dist 108.8316

Curve Data

Curve RDWY_1_31
P.I. Station 1071+04.45 X 1,788,429.4437 Y 101,376.6511
Delta = 30° 00' 00.00" (RT)
Degree = 28° 38' 52.40"
Tangent = 53.5898
Length = 104.7198
Radius = 200.0000
External = 7.0552
Long Chord = 103.5276
Mid. Ord. = 6.8148
P.C. Station 1070+50.86 X 1,788,414.2837 Y 101,428.0519
P.T. Station 1071+55.58 X 1,788,416.8721 Y 101,324.5567
C.C. X 1,788,222.4532 Y 101,371.4743
Back = 163° 34' 02.44"
Ahead = 193° 34' 02.44"
Chord Bear = 178° 34' 02.44"

Course from PT RDWY_1_31 to PC RDWY_1_34 193° 34' 02.44" Dist 97.2700

Curve Data

Curve RDWY_1_34
P.I. Station 1073+35.32 X 1,788,374.7064 Y 101,149.8288
Delta = 69° 00' 00.00" (RT)
Degree = 47° 44' 47.34"
Tangent = 82.4737
Length = 144.5133
Radius = 120.0000
External = 25.6088
Long Chord = 135.9375
Mid. Ord. = 21.1049
P.C. Station 1072+52.85 X 1,788,394.0538 Y 101,230.0010
P.T. Station 1073+97.36 X 1,788,292.9257 Y 101,139.1599
C.C. X 1,788,277.4024 Y 101,258.1516
Back = 193° 34' 02.44"
Ahead = 262° 34' 02.44"
Chord Bear = 228° 04' 02.44"

Course from PT RDWY_1_34 to PC RDWY_1_37 262° 34' 02.44" Dist 69.9331

ROAD 1

Curve Data

Curve RDWY_1_37
P.I. Station 1075+48.75 X 1,788,142.8059 Y 101,119.5757
Delta = 33° 00' 00.00" (LT)
Degree = 20° 50' 05.38"
Tangent = 81.4587
Length = 158.3886
Radius = 275.0000
External = 11.8110
Long Chord = 156.2084
Mid. Ord. = 11.3246
P.C. Station 1074+67.29 X 1,788,223.5801 Y 101,130.1133
P.T. Station 1076+25.68 X 1,788,080.8020 Y 101,066.7454
C.C. X 1,788,259.1543 Y 100,857.4239
Back = 262° 34' 02.44"
Ahead = 229° 34' 02.44"
Chord Bear = 246° 04' 02.44"

Course from PT RDWY_1_37 to PC RDWY_1_40 229° 34' 02.44" Dist 103.0276

Curve Data

Curve RDWY_1_40
P.I. Station 1078+24.22 X 1,787,929.6838 Y 100,937.9851
Delta = 46° 00' 00.00" (LT)
Degree = 25° 27' 53.25"
Tangent = 95.5068
Length = 180.6416
Radius = 225.0000
External = 19.4311
Long Chord = 175.8290
Mid. Ord. = 17.8864
P.C. Station 1077+28.71 X 1,788,002.3806 Y 100,999.9264
P.T. Station 1079+09.35 X 1,787,923.7412 Y 100,842.6633
C.C. X 1,788,148.3052 Y 100,828.6634
Back = 229° 34' 02.44"
Ahead = 183° 34' 02.44"
Chord Bear = 206° 34' 02.44"

Course from PT RDWY_1_40 to PC RDWY_1_43 183° 34' 02.44" Dist 135.7937

Curve Data

Curve RDWY_1_43
P.I. Station 1081+56.01 X 1,787,908.3939 Y 100,596.4857
Delta = 58° 00' 00.00" (RT)
Degree = 28° 38' 52.40"
Tangent = 110.8618
Length = 202.4582
Radius = 200.0000
External = 28.6708
Long Chord = 193.9238
Mid. Ord. = 25.0761
P.C. Station 1080+45.14 X 1,787,915.2919 Y 100,707.1327
P.T. Station 1082+47.60 X 1,787,810.9045 Y 100,543.7016
C.C. X 1,787,715.6794 Y 100,719.5770
Back = 183° 34' 02.44"
Ahead = 241° 34' 02.44"
Chord Bear = 212° 34' 02.44"

Course from PT RDWY_1_43 to PC RDWY_1_46 241° 34' 02.44" Dist 65.6655

Curve Data

Curve RDWY_1_46
P.I. Station 1083+69.31 X 1,787,703.8758 Y 100,485.7525
Delta = 17° 00' 00.00" (LT)
Degree = 15° 16' 43.95"
Tangent = 56.0441
Length = 111.2647
Radius = 375.0000
External = 4.1648
Long Chord = 110.8571
Mid. Ord. = 4.1191
P.C. Station 1083+13.27 X 1,787,753.1598 Y 100,512.4366
P.T. Station 1084+24.53 X 1,787,664.5470 Y 100,445.8252
C.C. X 1,787,931.7068 Y 100,182.6701
Back = 241° 34' 02.44"
Ahead = 224° 34' 02.44"
Chord Bear = 233° 04' 02.44"

Course from PT RDWY_1_46 to PC RDWY_1_49 224° 34' 02.44" Dist 110.8025

ROAD 1

Curve Data

Curve RDWY_1_49
P.I. Station 1086+19.36 X 1,787,527.8256 Y 100,307.0232
Delta = 27° 00' 00.00" (LT)
Degree = 16° 22' 12.80"
Tangent = 84.0276
Length = 164.9336
Radius = 350.0000
External = 9.9453
Long Chord = 163.4118
Mid. Ord. = 9.6705
P.C. Station 1085+35.33 X 1,787,586.7917 Y 100,366.8867
P.T. Station 1087+00.27 X 1,787,502.4639 Y 100,226.9145
C.C. X 1,787,836.1409 Y 100,121.2752
Back = 224° 34' 02.44"
Ahead = 197° 34' 02.44"
Chord Bear = 211° 04' 02.44"

Course from PT RDWY_1_49 to PC RDWY_1_52 197° 34' 02.44" Dist 83.4095

Curve Data

Curve RDWY_1_52
P.I. Station 1088+70.25 X 1,787,451.1590 Y 100,064.8606
Delta = 9° 00' 00.00" (RT)
Degree = 5° 12' 31.35"
Tangent = 86.5719
Length = 172.7876
Radius = 1,100.0000
External = 3.4014
Long Chord = 172.6100
Mid. Ord. = 3.3909
P.C. Station 1087+83.68 X 1,787,477.2887 Y 100,147.3950
P.T. Station 1089+56.47 X 1,787,412.4398 Y 99,987.4299
C.C. X 1,786,428.5895 Y 100,479.4042
Back = 197° 34' 02.44"
Ahead = 206° 34' 02.44"
Chord Bear = 202° 04' 02.44"

Course from PT RDWY_1_52 to PC RDWY_1_55 206° 34' 02.44" Dist 108.0878

Curve Data

Curve RDWY_1_55
P.I. Station 1091+52.57 X 1,787,324.7306 Y 99,812.0292
Delta = 92° 00' 00.00" (LT)
Degree = 67° 24' 24.48"
Tangent = 88.0201
Length = 136.4847
Radius = 85.0000
External = 37.3623
Long Chord = 122.2878
Mid. Ord. = 25.9540
P.C. Station 1090+64.55 X 1,787,364.0976 Y 99,890.7551
P.T. Station 1092+01.04 X 1,787,404.7825 Y 99,775.4337
C.C. X 1,787,440.1223 Y 99,852.7389
Back = 206° 34' 02.44"
Ahead = 114° 34' 02.44"
Chord Bear = 160° 34' 02.44"

Course from PT RDWY_1_55 to 43 114° 34' 02.44" Dist 23.9619

Point 43 X 1,787,426.5752 Y 99,765.4713 Sta 1092+25.00

==========

Ending chain RDWY_1 description

HORIZONTAL ALIGNMENT & ORIENTATION

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

DATUM INFORMATION

HORIZONTAL	VERTICAL
NAD 83 (1995)	NAVD 88

D.A.F. = 1.0001353

ROAD 2

Beginning chain RDWY_2 description
Feature: Mainline

Point 44 X 1,787,426.5752 Y 99,765.4713 Sta 2000+00.00

Course from 44 to 45 114° 34' 02.44" Dist 192.4989

Point 45 X 1,787,601.6478 Y 99,685.4374 Sta 2001+92.50

Course from 45 to PC RDWY_2_5 111° 34' 02.44" Dist 86.8692

Curve Data

Curve RDWY_2_5					
P.I. Station	2004+24.19	X	1,787,817.1135	Y	99,600.2706
Delta =	15° 00' 00.00" (RT)				
Degree =	5° 12' 31.35"				
Tangent =	144.8177				
Length =	287.9793				
Radius =	1,100.0000				
External =	9.4919				
Long Chord =	287.1576				
Mid. Ord. =	9.4107				
P.C. Station	2002+79.37	X	1,787,682.4350	Y	99,653.5048
P.T. Station	2005+67.35	X	1,787,933.4249	Y	99,513.9929
C.C.		X	1,787,278.0809	Y	98,630.5200

Back = 111° 34' 02.44"
Ahead = 126° 34' 02.44"
Chord Bear = 119° 04' 02.44"

Course from PT RDWY_2_5 to PC RDWY_2_8 126° 34' 02.44" Dist 192.2432

Curve Data

Curve RDWY_2_8					
P.I. Station	2009+17.24	X	1,788,214.4436	Y	99,305.5384
Delta =	35° 00' 00.00" (LT)				
Degree =	11° 27' 32.96"				
Tangent =	157.6494				
Length =	305.4326				
Radius =	500.0000				
External =	24.2646				
Long Chord =	300.7058				
Mid. Ord. =	23.1415				
P.C. Station	2007+59.59	X	1,788,087.8263	Y	99,399.4607
P.T. Station	2010+65.02	X	1,788,372.0340	Y	99,301.2264
C.C.		X	1,788,385.7100	Y	99,801.0393

Back = 126° 34' 02.44"
Ahead = 91° 34' 02.44"
Chord Bear = 109° 04' 02.44"

Course from PT RDWY_2_8 to PC RDWY_2_11 91° 34' 02.44" Dist 286.7844

Curve Data

Curve RDWY_2_11					
P.I. Station	2014+16.79	X	1,788,723.6707	Y	99,291.6048
Delta =	36° 00' 00.00" (RT)				
Degree =	28° 38' 52.40"				
Tangent =	64.9839				
Length =	125.6637				
Radius =	200.0000				
External =	10.2924				
Long Chord =	123.6068				
Mid. Ord. =	9.7887				
P.C. Station	2013+51.81	X	1,788,658.7111	Y	99,293.3823
P.T. Station	2014+77.47	X	1,788,775.1794	Y	99,251.9845
C.C.		X	1,788,653.2407	Y	99,093.4571

Back = 91° 34' 02.44"
Ahead = 127° 34' 02.44"
Chord Bear = 109° 34' 02.44"

Course from PT RDWY_2_11 to PC RDWY_2_14 127° 34' 02.44" Dist 552.6583

ROAD 2

Curve Data

Curve RDWY_2_14					
P.I. Station	2020+94.65	X	1,789,264.3761	Y	98,875.6963
Delta =	32° 00' 00.00" (LT)				
Degree =	25° 27' 53.25"				
Tangent =	64.5177				
Length =	125.6637				
Radius =	225.0000				
External =	9.0674				
Long Chord =	124.0368				
Mid. Ord. =	8.7161				
P.C. Station	2020+30.13	X	1,789,213.2370	Y	98,915.0324
P.T. Station	2021+55.79	X	1,789,328.5895	Y	98,869.4371
C.C.		X	1,789,350.4180	Y	99,093.3757

Back = 127° 34' 02.44"
Ahead = 95° 34' 02.44"
Chord Bear = 111° 34' 02.44"

Course from PT RDWY_2_14 to PC RDWY_2_17 95° 34' 02.44" Dist 429.7407

Curve Data

Curve RDWY_2_17					
P.I. Station	2027+04.32	X	1,789,874.5311	Y	98,816.2212
Delta =	18° 00' 00.00" (RT)				
Degree =	7° 38' 21.97"				
Tangent =	118.7883				
Length =	235.6194				
Radius =	750.0000				
External =	9.3488				
Long Chord =	234.6517				
Mid. Ord. =	9.2337				
P.C. Station	2025+85.53	X	1,789,756.3031	Y	98,827.7455
P.T. Station	2028+21.15	X	1,789,983.4113	Y	98,768.7264
C.C.		X	1,789,683.5413	Y	98,081.2834

Back = 95° 34' 02.44"
Ahead = 113° 34' 02.44"
Chord Bear = 104° 34' 02.44"

Course from PT RDWY_2_17 to PC RDWY_2_20 113° 34' 02.44" Dist 173.2123

Curve Data

Curve RDWY_2_20					
P.I. Station	2031+52.75	X	1,790,287.3498	Y	98,636.1452
Delta =	18° 00' 00.00" (LT)				
Degree =	5° 43' 46.48"				
Tangent =	158.3844				
Length =	314.1593				
Radius =	1,000.0000				
External =	12.4651				
Long Chord =	312.8689				
Mid. Ord. =	12.3117				
P.C. Station	2029+94.37	X	1,790,142.1761	Y	98,699.4715
P.T. Station	2033+08.53	X	1,790,444.9872	Y	98,620.7794
C.C.		X	1,790,542.0028	Y	99,616.0623

Back = 113° 34' 02.44"
Ahead = 95° 34' 02.44"
Chord Bear = 104° 34' 02.44"

Course from PT RDWY_2_20 to PC RDWY_2_23 95° 34' 02.44" Dist 747.8717

Curve Data

Curve RDWY_2_23					
P.I. Station	2041+97.68	X	1,791,329.9514	Y	98,534.5171
Delta =	97° 00' 00.00" (LT)				
Degree =	45° 50' 11.84"				
Tangent =	141.2868				
Length =	211.6212				
Radius =	125.0000				
External =	63.6451				
Long Chord =	187.2389				
Mid. Ord. =	42.1725				
P.C. Station	2040+56.40	X	1,791,189.3310	Y	98,548.2242
P.T. Station	2042+68.02	X	1,791,326.4189	Y	98,675.7598
C.C.		X	1,791,201.4580	Y	98,672.6345

Back = 95° 34' 02.44"
Ahead = 358° 34' 02.44"
Chord Bear = 47° 04' 02.44"

Course from PT RDWY_2_23 to 46 358° 34' 02.44" Dist 477.4978

Point 46 X 1,791,314.4806 Y 99,153.1083 Sta 2047+45.52

Course from 46 to PC RDWY_2_28 1° 04' 02.44" Dist 404.3187

ROAD 2

Curve Data

Curve RDWY_2_28					
P.I. Station	2052+16.73	X	1,791,323.2582	Y	99,624.2417
Delta =	9° 00' 00.00" (LT)				
Degree =	6° 44' 26.45"				
Tangent =	66.8965				
Length =	133.5177				
Radius =	850.0000				
External =	2.6284				
Long Chord =	133.3805				
Mid. Ord. =	2.6203				
P.C. Station	2051+49.83	X	1,791,322.0120	Y	99,557.3568
P.T. Station	2052+83.35	X	1,791,314.0259	Y	99,690.4980
C.C.		X	1,790,472.1595	Y	99,573.1903

Back = 1° 04' 02.44"
Ahead = 352° 04' 02.44"
Chord Bear = 356° 34' 02.44"

Course from PT RDWY_2_28 to PC RDWY_2_31 352° 04' 02.36" Dist 0.0839

Curve Data

Curve RDWY_2_31					
P.I. Station	2054+03.15	X	1,791,297.4925	Y	99,809.1505
Delta =	14° 00' 00.00" (RT)				
Degree =	5° 52' 35.36"				
Tangent =	119.7149				
Length =	238.2374				
Radius =	975.0000				
External =	7.3221				
Long Chord =	237.6452				
Mid. Ord. =	7.2675				
P.C. Station	2052+83.44	X	1,791,314.0143	Y	99,690.5811
P.T. Station	2055+21.67	X	1,791,310.1461	Y	99,928.1948
C.C.		X	1,792,279.6845	Y	99,825.1399

Back = 352° 04' 02.44"
Ahead = 6° 04' 02.44"
Chord Bear = 359° 04' 02.44"

Course from PT RDWY_2_31 to PC RDWY_2_34 6° 04' 02.44" Dist 243.7683

Curve Data

Curve RDWY_2_34					
P.I. Station	2058+36.27	X	1,791,343.3984	Y	100,241.0323
Delta =	9° 00' 00.00" (LT)				
Degree =	6° 21' 58.31"				
Tangent =	70.8315				
Length =	141.3717				
Radius =	900.0000				
External =	2.7830				
Long Chord =	141.2264				
Mid. Ord. =	2.7744				
P.C. Station	2057+65.44	X	1,791,335.9117	Y	100,170.5976
P.T. Station	2059+06.81	X	1,791,339.7746	Y	100,311.7711
C.C.		X	1,790,440.9532	Y	100,265.7252

Back = 6° 04' 02.44"
Ahead = 357° 04' 02.44"
Chord Bear = 1° 34' 02.44"

Course from PT RDWY_2_34 to 47 357° 04' 02.44" Dist 318.3161

Point 47 X 1,791,323.4888 Y 100,629.6703 Sta 2062+25.13

Course from 47 to 48 359° 04' 02.44" Dist 429.7798

Point 48 X 1,791,316.4932 Y 101,059.3931 Sta 2066+54.91

Course from 48 to 49 357° 04' 02.44" Dist 129.6113

Point 49 X 1,791,309.8620 Y 101,188.8347 Sta 2067+84.52

Course from 49 to 50 2° 04' 02.54" Dist 347.2312

Point 50 X 1,791,322.3883 Y 101,535.8399 Sta 2071+31.75

Course from 50 to 51 0° 34' 02.44" Dist 181.7014

Point 51 X 1,791,324.1875 Y 101,717.5324 Sta 2073+13.45

Ending chain RDWY_2 description

HORIZONTAL ALIGNMENT & ORIENTATION

ROADWAY DESIGN DIVISION.
Computer: WS6272
Date: 15-MAR-2021 14:53
File: 712160ch03.dgn

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

DATUM INFORMATION

HORIZONTAL	VERTICAL
NAD 83 (1995)	NAVD 88

D.A.F. = 1.0001353

ROAD 3

Beginning chain RDWY_3 description
Feature: Mainline

Point 81 X 1,792,347.2175 Y 104,766.2098 Sta 3000+00.00

Course from 81 to PC RDWY_3_3 290° 46' 57.98" Dist 38.0694

Curve Data

Curve RDWY_3_3
P.I. Station 3000+80.58 X 1,792,271.8799 Y 104,794.8020
Delta = 24° 00' 00.00" (LT)
Degree = 28° 38' 52.40"
Tangent = 42.5113
Length = 83.7758
Radius = 200.0000
External = 4.4681
Long Chord = 83.1647
Mid. Ord. = 4.3705
P.C. Station 3000+38.07 X 1,792,311.6251 Y 104,779.7179
P.T. Station 3001+21.85 X 1,792,229.4356 Y 104,792.4162
C.C. X 1,792,240.6599 Y 104,592.7314
Back = 290° 46' 57.98"
Ahead = 266° 46' 57.98"
Chord Bear = 278° 46' 57.98"

Course from PT RDWY_3_3 to PC RDWY_3_6 266° 46' 57.98" Dist 64.7868

Curve Data

Curve RDWY_3_6
P.I. Station 3002+91.33 X 1,792,060.2138 Y 104,782.9042
Delta = 53° 00' 00.00" (RT)
Degree = 27° 17' 01.34"
Tangent = 104.7021
Length = 194.2551
Radius = 210.0000
External = 24.6541
Long Chord = 187.4031
Mid. Ord. = 22.0638
P.C. Station 3001+86.63 X 1,792,164.7509 Y 104,788.7802
P.T. Station 3003+80.89 X 1,791,992.6089 Y 104,862.8549
C.C. X 1,792,152.9653 Y 104,998.4493
Back = 266° 46' 57.98"
Ahead = 319° 46' 57.98"
Chord Bear = 293° 16' 57.98"

Course from PT RDWY_3_6 to 82 319° 46' 57.98" Dist 96.3055

Point 82 X 1,791,930.4257 Y 104,936.3940 Sta 3004+77.19

Course from 82 to 83 330° 46' 57.98" Dist 241.4434

Point 83 X 1,791,812.5719 Y 105,147.1198 Sta 3007+18.64

Course from 83 to 84 339° 46' 57.98" Dist 181.3640

Point 84 X 1,791,749.8960 Y 105,317.3098 Sta 3009+00.00

Course from 84 to PC RDWY_3_15 337° 49' 59.60" Dist 221.9366

Curve Data

Curve RDWY_3_15
P.I. Station 3012+04.44 X 1,791,635.0281 Y 105,599.2524
Delta = 79° 03' 01.61" (LT)
Degree = 57° 17' 44.81"
Tangent = 82.5076
Length = 137.9691
Radius = 100.0000
External = 29.6438
Long Chord = 127.2836
Mid. Ord. = 22.8656
P.C. Station 3011+21.94 X 1,791,666.1585 Y 105,522.8429
P.T. Station 3012+59.91 X 1,791,554.0966 Y 105,583.2022
C.C. X 1,791,573.5495 Y 105,485.1126
Back = 337° 49' 59.60"
Ahead = 258° 46' 57.98"
Chord Bear = 298° 18' 28.79"

Course from PT RDWY_3_15 to PC RDWY_3_18 258° 46' 57.98" Dist 123.8378

ROAD 3

Curve Data

Curve RDWY_3_18
P.I. Station 3014+79.55 X 1,791,338.6445 Y 105,540.4742
Delta = 26° 00' 00.00" (RT)
Degree = 13° 48' 22.36"
Tangent = 95.8103
Length = 188.3210
Radius = 415.0000
External = 10.9162
Long Chord = 186.7094
Mid. Ord. = 10.6364
P.C. Station 3013+83.74 X 1,791,432.6245 Y 105,559.1121
P.T. Station 3015+72.06 X 1,791,246.0055 Y 105,564.9207
C.C. X 1,791,351.8949 Y 105,966.1843
Back = 258° 46' 57.98"
Ahead = 284° 46' 57.98"
Chord Bear = 271° 46' 57.98"

Course from PT RDWY_3_18 to PC RDWY_3_21 284° 46' 57.98" Dist 191.0696

Curve Data

Curve RDWY_3_21
P.I. Station 3018+35.54 X 1,790,991.2482 Y 105,632.1486
Delta = 15° 00' 00.00" (LT)
Degree = 10° 25' 02.69"
Tangent = 72.4089
Length = 143.9897
Radius = 550.0000
External = 4.7459
Long Chord = 143.5788
Mid. Ord. = 4.7053
P.C. Station 3017+63.13 X 1,791,061.2603 Y 105,613.6731
P.T. Station 3019+07.12 X 1,790,918.8398 Y 105,631.8741
C.C. X 1,790,920.9250 Y 105,081.8780
Back = 284° 46' 57.98"
Ahead = 269° 46' 57.98"
Chord Bear = 277° 16' 57.98"

Course from PT RDWY_3_21 to PC RDWY_3_24 269° 46' 57.98" Dist 161.1839

Curve Data

Curve RDWY_3_24
P.I. Station 3021+13.98 X 1,790,711.9816 Y 105,631.0898
Delta = 16° 00' 00.00" (RT)
Degree = 17° 37' 46.09"
Tangent = 45.6758
Length = 90.7571
Radius = 325.0000
External = 3.1940
Long Chord = 90.4625
Mid. Ord. = 3.1629
P.C. Station 3020+68.31 X 1,790,757.6571 Y 105,631.2630
P.T. Station 3021+59.06 X 1,790,668.0278 Y 105,643.5132
C.C. X 1,790,756.4249 Y 105,956.2606
Back = 269° 46' 57.98"
Ahead = 285° 46' 57.98"
Chord Bear = 277° 46' 57.98"

Course from PT RDWY_3_24 to PC RDWY_3_27 285° 46' 57.98" Dist 100.3503

Curve Data

Curve RDWY_3_27
P.I. Station 3023+20.98 X 1,790,512.2159 Y 105,687.5529
Delta = 17° 30' 00.00" (LT)
Degree = 14° 19' 26.20"
Tangent = 61.5659
Length = 122.1730
Radius = 400.0000
External = 4.7102
Long Chord = 121.6987
Mid. Ord. = 4.6554
P.C. Station 3022+59.42 X 1,790,571.4608 Y 105,670.8076
P.T. Station 3023+81.59 X 1,790,450.6777 Y 105,685.7080
C.C. X 1,790,462.6644 Y 105,285.8876
Back = 285° 46' 57.98"
Ahead = 268° 16' 57.98"
Chord Bear = 277° 01' 57.98"

Course from PT RDWY_3_27 to PC RDWY_3_30 268° 16' 57.98" Dist 429.9565

ROAD 3

Curve Data

Curve RDWY_3_30
P.I. Station 3028+50.61 X 1,789,981.8675 Y 105,671.6529
Delta = 76° 00' 00.00" (RT)
Degree = 114° 35' 29.61"
Tangent = 39.0643
Length = 66.3225
Radius = 50.0000
External = 13.4509
Long Chord = 61.5661
Mid. Ord. = 10.5995
P.C. Station 3028+11.54 X 1,790,020.9142 Y 105,672.8236
P.T. Station 3028+77.87 X 1,789,971.2854 Y 105,709.2566
C.C. X 1,790,019.4159 Y 105,722.8011
Back = 268° 16' 57.98"
Ahead = 344° 16' 57.98"
Chord Bear = 306° 16' 57.98"

Course from PT RDWY_3_30 to 85 344° 16' 57.98" Dist 159.1764

Point 85 X 1,789,928.1661 Y 105,862.4814 Sta 3030+37.04

Course from 85 to PC RDWY_3_35 350° 16' 57.98" Dist 74.1793

Curve Data

Curve RDWY_3_35
P.I. Station 3031+59.93 X 1,789,907.4249 Y 105,983.6032
Delta = 66° 00' 00.00" (LT)
Degree = 76° 23' 39.74"
Tangent = 48.7056
Length = 86.3938
Radius = 75.0000
External = 14.4272
Long Chord = 81.6959
Mid. Ord. = 12.0997
P.C. Station 3031+11.22 X 1,789,915.6457 Y 105,935.5964
P.T. Station 3031+97.62 X 1,789,860.2248 Y 105,995.6192
C.C. X 1,789,841.7218 Y 105,922.9375
Back = 350° 16' 57.98"
Ahead = 284° 16' 57.98"
Chord Bear = 317° 16' 57.98"

Course from PT RDWY_3_35 to 86 284° 16' 57.98" Dist 194.1986

Point 86 X 1,789,672.0289 Y 106,043.5295 Sta 3033+91.82

Course from 86 to 87 287° 16' 57.98" Dist 184.7118

Point 87 X 1,789,495.6568 Y 106,098.4052 Sta 3035+76.53

Course from 87 to PC RDWY_3_42 281° 16' 57.98" Dist 153.0601

Curve Data

Curve RDWY_3_42
P.I. Station 3037+58.74 X 1,789,316.9612 Y 106,134.0562
Delta = 22° 00' 00.00" (RT)
Degree = 38° 11' 49.87"
Tangent = 29.1570
Length = 57.5959
Radius = 150.0000
External = 2.8075
Long Chord = 57.2427
Mid. Ord. = 2.7559
P.C. Station 3037+29.59 X 1,789,345.5548 Y 106,128.3516
P.T. Station 3037+87.18 X 1,789,292.5867 Y 106,150.0567
C.C. X 1,789,374.9025 Y 106,275.4526
Back = 281° 16' 57.98"
Ahead = 303° 16' 57.98"
Chord Bear = 292° 16' 57.98"

Course from PT RDWY_3_42 to 88 303° 16' 57.98" Dist 123.4619

Point 88 X 1,789,189.3760 Y 106,217.8091 Sta 3039+10.64

Course from 88 to PC RDWY_3_47 295° 16' 57.98" Dist 97.9604

HORIZONTAL ALIGNMENT & ORIENTATION

ROADWAY DESIGN DIVISION.
Computer: WS6272
Date: 15-MAR-2021 14:53
File: 712160ch04.dgn

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

DATUM INFORMATION

HORIZONTAL	VERTICAL
NAD 83 (1995)	NAVD 88

D.A.F. = 1.0001353

ROAD 3

Curve Data

Curve RDWY_3_47
P.I. Station 3040+64.16 X 1,789,050.5678 Y 106,283.3724
Delta = 18° 02' 15.83" (RT)
Degree = 16° 22' 12.80"
Tangent = 55.5527
Length = 110.1862
Radius = 350.0000
External = 4.3813
Long Chord = 109.7318
Mid. Ord. = 4.3271
P.C. Station 3040+08.61 X 1,789,100.7991 Y 106,259.6466
P.T. Station 3041+18.79 X 1,789,010.1517 Y 106,321.4859
C.C. X 1,789,250.2792 Y 106,576.1205
Back = 295° 16' 57.98"
Ahead = 313° 19' 13.81"
Chord Bear = 304° 18' 05.90"

Course from PT RDWY_3_47 to 89 313° 19' 13.81" Dist 109.8739

Point 89 X 1,788,930.2154 Y 106,396.8681 Sta 3042+28.67

Course from 89 to PC RDWY_3_52 307° 19' 13.81" Dist 60.9377

Curve Data

Curve RDWY_3_52
P.I. Station 3043+18.49 X 1,788,858.7819 Y 106,451.3263
Delta = 11° 00' 00.00" (RT)
Degree = 19° 05' 54.94"
Tangent = 28.8867
Length = 57.5959
Radius = 300.0000
External = 1.3875
Long Chord = 57.5075
Mid. Ord. = 1.3811
P.C. Station 3042+89.60 X 1,788,881.7542 Y 106,433.8130
P.T. Station 3043+47.20 X 1,788,839.5733 Y 106,472.9010
C.C. X 1,789,063.6361 Y 106,672.3900
Back = 307° 19' 13.81"
Ahead = 318° 19' 13.81"
Chord Bear = 312° 49' 13.81"

Course from PT RDWY_3_52 to 90 318° 19' 13.81" Dist 215.6819

Point 90 X 1,788,696.1527 Y 106,633.9888 Sta 3045+62.88

Course from 90 to PC RDWY_3_57 327° 19' 13.81" Dist 53.4924

Curve Data

Curve RDWY_3_57
P.I. Station 3046+46.95 X 1,788,650.7625 Y 106,704.7470
Delta = 34° 00' 00.00" (RT)
Degree = 57° 17' 44.81"
Tangent = 30.5731
Length = 59.3412
Radius = 100.0000
External = 4.5692
Long Chord = 58.4743
Mid. Ord. = 4.3695
P.C. Station 3046+16.37 X 1,788,667.2701 Y 106,679.0135
P.T. Station 3046+75.71 X 1,788,651.4671 Y 106,735.3119
C.C. X 1,788,751.4405 Y 106,733.0074
Back = 327° 19' 13.81"
Ahead = 1° 19' 13.81"
Chord Bear = 344° 19' 13.81"

Course from PT RDWY_3_57 to PC RDWY_3_60 1° 19' 13.81" Dist 26.6945

ROAD 3

Curve Data

Curve RDWY_3_60
P.I. Station 3047+33.11 X 1,788,652.7896 Y 106,792.6873
Delta = 14° 00' 00.00" (LT)
Degree = 22° 55' 05.92"
Tangent = 30.6961
Length = 61.0865
Radius = 250.0000
External = 1.8775
Long Chord = 60.9347
Mid. Ord. = 1.8635
P.C. Station 3047+02.41 X 1,788,652.0823 Y 106,761.9993
P.T. Station 3047+63.50 X 1,788,646.0519 Y 106,822.6348
C.C. X 1,788,402.1486 Y 106,767.7606
Back = 1° 19' 13.81"
Ahead = 347° 19' 13.81"
Chord Bear = 354° 19' 13.81"

Course from PT RDWY_3_60 to PC RDWY_3_63 347° 19' 13.81" Dist 111.3471

Curve Data

Curve RDWY_3_63
P.I. Station 3049+11.84 X 1,788,613.4906 Y 106,967.3623
Delta = 73° 00' 00.00" (LT)
Degree = 114° 35' 29.61"
Tangent = 36.9981
Length = 63.7045
Radius = 50.0000
External = 12.2001
Long Chord = 59.4823
Mid. Ord. = 9.8072
P.C. Station 3048+74.84 X 1,788,621.6116 Y 106,931.2665
P.T. Station 3049+38.55 X 1,788,576.5977 Y 106,970.1496
C.C. X 1,788,572.8309 Y 106,920.2916
Back = 347° 19' 13.81"
Ahead = 274° 19' 13.81"
Chord Bear = 310° 49' 13.81"

Course from PT RDWY_3_63 to PC RDWY_3_66 274° 19' 13.81" Dist 154.0324

Curve Data

Curve RDWY_3_66
P.I. Station 3051+53.86 X 1,788,361.8970 Y 106,986.3702
Delta = 63° 00' 00.00" (RT)
Degree = 57° 17' 44.81"
Tangent = 61.2801
Length = 109.9557
Radius = 100.0000
External = 17.2828
Long Chord = 104.4997
Mid. Ord. = 14.7360
P.C. Station 3050+92.58 X 1,788,423.0030 Y 106,981.7537
P.T. Station 3052+02.54 X 1,788,338.2689 Y 107,042.9119
C.C. X 1,788,430.5365 Y 107,081.4695
Back = 274° 19' 13.81"
Ahead = 337° 19' 13.81"
Chord Bear = 305° 49' 13.81"

Course from PT RDWY_3_66 to PC RDWY_3_69 337° 19' 13.81" Dist 1,156.4262

Curve Data

Curve RDWY_3_69
P.I. Station 3064+93.86 X 1,787,840.3640 Y 108,234.3893
Delta = 67° 59' 59.91" (LT)
Degree = 28° 38' 52.40"
Tangent = 134.9016
Length = 237.3647
Radius = 200.0000
External = 41.2436
Long Chord = 223.6771
Mid. Ord. = 34.1925
P.C. Station 3063+58.96 X 1,787,892.3788 Y 108,109.9188
P.T. Station 3065+96.33 X 1,787,705.4719 Y 108,232.7895
C.C. X 1,787,707.8436 Y 108,032.8036
Back = 337° 19' 13.81"
Ahead = 269° 19' 13.90"
Chord Bear = 303° 19' 13.85"

Course from PT RDWY_3_69 to 91 269° 19' 13.90" Dist 648.6738

Point 91 X 1,787,056.8437 Y 108,225.0971 Sta 3072+45.00

==========
Ending chain RDWY_3 description

ROAD 4

Beginning chain RDWY_4 description
Feature: Mainline
==========

Point 55 X 1,787,878.0946 Y 100,602.8667 Sta 4000+00.00

Course from 55 to PC RDWY_4_3 306° 58' 20.60" Dist 153.7426

Curve Data

Curve RDWY_4_3
P.I. Station 4001+74.66 X 1,787,738.5539 Y 100,707.9127
Delta = 19° 00' 00.00" (LT)
Degree = 45° 50' 11.84"
Tangent = 20.9178
Length = 41.4516
Radius = 125.0000
External = 1.7381
Long Chord = 41.2619
Mid. Ord. = 1.7143
P.C. Station 4001+53.74 X 1,787,755.2657 Y 100,695.3321
P.T. Station 4001+95.19 X 1,787,718.6568 Y 100,714.3671
C.C. X 1,787,680.0869 Y 100,595.4664
Back = 306° 58' 20.60"
Ahead = 287° 58' 20.60"
Chord Bear = 297° 28' 20.60"

Course from PT RDWY_4_3 to PC RDWY_4_6 287° 58' 20.60" Dist 69.4582

Curve Data

Curve RDWY_4_6
P.I. Station 4002+93.81 X 1,787,624.8534 Y 100,744.7957
Delta = 22° 00' 00.00" (RT)
Degree = 38° 11' 49.87"
Tangent = 29.1570
Length = 57.5959
Radius = 150.0000
External = 2.8075
Long Chord = 57.2427
Mid. Ord. = 2.7559
P.C. Station 4002+64.65 X 1,787,652.5877 Y 100,735.7990
P.T. Station 4003+22.25 X 1,787,602.5088 Y 100,763.5267
C.C. X 1,787,698.8715 Y 100,878.4798
Back = 287° 58' 20.60"
Ahead = 309° 58' 20.60"
Chord Bear = 298° 58' 20.60"

Course from PT RDWY_4_6 to PC RDWY_4_9 309° 58' 20.60" Dist 35.1576

Curve Data

Curve RDWY_4_9
P.I. Station 4003+91.56 X 1,787,549.3878 Y 100,808.0569
Delta = 12° 00' 00.00" (LT)
Degree = 17° 37' 46.09"
Tangent = 34.1589
Length = 68.0678
Radius = 325.0000
External = 1.7902
Long Chord = 67.9435
Mid. Ord. = 1.7804
P.C. Station 4003+57.41 X 1,787,575.5656 Y 100,786.1126
P.T. Station 4004+25.47 X 1,787,519.2196 Y 100,824.0789
C.C. X 1,787,366.7796 Y 100,537.0475
Back = 309° 58' 20.60"
Ahead = 297° 58' 20.60"
Chord Bear = 303° 58' 20.60"

Course from PT RDWY_4_9 to 56 297° 58' 20.60" Dist 54.7145

Point 56 X 1,787,470.8972 Y 100,849.7425 Sta 4004+80.19

Course from 56 to 57 303° 58' 20.60" Dist 1,219.8118

Point 57 X 1,786,459.2988 Y 101,531.3652 Sta 4017+00.00

==========
Ending chain RDWY_4 description

HORIZONTAL ALIGNMENT & ORIENTATION

ROADWAY DESIGN DIVISION.
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Date: 15-MAR-2021 14:53
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PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

DATUM INFORMATION

HORIZONTAL	VERTICAL
NAD 83 (1995)	NAVD 88

D.A.F. = 1.0001353

A_A

Beginning chain A_A description

Point 60	X	1,787,822.2640 Y	106,896.8100 Sta	0+00.00	
Course from 60 to 61 121° 16' 21.34" Dist 1,560.1161					
Point 61	X	1,789,155.7066 Y	106,086.9379 Sta	12+60.12	

Ending chain A_A description

B_B

Beginning chain B_B description

Point 62	X	1,787,742.5182 Y	106,536.3206 Sta	0+00.00	
Course from 62 to 31 112° 35' 12.81" Dist 1,612.4538					
Point 63	X	1,789,231.2937 Y	105,917.0027 Sta	12+60.12	

Ending chain B_B description

C_C

Beginning chain C_C description

Point 64	X	1,788,092.8108 Y	105,558.5975 Sta	0+00.00	
Course from 64 to 65 120° 06' 49.63" Dist 880.2028					
Point 65	X	1,788,854.2132 Y	105,116.9832 Sta	8+80.20	

Ending chain C_C description

D_D

Beginning chain D_D description

Point 66	X	1,788,242.5755 Y	106,155.8614 Sta	0+00.00	
Course from 66 to 67 168° 33' 16.61" Dist 1,169.7888					
Point 67	X	1,788,474.7011 Y	105,009.3347 Sta	11+69.79	

Ending chain D_D description

E_E

Beginning chain E_E description

Point 68	X	1,789,893.1578 Y	105,888.0091 Sta	0+00.00	
Course from 68 to 69 223° 10' 56.64" Dist 1,407.5700					
Point 69	X	1,788,929.9250 Y	104,861.6388 Sta	14+07.57	

Ending chain E_E description

F_F

Beginning chain F_F description

Point 70	X	1,788,685.5199 Y	105,549.2089 Sta	0+00.00	
Course from 70 to 71 90° 00' 00.00" Dist 1,300.0000					
Point 71	X	1,789,985.5199 Y	105,549.0289 Sta	13+00.00	

Ending chain F_F description

HORIZONTAL ALIGNMENT & ORIENTATION

ROADWAY DESIGN DIVISION.
Computer: WS6272
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File: 71216ch06.dgn

GENERAL INFORMATION

olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	G1
	C.N. 71216	

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION

NOTES

- The locations of all aerial and underground utility facilities may not be indicated in these plans. Underground utilities, whether indicated or not will be located and flagged by the Utilities at the request of the Contractor.

  No excavation will be permitted in the area of underground utility facilities until all such facilities have been located and identified to the satisfaction of all parties. The excavation must be accomplished with extreme care in order to avoid any possibility of damage to the utility facility.

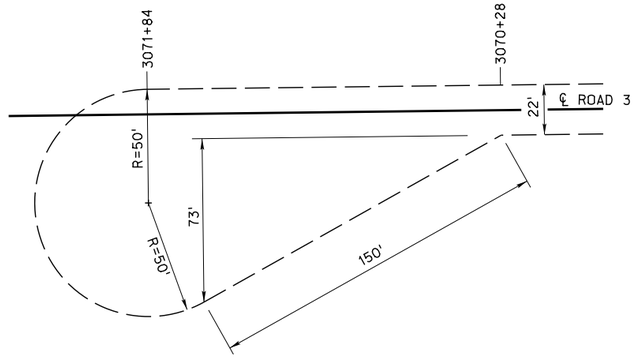
- The contractor will not be required to furnish borrow.

- The contractor will not be required to furnish borrow.

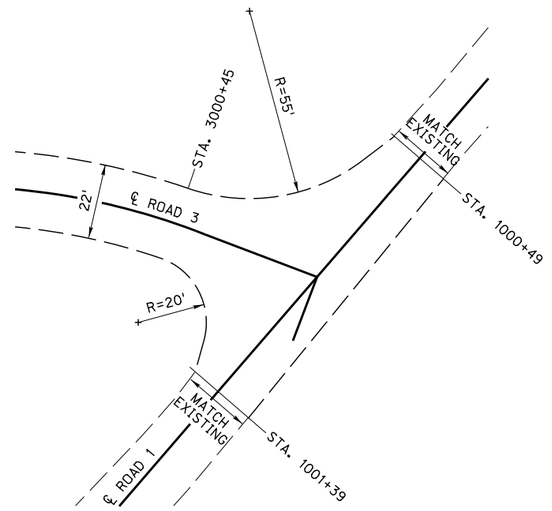
- SENSITIVE AREAS
  Sensitive Areas are designated on the Environmental Plans. The contractor may not work, stage, stockpile or store materials or equipment as described in the Environmental Commitments in the Special Provisions.

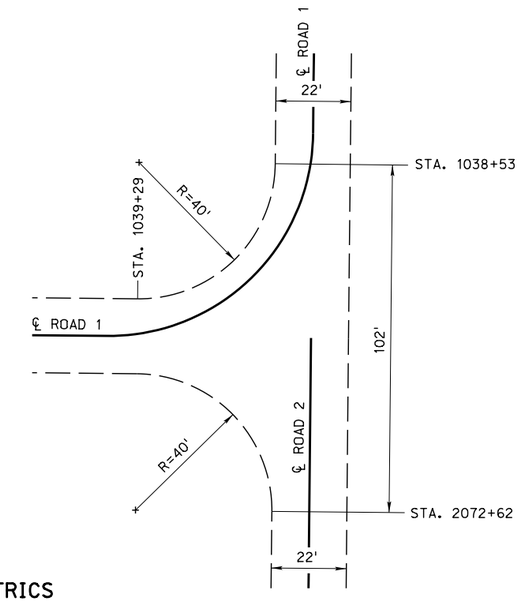
EARTHWORK

DESCRIPTION	STATION TO STATION	EXCAVATION (CU. YDS.)	EMBANKMENT (CU. YDS.)	BALANCE FACTOR	ADJUSTED EMBANKMENT (CU. YDS.)
MITIGATION		223225	8571	1.3	11142
ROAD 1	1019+00.00 - 1092+25.00	30	17457	1.3	22694
ROAD 2	2000+00.00 - 2073+13.45	80	14542	1.3	18905
ROAD 3	3000+00.00 - 3072+40.00	664	14688	1.3	19094
SPOIL AREA	4006+55.00 - 4016+30.00	0	117049	1.3	152164
TOTAL		223999	172307		223999



ROAD 3 TURNAROUND GEOMETRICS
NOT TO SCALE

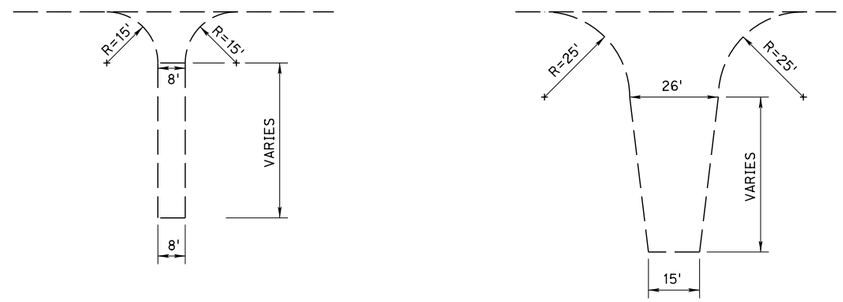




INTERSECTION GEOMETRICS
NOT TO SCALE

CULVERT PIPE LEGEND

TYPE		DESCRIPTION
1	RCSP	Reinforced Concrete Sewer Pipe
2	RCP	Reinforced Concrete Pipe
3	GCCMP	Galvanized (zinc) Coated Corrugated Metal Pipe
4	ACCMP	Aluminum Coated Corrugated Metal Pipe
5	PCCMP	Polymer Coated Corrugated Metal Pipe
6	HDPE-CI	High Density Polyethylene (corrugated Interior)
7	HDPE-SI	High Density Polyethylene (smooth Interior)
8	PVC	Polyvinyl Chloride Pipe



FIELD ENTRANCE GEOMETRICS
NOT TO SCALE

LEGEND

- GAS LINE
- ELECTRICAL SERVICE
- POWER LINE
- OVERHEAD POWER LINE
- SANITARY SEWER
- STORM SEWER
- TELEPHONE LINE
- FIBER OPTIC TELE. LINE
- OVERHEAD TELEPHONE LINE
- CABLE TV LINE
- OVERHEAD CABLE TV LINE
- WATER LINE
- FENCE - CHAIN LINK
- FENCE - R.O.W. OR WIRE
- FENCE - WOOD
- FLOWLINE
- CENTER LINE DRIVE
- BENCH MARK
- CENTER PIVOT
- CONTROL POINT
- xxxxxxxxx DIKE
- GAS METER
- GAS VALVE
- GRID TICK
- GUARDRAIL
- GUARD POST
- GUY POLE
- GUY WIRE
- OR LIGHT POLE
- MAILBOX
- MANHOLE
- MARSH
- OIL WELL
- PHOTO CODE POINT
- POWER BOX
- POWER POLE
- POWER PULL BOX
- PROPANE TANK
- R.O.W. MARKER
- ADVANCED R.R. WARNING SIGN
- RAILROAD WARNING
- RAILROAD TRACKS
- RETAINING WALL
- SATELLITE DISH
- SIGN
- TRAFFIC SIGNAL
- TRAFFIC SIGNAL/ST. LIGHT
- TELEPHONE BOX
- TELE. FIBER OPTICS BOX
- TELEPHONE PULL BOX
- TELEPHONE POLE
- TELEVISION BOX
- TREE - CONIFEROUS
- TREE - DECIDUOUS
- TREE STUMP
- WATER (FIRE) HYDRANT
- WATER VALVE
- WATER METER
- WELL
- WINDMILL

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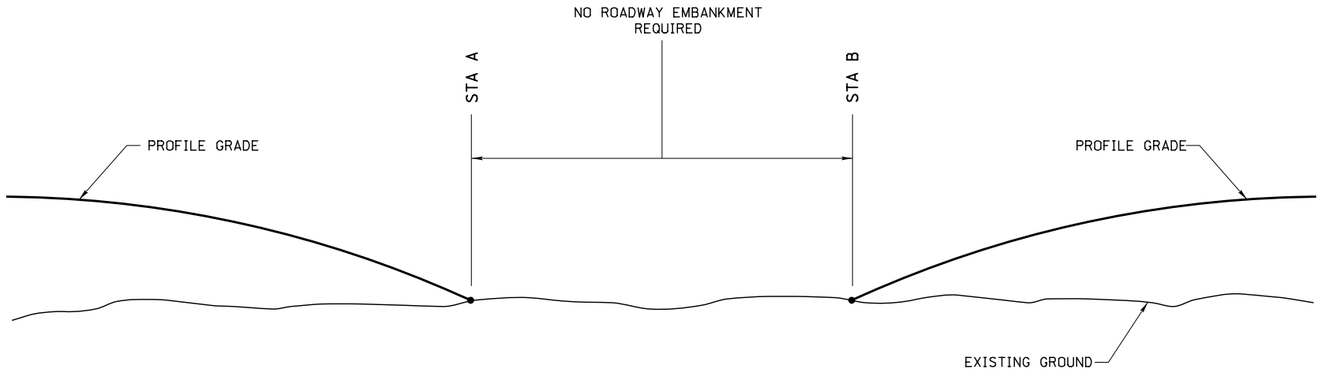
GENERAL INFORMATION

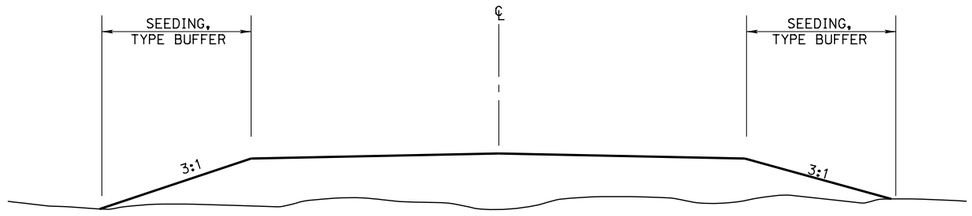
LOW ROADWAY WATER CROSSINGS FOR INFORMATION ONLY			
ROADWAY	STATION	A	B
1	1034+00	1032+91	1034+91
1	1047+50	1047+00	1048+00
1	1081+45	1081+15	1081+95
1	1090+20	1089+70	1090+70
2	2002+05	2001+30	2002+80
2	2023+60	2022+90	2024+20
2	2046+80	2046+30	2047+30
2	2054+65	2054+15	2055+15
2	2068+60	2068+10	2069+10
3	3024+60	3024+20	3025+00
3	3029+65	3029+25	3030+05
3	3036+85	3036+35	3039+35
3	3038+25		
3	3044+60	3044+10	3045+10
3	3052+25	3051+70	3052+80
3	3063+35	3062+75	3064+00



LOW WATER CROSSING DETAIL

FINAL SEEDING QUANTITIES (AC)						
	LOCATION					TOTAL
	ROADWAY 1*	ROADWAY 2*	ROADWAY 3*	WASTE SITE	MITIGATION SITE	
SEEDING, TYPE BUFFER	3	2	2	13	9	29
SEEDING, TYPE WETLAND	–	–	–	–	62	62

*SEE FINAL SEEDING DEAIL FOR PLACEMENT



FINAL SEEDING DETAIL

ROADWAY 1, 2, & 3

ROADWAY DESIGN DIVISION
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PRELIMINARY PLAN
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ROADWAY DESIGN DIVISION.
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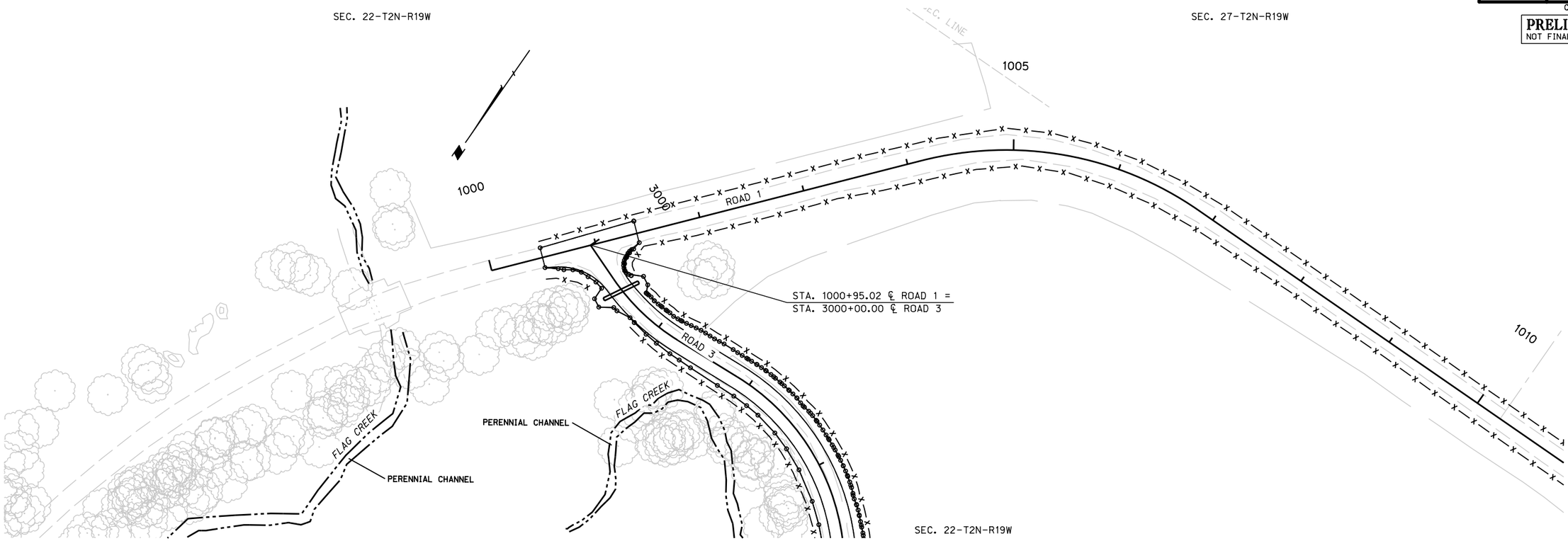
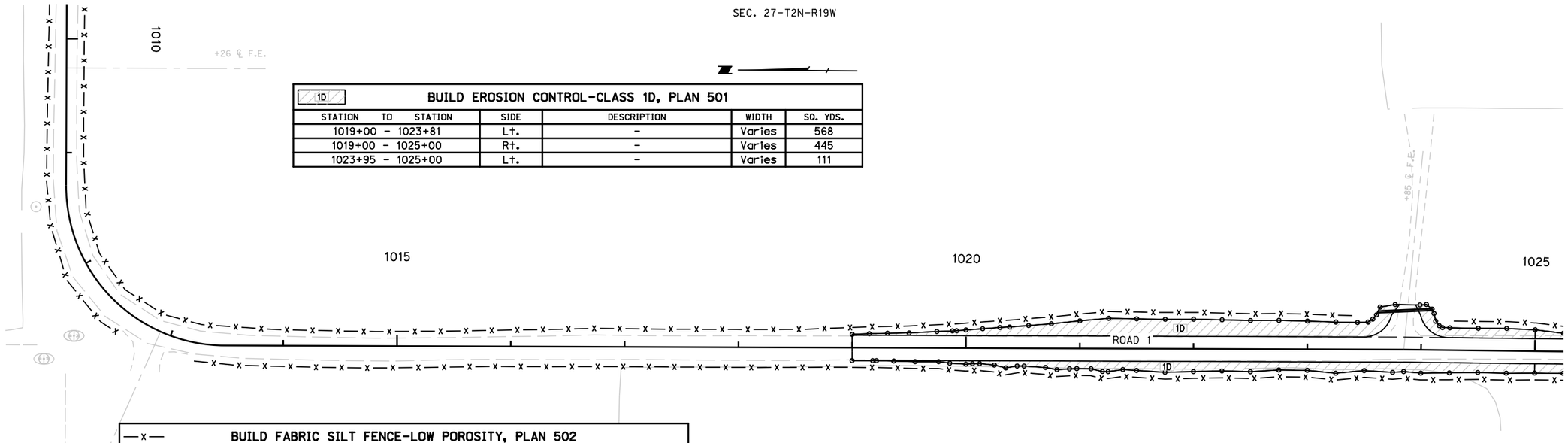
File: 712160cx01.dgn





1D	BUILD EROSION CONTROL-CLASS 1D, PLAN 501				
STATION	TO STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
1019+00	- 1023+81	Lt.	-	Varies	568
1019+00	- 1025+00	Rt.	-	Varies	445
1023+95	- 1025+00	Lt.	-	Varies	111

—x—	BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502				
STATION	TO STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
1000+49	- 1023+41	Lt.	-	-	2,284
1001+43	- 1012+60	Rt.	-	-	1,121
1013+25	- 1025+00	Rt.	-	-	1,179
1024+28	- 1025+00	Lt.	-	-	72

LEGEND

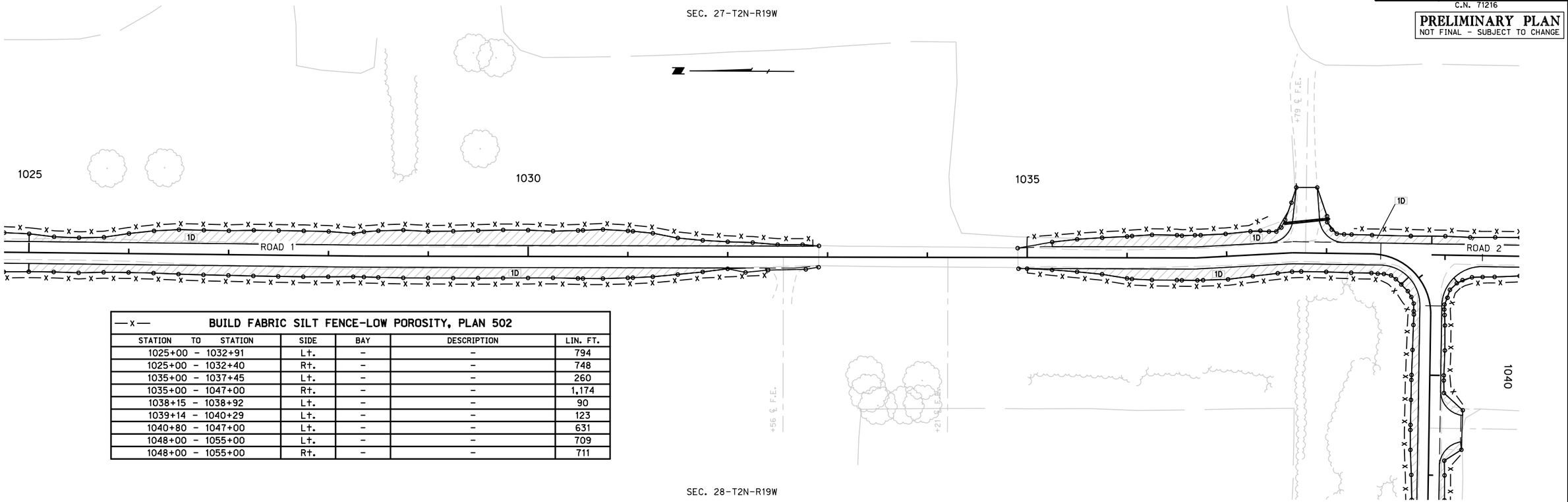
⟷ LIMITS OF CONSTRUCTION

WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

ROAD 1
EROSION & SEDIMENT CONTROL

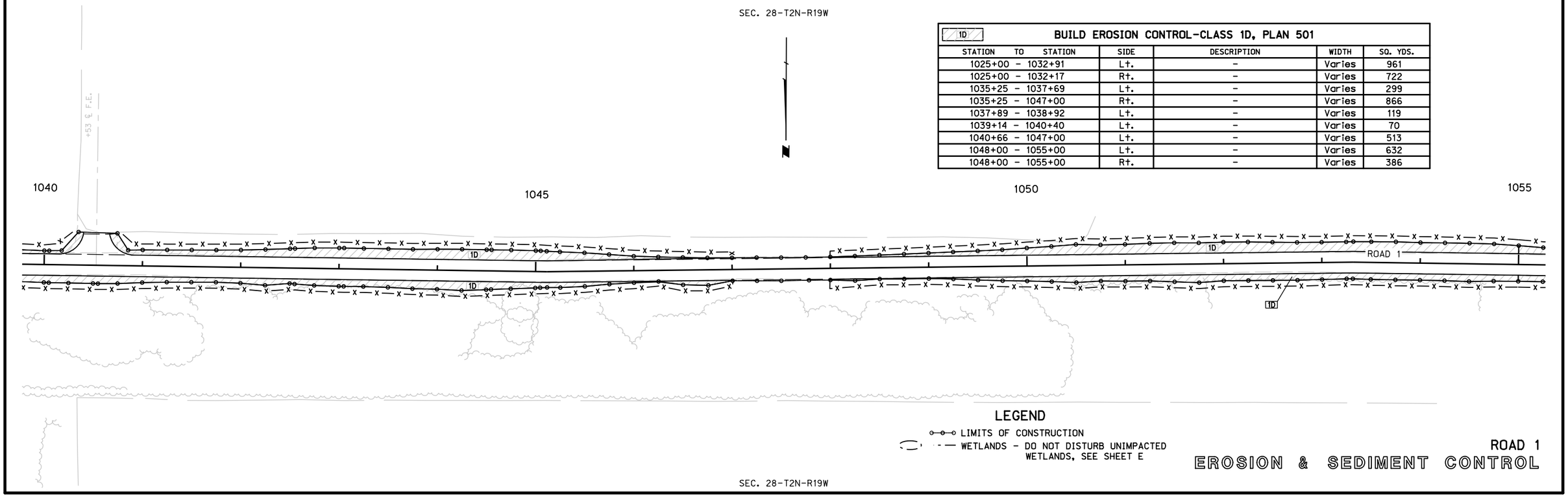
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SEC. 27-T2N-R19W



SEC. 28-T2N-R19W

SEC. 28-T2N-R19W



SEC. 28-T2N-R19W

—x— BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502

STATION	TO	STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
1025+00	-	1032+91	Lt.	-	-	794
1025+00	-	1032+40	Rt.	-	-	748
1035+00	-	1037+45	Lt.	-	-	260
1035+00	-	1047+00	Rt.	-	-	1,174
1038+15	-	1038+92	Lt.	-	-	90
1039+14	-	1040+29	Lt.	-	-	123
1040+80	-	1047+00	Lt.	-	-	631
1048+00	-	1055+00	Lt.	-	-	709
1048+00	-	1055+00	Rt.	-	-	711

1D BUILD EROSION CONTROL-CLASS 1D, PLAN 501

STATION	TO	STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
1025+00	-	1032+91	Lt.	-	Varies	961
1025+00	-	1032+17	Rt.	-	Varies	722
1035+25	-	1037+69	Lt.	-	Varies	299
1035+25	-	1047+00	Rt.	-	Varies	866
1037+89	-	1038+92	Lt.	-	Varies	119
1039+14	-	1040+40	Lt.	-	Varies	70
1040+66	-	1047+00	Lt.	-	Varies	513
1048+00	-	1055+00	Lt.	-	Varies	632
1048+00	-	1055+00	Rt.	-	Varies	386

LEGEND

LIMITS OF CONSTRUCTION

WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

ROAD 1
EROSION & SEDIMENT CONTROL

ROADWAY DESIGN DIVISION.
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PRELIMINARY PLAN
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ROADWAY DESIGN DIVISION.

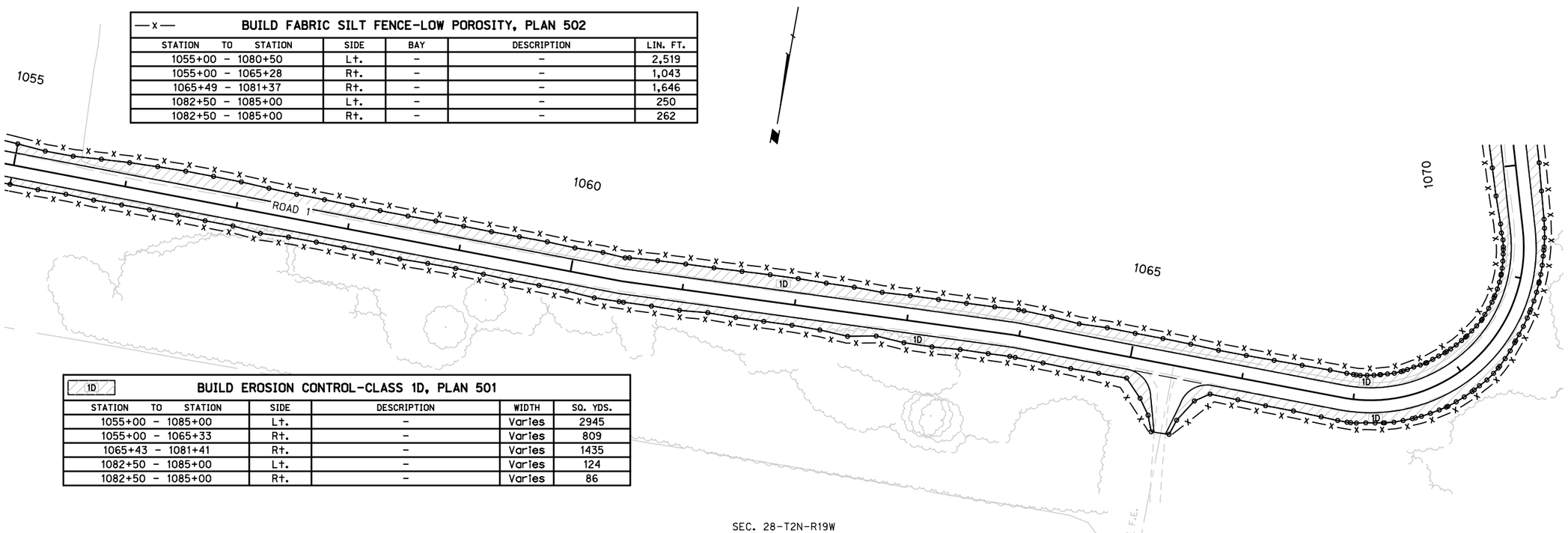
SEC. 28-T2N-R19W

—x— BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502

STATION	TO	STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
1055+00	-	1080+50	Lt.	-	-	2,519
1055+00	-	1065+28	Rt.	-	-	1,043
1065+49	-	1081+37	Rt.	-	-	1,646
1082+50	-	1085+00	Lt.	-	-	250
1082+50	-	1085+00	Rt.	-	-	262

1D BUILD EROSION CONTROL-CLASS 1D, PLAN 501

STATION	TO	STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
1055+00	-	1085+00	Lt.	-	Varies	2945
1055+00	-	1065+33	Rt.	-	Varies	809
1065+43	-	1081+41	Rt.	-	Varies	1435
1082+50	-	1085+00	Lt.	-	Varies	124
1082+50	-	1085+00	Rt.	-	Varies	86



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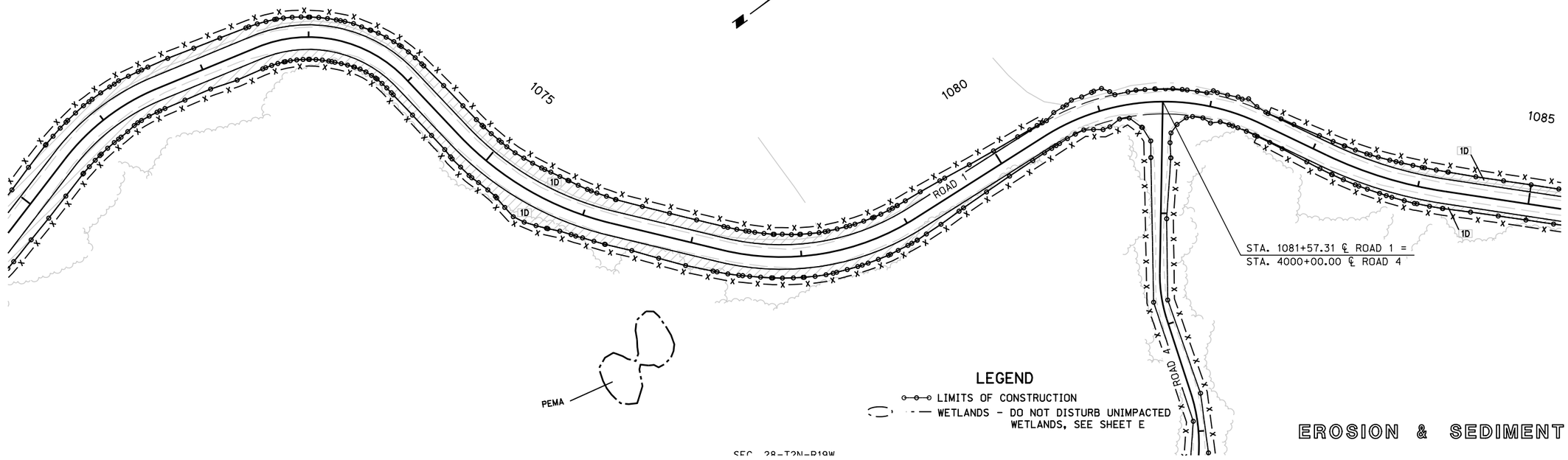

LEGEND
- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

SEC. 28-T2N-R19W

ROAD 1
EROSION & SEDIMENT CONTROL

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PRELIMINARY PLAN
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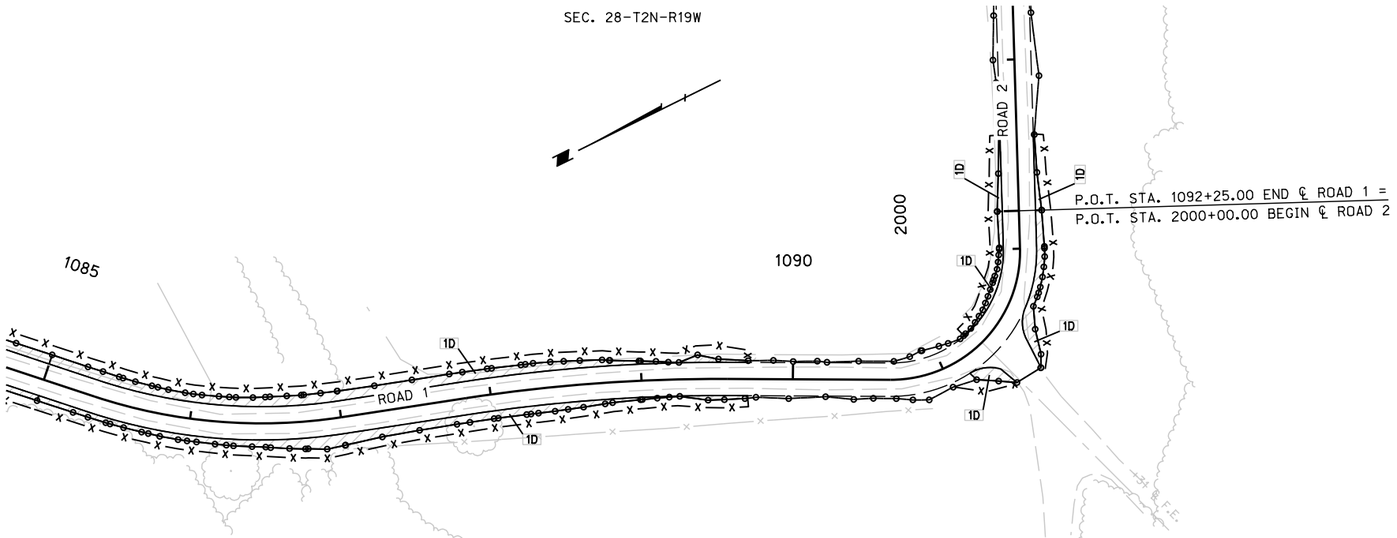
SEC. 28-T2N-R19W



SEC. 28-T2N-R19W

—x— BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502

STATION TO STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
1085+00 - 1089+70	Lt.	-	-	472
1085+00 - 1089+70	Rt.	-	-	486
1091+02 - 1091+29	Rt.	-	-	41
1091+25 - 1092+25	Lt.	-	-	90
1091+43 - 1092+25	Rt.	-	-	107

1D BUILD EROSION CONTROL-CLASS 1D, PLAN 501

STATION TO STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
1085+00 - 1089+70	Lt.	-	Varies	272
1085+00 - 1089+70	Rt.	-	Varies	223
1091+02 - 1091+29	Rt.	-	Varies	21
1091+25 - 1092+25	Lt.	-	Varies	20
1091+43 - 1092+25	Rt.	-	Varies	62

LEGEND

LIMITS OF CONSTRUCTION

WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

ROAD 1
EROSION & SEDIMENT CONTROL

ROADWAY DESIGN DIVISION.
Computer: WS6272
Date: 15-MAR-2021 14:54
File: 71216Ccx04.dgn

PRELIMINARY PLAN
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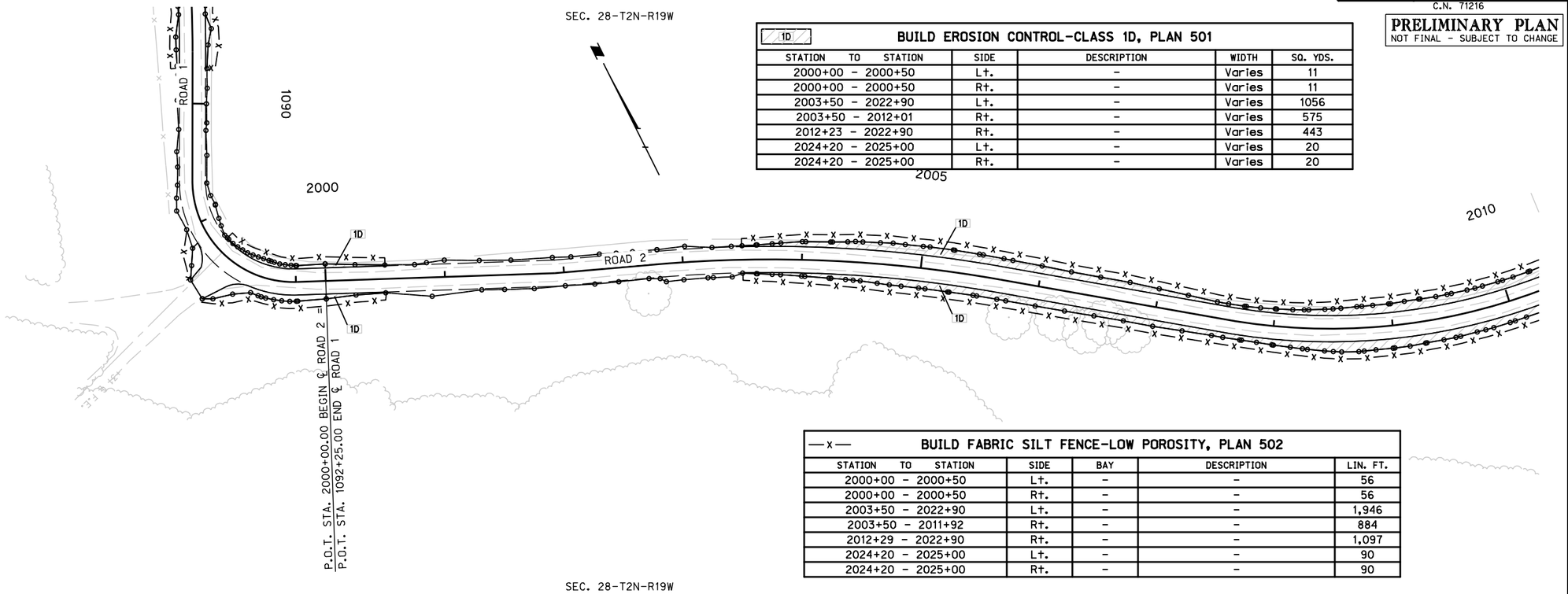
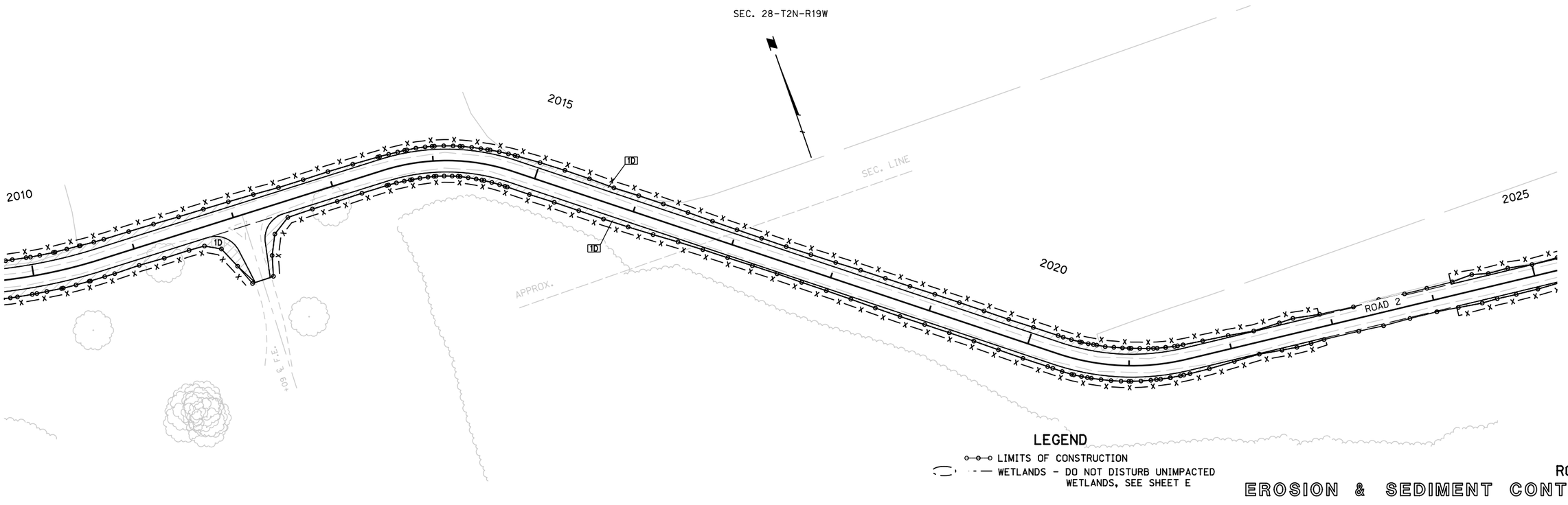


1D — BUILD EROSION CONTROL-CLASS 1D, PLAN 501

STATION TO STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
2000+00 - 2000+50	Lt.	-	Varies	11
2000+00 - 2000+50	Rt.	-	Varies	11
2003+50 - 2022+90	Lt.	-	Varies	1056
2003+50 - 2012+01	Rt.	-	Varies	575
2012+23 - 2022+90	Rt.	-	Varies	443
2024+20 - 2025+00	Lt.	-	Varies	20
2024+20 - 2025+00	Rt.	-	Varies	20

—x— BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502

STATION TO STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
2000+00 - 2000+50	Lt.	-	-	56
2000+00 - 2000+50	Rt.	-	-	56
2003+50 - 2022+90	Lt.	-	-	1,946
2003+50 - 2011+92	Rt.	-	-	884
2012+29 - 2022+90	Rt.	-	-	1,097
2024+20 - 2025+00	Lt.	-	-	90
2024+20 - 2025+00	Rt.	-	-	90



LEGEND

LIMITS OF CONSTRUCTION

WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

ROAD 2
EROSION & SEDIMENT CONTROL

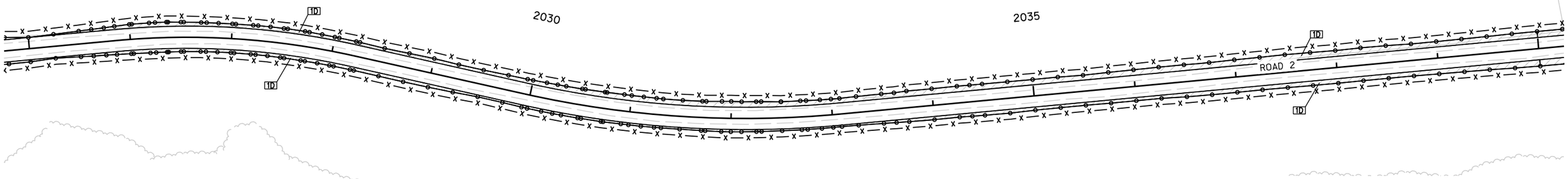
ROADWAY DESIGN DIVISION.
Computer: WS6272
Date: 15-MAR-2021 14:54
File: 712160cx05.dgn

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

SEC. 33-T2N-R19W

1D	BUILD EROSION CONTROL-CLASS 1D, PLAN 501				
STATION TO STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
2025+00 - 2046+30	Lt.	-	Varies	1102
2025+00 - 2041+62	Rt.	-	Varies	520
2041+68 - 2046+30	Rt.	-	Varies	270
2047+30 - 2054+15	Lt.	-	Varies	231
2047+30 - 2054+15	Rt.	-	Varies	262

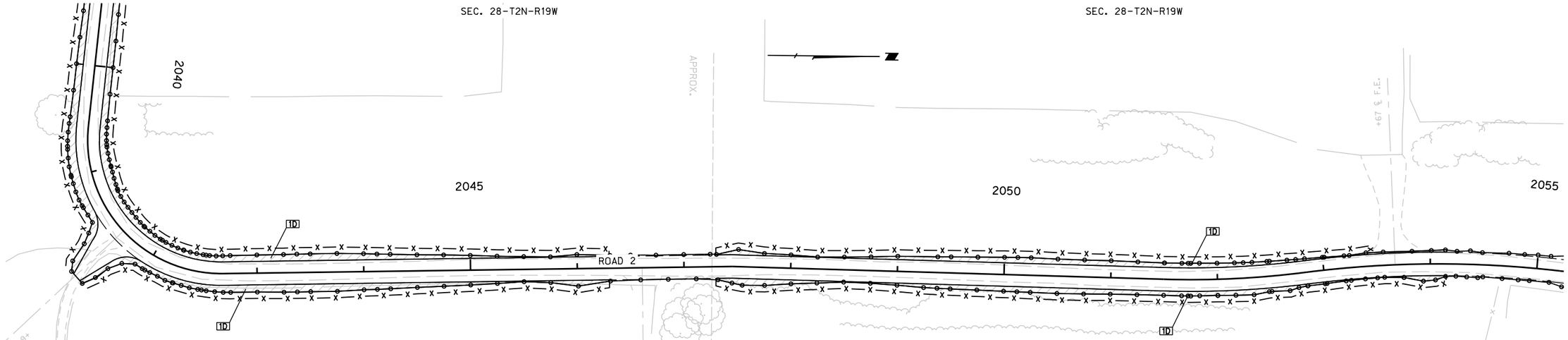


—x—	BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502				
STATION TO STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
2025+00 - 2046+30	Lt.	-	-	2,099
2025+00 - 2041+62	Rt.	-	-	1,700
2041+68 - 2046+30	Rt.	-	-	507
2047+30 - 2053+45	Lt.	-	-	630
2047+30 - 2054+15	Rt.	-	-	702

SEC. 33-T2N-R19W

SEC. 28-T2N-R19W

SEC. 28-T2N-R19W



LEGEND

LIMITS OF CONSTRUCTION

WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

SEC. 27-T2N-R19W

SEC. 33-T2N-R19W

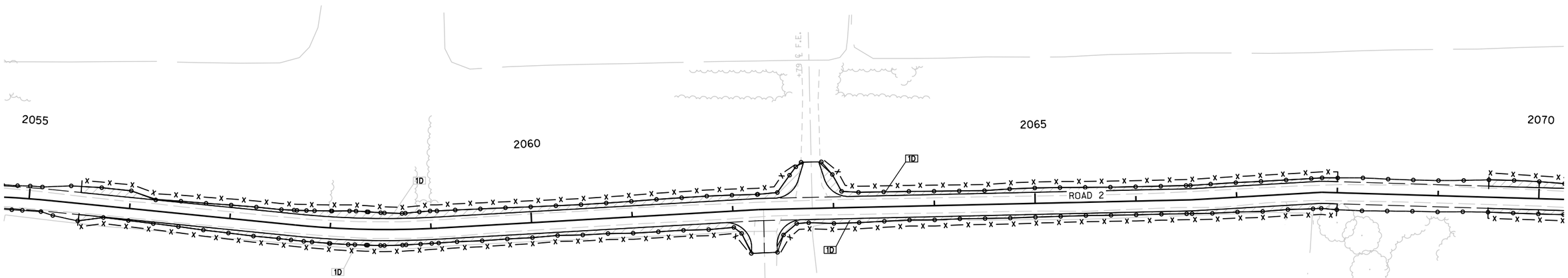
ROAD 2
EROSION & SEDIMENT CONTROL

Computer: WS6272
Date: 15-MAR-2021 14:54
File: 712160cx06.dgn

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.
Computer: WS6272
Date: 15-MAR-2021 14:54
File: 712160cx07.dgn

SEC. 28-T2N-R19W

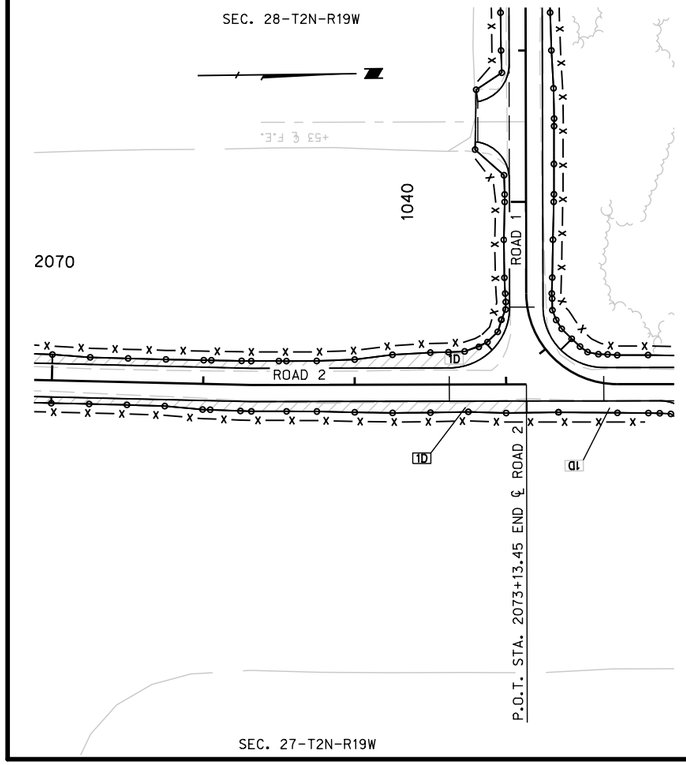


SEC. 27-T2N-R19W

—x— BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502				
STATION TO STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
2055+50 - 2062+67	Lt.	-	-	737
2055+50 - 2062+14	Rt.	-	-	692
2062+47 - 2068+00	Rt.	-	-	577
2062+92 - 2068+00	Lt.	-	-	532
2069+50 - 2072+84	Lt.	-	-	351
2069+50 - 2073+13	Rt.	-	-	375

1D BUILD EROSION CONTROL-CLASS 1D, PLAN 501				
STATION TO STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
2055+50 - 2062+71	Lt.	-	Varies	389
2055+00 - 2062+16	Rt.	-	Varies	293
2062+43 - 2068+00	Rt.	-	Varies	212
2062+86 - 2068+00	Lt.	-	Varies	218
2069+50 - 2072+91	Lt.	-	Varies	231
2069+50 - 2073+13	Rt.	-	Varies	237

SEC. 28-T2N-R19W



SEC. 27-T2N-R19W

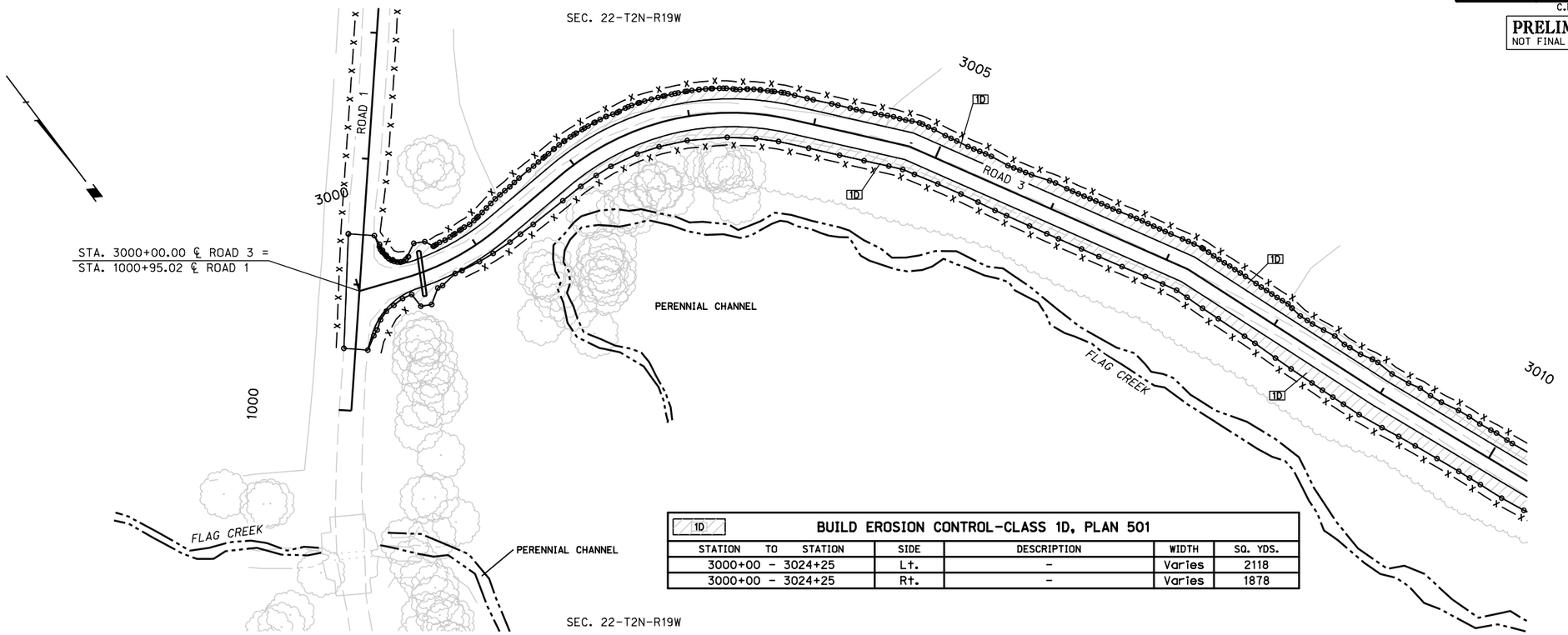
LEGEND

LIMITS OF CONSTRUCTION

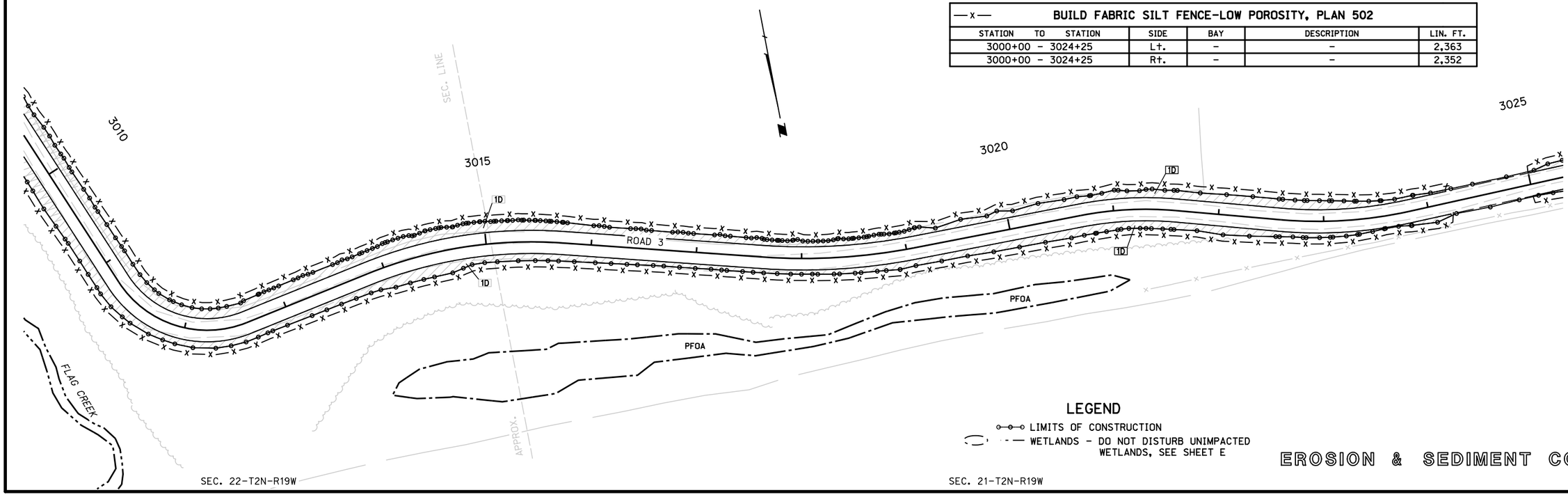
WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

ROAD 2
EROSION & SEDIMENT CONTROL

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



1D	BUILD EROSION CONTROL-CLASS 1D, PLAN 501				
STATION TO STATION		SIDE	DESCRIPTION	WIDTH	SQ. YDS.
3000+00 - 3024+25		Lt.	-	Varies	2118
3000+00 - 3024+25		Rt.	-	Varies	1878



—x—	BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502				
STATION TO STATION		SIDE	BAY	DESCRIPTION	LIN. FT.
3000+00 - 3024+25		Lt.	-	-	2,363
3000+00 - 3024+25		Rt.	-	-	2,352

LEGEND

- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

ROAD 3
EROSION & SEDIMENT CONTROL

ROADWAY DESIGN DIVISION.
Computer: WS6272
Date: 15-MAR-2021 14:54
File: 712160cx08.dgn

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

SEC. 21-T2N-R19W

3025 3030 3035 3040

+94 ℄ F.E.

ROAD 3

1D

—x— BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502

STATION	TO	STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
3025+00	-	3029+25	Lt.	-	-	467
3025+00	-	3028+65	Rt.	-	-	360
3030+05	-	3036+36	Lt.	-	-	630
3030+05	-	3031+41	Rt.	-	-	177
3031+55	-	3036+36	Rt.	-	-	532
3039+35	-	3044+10	Lt.	-	-	495

1D BUILD EROSION CONTROL-CLASS 1D, PLAN 501

STATION	TO	STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
3025+00	-	3029+26	Lt.	-	Varies	301
3025+00	-	3029+26	Rt.	-	Varies	178
3030+05	-	3036+35	Lt.	-	Varies	382
3030+05	-	3031+32	Rt.	-	Varies	31
3031+53	-	3036+37	Lt.	-	Varies	220
3039+35	-	3044+10	Lt.	-	Varies	600
3039+35	-	3043+25	Rt.	-	Varies	149

—x— BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502

STATION	TO	STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
3039+35	-	3043+25	Rt.	-	-	398
3045+10	-	3047+12	Lt.	-	-	251
3045+10	-	3047+50	Rt.	-	-	248
3046+96	-	3047+75	Lt.	-	-	126
3048+02	-	3051+70	Lt.	-	-	381
3050+50	-	3051+55	Rt.	-	-	110
3052+80	-	3055+00	Lt.	-	-	227

SEC. 21-T2N-R19W

SEC. 21-T2N-R19W

OPEN WATER
PEMA/PEMC
PEMA/PEMC
OPEN WATER

3040 3045 3050 3055

+25 ℄ F.E.

1D BUILD EROSION CONTROL-CLASS 1D, PLAN 501

STATION	TO	STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
3045+10	-	3047+12	Lt.	-	Varies	243
3045+10	-	3047+51	Rt.	-	Varies	69
3046+77	-	3047+51	Lt.	-	Varies	77
3049+39	-	3051+70	Lt.	-	Varies	269
3049+39	-	3051+70	Rt.	-	Varies	79
3052+80	-	3055+00	Lt.	-	Varies	133
3052+80	-	3055+00	Rt.	-	Varies	45

SEC. 21-T2N-R19W

LEGEND

LIMITS OF CONSTRUCTION

WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

ROAD 3
EROSION & SEDIMENT CONTROL

Computer: WS6272
Date: 15-MAR-2021 14:54
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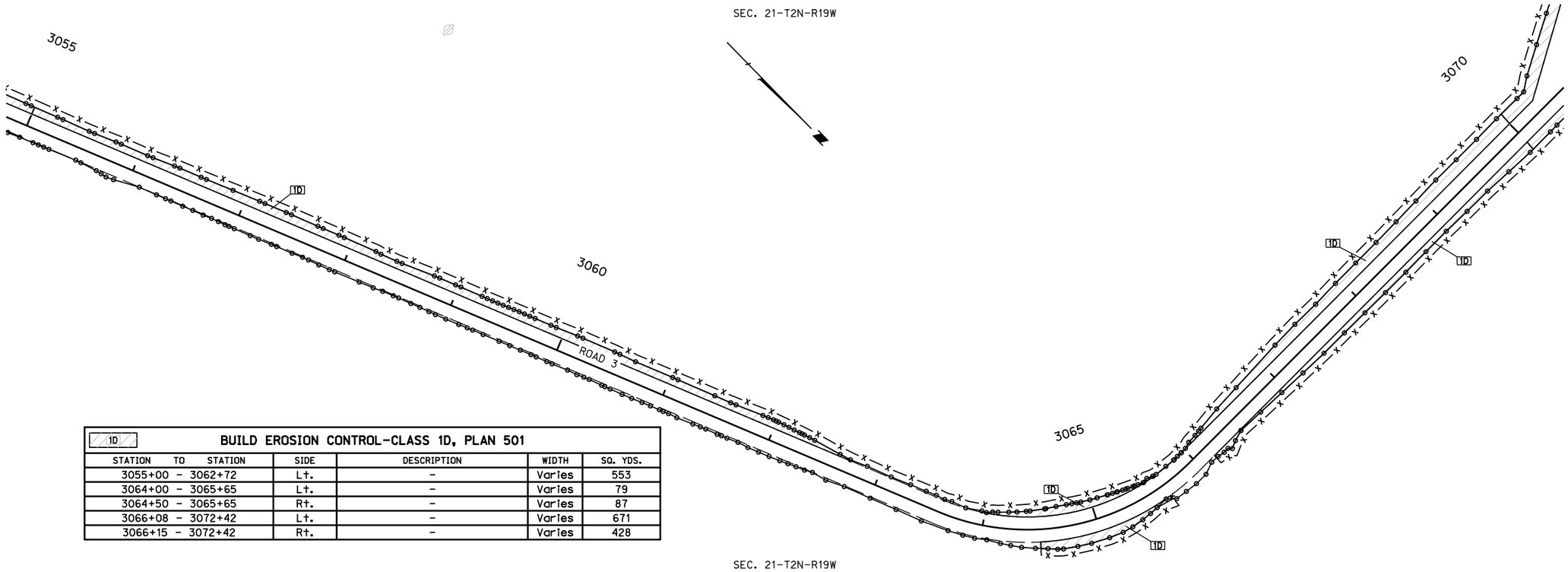
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

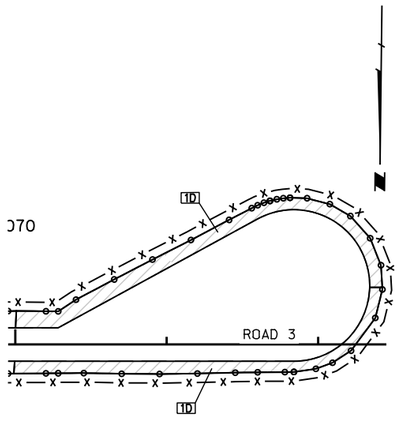
SEC. 21-T2N-R19W

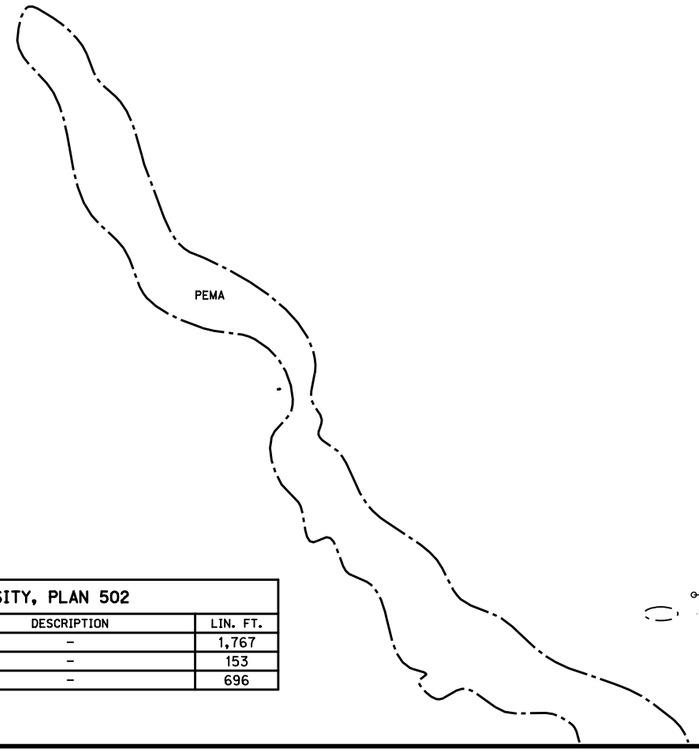


SEC. 21-T2N-R19W

1D	BUILD EROSION CONTROL-CLASS 1D, PLAN 501			
STATION TO STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
3055+00 - 3062+72	Lt.	-	Varies	553
3064+00 - 3065+65	Lt.	-	Varies	79
3064+50 - 3065+65	Rt.	-	Varies	87
3066+08 - 3072+42	Lt.	-	Varies	671
3066+15 - 3072+42	Rt.	-	Varies	428

SEC. 21-T2N-R19W





—x—	BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502				
STATION TO STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
3055+00 - 3072+45	Lt.	-	-	1,767
3064+50 - 3065+65	Rt.	-	-	153
3066+15 - 3072+45	Rt.	-	-	696

SEC. 21-T2N-R19W

LEGEND

- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

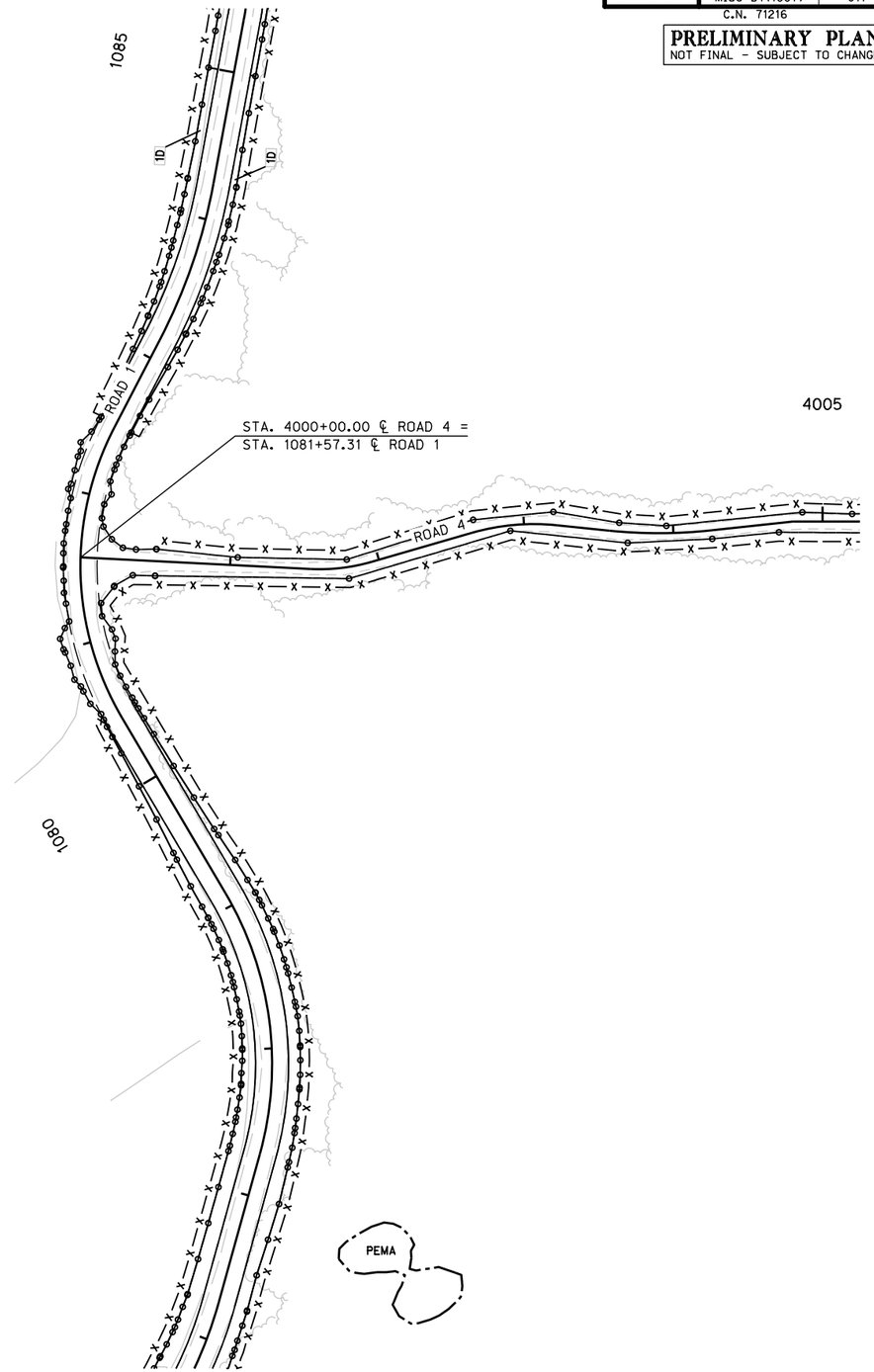
ROAD 3
EROSION & SEDIMENT CONTROL

File: 712160cx10.dgn Date: 15-MAR-2021 14:55 Computer: WS6272

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

—x— BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502				
STATION TO STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
4000+00 - 4005+00	Lt./Rt.	-	-	901

SEC. 28-T2N-R19W



SEC. 28-T2N-R19W

LEGEND

LIMITS OF CONSTRUCTION

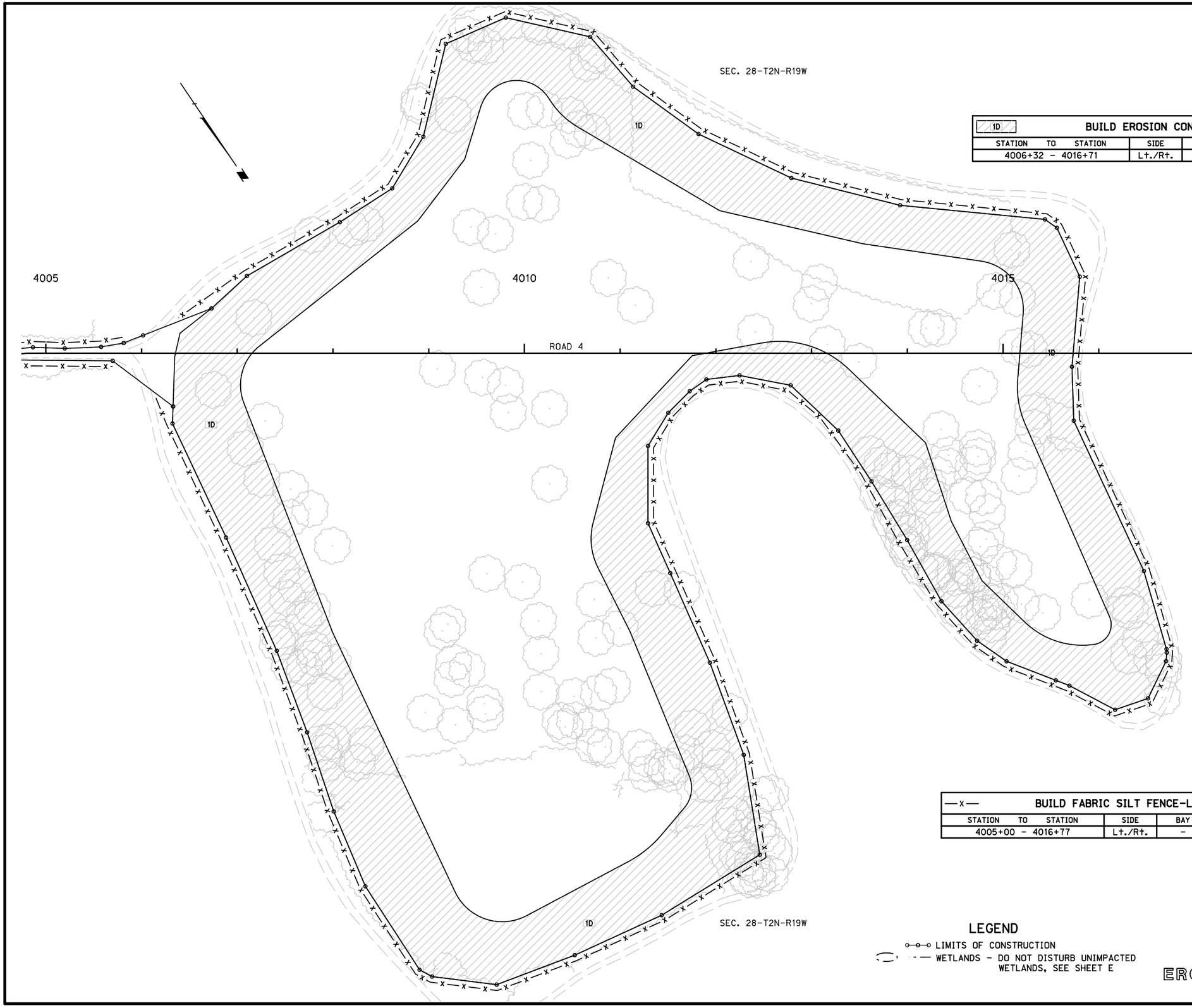
WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

ROAD 4
EROSION & SEDIMENT CONTROL

ROADWAY DESIGN DIVISION.

File: 712160cx11.dgn Date: 15-MAR-2021 14:55 Computer: WS6272

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE



1D	BUILD EROSION CONTROL-CLASS 1D, PLAN 501				
STATION TO STATION		SIDE	DESCRIPTION	WIDTH	SQ. YDS.
4006+32 - 4016+71		Lt./Rt.	-	Varies	23655

—x—	BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502				
STATION TO STATION		SIDE	BAY	DESCRIPTION	LIN. FT.
4005+00 - 4016+77		Lt./Rt.	-	-	4,044

LEGEND

LIMITS OF CONSTRUCTION

WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

ROAD 4
EROSION & SEDIMENT CONTROL

ROADWAY DESIGN DIVISION.
Computer: WS6272
Date: 15-MAR-2021 14:56
File: 712160cx12.dgn

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

File: ACAD-NDOT_Seeding Plan.dgn Date: 15-MAR-2021 14:56 Computer: WS6272

LEGEND

- LIMITS OF CONSTRUCTION
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR

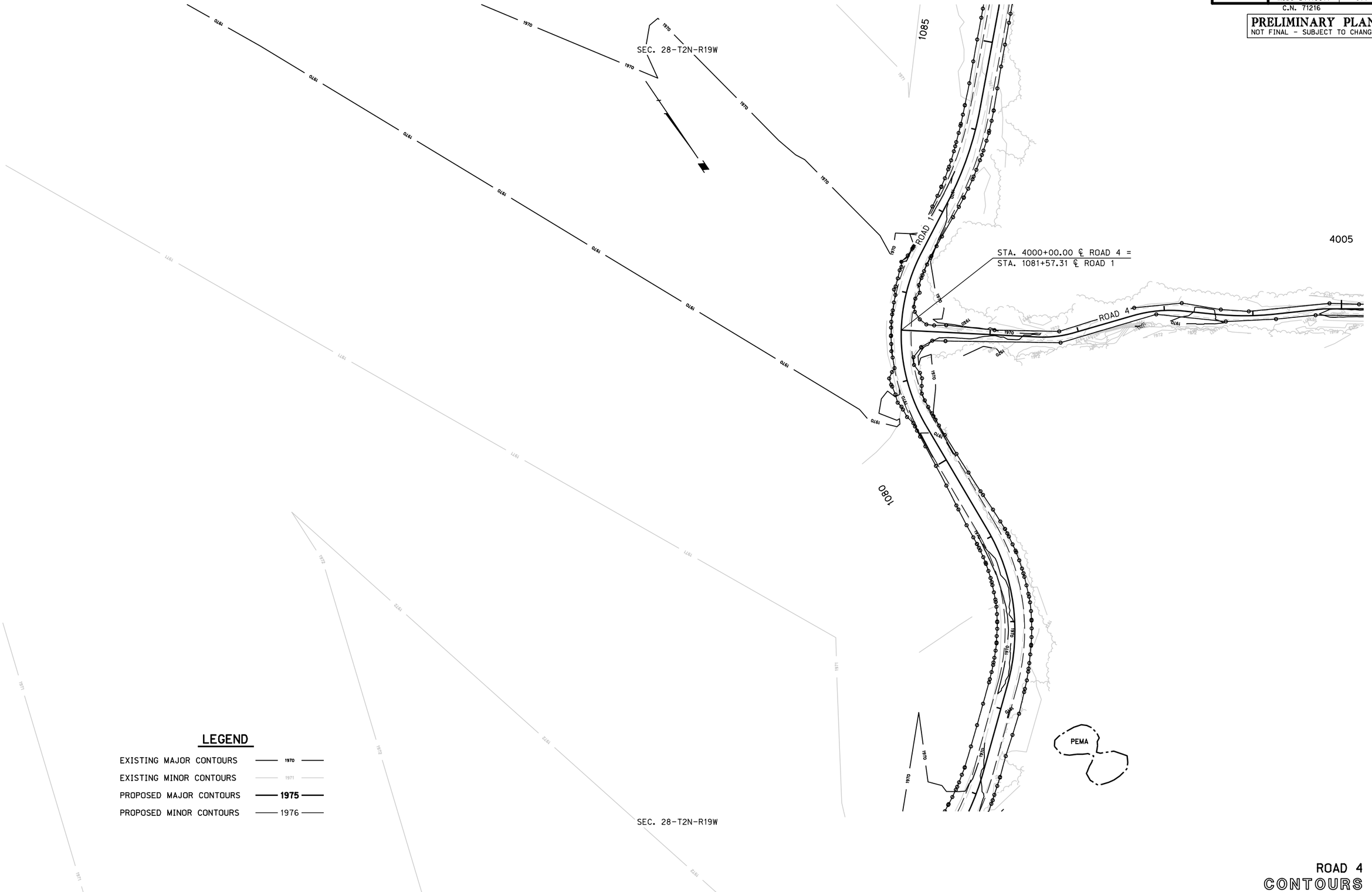
SEEDING TABLE (FOR INFORMATION ONLY)	
WETLAND SEEDING	62 ACRES
50' BUFFER SEED MIX	9 ACRES

SITE SEEDING PLAN

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

File: 712160ccontours01.dgn Date: 15-MAR-2021 15:29 Computer: WS6272



LEGEND

EXISTING MAJOR CONTOURS	1970
EXISTING MINOR CONTOURS	1971
PROPOSED MAJOR CONTOURS	**1975**
PROPOSED MINOR CONTOURS	1976

ROAD 4
CONTOURS
(FOR INFORMATION ONLY)

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

SEC. 28-T2N-R19W

4005 4010 4015

ROAD 4

SEC. 28-T2N-R19W

LEGEND

EXISTING MAJOR CONTOURS	1970
EXISTING MINOR CONTOURS	1971
PROPOSED MAJOR CONTOURS	1975
PROPOSED MINOR CONTOURS	1976

ROAD 4
CONTOURS
(FOR INFORMATION ONLY)

File: 712160contours02.dgn Date: 15-MAR-2021 14:56 Computer: WS6272

ROADWAY DESIGN DIVISION.

File: ACAD-NDOT_Site Plan.dgn Date: 15-MAR-2021 14:56 Computer: WS6272

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	J16

C.N. 71216

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

LEGEND

- LIMITS OF CONSTRUCTION
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR

N

0' 50' 100' 200'
SCALE IN FEET

LIMITS OF CONSTRUCTION

SITE CONTOURS PLAN

ROADWAY DESIGN DIVISION.

Computer: WS6272

Date: 15-MAR-2021 14:56

File: 71216ccp01.dgn

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	L1

C.N. 71216

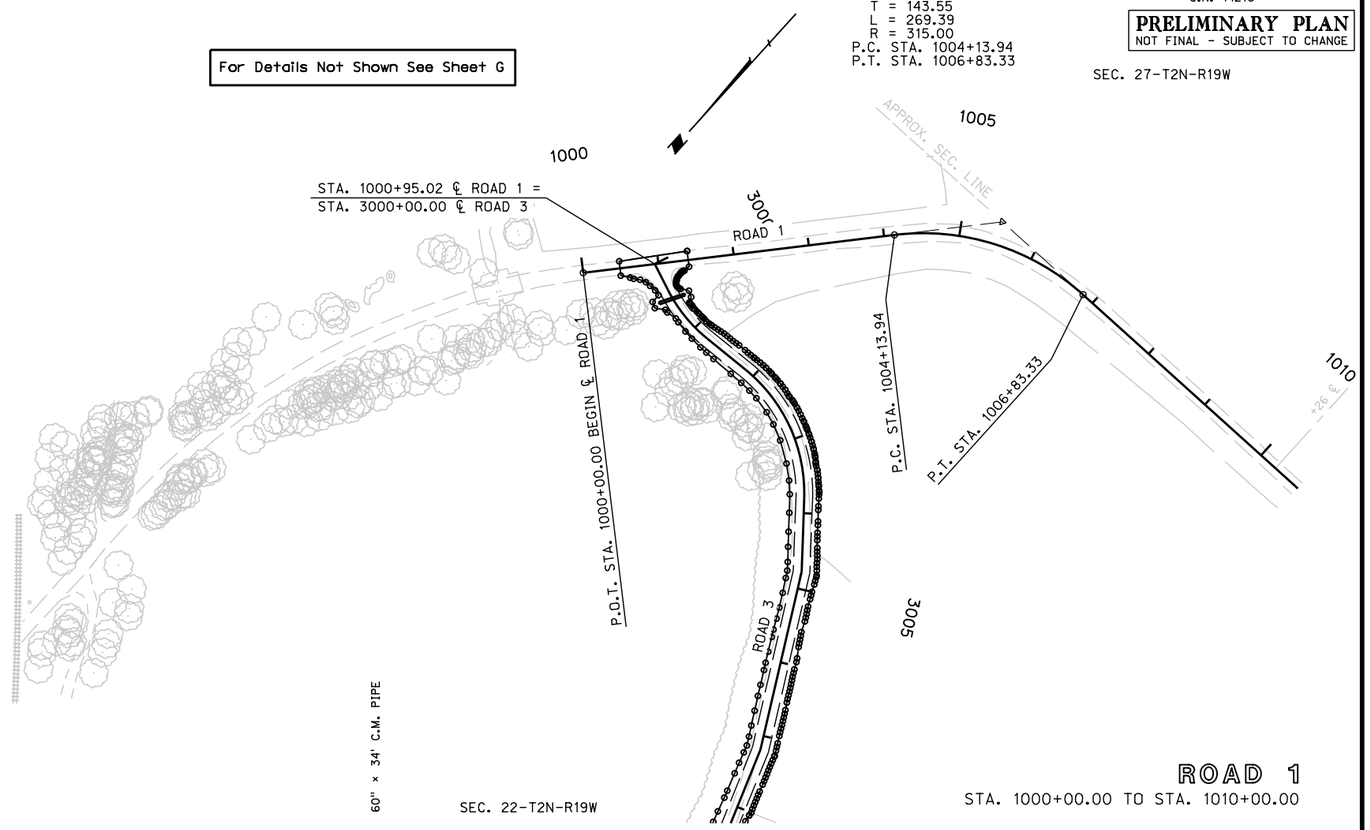
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SEC. 22-T2N-R19W

For Details Not Shown See Sheet G

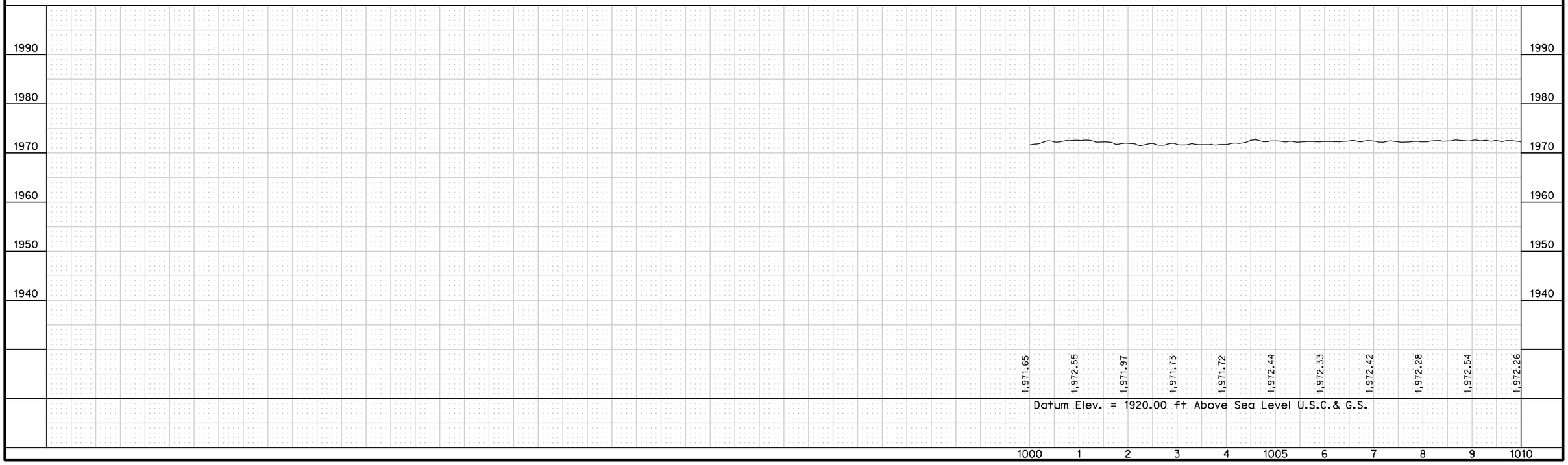
P.I. STA. 1005+57.49
Δ = 49°00'00.00" Rt.
T = 143.55
L = 269.39
R = 315.00
P.C. STA. 1004+13.94
P.T. STA. 1006+83.33

SEC. 27-T2N-R19W



ROAD 1

STA. 1000+00.00 TO STA. 1010+00.00



ROADWAY DESIGN DIVISION.

olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	L2
	C.N. 71216	

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SEC. 27-T2N-R19W

For Details Not Shown See Sheet G

Sta. 1023+85 Lt.
Lay 18" x 48' Driveway Culvert Pipe, Type 2, 3, 4, 5, 6, 7 or 8 & Build Earth Drive (26' Wide) on 3.5% Grade for 28'. See Sheet G.

STA. 1023+85 LT.
18" x 48' C.M. DR. PIPE
Remove.

Sta. 1037+79 Lt.
Lay 18" x 46' Driveway Culvert Pipe, Type 2, 3, 4, 5, 6, 7 or 8 & Build Earth Drive (26' Wide) on 6.5% Grade for 55'. See Sheet G.

P.I. STA. 1039+05.29
Δ = 90°00'00.00" Rt.
T = 60.00
L = 94.25
R = 60.00
P.C. STA. 1038+45.29
P.T. STA. 1039+39.54

P.I. STA. 1028+35.59
Δ = 0°30'00.00" Lt.

P.I. STA. 1036+69.27
Δ = 3°15'00.00" Lt.

P.C. STA. 1038+45.29

P.T. STA. 1039+39.54

P.C. STA. 1011+28.83

P.T. STA. 1013+48.74

P.I. STA. 1023+84.90
Δ = 0°30'00.00" Rt.

P.I. STA. 1037+65.81
Δ = 4°00'00.00" Rt.

ROAD 1

ROAD 2

+26 ℄

+95 ℄ F.E.

+56 ℄ F.E.

APPROX. SEC. LINE
890 ℄ F.E.

1010 1015 1020 1025 1030 1035 1040 2070

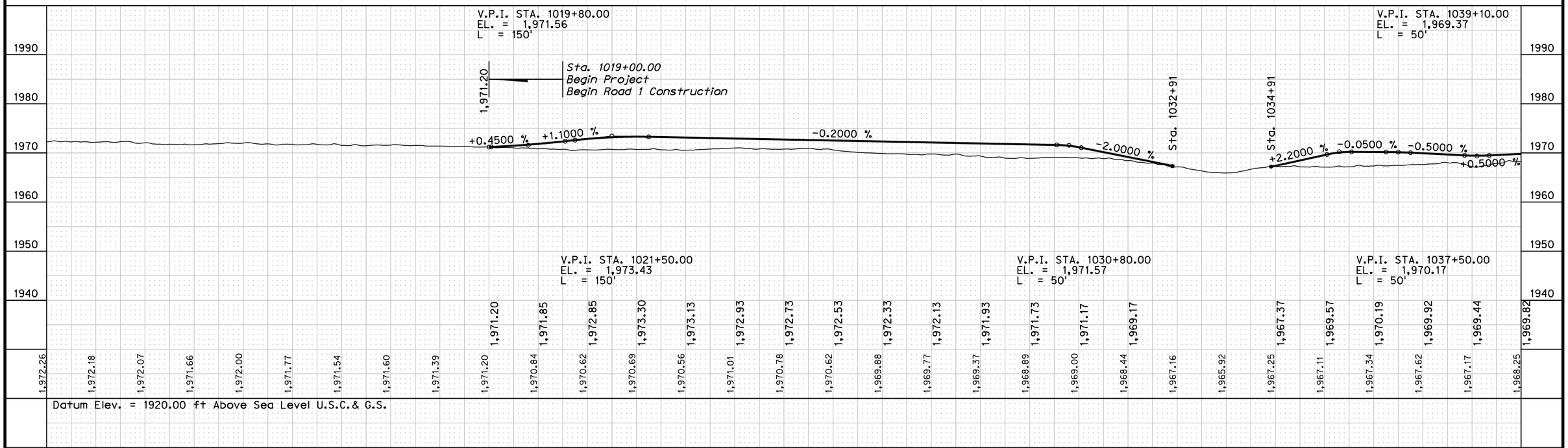
P.I. STA. 1012+68.83
Δ = 90°00'00.00" Lt.
T = 140.00
L = 219.91
R = 140.00
P.C. STA. 1011+28.83
P.T. STA. 1013+48.74

SEC. 28-T2N-R19W

Sta. 1032+91 to Sta. 1034+91
Concrete Slab
Use In Place

ROAD 1

STA. 1010+00.00 TO STA. 1040+00.00



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Date: 15-MAR-2021 14:56
File: 712160cp02.dgn

ROADWAY DESIGN DIVISION.

olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	L3
	C.N. 71216	

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SEC. 28-T2N-R19W

Sta. 1040+53 Lt. Build Earth Drive (26' Wide) on 6.5% Grade for 21'. See Sheet G.

P.I. STA. 1045+11.55
Δ = 1°30'00.00" Lt.

P.I. STA. 1053+31.73
Δ = 1°30'00.00" Rt.

P.I. STA. 1060+46.14
Δ = 3°00'00.00" Lt.

P.I. STA. 1063+95.11
Δ = 3°00'00.00" Rt.

Sta. 1065+39 Rt. Build Earth Drive (26' Wide) on 6% Grade for 50'. See Sheet G.

P.C. STA. 1066+89.91

P.T. STA. 1069+42.02

ROAD 1

P.I. STA. 1068+72.35
Δ = 107°00'00.00" Lt.
T = 182.44
L = 252.11
R = 135.00
P.C. STA. 1066+89.91
P.T. STA. 1069+42.02

ROAD 1 STA. 1040+00.00 TO STA. 1070+00.00

SEC. 28-T2N-R19W

V.P.I. STA. 1040+30.00
EL. = 1,969.97
L = 50'

+0.8000 %
-0.2500 %
-1.2519 %
+1.4000 %
+0.1200 %

Sta. 1047+00
Sta. 1048+00

V.P.I. STA. 1042+80.00
EL. = 1,971.97
L = 50'

V.P.I. STA. 1044+80.00
EL. = 1,971.47
L = 50'

V.P.I. STA. 1050+50.00
EL. = 1,972.29
L = 50'

| | | |

olsson | PROJECT NO. MISC-D7(1007) | SHEET NO. L4 | C.N. 71216

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

P.I. STA. 1071+04.45
Δ = 30°00'00.00" Rt.
T = 53.59
L = 104.72
R = 200.00
P.C. STA. 1070+50.86
P.T. STA. 1071+55.58

P.I. STA. 1073+35.32
Δ = 69°00'00.00" Rt.
T = 82.47
L = 144.51
R = 120.00
P.C. STA. 1072+52.85
P.T. STA. 1073+97.36

SEC. 28-T2N-R19W

P.I. STA. 1081+56.01
Δ = 58°00'00.00" Rt.
T = 110.86
L = 202.46
R = 200.00
P.C. STA. 1080+45.14
P.T. STA. 1082+47.60

P.I. STA. 1088+70.25
Δ = 9°00'00.00" Rt.
T = 86.57
L = 172.79
R = 1100.00
P.C. STA. 1087+83.68
P.T. STA. 1089+56.47

P.C. STA. 1070+50.86
P.T. STA. 1071+55.58
P.C. STA. 1072+52.85
P.T. STA. 1073+97.36
P.C. STA. 1074+67.29
P.T. STA. 1076+25.68
P.C. STA. 1077+28.71
P.T. STA. 1079+09.35
P.C. STA. 1080+45.14
P.T. STA. 1082+47.60
P.C. STA. 1083+13.27
P.T. STA. 1084+24.53
P.C. STA. 1085+35.33
P.T. STA. 1087+00.27
P.C. STA. 1087+83.68
P.T. STA. 1089+56.47
P.C. STA. 1090+64.55
P.T. STA. 1092+01.04

STA. 1081+57.31 ℄ ROAD 1 =
STA. 4000+00.00 ℄ ROAD 4

P.O.T. STA. 1092+25.00 END ℄ ROAD 1 =
P.O.T. STA. 2000+00.00 BEGIN ℄ ROAD 2

ROAD 1
ROAD 2
ROAD 4

1070 1075 1080 1085 1090 2000 2005 4005

P.I. STA. 1075+48.75
Δ = 33°00'00.00" Lt.
T = 81.46
L = 158.39
R = 275.00
P.C. STA. 1074+67.29
P.T. STA. 1076+25.68

P.I. STA. 1078+24.22
Δ = 46°00'00.00" Lt.
T = 95.51
L = 180.64
R = 225.00
P.C. STA. 1077+28.71
P.T. STA. 1079+09.35

Sta. 1081+57 Rt. Build Earth Drive (26' Wide) on 0.5% Grade for 20'. See Sheet G.

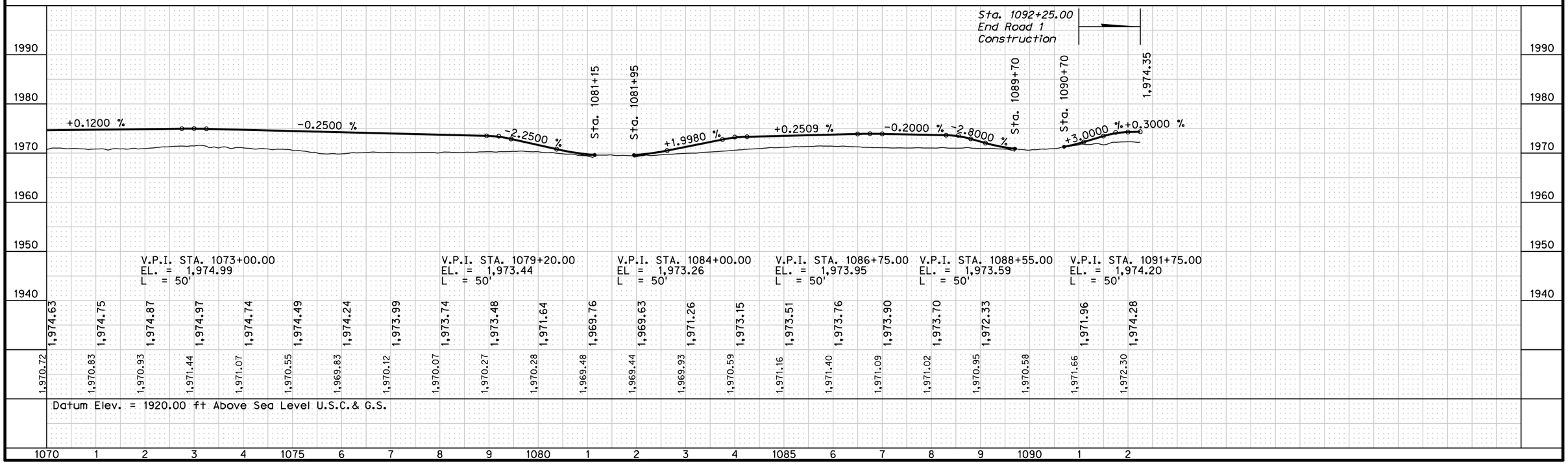
P.I. STA. 1083+69.31
Δ = 17°00'00.00" Lt.
T = 56.04
L = 111.26
R = 375.00
P.C. STA. 1083+13.27
P.T. STA. 1084+24.53

P.I. STA. 1086+19.36
Δ = 27°00'00.00" Lt.
T = 84.03
L = 164.93
R = 350.00
P.C. STA. 1085+35.33
P.T. STA. 1087+00.27

P.I. STA. 1091+52.57
Δ = 92°00'00.00" Lt.
T = 88.02
L = 136.48
R = 85.00
P.C. STA. 1090+64.55
P.T. STA. 1092+01.04

Sta. 1091+31 Rt. Build Earth Drive (26' Wide) on 7% Grade for 20'. See Sheet G.

ROAD 1
STA. 1070+00.00 TO STA. 1092+25.00



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ROADWAY DESIGN DIVISION.

olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	L5
	C.N. 71216	

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

P.I. STA. 2004+24.19
Δ = 15°00'00.00" Rt.
T = 144.82
L = 287.98
R = 1100.00
P.C. STA. 2002+79.37
P.T. STA. 2005+67.35

SEC. 28-T2N-R19W

P.I. STA. 2014+16.79
Δ = 36°00'00.00" Rt.
T = 64.98
L = 125.66
R = 200.00
P.C. STA. 2013+51.81
P.T. STA. 2014+77.47

P.O.T. STA. 2000+00.00 BEGIN ℄ ROAD 2 = ℄ ROAD 1
P.O.T. STA. 1092+25.00 END ℄ ROAD 1

P.I. STA. 2001+92.50
Δ = 3°00'00.00" Lt.

P.C. STA. 2002+79.37

P.T. STA. 2005+67.35

P.C. STA. 2007+59.59

P.T. STA. 2010+65.02

P.C. STA. 2013+51.81

P.T. STA. 2014+77.47

ROAD 1

ROAD 2

SEC. LINE

2000 1090 2005 2010 2015 2020

P.I. STA. 2009+17.24
Δ = 35°00'00.00" Lt.
T = 157.65
L = 305.43
R = 500.00
P.C. STA. 2007+59.59
P.T. STA. 2010+65.02

Sta. 2012+09 Rt. Build Earth Drive (26' Wide) on 4.5% Grade for 54'. See Sheet G.

SEC. 33-T2N-R19W

ROAD 2

STA. 2000+00.00 TO STA. 2020+00.00

Sta. 2000+00.00
Begin Road 2
Construction

V.P.I. STA. 2004+00.00
EL. = 1,974.23
L = 75'

1,974.35

-3.2000 %

Sta. 2001+30

Sta. 2002+80

+2.7000 %

-0.2000 %

V.P.I. STA. 2001+85.00
EL. = 1,968.43
L = 200'

1,974.35	1,971.18	1,971.54	1,973.96	1,974.03	1,973.83	1,973.63	1,973.43	1,973.23	1,973.03	1,972.83	1,972.63	1,972.43	1,972.23	1,972.03	1,971.83	1,971.63	1,971.43	1,971.23	1,971.03		
1,972.21	1,970.84	1,969.86	1,971.19	1,971.64	1,970.88	1,970.67	1,970.86	1,970.47	1,969.71	1,969.64	1,969.64	1,969.63	1,969.62	1,969.40	1,968.93	1,968.77	1,968.74	1,968.70	1,968.35	1,968.16	

Datum Elev. = 1920.00 ft Above Sea Level U.S.C.& G.S.

1990 1980 1970 1960 1950 1940

2000 1 2 3 4 2005 6 7 8 9 2010 1 2 3 4 2015 6 7 8 9 2020

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ROADWAY DESIGN DIVISION.

olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	L6
	C.N. 71216	

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

P.I. STA. 2027+04.32
Δ = 18°00'00.00" Rt.
T = 118.79
L = 235.62
R = 750.00
P.C. STA. 2025+85.53
P.T. STA. 2028+21.15

SEC. 28-T2N-R19W

SEC. 27-T2N-R19W

P.C. STA. 2020+30.13
P.T. STA. 2021+55.79
P.C. STA. 2025+85.53
P.T. STA. 2028+21.15
P.C. STA. 2029+94.37
P.T. STA. 2033+08.53
P.C. STA. 2040+56.40
P.T. STA. 2042+68.02
P.I. STA. 2047+45.52
Δ = 2°30'00.00" Rt.

2020 2025 2030 2035 2040 2045 2050

APPROX. SEC. LINE

ROAD 2

Sta. 2041+64 Rt.
Build Earth Drive (26' Wide)
on 5% Grade for 51'.
See Sheet G.

SEC. 34-T2N-R19W

P.I. STA. 2020+94.65
Δ = 32°00'00.00" Lt.
T = 64.52
L = 125.66
R = 225.00
P.C. STA. 2020+30.13
P.T. STA. 2021+55.79

P.I. STA. 2031+52.75
Δ = 18°00'00.00" Lt.
T = 158.38
L = 314.16
R = 1000.00
P.C. STA. 2029+94.37
P.T. STA. 2033+08.53

SEC. 33-T2N-R19W

P.I. STA. 2041+97.68
Δ = 97°00'00.00" Lt.
T = 141.29
L = 211.62
R = 125.00
P.C. STA. 2040+56.40
P.T. STA. 2042+68.02

ROAD 2

STA. 2020+00.00 TO STA. 2050+00.00

V.P.I. STA. 2021+00.00
EL. = 1,970.83
L = 75'

V.P.I. STA. 2026+00.00
EL. = 1,970.78
L = 75'

V.P.I. STA. 2034+00.00
EL. = 1,971.97
L = 75'

V.P.I. STA. 2043+75.00
EL. = 1,970.52
L = 75'

V.P.I. STA. 2049+75.00
EL. = 1,970.21
L = 75'

1990 1980 1970 1960 1950 1940

-0.2000 % -1.5000 % +1.6000 % +0.1500 % -0.1500 % -1.5000 % +1.4000 %

Sta. 2022+90 Sta. 2024+20 Sta. 2046+30 Sta. 2047+30

V.P.I. STA. 2023+60.00
EL. = 1,966.93
L = 200'

V.P.I. STA. 2046+75.00
EL. = 1,966.01
L = 200'

| | | |

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

P.I. STA. 2054+03.15
Δ = 14°00'00.00" Rt.
T = 119.71
L = 238.24
R = 975.00
P.C. STA. 2052+83.44
P.T. STA. 2055+21.67

SEC. 28-T2N-R19W

For Details Not Shown See Sheet G

Sta. 2062+79 Lt.
Build Earth Drive (26' Wide)
on 4% Grade for 35'.
See Sheet G.

P.C. STA. 2051+49.83
P.T. STA. 2052+83.35
P.C. STA. 2057+65.44
P.T. STA. 2059+06.81
P.I. STA. 2066+54.91
Δ = 2°00'00.00" Lt.
P.I. STA. 2071+31.75
Δ = 1°30'00.10" Lt.
ROAD 1
1040
1035
P.C. STA. 2052+83.44
P.T. STA. 2055+21.67
P.I. STA. 2062+25.13
Δ = 2°00'00.00" Rt.
P.I. STA. 2067+84.52
Δ = 5°00'00.10" Rt.
ROAD 2
P.O.T. STA. 2073+13.45 END ℄ ROAD 2

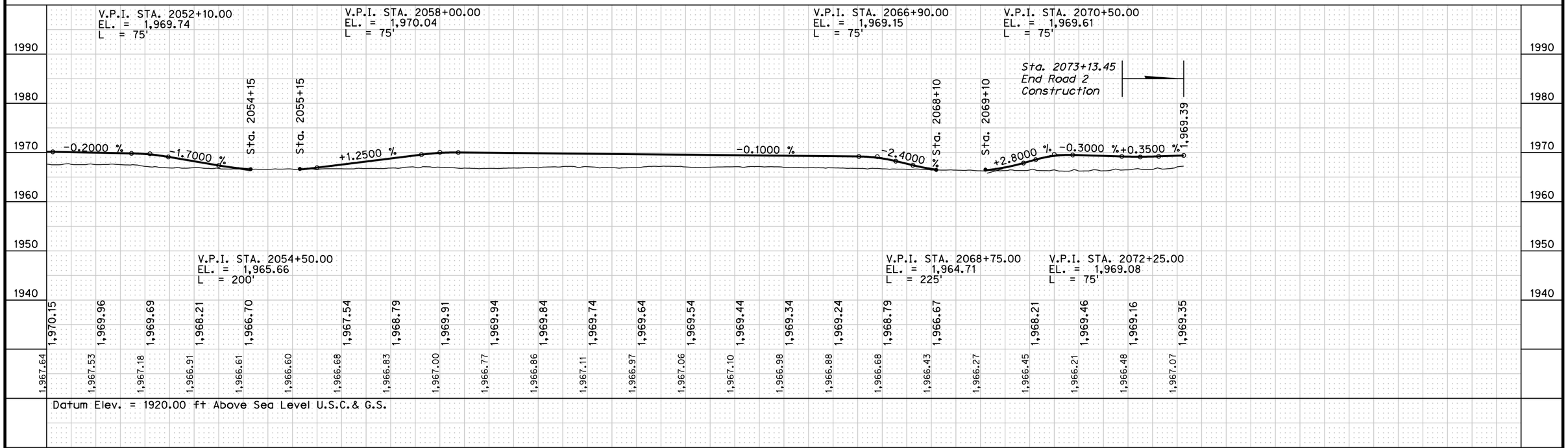
P.I. STA. 2052+16.73
Δ = 9°00'00.00" Lt.
T = 66.90
L = 133.52
R = 850.00
P.C. STA. 2051+49.83
P.T. STA. 2052+83.35

P.I. STA. 2058+36.27
Δ = 9°00'00.00" Lt.
T = 70.83
L = 141.37
R = 900.00
P.C. STA. 2057+65.44
P.T. STA. 2059+06.81

Sta. 2062+30 Rt.
Build Earth Drive (26' Wide)
on 6% Grade for 32'.
See Sheet G.

SEC. 27-T2N-R19W

ROAD 2
STA. 2050+00.00 TO STA. 2073+13.45



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ROADWAY DESIGN DIVISION.

olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	L8
	C.N. 71216	

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

For Details Not Shown See Sheet G

SEC. 22-T2N-R19W

SEC. 21-T2N-R19W

STA. 3000+00.00 ℄ ROAD 3 =
STA. 1000+95.02 ℄ ROAD 1

ROAD 1

ROAD 3

P.C. STA. 3001+86.63

P.T. STA. 3003+80.89

P.I. STA. 3002+91.33
Δ = 53°00'00.00" Rt.
T = 104.70
L = 194.26
R = 210.00
P.C. STA. 3001+86.63
P.T. STA. 3003+80.89

P.I. STA. 3004+77.19
Δ = 11°00'00.00" Rt.

P.I. STA. 3007+18.64
Δ = 9°00'00.00" Rt.

P.I. STA. 3009+00.00
Δ = 1°56'58.39" Lt.

P.I. STA. 3014+79.55
Δ = 26°00'00.00" Rt.
T = 95.81
L = 188.32
R = 415.00
P.C. STA. 3013+83.74
P.T. STA. 3015+72.06

P.C. STA. 3017+63.13

P.T. STA. 3019+07.12

P.C. STA. 3000+38.07

P.T. STA. 3001+21.85

P.C. STA. 3011+21.94

P.T. STA. 3012+59.91

P.C. STA. 3013+83.74

P.T. STA. 3015+72.06

P.I. STA. 3000+80.58
Δ = 24°00'00.00" Lt.
T = 42.51
L = 83.78
R = 200.00
P.C. STA. 3000+38.07
P.T. STA. 3001+21.85

P.I. STA. 3012+04.44
Δ = 79°03'01.61" Lt.
T = 82.51
L = 137.97
R = 100.00
P.C. STA. 3011+21.94
P.T. STA. 3012+59.91

P.I. STA. 3018+35.54
Δ = 15°00'00.00" Lt.
T = 72.41
L = 143.99
R = 550.00
P.C. STA. 3017+63.13
P.T. STA. 3019+07.12

STA. 3000+51
36" x 30" C.M. PIPE
Remove & Build 36" x 36" Culvert Pipe, Type 2, 3, 4, 5, 7 or 8. Plan 411.
Fill= 1'. Exc.= 28 Cu. Yds.

ROAD 3

STA. 3000+00.00 TO STA. 3020+00.00

STA 3000+45.00
EL = 1,974.09
L = 50'

Sta. 3000+00.00
Begin Road 3
Construction

1,972.93

-3.5000 %

+1.0000 %

+0.1500 %

+0.3500 %

STA 3002+00.00
EL = 1,975.64
L = 50'

STA 3011+00.00
EL = 1,976.98
L = 50'

1,974.64	1,975.58	1,975.79	1,975.94	1,976.09	1,976.24	1,976.39	1,976.54	1,976.69	1,976.84	1,977.00	1,977.34	1,977.69	1,978.04	1,978.39	1,978.74	1,979.09	1,979.44	1,979.79	1,980.14
1,973.43	1,972.99	1,972.99	1,972.85	1,973.54	1,973.55	1,973.85	1,973.88	1,973.71	1,973.71	1,973.97	1,974.45	1,974.55	1,975.07	1,975.67	1,976.69	1,977.31	1,977.60	1,977.77	1,977.70

Datum Elev. = 1930.00 ft Above Sea Level U.S.C.& G.S.

2000 1990 1980 1970 1960 1950

3000 1 2 3 4 3005 6 7 8 9 3010 1 2 3 4 3015 6 7 8 9 3020

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ROADWAY DESIGN DIVISION.

olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	L9
	C.N. 71216	

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

P.I. STA. 3021+13.98
Δ = 16°00'00.00" Rt.
T = 45.68
L = 90.76
R = 325.00
P.C. STA. 3020+68.31
P.T. STA. 3021+59.06

P.I. STA. 3028+50.61
Δ = 76°00'00.00" Rt.
T = 39.06
L = 66.32
R = 50.00
P.C. STA. 3028+11.54
P.T. STA. 3028+77.87

SEC. 21-T2N-R19W

P.I. STA. 3037+58.74
Δ = 22°00'00.00" Rt.
T = 29.16
L = 57.60
R = 150.00
P.C. STA. 3037+29.59
P.T. STA. 3037+87.18

P.I. STA. 3040+64.16
Δ = 18°02'15.83" Rt.
T = 55.55
L = 110.19
R = 350.00
P.C. STA. 3040+08.61
P.T. STA. 3041+18.79

P.I. STA. 3043+18.49
Δ = 11°00'00.00" Rt.
T = 28.89
L = 57.60
R = 300.00
P.C. STA. 3042+89.60
P.T. STA. 3043+47.20

P.I. STA. 3046+46.95
Δ = 34°00'00.00" Rt.
T = 30.57
L = 59.34
R = 100.00
P.C. STA. 3046+16.37
P.T. STA. 3046+75.71

Sta. 3046+64 Lt.
Build Earth Drive (8' Wide)
on 8% Grade for 75'.
See Sheet G.

P.C. STA. 3020+68.31
P.T. STA. 3021+59.06
P.C. STA. 3022+59.42
P.T. STA. 3023+81.59
P.C. STA. 3028+11.54
P.T. STA. 3028+77.87
P.I. STA. 3030+37.04
Δ = 6°00'00.00" Rt.
P.C. STA. 3031+11.22
P.T. STA. 3031+97.62
P.I. STA. 3033+91.82
Δ = 3°00'00.00" Rt.
P.C. STA. 3035+76.53
P.I. STA. 3035+76.53
Δ = 6°00'00.00" Lt.
P.C. STA. 3037+29.59
P.T. STA. 3037+87.18
P.I. STA. 3039+10.64
Δ = 8°00'00.00" Lt.
P.C. STA. 3040+08.61
P.T. STA. 3041+18.79
P.I. STA. 3042+28.67
Δ = 6°00'00.00" Lt.
P.C. STA. 3042+89.60
P.T. STA. 3043+47.20
P.I. STA. 3045+62.88
Δ = 9°00'00.00" Rt.
P.C. STA. 3046+16.37
P.C. STA. 3047+02.41
P.T. STA. 3046+75.71
P.I. STA. 3047+63.50
P.C. STA. 3048+74.84
P.T. STA. 3049+38.55

Sta. 3031+31 Rt.
Build Earth Drive (15' Wide)
on 1% Grade for 44'.
See Sheet G.

P.I. STA. 3023+20.98
Δ = 17°30'00.00" Lt.
T = 61.57
L = 122.17
R = 400.00
P.C. STA. 3022+59.42
P.T. STA. 3023+81.59

P.I. STA. 3031+59.93
Δ = 66°00'00.00" Lt.
T = 48.71
L = 86.39
R = 75.00
P.C. STA. 3031+11.22
P.T. STA. 3031+97.62

SEC. 21-T2N-R19W

P.I. STA. 3047+33.11
Δ = 14°00'00.00" Lt.
T = 30.70
L = 61.09
R = 250.00
P.C. STA. 3047+02.41
P.T. STA. 3047+63.50

P.I. STA. 3049+11.84
Δ = 73°00'00.00" Lt.
T = 37.00
L = 63.70
R = 50.00
P.C. STA. 3048+74.84
P.T. STA. 3049+38.55

Sta. 3048+74 Lt./Rt.
Gate and Posts
Use In Place

ROAD 3

STA. 3020+00.00 TO STA. 3050+00.00

STA 3021+25.00
EL = 1,980.57
L = 50'

STA 3024+50.00
EL = 1,976.51
L = 150'

STA 3026+00.00
EL = 1,979.66
L = 50'

STA 3028+25.00
EL = 1,979.32
L = 50'

STA 3031+75.00
EL = 1,980.87
L = 50'

STA 3035+35.00
EL = 1,980.33
L = 50'

STA 3040+00.00
EL = 1,982.16
L = 50'

STA 3042+30.00
EL = 1,985.38
L = 50'

STA 3047+55.00
EL = 1,988.13
L = 50'

STA 3049+15.00
EL = 1,989.33
L = 50'

STA 3023+00.00
EL = 1,979.96
L = 50'

STA 3029+50.00
EL = 1,976.26
L = 125'

STA 3044+65.00
EL = 1,977.98
L = 125'

-0.3500 % -2.3000 % +2.1000 % -0.1500 % -2.4500 % +2.0500 % -0.1500 % -2.5000 % +3.3500 % +1.4000 % -3.1500 % +3.5000 % +0.7500 % -5.2000 %

Sta. 3024+20 Sta. 3025+00 Sta. 3029+25 Sta. 3030+05 Sta. 3036+35 Sta. 3039+35 Sta. 3044+10 Sta. 3045+10 Sta. 3047+50 Sta. 3049+40

2000 1990 1980 1970 1960 1950

1,980.14 1,980.49 1,980.31 1,979.84 1,977.75 1,977.47 1,979.52 1,979.51 1,979.36 1,977.51 1,979.34 1,980.83 1,980.68 1,980.53 1,980.38 1,978.71 1,978.85 1,982.04 1,983.56 1,984.96 1,983.18 1,980.03 1,982.71 1,986.21 1,984.91

1,977.70 1,977.74 1,977.83 1,977.77 1,977.45 1,977.47 1,977.10 1,977.04 1,977.16 1,976.88 1,977.12 1,977.57 1,978.21 1,978.24 1,978.10 1,977.96 1,978.30 1,977.00 1,977.09 1,978.75 1,979.67 1,980.92 1,982.25 1,980.50 1,979.74 1,979.33 1,980.01 1,985.80 1,988.43 1,989.34 1,980.53

Datum Elev. = 1930.00 ft Above Sea Level U.S.C.& G.S.

3020 1 2 3 4 3025 6 7 8 9 3030 1 2 3 4 3035 6 7 8 9 3040 1 2 3 4 3045 6 7 8 9 3050

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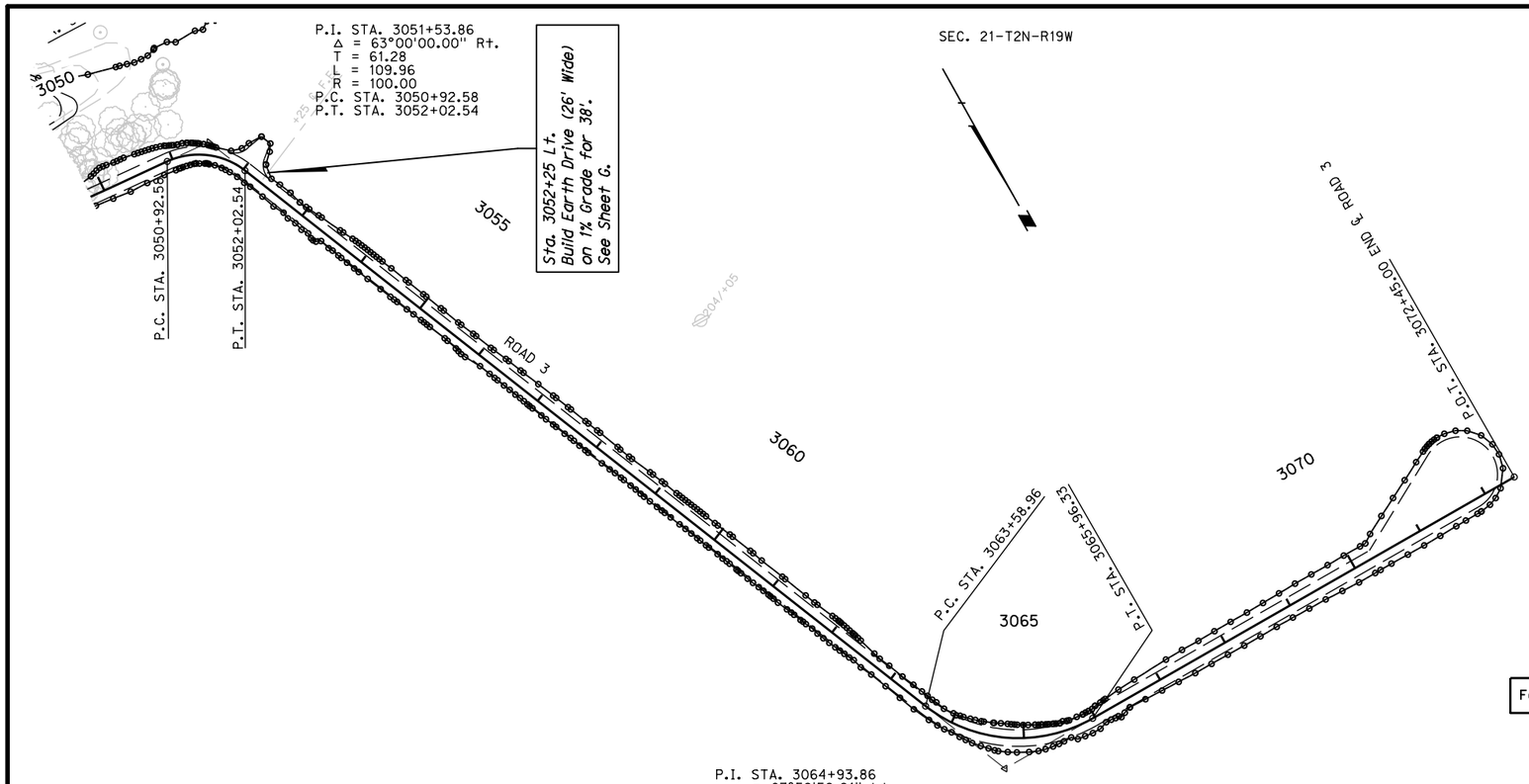
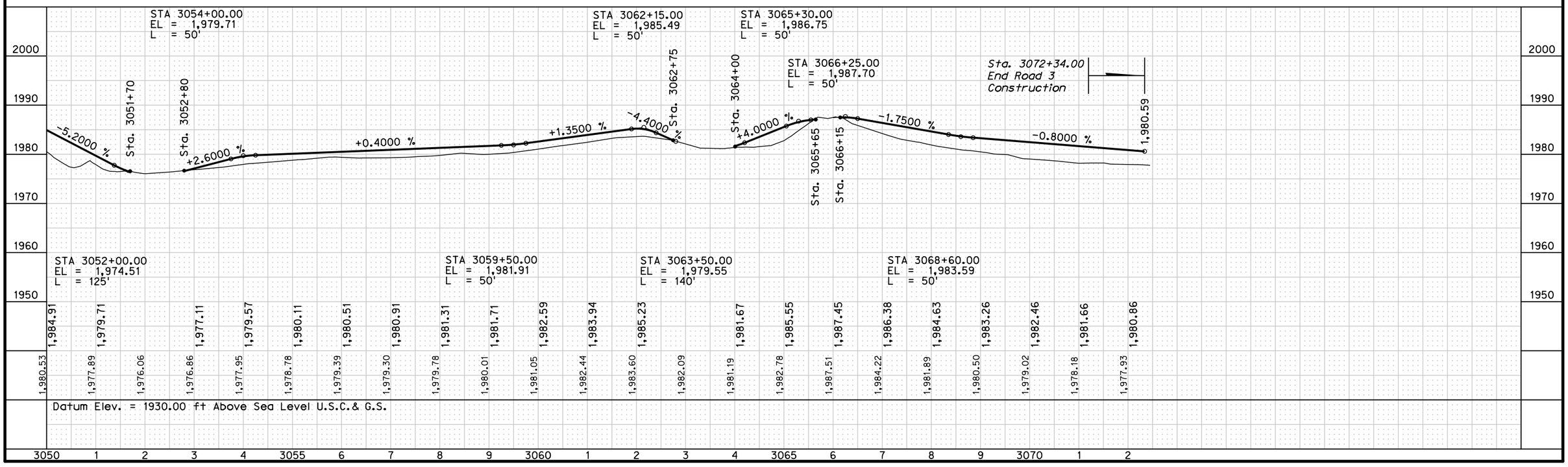
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.



ROAD 3

STA. 3050+00.00 TO STA. 3072+45.00

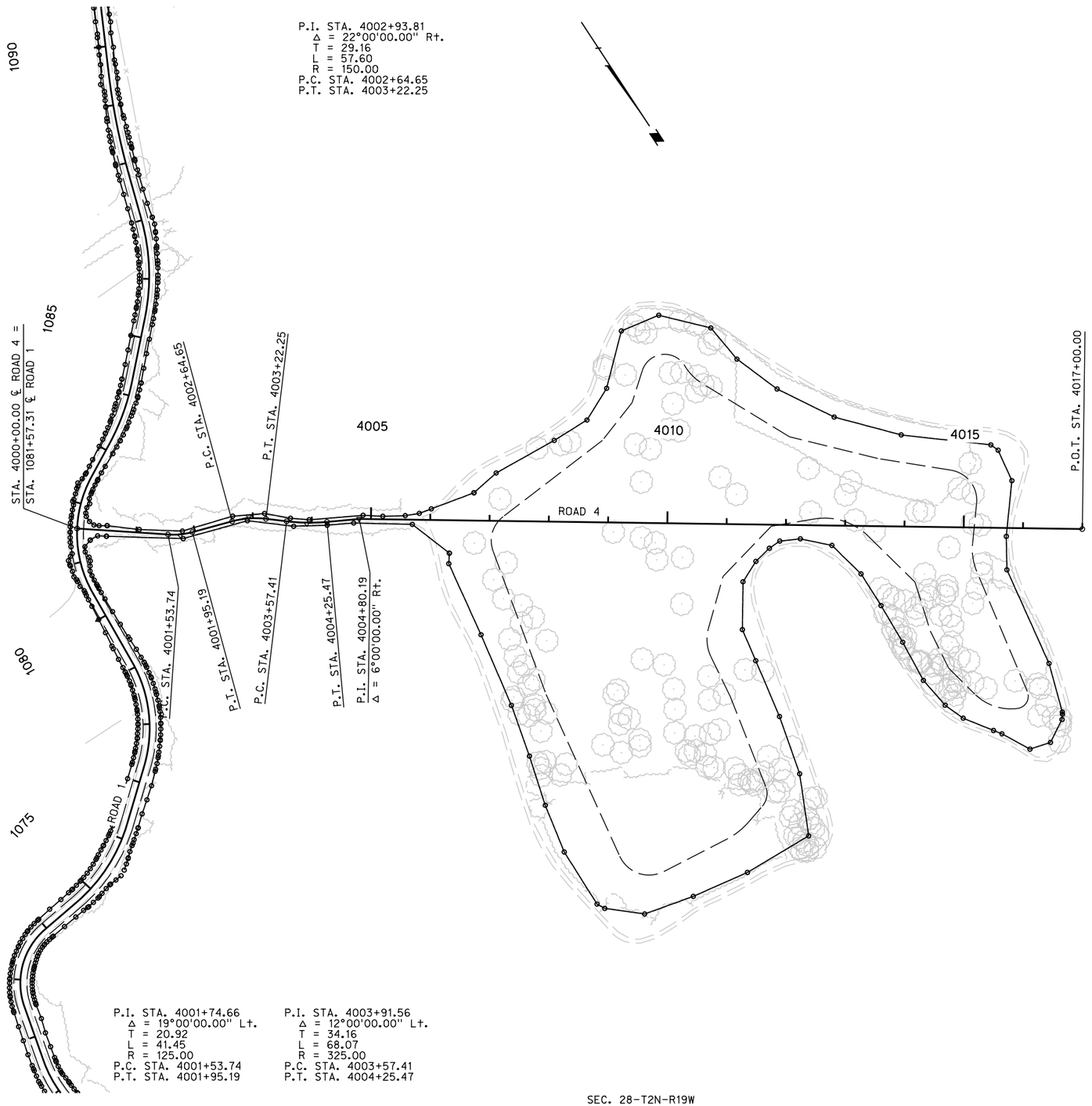


Computer: WS6272
Date: 15-MAR-2021 16:24
File: 712160cp10.dgn

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SEC. 28-T2N-R19W

P.I. STA. 4002+93.81
Δ = 22°00'00.00" Rt.
T = 29.16
L = 57.60
R = 150.00
P.C. STA. 4002+64.65
P.T. STA. 4003+22.25



P.I. STA. 4001+74.66
Δ = 19°00'00.00" Lt.
T = 20.92
L = 41.45
R = 125.00
P.C. STA. 4001+53.74
P.T. STA. 4001+95.19

P.I. STA. 4003+91.56
Δ = 12°00'00.00" Lt.
T = 34.16
L = 68.07
R = 325.00
P.C. STA. 4003+57.41
P.T. STA. 4004+25.47

SEC. 28-T2N-R19W

ROAD 4

STA. 4000+00.00 TO STA. 4016+30.00

ROADWAY DESIGN DIVISION.

File: 712160cp11.dgn Date: 15-MAR-2021 14:57 Computer: WS6272

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

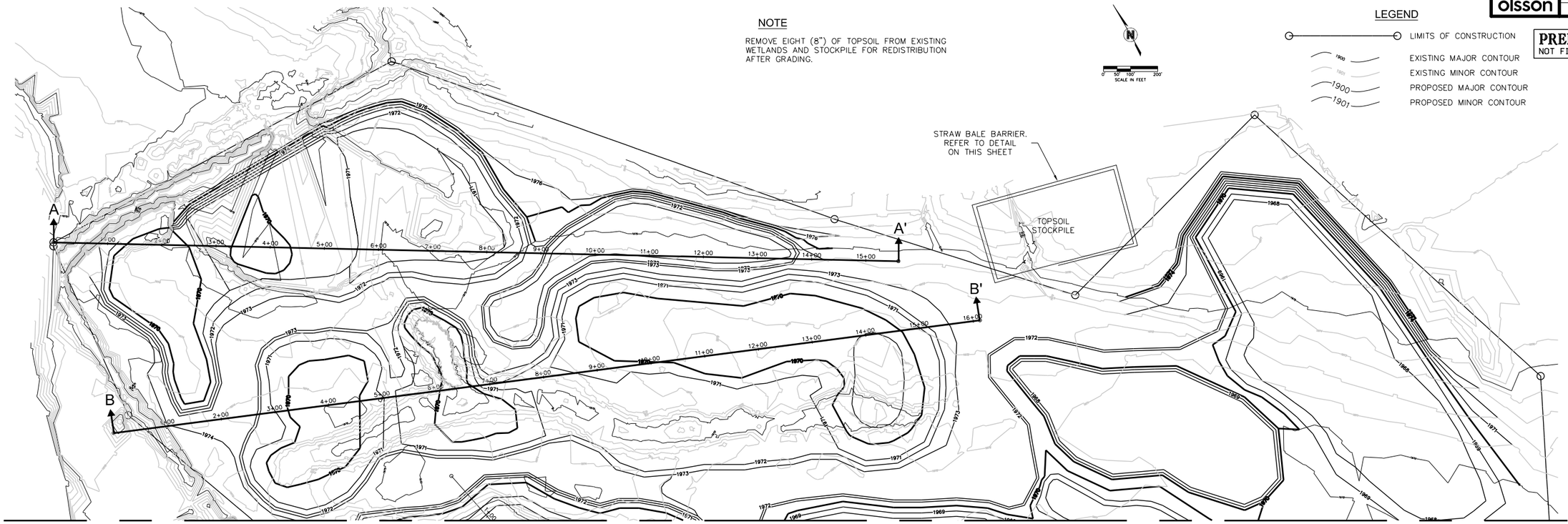
ROADWAY DESIGN DIVISION.

NOTE

REMOVE EIGHT (8") OF TOPSOIL FROM EXISTING WETLANDS AND STOCKPILE FOR REDISTRIBUTION AFTER GRADING.

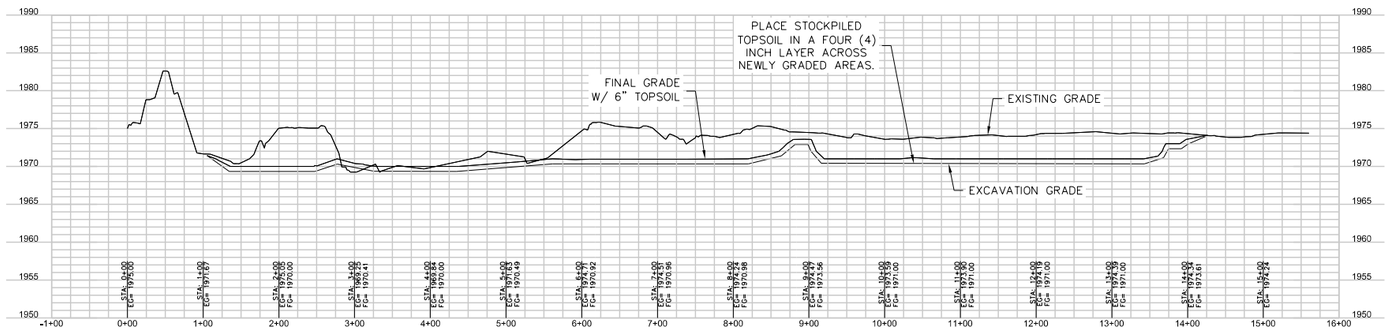
LEGEND

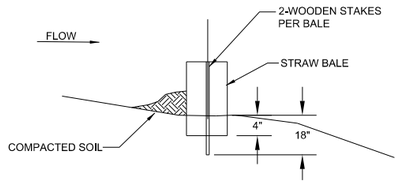
- LIMITS OF CONSTRUCTION
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR



MATCHLINE: SEE SHEET L13 & L14

PROFILE 'A-A'



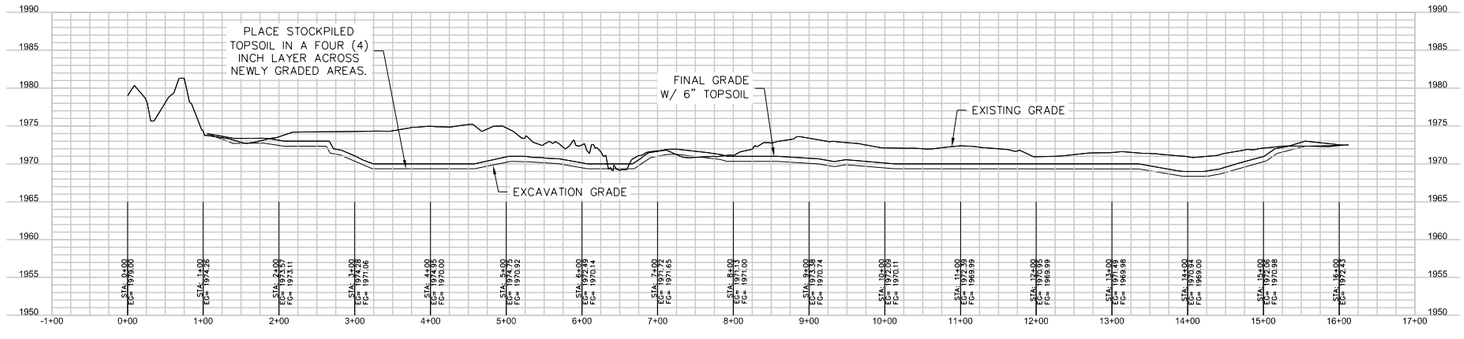


NOTES:
1. CONSTRUCT SEDIMENT CONTROL SYSTEM AT START OF CONSTRUCTION.
2. MAINTAIN AS NECESSARY TO BE EFFECTIVE DURING THE CONSTRUCTION PERIOD.

PROFILE SCALE
VERTICAL: 1" = 10'
HORIZONTAL: 1" = 100'

STRAW BALE BARRIER
NOT TO SCALE

PROFILE 'B-B'



PROFILE SCALE
VERTICAL: 1" = 10'
HORIZONTAL: 1" = 100'

SITE PLAN & PROFILE

File: ACAD-NDOT_Grading Plan.dgn Date: 15-MAR-2021 14:57 Computer: WS6272

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

LEGEND

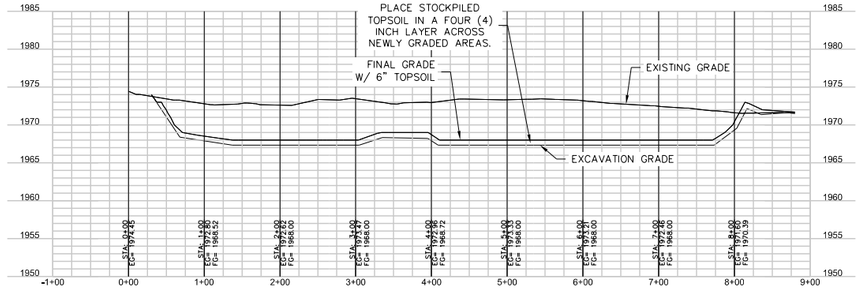
- LIMITS OF CONSTRUCTION
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR

SCALE IN FEET: 0, 50, 100, 200

NOTE

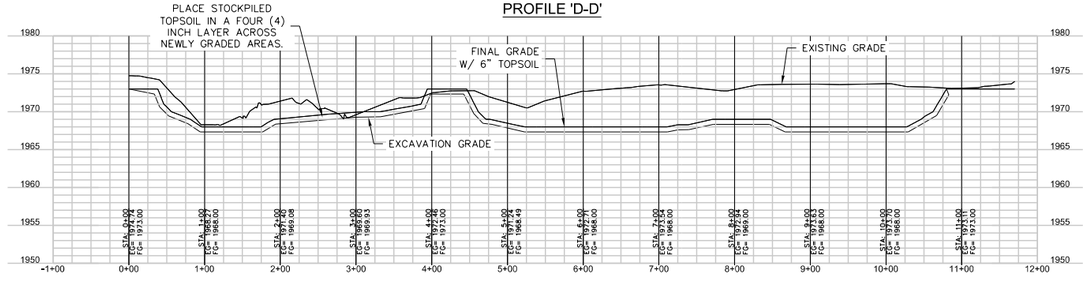
REMOVE EIGHT (8") OF TOPSOIL FROM EXISTING WETLANDS AND STOCKPILE FOR REDISTRIBUTION AFTER GRADING.

PROFILE 'C-C'



PROFILE SCALE
VERTICAL: 1" = 10'
HORIZONTAL: 1" = 100'

PROFILE 'D-D'



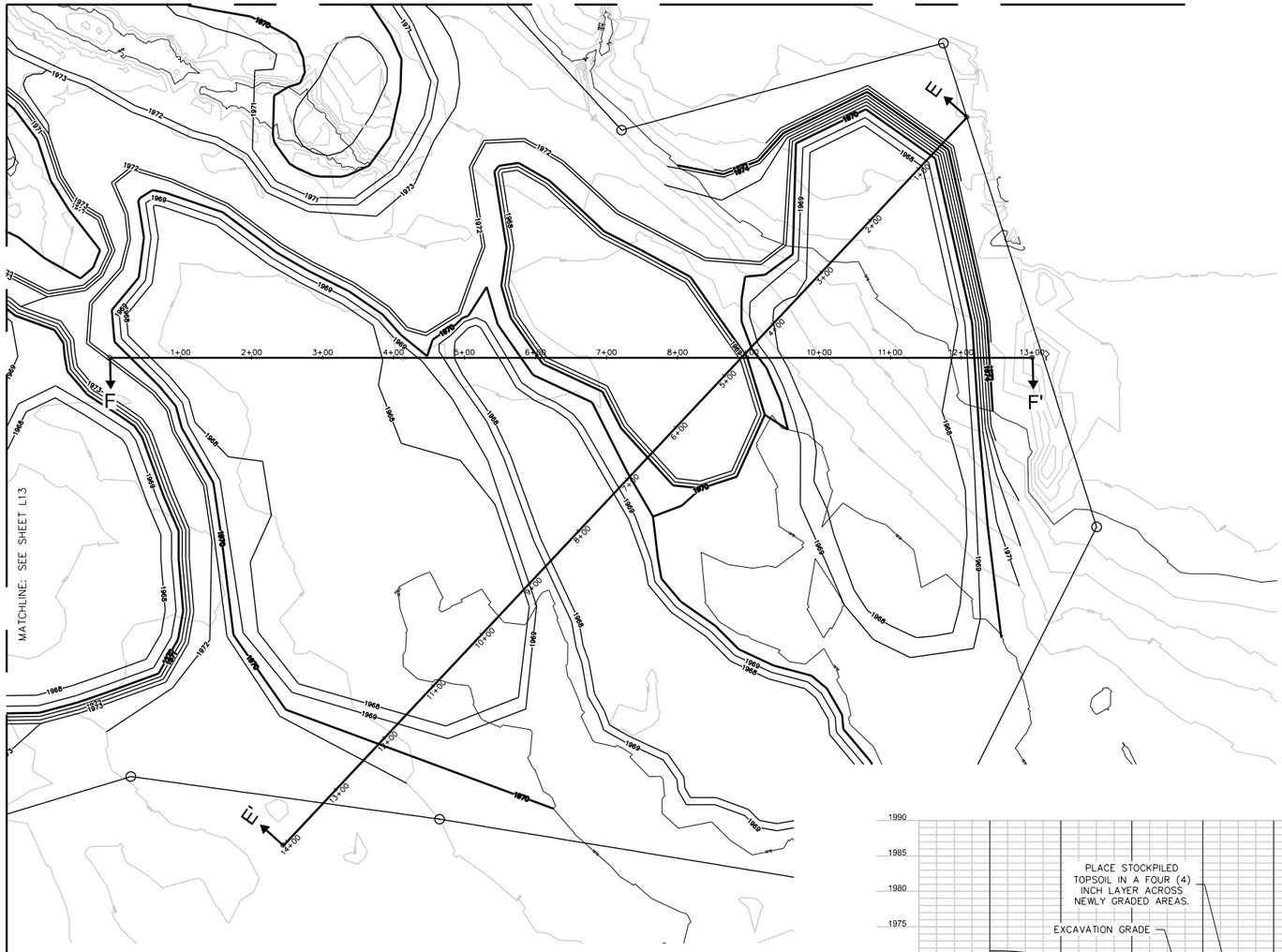
PROFILE SCALE
VERTICAL: 1" = 10'
HORIZONTAL: 1" = 100'

SITE PLAN & PROFILE

ROADWAY DESIGN DIVISION.
File: ACAD-NDOT_Grading Plan.dgn Date: 15-MAR-2021 14:57 Computer: WS6272

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

MATCHLINE: SEE SHEET L12



MATCHLINE: SEE SHEET L13

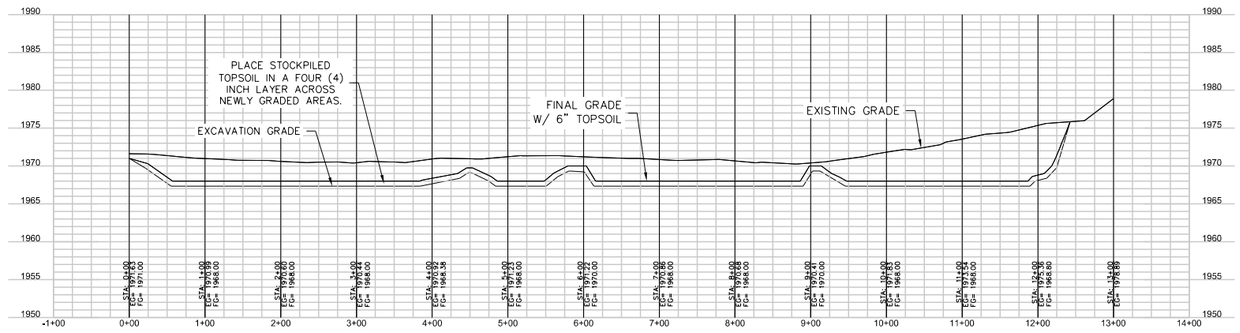
LEGEND

- LIMITS OF CONSTRUCTION
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR

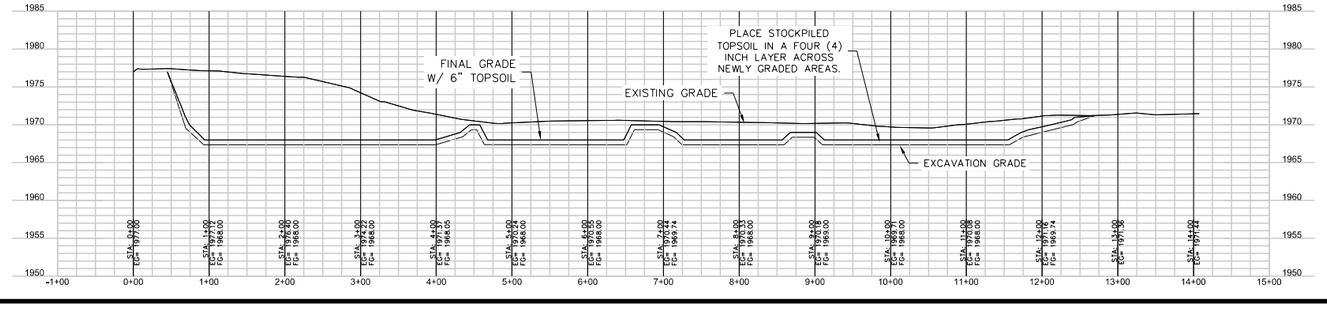
NOTE

REMOVE EIGHT (8") OF TOPSOIL FROM EXISTING WETLANDS AND STOCKPILE FOR REDISTRIBUTION AFTER GRADING.

PROFILE 'F-F'



PROFILE 'E-E'



PROFILE SCALE
VERTICAL: 1" = 10'
HORIZONTAL: 1" = 100'

PROFILE SCALE
VERTICAL: 1" = 10'
HORIZONTAL: 1" = 100'

SITE PLAN & PROFILE

File: ACAD-NDOT_Grading Plan.dgn Date: 15-MAR-2021 14:57 Computer: WS6272
ROADWAY DESIGN DIVISION.

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

EARTHWORK QUANTITIES FOR Road1

STATION	BALANCE FACTOR	CUT (SQ FT)	CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (SQ FT)	FILL (CU YD)	ADJUSTED FILL (CU YD)	*******ADDED QUANTITIES******* CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (CU YD)	ADJUSTED FILL (CU YD)	MASS ORDINATE (CU YD)
1019+00.00	1.3	0	0	0	0	0	0	0	0	0	0	0
1020+00.00	1.3	0	0	0	22.7	42	54.6	0	0	0	0	-54.6
1021+00.00	1.3	0	0	0	67.8	167.6	217.9	0	0	0	0	-272.5
1022+00.00	1.3	0	0	0	87.5	287.6	373.9	0	0	0	0	-646.4
1023+00.00	1.3	0	0	0	80.2	310.6	403.7	0	0	0	0	-1050.1
1023+85.00	1.3	0	0	0	54.6	212.2	275.8	0	0	60	78	-1404
1024+00.00	1.3	0	0	0	55.5	30.6	39.8	0	0	0	0	-1443.7
1025+00.00	1.3	0	0	0	56.7	207.8	270.1	0	0	0	0	-1713.8
1026+00.00	1.3	0	0	0	54.1	205.2	266.7	0	0	0	0	-1980.6
1027+00.00	1.3	0	0	0	73.8	236.9	307.9	0	0	0	0	-2288.5
1028+00.00	1.3	0	0	0	76.6	278.5	362.1	0	0	0	0	-2650.5
1029+00.00	1.3	0	0	0	92.4	313	406.9	0	0	0	0	-3057.4
1030+00.00	1.3	0	0	0	97.4	351.5	456.9	0	0	0	0	-3514.3
1031+00.00	1.3	0	0	0	74	317.4	412.6	0	0	0	0	-3927
1032+00.00	1.3	0	0	0	15.7	166.1	215.9	0	0	0	0	-4142.9
1032+91.00	1.3	0	0	0	0	26.5	34.4	0	0	0	0	-4177.3
1033+00.00	1.3	0	0	0	0	0	0	0	0	0	0	-4177.3
1034+00.00	1.3	0	0	0	0	0	0	0	0	0	0	-4177.3
1034+91.00	1.3	0	0	0	0	0	0	0	0	0	0	-4177.3
1035+00.00	1.3	0.3	0	0	0.9	0.2	0.2	0	0	0	0	-4177.4
1036+00.00	1.3	0	0.6	0.6	81	151.7	197.2	0	0	0	0	-4374
1037+00.00	1.3	0	0	0	96.8	329.3	428	0	0	0	0	-4802.1
1037+79.00	1.3	0	0	0	69.9	243.9	317	0	0	130	169	-5288.1
1038+00.00	1.3	0	0	0	66.9	53.2	69.2	0	0	0	0	-5357.3
1038+53.00	1.3	0	0	0	50.9	115.6	150.3	0	0	0	0	-5507.6
1039+00.00	1.3	0	0	0	167.2	189.8	246.8	0	0	0	0	-5754.4
1039+29.00	1.3	0	0	0	47.6	115.4	150	0	0	0	0	-5904.3
1040+00.00	1.3	0	0	0	38.2	112.8	146.7	0	0	0	0	-6051
1040+53.00	1.3	0	0	0	42.2	78.9	102.6	0	0	18	23.4	-6177
1041+00.00	1.3	0	0	0	42.9	74.1	96.3	0	0	0	0	-6273.3
1042+00.00	1.3	0	0	0	42	157.2	204.4	0	0	0	0	-6477.6
1043+00.00	1.3	0	0	0	72.3	211.7	275.2	0	0	0	0	-6752.8
1044+00.00	1.3	0	0	0	71.4	266.1	345.9	0	0	0	0	-7098.8
1045+00.00	1.3	0	0	0	63.2	249.3	324	0	0	0	0	-7422.8
1046+00.00	1.3	0	0	0	24	161.5	209.9	0	0	0	0	-7632.7
1047+00.00	1.3	1.1	2	2	1.4	47	61.1	0	0	0	0	-7691.8
1048+00.00	1.3	0.9	3.7	3.7	0	2.6	3.4	0	0	0	0	-7691.5
1049+00.00	1.3	0	1.7	1.7	19.9	36.9	47.9	0	0	0	0	-7737.7
1050+00.00	1.3	0	0	0	53.1	135.2	175.7	0	0	0	0	-7913.5
1051+00.00	1.3	0	0	0	67.1	222.6	289.4	0	0	0	0	-8202.8
1052+00.00	1.3	0	0	0	72.7	258.9	336.6	0	0	0	0	-8539.4
1053+00.00	1.3	0	0	0	65.2	255.4	332	0	0	0	0	-8871.4
1054+00.00	1.3	0	0	0	62.8	237	308.1	0	0	0	0	-9179.5
1055+00.00	1.3	0	0	0	62.5	232	301.6	0	0	0	0	-9481.2
1056+00.00	1.3	0	0	0	69.7	244.8	318.3	0	0	0	0	-9799.4
1057+00.00	1.3	0	0	0	67	253.1	329.1	0	0	0	0	-10128.5
1058+00.00	1.3	0	0	0	67.6	249.3	324	0	0	0	0	-10452.6
1059+00.00	1.3	0	0	0	70.5	255.7	332.5	0	0	0	0	-10785
1060+00.00	1.3	0	0	0	71.9	263.7	342.8	0	0	0	0	-11127.8
1061+00.00	1.3	0	0	0	75.4	272.8	354.6	0	0	0	0	-11482.5
1062+00.00	1.3	0	0	0	88.6	303.7	394.8	0	0	0	0	-11877.3
1063+00.00	1.3	0	0	0	83.4	318.5	414.1	0	0	0	0	-12291.3
1064+00.00	1.3	0	0	0	82.9	308	400.4	0	0	0	0	-12691.7
1065+00.00	1.3	0	0	0	84.4	309.8	402.8	0	0	0	0	-13094.5
1065+39.00	1.3	0	0	0	90.8	126.5	164.5	0	0	95	123.5	-13382.4
1066+00.00	1.3	0	0	0	86.4	200.2	260.2	0	0	0	0	-13642.7
1067+00.00	1.3	0	0	0	99.1	343.5	446.6	0	0	0	0	-14089.2
1068+00.00	1.3	0	0	0	117.4	400.9	521.2	0	0	0	0	-14610.4
1069+00.00	1.3	0	0	0	83.8	372.6	484.4	0	0	0	0	-15094.8

EARTHWORK QUANTITIES FOR Road1

STATION	BALANCE FACTOR	CUT (SQ FT)	CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (SQ FT)	FILL (CU YD)	ADJUSTED FILL (CU YD)	*******ADDED QUANTITIES******* CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (CU YD)	ADJUSTED FILL (CU YD)	MASS ORDINATE (CU YD)
1070+00.00	1.3	0	0	0	112.6	363.7	472.8	0	0	0	0	-15567.6
1071+00.00	1.3	0	0	0	117.6	426.3	554.2	0	0	0	0	-16121.8
1072+00.00	1.3	0	0	0	111.8	424.8	552.3	0	0	0	0	-16674.1
1073+00.00	1.3	0	0	0	98.3	389.1	505.8	0	0	0	0	-17179.9
1074+00.00	1.3	0	0	0	99.5	366.3	476.2	0	0	0	0	-17656.1
1075+00.00	1.3	0	0	0	113.1	393.7	511.8	0	0	0	0	-18167.9
1076+00.00	1.3	0	0	0	134.8	459.1	596.8	0	0	0	0	-18764.7
1077+00.00	1.3	0	0	0	113.8	460.4	598.5	0	0	0	0	-19363.2
1078+00.00	1.3	0	0	0	99.3	394.6	513	0	0	0	0	-19876.2
1079+00.00	1.3	0	0	0	87.2	345.4	449	0	0	0	0	-20325.2
1080+00.00	1.3	0	0	0	31.2	219.3	285	0	0	0	0	-20610.2
1081+00.00	1.3	2.9	5.4	5.4	3.2	63.7	82.8	0	0	0	0	-20687.6
1081+15.00	1.3	0	0.8	0.8	1.8	1.4	1.8	0	0	0	0	-20688.6
1081+57.00	1.3	0.5	0.4	0.4	0	1.4	1.8	0	0	0	0	-20690.1
1081+95.00	1.3	0	0.4	0.4	1.1	0.8	1	0	0	0	0	-20690.7
1082+00.00	1.3	1.5	0.1	0.1	2	0.3	0.4	0	0	0	0	-20691
1083+00.00	1.3	0	2.8	2.8	27.4	54.4	70.8	0	0	0	0	-20759
1084+00.00	1.3	0	0	0	63.2	167.8	218.1	0	0	0	0	-20977.1
1085+00.00	1.3	0	0	0	56.7	222	288.6	0	0	0	0	-21265.7
1086+00.00	1.3	0	0	0	54.1	205.2	266.7	0	0	0	0	-21532.5
1087+00.00	1.3	0	0	0	73.7	236.7	307.7	0	0	0	0	-21840.1
1088+00.00	1.3	0	0	0	65.8	258.3	335.8	0	0	0	0	-22176
1089+00.00	1.3	0	0	0	27.2	172.2	223.9	0	0	0	0	-22399.8
1089+70.00	1.3	0	0	0	3.1	39.3	51.1	0	0	0	0	-22450.9
1090+00.00	1.3	0	0	0	2.5	3.1	4	0	0	0	0	-22454.9
1090+70.00	1.3	5	6.5	6.5	1.5	5.2	6.7	0	0	0	0	-22455.2
1091+00.00	1.3	2.4	4.1	4.1	3.9	3	3.9	0	0	0	0	-22455
1091+31.00	1.3	0	1.4	1.4	20.9	14.2	18.5	0	0	18	23.4	-22495.5
1092+00.00	1.3	0	0	0	46.8	86.5	112.5	0	0	0	0	-22608
1092+25.00	1.3	0	0	0	46	43	55.9	0	0	0	0	-22663.8

EARTHWORK QUANTITIES FOR Road1

TOTALS

STATION	TOTAL CUT (CU YD)	TOTAL FILL (CU YD)	TOTAL ADJ. FILL (CU YD)	TOTAL ADDED CUT (CU YD)	TOTAL ADDED ADJ. FILL (CU YD)
1092+25.00	30	17136	22276	0	417
GRAND TOTALS	30	17136	22276	0	417

EARTHWORK QUANTITIES FOR Road2

STATION	BALANCE FACTOR	CUT (SQ FT)	CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (SQ FT)	FILL (CU YD)	ADJUSTED FILL (CU YD)	*******ADDED QUANTITIES******* CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (CU YD)	ADJUSTED FILL (CU YD)	MASS ORDINATE (CU YD)
2000+00.00	1.3	0	0	0	46	0	0	0	0	0	0	0
2001+00.00	1.3	4	7.4	7.4	4.6	93.7	121.8	0	0	0	0	-114.4
2001+30.00	1.3	7.1	6.2	6.2	0.4	2.8	3.6	0	0	0	0	-111.9
2002+00.00	1.3	0	9.2	9.2	1.2	2.1	2.7	0	0	0	0	-105.3
2002+80.00	1.3	0	0	0	2.1	4.9	6.4	0	0	0	0	-111.7
2003+00.00	1.3	0.7	0.3	0.3	4.7	2.5	3.3	0	0	0	0	-114.7
2004+00.00	1.3	0	1.3	1.3	53	106.9	138.9	0	0	0	0	-252.3
2005+00.00	1.3	0	0	0	83.3	252.4	328.1	0	0	0	0	-580.5

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PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

EARTHWORK QUANTITIES FOR Road2

STATION	BALANCE FACTOR	CUT (SQ FT)	CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (SQ FT)	FILL (CU YD)	ADJUSTED FILL (CU YD)	*******ADDED QUANTITIES******* CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (CU YD)	ADJUSTED FILL (CU YD)	MASS ORDINATE (CU YD)
2006+00.00	1.3	0	0	0	80.5	303.3	394.3	0	0	0	0	-974.8
2007+00.00	1.3	0	0	0	65.9	271.1	352.4	0	0	0	0	-1327.2
2008+00.00	1.3	0	0	0	68.9	249.6	324.5	0	0	0	0	-1651.8
2009+00.00	1.3	0	0	0	97.2	307.6	399.9	0	0	0	0	-2051.6
2010+00.00	1.3	0	0	0	88.4	343.7	446.8	0	0	0	0	-2498.4
2011+00.00	1.3	0	0	0	81.7	315	409.5	0	0	0	0	-2907.9
2012+00.00	1.3	0	0	0	78.1	295.9	384.7	0	0	0	0	-3292.6
2012+09.00	1.3	0	0	0	73.2	25.2	32.8	0	0	65	84.5	-3409.9
2013+00.00	1.3	0	0	0	66.1	234.7	305.2	0	0	0	0	-3715.1
2014+00.00	1.3	0	0	0	64.3	241.5	313.9	0	0	0	0	-4029
2015+00.00	1.3	0	0	0	77.1	261.9	340.4	0	0	0	0	-4369.4
2016+00.00	1.3	0	0	0	72.9	277.8	361.1	0	0	0	0	-4730.5
2017+00.00	1.3	0	0	0	64.9	255.2	331.7	0	0	0	0	-5062.3
2018+00.00	1.3	0	0	0	62.5	235.9	306.7	0	0	0	0	-5369
2019+00.00	1.3	0	0	0	69.5	244.4	317.8	0	0	0	0	-5686.8
2020+00.00	1.3	0	0	0	70	258.3	335.8	0	0	0	0	-6022.6
2021+00.00	1.3	0	0	0	66.7	253.1	329.1	0	0	0	0	-6351.7
2022+00.00	1.3	0	0	0	30.5	180	234	0	0	0	0	-6585.7
2022+90.00	1.3	1.2	2	2	1.3	53	68.9	0	0	0	0	-6652.6
2023+00.00	1.3	0.3	0.3	0.3	1.6	0.5	0.7	0	0	0	0	-6653
2024+00.00	1.3	1.4	3.1	3.1	1.5	5.7	7.5	0	0	0	0	-6657.3
2024+20.00	1.3	2	1.3	1.3	1.2	1	1.3	0	0	0	0	-6657.4
2025+00.00	1.3	0	3	3	20.7	32.4	42.2	0	0	0	0	-6696.6
2026+00.00	1.3	0	0	0	51.7	134.1	174.3	0	0	0	0	-6870.9
2027+00.00	1.3	0	0	0	53.1	194.1	252.3	0	0	0	0	-7123.2
2028+00.00	1.3	0	0	0	54.9	200	260	0	0	0	0	-7383.2
2029+00.00	1.3	0	0	0	57.2	207.6	269.9	0	0	0	0	-7653
2030+00.00	1.3	0	0	0	59.2	215.6	280.2	0	0	0	0	-7933.3
2031+00.00	1.3	0	0	0	69.3	238	309.4	0	0	0	0	-8242.6
2032+00.00	1.3	0	0	0	68.4	255	331.5	0	0	0	0	-8574.1
2033+00.00	1.3	0	0	0	59.8	237.4	308.6	0	0	0	0	-8882.7
2034+00.00	1.3	0	0	0	67.6	235.9	306.7	0	0	0	0	-9189.4
2035+00.00	1.3	0	0	0	67.9	250.9	326.2	0	0	0	0	-9515.7
2036+00.00	1.3	0	0	0	72.7	260.4	338.5	0	0	0	0	-9854.1
2037+00.00	1.3	0	0	0	74.9	273.3	355.3	0	0	0	0	-10209.5
2038+00.00	1.3	0	0	0	75.4	278.3	361.8	0	0	0	0	-10571.3
2039+00.00	1.3	0	0	0	74.2	277	360.1	0	0	0	0	-10931.4
2040+00.00	1.3	0	0	0	83.6	292.2	379.9	0	0	0	0	-11311.3
2041+00.00	1.3	0	0	0	102.9	345.4	449	0	0	0	0	-11760.3
2041+64.00	1.3	0	0	0	86.8	224.8	292.3	0	0	50	65	-12117.6
2042+00.00	1.3	0	0	0	78.3	110.1	143.1	0	0	0	0	-12260.7
2043+00.00	1.3	0	0	0	81.3	295.6	384.2	0	0	0	0	-12644.9
2044+00.00	1.3	0	0	0	73.4	286.5	372.4	0	0	0	0	-13017.3
2045+00.00	1.3	0	0	0	36.4	203.3	264.3	0	0	0	0	-13281.7
2046+00.00	1.3	1.7	3.1	3.1	4.2	75.2	97.7	0	0	0	0	-13376.3
2046+30.00	1.3	2.4	2.3	2.3	1.2	3	3.9	0	0	0	0	-13377.9
2047+00.00	1.3	0	3.1	3.1	3.1	5.6	7.2	0	0	0	0	-13382
2047+30.00	1.3	0	0	0	3.6	3.7	4.8	0	0	0	0	-13386.9
2048+00.00	1.3	0.7	0.9	0.9	10	17.6	22.9	0	0	0	0	-13408.9
2049+00.00	1.3	0	1.3	1.3	33.7	80.9	105.2	0	0	0	0	-13512.8
2050+00.00	1.3	0	0	0	65.7	184.1	239.3	0	0	0	0	-13752.1
2051+00.00	1.3	0	0	0	59.4	231.7	301.2	0	0	0	0	-14053.2
2052+00.00	1.3	0	0	0	60.6	222.2	288.9	0	0	0	0	-14342.1
2053+00.00	1.3	0	0	0	27.8	163.7	212.8	0	0	0	0	-14554.9
2054+00.00	1.3	2.4	4.4	4.4	0.7	52.8	68.6	0	0	0	0	-14619.1
2054+15.00	1.3	0.1	0.7	0.7	0.8	0.4	0.5	0	0	0	0	-14619
2055+00.00	1.3	0	0.2	0.2	2.7	5.5	7.2	0	0	0	0	-14626
2055+15.00	1.3	1.1	0.3	0.3	1	1	1.3	0	0	0	0	-14627
2056+00.00	1.3	1.9	4.7	4.7	14.8	24.9	32.3	0	0	0	0	-14654.6

EARTHWORK QUANTITIES FOR Road2

STATION	BALANCE FACTOR	CUT (SQ FT)	CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (SQ FT)	FILL (CU YD)	ADJUSTED FILL (CU YD)	*******ADDED QUANTITIES******* CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (CU YD)	ADJUSTED FILL (CU YD)	MASS ORDINATE (CU YD)
2057+00.00	1.3	0	3.5	3.5	42.8	106.7	138.7	0	0	0	0	-14789.7
2058+00.00	1.3	0	0	0	68.4	205.9	267.7	0	0	0	0	-15057.4
2059+00.00	1.3	0	0	0	77.1	269.4	350.3	0	0	0	0	-15407.7
2060+00.00	1.3	0	0	0	67	266.9	346.9	0	0	0	0	-15754.6
2061+00.00	1.3	0	0	0	62.7	240.2	312.2	0	0	0	0	-16066.9
2062+00.00	1.3	0	0	0	65.3	237	308.1	0	0	0	0	-16375
2062+30.00	1.3	0	0	0	58.4	68.7	89.3	0	0	30	39	-16503.4
2062+79.00	1.3	0	0	0	55.3	103.2	134.1	0	0	30	39	-16676.5
2063+00.00	1.3	0	0	0	55.9	43.2	56.2	0	0	0	0	-16732.7
2064+00.00	1.3	0	0	0	51.5	198.9	258.6	0	0	0	0	-16991.3
2065+00.00	1.3	0	0	0	51.7	191.1	248.4	0	0	0	0	-17239.7
2066+00.00	1.3	0	0	0	51.7	191.5	248.9	0	0	0	0	-17488.6
2067+00.00	1.3	0	0	0	46.2	181.3	235.7	0	0	0	0	-17724.3
2068+00.00	1.3	6.1	11.3	11.3	2.2	89.6	116.5	0	0	0	0	-17829.5
2068+10.00	1.3	5	2.1	2.1	0.1	0.4	0.6	0	0	0	0	-17828
2069+00.00	1.3	0	8.3	8.3	2.2	3.8	5	0	0	0	0	-17824.7
2069+10.00	1.3	0	0	0	2.2	0.8	1.1	0	0	0	0	-17825.7
2070+00.00	1.3	0	0	0	43.7	76.5	99.4	0	0	0	0	-17925.2
2071+00.00	1.3	0	0	0	91.9	251.1	326.4	0	0	0	0	-18251.6
2072+00.00	1.3	0	0	0	72.9	305.2	396.7	0	0	0	0	-18648.4
2073+00.00	1.3	0	0	0	0	135	175.5	0	0	0	0	-18823.9

EARTHWORK QUANTITIES FOR Road2

TOTALS

STATION	TOTAL CUT (CU YD)	TOTAL FILL (CU YD)	TOTAL ADJ. FILL (CU YD)	TOTAL ADDED CUT (CU YD)	TOTAL ADDED ADJ. FILL (CU YD)
2073+00.00	80	14367	18677	0	228
GRAND TOTALS	80	14367	18677	0	228

EARTHWORK QUANTITIES FOR Road3

STATION	BALANCE FACTOR	CUT (SQ FT)	CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (SQ FT)	FILL (CU YD)	ADJUSTED FILL (CU YD)	*******ADDED QUANTITIES******* CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (CU YD)	ADJUSTED FILL (CU YD)	MASS ORDINATE (CU YD)
3000+12.00	1.3	0	0	0	0	0	0	0	0	0	0	0
3001+00.00	1.3	5.3	8.6	8.6	31.7	51.7	67.2	0	0	0	0	-58.5
3002+00.00	1.3	0	9.8	9.8	72.1	192.2	249.9	0	0	0	0	-298.6
3003+00.00	1.3	0	0	0	80.1	281.9	366.4	0	0	0	0	-665
3004+00.00	1.3	0	0	0	81.8	299.8	389.8	0	0	0	0	-1054.8
3005+00.00	1.3	0	0	0	75.9	292	379.6	0	0	0	0	-1434.4
3006+00.00	1.3	0	0	0	80.8	290.2	377.2	0	0	0	0	-1811.6
3007+00.00	1.3	0	0	0	78.4	294.8	383.3	0	0	0	0	-2194.9
3008+00.00	1.3	0	0	0	75	284.1	369.3	0	0	0	0	-2564.2
3009+00.00	1.3	0	0	0	86.7	299.4	389.3	0	0	0	0	-2953.5
3010+00.00	1.3	0	0	0	91.8	330.6	429.7	0	0	0	0	-3383.2
3011+00.00	1.3	0	0	0	88.4	333.7	433.8	0	0	0	0	-3817
3012+00.00	1.3	0	0	0	77.2	306.7	398.7	0	0	0	0	-4215.7
3013+00.00	1.3	0	0	0	87.4	304.8	396.3	0	0	0	0	-4611.9
3014+00.00	1.3	0	0	0	85.5	320.2	416.2	0	0	0	0	-5028.2
3015+00.00	1.3	0	0	0	82.2	310.6	403.7	0	0	0	0	-5431.9
3016+00.00	1.3	0	0	0	57.9	259.4	337.3	0	0	0	0	-5769.2

ROADWAY DESIGN DIVISION.

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PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

ROADWAY DESIGN DIVISION.

EARTHWORK QUANTITIES FOR Road3

STATION	BALANCE FACTOR	CUT (SQ FT)	CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (SQ FT)	FILL (CU YD)	ADJUSTED FILL (CU YD)	*******ADDED QUANTITIES******* CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (CU YD)	ADJUSTED FILL (CU YD)	MASS ORDINATE (CU YD)
3017+00.00	1.3	0	0	0	45.4	191.3	248.7	0	0	0	0	-6017.9
3018+00.00	1.3	0	0	0	44.8	167	217.1	0	0	0	0	-6235
3019+00.00	1.3	0	0	0	51.7	178.7	232.3	0	0	0	0	-6467.3
3020+00.00	1.3	0	0	0	64.6	215.4	280	0	0	0	0	-6747.3
3021+00.00	1.3	0	0	0	77.7	263.5	342.6	0	0	0	0	-7089.9
3022+00.00	1.3	0	0	0	71.8	276.9	359.9	0	0	0	0	-7449.8
3023+00.00	1.3	0	0	0	55.9	236.5	307.4	0	0	0	0	-7757.2
3024+00.00	1.3	3.8	7	7	4	110.9	144.2	0	0	0	0	-7894.4
3024+20.00	1.3	1.2	1.9	1.9	0.2	1.6	2	0	0	0	0	-7894.6
3025+00.00	1.3	3.8	7.4	7.4	0	0.3	0.4	0	0	0	0	-7887.5
3026+00.00	1.3	2.4	11.5	11.5	66	122.2	158.9	0	0	0	0	-8034.9
3027+00.00	1.3	0	4.4	4.4	68.9	249.8	324.8	0	0	0	0	-8355.3
3028+00.00	1.3	0	0	0	56.1	231.5	300.9	0	0	0	0	-8656.2
3028+99.65	1.3	0	0	0	11.9	125.5	163.1	0	0	0	0	-8819.3
3029+00.00	1.3	0	0	0	11.7	0.2	0.2	0	0	0	0	-8819.5
3029+25.00	1.3	0.1	0	0	0.5	5.6	7.3	0	0	0	0	-8826.8
3030+00.00	1.3	0.4	0.7	0.7	1.2	2.4	3.1	0	0	0	0	-8829.2
3030+05.00	1.3	0	0	0	1.2	0.2	0.3	0	0	0	0	-8829.4
3031+00.00	1.3	0	0	0	40	72.5	94.2	0	0	0	0	-8923.7
3031+36.44	1.3	0	0	0	54.6	63.8	83	0	0	40	52	-9058.7
3032+00.00	1.3	0	0	0	76.9	154.8	201.2	0	0	0	0	-9259.9
3033+00.00	1.3	0	0	0	74.5	280.4	364.5	0	0	0	0	-9624.4
3034+00.00	1.3	0	0	0	62.2	253.1	329.1	0	0	0	0	-9953.4
3035+00.00	1.3	0	0	0	60.1	226.5	294.4	0	0	0	0	-10247.9
3036+00.00	1.3	0.1	0.2	0.2	4.8	120.2	156.2	0	0	0	0	-10403.9
3036+35.00	1.3	10.8	7.1	7.1	2	4.4	5.7	0	0	0	0	-10402.6
3037+00.00	1.3	40	61.1	61.1	0	2.4	3.1	0	0	0	0	-10344.6
3038+00.00	1.3	51.8	170	170	0.4	0.7	1	0	0	0	0	-10175.5
3039+00.00	1.3	22.4	137.4	137.4	1.4	3.3	4.3	0	0	0	0	-10042.5
3039+35.00	1.3	1.1	15.2	15.2	0.5	1.2	1.6	0	0	0	0	-10028.8
3040+00.00	1.3	1.1	2.6	2.6	63.5	77	100.1	0	0	0	0	-10126.3
3041+00.00	1.3	0	2	2	86	276.9	359.9	0	0	0	0	-10484.2
3042+00.00	1.3	0	0	0	91.8	329.3	428	0	0	0	0	-10912.2
3043+00.00	1.3	0	0	0	76.6	311.9	405.4	0	0	0	0	-11317.6
3044+00.00	1.3	8.2	15.2	15.2	7.9	156.5	203.4	0	0	0	0	-11505.9
3044+10.00	1.3	0.9	1.7	1.7	1.5	1.7	2.3	0	0	0	0	-11506.5
3045+00.00	1.3	0.4	2.2	2.2	2.9	7.3	9.5	0	0	0	0	-11513.8
3045+10.00	1.3	0.1	0.1	0.1	2.2	0.9	1.2	0	0	0	0	-11515
3046+00.00	1.3	0.6	1.2	1.2	86.2	147.3	191.5	0	0	0	0	-11705.3
3046+64.00	1.3	0	0.7	0.7	109.5	231.9	301.5	0	0	50	65	-12071.1
3047+00.00	1.3	0	0	0	33.4	95.3	123.8	0	0	0	0	-12195
3047+50.00	1.3	4.8	4.4	4.4	0.9	31.8	41.3	0	0	0	0	-12231.8
3048+00.00	1.3	4.9	9	9	0.8	1.6	2	0	0	0	0	-12224.9
3048+50.00	1.3	0	4.5	4.5	0.3	1	1.3	0	0	0	0	-12221.7
3049+00.00	1.3	0.1	0.1	0.1	1	1.2	1.6	0	0	0	0	-12223.2
3049+25.00	1.3	0.1	0.1	0.1	2	1.4	1.8	0	0	0	0	-12224.9
3049+40.00	1.3	4.3	1.2	1.2	3.9	1.6	2.1	0	0	0	0	-12225.8
3050+00.00	1.3	0	4.8	4.8	137.1	156.7	203.7	0	0	0	0	-12424.7
3051+00.00	1.3	0	0	0	49.3	345.2	448.7	0	0	0	0	-12873.4
3051+70.00	1.3	0.5	0.6	0.6	0.9	65.1	84.6	0	0	0	0	-12957.4
3052+00.00	1.3	0.3	0.4	0.4	0	0.5	0.6	0	0	0	0	-12957.6
3052+80.00	1.3	1	1.9	1.9	0	0	0	0	0	0	0	-12955.6
3053+00.00	1.3	1.6	1	1	4	1.5	1.9	0	0	0	0	-12956.6
3054+00.00	1.3	6.7	15.4	15.4	39.6	80.7	105	0	0	0	0	-13046.2
3055+00.00	1.3	0	12.4	12.4	32.1	132.8	172.6	0	0	0	0	-13206.4
3056+00.00	1.3	0.1	0.2	0.2	26	107.6	139.9	0	0	0	0	-13346.1
3057+00.00	1.3	0.1	0.4	0.4	39.4	121.1	157.4	0	0	0	0	-13503.2
3058+00.00	1.3	0	0.2	0.2	37.2	141.9	184.4	0	0	0	0	-13687.4
3059+00.00	1.3	0	0	0	41	144.8	188.3	0	0	0	0	-13875.6

EARTHWORK QUANTITIES FOR Road3

STATION	BALANCE FACTOR	CUT (SQ FT)	CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (SQ FT)	FILL (CU YD)	ADJUSTED FILL (CU YD)	*******ADDED QUANTITIES******* CUT (CU YD)	ADJUSTED CUT (CU YD)	FILL (CU YD)	ADJUSTED FILL (CU YD)	MASS ORDINATE (CU YD)
3060+00.00	1.3	0	0	0	38.3	146.9	190.9	0	0	0	0	-14066.5
3061+00.00	1.3	0	0	0	36.5	138.5	180.1	0	0	0	0	-14246.6
3062+00.00	1.3	0	0	0	40.4	142.4	185.1	0	0	0	0	-14431.7
3062+75.00	1.3	0.1	0.1	0.1	2.5	59.6	77.5	0	0	0	0	-14509.1
3063+00.00	1.3	0.2	0.1	0.1	0.2	1.2	1.6	0	0	0	0	-14510.6
3064+00.00	1.3	0.7	1.7	1.7	0.5	1.3	1.7	0	0	0	0	-14510.6
3065+00.00	1.3	0.1	1.5	1.5	73.2	136.5	177.4	0	0	0	0	-14686.5
3066+00.00	1.3	18.3	34.1	34.1	0	135.6	176.2	0	0	0	0	-14828.7
3067+00.00	1.3	18.3	67.8	67.8	57.2	105.9	137.7	0	0	0	0	-14898.6
3068+00.00	1.3	0	33.9	33.9	78.8	251.9	327.4	0	0	0	0	-15192.1
3069+00.00	1.3	0	0	0	80.1	294.3	382.5	0	0	0	0	-15574.6
3070+00.00	1.3	0	0	0	105.4	343.5	446.6	0	0	0	0	-16021.2
3070+28.00	1.3	0	0	0	109.5	111.4	144.9	0	0	0	0	-16166.1
3071+00.00	1.3	0	0	0	240.1	466.1	606	0	0	0	0	-16772
3071+84.00	1.3	0	0	0	310.4	856.3	1113.2	0	0	0	0	-17885.3
3072+00.00	1.3	0	0	0	301.2	181.2	235.6	0	0	0	0	-18120.9
3072+40.00	1.3	0	0	0	20.3	238.1	309.6	0	0	0	0	-18430.5

EARTHWORK QUANTITIES FOR Road3

TOTALS

STATION	TOTAL CUT (CU YD)	TOTAL FILL (CU YD)	TOTAL ADJ. FILL (CU YD)	TOTAL ADDED CUT (CU YD)	TOTAL ADDED ADJ. FILL (CU YD)
3072+40.00	664	14598	18977	0	117
GRAND TOTALS	664	14598	18977	0	117

File: 712160cewsht01.dgn Date: 11-MAR-2021 18:18 Computer: WS6272

ROADWAY DESIGN DIVISION.

Computer: WS6272

Date: 11-MAR-2021 18:18

File: 712160culvxssht01.dgn

0 10' 20'

SCALE

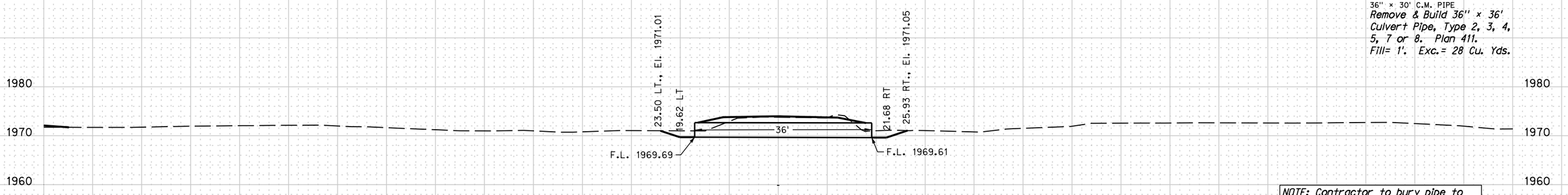
olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	R1

C.N. 71216

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

STA. 3000+51
36" x 30' C.M. PIPE
Remove & Build 36" x 36' Culvert Pipe, Type 2, 3, 4, 5, 7 or 8. Plan 411.
Fill= 1'. Exc.= 28 Cu. Yds.



NOTE: Contractor to bury pipe to accomodate a minimum of 1.0' of cover over pipe.

DRAINAGE CROSS SECTIONS

160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

ROADWAY DESIGN DIVISION.

File: 7120160cxsRoad1.dgn Date: 11-MAR-2021 18:47 Computer: WS6272

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X1

C.N. 71216

1025+00.00

19.16, El. 1969.79
3:1
11.00, El. 1972.51
2.0%
1972.73
1970.78
-11.00, El. 1972.51
3:1
-18.76, El. 1969.92

1024+00.00

20.45, El. 1969.56
3:1
11.00, El. 1972.71
2.0%
1972.93
1971.01
-11.00, El. 1972.71
3:1
-41.88, El. 1969.46

1023+85.00

19.24, El. 1970.00
3:1
11.00, El. 1972.74
2.0%
1972.96
1970.94
-11.00, El. 1972.74
3.5%
-39.00, El. 1971.78

1023+00.00

18.47, El. 1970.42
3:1
11.00, El. 1972.91
2.0%
1973.13
1970.56
-11.00, El. 1972.91
3:1
-24.73, El. 1968.33

1022+00.00

19.80, El. 1970.15
3:1
11.00, El. 1973.08
2.0%
1973.30
1970.69
-11.00, El. 1973.08
3:1
-25.93, El. 1968.11

1021+00.00

17.54, El. 1970.45
3:1
11.00, El. 1972.63
2.0%
1972.85
1970.62
-11.00, El. 1972.63
3:1
-24.23, El. 1968.22

1020+00.00

14.12, El. 1970.58
3:1
11.00, El. 1971.63
2.0%
1971.85
1970.84
-11.00, El. 1971.63
3:1
-15.91, El. 1969.99

1019+00.00

1971.20

ROAD 1

ROADWAY DESIGN DIVISION.

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X2

C.N. 71216

1032+91.00

1970 1990 1980 1970

1967.02 1967.02

1032+00.00

1970 1990 1980 1970

11.83, El. 1968.67
11.00, El. 1968.95
3:1
2.0%
1969.17
1968.44
-15.18, El. 1967.56
-11.00, El. 1968.95
3:1

1031+00.00

1970 1990 1980 1970

21.16, El. 1967.56
3:1
11.00, El. 1970.95
2.0%
1971.17
1969.00
-25.90, El. 1965.98
-11.00, El. 1970.95
3:1

1030+00.00

1970 1990 1980 1970

21.46, El. 1968.02
3:1
11.00, El. 1971.51
2.0%
1971.73
1968.89
-26.39, El. 1966.38
-11.00, El. 1971.51
3:1

1029+00.00

1970 1990 1980 1970

21.72, El. 1968.14
3:1
11.00, El. 1971.71
2.0%
1971.93
1969.37
-24.92, El. 1967.07
-11.00, El. 1971.71
3:1

1028+00.00

1970 1990 1980 1970

21.01, El. 1968.57
3:1
11.00, El. 1971.91
2.0%
1972.13
1969.77
-24.31, El. 1967.47
-11.00, El. 1971.91
3:1

1027+00.00

1970 1990 1980 1970

20.67, El. 1968.89
3:1
11.00, El. 1972.11
2.0%
1972.33
1969.88
-23.96, El. 1967.79
-11.00, El. 1972.11
3:1

1026+00.00

1970 1990 1980 1970

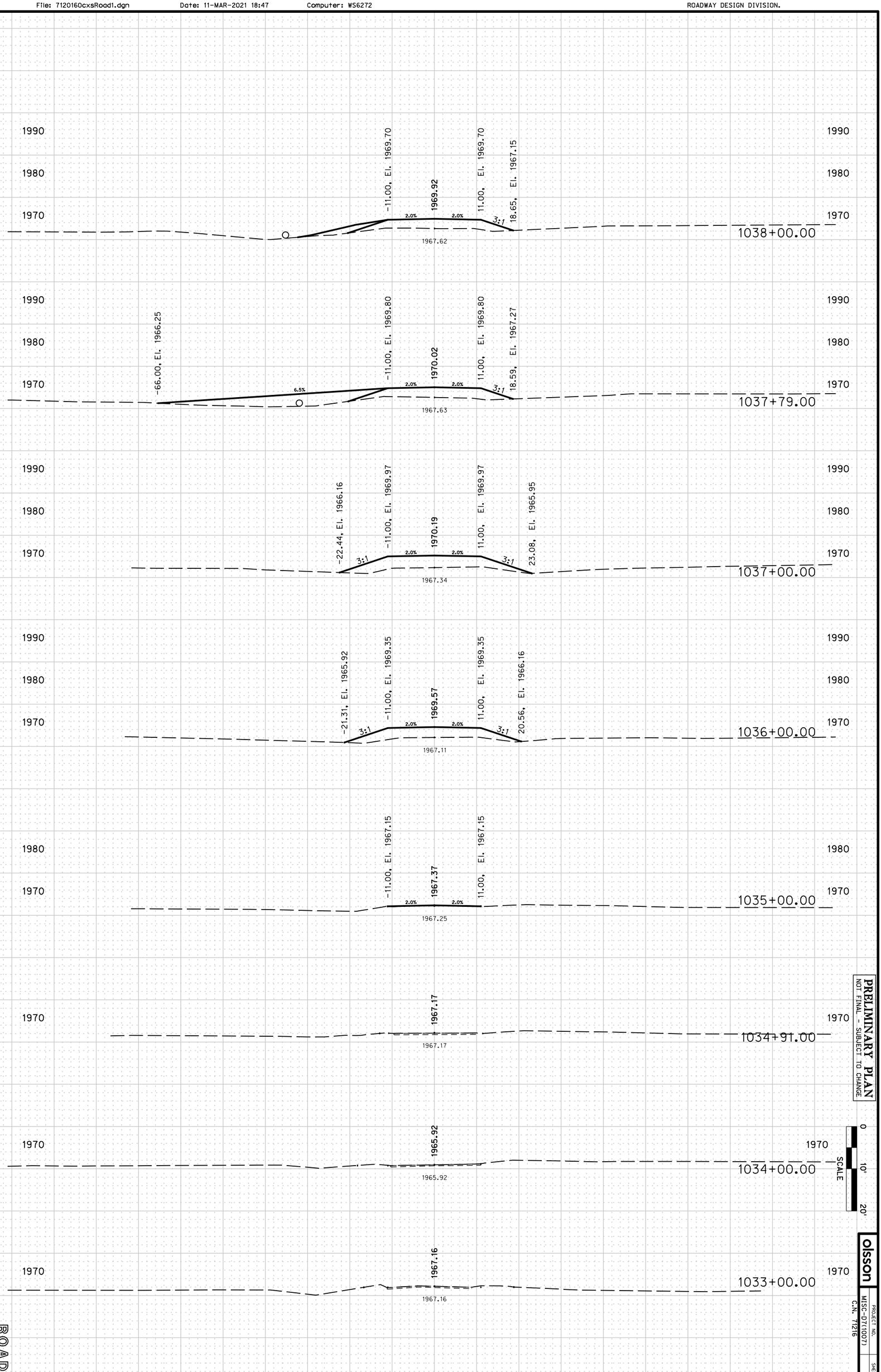
18.88, El. 1969.68
3:1
11.00, El. 1972.31
2.0%
1972.53
1970.62
-20.12, El. 1969.27
-11.00, El. 1972.31
3:1

1970 1990 1980 1970

ROAD 1

0 10 20 30 40 50 60 70 80 90 0 10 20 30 40 50 60 70 80 90

File: 7120160cxsRoad1.dgn Date: 11-MAR-2021 18:47 Computer: WS6272



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

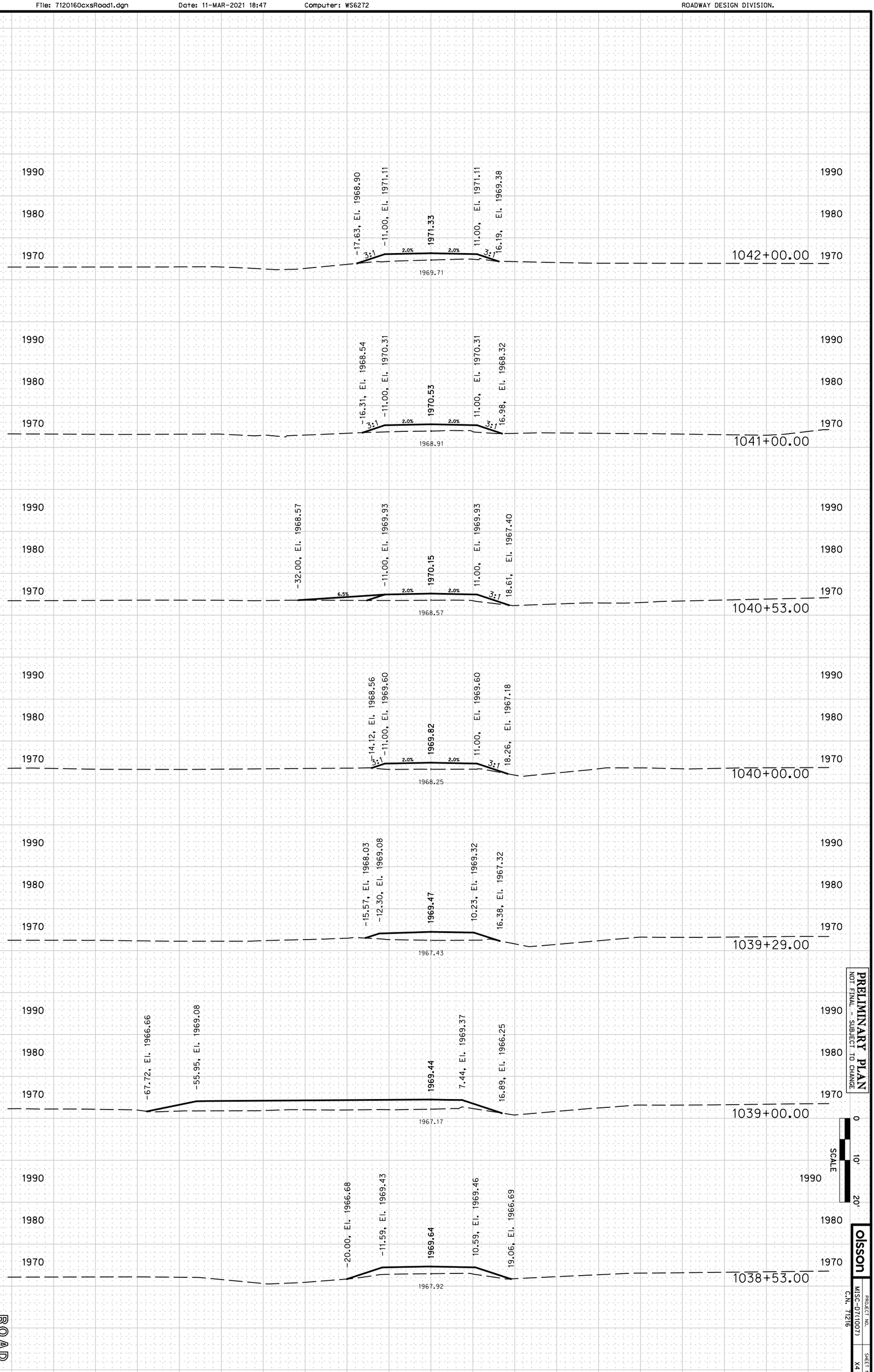
SCALE 0 10' 20'

ROAD 1

olsson

PROJECT NO. MISC-D710077
C.N. 7126

SHEET NO. X3



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

olsson

PROJECT NO. MISC-D7(100)7 C.N. 7126

SHEET NO. X4

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X5

C.N. 71216

0 10' 20'
SCALE

ROADWAY DESIGN DIVISION.

File: 7120160cxsRoad1.dgn Date: 11-MAR-2021 18:47 Computer: WS6272

1050+00.00
1049+00.00
1048+00.00
1047+00.00
1046+00.00
1045+00.00
1044+00.00
1043+00.00

1990 1980 1970

3:1 2.0% 2.0% 3:1

-18.32, El. 1968.93
-11.00, El. 1971.37
15.28, El. 1969.94
11.00, El. 1971.37
1971.59
1969.50

-14.39, El. 1968.84
-11.00, El. 1969.97
11.56, El. 1969.78
11.00, El. 1969.97
1970.19
1969.27

-11.00
1968.79
11.00,
1968.79
1968.71
1968.71

-14.76, El. 1968.49
-11.00, El. 1969.75
12.28, El. 1969.32
11.00, El. 1969.75
1969.97
1968.86

-21.27, El. 1967.57
-11.00, El. 1971.00
16.70, El. 1969.10
11.00, El. 1971.00
1971.22
1968.94

-21.30, El. 1968.02
-11.00, El. 1971.45
19.41, El. 1968.65
11.00, El. 1971.45
1971.67
1969.38

-21.13, El. 1968.32
-11.00, El. 1971.70
17.84, El. 1969.42
11.00, El. 1971.70
1971.92
1969.38

0 10 20 30 40 50 60 70 80 90

ROAD 1

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X6

C.N. 71216

ROADWAY DESIGN DIVISION.

File: 7120160cxsRoad1.dgn Date: 11-MAR-2021 18:47 Computer: WS6272

1990 1980 1970

1057+00.00
16.35, El. 1971.07
11.00, El. 1972.85
2.0%
3:1
1973.07
1970.83
-11.00, El. 1972.85
-23.19, El. 1968.79

1056+00.00
16.47, El. 1970.91
11.00, El. 1972.73
2.0%
3:1
1972.95
1970.51
-11.00, El. 1972.73
-21.44, El. 1969.25

1055+00.00
17.09, El. 1970.58
11.00, El. 1972.61
2.0%
3:1
1972.83
1970.54
-11.00, El. 1972.61
-19.20, El. 1969.88

1054+00.00
17.34, El. 1970.38
11.00, El. 1972.49
2.0%
3:1
1972.71
1970.41
-11.00, El. 1972.49
-20.90, El. 1969.19

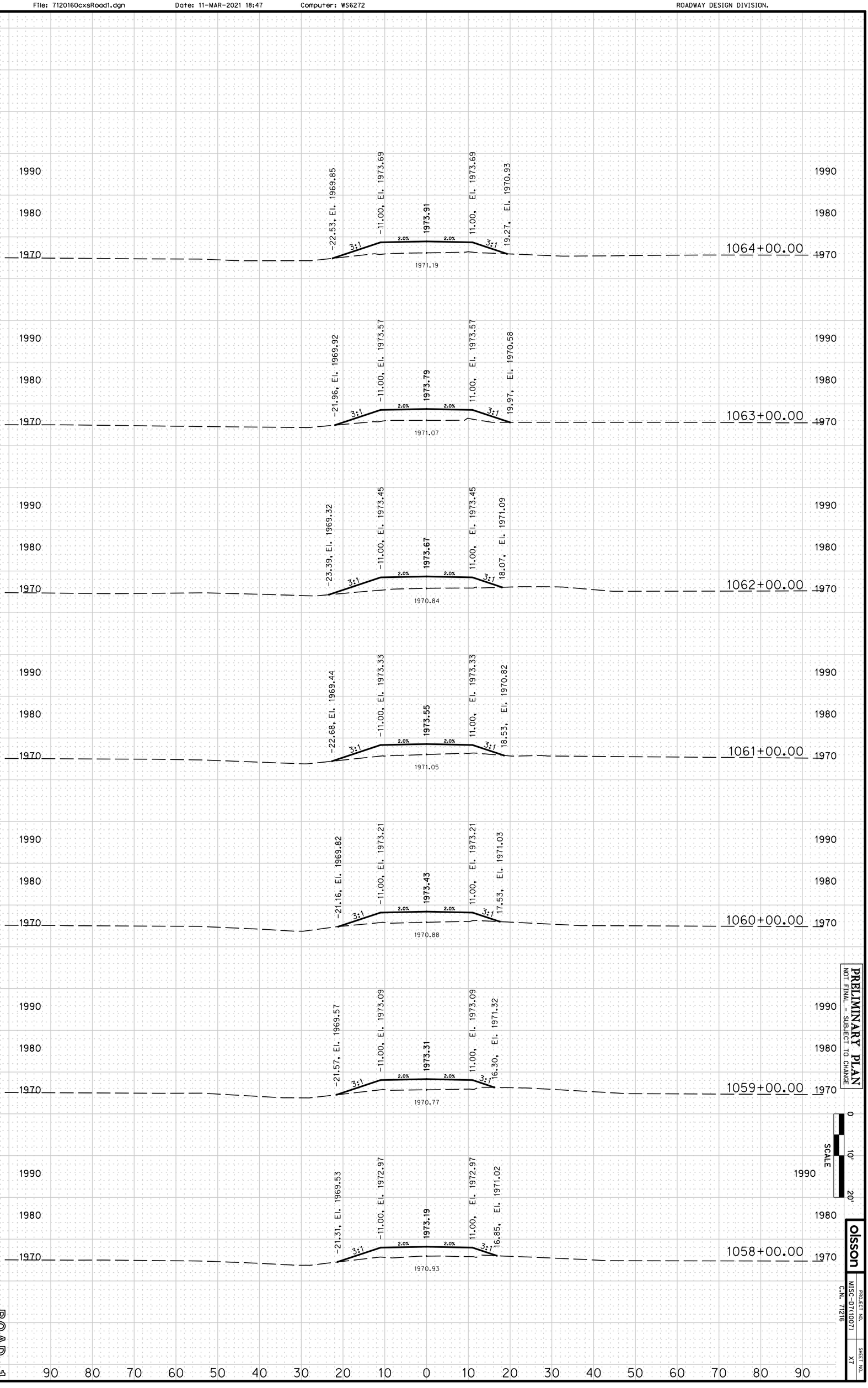
1053+00.00
17.30, El. 1970.27
11.00, El. 1972.37
2.0%
3:1
1972.59
1970.17
-11.00, El. 1972.37
-20.70, El. 1969.14

1052+00.00
17.40, El. 1970.12
11.00, El. 1972.25
2.0%
3:1
1972.47
1969.87
-11.00, El. 1972.25
-21.96, El. 1968.60

1051+00.00
16.61, El. 1970.26
11.00, El. 1972.13
2.0%
3:1
1972.35
1969.86
-11.00, El. 1972.13
-20.87, El. 1968.84

0 10 20 30 40 50 60 70 80 90

ROAD 1



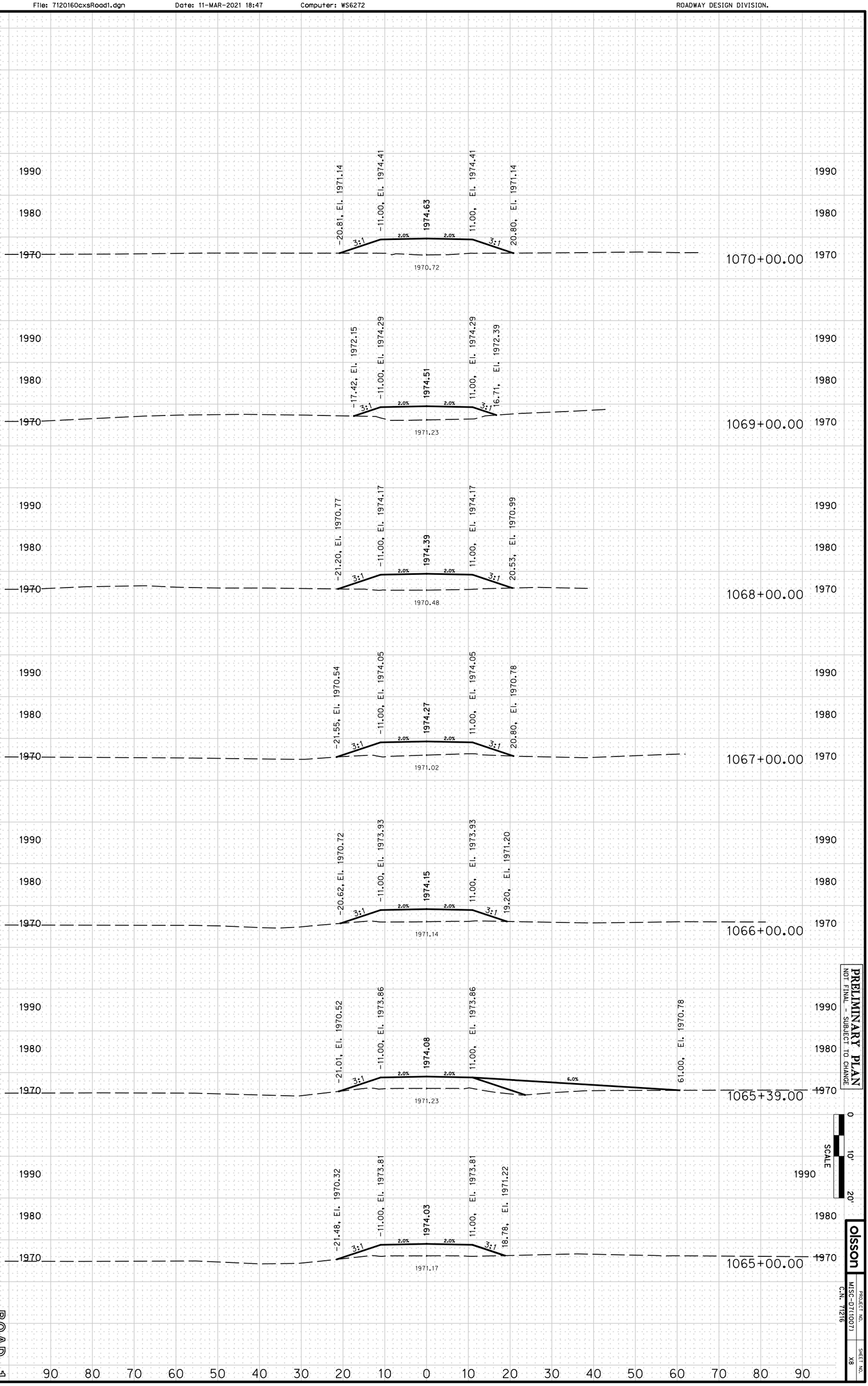
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

olsson

PROJECT NO. MISC-D7(100)7
C.N. 7126

SHEET NO. X7



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

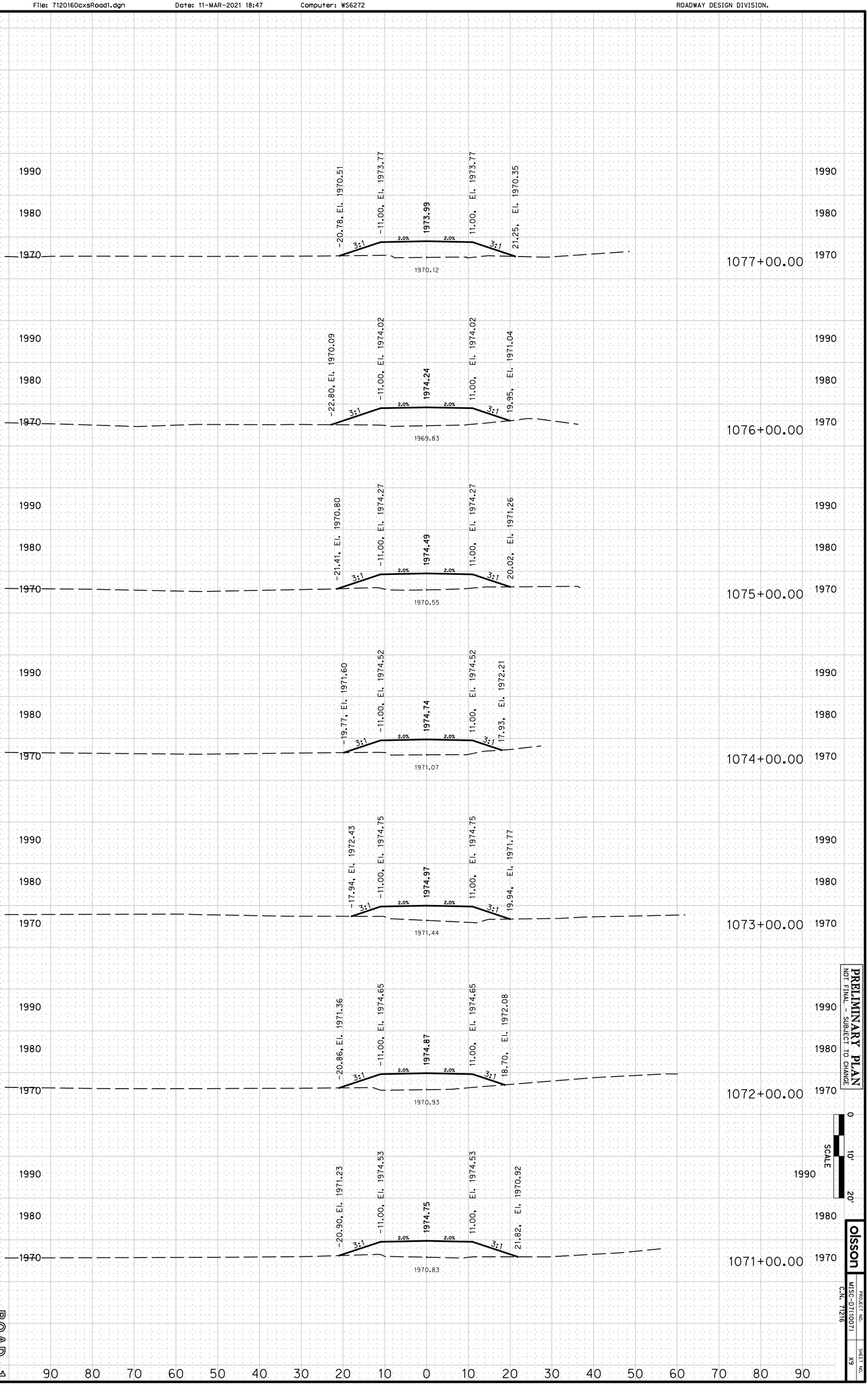
SCALE 0 10' 20'

ROAD 1

olsson

PROJECT NO. MISC-D7(100?) C.N. 71216

SHEET NO. X8



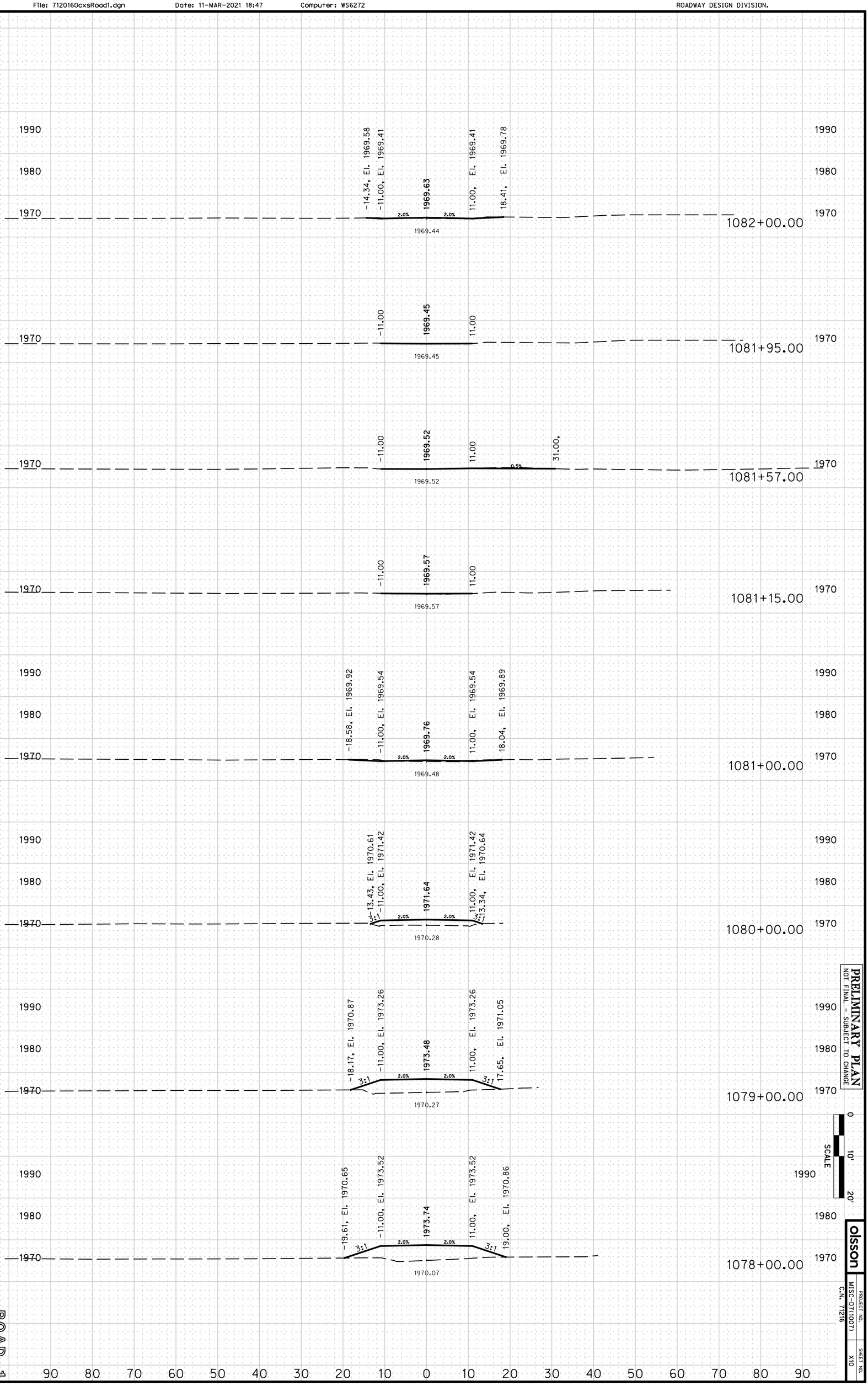
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

olsson

PROJECT NO. MISC-D7(100)7
C.N. 7126

SHEET NO. X9



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

olsson

PROJECT NO. MISC-D(110077) C.N. 7126

SHEET NO. X10

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X11
C.N. 71216	

SCALE 0 10' 20'

ROADWAY DESIGN DIVISION.

Computer: WS6272

Date: 11-MAR-2021 18:47

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1089+00.00

1088+00.00

1087+00.00

1086+00.00

1085+00.00

1084+00.00

1083+00.00

1990 1980 1970

3:1 2.0% 2.0% 3:1

11.00, EL. 1972.11
12.46, EL. 1971.62
1972.33
1970.95
11.00, EL. 1973.48
16.11, EL. 1971.78
1973.70
1971.02
11.00, EL. 1973.68
18.69, EL. 1971.12
1973.90
1971.09
11.00, EL. 1973.54
4.84, EL. 1972.26
1973.76
1971.40
11.00, EL. 1973.29
14.49, EL. 1972.13
1973.51
1971.16
11.00, EL. 1972.93
15.49, EL. 1971.44
1973.15
1970.59
11.00, EL. 1971.04
13.08, EL. 1970.35
1971.26
1969.94

-11.00, EL. 1972.11
-12.94, EL. 1971.46
-11.00, EL. 1973.48
-17.19, EL. 1971.42
-11.00, EL. 1973.68
-17.48, EL. 1971.52
-11.00, EL. 1973.54
-16.37, EL. 1971.75
-11.00, EL. 1973.29
-17.35, EL. 1971.18
-11.00, EL. 1972.93
-17.50, EL. 1970.76
-11.00, EL. 1971.04
-13.08, EL. 1970.35

ROAD 1

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X12
C.N. 71216	

0 10' 20'
SCALE

ROADWAY DESIGN DIVISION.

Computer: WS6272

Date: 11-MAR-2021 18:47

File: 7120160cxsRoad1.dgn

1092+25.00

11.00, El. 1974.13
15.04, El. 1972.78
3:1
2.0%
2.0%
1974.35
1972.21
3:1
-11.00, El. 1974.13
-14.35, El. 1973.01

1092+00.00

11.00, El. 1974.06
16.16, El. 1972.33
3:1
2.0%
2.0%
1974.28
1972.30
3:1
-11.00, El. 1974.06
-13.77, El. 1973.13

1091+31.00

31.00, El. 1971.17
7.0%
11.00, El. 1972.66
2.0%
2.0%
1972.88
1971.88
-11.00, El. 1972.66
-11.68, El. 1972.43

1091+00.00

11.00, El. 1971.74
12.85, El. 1972.34
2.0%
2.0%
1971.96
1971.66
-11.00, El. 1971.74
-16.54, El. 1972.37

1090+70.00

11.00
2.0%
2.0%
1971.36
1971.36
-11.00

1090+00.00

11.00
2.0%
2.0%
1970.58
1970.58
-11.00

1089+70.00

11.00
2.0%
2.0%
1970.82
1970.82
-11.00

1990
1980
1970

ROAD 1

ROADWAY DESIGN DIVISION.

Computer: WS6272

Date: 11-MAR-2021 18:47

File: 7120160cxsRoad2.dgn

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X13

C.N. 71216

2005+00.00

17.58, EL. 1971.62
11.00, EL. 1973.81
3:1
2.0%
1974.03
2.0%
11.00, EL. 1973.81
3:1
-18.89, EL. 1971.18
1970.88

2004+00.00

14.13, EL. 1972.70
11.00, EL. 1973.74
3:1
2.0%
1973.96
2.0%
11.00, EL. 1973.74
3:1
-15.96, EL. 1972.09
1971.64

2003+00.00

13.45, EL. 1971.32
11.00, EL. 1971.32
2.0%
1971.54
2.0%
11.00, EL. 1971.32
-14.72, EL. 1972.11
1971.19

2002+80.00

11.00
11.00
2.0%
1970.92
2.0%
11.00
-11.00
1970.92

2002+00.00

11.00
11.00
2.0%
1969.86
2.0%
11.00
-11.00
1969.86

2001+30.00

17.43, EL. 1971.53
11.00, EL. 1970.27
2.0%
1970.49
2.0%
11.00, EL. 1970.27
-16.23, EL. 1970.53
1970.40

2001+00.00

16.15, EL. 1972.10
11.00, EL. 1970.96
2.0%
1971.18
2.0%
11.00, EL. 1970.96
-14.14, EL. 1971.12
1970.84

2000+00.00

15.04, EL. 1972.78
11.00, EL. 1974.13
3:1
2.0%
1974.35
2.0%
11.00, EL. 1974.13
3:1
-14.35, EL. 1973.01
1972.21

ROAD 2

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X14

C.N. 71216

ROADWAY DESIGN DIVISION.

File: 7120160cxsRoad2.dgn Date: 11-MAR-2021 18:47 Computer: WS6272

2012+00.00

11.00, EL. 1972.41
17.95, EL. 1970.10
3:1
2.0%
1972.63
2.0%
1969.63
-11.00, EL. 1972.41
3:1
-16.61, EL. 1970.55

2011+00.00

11.00, EL. 1972.61
17.19, EL. 1970.55
3:1
2.0%
1972.83
2.0%
1969.64
-11.00, EL. 1972.61
3:1
-18.07, EL. 1970.26

2010+00.00

11.00, EL. 1972.81
17.93, EL. 1970.51
3:1
2.0%
1973.03
2.0%
1969.64
-11.00, EL. 1972.81
3:1
-18.96, EL. 1970.16

2009+00.00

11.00, EL. 1973.01
19.68, EL. 1970.12
3:1
2.0%
1973.23
2.0%
1969.71
-11.00, EL. 1973.01
3:1
-18.98, EL. 1970.35

2008+00.00

11.00, EL. 1973.21
16.49, EL. 1971.38
3:1
2.0%
1973.43
2.0%
1970.47
-11.00, EL. 1973.21
3:1
-15.08, EL. 1971.86

2007+00.00

11.00, EL. 1973.41
16.93, EL. 1971.44
3:1
2.0%
1973.63
2.0%
1970.86
-11.00, EL. 1973.41
3:1
-16.30, EL. 1971.65

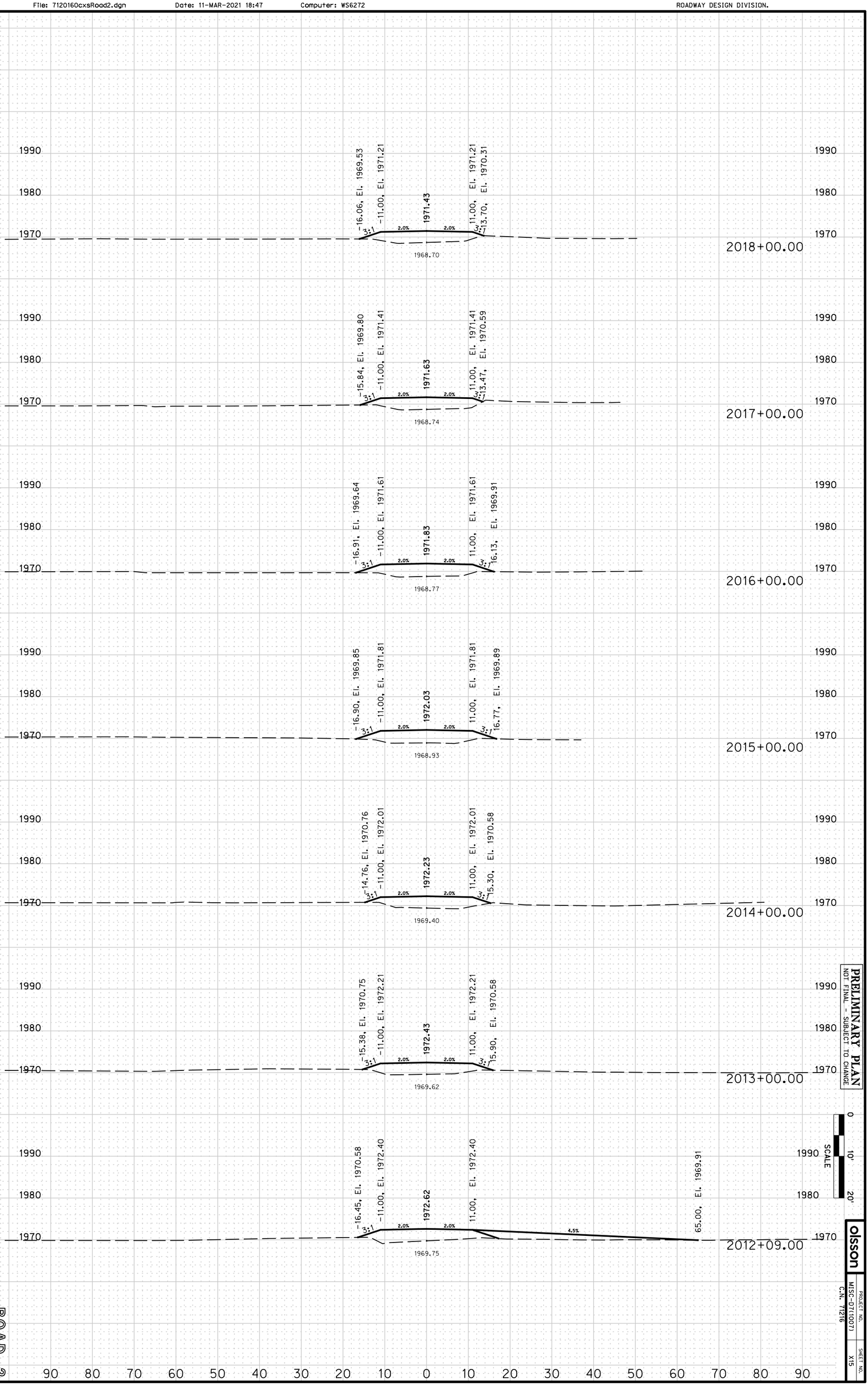
2006+00.00

11.00, EL. 1973.61
17.29, EL. 1971.52
3:1
2.0%
1973.83
2.0%
1970.67
-11.00, EL. 1973.61
3:1
-18.06, EL. 1971.26

1990 1980 1970

90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90

ROAD 2



ROAD 2

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

olsson

PROJECT NO. MISC-D7(100)7 C.N. 7126

SHEET NO. X15

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X16

C.N. 71216

ROADWAY DESIGN DIVISION.

Computer: WS6272

Date: 11-MAR-2021 18:47

File: 7120160cxsRoad2.dgn

2024+20.00 | 2024+00.00 | 2023+00.00 | 2022+90.00 | 2022+00.00 | 2021+00.00 | 2020+00.00 | 2019+00.00

11.00 | 1968.02 | 1968.04 | 1968.08 | 1968.05 | 1969.33 | 1970.71 | 1971.03 | 1971.23

-11.00 | 1968.02 | 1968.04 | 1968.08 | 1968.05 | -13.16, EL. 1968.39 / -11.00, EL. 1969.11 | 1967.82 | -17.39, EL. 1968.36 / -11.00, EL. 1970.49 | 1968.00 | -17.17, EL. 1968.76 / -11.00, EL. 1970.81 | 1968.16 | -17.26, EL. 1968.93 / -11.00, EL. 1971.01 | 1968.35

13.06, EL. 1968.43 / 11.00, EL. 1969.11 | 15.52, EL. 1968.99 / 11.00, EL. 1970.49 | 15.31, EL. 1969.38 / 11.00, EL. 1970.81 | 14.78, EL. 1969.75 / 11.00, EL. 1971.01

3:1 | 2.0%

1970 | 1980 | 1990

0 10 20 30 40 50 60 70 80 90

ROAD 2

ROADWAY DESIGN DIVISION.

Files: 7120160cxsRoad2.dgn Date: 11-MAR-2021 18:47 Computer: WS6272

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X17

C.N. 71216

1990 1980 1970

2031+00.00

11.00, El. 1971.31
-13.43, El. 1970.49
3:1
2.0%
1971.53
2.0%
1968.49
-11.00, El. 1971.31
-16.82, El. 1969.37
3:1

2030+00.00

11.00, El. 1971.16
-14.04, El. 1970.14
3:1
2.0%
1971.38
2.0%
1968.69
-11.00, El. 1971.16
-15.61, El. 1969.62
3:1

2029+00.00

11.00, El. 1971.01
-14.88, El. 1969.71
3:1
2.0%
1971.23
2.0%
1968.57
-11.00, El. 1971.01
-15.28, El. 1969.58
3:1

2028+00.00

11.00, El. 1970.86
-14.87, El. 1969.57
3:1
2.0%
1971.08
2.0%
1968.43
-11.00, El. 1970.86
-14.84, El. 1969.58
3:1

2027+00.00

11.00, El. 1970.71
-14.63, El. 1969.50
3:1
2.0%
1970.93
2.0%
1968.32
-11.00, El. 1970.71
-15.16, El. 1969.32
3:1

2026+00.00

11.00, El. 1970.42
-14.77, El. 1969.16
3:1
2.0%
1970.64
2.0%
1968.20
-11.00, El. 1970.42
-15.35, El. 1968.97
3:1

2025+00.00

11.00, El. 1968.95
3:1
2.0%
1969.18
2.0%
1967.89
-11.00, El. 1968.96
3:1

90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90

ROAD 2

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X18

C.N. 71216

2038+00.00
16.14, El. 1969.44
11.00, El. 1971.15
3:1
2.0%
1971.37
1968.23
-17.33, El. 1969.05
-11.00, El. 1971.15

2037+00.00
15.80, El. 1969.71
11.00, El. 1971.30
3:1
2.0%
1971.52
1968.34
-17.57, El. 1969.11
-11.00, El. 1971.30

2036+00.00
14.48, El. 1970.29
11.00, El. 1971.45
3:1
2.0%
1971.67
1968.50
-17.11, El. 1969.42
-11.00, El. 1971.45

2035+00.00
14.55, El. 1970.42
11.00, El. 1971.60
3:1
2.0%
1971.82
1968.77
-16.90, El. 1969.64
-11.00, El. 1971.60

2034+00.00
14.86, El. 1970.44
11.00, El. 1971.73
3:1
2.0%
1971.95
1968.87
-17.13, El. 1969.68
-11.00, El. 1971.73

2033+00.00
13.23, El. 1970.86
11.00, El. 1971.61
3:1
2.0%
1971.83
1969.06
-16.22, El. 1969.87
-11.00, El. 1971.61

2032+00.00
13.69, El. 1970.56
11.00, El. 1971.46
3:1
2.0%
1971.68
1968.76
-17.33, El. 1969.34
-11.00, El. 1971.46

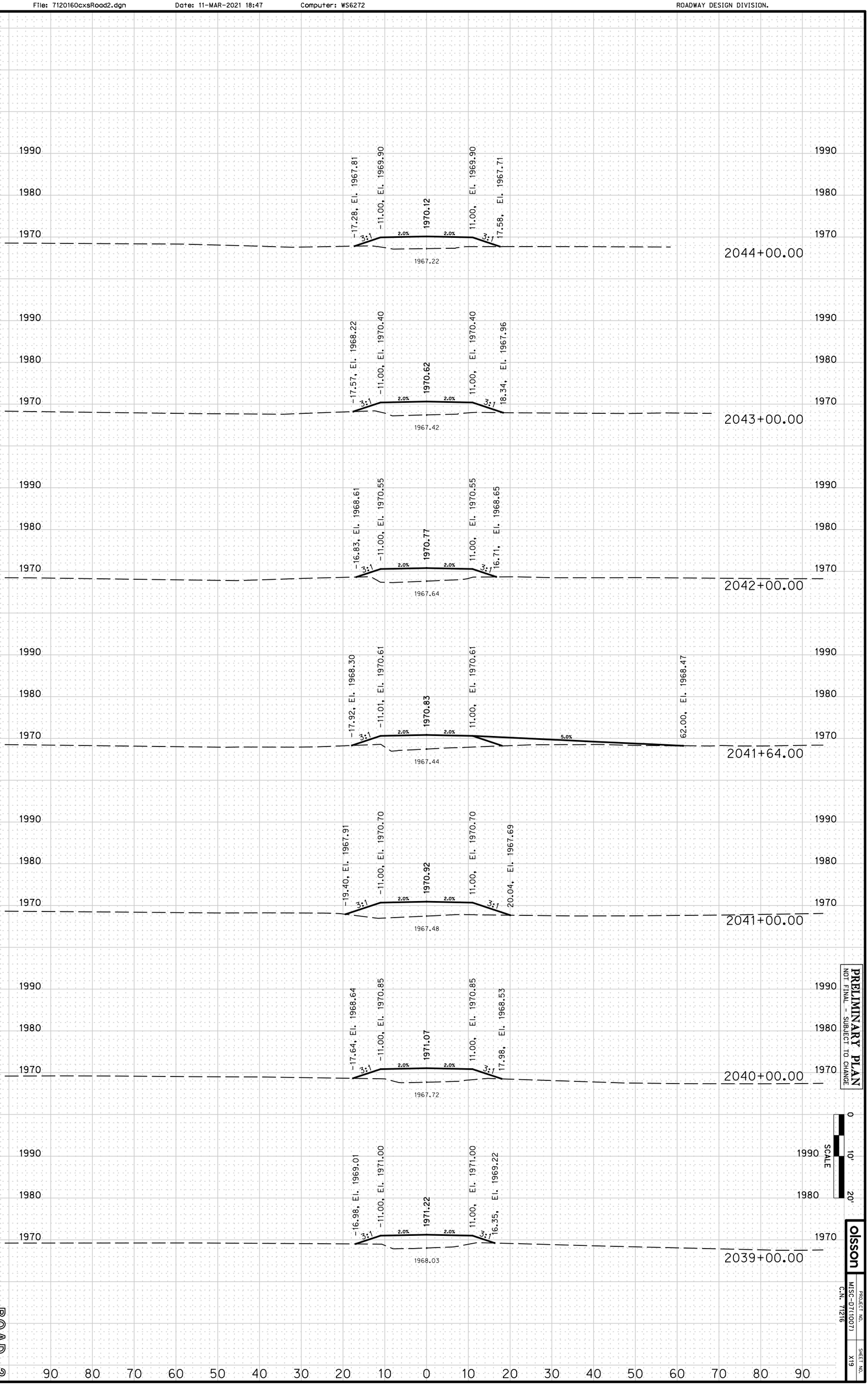
1990 1980 1970

90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90

ROAD 2

ROADWAY DESIGN DIVISION.

File: 7120160cxsRoad2.dgn Date: 11-MAR-2021 18:47 Computer: WS6272


1990
1980
1970
-17.28, El. 1967.81
-11.00, El. 1969.90
1970.12
11.00, El. 1969.90
17.58, El. 1967.71
3:1
2.0%
2.0%
3:1
1967.22
2044+00.00
-17.57, El. 1968.22
-11.00, El. 1970.40
1970.62
11.00, El. 1970.40
18.34, El. 1967.96
1967.42
2043+00.00
-16.83, El. 1968.61
-11.00, El. 1970.55
1970.77
11.00, El. 1970.55
16.71, El. 1968.65
1967.64
2042+00.00
-17.92, El. 1968.30
-11.01, El. 1970.61
1970.83
11.00, El. 1970.61
5.0%
62.00, El. 1968.47
1967.44
2041+64.00
-19.40, El. 1967.91
-11.00, El. 1970.70
1970.92
11.00, El. 1970.70
20.04, El. 1967.69
1967.48
2041+00.00
-17.64, El. 1968.64
-11.00, El. 1970.85
1971.07
11.00, El. 1970.85
17.98, El. 1968.53
1967.72
2040+00.00
-16.98, El. 1969.01
-11.00, El. 1971.00
1971.22
11.00, El. 1971.00
16.35, El. 1969.22
1968.03
2039+00.00
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE
SCALE
0
10'
20'
ROAD 2
90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90
olsson
PROJECT NO.
MISC-D710077
C.N. 71216
SHEET NO.
X19

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X20

C.N. 71216

ROADWAY DESIGN DIVISION.

2050+00.00

16.10, El. 1968.23
11.00, El. 1969.93
3:1
2.0%
1970.15
1967.64
-11.00, El. 1969.93
3:1
-17.13, El. 1967.88

2049+00.00

13.82, El. 1968.00
11.00, El. 1968.94
3:1
2.0%
1969.16
1967.55
-11.00, El. 1968.94
3:1
-14.91, El. 1967.64

2048+00.00

13.16, El. 1967.65
11.00, El. 1967.54
3:1
2.0%
1967.76
1967.09
-11.00, El. 1967.54

2047+30.00

11.00
1966.85
1966.85
-11.00

2047+00.00

11.00
1966.65
1966.65
-11.00

2046+30.00

11.00
1966.71
1966.71
-11.00

2046+00.00

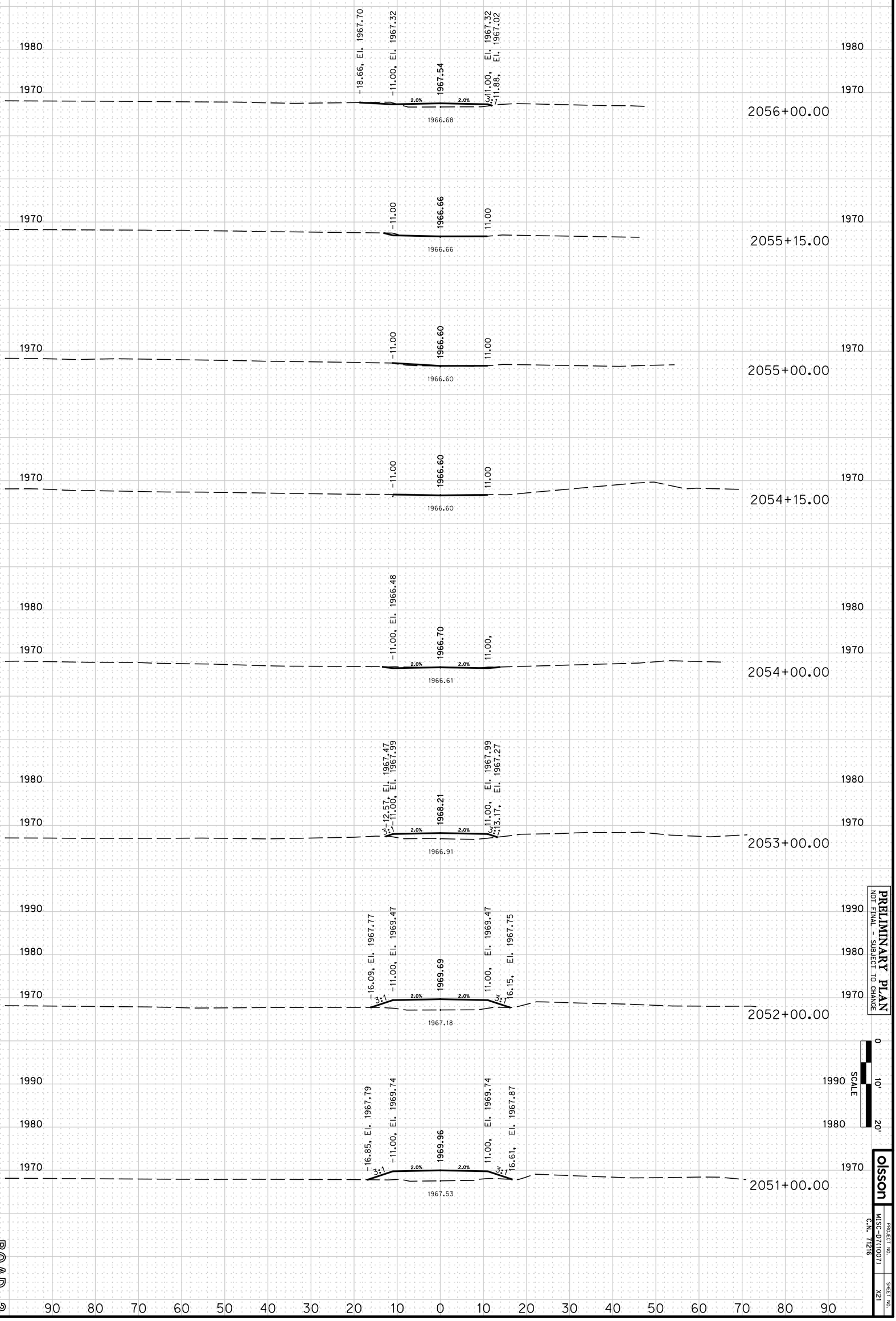
13.58, El. 1967.65
11.00, El. 1966.96
2.0%
1967.18
1966.95
-11.00, El. 1966.96

2045+00.00

14.35, El. 1967.30
11.00, El. 1968.42
3:1
2.0%
1968.64
1966.99
-11.00, El. 1968.42
3:1
-14.16, El. 1967.36

ROAD 2

File: 7120160cxsRoad2.dgn Date: 11-MAR-2021 18:47 Computer: WS6272



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

olsson

PROJECT NO. MISC-D7(100)7
C.N. 7126

SHEET NO. X21

ROADWAY DESIGN DIVISION.

Computer: WS6272

Date: 11-MAR-2021 18:47

File: 7120160cxsRoad2.dgn

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X22

C.N. 71216

2062+30.00

43.00, El. 1967.35
6.0%
11.00, El. 1969.39
2.0%
1969.61
2.0%
1967.17
3:1
-15.39, El. 1967.92
-11.00, El. 1969.39

2062+00.00

16.33, El. 1967.64
3:1
11.00, El. 1969.42
2.0%
1969.64
2.0%
1966.97
3:1
-15.95, El. 1967.77
-11.00, El. 1969.42

2061+00.00

16.38, El. 1967.72
3:1
11.00, El. 1969.52
2.0%
1969.74
2.0%
1967.11
3:1
-15.53, El. 1968.01
-11.00, El. 1969.52

2060+00.00

15.00, El. 1968.28
3:1
11.00, El. 1969.62
2.0%
1969.84
2.0%
1966.87
3:1
-15.82, El. 1968.01
-11.00, El. 1969.62

2059+00.00

15.01, El. 1968.38
3:1
11.00, El. 1969.72
2.0%
1969.94
2.0%
1966.77
3:1
-17.46, El. 1967.56
-11.00, El. 1969.72

2058+00.00

15.58, El. 1968.17
3:1
11.00, El. 1969.69
2.0%
1969.91
2.0%
1967.00
3:1
-16.91, El. 1967.72
-11.00, El. 1969.69

2057+00.00

14.43, El. 1967.42
3:1
11.00, El. 1968.57
2.0%
1968.79
2.0%
1966.83
3:1
-13.38, El. 1967.77
-11.00, El. 1968.57

ROAD 2

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X23

C.N. 71216

ROADWAY DESIGN DIVISION.

2068+10.00

11.00

1966.45

-11.00

2068+00.00

15.06, El. 1966.86
11.00, El. 1966.45
2.0%
1966.67
2.0%
-16.79, El. 1967.63
1966.43

2067+00.00

13.88, El. 1967.61
11.00, El. 1968.57
3:1
2.0%
1968.79
2.0%
-13.48, El. 1967.74
-11.00, El. 1968.57
3:1
1966.68

2066+00.00

13.83, El. 1968.08
11.00, El. 1969.02
3:1
2.0%
1969.24
2.0%
-14.34, El. 1967.90
-11.00, El. 1969.02
3:1
1966.88

2065+00.00

13.79, El. 1968.19
11.00, El. 1969.12
3:1
2.0%
1969.34
2.0%
-15.33, El. 1967.68
-11.00, El. 1969.12
3:1
1966.98

2064+00.00

14.31, El. 1968.12
11.00, El. 1969.22
3:1
2.0%
1969.44
2.0%
-14.42, El. 1968.08
-11.00, El. 1969.22
3:1
1967.10

2063+00.00

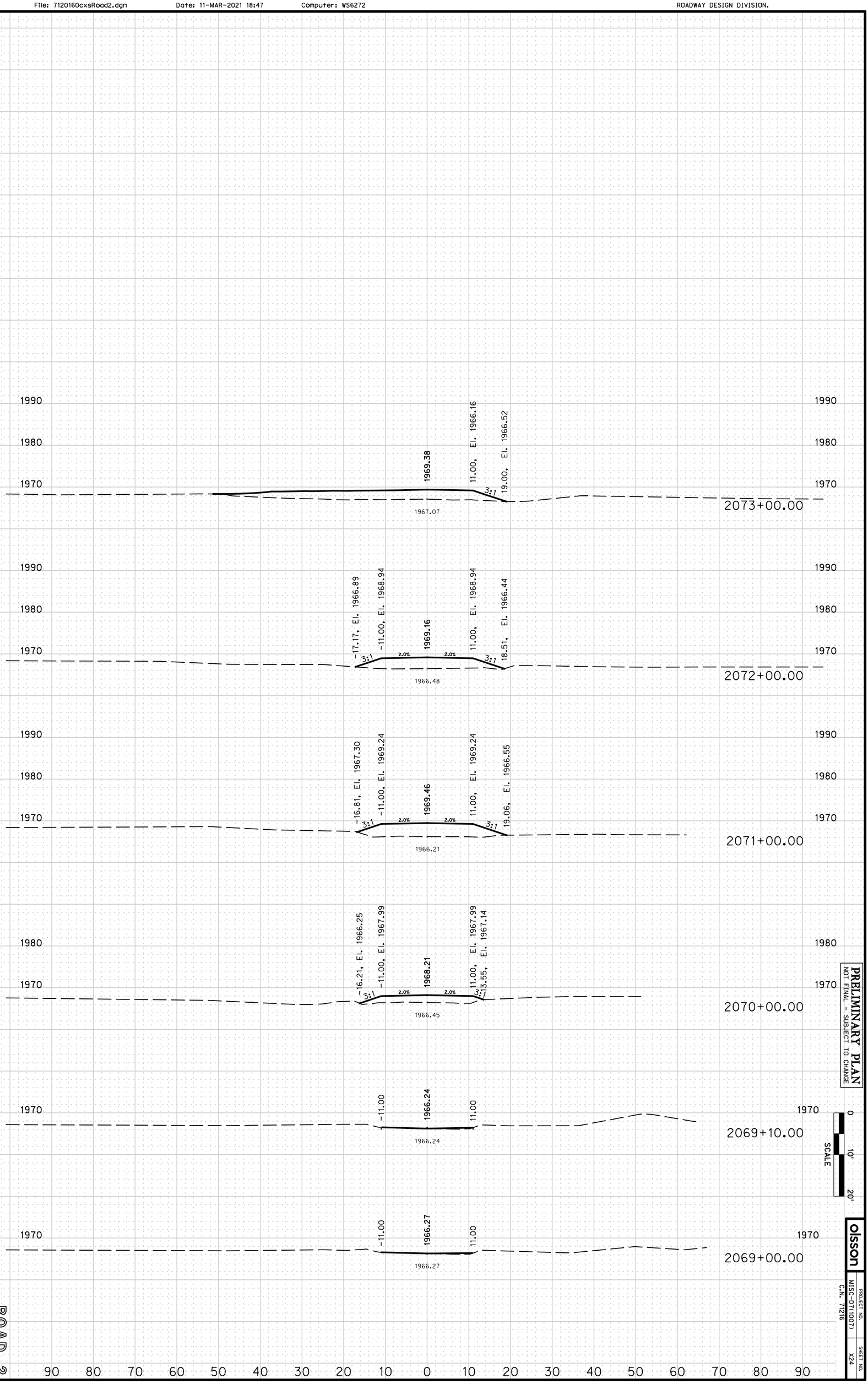
15.59, El. 1967.79
11.00, El. 1969.32
3:1
2.0%
1969.54
2.0%
-20.48, El. 1967.73
-11.00, El. 1969.32
1967.06

2062+79.00

14.62, El. 1968.13
11.00, El. 1969.34
3:1
2.0%
1969.56
2.0%
4.0%
-46.00, El. 1967.84
-11.00, El. 1969.34
1967.16

ROAD 2

File: 7120160cxsRoad2.dgn Date: 11-MAR-2021 18:47 Computer: WS6272



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

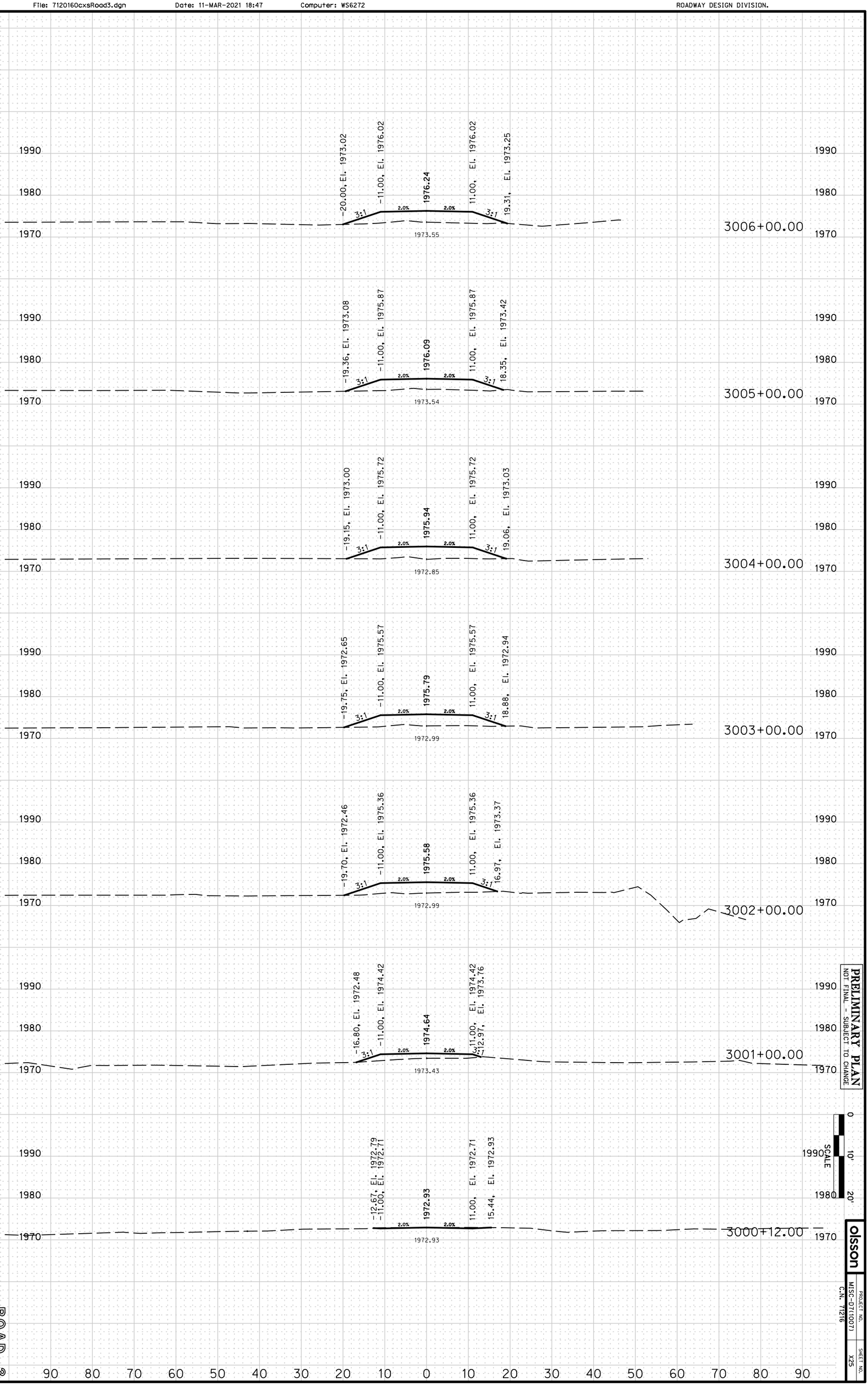
SCALE 0 10' 20'

ROAD 2

olsson

PROJECT NO. MISC-D7(100)7
C.N. 7126

SHEET NO. X24



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

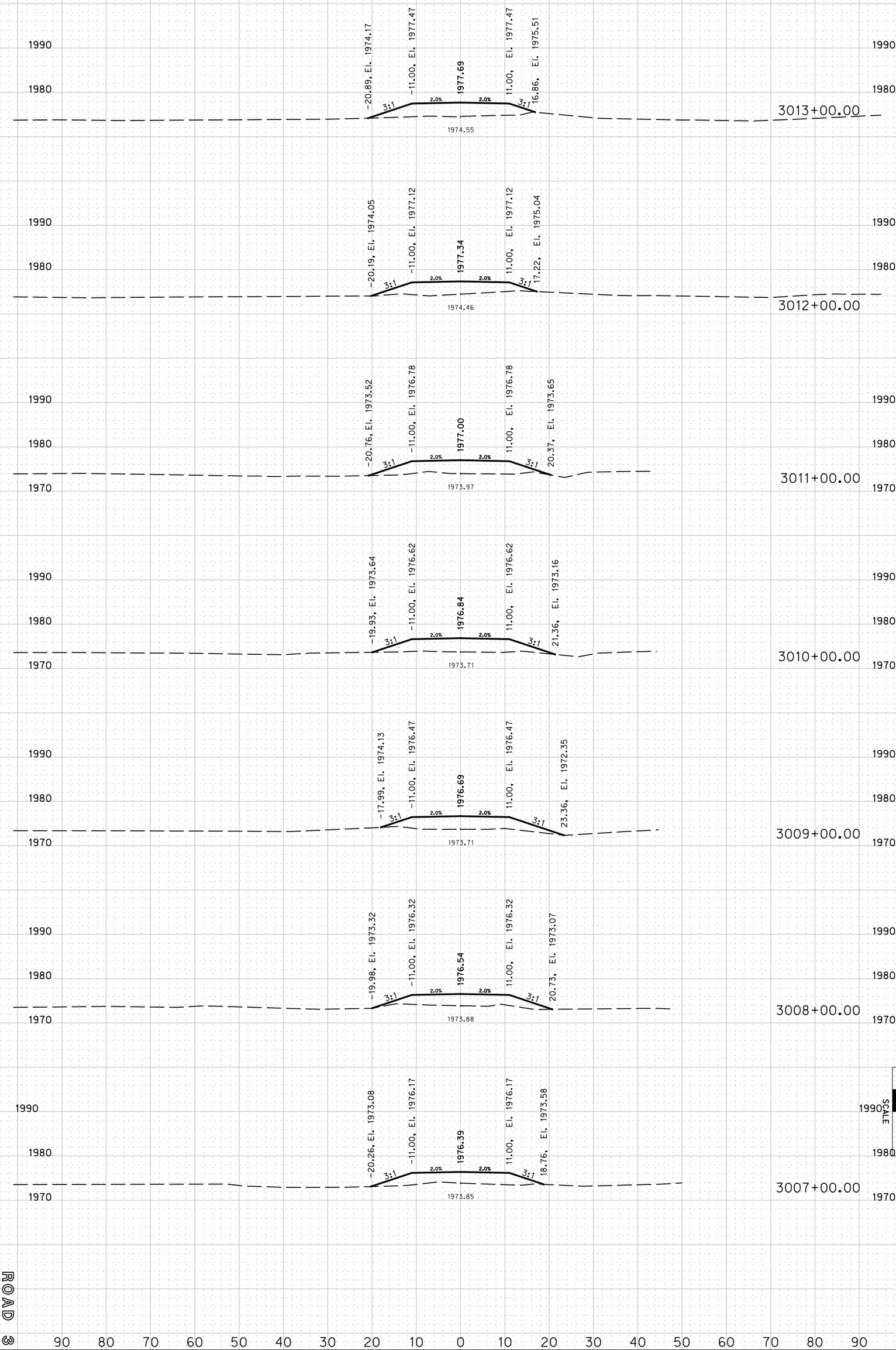
SCALE 0 10' 20'

ROAD 3

olsson

PROJECT NO. MISC-D7(100)7
C.N. 7126

SHEET NO. X25



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

ROAD 3

olsson

PROJECT NO. MISC-D7(10077) C.N. 7126

SHEET NO. X26

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X27

C.N. 71216

3020+00.00

18.97, El. 1977.26
11.00, El. 1979.92
1980.14
1977.70
-17.69, El. 1977.69
-11.00, El. 1979.92

3019+00.00

17.71, El. 1977.33
11.00, El. 1979.57
1979.79
1977.77
-17.13, El. 1977.52
-11.00, El. 1979.57

3018+00.00

14.88, El. 1977.92
11.00, El. 1979.22
1979.44
1977.60
-16.90, El. 1977.25
-11.00, El. 1979.22

3017+00.00

15.14, El. 1977.49
11.00, El. 1978.87
1979.09
1977.31
-17.70, El. 1976.63
-11.00, El. 1978.87

3016+00.00

16.61, El. 1976.65
11.00, El. 1978.52
1978.74
1976.69
-18.53, El. 1976.01
-11.00, El. 1978.52

3015+00.00

17.40, El. 1976.03
11.00, El. 1978.17
1978.39
1975.67
-21.87, El. 1974.54
-11.00, El. 1978.17

3014+00.00

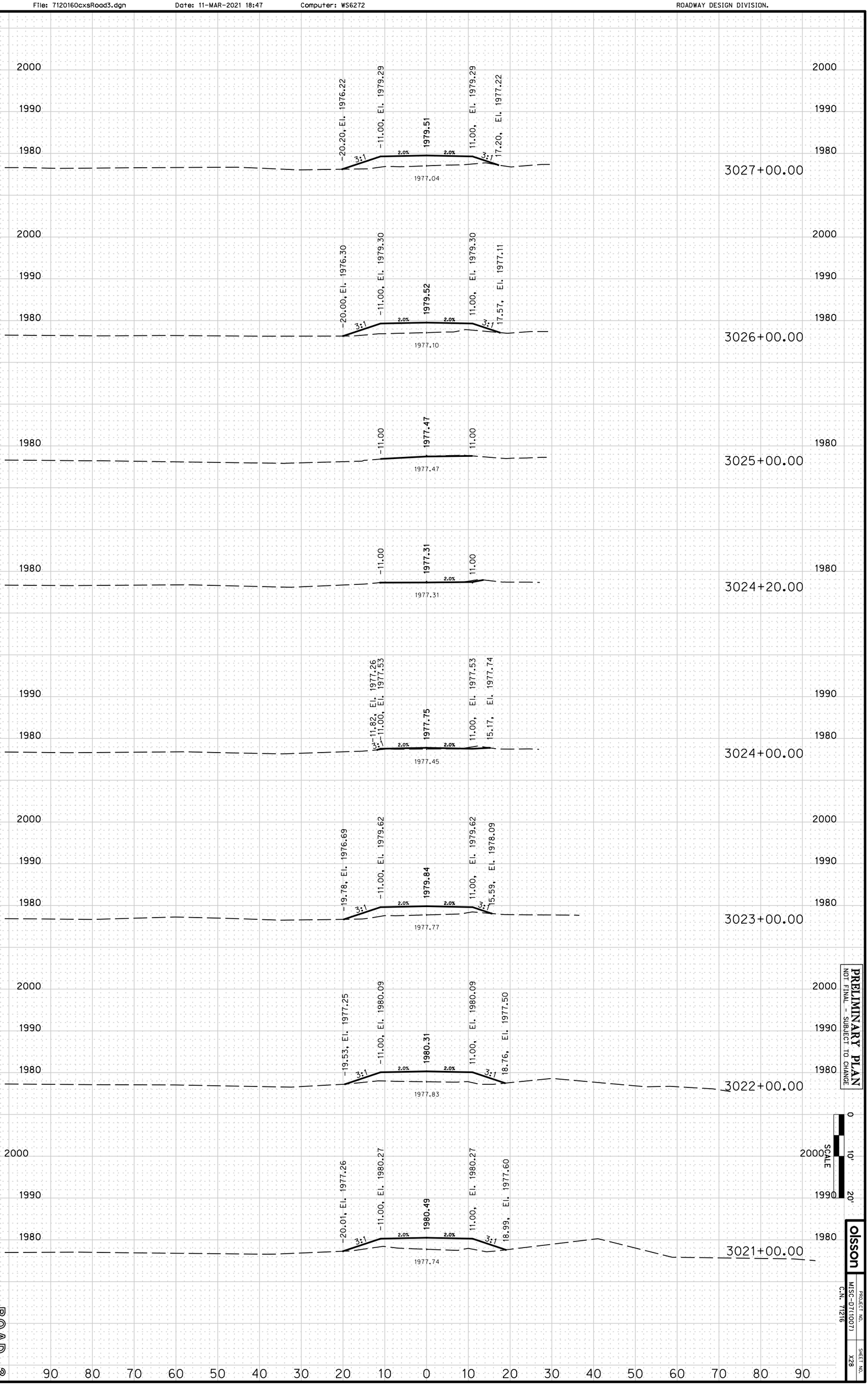
20.36, El. 1974.70
11.00, El. 1977.82
1978.04
1975.07
-20.68, El. 1974.59
-11.00, El. 1977.82

3:1
2.0%

ROAD 3

ROADWAY DESIGN DIVISION.

Files: 7120160cxsRoad3.dgn Date: 11-MAR-2021 18:47 Computer: WS6272



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

ROAD 3

olsson

PROJECT NO. MISC-D7(110077) C.N. 71216

SHEET NO. X28

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson	PROJECT NO.	SHEET NO.
	MISC-D7(1007)	X29
	C.N. 71216	

3031+36.44

3031+00.00

3030+05.00

3030+00.00

3029+25.00

3029+00.00

3028+99.65

3028+00.00

ROAD 3

ROADWAY DESIGN DIVISION.

Computer: WS6272

Date: 11-MAR-2021 18:47

File: 7120160cxsRoad3.dgn

ROADWAY DESIGN DIVISION.

File: 7120160cxsRoad3.dgn Date: 11-MAR-2021 18:47 Computer: WS6272

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X30

C.N. 71216

3037+00.00

19.50, El. 1978.83
11.00
2.0%
1977.00
1977.00
11.00
15.72, El. 1977.55

3036+35.00

16.00, El. 1979.88
11.00
2.0%
1977.68
1977.68
11.00
18.38, El. 1978.67

3036+00.00

11.00, El. 1978.49
12.55, El. 1978.57
2.0%
1978.30
1978.71
11.00
11.00, El. 1978.49

3035+00.00

16.80, El. 1978.23
3:1
11.00, El. 1980.16
2.0%
1977.96
1980.38
11.00
11.00, El. 1980.16
3:1
17.14, El. 1978.12

3034+00.00

16.50, El. 1978.48
3:1
11.00, El. 1980.31
2.0%
1978.10
1980.53
11.00
11.00, El. 1980.31
3:1
17.25, El. 1978.23

3033+00.00

18.10, El. 1978.10
3:1
11.00, El. 1980.46
2.0%
1978.24
1980.68
11.00
11.00, El. 1980.46
3:1
18.03, El. 1978.12

3032+00.00

17.61, El. 1978.41
3:1
11.00, El. 1980.61
2.0%
1978.21
1980.83
11.00
11.00, El. 1980.61
3:1
19.09, El. 1977.92

ROAD 3

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X31

C.N. 71216

ROADWAY DESIGN DIVISION.

File: 7120160cxsRoad3.dgn Date: 11-MAR-2021 18:47 Computer: WS6272

3043+00.00

11.00, El. 1982.96
13.07, El. 1982.27
3:1
2.0%
1983.18
2.0%
1980.50
-11.00, El. 1982.96
3:1
-22.93, El. 1978.98

3042+00.00

11.00, El. 1984.74
14.45, El. 1983.59
3:1
2.0%
1984.96
2.0%
1982.25
-11.00, El. 1984.74
3:1
-26.88, El. 1979.45

3041+00.00

11.00, El. 1983.34
16.35, El. 1981.56
3:1
2.0%
1983.56
2.0%
1980.92
-11.00, El. 1983.34
3:1
-23.88, El. 1979.05

3040+00.00

11.00, El. 1981.82
15.37, El. 1980.36
3:1
2.0%
1982.04
2.0%
1979.67
-11.00, El. 1981.82
3:1
-20.24, El. 1978.74

3039+35.00

11.00
2.0%
1979.36
-11.00

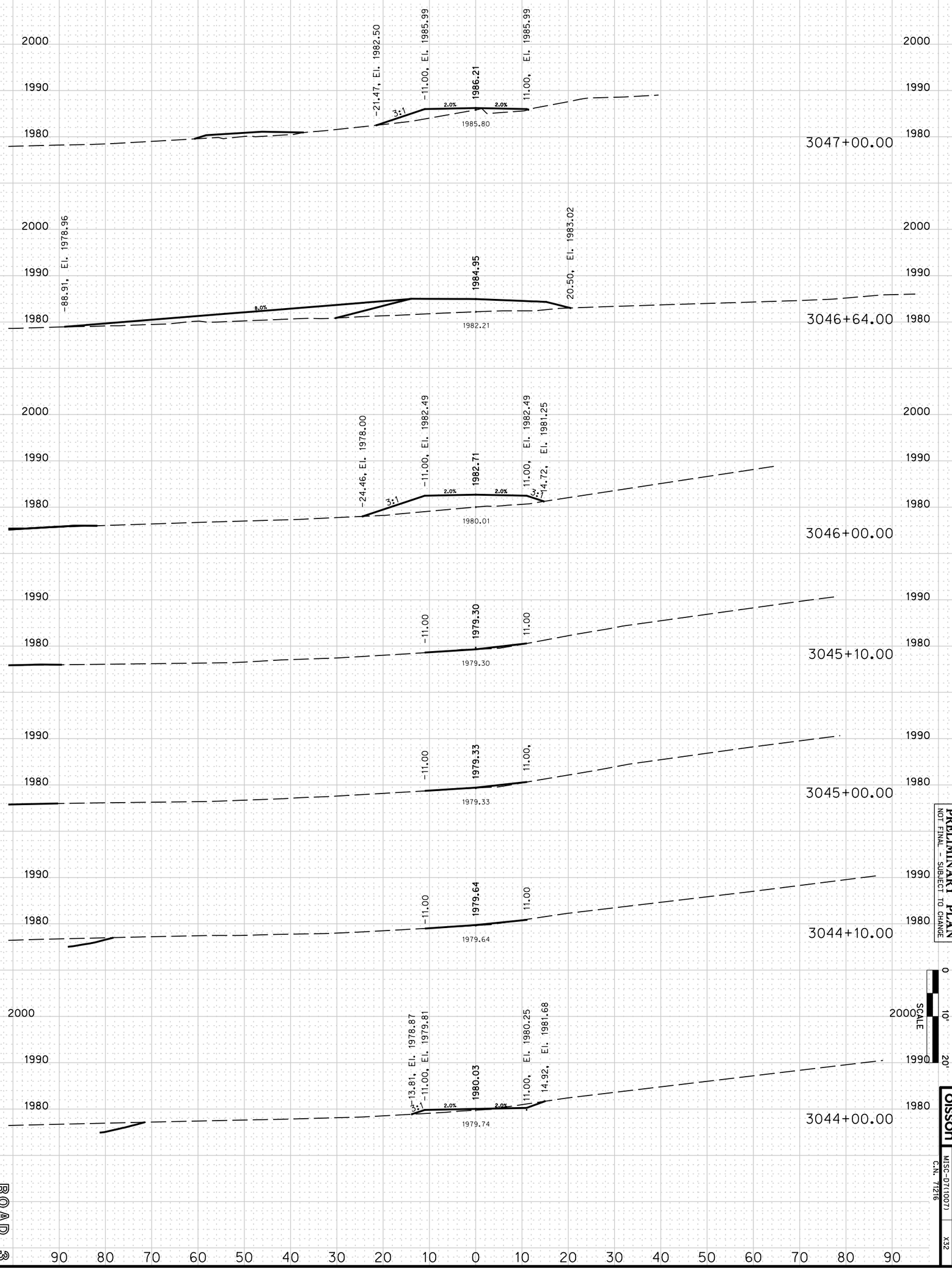
3039+00.00

11.00
2.0%
1978.75
1978.75
2.0%
1978.75
-11.00

3038+00.00

11.00, El. 1978.51
15.41, El. 1978.51
2.0%
1977.08
2.0%
1977.08
-11.00
-16.58, El. 1977.97

ROAD 3



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

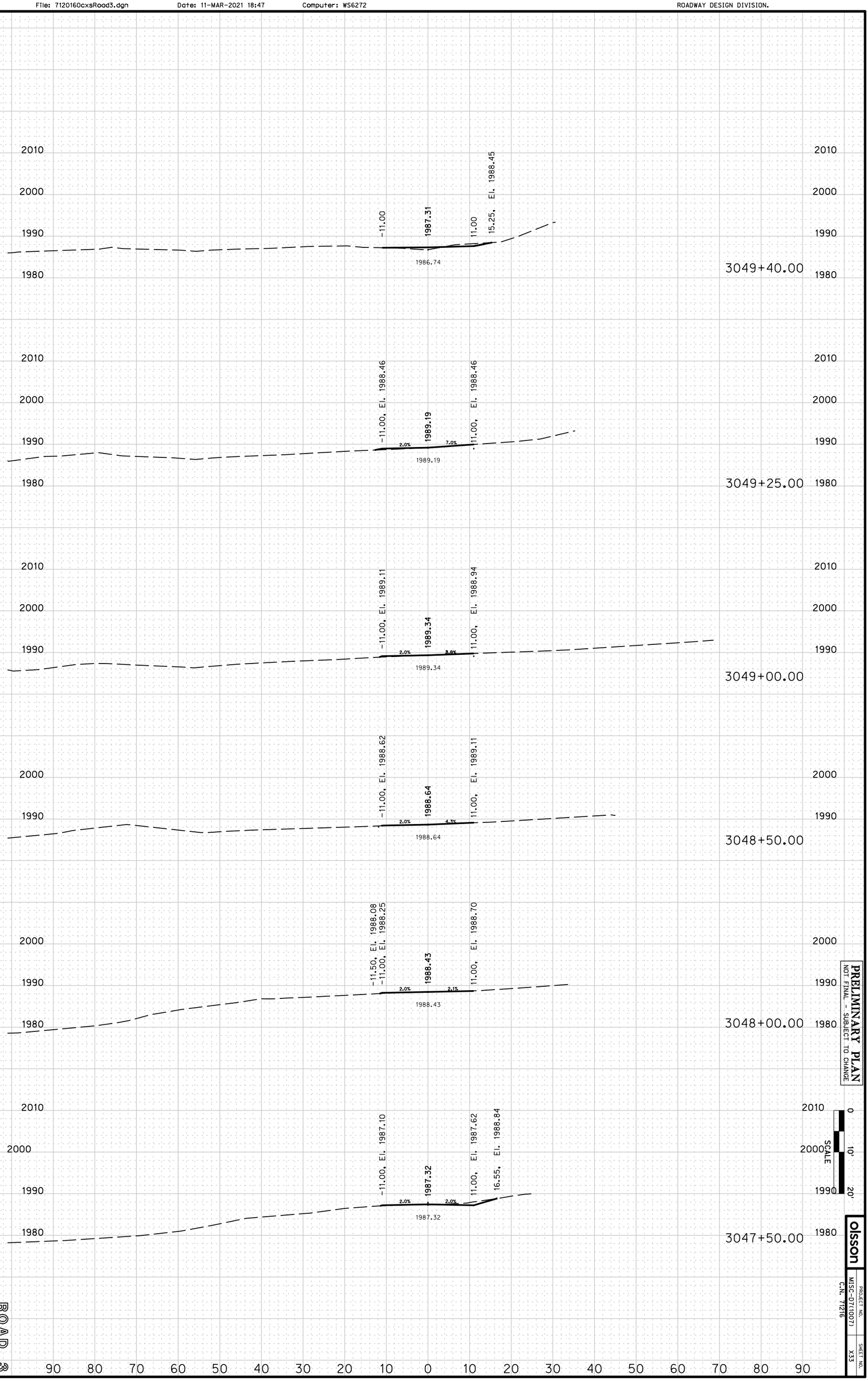
SCALE 0 10' 20'

ROAD 3

olsson

PROJECT NO. MISC-D(110017) C.N. 71216

SHEET NO. X32



ROAD 3

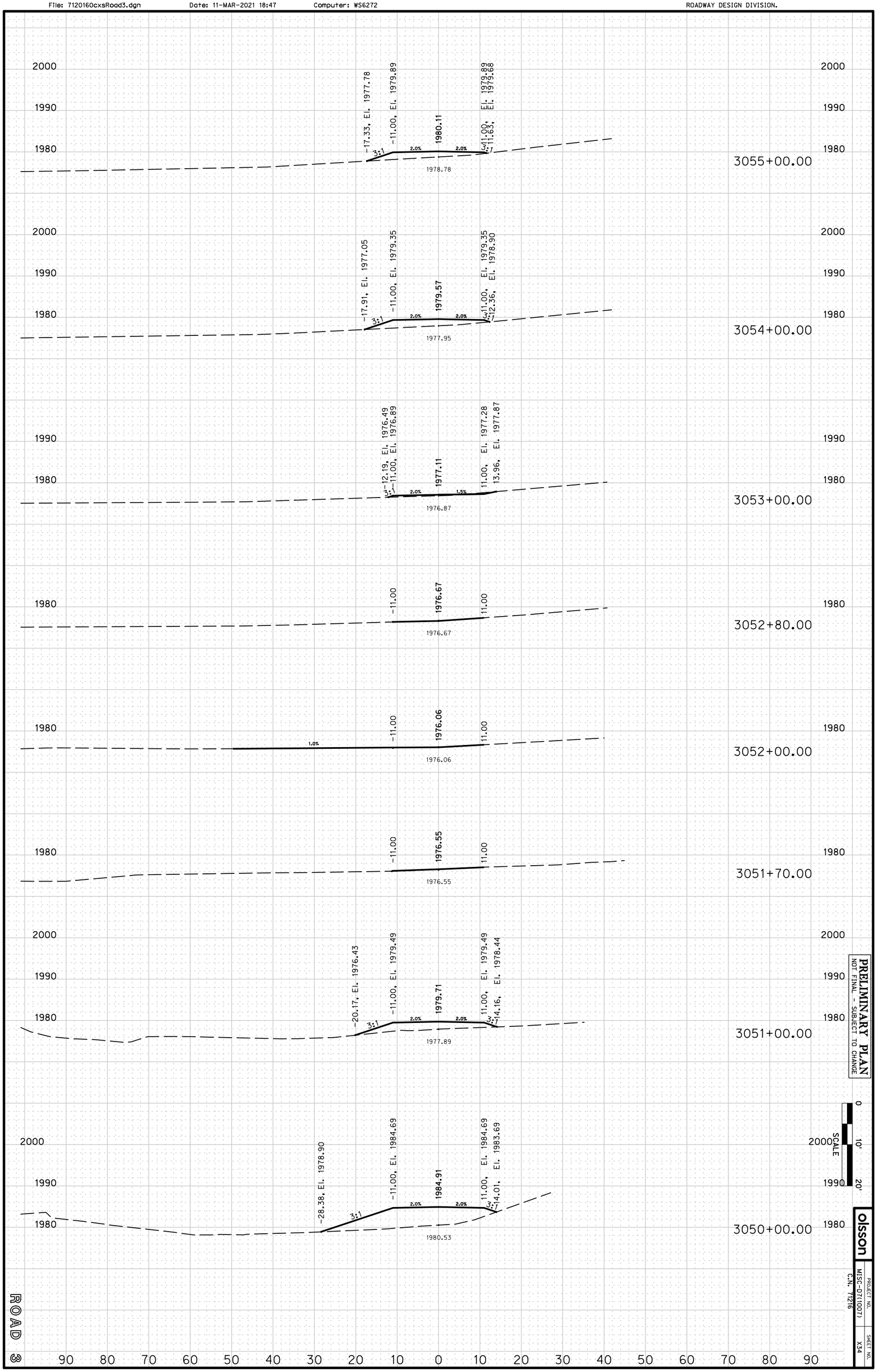
PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

olsson

PROJECT NO. MISC-D7(100?) C.N. 7126

SHEET NO. X33



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

ROAD 3

olsson

PROJECT NO. MISC-D7(100?) C.N. 7126

SHEET NO. X34

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

0 10' 20'
SCALE

olsson

PROJECT NO.	SHEET NO.
MISC-D7(1007)	X35

C.N. 71216

ROADWAY DESIGN DIVISION.

File: 7120160cxsRoad3.dgn Date: 11-MAR-2021 18:47 Computer: WS6272

3062+00.00

11.00, EL. 1985.01
-13.10, EL. 1984.31
-17.65, EL. 1982.79
1985.23
1983.61

3061+00.00

11.00, EL. 1983.72
-12.77, EL. 1983.13
-17.29, EL. 1981.62
1983.94
1982.44

3060+00.00

11.00, EL. 1982.37
-12.39, EL. 1981.90
-18.02, EL. 1980.03
1982.59
1981.05

3059+00.00

11.00, EL. 1981.49
-12.54, EL. 1980.98
-17.91, EL. 1979.19
1981.71
1980.01

3058+00.00

11.00, EL. 1981.09
-12.48, EL. 1980.60
-17.94, EL. 1978.78
1981.31
1979.78

3057+00.00

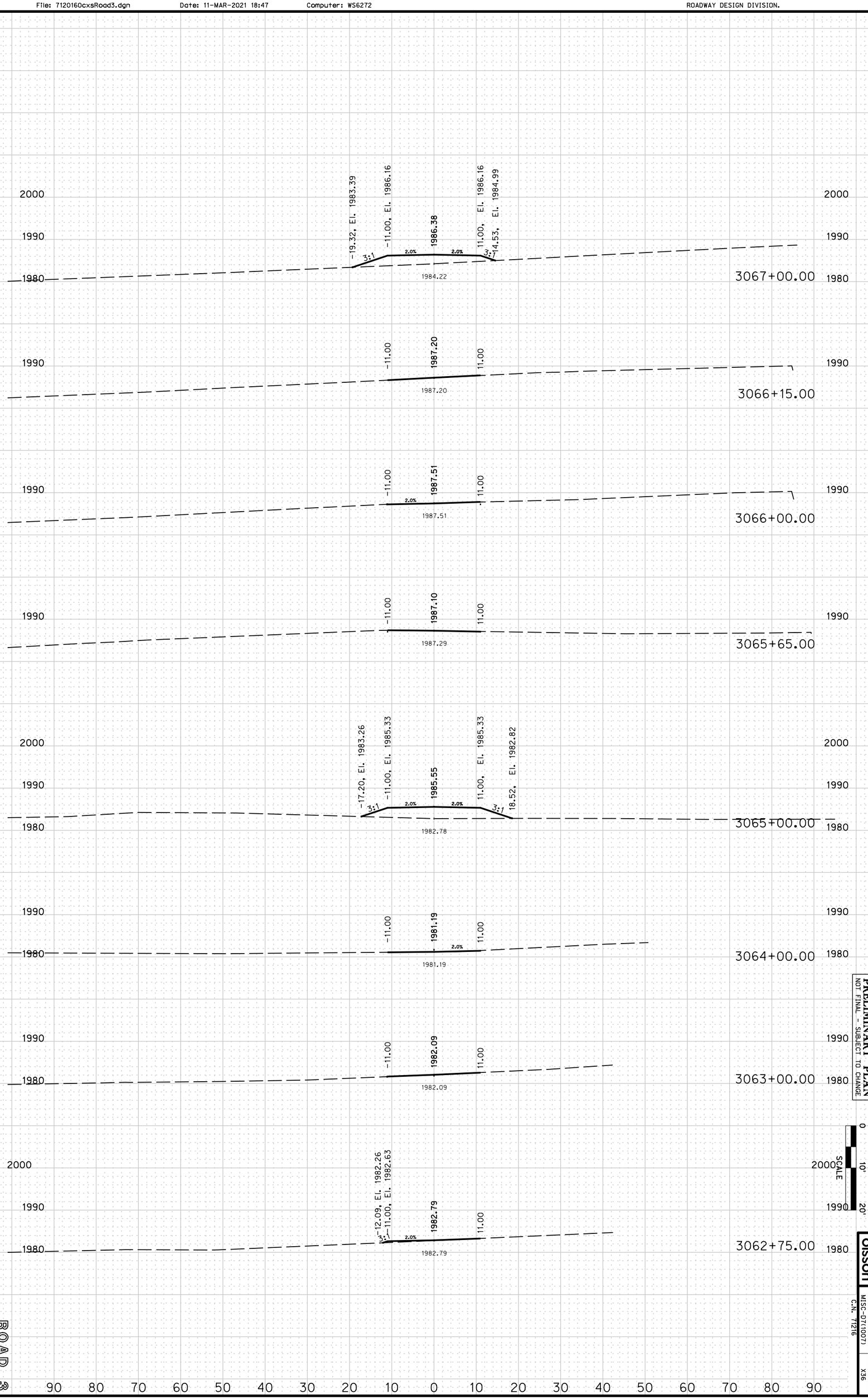
11.00, EL. 1980.69
-12.06, EL. 1980.34
-18.23, EL. 1978.28
1980.91
1979.30

3056+00.00

11.00, EL. 1980.29
-17.03, EL. 1978.28
1980.51
1979.39

2.0%
3:1

ROAD 3



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

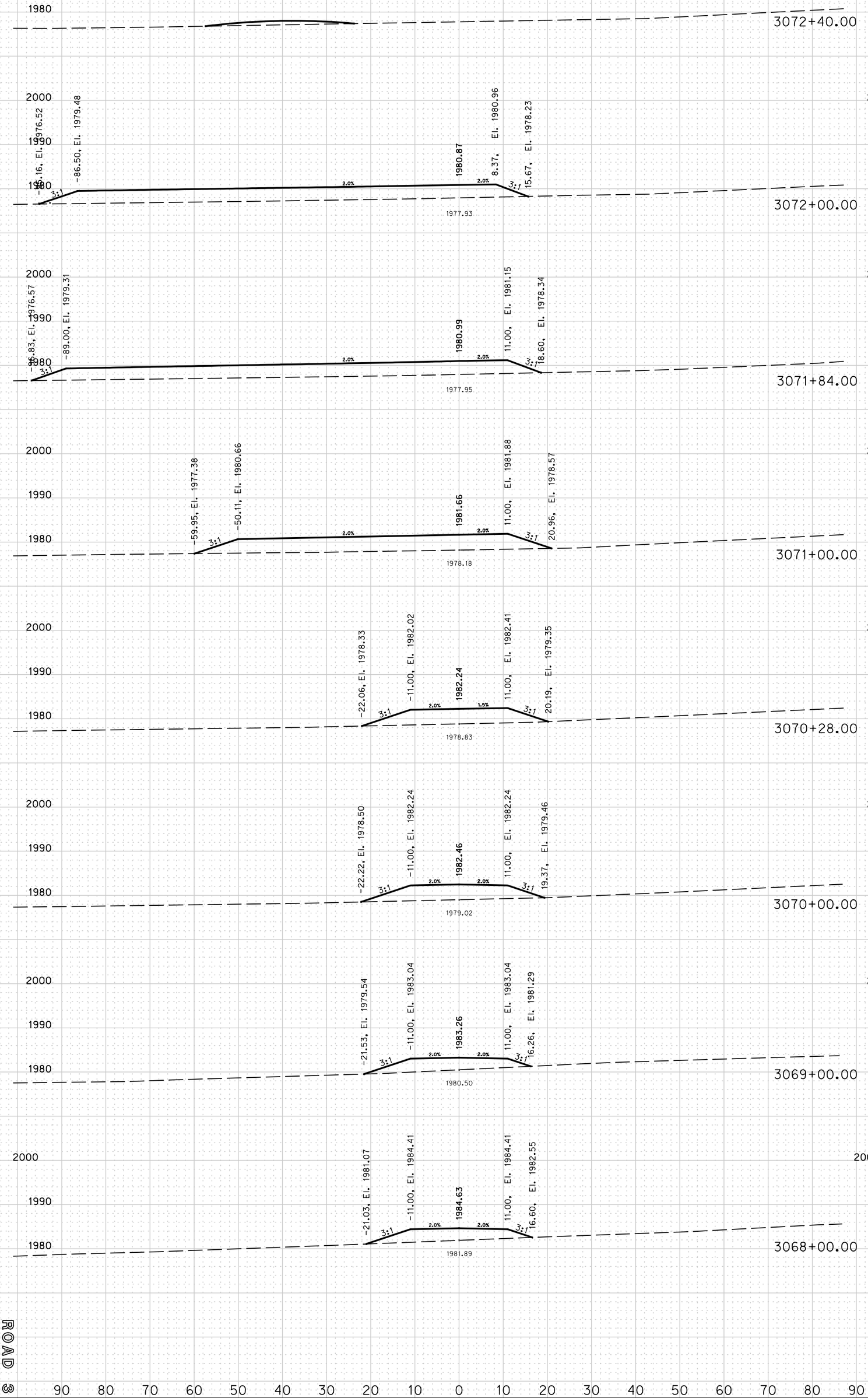
SCALE 0 10' 20'

ROAD 3

olsson

PROJECT NO. MISC-D7(100)7
C.N. 7126

SHEET NO. X36



PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

SCALE 0 10' 20'

ROAD 3

olsson

PROJECT NO. MISC-D(110017) C.N. 71216

SHEET NO. X37

Appendix E

Water Budget

Job No.	018-0451	Task

Project	NDOT Bank Site 7	**Computed**	TEW	**Date**	3/21/2018
Subject	NRCS Hydrologic Analysis	**Checked**		**Date**	
Task	Determination of Sustainable Wetland Area	**Sheet**	1	of	8
Site	Orleans				

COMMENTS

Water budget evaluation for HC-O

DRAINAGE AREA

The drainage area was determined from City of Lincoln 2' contours to be

DA = 80 acres

SOIL TYPES From the soil survey (Ref. 1) and SSURGO data (Ref. 8):

	Map Unit Symbol & Key	Soil Name	Hydrologic Soil Group
	2117		B
	2176		B
	2326		A
	2366		A
	3541		B
	8860		B

Area, acres & % Area
A SOILS
18
22.5%
B SOILS
62
77.5%
C SOILS
0
0.0%
D SOILS
0
0.0%
WATER
0
0.0%

TOTAL
80
100.0%

* Use C Soil (lower CN will produce less runoff to site and wetland area will be conservatively low)

Job No.	018-0451	Task

Project	NDOT Bank Site 7	**Computed**	TEW	**Date**	3/21/2018
Subject	NRCS Hydrologic Analysis	**Checked**		**Date**	
Task	Determination of Sustainable Wetland Area	**Sheet**	2	of	8
Site	Orleans				

SEASONAL RUNOFF CURVE NUMBERS (RCN)

Runoff curve numbers were determined based on parcel/land use data and aerial photography.

As defined in Ref. 7, the growing season is estimated based on 28º F air temp. thresholds at a frequency of 5 years in 10.

GROWING SEASON (From Soil Survey (Ref. 1), Tables 2 and 3)

(p. 109)

Growing season starts	21-Apr
Growing season end	19-Oct
Growing Season (days)	181

BASIS FOR SEASONAL RCN (From NEH-4 (Ref. 2), page 10.14)

Nov - May	Fallow or plowed	Curve for Fallow
June - Aug	Full Growth	Curve No. from Table 9.1 (full growth)
Sept - Oct	Harvest	Curve No. = $2(RCN_{tab.9.1})-(RCN_{Fallow})$

LAND USE AND TREATMENT

					(Frac. A_{total})
LU 1	Row Crops	40	acres	or	50.0%
LU 2	Open Areas or Pasture	40	acres	or	50.0%
LU 3	Trees or Forest		acres	or	0.0%
LU 4	Farmstead		acres	or	0.0%
LU 5	Urban		acres	or	0.0%
LU 6			acres	or	0.0%
LU 7			acres	or	0.0%
LU 8			acres	or	0.0%
	Total	80	acres	or	100.0%

CURVE NUMBERS (From TR-55 (Ref. 9), Tables 2-2a and 2-2c; also NEH-4 (Ref. 2), Table 9.1, for AMC II)

First Row: Full Growth (Jun - Aug) Condition
Second Row: Fallow (Nov - May) Condition

		Curve Number Hydrologic Soil Group			
Land Use and Treatment		A	B	C	D
LU 1	Row Crops	67	78	85	91
		74	83	88	90
LU 2	Open Areas or Pasture	39	61	74	80
		39	61	74	80
LU 3	Trees or Forest	30	55	70	77
		30	55	70	77
LU 4	Farmstead	59	74	82	86
		59	74	82	86
LU 5	Urban	77	85	90	92
		77	85	90	92
LU 6					
LU 7					
LU 8					

Job No.	018-0451	Task	

Project	NDOT Bank Site 7	**Computed**	TEW	**Date**	3/21/2018
Subject	NRCS Hydrologic Analysis	**Checked**		**Date**	

Job No.	018-0451	Task

Project	NDOT Bank Site 7	**Computed**	TEW	**Date**	3/21/2018
Subject	NRCS Hydrologic Analysis	**Checked**		**Date**	
Task	Determination of Sustainable Wetland Area	**Sheet**	3	of	8
Site	Orleans				

COMPUTE COMPOSITE RCN

			A soils	B soils	C soils	D soils	
Row Crops		Area, ac	9	31	0	0	40
		Frac. Area	22.5%	77.5%	0.0%	0.0%	100.0%
LU 1	Jan-May	Fallow	74	83	88	90	81.0
50.0% of A_{total}	June-Aug	Full Growth	67	78	85	91	75.5
	Sept-Oct	Harvest (1)	60	73	82	92	70.1
	Nov-Dec	Fallow	74	83	88	90	81.0
Open Areas or Pasture		Area, ac	9	31	0	0	40
		Frac. Area	22.5%	77.5%	0.0%	0.0%	100.0%
LU 2	Jan-May	Fallow	39	61	74	80	56.1
50.0% of A_{total}	June-Aug	Full Growth	39	61	74	80	56.1
	Sept-Oct	Harvest	39	61	74	80	56.1
	Nov-Dec	Fallow	39	61	74	80	56.1
Trees or Forest		Area, ac					0
		Frac. Area	0.0%	0.0%	0.0%	0.0%	0.0%
LU 3	Jan-May	Fallow					0.0
0.0% of A_{total}	June-Aug	Full Growth					0.0
	Sept-Oct	Harvest					0.0
	Nov-Dec	Fallow					0.0
Farmstead		Area, ac					0
		Frac. Area	0.0%	0.0%	0.0%	0.0%	0.0%
LU 4	Jan-May	Fallow					0.0
0.0% of A_{total}	June-Aug	Full Growth					0.0
	Sept-Oct	Harvest					0.0
	Nov-Dec	Fallow					0.0
Urban		Area, ac					0
		Frac. Area	0.0%	0.0%	0.0%	0.0%	0.0%
LU 5	Jan-May	Fallow					0.0
0.0% of A_{total}	June-Aug	Full Growth					0.0
	Sept-Oct	Harvest					0.0
	Nov-Dec	Fallow					0.0

Job No.	018-0451	Task

Project	NDOT Bank Site 7	**Computed**	TEW	**Date**	3/21/2018
Subject	NRCS Hydrologic Analysis	**Checked**		**Date**	
Task	Determination of Sustainable Wetland Area	**Sheet**	4	of	8
Site	Orleans				

		Area, ac					0
		Frac. Area	0.0%	0.0%	0.0%	0.0%	0.0%
LU 6	Jan-May	Fallow					0.0
0.0% of A_{total}	June-Aug	Full Growth					0.0
	Sept-Oct	Harvest					0.0
	Nov-Dec	Fallow					0.0
		Area, ac					0
		Frac. Area	0.0%	0.0%	0.0%	0.0%	0.0%
LU 7	Jan-May	Fallow					0.0
0.0% of A_{total}	June-Aug	Full Growth					0.0
	Sept-Oct	Harvest					0.0
	Nov-Dec	Fallow					0.0
		Area, ac					0
		Frac. Area	0.0%	0.0%	0.0%	0.0%	0.0%
LU 8	Jan-May	Fallow					0.0
0.0% of A_{total}	June-Aug	Full Growth					0.0
	Sept-Oct	Harvest					0.0
	Nov-Dec	Fallow					0.0

		CCN
Jan-May	Fallow	68.5
June-Aug	Full Growth	65.8
Sept-Oct	Harvest	63.1
Nov-Dec	Fallow	68.5

Notes: (1) See previous equation for harvest season curve numbers for row crops

Job No.	018-0451	Task	

Project	NDOT Bank Site 7	**Computed**	TEW	**Date**	3/21/2018
Subject	NRCS Hydrologic Analysis	**Checked**		**Date**	
Task	Determination of Sustainable Wetland Area	**Sheet**	5	of	8
Site	Orleans				

COMPUTE PRECIPITATION NEEDED FOR RUNOFF TO OCCUR

Months	Composite CN	Precip for Runoff*
Jan-May	69	0.90
June-Aug	66	1.03
Sept-Oct	63	1.18
Nov-Dec	69	0.90

*Ref. 2: NEH-4, Table 10.1, Antecedent Moisture Condition II

DETERMINE 50% CHANCE EXCEEDANCE RUNOFF

Daily precipitation values were obtained for the following gage(s):

Station	ID	Period of Record
McCook #2	254795	1996-2017
Orleans 2 W	254815	1950-2017
Alma 0.1 NNW	254790	2004-2017

Source:

NOAA Stations

Notes:

Runoff was calculated using the precipitation for runoff values shown above. Maximum daily runoff values for each year were identified, and an HEC-FFA analysis was performed to determine the 50% exceedance runoff. A skew coefficient of -0.04 was used within HEC-FFA (see Ref. 3).

2.15

The resulting 50% chance exceedance runoff value* is 1.25 inches

* The value indicated, 1.82 inches, is conservative and based on the confidence limits of the analysis. The expected 50% chance exceedance runoff from the HEC-FFA analysis is 1.96 inches.

Job No.	018-0451	Task

Project	NDOT Bank Site 7	**Computed**	TEW	**Date**	3/21/2018
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Task	Determination of Sustainable Wetland Area	**Sheet**	6	of	8
Site	Orleans				

WETLAND INUNDATION

An area must be inundated or saturated to the surface for at least 5% of the growing season in most years.

Δm = (Ps x Pa x L) / 50% chance exceedance runoff

where:

- Δm = Min. drainage area required to supply runoff for the inundation period. In this case, this is a known and is equal to the watershed area.
- Ps = Wetland Storage Adjustment Function
- Pa = Wetland Surface Area. In this case, the equation will be solved for Pa.
- L = Wetland Losses

Ps - WETLAND STORAGE ADJUSTMENT FUNCTION

from Ref. 4, page 19-22, use Ps = 1.15

WETLAND LOSSES

L = Ed + Sw + F + O, where:

- Ed = Average Evaporation
- Sw = Soil water holding capacity.
- F = Infiltration Rate
- O = Outflow, which for this project is assumed to be 0 (zero)

Ed - EVAPORATION

from the Climatic Atlas of the US (Ref. 5):

(p. 63)	approx. Mean Annual Lake Evaporation	=	54	inches
(p. 63)	approx. Mean May-Oct evap. in percent of total evap.	=	76%	
	May-Oct Evaporation (Mean annual evap x percent)	=	41.04	inches
	Growing Season (shown previously)	=	181	days
	Average evaporation (May-Oct evap / growing season)	=	0.23	in./day
	Required inundation period as percent of growing season	=	5%	
	Required inundation period	=	9	days
	Ed (average evap. x inundation period)	=	2.05	inches

Sw - SOIL WATER HOLDING CAPACITY

based on soils data (Ref. 8),

Use available water capacity = 0.20 inches/inch

Use an average depth to ground water = 5 feet = 60 inches

use 50%

Sw = 6.00 inches

Job No.	018-0451	Task	

Project	NDOT Bank Site 7	**Computed**	TEW	**Date**	3/21/2018
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Job No.	018-0451	Task

Project	NDOT Bank Site 7	**Computed**	TEW	**Date**	3/21/2018
Subject	NRCS Hydrologic Analysis	**Checked**		**Date**	
Task	Determination of Sustainable Wetland Area	**Sheet**	7	of	8
Site	Orleans				

F - INFILTRATION

	Map Unit Symbol	Soil Type	Area, ac	Avg. Permeability (see Ref. 6) (in/hr)	Area * Avg Permeability
	2117		3.7	1.417320	5.2441
	2326		9.3	0.141732	1.3181
	2366		8.4	0.014173	0.1191
	3541		50.4	0.014173	0.7143
	8860		7.0	0.014173	0.0992
					0.0000
					0.0000
					0.0000
					0.0000
					0.0000
					0.0000
					0.0000
					0.0000
					0.0000
					0.0000
					0.0000
					0.0000
					0.0000
					0.0000
		Subtotal	78.8		
		WATER	0		
		Total	78.8		7.4948

Average Infiltration Rate (in/hr) = 0.0951

Inundation Period = 9 days

Infiltration (F) = Ave. infiltration rate x Inundation period x (24 hrs/day) = 20.66 inches

COMPUTE WETLAND LOSSES

L = Ed + Sw + F + O = 28.71 inches

Water and gravel areas are not facored into seepage rate as wetland would not be constructed in these areas.

Job No.	018-0451	Task

Project	NDOT Bank Site 7	**Computed**	TEW	**Date**	3/21/2018
Subject	NRCS Hydrologic Analysis	**Checked**		**Date**	
Task	Determination of Sustainable Wetland Area	**Sheet**	8	of	8
Site	Orleans				

COMPUTE TOTAL AREA OF WETLANDS THAT CAN BE SUPPORTED BY THE DRAINAGE AREA

$\triangle m$ = (Ps x Pa x L) / 50% chance exceedance runoff

where:	$\triangle m$ =	80	acres
	Ps =	1.15	
	L =	28.71	inches
	50% chance exceedance runoff =	1.251	inches

Pa (Wetland Surface Area) = 3.0 acres

26.39226

Appendix F

Hydrology and Hydraulics Model

NEBRASKA

Good Life. Great Journey.

DEPARTMENT OF TRANSPORTATION

District 7 Wetland Mitigation Bank

Harlan County, Nebraska

Hydrologic and Hydraulic Investigation

NDOT Project No. MISC-STWD (1093)

NDOT Control No. 71216

December 2020

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2.0 Hydrology 3
3.0 Hydraulic Analysis 11
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5.0 Harlan County Reservoir Storage 16
6.0 Conclusions 18

1.0 Hydrologic and Hydraulic Investigation of Proposed Wetland and Roadway Activities

The Nebraska Department of Transportation (NDOT) is proposing to construct a wetland mitigation bank southwest of Orleans and south of Nebraska Highway 89 (N-89) in NDOT District 7 (Figure 1). The site is located in Sections 20 and 21, Township 2 North, Range 19 West, Harlan County, Nebraska at approximately 40.125767° latitude, -99.472450° longitude. The site is a United States Army Corps of Engineers (USACE)-owned property that is approximately 160 acres in size and consists of agricultural land, a hay field, a managed grassland, woodland, and an oxbow channel. The site is bordered by the Republican River along the southern and eastern boundary with agricultural fields to the north and west. Overall, the site is relatively flat with the eastern half draining southeast towards the downstream portion of the Republic River floodplain.

It is anticipated that the proposed bank location provides ample groundwater hydrology to support an emergent wetland system. The mitigation bank site would not require water control structures or other engineered elements to sustain a functional wetland system. The site would be regraded, and the elevation lowered, to decrease the depth of groundwater, thereby promoting the development of groundwater-supported wetland communities. In terms of long-term stability, operation and maintenance requirements are assumed to be minimal. Spoil from the wetland mitigation bank location would be relocated throughout the project study area to improve existing roadways and stockpiled at designated locations (See Figure 1 for project study area boundary including wetland mitigation bank, roadway improvement areas, and spoil locations).

The hydrologic and hydraulic analysis included herein is based upon November 2020 preliminary design specifications of the mitigation bank, roadway improvements, and stockpile locations.

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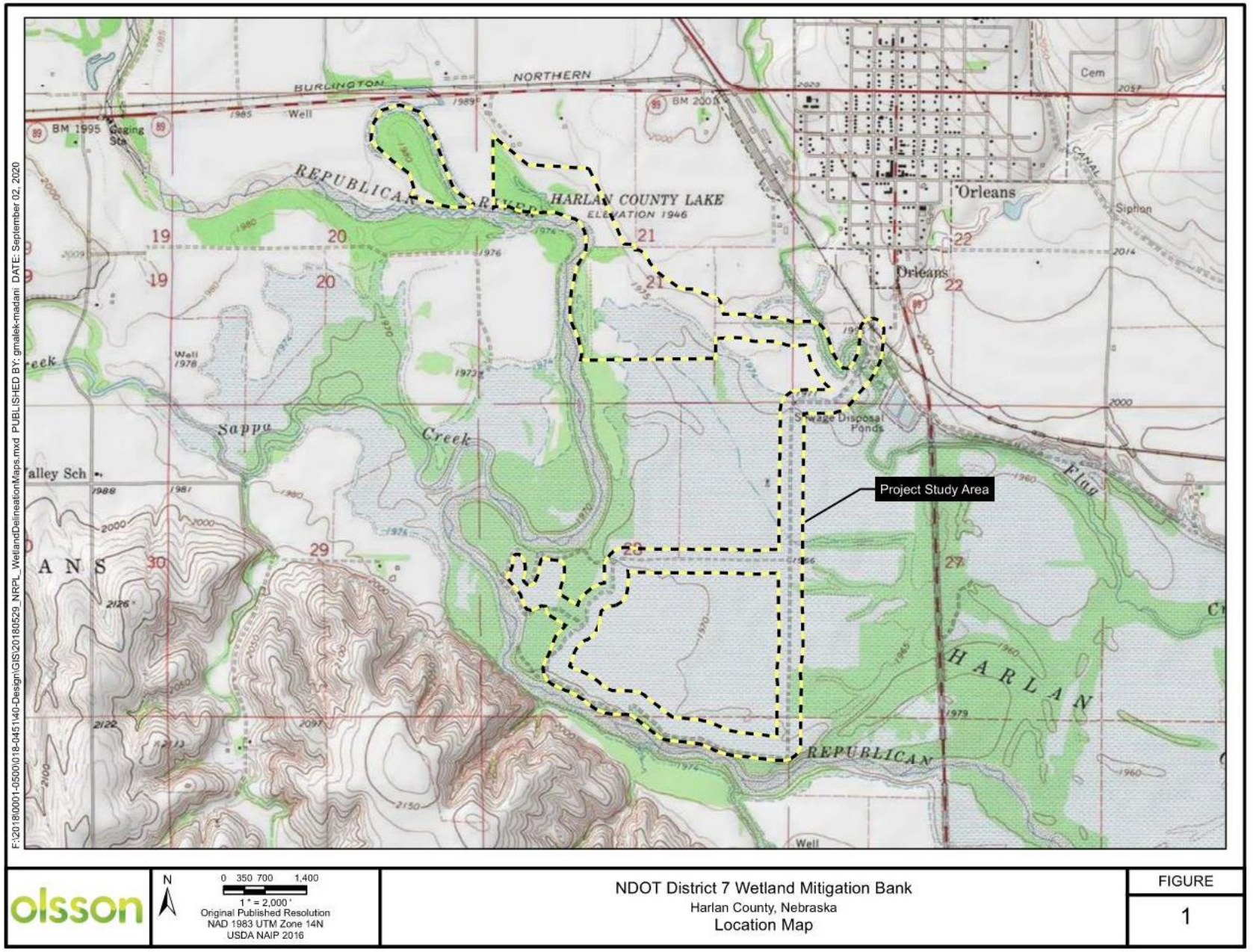
F:\2018\0001-0500\018-0451\40-Design\GIS\20180529_NRPL_WetlandDelineationMaps.mxd PUBLISHED BY: gmalek-madani DATE: September 02, 2020
BURLINGTON NORTHERN
BM 1995
Gaging Sta
BM 2001
Well
REPUBLICAN RIVER
HARLAN COUNTY LAKE
ELEVATION 1946
Orleans
Cem
Canal
Siphon
Sewage Disposal Ponds
Sappa Creek
Project Study Area
HARLAN
REPUBLICAN
olsson
N
0 350 700 1,400
1 " = 2,000 '
Original Published Resolution
NAD 1983 UTM Zone 14N
USDA NAIP 2016
NDOT District 7 Wetland Mitigation Bank
Harlan County, Nebraska
Location Map
FIGURE
1

2.0 Hydrology

The peak flow rates were developed using a Bulletin 17C analysis within the HEC-SSP computer program for USGS Stream Gauges 06844500 – Republican River at Orleans, Nebraska, and 06847500 – Sappa Creek at Samford, Nebraska. The output is included in Figures 2-9. The peak flow rates calculated from the 17C analysis for the Republican River (46,120 cfs for the 100-year) are lower than the peak flows used in the NDOT 89 Orleans West project hydraulic models (60,000 cfs for the 100-year, STP-89-3(104)). At the confluence of the Republican River and Sappa Creek, the combined peak discharge from the 17C analysis is 59,070 cfs. The period of record for both gages is 73 years, so gage skew was used for the analyses.

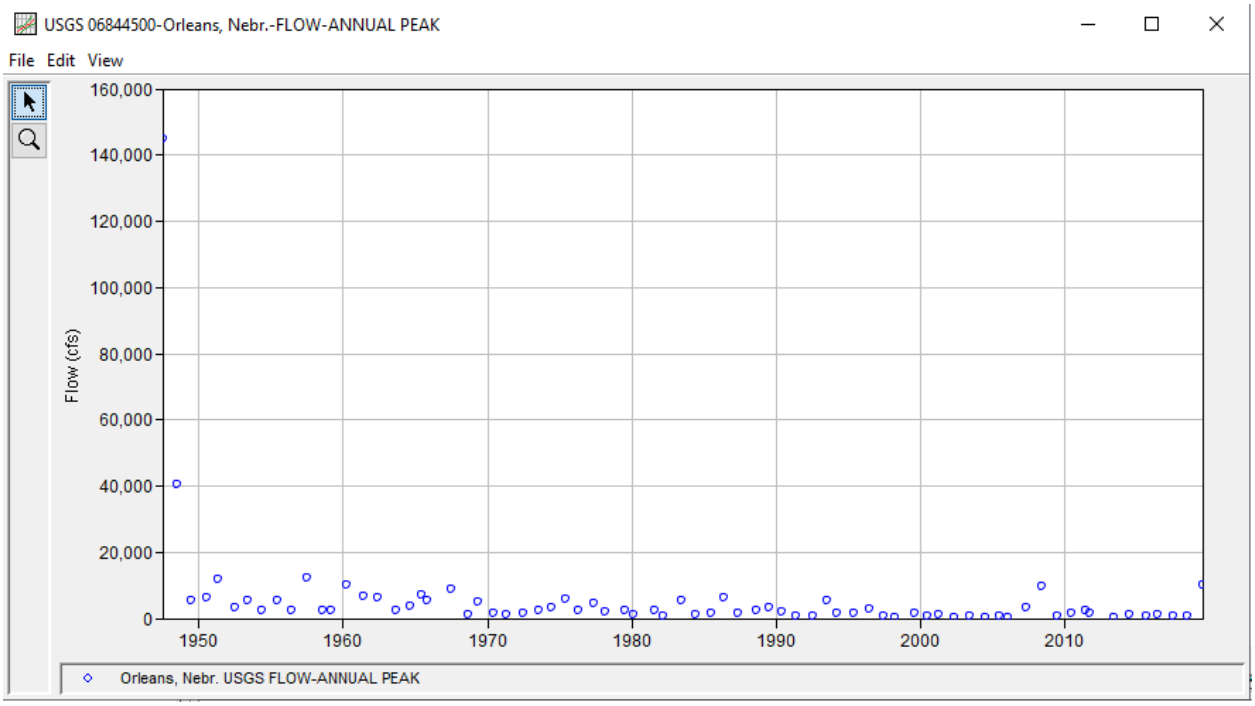

Figure 2. Annual Peak Flows for Republican River Gage at Orleans, NE

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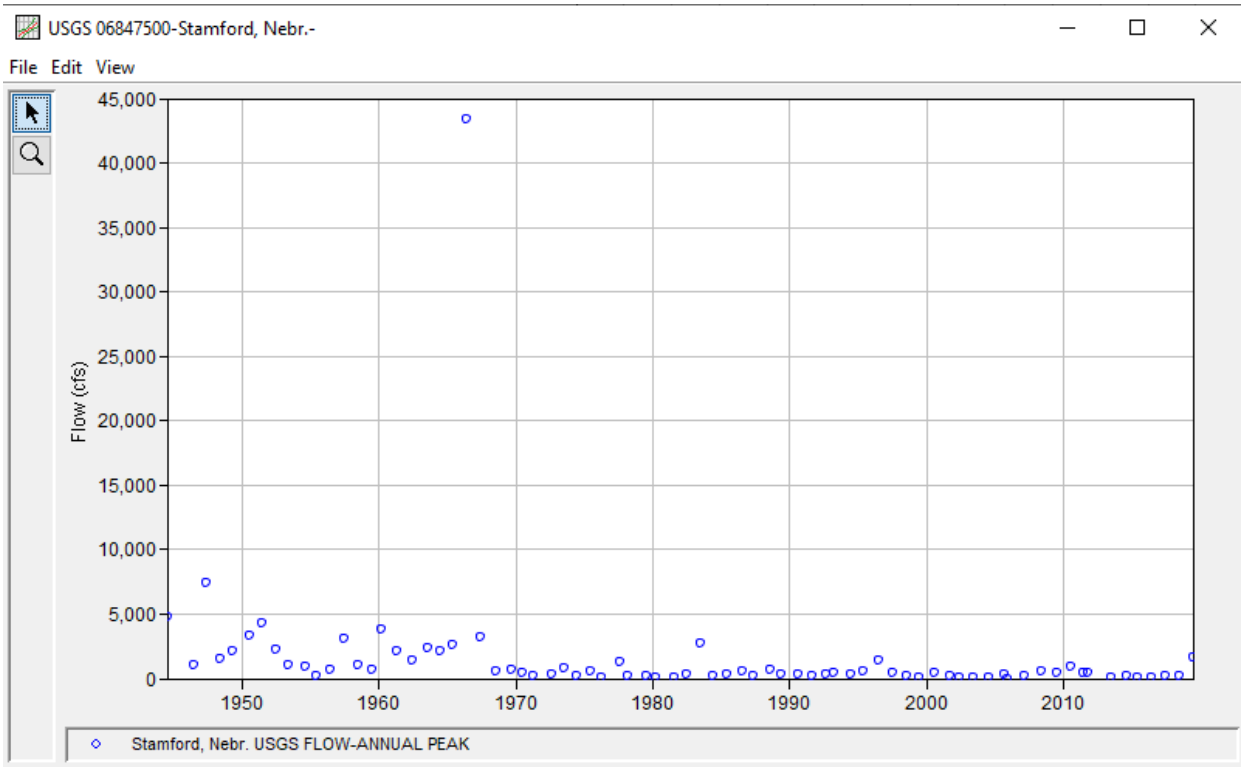

Figure 3. Annual Peak Flows for Sappa Creek at Stamford, NE

For both gages, the 500-year peak flow appears to be much higher than the 100-year and smaller events. The annual peak flow rates for the two gages include two larger events, each. The remainder of the peak flow rates are typically below 10 percent of the peak flow of record. For example, the annual peak flow rates for the Republican River gage are all below 20,000 cfs, except for the first two years of record. The peak flow for the flood of record, in 1947, is approximately 145,000 cfs on the Republican River. The annual peak flows for Sappa Creek are all below 5,000 cfs, except for two years. The peak flow for the flood of record for Sappa Creek, in 1966, is approximately 44,000 cfs. The largest annual peak flow value from each of the gage records is outside (above) the upper confidence limits for extreme events, when the entire period of record is analyzed.

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Bulletin 17 Editor - Repub River at Orleans, NE

Name: Repub River at Orleans, NE
Description: USGS 06844500
Flow Data Set: USGS 06844500-Orleans, Nebr.-FLOW-ANNUAL PEAK
DSS File Name: F:/2018/0001-0500/018-0451/40-Design/Calcs/WTRS/SSP/Rep_River_at_Orleans/Republican_at_Orleans.dss
Report File: F:\2018\0001-0500\018-0451\40-Design\Calcs\WTRS\SSP\Rep_River_at_Orleans\Bulletin17Results\Repub_River_at_Orleans_NE\Repub_River_at_Orleans_NE.rpt

General | Options | EMA Data | Tabular Results

Frequency Curve for: USGS 06844500-Orleans, Nebr.-FLOW-ANNUAL PEAK

Percent Chance Exceedance	Computed Curve Flow in cfs	Variance Log (EMA)	Confidence Limits Flow in cfs	
			0.05	0.95
0.2	105513.6	0.06978	514335.1	50297.9
0.5	66779.4	0.04797	239675.3	35724.9
1.0	46124.7	0.03468	132539.5	26814.0
2.0	31020.5	0.02406	72199.6	19492.7
5.0	17364.5	0.01390	31410.8	11952.1
10.0	10524.5	0.00894	16282.1	7658.7
20.0	5846.3	0.00604	8109.1	4423.8
50.0	2006.7	0.00456	2601.9	1549.2
80.0	739.7	0.00464	954.2	563.6
90.0	451.4	0.00582	591.5	324.5
95.0	304.4	0.00827	412.7	200.5
99.0	150.4	0.01960	236.1	78.2

Distribution Parameters

Parameter	Value
Mean	3.324
Standard Dev	0.535
Station Skew	0.245
Regional Skew	
Weighted Skew	
Adopted Skew	0.245
EMA Estimate of MSE (G at-site)	0.086
Grubbs-Beck Critical Value	0.000

Events

Event	Number
Historic Events	0
High Outliers	
Low Outliers and Zero Flows	0
Missing Flows	0
Systematic Events	73
Historic Period	73
Equivalent Record Length (years)	73.000

Compute | Plot Curve | View Report | Print | OK | Cancel | Apply

Figure 4. Summary Table of Bulletin 17C Analysis of Republican River Annual Peak Flows

Bulletin 17 Editor -

Name: Sappa Creek at Stamford, NE

Description: USGS 06847500, Sappa Creek near Stamford, NE

Flow Data Set: USGS 06847500-Stamford, Nebr.-FLOW-ANNUAL PEAK

DSS File Name: F:\2018\0001-0500\018-0451\40-Design\Calcs\WTRS\SSP\Sappa_Creek_at_Samford\Sappa_Creek_at_Samford.dss

Report File: F:\2018\0001-0500\018-0451\40-Design\Calcs\WTRS\SSP\Sappa_Creek_at_Samford\Bulletin17Results\Sappa_Creek_at_Stamford_NE\Sappa_Creek_at_Stamford_NE.rpt

General | Options | EMA Data | Tabular Results

Frequency Curve for: USGS 06847500-Stamford, Nebr.-FLOW-ANNUAL PEAK

Percent Chance Exceedance	Computed Curve Flow in cfs	Variance Log (EMA)	Confidence Limits Flow in cfs	
			0.05	0.95
0.2	41107.2	0.08983	241421.5	17609.8
0.5	24674.6	0.06123	102815.2	12102.6
1.0	16293.2	0.04395	52893.5	8801.9
2.0	10418.7	0.03026	26651.0	6155.9
5.0	5393.6	0.01740	10381.4	3530.9
10.0	3042.2	0.01129	4926.0	2116.4
20.0	1544.3	0.00785	2230.1	1120.1
50.0	442.2	0.00614	597.6	327.5
80.0	134.5	0.00649	181.2	96.7
90.0	73.9	0.00878	101.5	47.6
95.0	45.6	0.01333	65.3	25.1
99.0	19.0	0.03374	32.6	7.0

16293.2

Distribution Parameters

Parameter	Value
Mean	2.664
Standard Dev	0.631
Station Skew	0.176
Regional Skew	
Weighted Skew	
Adopted Skew	0.176
EMA Estimate of MSE (G at-site)	0.079
Grubbs-Beck Critical Value	26.000

Events

Event	Number
Historic Events	0
High Outliers	
Low Outliers and Zero Flows	1
Missing Flows	1
Systematic Events	75
Historic Period	76
Equivalent Record Length (years)	74.000

Compute | Plot Curve | View Report | Print | OK | Cancel | Apply

Figure 5. Summary Table of Bulletin 17C Analysis of Sapp Creek Annual Peak Flow

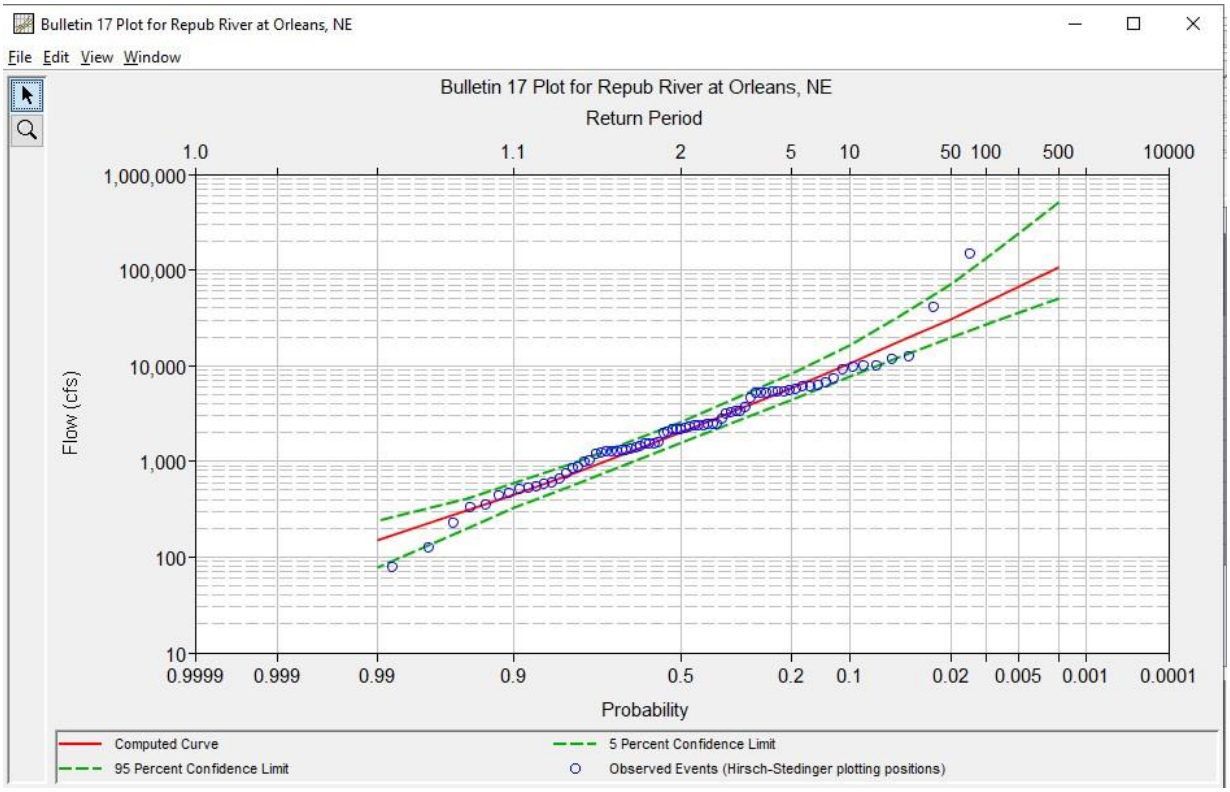

Figure 6. Plot of Republican River Bulletin 17C Computed Curve and Confidence Limits

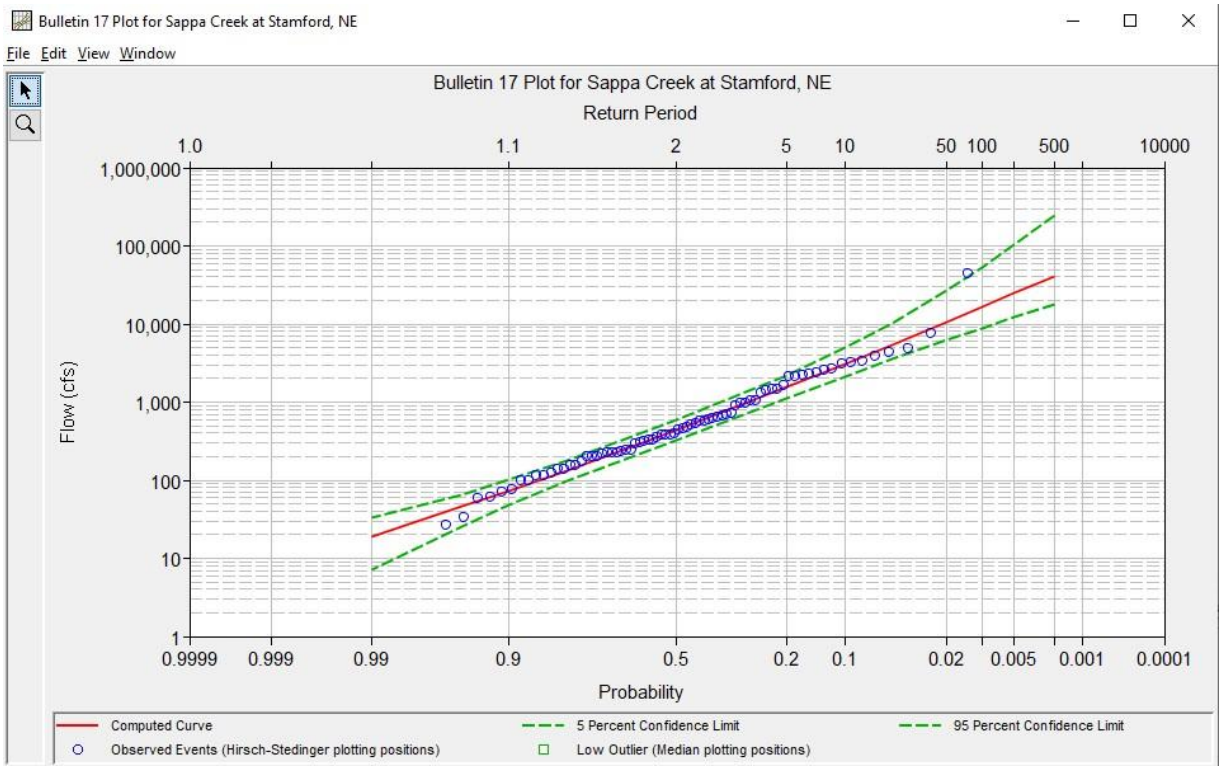

Figure 7. Plot of Sappa Creek Bulleting 17C Computed Curve and Confidence Limits

Four large dams were constructed in the Republican River watershed during the late 1940's and early 1950's, including Medicine Creek, Red Willow Creek, Swanson, and Enders. The latest and largest dam to be constructed, Swanson, was completed in 1953. Together they control approximately 74 percent of the contributing drainage area of the Republican River at Orleans, NE. Thus, the gage records from after 1953 provide a better indicator of current peak flow values. The computed one percent annual chance event peak flow from the Bulletin 17C analysis of the entire period of record for the Republican River gage is approximately 46,000 cubic feet per second. When the Bulletin 17C analysis is performed with a period of record beginning in 1954, the peak flow estimate is 15,400 cubic feet per second, or less than one-third of the estimate for the entire period of record. The results of the post-1954 Bulletin 17C analysis are provided below. No large dams were constructed on Sappa Creek during the period of record.

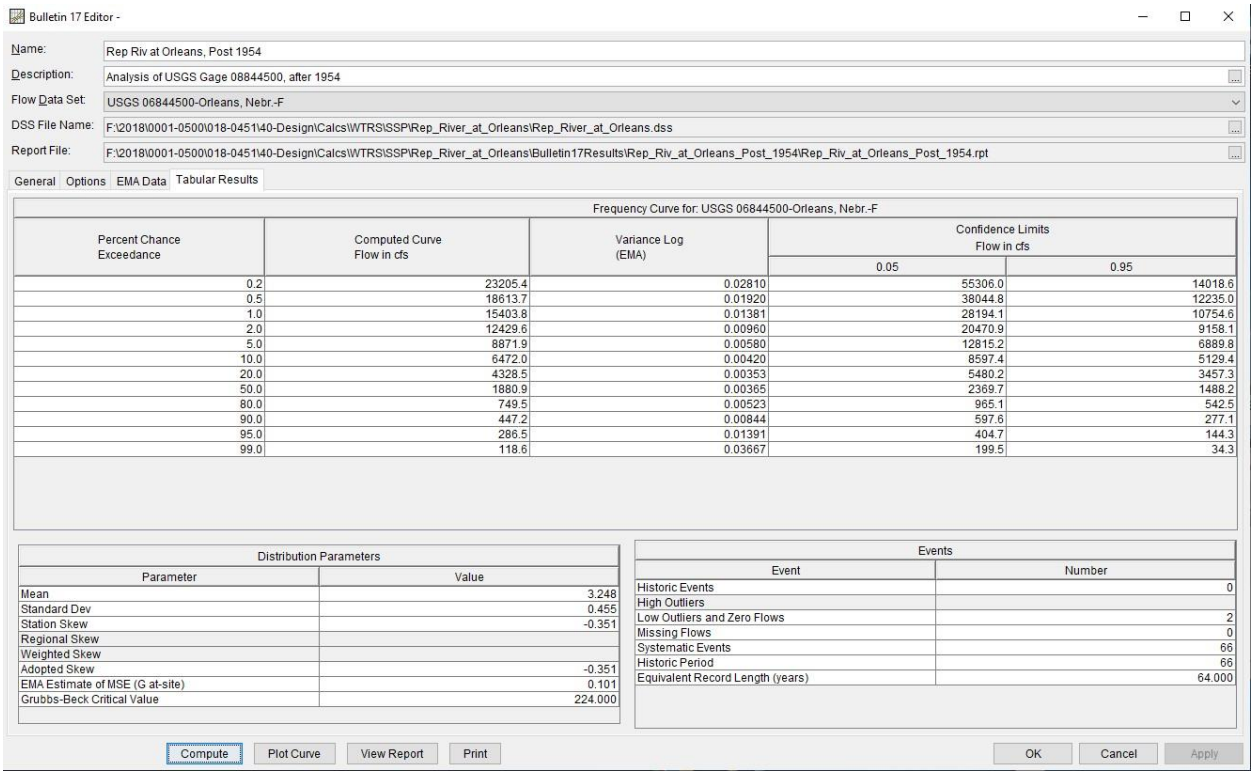

Figure 8. Post-1954 Bulletin 17C Republican River Analysis of Annual Peak Flow

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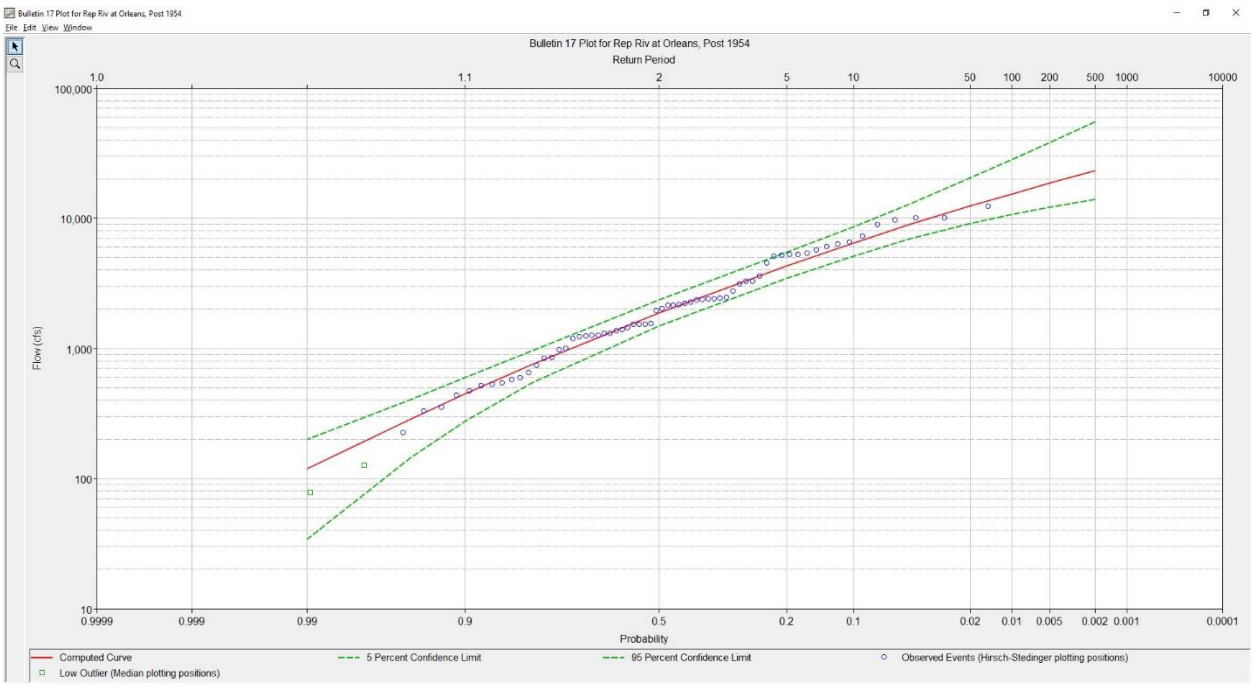

Figure 9. Post-1954 Bulletin 17C Republican River Computed Curve and Confidence Limits

In order to be consistent with flows used in the previous NDOT analyses for Highway 89, and to evaluate the impacts of extreme events on the proposed wetlands and roadways, the peak flow estimates from the full period of record are used for the hydraulic analysis, described in Section 3.0, below. The larger one percent annual chance event peak flow results in maximum flood extents closer to the regulatory floodplain in the project vicinity. The post-1954 one percent annual chance peak flood event is roughly equivalent to a five percent annual chance, or 20-year event, for the entire period of record.

The hydrographs were developed by assessment of the gage records and identifying representative hydrographs for Sappa Creek and the Republican River that occurred from the same rainfall event (Figures 10 & 11). The hydrographs were then scaled to match the design event. The Republican River gage is at the upstream face of Highway 89. The Sappa Creek gage is several miles west of the confluence. The Sappa gage was lagged by 3 hours to reflect the travel time of the flood hydrograph at an average flood wave velocity of 2 feet per second.

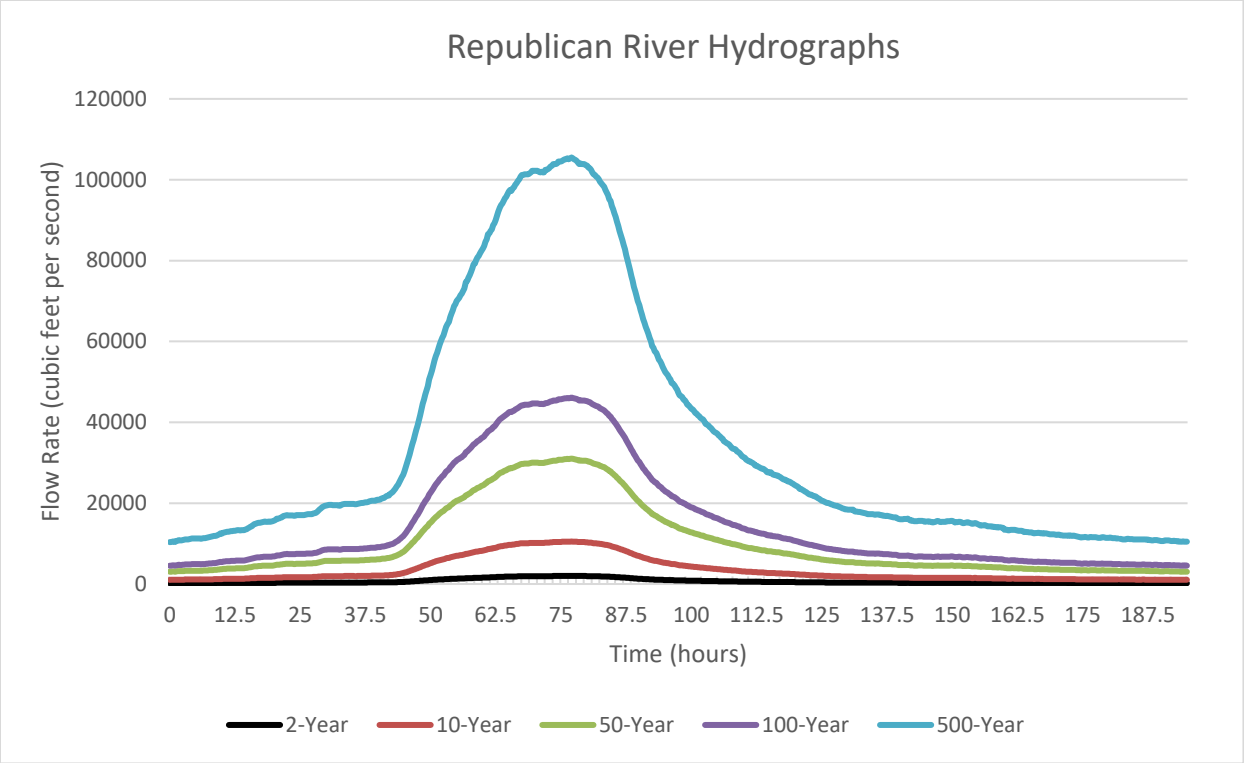

Figure 10. Representative Hydrographs for the Republican River

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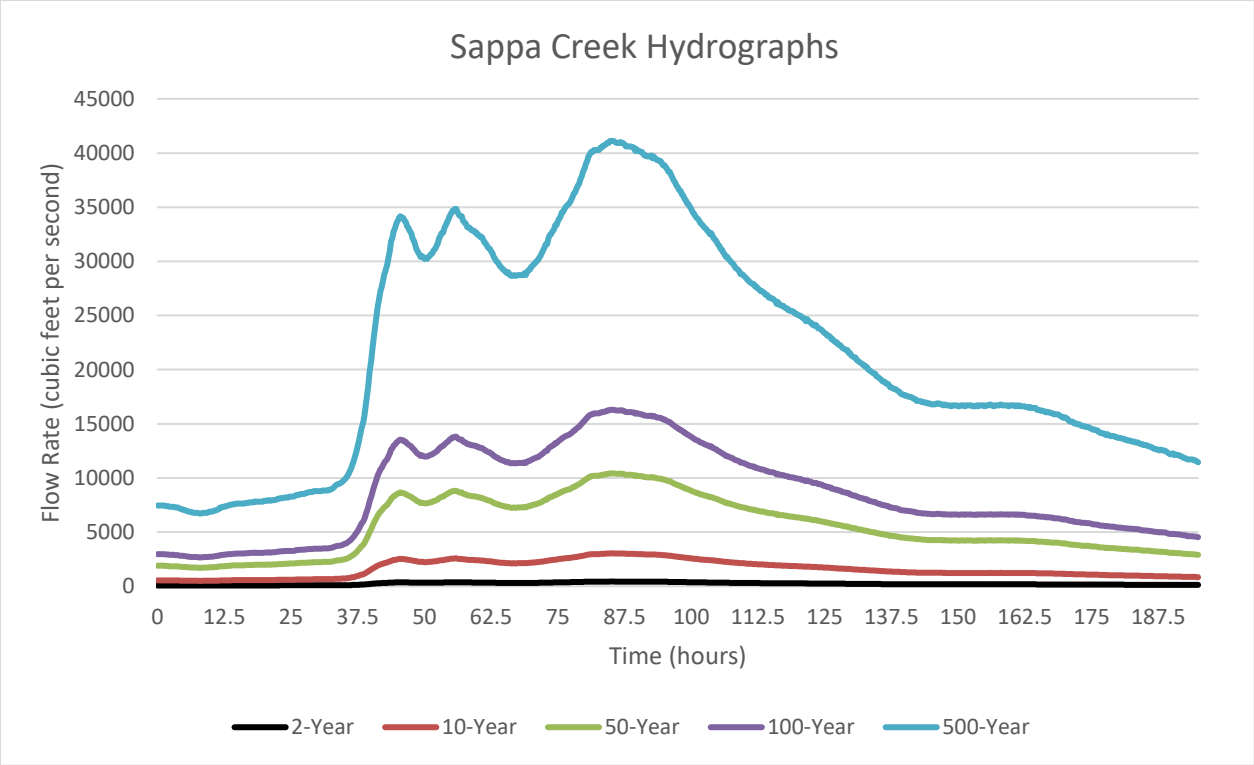

Figure 11. Representative Hydrographs for Sappa Creek

3.0 Hydraulic Analysis

The 2D hydraulic analysis of the reach of the Republican River was performed using HEC-RAS. The downstream end of the 2D model area was set downstream of the Highway 89 crossing of the Republican River, on the south side of Orleans (Figure 12). The downstream boundary condition for the 2D model area is normal depth, based on a friction slope of 0.0005, consistent with the 1-D HEC-RAS model of Highway 89 developed for the NDOT 89 Orleans South project (STP-89-3(111)).

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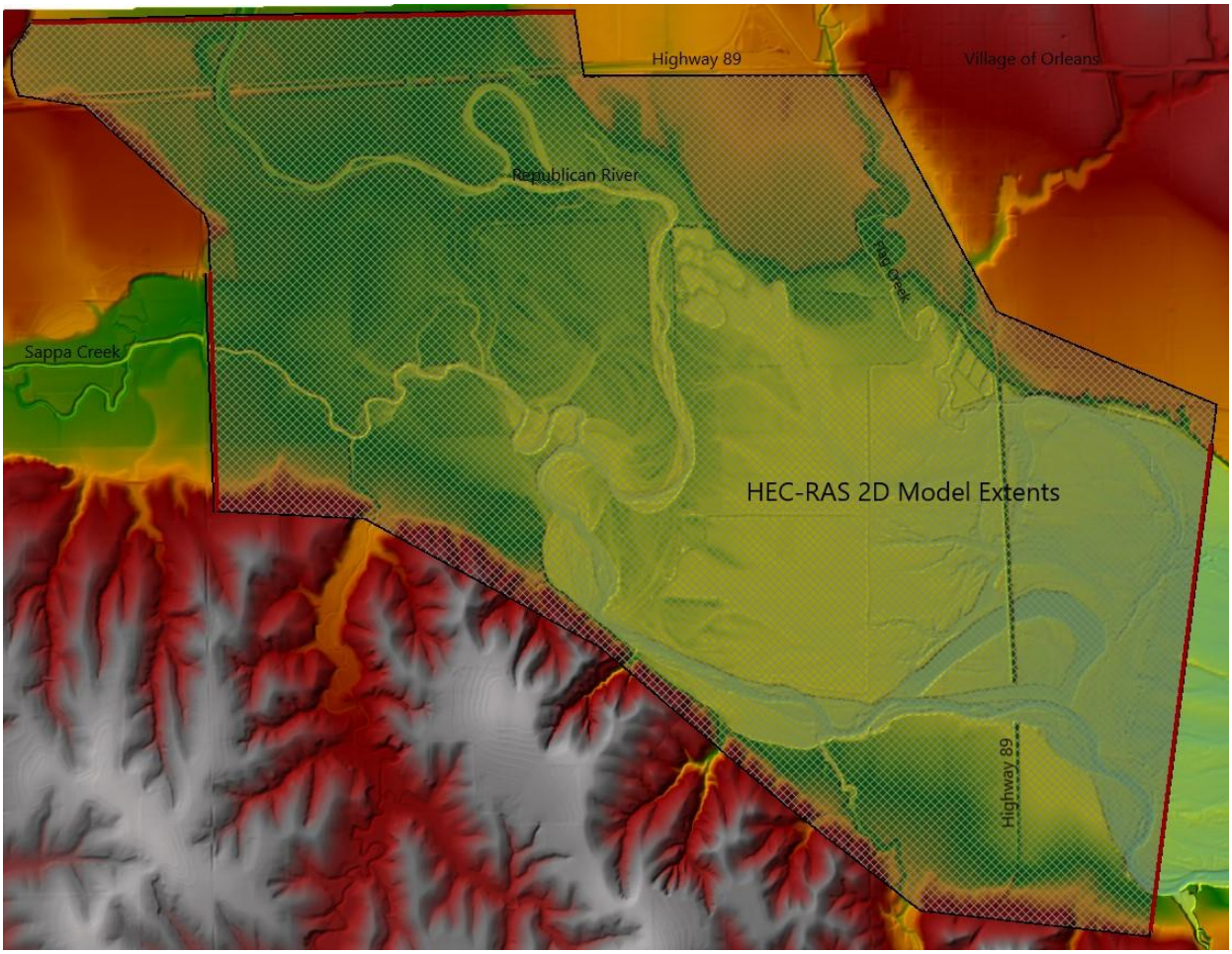

Figure 12. HEC-RAS 2D Hydraulic Model Extents

At Highway 89, the runoff from flood events flows through the Republican River and Flag Creek bridge openings, concentrating the flow and increasing velocities. The downstream boundary condition for the 2D HEC-RAS model spans the entire Republican River valley, which means flow can exit the model area at any point along the downstream boundary, if the elevation of the water surface in the mesh exceeds the surface elevation. Downstream of the bridges the flow slowly expands. At the downstream boundary of the 2D model, the flow velocities appear to be fairly evenly distributed across the floodplain.

The upstream end of the 2D hydraulic model on the Republican River is just upstream of Highway 89, west of Orleans. Republican River flow hydrographs are applied at the upstream boundary across the entire Republican River valley. Flow in the left (east) overbank of the Republican River is conveyed south under the Highway 89 roadway embankment via a series of bridge openings in the overbank. For smaller events, the peak flow in the Republican River channel is separated from the flow in the overbank by high ground. However, flow in the overbank of the NDOT Orleans West (STP-89-3(104) hydraulic models for the Highway 89 crossing of the Republican River occurs for all events modeled. Flows in the bridge openings

in the overbank of the 2D model are also assumed to occur, even when high ground separates the channel and the overbank bridges. The overbank flows are consistent with the NDOT models and reflect the potential for overflow from the channel to the overbank, upstream of the 2D model extents.

The west edge of the model (upstream limits of model for Sappa Creek) is located along Sappa Creek, approximately 11,000 feet (following streamline) upstream of the confluence with the Republican River. At this location, high ground on the north side of the floodplain separates the Sappa Creek and Republican River floodplains. The west boundary of the model is just downstream of Fencepost Road.

The topographic data used as the basis of the modeling analysis was the USGS 2020 Original Project Resolution (OPR) Digital Elevation Models (DEM) for Southern Nebraska (flights in 2018 and 2019, published in 2020). The elevation value for the DEMs was adjusted from meters to feet. The computational mesh was generated with point spacing of 60 feet. More detailed point spacing was used in the channels and near drainage structures. The default Manning's "*n*" value was 0.04. Areas with sparse trees or buildings were assigned an "*n*" value of 0.06. Areas of dense tree cover were assigned a 0.08 "*n*" value. Elevations are in the NAVD 88 vertical datum.

There are no bridge openings in the project reach. Bridge openings in the Highway 89 crossings, near the upstream and downstream ends of the model extents were reflected in the 2018 LiDAR topography (bridge deck removed and channel topography reflected through the roadway crossing). The exception was Flag Creek, where the bridge deck was not removed from the model and the road elevations were reflected across the channel. An internal boundary was created along the Highway 89 roadway. The Flag Creek bridge opening was modeled as a large culvert, conveying flows across the internal boundary. Breaklines were implemented into the model along all elevated roadways and earthen berms, to prevent flow passing those features until the flood elevation was high enough to overtop the features.

The proposed 2D model surface was created by revising the existing conditions surface to reflect the excavation and grading of the wetlands, and the fill along the roadways and in the spoil, or waste, area. The spoil amounted to approximately 6 ft of fill over the waste area. The difference between existing and proposed conditions peak water surface elevations (proposed minus existing) for the 100-year event is generally 0.3 to 0.5 ft upstream of the proposed roadway and waste fill areas. At some locations, immediately upstream of the roadways, the increase in the flood elevations exceeds 0.5 feet. The increase does not exceed one foot at any location. The larger increases are due to water surface elevations across the roadway dropping further for existing conditions. The increases are localized and are not representative of the general change in water surface elevation upstream of the roadways. At the upstream and downstream extents of the 2D model, the proposed peak water surface elevations are generally within 0.01 ft of existing. The flood elevations are reduced by up to 0.2 feet or more, in the vicinity of the roadways (east of the waste area) and the wetlands. A map of the computed peak 100-year

water surface elevation differences is shown below (Figure 13). Breaklines were implemented along the regraded roadways, to show the impacts of roadway grading on flow patterns and velocities.

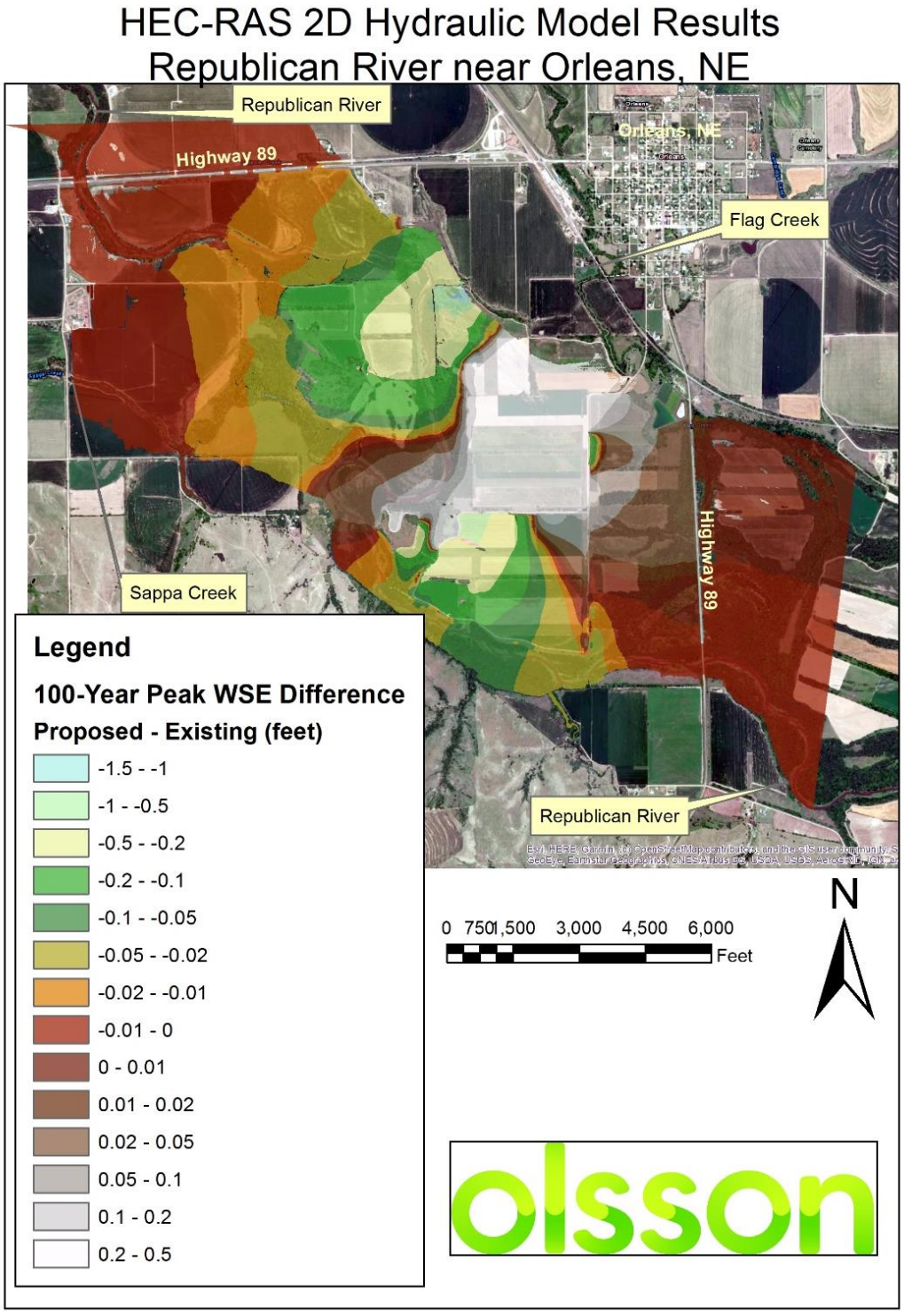

Figure 13. Difference in 100-Year Peak Flood Elevations (Proposed – Existing)

The computed peak water surface elevations at the upstream end of the 2D model, are slightly below 1987 ft for the one percent annual chance, or 100-year, event. The NDOT Orleans West (STP-89-3(104)) hydraulic model had an elevation of 1987.37 ft at Hydraulic Cross Section 3 (RAS Section 7015). There seems to be reasonable agreement between the 2D model and the NDOT Orleans West model.

4.0 Inundation of Wetlands

The more frequent, smaller storms modeled both show similar inundation patterns for existing and proposed conditions. This is consistent with "rules of thumb" that state the bank-full, or channel-forming discharge is typically between and 1-year and 2-year event. It appears the 2-year storm just slightly exceeds bank-full capacity at the upstream end of the proposed wetland bank, in the left overbank of the Republican River (Figure 14). The pattern appears to be similar for proposed conditions. A break interrupts the berm at the north end of the proposed mitigation bank wetlands, providing a conveyance path which allows overflows from Republican River to just begin flowing into the wetland areas for the 2-year storm. The interruption in the berm at the north end of the wetlands is preserved for proposed conditions (Figure 15). The results also indicate the 10-year, and larger storms, inundate most of the project area, for existing and proposed conditions (Figure 16).

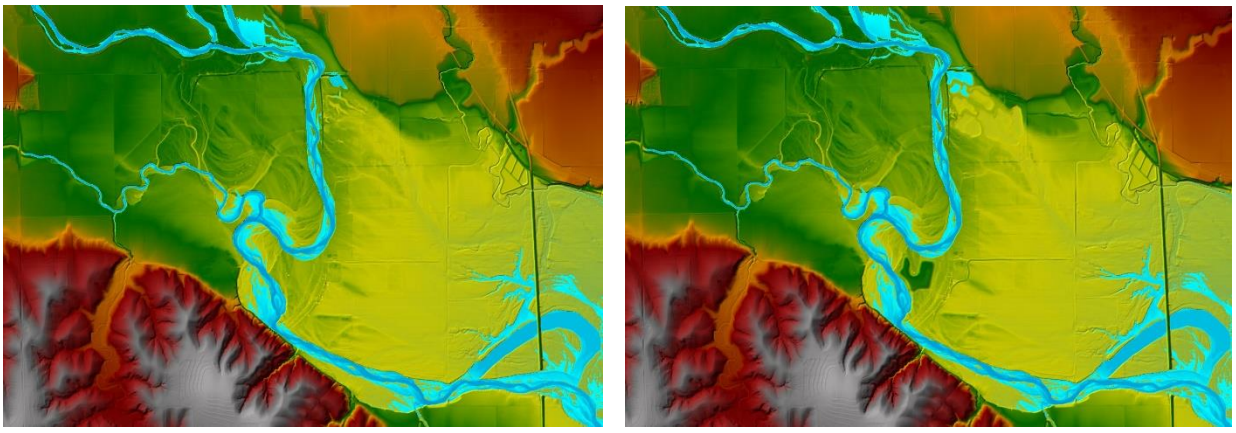

Figure 14. 2-Year Flood Extents, Existing (left) and Proposed (right)

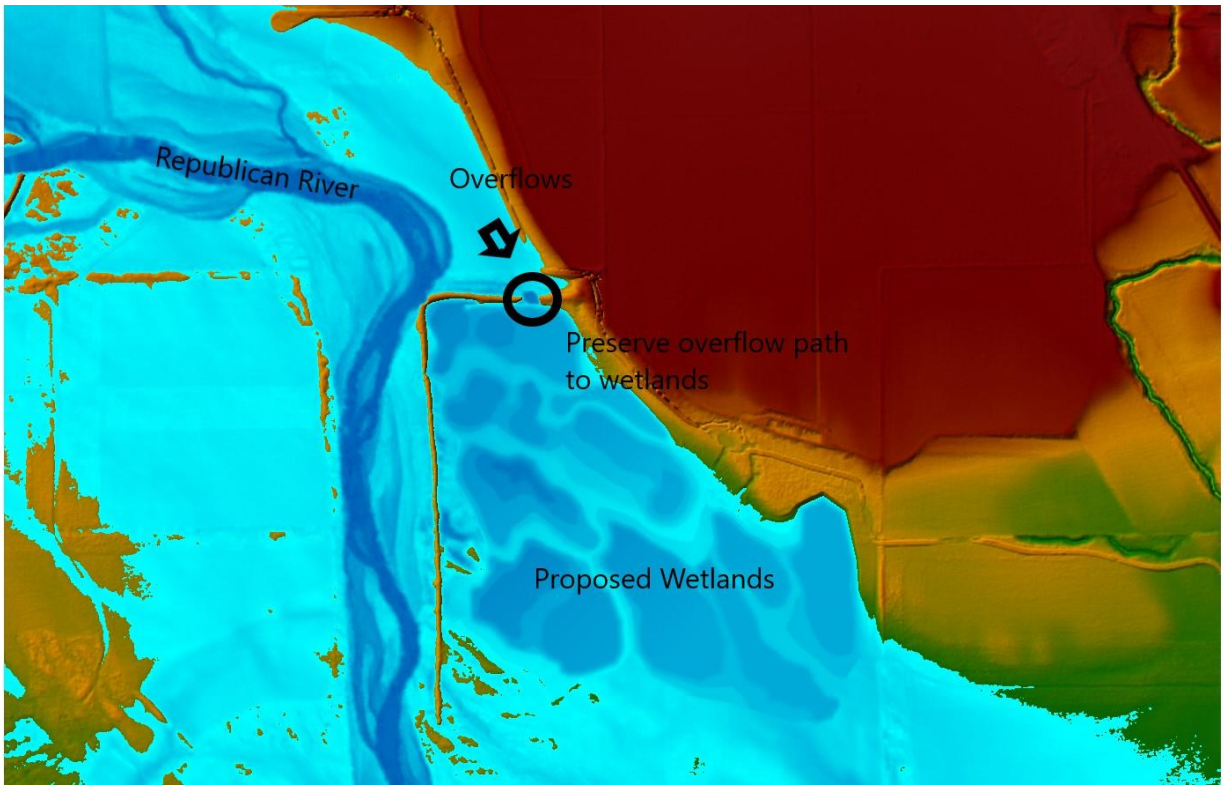

Figure 15. Constructed Berm and Wetland Overflow Path

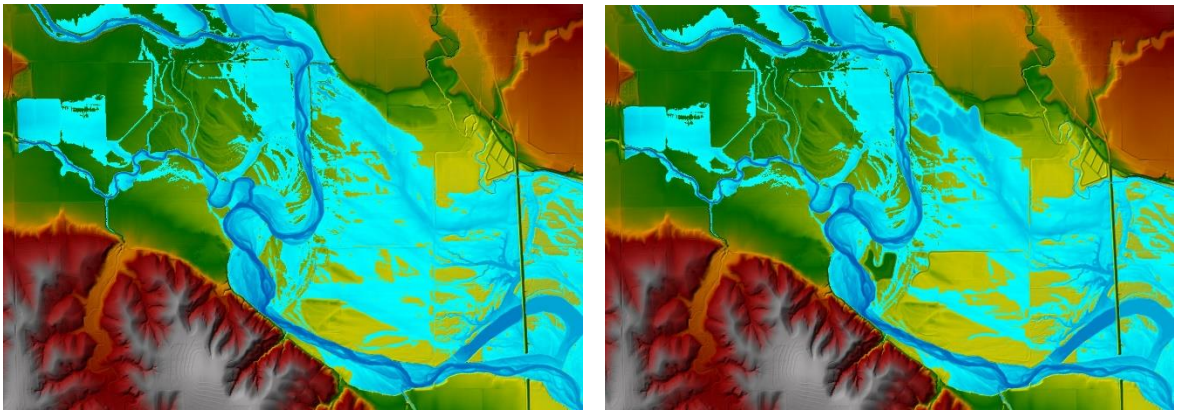

Figure 16. 10-Year Flood Extents, Existing (Left) and Proposed (Right)

5.0 Harlan County Reservoir Storage

In order to determine potential impacts on the flood storage of the Harlan County Reservoir, the flood storage values for the existing and proposed surfaces were evaluated at a range of elevations, from the lowest point on the surfaces, to the top of the Harlan County Reservoir dam at elevation 1986.3 ft. All

elevations are expressed in the North American Vertical Datum of 1988 (NAVD 88). The cut and fill volumes and differences between existing and proposed volumes are provided in the tables below (Tables 1 through 3). The volumes were calculated for the area within the footprint of the proposed grading, only. The roadways and waste area only include fill. The wetlands are mostly cut, with a small amount of fill. Fill was assumed to be negligible, compared to cut. The numbers in Table 4 below represent net cut.

Table 1. Flood Storage Volumes for Existing and Proposed Surfaces for Roads (acre-feet)

Elevation	Description	Cut	Fill	Difference* (Cut - Fill)
1966	Lowest Elevation of Roadway Surface	0.0	0.0	0
1969		0.0	3.2	-3.2
1971		0.0	7.9	-7.9
1974.3	Top of Flood Control Pool	0.0	15.5	-14.9
1976.3	Top of Surcharge	0.0	16.9	-16.6
1982.8	Top of Crest	0.0	22.9	-22.7
1986.8	Top of Dam	0.0	23.6	-23.6

*Represents the change in available flood storage volume for the reservoir

Table 2. Flood Storage Volumes for Existing and Proposed Surfaces for Waste Area (acre-feet)

Elevation	Description	Cut	Fill	Difference* (Cut - Fill)
1971	Lowest Elevation of Waste Area Surface	0.0	0.0	0.0
1974.3	Top of Flood Control Pool	0.0	20.7	-15.0
1976.3	Top of Surcharge	0.0	41.8	-36.8
1982.8	Top of Crest	0.0	69.7	-69.7
1986.8	Top of Dam	0.0	69.7	-69.7

*Represents the change in available flood storage volume for the reservoir

Table 3. Flood Storage Volumes for Existing and Proposed Surfaces for Wetland Area (acre-feet)

Elevation	Description	Cut	Fill	Difference* (Cut - Fill)
1969	Lowest Elevation of Wetland Area Surface	18.5	0.0	18.5
1971		71.8	0.0	71.8
1974.3	Top of Flood Control Pool	130.5	0.0	130.5
1976.3	Top of Surcharge	137.9	0.0	137.9
1982.8	Top of Crest	139.2	0.0	139.2
1986.8	Top of Dam	139.2	0.0	139.2

*Represents the change in available flood storage volume for the reservoir

Table 4. Net Change in Flood Storage Volumes for Project Area (acre-feet)

Elevation	Description	Cut	Fill	Difference* (Cut - Fill)
1969	Lowest Elevation of Wetland Area Surface	18.5	3.2	15.3
1971		71.8	7.9	63.9
1974.3	Top of Flood Control Pool	130.5	29.9	100.6
1976.3	Top of Surcharge	137.9	53.4	84.5
1982.8	Top of Crest	139.2	92.4	46.8
1986.8	Top of Dam	139.2	93.3	45.9

The proposed grading work to excavate the wetland areas and fill the roadway alignments and spoil area will result in an increase to total flood storage of 100.6 acre-feet at the top of the Flood Control Pool Elevation. For reference, the volume of water stored below the top of the Flood Control Pool Elevation is approximately 840,000 acre-feet, according to the Republican River Basin Reservoir Regulation Manual, Volume No. 1, Master Manual (Kansas City District, U.S Army Corps of Engineers, July 1977). The proposed work will have a small, net positive benefit on the flood control functions of the reservoir. The elevations from the manual were originally provided in the National Geodetic Vertical Datum of 1929. They were converted to NAVD 88 by the addition of 0.845 feet, and rounded to the nearest tenth of a foot.

It should be noted that backwater from the reservoir will not flow into wetlands until the pool elevation reaches 1970, which will cause inundation of the wetland cells at the southeast end of the wetland area. When the reservoir pool reaches 1973, the remainder of the wetland cells will be inundated. Below 1973, there may be a small net loss of reservoir flood storage, no more than 25 acre-feet, which amounts to 0.002 percent of the flood control pool storage.

6.0 Conclusions

The proposed grading associated with the wetlands and the roadways will cause a maximum, localized increase of approximately 0.9 feet in the 100-year flood elevation, immediately upstream from the proposed roadway fill. The typical increase in flood elevations upstream of the proposed roadway fill will be from 0.2 to 0.5 feet. It appears the wetlands will continue to be inundated at approximately the same frequency. The 2-year event overflows the left bank of the Republican River for both existing and proposed conditions. For proposed conditions, an opening in the berm at the north end of the wetland mitigation bank, which allows overflows from the Republican River to flow into the wetlands, is preserved (Figure 15). The proposed grading will have a small, positive impact on the flood storage of the Harlan County Reservoir at the flood control pool elevation.

Appendix G

Proposed Seed Mixes

Project No. MISC-D7(1007), C.N. 71216, D7 Wetland Bank

SEEDING

Type "Wetland"	Seeding rate using mechanical seed drill (pounds/acre)
Bluejoint (Calamagrostis canadensis)	0.5
Inland saltgrass (Distichlis spicata)	2
Woolly sedge (Carex pellita)	1.5
Short-beaked sedge (Carex brevior)	1
Nebraska sedge (Carex nebraskensis)	0.5
Fox sedge (Carex vulpinoidea)	0.75
Spikerush (Eleocharis palustris)	0.3
New England aster (Aster novae-angliae)	0.2
Arrowhead (Sagittaria latifolia)	5

Project No. MISC-D7(1007), C.N. 71216, D7 Wetland Bank

SEEDING

Type "Buffer"	Seeding rate using mechanical seed drill (pounds/acre)
Canada wildrye – Mandan, NE or KS native	5
Western wheatgrass – Flintlock, Barton Arriba	4
Slender wheatgrass	6
Thickspike wheatgrass – Critana	4
Indiangrass – Holt, Nebraska-54, Chief, Oto	4
Little bluestem – Camper, Blaze, Pastura	2.5
Prairie cordgrass (Spartina pectinata)	1
Switchgrass – Pathfinder, Blackwell, Nebraska-28, Trailblazer	2
Prairie sandreed – Goshen, Pronghorn	3
Sand dropseed (Sporobolus cryptandrus)	0.3
Purple prairie clover (Dalea purpurea)	0.2
Blackeyed Susan (Rudbeckia hirta)	0.25
Common milkweed (Asclepias syriaca)	0.3
New England aster (Aster novae-angliae)	0.2
Blue vervain (Verbena hastata)	0.1
Thickspike gayfeather (Liatris pycnostachya)	0.15
Oats/wheat (wheat in the fall)	16

Appendix H

Long-Term Management Plan

DRAFT MANAGMENT AND USE PLAN

NEBRASKA DEPARTMENT OF TRANSPORTATION AND
UNITED STATES ARMY CORPS OF ENGINEERS KANSAS CITY DISTRICT
NDOT PROJECT NO. MISC-STWD (1093)
STATE CONTROL NO. 71216
DISTRICT 7 WETLAND MITIGATION BANK

A. Location and Description: The proposed bank is in Harlan County, Nebraska approximately 0.75 miles southwest of the City of Orleans at approximately 40.122995° latitude, -99.471144°longitude. The site is near NE HWY 89 and can be accessed via a two-track road from South Republican Avenue just outside the southern boundary of Orleans. The site is located upstream of Harlan County Lake Reservoir and is within the historic floodplain of the Republican River. The wetland mitigation bank site is in Section 21, Township 2 North, Range 19 West. The site includes approximately 70 acres of a United States Army Corps of Engineers (USACE)-owned property and consists of agricultural land, a hay field, a managed grassland, and riparian woodlands, The site is located within Parcel ID 280014500.

Parcel ID	Owner Name	Owner Address	Section-Township-Range	Legal Description
280014500	USACE	70788 Corps Road A, Republican City, NE 68791-0000	21-2N-19W	FCL. 20-2-19

B. Management Objectives: The objective of this management program is to establish and maintain wetland habitat to be used by the Nebraska Department of Transportation (NDOT) to compensate for planned and future unavoidable wetland impacts resulting from NDOT projects, and to enhance and create wetland habitat on USACE property to expand wildlife habitat and recreational opportunities. The bank is needed by NDOT to support the future transportation infrastructure needs of the public that often results in unavoidable impacts to waters of the United States requiring compensatory mitigation in accordance with 33 CFR 332.

1. The overall goals and objectives of the site include:
   a. Goal No. 1: Enhance, establish, and restore and maintain self-sustaining Palustrine Emergent (PEM) wetland. Site-specific objectives are as follows:
      i. Enhance approximately 2.00 acres of existing wetland and open water areas as PEM Floodplain Depressional wetlands.
      ii. Establish approximately 55.22 acres of new PEM Floodplain Depressional wetland.
      iii. Restore approximately 3.41 acres of farmed wetland areas as PEM Floodplain Depressional wetlands.
   a. Goal No. 2: Establish and maintain a consistent upland buffer surrounding the aquatic resources. Specific objectives include creating an upland buffer with a mix of native

herbaceous species.

i. Establish approximately 8.59 acres of upland buffer surrounding the mitigation bank wetlands. The upland buffer would act to filter sediment and agricultural contaminants prior to surface water runoff reaching the restored wetland areas and would act as a barrier to invasion by potential unwanted plant species.

C. Intentions: USACE intends for NDOT to construct a wetland approximately 70 acres in size. Once constructed, the wetland mitigation bank site will be utilized by NDOT to offset unavoidable impacts to waters of the United States (WOTUS) resulting from its transportation improvement projects.

D. Access and Use: USACE intends for NDOT and the public to have access to the site.

1. USACE grants and assigns to NDOT the right to access and make use of the USACE Parcel ID 280014500 to construct, monitor, and repair the wetland mitigation bank NDOT, its employees and contractors shall have the right to access the site for the construction, reconstruction, inspection, monitoring, repair operation, and maintenance of a wetland mitigation bank.
2. USACE agrees to forego any use of wetland mitigation bank credits for their own use, and acknowledges that the wetland mitigation bank credits established are intended only for use by NDOT.
3. The wetland mitigation bank site will remain accessible by the public for the purposes of hunting and recreation, consistent with USACE policies for properties included the Harlan County Lake site.

E. Design and Construction:

1. NDOT will:
   a. Design and construct a wetland mitigation bank, with efforts consisting of earthwork, erosion control, and application of wetland seed mix and buffer area seed mixes.
   b. Assign a project manager, or designee, who will monitor all construction and seeding activities. The NDOT project manager, or designee, will ensure that the wetland mitigation bank is constructed according to the approved design documents and Site Development Plan, will document daily work activities, and will make weekly reports to the USACE.
   c. Monitor and evaluate the success of the wetland mitigation bank through an establishment period.
2. USACE will review and approve NDOT's final wetland mitigation bank design plans, as well as the Site Development Plan, prior to the commencement of construction.

F. Wetland Establishment Period: The wetland establishment period shall be approximately five years after completion of initial wetland construction, subject to additional criterial more specifically set forth in the Site Development Plan, once complete. The USACE and NDOT will work together to determine the official completion date of the wetland establishment period. Upon completion of the establishment period, NDOT will submit the wetland mitigation bank to the United States Army Corps of Engineers, Omaha District, Regulatory Branch ("Omaha District"), for approval. NDOT will notify USACE when the wetland mitigation bank has been approved as a wetland mitigation site by the Omaha District. Official completion of the wetland establishment period occurs upon acceptance and approval of the wetland mitigation bank by the Omaha District.

G. Duties for Maintenance, Repair, Reconstruction:

1. Wetland Establishment Period: During the establishment period, NDOT shall be responsible for, and bear the cost of, initial site construction, operational maintenance, monitoring repair, and reconstruction as set forth in the Site Development Plan; *except,* that in the event of serious damage to or destruction of the wetland mitigation bank site, or a portion thereof, which requires significant repair or reconstruction, NDOT shall have the option to abandon the site or affected portion, rather than instituting repair or reconstruction, by providing the USACE with at least 30 days advance written notice of its intention to abandon. If NDOT elects to make significant repairs, it shall do so at NDOT cost.
2. Post Establishment Period: After official completion of the wetland establishment period as defined in Section F above:
    a. At USACE cost, USACE will be responsible for day-to-day operational maintenance and repair of USACE property according to Title 36 – Rules and Regulations Governing Public Use of Corps of Engineers Water Resources Development Projects. Future operation and maintenance activities may include, but not be limited to; habitat planning and evaluations, controlled burning, grazing, law enforcement activities, and maintaining signage and public access roads. Activities required of the USACE do not include maintenance, repair, or reconstruction of the mitigation bank per se. Maintenance, repair, or reconstruction of the mitigation bank to meet the wetland credit certification requirements set forth in the Site Development Plan are the responsibility of NDOT as discussed in section 2.b.; however, USACE may conduct activities within the mitigation bank as deemed necessary, within the constraints and parameters set forth in the Site Development Plan and Title 36 – Rules and Regulations Governing Public Use of Corps of Engineers Water Resources Development Projects. USACE activities will be documented and communicated to NDOT to assist in long-term management decisions and needs.
    b. At NDOT cost, NDOT will be responsible for day-to-day operational maintenance and repair of the wetland mitigation bank to maintain wetland habitat and wetland credits in accordance with the long-term management policies and procedures set forth in the Site Development Plan. Future operation and maintenance activities may include, but not be limited to noxious weed and invasive species management, controlled burning, grazing, reseeding, and regrading or repair of the site maintain hydrology as needed.
        i. NDOT will continue to monitor the site to control invasive/noxious species as needed.
        ii. NDOT will control for invasive and noxious vegetative species currently found on site such as *Phalaris arundinacea, Typha angustifolia,* and *Phragmites australis* with methods, including herbicidal treatment, approved by the USACE Kansas City District Office and USACE Omaha District Regulatory Branch. In addition, NDOT will control for other noxious weeds listed in Nebraska including: *Cirsium arvense, Carduus nutans, Carduus acanthoides, Euphorbia esula, Centaurea stoebe, Centaurea maculosa, Lythrum salicaria, Fallopia japonica, and Fallopia sachalinenis.*
        iii. NDOT will monitor shrub and tree establishment and remove as needed.
        iv. NDOT will apply controlled burning practices if needed.
        v. There are no specific management activities required with respect to Threatened and Endangered Species or Archeological Sites.

        NDOT management activities will be coordinated with USACE Kansas City District and USACE Omaha District Regulatory Branch.

c. After establishment, NDOT will be responsible for repairing or reconstructing the wetland in the event of serious damage to the wetland mitigation bank site, or a portion thereof, due to flooding or other natural events that seriously alter the intended function of the site as designed; *except,* that in the event of serious damage to or destruction of the wetland mitigation bank site or a portion thereof, NDOT shall have the option to abandon the site or affected portion, rather than instituting repair or reconstruction, by providing the USACE with at least 30 days advance written notice of its intention to abandon.
    i. Post establishment, if NDOT elects to undertake significant repairs or reconstruction to all or a portion of the wetland mitigation bank site, it shall do so at NDOT cost. Such repair and/or reconstruction activities may include earthwork, seeding, and erosion control measures consistent with those authorized during the initial establishment period.
    ii. A new establishment period will occur regarding the portion of the wetland seriously damaged or destroyed, and follow the process, duties, and obligations for completing the establishment period as set forth above, including the pre and post establishment obligations for maintenance and repair of the affected portion of the wetland.

H. Site Constraints and Uses: Pending USACE Omaha District Regulatory Branch and Interagency Review Team approval, the following conditions and protections afforded to the proposed site are as follows.

1. There shall be no construction or placement of structures or mobile homes, fences, signs, billboards or other advertising material, or other structures, whether temporary or permanent, on the land.
2. There shall be no tilling, draining, excavating, dredging, mining, drilling or removal of topsoil, loam, peat, sand, gravel, rock, minerals, or other materials.
3. There shall be no building of roads or paths for vehicular or pedestrian travel or any change in the topography of the land aside from those depicted in the approved mitigation plan.
4. There shall be no removal, destruction, or cutting of trees or plants, spraying with biocides, insecticides, or pesticides, grazing of animals, farming, tilling of soil, or other agricultural activity aside from those activities included in the approved management plan. Management activities are acceptable upon approval from the USACE Kansas City District Office. Noxious weed control is allowed but must be documented in monitoring.
5. There shall be no operation of all-terrain vehicles or any other type of motorized vehicle on the land, except for pre-existing access or constructed access in the approved mitigation plan. All-terrain vehicles may be used for maintenance and monitoring by Harlan County Lake USACE staff.
6. Public access would be maintained, with limited vehicle access as previously discussed. Activities such as hunting and fishing would continue to be allowed according to the rules and regulations outlined by the Harlan County Lake USACE.

During the Post Establishment Period, the USACE will be responsible for overseeing the operation, and normal property maintenance and repair of the site according to the conditions outlined in Section G.

Appendix I

Financial Assurances Letter

NEBRASKA

Good Life. Great Journey.

DEPARTMENT OF TRANSPORTATION

Pete Ricketts, Governor

9/16/2021

Matt Wray
Environmental Resources Specialist
Omaha District – Nebraska Regulatory Office
U.S. Army Corps of Engineers
8901 S. 154th Street, Suite #2
Omaha, NE 68138-3621

RE: Financial Assurances Letter
District 7 Wetland Mitigation Bank
NDOT C.N.: 71216
NDOT P.N.: MISC-D7(1007)

Attention Mr. Wray:

The Nebraska Department of Transportation (NDOT) intends to construct the District 7 Wetland Mitigation Bank, located southwest of Orleans, NE in Section 21, Township 2 North, Range 19 West of Harlan County. NDOT would be responsible for all costs associated with the site construction, maintenance, protection, monitoring, corrective actions, and long-term management. NDOT has adequate funding to facilitate all noted costs.

Kurt Vosburg
Highway District Engineer, District 7
Nebraska Department of Transportation
619 Auditorium Drive
McCook, NE 69001

John R. Selmer, P.E., Director
Department of Transportation
District 7 Headquarters
619 Auditorium Drive
McCook, NE 69001-3569
OFFICE 308-345-8490 FAX 308-345-8492
NDOT.ContactUs@nebraska.gov
dot.nebraska.gov

Appendix J

Draft Mitigation Bank Ledger

Mitigation Site Name: District 7 Wetland Mitigation Bank
NDOT Project Number: MISC-STWD(1093)
NDOT Control Number: 71216
Legal Description: Section 21, Township 2 North, Range 19 West; FCL 20-2-19
Geographic Service Area: HUC8 (10250009, 10250016, 10250014, 10250008) & Ecoregion Cenral Great Plains - Rolling Plains and Breaks
Total Size (ac.): 70
Cowardin Class(es): PEMA/C
NE Wetland Subclass(es): Floodplain Depression

Approved Site Dev. Plan:
Construction Complete:
Bank Certified:
% of Credits:

ACCOUNTING

Type	Credits Produced	Debits Used	Balance
BUFFER	0.00	0.00	**0.00**
PEMA/C	0.00	0.00	**0.00**
PSSA	0.00	0.00	**0.00**
PFOA	0.00	0.00	**0.00**
PEMF	0.00	0.00	**0.00**
TOTAL	0.00	0.00	**0.00**

WETLAND CREDITS

Credit Establishment Date	Available Acres[1]	Credit Release[2]	Mitigation Type	Credit Development	Cowardin Class	NE Sub-Class[5]	Credits Available

EXPECTED DEVELOPMENT

	PEMA/C (ac.)	PSSA (ac.)	PFOA (ac.)	PEMF (ac.)	TOTAL CREDITS
Re-Establishment (1:1)	3.41	0.00	0.00	0.00	3.41
Rehabilitation (1:1)	0.00	0.00	0.00	0.00	0.00
Enhancement (3:1)	2.00	0.00	0.00	0.00	0.67
Creation (1:1)	55.22	0.00	0.00	0.00	55.22
Protection (10:1)	0.00	0.00	0.00	0.00	0.00
Buffer (4:1)	8.59	0.00	0.00	0.00	2.15
TOTAL CREDITS	61.44	0.00	0.00	0.00	61.44

WETLAND DEBITS

Permit Date	COE Permit Number	Project Name	NDOT Control Number	NDOT Project Number	Impacted Acres	Impacted Cowardin Class	Impacted NE Sub-Class[5]	In Bank Service Area?	Future Project to be Debited?	Debit Ratio[4]	Credit Cowardin Class	Credit NE Sub-Class[5]	Total Debits	Notes