# MONTANA DEPARTMENT OF TRANSPORTATION
# WETLAND MITIGATION MONITORING REPORT: YEAR 2016

## KINDSFATER MITIGATION SITE
## YELLOWSTONE COUNTY, MONTANA



*Prepared for:*

MONTANA MDT DEPARTMENT OF TRANSPORTATION

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Helena, Montana 59620

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December 2016

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## KINDSFATER
## YELLOWSTONE COUNTY, MONTANA
### INITIAL CONSTRUCTION: 2012

MDT Project Number STPX-0056 (56)
Control Number 5034

USACE: NWO-2007-00824-MTB

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Cover: View looking southwest at wetland Cell 13.

# 1.0 INTRODUCTION

The Kindsfater 2016 Wetland Mitigation Monitoring Report presents the results of the fourth year of post construction monitoring at the Kindsfater mitigation area. This Montana Department of Transportation (MDT) wetland mitigation project is located in the northwest quarter of Section 6, Township 2 South, Range 25 East, Yellowstone County, Montana. This MDT-owned property is located approximately 3 miles northeast of Laurel, Montana, and is adjacent to 72nd Street West and Laurel Airport Road, as illustrated in Figure 1-1. The site is intended to provide 43.8 acres of wetland mitigation credits to assist MDT in meeting compensatory mitigation requirements for proposed construction projects in Watershed #13 – Upper Yellowstone. The US Army Corps of Engineers (USACE) permit number NWO-2007-00824-MTB approved the Kindsfater project and proposed crediting that was presented in the August 2012 Kindsfater wetland mitigation plan [MDT and Morrison-Maierle, Inc., 2015]. The objectives of this project included creating, restoring, enhancing, and preserving wetland habitat within the historic Kindsfater gravel pit.

The Kindsfater site was previously a gravel mining operation that ended mining in 1987. The mining excavations exposed groundwater throughout the site. The historic gravel pit eventually evolved into a wetland complex that included emergent, scrub/shrub, and forested wetland habitats. The site was identified in 2002 as a potential wetland restoration site and evaluated by Carter Burgess, Inc. (CB) to determine the practicality of developing wetland mitigation credits. A wetland delineation conducted by CB in 2002 identified 47.6 acres within the site. In 2006, Morrison-Maierle, Inc. (MMI) delineated wetlands within the site and identified 32.9 acres of emergent, scrub/shrub, and forested wetlands. In 2012, MMI re-delineated the site to verify the wetland acreage and identified a total of 25.9 acres of wetlands on the site. Based on these findings, approximately 22 acres of wetland habitat was converted to upland between 2002 and 2012.

The project was designed for two phases of development: the Base Project and Alternative Option. The Base Project would involve creating, restoring, enhancing, and preserving wetlands within the western half of the site. The Alternative Option would include excavating and removing gravel materials and constructing new wetlands within the eastern half of the site. Credits to be developed from both phases would total 43.8 credit acres under full build-out. The following section provides the amount of wetland credits that are estimated for each phase as presented in the mitigation plan.

*Base Project:*

- Create (establishment) two emergent wetland areas (Cells 7 and 9) that total 1.8 acres (1:1 mitigation ratio)
- Restore (rehabilitation) former wetland areas within the site (Cells 1–6 and a portion of Cell 8) with tree/shrub plantings that total 14.0 acres (1:1 mitigation ratio)
- Restore (reestablishment) several depressional emergent wetland areas (adjacent to Cells 1–12) that total 9.2 acres (1.5:1 mitigation ratio)
- Enhance 3.1 acres (3:1 mitigation ratio) of existing palustrine, emergent, scrub/shrub, and forested wetland (Cells 10–12 and a portion of Cell 8)

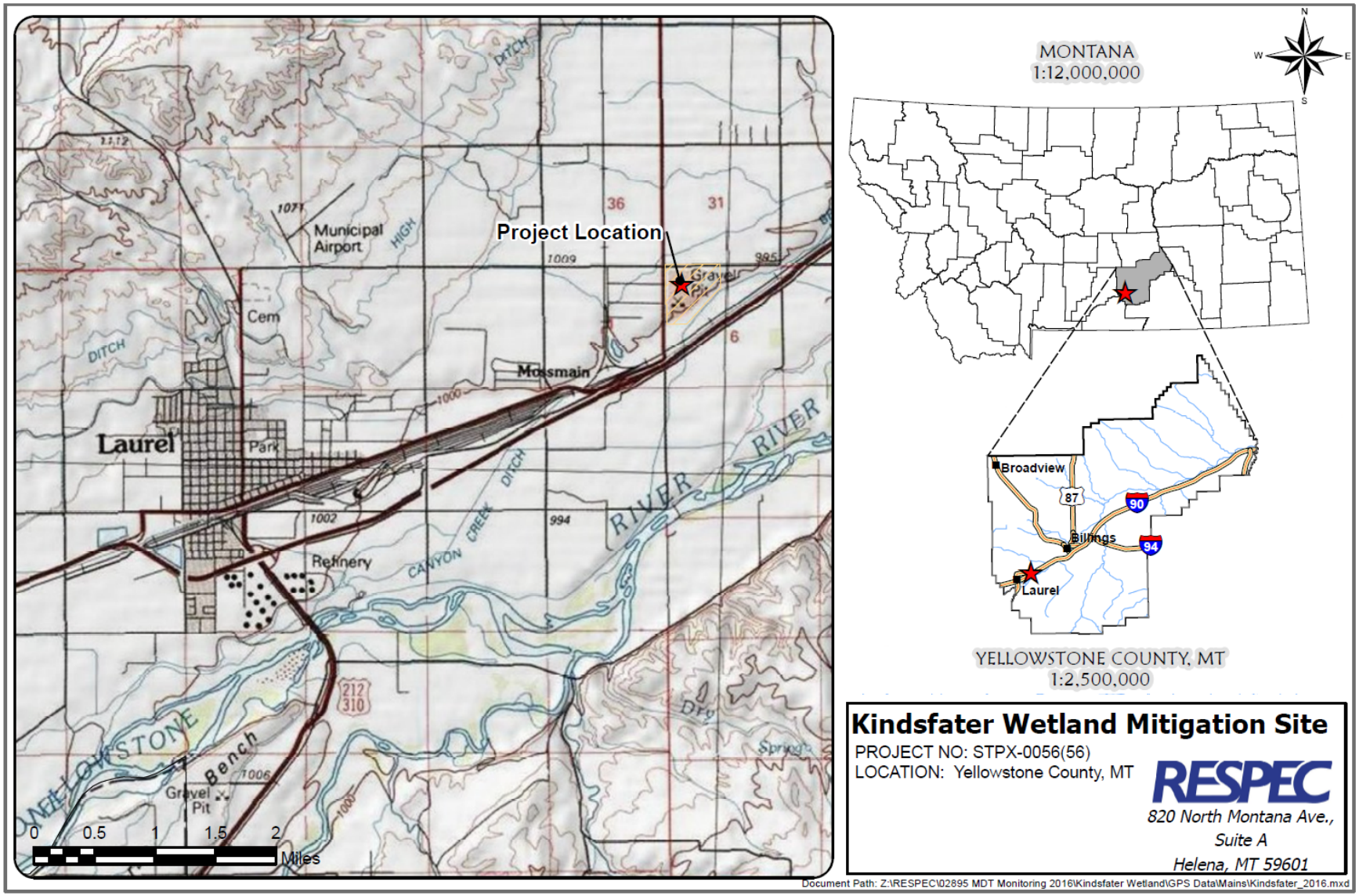



**Figure 1-1.** Project Location of the Kindsfater Site.

- Preserve 21.9 acres (4:1 mitigation ratio) of existing palustrine emergent, scrub/shrub, and forested wetlands
- Designate a 50-foot-wide upland buffer around the mitigation area that totals 4.3 acres (5:1 mitigation ratio)
- Mitigate temporary impacts during establishment of wetland Cells 10–12 and a portion of Cell 8, which totals 3.6 acres (0:1 mitigation ratio).

*Alternative Option:*

- Create two lacustrine emergent wetland cells that total 2.8 acres (1:1 mitigation ratio)
- Create palustrine emergent and scrub/shrub wetlands that total 11.1 acres (1:1 mitigation ratio)
- Designate a 50-foot-wide upland buffer around the perimeter of the excavated area that will total 3.0 acres (5:1 mitigation ratio).

Table 1-1 provides a breakdown of the compensatory credits by bid phase and mitigation type and includes a brief description of each credit type, approved mitigation ratios, and anticipated mitigation credits, assuming the site develops to full potential. A total of 29.3 mitigation credits may be generated after the base bid phase in the western half of the site is complete. The additional Alternative Bid phase in the eastern half of the site would result in 14.5 mitigation credits as designed. A maximum 43.8 mitigation credits would be anticipated at the Kindsfater site after both phases are complete.

The project was constructed during fall/winter 2012 and consisted of excavating a series of 14 cells that range in size from 0.24 to 1.39 acres. Each cell was designed to expose the shallow groundwater table for limited portions of the year. Wetland Cells 1–12 were constructed under the base bid phase. Wetland Cells 13 and 14 were completed as part of the Alternative Bid phase; however, the 11.1 acres of created wetlands within the gravel mining area were not completed as planned. Because of the steepness of the slopes from the gravel excavation, the contractor and MDT construction project manager decided to lessen the slopes so that people could still access the Kindsfater site from a gravel parking area along Laurel Airport Road. The area around the excavated cells was not constructed to the bottom elevation of the preexisting wetland areas. Because of this design change, the total wetland credits possible at this site has been reduced from 43.8 acres (as described above) to 32.7 acres.

The site consists of an upper terrace with a slope that descends into a lower terrace that is adjacent to the Billings Bench Water Canal (BBWC). The project was designed to intercept shallow, unconfined groundwater flow through the project area to provide the hydrology that was required to sustain the wetland and open-water areas. Revegetating desirable species included a combination of plantings and cuttings (*Salix* spp.); seeding with wetland plant species; and natural recruitment of existing shrubs, trees, and emergent plants. Woody plantings that were identified in the mitigation plan included locally collected willow cuttings, red osier (*Cornus alba*), cottonwoods (*Populus* spp.), choke cherry (*Prunus virginiana*), black hawthorn (*Crataegus douglasii*), silver buffalo-berry (*Shepherdia argentea*), Woods' rose (*Rosa woodsii*), and Rocky Mountain juniper (*Juniperus scopulorum*). The wetland seed mix included beaked spike-rush (*Eleocharis rostellata*), Baltic rush (*Juncus balticus*), hard-stem club-rush (*Schoenoplectus acutus*), bluejoint (*Calamagrostis canadensis*), tufted hairgrass (*Deschampsia caespitosa*), fowl blue grass (*Poa palustris*), and slender wild rye (*Elymus trachycaulus*). The locations of the woody planting areas are shown in Figure A-2 (Appendix A). Several state-listed noxious weed

species have been documented across the Kindsfater site. Weed-control measures have been implemented under the guidelines of the Yellowstone County noxious weed plan.

**Table 1-1. Wetland Credit Determination for the Kindsfater Site**

| Compensatory Mitigation Type | Mitigation Area Description | Proposed Wetland Type (Cowardin) | Mitigation Surface Area (Acres) | USACE-Approved Mitigation Ratios | Anticipated Mitigation Credit (Acres) |
|---|---|---|---|---|---|
| **Base Bid Credits** | | | | | |
| Creation (Establishment) | Wetland Cells 7 and 9 | Lacustrine emergent | 1.8 | 1:1 | 1.8 |
| Restoration (Reestablishment) | Wetland Cells 1–6 and parts of Cell 8 | Lacustrine emergent and Palustrine emergent, scrub/shrub | 14.0 | 1:1 | 14.0 |
| Restoration (Rehabilitation) | Areas adjacent to Wetland Cells 1–12 | Palustrine emergent, scrub/shrub | 9.2 | 1.5:1 | 6.1 |
| Enhancement | Wetland Cells 10–12 and parts of Cell 8 | Palustrine emergent, scrub/shrub | 3.1 | 3:1 | 1.0 |
| Preservation | Existing wetland areas | Palustrine emergent, scrub/shrub | 21.9 | 4:1 | 5.5 |
| Upland Buffer | 50-foot wide upland perimeter | N/A | 4.3 | 5:1 | 0.9 |
| Temporary Impacts | Wetland Cells 10–12 and parts of Cell 8 | N/A | 3.6 | 0:1 | 0.0[(a)] |
| **Subtotal Mitigation Credit** | | | | | **29.3** |
| **Alternative Bid Credits** | | | | | |
| Creation (Establishment) | Gravel mining area | Palustrine emergent, scrub/shrub | -11.1[(b)] | 1:1 | -11.1 |
| Creation (Establishment) | Wetland Cells 13 and 14 | Lacustrine emergent | 2.8 | 1:1 | 2.8 |
| Upland Buffer | 50-foot-wide upland perimeter | N/A | 2.3 | 5:1 | 0.5 |
| **Subtotal Mitigation Credit** | | | | | **3.3** |

(a) Temporary impacts will result from construction activities in proposed enhancement areas for Wetland Cells 10, 11, and 12 and parts of Cell 8.

(b) 11.1 acres of creation wetlands in Alternative Bid Credits (gravel mining area) were not constructed as planned; therefore, the anticipated credits for this gravel mining area have been subtracted to indicate this reduction in credits. Additionally, upland buffer credits have been reduced to include a 50-foot-wide perimeter around only wetland Cells 13 and 14.

The USACE-approved performance standards for the Kindsfater wetland mitigation site are listed below.

1. **Wetland Characteristics** for all of the restored, created, enhanced, and preserved wetlands within the project limits will meet the three parameter criteria for hydrology, vegetation, and soils established for determining wetland areas as outlined in the 1987 *Corps of Engineers Wetland Delineation Manual* (1987 Wetland Manual) [Environmental Laboratory, 1987] and the 2010 *Regional Supplement to the Corps of Engineers Manual: Great Plains Region (Version 2.0)* (2010 Regional Supplement) [USACE, 2010]. These methodologies were used to establish baseline wetland conditions on site.
    a. **Wetland Hydrology Success** will be achieved where wetland hydrology is present as per the technical guidelines in the 1987 Wetland Manual and the 2010 Regional Supplement. Wetland hydrology will be confirmed through the periodic observations of surface water across the site and saturated soil conditions during the annual mid-season monitoring event. Soil saturation will be present for at least 12.5 percent of the growing season.
    b. **Hydric Soil Success** will be achieved where hydric soil conditions are present (per the most recent Natural Resource Conservation Service [NRCS] definitions for hydric soil) or appear to be forming, the soil is sufficiently stable to prevent erosion, and the soil is able to support plant cover. Soil sampling will be conducted during the course of the monitoring period to determine if wetland areas are exhibiting characteristics of hydric soils per the 1987 Wetland Manual. Because typical hydric soil indicators may require long periods to form, a lack of distinctive hydric soil features will not be considered a failure if hydrologic and vegetation success is achieved.
    c. **Hydrophytic Vegetation Success** will be achieved by delineating the developing wetlands by using the technical guidelines established in the 1987 Wetland Manual and the 2010 Regional Supplement. Noxious weeds do not exceed 5 percent cover. The following concept of "dominance," as defined in the 1987 Wetland Manual, will be applied during future routine wetland determinations in created/restored wetlands: "*Subjectively determine the dominant species by estimating those having the largest relative basal area (woody overstory), greatest height (woody understory), greatest percentage of aerial cover (herbaceous understory), and/or greatest number of stems (woody vines)"* [Environmental Laboratory, 1987]. Additionally, as per guidance from the USACE, hydrophytic vegetation success will include achieving a minimum overall vegetation cover of 80 percent in created wetland areas within 5 years after site construction.
        i. **Woody Plants –** Plantings will be considered successful where they exceed 50 percent survival after 5 years. Natural colonization of woody plant species from nearby sources is anticipated after construction activities are complete. The rate and extent of natural woody plant colonization will depend on factors such as planting locations, habitat availability, animal activity, seed sources, and other natural selection factors.
        ii. **Herbaceous Plants –** At the conclusion of the monitoring period, ocular coverage of desirable hydrophytic vegetation (wetland plants listed as OBL, FACW, and FAC) will be at least 80 percent.

2. **Open-Water Areas:** The intent of the project is to provide seasonal open water in the wetland enhancement areas where excavation in the existing wetland will be completed and in the gravel removal area where wetland will be created. Open water that is established within the designated wetland cells will be considered successful and creditable.
3. **Upland Buffer:** Success will be achieved when noxious weeds do not exceed 5 percent cover within the buffer areas on site. Any area within the creditable buffer area that is disturbed by project construction must have at least 50 percent aerial cover of non-noxious weed species by the end of the monitoring period.
4. **Weed Control:** Implementing weed control will be based on annual monitoring of the site to determine weed species and the degree of infestation within the site. Control measures based upon the monitoring results will be implemented by MDT to minimize and/or eliminate the intrusion of state-listed noxious weed species within the site. Success will be achieved where less than 5 percent absolute cover of noxious weed species occurs across the site.
5. **Fencing** has been installed along the easement boundaries to protect the integrity of the wetland from disturbance that may be detrimental to the site. Fencing installed along the perimeter of the site has been designed to be wildlife-friendly to allow for wildlife movement into and out of the wetland complex.
6. **Monitoring** this MDT mitigation site will be based on the MDT standard monitoring protocols used for all of the MDT wetland mitigation sites for a minimum period of 5 years or longer as determined by the USACE Montana Regulatory Office's review of annual monitoring reports for the site and whether or not the site has met the wetland success criteria. The site will be monitored annually beginning with the first full growing season following construction.

Figures A-2 and A-3 (Appendix A) of this report show the site monitoring activity locations and mapped site features, respectively. The MDT Wetland Mitigation Site Monitoring form, USACE Wetland Determination Data forms [USACE, 2010], and the 2008 MDT Montana Wetland Assessment Method (MWAM) forms [Berglund and McEldowney, 2008] are included in Appendix B. Project area photographs are included in Appendix C, and the MDT plan sheets for the Kindsfater wetland mitigation complex are located in Appendix D.

# 2.0 METHODS

The 2016 monitoring event was completed on June 20, 2016. Information for the Wetland Mitigation Site Monitoring form and Wetland Determination Data forms was recorded in the field during the site investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) and are illustrated on Figure A-2 (Appendix A). Data-collection activities included a wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data collection, bird- and wildlife-use documentation, photographic documentation, functional assessment, and a nonengineering examination of the infrastructure established within the mitigation project area.

## 2.1 HYDROLOGY

The presence of hydrological indicators as outlined on the Wetland Determination Data forms was assessed at eight data points established within the project area. The hydrologic indicators were evaluated according to features observed in situ during the site visit. The data were recorded on the Wetland Determination Data forms (Appendix B). Hydrologic assessments allow evaluation of mitigation goals that address inundation and saturation requirements.

Technical criteria for wetland hydrology guidelines have been established as “permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season) during the growing season” [USACE, 2010]. Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered jurisdictional wetlands. The growing season is defined for purposes of this report as the number of days when a 50 percent probability exists that the minimum daily temperature is greater than or equal to 28.5 degrees Fahrenheit [Environmental Laboratory, 1987]. Temperature data recorded for the meteorological station at the Billings Logan International Airport, Montana (240807), which is located approximately 10 miles northeast of the Kindsfater wetland mitigation site, have a median (5 years in 10) growing season length of 156 days. Areas that are defined as wetlands would require 19.5 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18–20 inches of the ground surface. The data were recorded on the Wetland Determination Data forms (Appendix B).

## 2.2 VEGETATION

The boundaries of general dominant-species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2016 aerial photographs. The percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (< 1 percent), 1 (1–5 percent), 2 (6–10 percent), 3 (11–20 percent), 4 (21–50 percent), and 5 (> 50 percent) (Appendix B). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure A-3, Appendix A).

Temporal changes in vegetation were evaluated through annual assessments of static belt transects that are established in August 2013 (Figure A-2, Appendix A). Vegetation composition was assessed and recorded along three vegetation belt transects (T-1, T-2, and T-3) that are approximately 10 feet wide and 300, 388, and 292 feet long, respectively (Figure A-2, Appendix A). The transect endpoints were recorded with a resource-grade GPS unit.

Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species within the belt transect was estimated using the same values and cover ranges that were used for the vegetation community polygon data (Appendix B). Photographs were taken at the transect endpoints during the monitoring event (Appendix C).

The *Montana Noxious Weed List* (July 2015) was prepared by the Montana Department of Agriculture [2015] and used to categorize weeds identified within the site. The location of noxious weeds was noted in the field during the investigation and mapped on the 2016 aerial photos (Figures A-3, Appendix A). The noxious weed species that were identified are color-coded. The locations are denoted with the symbol "**x**", "▲", or "■," which represent 0.0–0.1 acre, 0.1–1.0 acre, or greater than 1.0 acre in extent, respectively. The letters T, L, M, and H represent the cover classes and stand for less than 1 percent, 1–5 percent, 6–25 percent, and 26–100 percent, respectively.

## 2.3 SOIL

Soil information was obtained from the *Web Soil Survey for Yellowstone County, Montana* [USDA, 2015] and in situ soil descriptions. Soil cores were excavated by using a Montana sharpshooter shovel and evaluated according to procedures outlined in the 1987 Wetland Manual and the 2010 Regional Supplement. A description of the soil profile, including hydric soil indicators when present, was recorded on the Wetland Determination Data form for each profile (Appendix B).

## 2.4 WETLAND DELINEATION

Waters of the US, including special aquatic sites and jurisdictional wetlands, were delineated throughout the project area in accordance with criteria established in the 1987 Wetland Manual and the 2010 Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology described in the 2010 Regional Supplement must be satisfied to delineate a representative area as jurisdictional. The name and indicator status of plant species was derived from the 2016 national wetland plant list (NWPL) [Lichvar et al., 2016]. A routine level-2 on-site determination method [Environmental Laboratory, 1987] was used to delineate jurisdictional areas within the project boundaries. The information was recorded onto Wetland Determination Data forms (Appendix B).

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross-referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was classified as an atypical situation, potential problem area, or special aquatic site (i.e., mudflat). The wetland boundary was surveyed and identified on the 2016 aerial photographs. Wetland areas were estimated using GIS methods.

## 2.5 WILDLIFE

Observations and other positive indicators of use by mammal, reptile, amphibian, and bird species were recorded on the Wetland Mitigation Site Monitoring forms during each of the site visits. Indirect-use indicators, including tracks, scat, burrows, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods,

such as snap traps, live traps, and pitfall traps, were not used. A comprehensive list of wildlife species observed on the sites each year is compiled and updated annually in each report.

### 2.6 FUNCTIONAL ASSESSMENT

The MDT MWAM [Berglund and McEldowney, 2008] was used to evaluate functions and values on the sites. This method provides an objective means of assigning wetlands an overall rating and provides regulators with a means of assessing mitigation success based on wetland functions. Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and relate to ecological significance without regard to subjective human values [Berglund and McEldowney, 2008]. Field data for this assessment were collected during the site visit. MWAM forms were completed for two separate assessment areas (AAs) within the mitigation site (Appendix B).

### 2.7 PHOTOGRAPHIC DOCUMENTATION

Monitoring at photo points provided supplemental information that documented wetland, upland, and transect conditions; site trends; and current land uses that surround the site. Photographs were taken at established photo points throughout the mitigation site during the site visit (Appendix C). Photo-point locations were recorded with a resource-grade GPS unit (Figure A-2, Appendix A).

### 2.8 GLOBAL POSITIONING SYSTEM DATA

Site features and survey points were collected using a resource-grade (± 1 meter) Trimble R1 GNSS GPS receiver and companion Android tablet during the 2016 monitoring season. The collected data were then transferred to a personal computer, imported into GIS, and projected in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with GPS included wetland boundaries, fence boundaries, photographic points, transect endpoints, noxious weed infestations, and wetland data points.

### 2.9 MAINTENANCE NEEDS

Channels, engineered structures, fencing, and other man-made features were examined during the site visit for obvious signs of breaching, damage, or other problems. This examination was cursory and did not constitute an engineering-level structural inspection.

## 3.0 RESULTS

### 3.1 HYDROLOGY

Climate data from the meteorological station at Laurel, Montana (244894) [Western Regional Climate Center, 2016], which is located approximately 3 miles southwest of the site, recorded an average annual precipitation rate of 14.3 inches from September 1951 to October 1993. Data collection at this station was discontinued after 1994. The weather station at the Billings Logan International Airport, Montana (240807), which is located approximately 10 miles northeast of the site, recorded an average annual precipitation rate of 14.14 inches from August 1934 through August 2016. The Billings International Airport site was updated daily and accessed on August 30, 2016, to obtain recent

precipitation data. No measurable precipitation was recorded for the month of August from this station. The values used in this report were extracted from the most recent data available. The historic precipitation average from January through August was 9.4 inches. Annual precipitation in recent years for the same time (January through August) was 11.9 inches (2010), 15.9 inches (2011), 4.8 inches (2012), 8.0 inches (2013), 9.9 inches (2014), 8.9 inches (2015), and 6.1 inches (2016). Comparing the historic average with the annual precipitation the data indicates that 2012, 2013, 2015, and 2016 were below the long-term average for precipitation, and 2010, 2011, and 2014 were above average.

The wetland area decreased by approximately 22 acres between 2002 and 2016 with an upward trend in precipitation, as shown in Chart 3-1. The site history suggests that direct precipitation may not affect this site's wetland development from year to year. However, mid- to long-term drought may affect recharge of groundwater, which appears to be the primary hydrologic driver on this site.

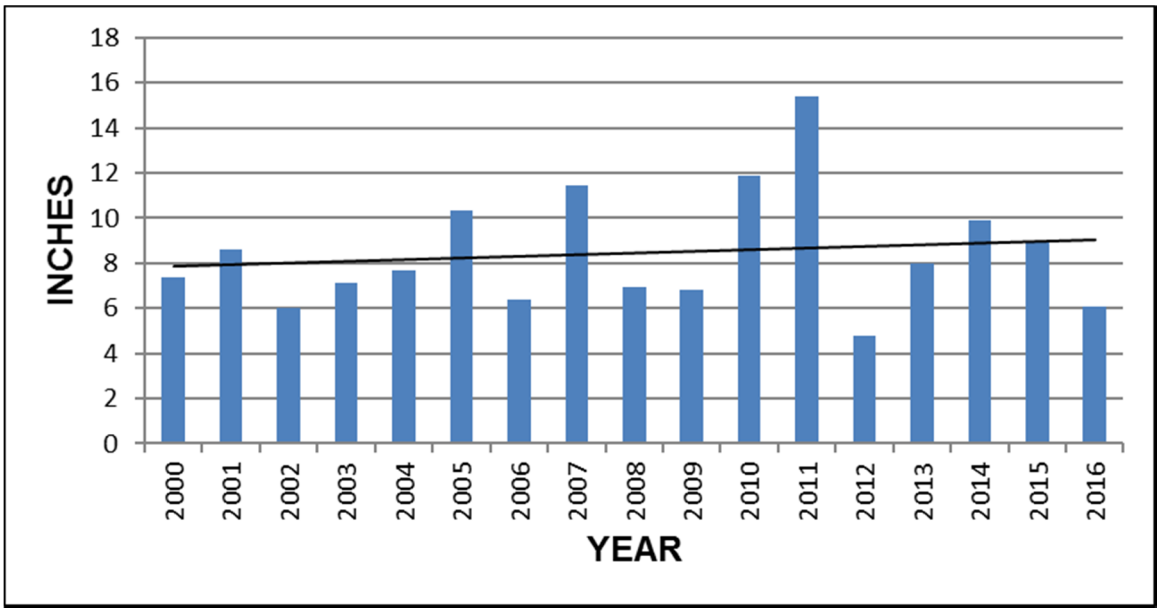



**Chart 3-1.** Average Yearly Precipitation Totals From 2000 Through 2016 at Station 240807.

Reductions in the areal extent of wetlands before the mitigation plan was implemented could be caused by several factors, including less flood irrigation on fields west and north of the site, reduced recharge of groundwater because of persistent drought conditions, increased withdrawal of groundwater for domestic usage from the underlying aquifer, and ongoing dewatering activities associated with the Fisher-Mobley gravel operation directly north of the site. Decreased flood irrigation will likely affect the long-term supply of water that enters the Kindsfater site on a permanent basis. Although the trend in precipitation at this site over the last 15 years has been positive, this trend represents the climb out of statewide drought conditions; precipitation for most years during that period remained well below the long-term average, which likely reduced groundwater recharge. The dewatering associated with the adjacent active gravel operation and resultant cone of depression has likely compounded this effect and further reduced the site's hydrology. Groundwater data from monitoring wells on and surrounding the project area show a decline in groundwater elevations over

the period of record, as shown in Chart 3-2, which supports the idea that below-average precipitation and pumping may be negatively affecting recharge and suppressing groundwater levels. These negative effects ultimately reduced the opportunity for wetland development on this site.

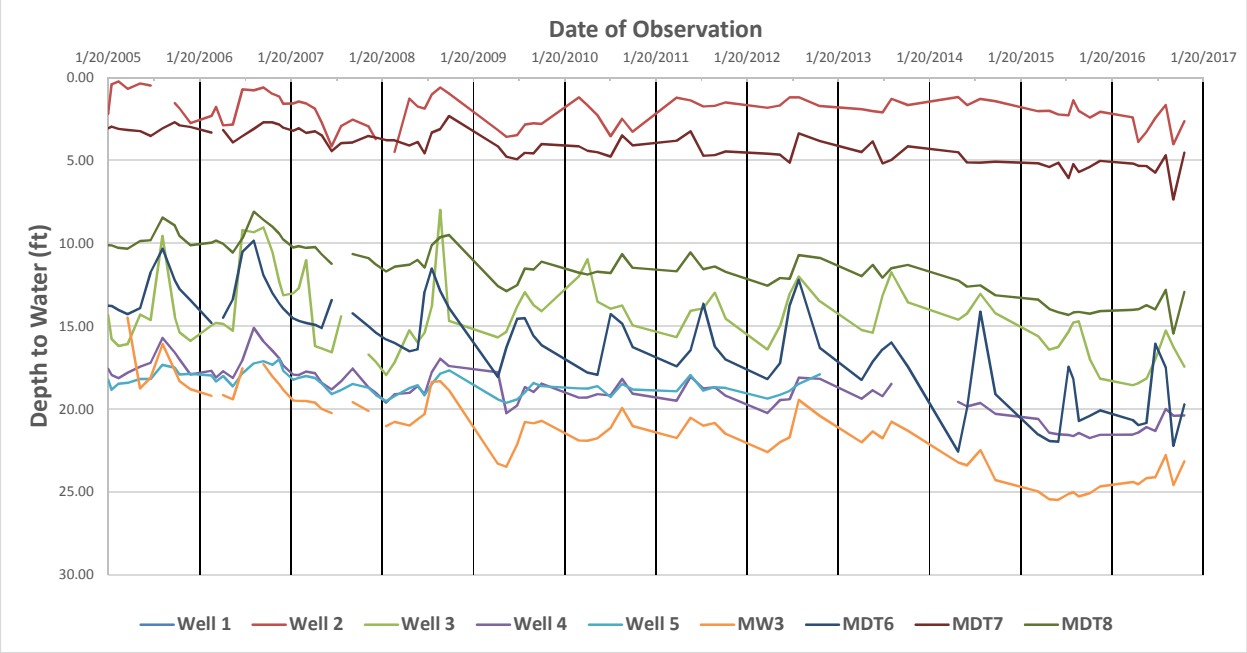



**Chart 3-2.** Groundwater Levels in Monitoring Wells Local to the Kindsfater Site.

Given the current recovery from the drought conditions of the early 2000s, the groundwater table may be expected to increase after the gravel mining is terminated, unless that operation permanently alters the nature of the aquifer. Closing the Fisher Sand & Gravel pit to the north of the site, beginning in 2016, is expected to lead to an increase in groundwater levels because the pit will no longer be dewatered for excavation activities. MDT will continue to have the US Geological Survey (USGS) monitor groundwater wells in the project vicinity to document groundwater levels moving forward. Negative changes in groundwater levels could occur if mining activities remove or increase the permeability of the aquifer's confining layers, such as the underlying Colorado shale.

Eight data points were sampled to determine the wetland/upland boundaries. DP-1W, DP-3W, and DP-4W are located in areas that met the wetland criteria. Wetland hydrology indicators at DP-1W and DP-4W included saturation on aerial imagery and drainage patterns. DP-3W exhibited a positive FAC-neutral test, geomorphic position, saturation on aerial imagery, and drainage patterns. No primary or secondary indicators of wetland hydrology were observed at DP-1U, DP-2U, DP-2U (formerly K-2W), DP-3U, or DP-4U, which are located in upland areas that did not meet the wetland criteria.

During the June 2016 monitoring, many areas defined as wetlands across the site were not inundated but were saturated or exhibited signs of periodic saturation within 12 inches (1 foot) of the ground. Constructed Cells 3, 6, 7, 9, 13, and 14 represented isolated wetland depressions surrounded by upland habitat. The remaining constructed cells were situated within a contiguous wetland mosaic with frequent surface drainages between cells. Shallow groundwater flows through the cells that were constructed along the upper terrace then discharges into the natural slope wetlands to recharge the depressional wetlands along the lower terrace.

## 3.2 VEGETATION

Monitoring year 2016 marked the fourth year of monitoring at the Kindsfater site. A total of 11 new plants were noted in 2016 for a total of 96 plant species site-wide from 2013 through 2016. These species are listed in Table 3-1. Vegetation plant communities were identified by plant composition, species dominance, and the results of the wetland delineation. The community composition is provided on the Wetland Mitigation Site Monitoring form (Appendix B), and the community boundaries are shown on Figure A-3 (Appendix A).

Ten vegetation community types were identified in 2016 including three upland communities and seven wetland communities.

- Wetland Type 2 – *Eleocharis palustris*/*Bromus* spp.
- Wetland Type 3 – *Alopecurus pratensis*/*Poa palustris*
- Wetland Type 5 – *Typha latifolia*
- Wetland Type 8 – *Populus deltoides*
- Wetland Type 9 – *Salix exigua*
- Wetland Type 10 – *Poa palustris*
- Wetland Type 11 – *Phalaris arundinacea*
- Upland Type 4 – *Elaeagnus angustifolia*
- Upland Type 6 – *Elymus trachycaulus*/*Bromus* spp.
- Upland Type 7 – *Bromus tectorum*/*Agropyron cristatum*.

Wetland community Type 2 – *Eleocharis palustris/Bromus* spp. was mapped across 1.5 acres of the project area within two of the excavated wetland cells. This community was dominated by common spike-rush (*Eleocharis palustris*), field brome (*Bromus arvensis*), cheatgrass, and fowl bluegrass, with lesser cover provided by many other species. Changes in the vegetation across some areas that were mapped as Type 2 include the transition from common spike-rush to a dominance of eastern cottonwood (*Populus deltoides*) or field meadow-foxtail (*Alopecurus pratensis*). The 2016 acreage for Type 2 is a 7.5-acre decrease compared to 2015 (9.0 acres), which is likely a result of decreased regional precipitation rates and lower site-wide saturation and inundation levels compared to what was observed in previous years.

Wetland community Type 3 – *Alopecurus pratensis*/*Poa palustris* was identified across 18.3 acres of preexisting wetland that remained relatively undisturbed during the 2012 construction and replaced community Type 2 in one restored wetland cell located near the western project boundary. The majority of this community type was located on the upper and lower terraces along the eastern boundary and included the slope wetlands between the terraces. Field meadow-foxtail and fowl bluegrass dominated the community. Other species identified in this community included western-wheatgrass (*Pascopyrum smithii*), cheatgrass, Northwest Territory sedge (*Carex utriculata*), Nebraska sedge (*Carex nebrascensis*), creeping wild rye (*Elymus repens*), annual rabbit's-foot grass (*Polypogon monspeliensis*), dock-leaf smartweed (*Persicaria lapathifolia*), eastern cottonwood root suckers, field sow-thistle (*Sonchus arvensis*), and many additional species in trace amounts. Bare ground was estimated between 1 and 5 percent of total cover.

**Table 3-1. Vegetation Species Observed From 2013 Through 2016 at the Kindsfater Site (Page 1 of 3)**

| Scientific Names | Common Names | GP Indicator Status[(a)] |
|---|---|---|
| *Agropyron cristatum* | Crested Wheatgrass | NL |
| *Alopecurus pratensis* | Field Meadow-Foxtail | FACW |
| *Amaranthus retroflexus* | Red-Root | FACU |
| ***Artemisia dracunculus*** | **Tarragon** | **NL** |
| *Artemisia frigida* | Fringed Sage | NL |
| *Asclepias speciosa* | Showy Milkweed | FAC |
| *Atriplex suckleyi* | Suckley's Saltbush | NL |
| *Bassia scoparia (Kochia scoparia)* | Mexican-Fireweed | FACU |
| *Brassica nigra* | Black Mustard | NL |
| *Bromus arvensis* | Field Brome | FACU |
| *Bromus inermis* | Smooth Brome | UPL |
| *Bromus tectorum* | Cheatgrass | NL |
| *Calamagrostis canadensis* | Bluejoint | FACW |
| *Carex nebrascensis* | Nebraska Sedge | OBL |
| *Carex utriculata* | Northwest Territory Sedge | OBL |
| *Chenopodium album* | Lamb's-Quarters | FACU |
| *Chenopodium* sp. | Goosefoot | NL |
| *Cirsium arvense* | Canadian Thistle | FACU |
| *Cirsium vulgare* | Bull Thistle | UPL |
| *Conium maculatum* | Poison-Hemlock | FACW |
| *Convolvulus arvensis* | Field Bindweed | NL |
| *Cornus alba* | Red Osier | FACW |
| *Cynoglossum officinale* | Gypsy-Flower | FACU |
| ***Dactylis glomerata*** | **Orchard Grass** | **FACU** |
| *Deschampsia caespitosa* | Tufted Hair Grass | FACW |
| *Descurainia sophia* | Herb Sophia | NL |
| *Elaeagnus angustifolia* | Russian Olive | FACU |
| *Elaeagnus commutata* | American Silverberry | UPL |
| *Eleocharis palustris* | Common Spike-Rush | OBL |
| *Elymus repens* | Creeping Wild Rye | FACU |
| *Elymus trachycaulus* | Slender Wild Rye | FACU |
| *Epilobium ciliatum* | Fringed Willowherb | FACW |
| *Equisetum hyemale* | Tall Scouring-Rush | FACW |
| *Erigeron caespitosus* | Caespitose Fleabane | NL |
| *Erodium cicutarium* | Stork's bill | NL |
| *Euphorbia esula* | Leafy Spurge | NL |
| *Glycyrrhiza lepidota* | American Licorice | FACU |
| *Hesperostipa comata* | Needle-and-Thread | NL |
| *Heterotheca villosa* | Hairy Goldenaster | NL |

**Table 3-1. Vegetation Species Observed From 2013 Through 2016 at the Kindsfater Site (Page 2 of 3)**

| Scientific Names | Common Names | GP Indicator Status[(a)] |
|---|---|---|
| *Hordeum jubatum* | Fox-Tail Barley | FACW |
| *Hyoscyamus niger* | Black Henbane | NL |
| *Juncus articulatus* | Joint-Leaf Rush | OBL |
| *Juncus balticus* | Baltic Rush | FACW |
| *Juncus ensifolius* | Dagger-Leaf Rush | FACW |
| *Juncus torreyi* | Torrey's Rush | FACW |
| *Juniperus scopulorum* | Rocky Mountain Juniper | NL |
| *Lactuca serriola* | Prickly Lettuce | FAC |
| *Lemna minor* | Common Duckweed | OBL |
| ***Lepidium campestre*** | **Field Pepperweed** | **NL** |
| *Logfia arvensis* | Field Fluffweed | NL |
| *Lycopus asper* | Rough Water-Horehound | OBL |
| ***Marrubium vulgare*** | **White Horehound** | **FACU** |
| *Medicago lupulina* | Black Medick | FACU |
| *Medicago sativa* | Alfalfa | UPL |
| *Melilotus albus* | White Sweet Clover | FACU |
| *Melilotus officinalis* | Yellow Sweet Clover | FACU |
| *Mentha arvensis* | American Wild Mint | FACW |
| ***Muhlenbergia asperifolia*** | **Alkali Muhly** | **FACW** |
| ***Nassella viridula*** | **Green Needlegrass** | **NL** |
| ***Nepeta cataria*** | **Catnip** | **FACU** |
| *Opuntia fragilis* | Brittle Pricklypear | NL |
| *Panicum capillare* | Common Panic Grass | FAC |
| *Pascopyrum smithii* | Western-Wheat Grass | FACU |
| *Persicaria lapathifolia* | Dock-Leaf Smartweed | OBL |
| *Phalaris arundinacea* | Reed Canary Grass | FACW |
| *Poa palustris* | Fowl Blue Grass | FACW |
| *Poa pratensis* | Kentucky Blue Grass | FACU |
| *Polypogon monspeliensis* | Annual Rabbit's-Foot Grass | FACW |
| *Populus angustifolia* | Narrow-Leaf Cottonwood | FACW |
| *Populus deltoides* | Eastern Cottonwood | FAC |
| ***Potentilla pensylvanica*** | **Pennsylvania Cinquefoil** | **FACU** |
| *Rumex crispus* | Curly Dock | FAC |
| *Salix exigua* | Narrow-Leaf Willow | FACW |
| *Salix lutea (S. eriocephala)* | Yellow Willow | FACW |
| *Salix* sp. | Willow | NL |
| *Salsola tragus* | Prickly Russian-Thistle | FACU |
| *Schedonorus pratensis* | False Meadow Rye | FACU |

**Table 3-1. Vegetation Species Observed From 2013 Through 2016 at the Kindsfater Site (Page 3 of 3)**

| Scientific Names | Common Names | GP Indicator Status[(a)] |
|---|---|---|
| *Schoenoplectus acutus* | Hard-Stem Club-Rush | OBL |
| *Schoenoplectus pungens* | Three-Square | OBL |
| *Scirpus microcarpus* | Red-Tinge Bulrush | OBL |
| *Sisymbrium altissimum* | Tall Hedge-Mustard | FACU |
| ***Sisymbrium loeselii*** | **Small Tumbleweed Mustard** | **NL** |
| *Solanum dulcamara* | Climbing Nightshade | FACU |
| *Solidago canadensis* | Canadian Goldenrod | FACU |
| *Sonchus arvensis* | Field Sow-Thistle | FAC |
| ***Tanacetum vulgare*** | **Common Tansy** | **FACU** |
| *Taraxacum officinale* | Common Dandelion | FACU |
| *Thlaspi arvense* | Field Pennycress | FACU |
| *Tragopogon dubius* | Meadow Goat's-beard | NL |
| *Typha angustifolia* | Narrow-Leaf Cattail | OBL |
| *Typha latifolia* | Broad-Leaf Cattail | OBL |
| *Verbascum thapsus* | Great Mullein | UPL |
| ***Verbena bracteata*** | **Carpet Vervain** | **FACU** |
| *Veronica peregrina* | Neckweed | FACW |
| *Vicia sativa* | Garden Vetch | FACU |
| *Xanthium strumarium* | Rough Cockleburr | FAC |

(a) 2016 NWPL [Lichvar et al., 2016].
New species that were identified in 2016 are **bolded.**

Upland community Type 4 – *Elaeagnus angustifolia* was a scrub/shrub and forested community identified on 24.7 acres and scattered throughout upland community Type 7 – *Bromus tectorum*/ *Argropyron cristatum*. Together, upland community Types 7 and 4 formed a mosaic across 61.8 acres of the site. Russian olive (*Elaeagnus angustifolia*), American silverberry (*Elaeagnus commutata*), eastern cottonwood, and narrow-leaf cottonwood (*Populus angustifolia*) were the dominant, mature woody species identified in this community.

Wetland community Type 5 – *Typha latifolia* characterized 9.6 acres of preexisting wetlands that were dominated by broad-leaf cattail (*Typha latifolia*). This community type was undisturbed during 2012 construction and was characterized by seasonal/intermittent to permanent/perennial wetland hydrology. Hard-stem club-rush, common spike-rush, Baltic rush, dock-leaf smartweed, horehound (*Marrubium vulgare*), annual rabbit's-foot grass, and climbing nightshade (*Solanum dulcamara*) were identified in this community.

Upland community Type 6 – *Elymus trachycaulus/Bromus* spp. was created in 2014 to characterize 19.0 acres along the dry slopes near the east boundary. After the 2015 field survey, *Bromus* spp. was added to the community type as percent cover by cheatgrass had increased to the same cover class as field brome. In 2016, this community type (19.4 acres) was encountered near the end of T-1 and

was mapped along the outer wetland boundary accordingly. Twelve species were identified within this community. Slender wild rye, field brome, cheatgrass, creeping wild rye, field bindweed (*Convolvulus arvensis*), and Canada thistle (*Cirsium arvense*) dominated the vegetation cover. This community was represented by primarily nonnative, drought-tolerant species that are commonly found in recently disturbed and/or degraded landscapes.

Upland community Type 7 – *Bromus tectorum*/*Agropyron cristatum* replaced community Type 1 – *Chenopodium* spp./*Bromus* spp. in 2016 because of the absence of *Chenopodium* species, a dominance of cheatgrass (*Bromus tectorum*), and a codominance of crested wheatgrass (*Agropyron cristatum*) across uplands that were disturbed by the 2012 construction. Additionally, one wetland cell transitioned from common spike-rush to a dominance of cheatgrass in 2016, which represented a 0.8-acre shift from community Type 2 – *Elocharis palustris/Bromus* spp. to Type 7 – *Bromus tectorum/Agropyron cristatum*. The total acreage for community Type 7 represents approximately 36.4 acres and surrounds stands of upland community Type 4 – *Elaeagnus angustifolia*. Together, Types 4 – *Elaeagnus angustifolia* and 7 characterize a total of 61.8 acres of uplands within the project area. Shifts in vegetation composition across cheatgrass-dominated landscape will likely depend on whether perennial species are present in the seed bank and, if so, a favorable response to average or above-average precipitation events. This community was represented by primarily nonnative species commonly found in recently disturbed and/or degraded landscapes; although, native species such as green needlegrass (*Stipa viridula*), fringed sage (*Artemisia frigida*), and brittle prickly pear (*Opuntia aragilis*) were noted across this community type.

Wetland community Type 8 – *Populus deltoides* was the dominant species in several wetland areas that replaced community Type 2 – *Eleocharis palustris/Bromus* spp. This vegetation shift was generally noted in rocky substrates within constructed wetland Cells 5, 8, 10, and 13 and part of 14. Wetland Cell 12 will likely transition to a dominance of cottonwood in the near future based on the number of eastern cottonwood root suckers noted across this cell during the 2016 survey. In addition to eastern cottonwood, narrow-leaf willow (*Salix exigua*), fowl bluegrass, common spike-rush, and three-square bulrush (*Schoenoplectus pungens*) were common species. Most of the soils within this community type were saturated to the surface but were not inundated, which may have been more favorable for the growth of woody species. This community type represents 3.4 acres across five wetland cells.

Wetland community Type 9 – *Salix exigua* replaced a small portion of community Type 2 – *Eleocharis palustris/Bromus* spp. in 2016 and represents approximately 0.6 acre of created scrub/shrub wetlands. Currently, narrow-leaf willows that are 5–6 feet tall occupy the northeastern border around wetland Cell 14, which is located near the eastern project boundary. This community type will likely increase with time because of the number of small narrow-leaf root suckers noted in other wetland cells.

Wetland community Type 10 – *Poa palustris* was mapped across 1.0 acre and replaced community Type 2 – *Eleocharis palustris/Bromus* spp. in three wetland cells that are located in the northwestern quarter of the project site. Soils were generally dry within these three constructed wetlands during the 2016 field survey. Fowl bluegrass exhibited a high cover value of 50 percent or greater with a variety of other species that represent lower values. Fowl bluegrass was included in the wetland seed mix

and has a facilitative wetland (FACW) NWPL rating, which, in some cells, has replaced obligate (OBL) species (e.g., common spike-rush) that require wetter soil conditions.

Wetland community Type 11 – *Phalaris arundinacea* characterized 0.2 acre of preexisting wetlands that were dominated by reed canary grass. These areas were undisturbed during the 2012 construction and represent a monoculture of reed canary grass with a small amount of creeping wild rye. Because of the dense, tall patches of this grass, establishment by other species is limited.

Vegetation cover was measured along three transects at the Kindsfater mitigation site in 2016 (Figure A-2, Appendix A). Baseline conditions were documented along the vegetation transects for the first time in 2013. The data recorded on T-1 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphical formats in Table 3-2 and Charts 3-3 and 3-4, respectively. T-1 began in upland Type 7 – *Bromus tectorum/Agropyron cristatum*, extended 300 feet across excavated Cell 14, intersected wetland Types 9 – *Salix exigua* and 8 – *Populus deltoides*, and ended in upland Type 6 – *Elymus trachycaulus/Bromus* spp. Changes in vegetation included the shift from community Type 2 – *Eleocharis palustris/Bromus* spp. to a dominance of eastern cottonwood and narrow-leaf willow. Wetland acreage remained consistent with 2013, 2014, and 2015 observations and composed approximately 40 percent of the transect during the 2016 survey. A total of 40 species were identified, including 14 hydrophytes and 26 upland species. Because of modifications to the wetland plan in this area and the distinct topographic breaks between upland and wetland habitat along this transect, minimal changes to the percent wetland/upland habitat are expected, although, community composition will likely shift with time.

**Table 3-2. Data Summary for T-1 From 2013 Through 2016 at the Kindsfater Site**

| Monitoring Year | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| **Transect Length (feet)** | **300** | **300** | **300** | **300** |
| Vegetation Community Transitions Along Transect | 4 | 4 | 4 | 4 |
| Vegetation Communities Along Transect | 2 | 2 | 2 | 4 |
| Hydrophytic Vegetation Communities Along Transect | 1 | 1 | 1 | 2 |
| Total Vegetative Species | 24 | 36 | 45 | 40 |
| Total Hydrophytic Species | 9 | 13 | 14 | 14 |
| Total Upland Species | 15 | 23 | 31 | 26 |
| Estimated % Total Vegetative Cover | 70 | 70 | 70 | 75 |
| Estimated % Unvegetated | 30 | 30 | 30 | 25 |
| % Transect Length Comprising Hydrophytic Vegetation Communities | 40.3 | 40.3 | 40.3 | 40.3 |
| % Transect Length Comprising Upland Vegetation Communities | 59.7 | 59.7 | 59.7 | 59.7 |
| % Transect Length Comprising Unvegetated Open Water | 0 | 0 | 0 | 0 |
| % Transect Length Comprising Mudflat | 0 | 0 | 0 | 0 |

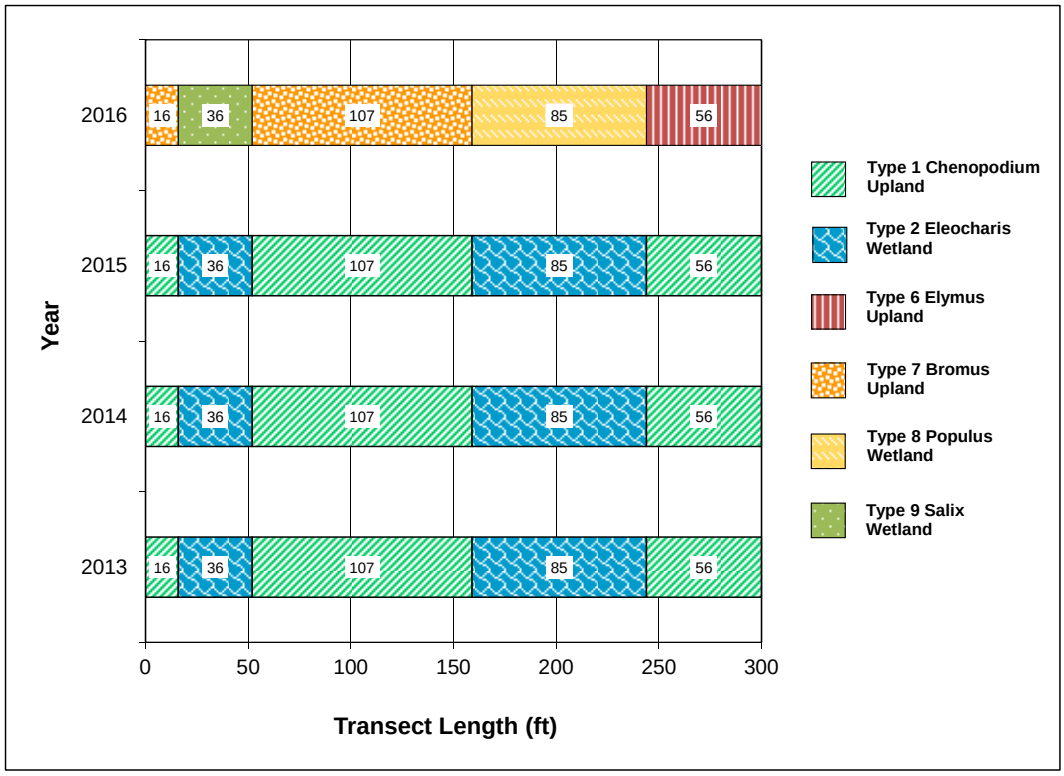



**Chart 3-3.** Transect Map Showing Community Types on T-1 From Start (0 Foot) to Finish (300 Feet) at the Kindsfater Site From 2013 Through 2016.

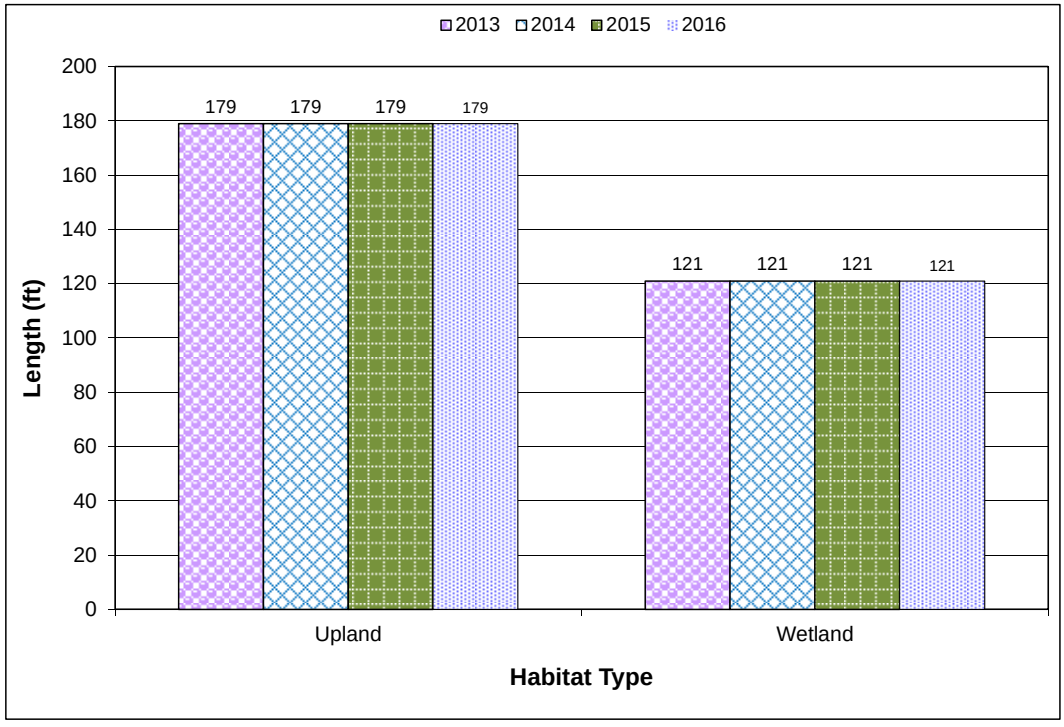



**Chart 3-4.** Length of Habitat Types Within T-1 From 2013 Through 2016 at the Kindsfater Site.

Data collected on T-2 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphical formats in Table 3-3 and Charts 3-5 and 3-6, respectively. This 388-foot transect began in preexisting wetland Type 3– *Alopecurus pratensis/Poa palustris*, bisected excavated Cell 8 and wetland Type 8 – *Populus deltoides*, and ended in wetland Type 3. Hydrophytic vegetation remained consistent with 2013, 2014, and 2015 observations and composed 100 percent of the transect during the 2016 survey. A total of 35 species were identified, including 18 hydrophytes and 17 upland species. Approximately 40 percent of the transect that occurred primarily within the constructed basins consisted of rocky substrate because of excavation in 2012.

**Table 3-3. Data Summary for T-2 From 2013 Through 2016 at the Kindsfater Site**

| Monitoring Year | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| **Transect Length (feet)** | **388** | **388** | **388** | **388** |
| Vegetation Community Transitions Along Transect | 2 | 2 | 2 | 2 |
| Vegetation Communities Along Transect | 2 | 2 | 2 | 2 |
| Hydrophytic Vegetation Communities Along Transect | 2 | 2 | 2 | 2 |
| Total Vegetative Species | 22 | 33 | 39 | 35 |
| Total Hydrophytic Species | 16 | 19 | 20 | 18 |
| Total Upland Species | 6 | 14 | 19 | 17 |
| Estimated % Total Vegetative Cover | 60 | 60 | 60 | 60 |
| Estimated % Unvegetated | 40 | 40 | 40 | 40 |
| % Transect Length Comprising Hydrophytic Vegetation Communities | 100 | 100 | 100 | 100 |
| % Transect Length Comprising Upland Vegetation Communities | 0 | 0 | 0 | 0 |
| % Transect Length Comprising Unvegetated Open Water | 0 | 0 | 0 | 0 |
| % Transect Length Comprising Mudflat | 0 | 0 | 0 | 0 |

Data collected on T-3 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphic formats in Table 3-4 and Charts 3-7 and 3-8, respectively. This 292-foot transect began in preexisting wetland Type 3 – *Alopecurus pratensis/Poa palustris*, which continues across the excavated Cell 4 and ended in upland Type 6 – *Elymus trachycaulus/Bromus spp*. Hydrophytic vegetation shifted in 2016 with the transition of Type 2 – *Eleocharis palustris/Bromus* spp. to community Type 3 but the overall wetland acreage remained consistent with 2013, 2014, and 2015 observations composed approximately 90 percent of the transect during the 2016 survey. A total of 28 species were identified, including 15 hydrophytes and 13 upland species.

A total of 41 infestations of Montana-listed Priority 2B noxious weeds and Yellowstone County noxious weeds were identified and mapped at the Kindsfater site (Figure A-3, Appendix A). Fifteen infestations of Canada thistle, ten infestations of gypsy-flower (houndstongue, *Cynoglossum officinale*), four infestations of spotted knapweed (*Centaurea stoebe*), four infestations of leafy spurge (*Euphorbia esula*), and five infestations of field bindweed were identified in areas less than 1.0 acre in size with cover classes that ranged from trace (< 1 percent) to moderate (6–25 percent). Additionally, three infestations of great mullein (*Verbascum thapsus*), which is a Yellowstone County-designated noxious

weed, were observed in high amounts in community Type 6 – *Elymus trachycaulus/Bromus* spp. The extent of weed infestations observed in 2016 exceeds the success criterion for weed population at less than 5 percent site-wide. A weed contractor with MDT treated this site in 2012 before construction. A total of 3.5 acres of the site were treated in July 2016, with treatment concentrated in areas of infestation by Canada thistle, field bindweed, leafy spurge, and houndstongue. MDT has an ongoing weed-control program for their mitigation sites that includes an annual assessment of weeds that are identified at each location and treatment to contain and control identified populations. Signs that indicate previously conducted weed control were noted during the 2016 monitoring. However, portions of the site are difficult to access with conventional weed spraying equipment (i.e., trucks with tanks/hoses or 4-wheelers). Steep slopes, uneven terrain, areas of waist-high vegetation, and forest/shrublands potentially limit access into some areas of the site where noxious weeds are a problem. Backpack sprayers or other types of equipment may be needed for weed control in some areas of the site.

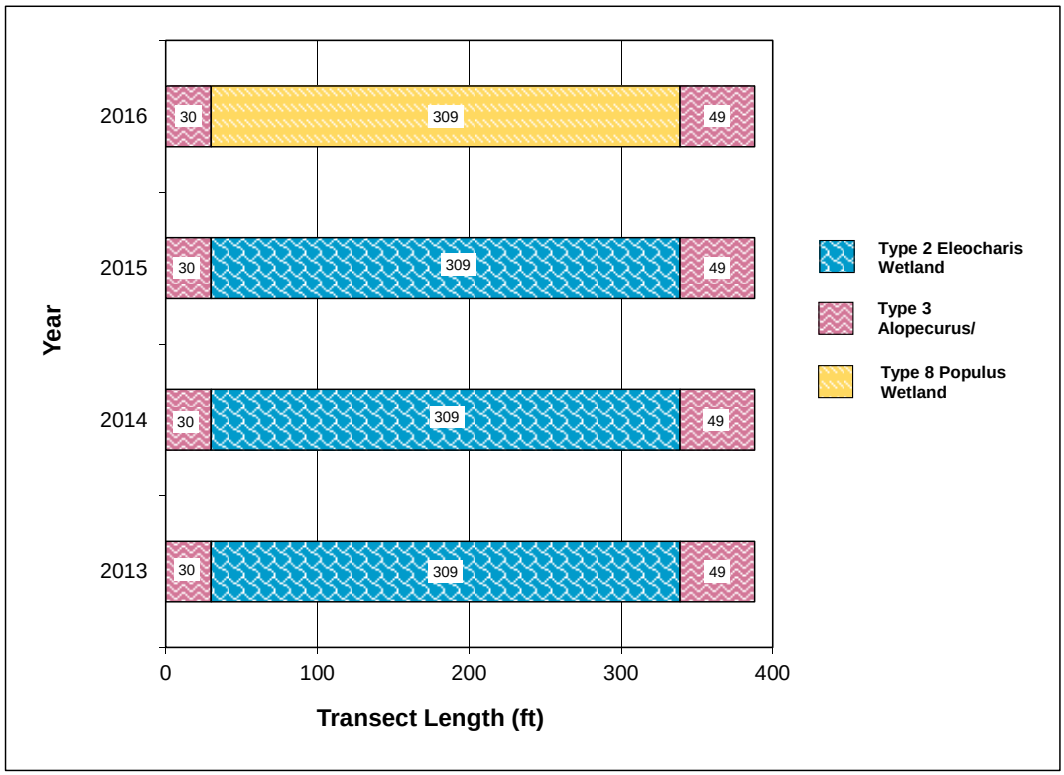



**Chart 3-5.** Transect Map Showing Community Types on T-2 From Start (0 Foot) to Finish (388 Feet) at the Kindsfater Site From 2013 Through 2016.

Two Priority 3 regulated weed species (not Montana-listed noxious weeds)—cheatgrass and Russian olive—were identified across the site with increased cover classes observed since 2014. These plants may not be intentionally spread or sold other than as a contaminant in agricultural projects. Regulated plants have the potential to cause significant negative impacts. The Montana Department of Agriculture (July 2015) recommends research, education, and prevention to minimize the spread of regulated plant species.

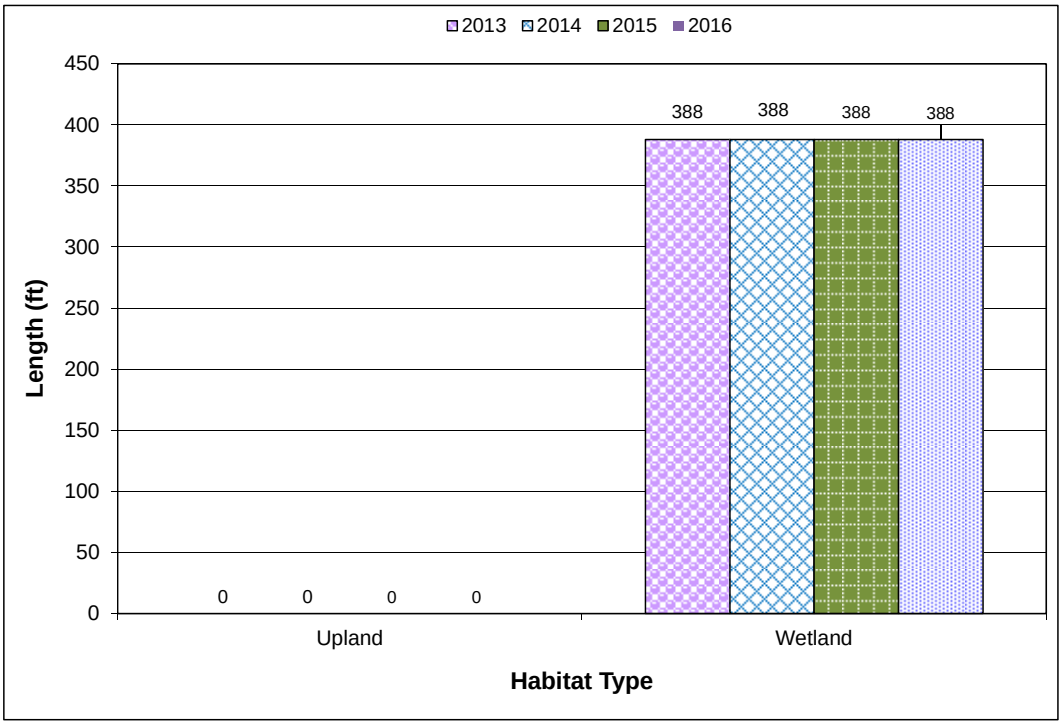



**Chart 3-6.** Length of Habitat Types Within T-2 From 2013 Through 2016 at the Kindsfater Site.

**Table 3-4. Data Summary for T-3 From 2013 Through 2016 at the Kindsfater Site**

| Monitoring Year | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| **Transect Length (feet)** | **292** | **292** | **292** | **292** |
| Vegetation Community Transitions Along Transect | 2 | 2 | 2 | 1 |
| Vegetation Communities Along Transect | 3 | 3 | 3 | 2 |
| Hydrophytic Vegetation Communities Along Transect | 2 | 2 | 2 | 1 |
| Total Vegetative Species | 18 | 26 | 32 | 28 |
| Total Hydrophytic Species | 11 | 18 | 18 | 15 |
| Total Upland Species | 7 | 8 | 14 | 13 |
| Estimated % Total Vegetative Cover | 70 | 70 | 70 | 70 |
| Estimated % Unvegetated | 30 | 30 | 30 | 30 |
| % Transect Length Comprising Hydrophytic Vegetation Communities | 89.7 | 89.7 | 89.7 | 89.7 |
| % Transect Length Comprising Upland Vegetation Communities | 10.3 | 10.3 | 10.3 | 10.3 |
| % Transect Length Comprising Unvegetated Open Water | 0 | 0 | 0 | 0 |
| % Transect Length Comprising Mudflat | 0 | 0 | 0 | 0 |

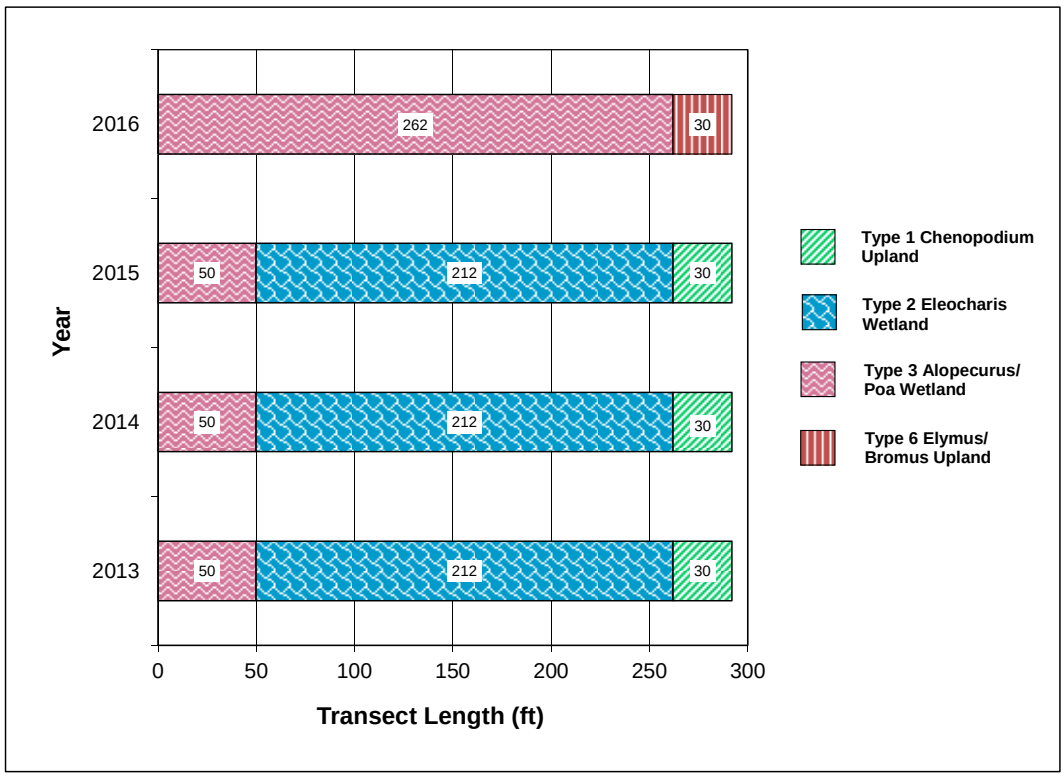



**Chart 3-7.** Transect Map Showing Community Types on T-3 From Start (0 Foot) to Finish (292 Feet) at the Kindsfater Site From 2013 Through 2016.

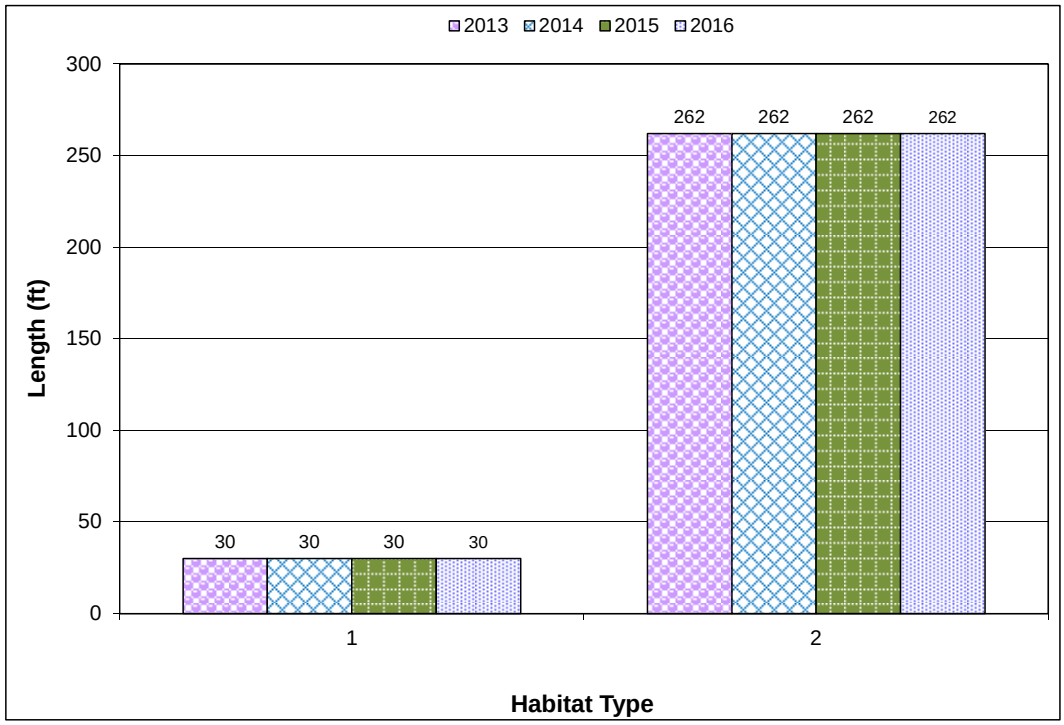



**Chart 3-8.** Length of Habitat Types Within T-3 From 2013 Through 2016 at the Kindsfater Site.

A few thousand cuttings and containerized materials were planted in approximately 27 clusters (Figure A-2, Appendix A) around the Kindsfater site. The woody planting zones were generally located around the excavated wetland cells. Each individual cluster was monitored in 2016 with the number of live plants counted and recorded by species. Only 9 percent of the observed plantings were alive during the 2016 evaluations. Low survival is likely caused by lack of sufficient moisture. The species planted and species surviving are listed on the Wetland Mitigation Site Monitoring form (Appendix B).

## 3.3 SOIL

The project site was mapped in the *Web Soil Survey for Yellowstone County Soil Survey* [USDA, 2016]. Five soil series were mapped within the monitoring area and include the Bew silty clay loam, Shoreu gravelly loam, Wanetta clay loam, Larim gravelly loam, and alluvial land (wet). The existing wetlands across the site were located in areas mapped as Bew silty clay loam, Wanetta clay loam, Larim gravelly loam, and alluvial land mapped along the irrigation canal. The constructed cells were generally mapped in the Bew and Wanetta series. The Bew soils consist of very deep, well-drained, slowly permeable soils that occur on uplands and in valleys. The Wanetta series is a well-drained, moderately permeable loam to gravelly loam. The Bew soil and alluvial land map units are listed on the *Montana Hydric Soils List* [Montana Department of Agriculture, 2015]. The historic gravel mining operations disturbed soils extensively across the site. Soil profiles observed in the test pits provided evidence that the NRCS mapped soil units are not applicable for describing contemporary soil conditions within the Kindsfater mitigation area.

Soil test pits were excavated at eight locations (Figure A-2). DP-1U and DP-1W were located near the eastern site boundary while data points DP-2U, DP-2U (formerly K-2W), DP-3W, DP-3U, DP-4W, and DP-4U were located in the northwestern quarter of the site. The soil profile at DP-1W located in wetland Type 5 – *Typha latifolia* revealed a brown (10YR 4/3) fine sand. No hydric soil indicators were observed for DP-1W, likely because of its location in a recently constructed wetland where soils may be too young to have formed hydric indicators (*Problematic Hydric Soils: Recently Developed Wetlands*) [USACE, 2010]. The soil profile at DP-3W, which is located in wetland Type 5, revealed a dark grayish-brown (10 YR 4/2) sandy clay loam with yellowish-brown (10 YR 5/6) redox concentrations in the matrix. This soil met the criteria for depleted matrix and classification as a hydric soil. Additional data points (DP-3U, DP-4W, and DP-4U) were added in 2016 to supplement the wetland delineation and to provided paired data points. The soil profile at DP-4W, which is located in wetland Type 10 – *Poa palustris*, revealed a brown soil (10YR 4/3) silty loam. No hydric soil indicators were observed at the data point because of recent wetland construction. The soil profile at DP-1U, which is located in upland Type 4 – *Elaeagnus angustiolia*, exhibited a dark grayish-brown (10YR 4/2) sandy loam with 10 percent yellowish-brown (10YR 5/6) redox concentrations in the matrix. This soil met the criteria for depleted matrix but did not exhibit wetland hydrology or hydrophytic vegetation. The soil profile at DP-2U, which is located in upland Type 4, revealed a dark gray (10 YR 4/1) sandy loam without redox features, with no hydric soil indicators observed.

Soils within DP-2U (formerly K-2W) were also a dark gray (10 YR 4/1) sandy loam without redox features. Because this data point was within a constructed wetland cell, where hydric soils are likely to develop as hydrology improves, the hydric soil indicator for *Problematic Hydric Soils: Recently Developed Wetlands* was used at this data point. The soil profile at DP-3U (located in upland Types 4

and7) revealed a dark grayish-brown (10 YR 4/2) sandy loam without redox features. The soil profile for DP-4U (also located within upland Types 4 and 7) revealed a brown (10 YR 4/3) sandy silt loam also without hydric soil indicators.

## 3.4 WETLAND DELINEATION

Eight data points were evaluated to confirm the wetland boundary determination in 2016 (Figure A-2, Appendix A). The completed Wetland Determination Data forms are located in Appendix B. DP-1W, DP-3W, and DP-4W are located in areas that were classified as wetlands. The total wetland acreage surveyed within the area in 2016 was 34.4 acres. The delineation confirmed 8.70 acres in the restoration areas (reestablishment and rehabilitation), 3.4 acres in the enhancement area, and 2.0 acres of created wetland in the excavated cells; Table 3-5 displays these acreages. Uplands accounted for 81.3 acres of the mitigation site.

**Table 3-5. Wetland Acres Delineated From 2013 Through 2016 at the Kindsfater Site**

| Habitat Type | 2013 Acreage | 2014 Acreage | 2015 Acreage | 2016 Acreage |
|---|---|---|---|---|
| Preservation | 21.9 | 21.3 | 21.3 | 20.3 |
| Reestablishment (Restoration) | 7.9 | 7.9 | 7.9 | 7.8 |
| Rehabilitation (Restoration) | 0.9 | 0.9 | 0.9 | 0.9 |
| Enhancement | 3.0 | 3.0 | 3.0 | 3.4 |
| Creation | 1.8 | 1.8 | 1.8 | 2.0 |
| **Total Wetland Habitat** | **35.5** | **34.9** | **34.9** | **34.4** |

## 3.5 WILDLIFE

A comprehensive list of bird and other wildlife species that were observed directly or indirectly from 2013 through 2016 is presented in Table 3-6 and noted on the Wetland Mitigation Site Monitoring form (Appendix B). Twelve bird species were identified in 2016, including barn swallow (*Riparia riparia*), common grackle (*Quiscalus quiscula*), collared dove (*Streptopelia decaota*), mourning dove (*Zenaida macroura*), European starling (*Sturnus vulgaris*), Luzuli bunting (*Passerina amoena*), red-tailed hawk (*Buteo jamaicensis*), red-winged blackbird (*Agelaius phoeniceus*), Swainson's hawk (*Buteo swainsoni*), western wood-pewee (*Contopus sordidulus*), white-crowned sparrow (*Zonotrichia leucophrys*), and yellow warbler (*Dendroica petechia*). Five white-tailed deer (*Odocoileus virginianus*) and raccoon (*Procyon lotor*) tracks were observed on site in 2016.

## 3.6 FUNCTIONAL ASSESSMENT

The 2008 MDT MWAM [Berglund and McEldowney, 2008] was used to evaluate two general AA: Created and Existing, as shown in Table 3-7 and Appendix B. The findings of the assessment are described below.

**Table 3-6. Wildlife Species Observed From 2013 Through 2016 at the Kindsfater Site**

| Common Name | Scientific Name |
|---|---|
| *Amphibian* | |
| Boreal Chorus Frog | *Pseudacris maculata* |
| Plains Spadefoot | *Spea bombifrons* |
| Northern Leopard Frog | *Rana pipiens* |
| *Bird* | |
| American Goldfinch | *Spinus tristus* |
| **Bank Swallow** | ***Riparia*** |
| **Common Grackle** | ***Quiscalus quiscula*** |
| Common Yellowthroat | *Geothlypis trichas* |
| **Collared Dove** | ***Streptopelia decaocto*** |
| Double-crested Cormorant | *Phalacrocorax auritus* |
| Downy Woodpecker | *Picoides pubescens* |
| **European Starling** | ***Sturnus vulgaris*** |
| Gray Catbird | *Dumetella carolinensis* |
| **Luzuli Bunting** | ***Passerina amoena*** |
| Killdeer | *Charadrius vociferus* |
| Mallard | *Anas platyrhynchos* |
| **Mourning Dove** | ***Zenaida macroura*** |
| Northern Flicker | *Colaptes auratus* |
| Northern Harrier | *Circus cyaneus* |
| **Red-tailed Hawk** | ***Buteo jamaicensis*** |
| **Red-winged Blackbird** | ***Agelaius phoeniceus*** |
| Ring-necked Pheasant | *Phasianus colchicus* |
| Spotted Sandpiper | *Actitis macularius* |
| **Swainson's Hawk** | ***Buteo swainsoni*** |
| Vesper Sparrow | *Pooecetes gramineus* |
| Western Kingbird | *Tyrannus verticalis* |
| Western Meadowlark | *Sturnella neglecta* |
| Western Tanager | *Piranga ludoviciana* |
| **Western Wood-Pewee** | ***Contopus sordidulus*** |
| **White-crowned Sparrow** | ***Zonotrichia leucophrys*** |
| **Yellow Warbler** | ***Dendroica petechia*** |
| *Mammal* | |
| **White-tailed Deer** | ***Odocoileus virginianus*** |
| Raccoon (tracks) | *Procyon lotor* |
| Vole sp. | |

Species that were observed in 2016 are **bolded.**

**Table 3-7. Functions and Values of the Kindsfater Site From 2013 Through 2016**

| Function and Value Parameters From the 2008 MDT Montana Wetland Assessment Method | 2013 AA 1 (Existing Wetlands) | 2014 AA 1 (Existing Wetlands) | 2015 AA 1 (Existing Wetlands) | 2016 AA 1 (Existing Wetlands) | 2013 AA 2 (Created Wetlands) | 2014 AA 2 (Created Wetlands) | 2015 AA 2 (Created Wetlands) | 2016 AA 2 (Created Wetlands) |
|---|---|---|---|---|---|---|---|---|
| Listed/Proposed Threatened and Endangered Species Habitat | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) |
| Montana Natural Heritage Program (MTNHP) Species Habitat | High (0.9) | High (0.9) | High (0.9) | High (0.9) | High (0.9) | High (0.9) | High (0.9) | High (0.9) |
| General Wildlife Habitat | Low (0.3) | Low (0.3) | Low (0.3) | Mod (0.5) | Low (0.3) | Low (0.3) | Low (0.3) | Mod (0.5) |
| General Fish/Aquatic Habitat | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Flood Attenuation | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Short- and Long-Term Surface-Water Storage | High (0.9) | High (0.9) | High (0.9) | High (0.9) | Mod (0.6) | Low (0.3) | Low (0.3) | Low (0.3) |
| Sediment/Nutrient/Toxicant Removal | High (0.9) | High (0.9) | High (0.9) | High (0.9) | Mod (0.5) | Mod (0.7) | High (1.0) | High (1.0) |
| Sediment/Shoreline Stabilization | N/'A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Production Export/Food Chain Support | Mod (0.6) | Mod (0.6) | Mod (0.6) | Mod (0.6) | Low (0.3) | Low (0.3) | Low (0.3) | Low (0.3) |
| Groundwater Discharge/Recharge | Mod (0.7) | Mod (0.7) | Mod (0.7) | Mod (0.7) | Mod (0.7) | Mod (0.7) | Mod (0.7) | Mod (0.7) |
| Uniqueness | Low (0.2) | Low (0.2) | Low (0.2) | Low (0.2) | Low (0.2) | Low (0.2) | Low (0.2) | Low (0.2) |
| Recreation/Education Potential | High (0.2) | High (0.2) | High (0.2) | High (0.2) | High (0.2) | High (0.2) | High (0.2) | High (0.2) |
| **Actual Points/Possible Points** | **4.7/8** | **4.7/8** | **4.7/8** | **4.9/8** | **3.7/8** | **3.6/8** | **3.9/8** | **4.1/8** |
| **% of Possible Score Achieved** | **59%** | **59%** | **59%** | **61%** | **46%** | **45%** | **49%** | **51%** |
| **Overall Category** | **III** | **III** | **III** | **III** | **III** | **III** | **III** | **III** |
| **Total Acreage of Assessed Wetlands within Site Boundaries (acres)** | **33.7** | **33.1** | **33.1** | **32.4** | **1.8** | **1.8** | **1.8** | **2.0** |
| **Functional Units (acreage × actual points)** | **158.44** | **155.57** | **155.57** | **158.76** | **6.55** | **6.37** | **7.02** | **8.2** |

The Existing Wetland AA included 33.1 acres of preexisting wetland habitat identified in the 2012 wetland delineation conducted by MMI. In 2016, the preexisting wetlands acreage was calculated from a dgn file provided by MDT. A shapefile of the credit areas was created in and exported from Autodesk Civil 3D and overlaid with the 2016 delineated wetland boundaries in ArcMap and calculated acreages. Slight shifts in acreage within this AA included 20.3 acres of preservation wetland habitat, 8.7 acres of restoration habitat, and 3.4 acres of enhancement habitat for a total of 32.4 acres. The Existing Wetland AA was rated as a Category III wetland and scored 61 percent of the possible points and 158.76 functional units. This AA received high ratings for short- and long-term surface-water storage, sediment/nutrient/toxicant removal, recreation/education potential, and the 2013 observation of the plains spadefoot (an S3 sensitive species) in its documented primary habitat.

The Created Wetlands AA encompassed 2.0 acres of constructed palustrine, emergent wetlands and included Cells 9, 13, 14, and a portion of Cell 7. This AA was rated as a Category III wetland with

51 percent of the possible points and a total of 8.2 functional units. Recreational use was reflected in a moderate disturbance rating for the site in 2016. The AA received a high rating for Montana Natural Heritage Program (MTNHP) species habitat because of the documented primary habitat of the plains spadefoot (an S3 sensitive species) observed in 2013. The AA was also given a high rating for recreation/education potential because access to the site is permitted to the public without permission. In 2016, the hydrophytic vegetation cover continues to increase in the AA, which resulted in a high rating for sediment/nutrient/toxicant removal. The rating for this AA is expected to increase as desirable vegetation cover increases and if the site retains wetland hydrology.

## 3.7 PHOTOGRAPHIC DOCUMENTATION

Photographs taken at photo points 1–12 (PP1–PP12), transect endpoints, and wetland determination data points are provided in Appendix C.

## 3.8 MAINTENANCE NEEDS

No man-made water-control structures were installed within the Kindsfater site. The perimeter fence that was installed around the site was in good condition at the time of the 2016 investigation. Two bluebird boxes were installed on the site (Figure A-2, Appendix A). The two trees to which the bird boxes had been mounted had fallen over before the 2016 survey, which rendered the boxes unusable. This site appears to be used by a high number of people for a variety of recreational activities.

As noted in the vegetation section of this report, 41 infestations of state-listed Priority 2B noxious weeds and one Yellowstone County-listed noxious weed (great mullein) were mapped at the Kindsfater site (Figure A-3, Appendix A). Fifteen infestations of Canada thistle, ten infestations of gypsy-flower, four infestations of spotted knapweed, four infestations of leafy spurge, and five infestations of field bindweed were identified in areas less than 1.0 acre in size with cover classes that ranged from trace (< 1 percent) to moderate (6–25 percent). Additionally, great mullein was observed in three areas between 0.1 and 1 acre with a cover class that ranged from moderate to high (26–100 percent) across portions of community Type 6 – *Elymus trachycaulus/Bromus* spp. The extent of weed infestations observed in 2016 exceeds the success criterion for weed populations at less than 5 percent site-wide. A weed contractor with MDT treated this site in 2012 before construction. In 2016, a total of 3.5 acres across the site were treated on July 13 for noxious weed infestations, including Canada thistle, leafy spurge, field bindweed, and houndstongue. MDT has an ongoing weed-control program for their mitigation sites that includes an annual assessment of weeds identified at each location and treatment to contain and control identified populations.

Signs that indicate previously conducted weed control were noted during the 2016 monitoring. However, portions of the site are difficult to access with conventional weed spraying equipment (i.e., trucks with tanks/hoses or 4-wheelers). Steep slopes, uneven terrain, areas of waist-high vegetation and forest/shrublands potentially limit access into some areas of the site where noxious weeds are a problem. Backpack sprayers or other types of equipment may be needed for weed control in some areas of the site.

Two Priority 3 regulated weed species (not Montana-listed noxious weeds)—cheatgrass and Russian olive—were identified across the site with increased cover classes observed since 2014. Regulated plants have the potential to cause significant negative impacts and these plants may not be intentionally spread or sold other than as a contaminant in agricultural products. The Montana Department of Agriculture (July 2015) recommends research, education, and prevention to minimize the spread of regulated plant species.

## 3.9 CURRENT CREDIT SUMMARY

Table 3-8 summarizes the current estimated wetland credits based on the USACE-approved credit ratios [USACE, 2005] and the wetland delineation that was completed in June 2016. A total of 41.6 acres were delineated at the Kindsfater site in 2016, including 2.0 acres of creation, 7.8 acres of reestablishment, 0.9 acre of rehabilitation, 3.4 acres of enhancement, 20.3 acres of wetland preservation, and 22.6 acres of upland buffer. After applying the USACE-approved ratios to these values, a total of 21.1 acres of mitigation credits have been estimated in 2016, which is well below the targeted 32.7 acres that were anticipated at this site. As shown in Table 1-1, the credit summary has been revised to show the removal of 11.1 acres of planned creation wetland included in the Alternative Bid which was not constructed and has been subtracted reducing the anticipated mitigation credit acreage to 32.7. Although 2016 represents the fourth year of monitoring, attaining the full target value of 32.7 credit acres may prove difficult without an increase of groundwater or supplemental water into the mitigation area.

Table 3-9 provides a summary of the site conditions in relation to the established performance standards and success criteria. This site meets the established performance standards with the exception of the success criteria that measures desirable hydrophytic herbaceous plant cover across all of the wetlands, noxious weed cover, and woody plantings. All of the wetlands that were delineated within the Kindsfater site in 2016 met the three criteria outlined in the 1987 Wetland Manual and 2010 Regional Supplement. The percent cover by desirable hydrophytic vegetation varied across the wetland sites. Overall, the restored, enhanced, created and preserved wetlands exhibited less than 80 percent cover by desirable hydrophytic vegetation and several wetlands exhibited greater than 5 percent cover from noxious weeds. Overall, created wetland areas alone exhibited less than 5 percent cover from noxious weeds and are close to and approaching 80 percent hydrophytic vegetation cover. Upland buffer areas exhibited more than 5 percent cover by noxious weed infestations MDT implements weed-control measures based on the results of field surveys to minimize and/or eliminate the intrusion of state-listed noxious weed species within the site. Woody planting survival was estimated at 9 percent during the 2016 survey, well below the 50 percent threshold for success, however, the percentage of volunteer woody species in several areas was estimated at 40 percent. Comprehensive site monitoring has occurred for 4 years and will be conducted for a minimum of 5 years as determined by the USACE Montana Regulatory Office's review of annual monitoring reports for the site and attaining wetland success criteria.

## Table 3-8. Wetland Mitigation Credits Estimated for the Kindsfater Site From 2013 Through 2016

| Compensatory Mitigation Type | Mitigation Area Description | Wetland Type [Cowardin] | Anticipated Mitigation Surface Area (acres) | USACE-Approved Mitigation Ratios | Anticipated Mitigation Credit (acres) | 2013 Delineated Acres | 2013 Mitigation Credit (acres) | 2014 Delineated Acres | 2014 Mitigation Credit (acres) | 2015 Delineated Acres | 2015 Mitigation Credit (acres) | 2016 Delineated Acres[a] | 2016 Mitigation Credit (acres) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Creation (Establishment) | Wetland Cells 7, 9, 13, and 14 | Lacustrine emergent | 4.6 | 1:1 | 4.6 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 2.0 | 2.0 |
| Restoration (Reestablishment) | Wetland Cells 1–6 and parts of Cell 8 | Lacustrine emergent and Palustrine emergent, scrub/shrub | 14.0 | 1:1 | 14.0 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.8 | 7.8 |
| Restoration (Rehabilitation) | Areas adjacent to Wetland Cells 1–12 | Palustrine emergent, scrub/shrub | 9.2 | 1.5:1 | 6.1 | 0.9 | 0.6 | 0.9 | 0.6 | 0.9 | 0.6 | 0.9 | 0.6 |
| Enhancement | Wetland Cells 10–12 and parts of Cell 8 | Palustrine emergent, scrub/shrub | 3.1 | 3:1 | 1.0 | 3.0 | 1.0 | 3.0 | 1.0 | 3.0 | 1.0 | 3.4 | 1.1 |
| Preservation | Existing wetland areas | Palustrine emergent, scrub/shrub | 21.9 | 4:1 | 5.5 | 21.9 | 5.5 | 21.3 | 5.3 | 21.3 | 5.3 | 20.3 | 5.1 |
| Upland Buffer | 50-foot-wide upland perimeter | N/A | 7.3 | 5:1 | 1.5 | 22.9 | 1.46[b] | | 4.56[c] | | 4.6[c] | | 4.52[c] |
| **Totals** | | | | | **32.7[d]** | **58.4** | **18.2** 22.8 | **57.7** | **21.1** 22.9 | **57.8** | **21.2** 22.6 | **57.0** | **21.1** |

(a) The 2016 credit acres were derived from dgn provided by MDT (5034000ENDETZ01.DGN). A shapefile of the credit areas (MDT_Crediting_polys.shp) was created in and exported from Autodesk Civid 3D, then overlaid with the 2016 delineated wetland boundaries in ArcMap and calculated acreages.

(b) Estimated credit acres for upland buffer included the 1.46 acres anticipated in the USACE-approved mitigation plan.

(c) Value calculated using GIS.

(d) 11.1 acres of creation wetlands in the Alternative Bid Credits (gravel mining area) were not constructed as planned; the anticipated credits for this gravel mining area have been subtracted to indicate this reduction in credits.

**60.1**

**Table 3-9. Summary of Performance Standards and Success Criteria Compared to Existing Site Conditions (Page 1 of 2)**

| Performance Standards | Success Criteria | Criteria Achieved Y/N | Discussion |
|---|---|---|---|
| Wetland Characteristics | The three parameter criteria for hydrology, vegetation, and soils are met as outlined in the 1987 Wetland Manual and 2010 Regional Supplement. | Y | Areas that were identified as wetland habitat within the mitigation site meet the three parameter criteria. |
| Wetland Hydrology | Soil saturation is present for at least 12.5 percent of the growing season. | Y | Areas that were identified as wetland habitat within the mitigation site exhibit soil saturation for a minimum 12.5 percent of growing season. |
| Hydric Soil | Hydric soil conditions are present or appear to be forming. | Y | The recently constructed wetland complex exhibits weak hydric soil development, including faint redoximorphic concentrations observed within several of the excavated depressions. Preexisting hydric soil characteristics are present in several areas identified as wetland before project construction. |
| | Soil is sufficiently stable to prevent erosion. | Y | Disturbed soil is stable and does not exhibit signs of erosion. |
| | Soil is able to support plant cover. | Y | Plant cover has continued to develop across disturbed soils. |
| Hydrophytic Vegetation | Wetlands are delineated as hydrophytic by using technical guidelines. | Y | Areas that were identified as wetland habitat within the mitigation site support a prevalence of hydrophytic vegetation (OBL, FACW, and FAC). |
| | Noxious weeds do not exceed 5 percent cover. | N | Although many noxious weed infestations have been mapped across this site, the infestations are generally located outside of excavated/created wetlands. Overall, the estimated noxious weed cover across all of the delineated wetlands is greater than 5 percent. |
| | Hydrophytic vegetation success will include achieving a minimum overall vegetation cover of 80 percent in created wetland areas within 5 years after site construction. | N | The majority of created wetlands exhibited slightly less than 80 percent hydrophytic vegetation cover during the 2016 monitoring event. These areas are close to and approaching 80 percent and generally showed increased vegetation cover, with hydophytic vegetation cover anticipated to increase in subsequent monitoring years. |
| Woody Plants | Plantings exceed 50 percent survival after 5 years. | N | Approximately 9 percent of the woody plantings observed were alive in 2016, which does not meet the 50 percent survival criteria. However, several wetland cells exhibit at least 40 percent cover by volunteer woody species which are expected to continue expanding across the site. This cover value of volunteer woody species has been included in the success criteria determination for this performance criteria, almost meeting the 50 percent. |
| Herbaceous Plants | At the conclusion of the monitoring period, ocular coverage of desirable hydrophytic vegetation will be at least 80 percent. | N | In total, restored, created, enhanced, and preserved wetlands exhibited less than 80 percent desirable hydrophytic vegetation cover during the 2016 monitoring event. These areas generally showed increased overall vegetation cover and are anticipated to meet these criteria within 5 years postconstruction. |
| Open-Water Areas | Open water that is established within the designated wetland cells will be considered successful and creditable. | N/A | Although inundation was observed during the 2016 monitoring event, no areas of open water were mapped within the Kindsfater site. |

**Table 3-9. Summary of Performance Standards and Success Criteria Compared to Existing Site Conditions (Page 2 of 2)**

| Performance Standards | Success Criteria | Criteria Achieved Y/N | Discussion |
|---|---|---|---|
| Upland Buffer | Noxious weeds do not exceed 5 percent cover within the buffer areas on site. | N | Many noxious weed infestations, including field bindweed, leafy spurge, houndstongue (gypsy-flower), Canada thistle, and spotted knapweed, have been mapped within the site. MDT will need to continue to implement weed-control measures to meet these criteria. |
| | Any disturbed area within the creditable buffer zone must have at least 50 percent aerial cover of nonweed species by the end of the monitoring period. | Y | Upland buffers surround wetland areas within the site exhibited greater than 50 percent aerial cover of nonweed species. |
| Weed Control | Less than 5 percent absolute cover of noxious weed species occurs across the site. | N | Although the estimated coverage of noxious weeds within the constructed wetlands is generally below 5 percent, state-listed noxious weed species across the entire site have been estimated at greater than 5 percent absolute cover in 2016. |
| Fencing | Wildlife-friendly fencing is installed along the easement boundaries. | Y | Wildlife-friendly fencing has been installed around the easement boundaries and is in good condition. |

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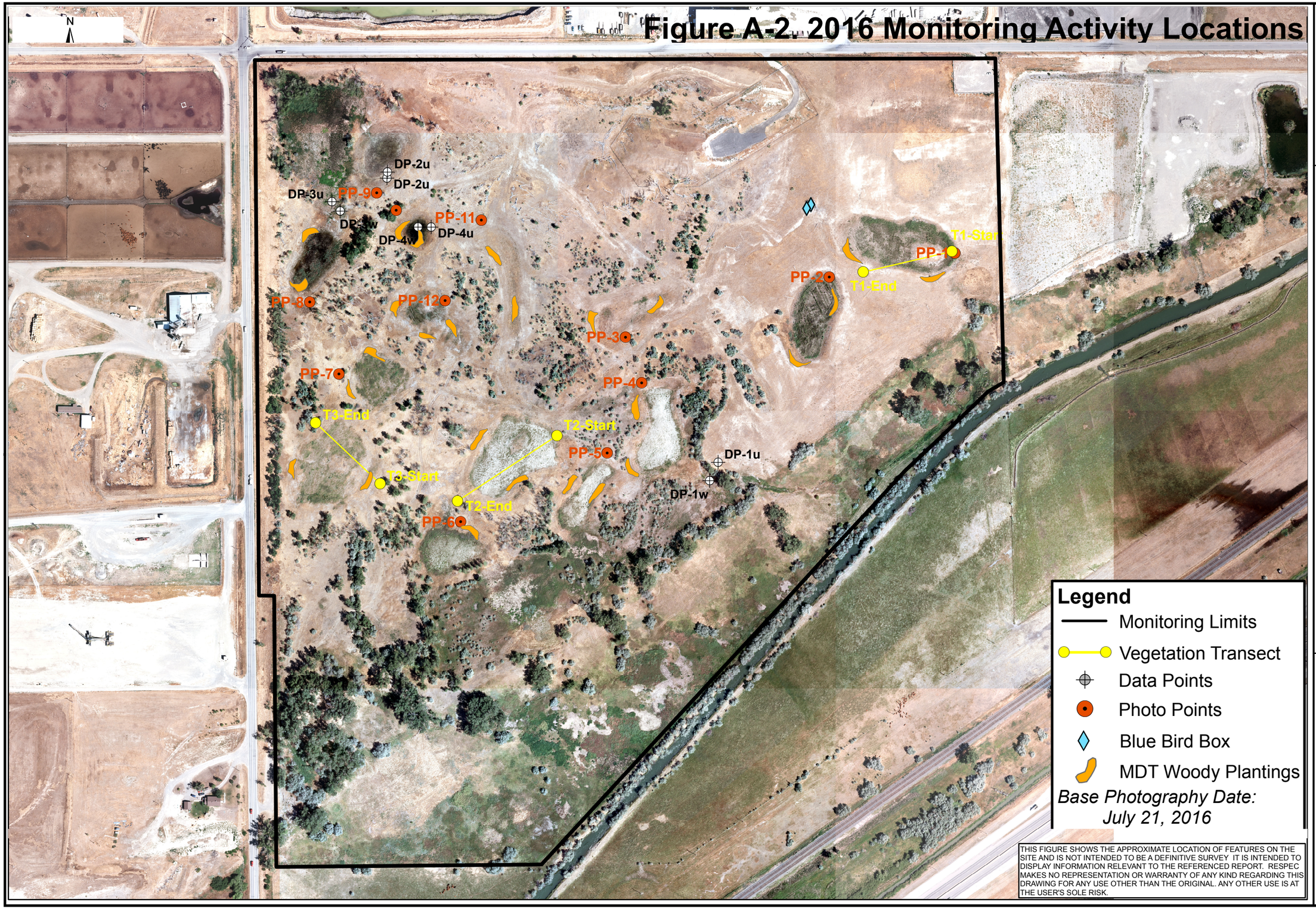
**US Department of Agriculture, 2016. "**Web Soil Survey for Yellowstone County, Montana," *usda.gov,* retrieved June 20, 2016, from *http://websoilsurvey.nrcs.usda.gov/app/*

**Western Regional Climate Center, 2016.** "Monthly Sum Precipitation at the Laurel, Montana (244894)" *dri.edu*, Western Regional Climate Center, United States Historical Climatology Network, Reno, NV, retrieved August 30, 2016, from *http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?mt0802*

# APPENDIX A
# PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana

# Figure A-2. 2016 Monitoring Activity Locations




RESPEC
820 North Montana Ave., Suite A
Helena, MT 59601

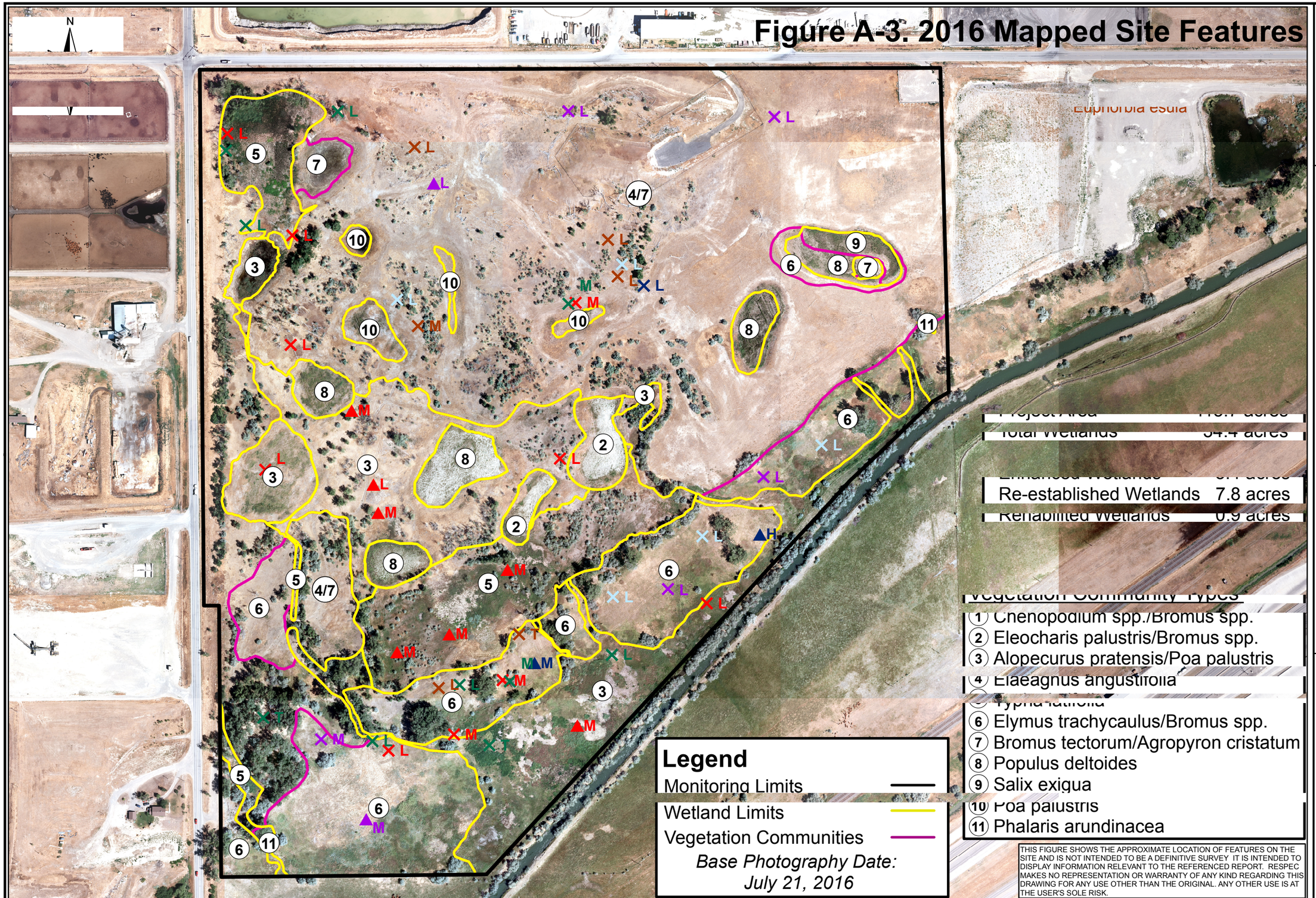
**Kindsfater Wetland Mitigation Site**
**2016 Monitoring Activity Locations**

0 125 250 500 750 1,000 1,250 Feet

Project: STPX-0056(56)
Location: Yellowstone Co., Montana
Date: December 2016
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016\Kindsfater Wetland\GPS Data\Mains\Monitor2016.mxd

# Figure A-3. 2016 Mapped Site Features




RESPEC
820 North Montana Ave.,
Suite A
Helena, MT 59601

**Kindsfater Wetland Mitigation Site**
**2016 Mapped Site Features**

0 125 250 500 750 1,000 1,250 Feet

Project: STPX-0056(56)
Location: Yellowstone Co., Montana
Date: December 2016
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016\Kindsfater Wetland\GPS Data\Mainst\Veg2016.mxd

# APPENDIX B
# MONITORING FORMS

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana

**RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM**

Project Name: **Kindsfater** Project Number: _____
Assessment Date: **June 20, 2016** Person(s) conducting the assessment: **C. Hoschouer, C. Seibert**
Location: **Laurel, MT** MDT District: **Billings** Milepost: **NA**
Legal Description: T **2S** R **25E** Section **6**
Weather Conditions: **Very warm, sunny, 86F** Time of Day: **8 am**
Initial Evaluation Date: **August 22, 2013** Monitoring Year: **4** # Visits in Year: **1**
Size of evaluation area: **115.69 acres** Land use surrounding wetland: **Commercial and agriculture**

## HYDROLOGY

Surface Water Source: **Groundwater**
Inundation: **Absent** Average Depth: _____ Range of Depths: _____
Percent of assessment area under inundation: **0%**
Depth at emergent vegetation-open water boundary: _____**feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **Yes**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
**Saturation visible on aerial imagery, signs of ponded water - water marks, geomorphic position and drainage patterns.**

Groundwater Monitoring Wells: **Present**
Record depth of water below ground surface (in feet):

| Well Number | Depth | Well Number | Depth | Well Number | Depth |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Additional Activities Checklist:
☐ Map emergent vegetation-open water boundary on aerial photograph.
☒ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☐ Use GPS to survey groundwater monitoring well locations, if present.

**COMMENTS / PROBLEMS:**
**Only observed one groundwater well and it was locked.**

## VEGETATION COMMUNITIES

Community Number: **2** Community Title (main spp): **Eleocharis palustris/Bromus spp.**

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Eleocharis palustris | 3 = 11-20% | Elymus trachycaulus | 1 = 1-5% |
| Bromus arvensis (japonicus) | 2 = 6-10% | Juncus balticus | 1 = 1-5% |
| Poa palustris | 2 = 6-10% | Populus deltoides | 1 = 1-5% |
| Alopecurus pratensis | 1 = 1-5% | Schoenoplectus pungens | 1 = 1-5% |
| Bromus tectorum | 1 = 1-5% | Scirpus microcarpus | 1 = 1-5% |
| Cirsium arvense | 1 = 1-5% | Epilobium ciliatum | 1 = 1-5% |

Comments / Problems: **Many other species were recorded representing 1 percent or less.**

Community Number: **3** Community Title (main spp): **Alopecurus pratensis/Poa palustris**

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Alopecurus pratensis | 4 = 21-50% | Pascopyrum smithii | 1 = 1-5% |
| Poa palustris | 4 = 21-50% | Poa pratensis | 1 = 1-5% |
| Carex nebrascensis | 1 = 1-5% | Populus deltoides | 1 = 1-5% |
| Elymus repens | 1 = 1-5% | Sonchus arvensis | 1 = 1-5% |
| Bromus tectorum | 1 = 1-5% | Typha latifolia | + = < 1% |
| Carex utriculata | 1 = 1-5% | Mentha arvensis | + = < 1% |

Comments / Problems: **Existing drier wetland community. Many other species were recorded representing 1 percent of less.**

Community Number: **4** Community Title (main spp): **Elaeagnus angustifolia**

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Elaeagnus angustifolia | 5 = > 50% | | |
| Populus deltoides | 2 = 6-10% | | |
| Populus angustifolia | 1 = 1-5% | | |
| Elaeagnus commutata | 1 = 1-5% | | |
| | | | |
| | | | |

Comments / Problems: **Scrub-shrub and tree vegetation community interspersed throughout upland community 7.**

Community Number: **5** Community Title (main spp): **Typha latifolia**

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Typha latifolia | 5 = > 50% | Juncus balticus | 1 = 1-5% |
| Schoenoplectus acutus | 2 = 6-10% | Persicaria lapathifolia | 1 = 1-5% |
| Eleocharis palustris | 1 = 1-5% | | |
| Marrubium vulgare | 1 = 1-5% | | |
| Solanum dulcamara | 1 = 1-5% | | |
| Polypogon monspeliensis | 1 = 1-5% | | |

Comments / Problems: **Pre-construction existing wetland community**

## VEGETATION COMMUNITIES (continued)

Community Number: **6** Community Title (main spp): **Elymus trachycaulus/Bromus spp.**

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Elymus trachycaulus | 3 = 11-20% | Verbascum thapsus | 1 = 1-5% |
| Bromus tectorum | 3 = 11-20% | Cynoglossum officinale | 1 = 1-5% |
| Bromus arvensis | 3 = 11-20% | Centaurea stoebe | 1 = 1-5% |
| Elymus repens | 2 = 6-10% | Solidago canadensis | 1 = 1-5% |
| Cirsium arvense | 2 = 6-10% | Lactuca serriola | 1 = 1-5% |
| Convolvulus arvensis | 2 = 6-10% | Euphorbia esula | + = < 1% |

Comments / Problems: **Community generally located along the drier slope between the upper and lower terraces. Cheatgrass and noxious weeds are increasing.**

Community Number: **7** Community Title (main spp): **Bromus tectorum/Agropyron cristatum**

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Bromus tectorum | 4 = 21-50% | Tragopogon dubius | + = < 1% |
| Agropyron cristatum | 3 = 11-20% | Verbena bracteata | + = < 1% |
| Medicago lupulina | 1 = 1-5% | Sisymbrium altissimum | + = < 1% |
| Convolvulus arvense | 1 = 1-5% | Artemisia frigida | + = < 1% |
| Stipa viridula | 1 = 1-5% | Opuntia aragilis | + = < 1% |
| Marrubium vulgare | 1 = 1-5% | Bare ground | 2 = 6-10% |

Comments / Problems: **Drier upland community type primarily in the southeastern portion of the project area.**

Community Number: **8** Community Title (main spp): **Populus deltoides**

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Populus deltoides | 4 = 21-50% | Hordeum jubatum | 1 = 1-5% |
| Salix exigua | 3 = 11-20% | Juncus articulatus | 1 = 1-5% |
| Poa palustris | 3 = 11-20% | Juncus torreyi | 1 = 1-5% |
| Eleocharis palustris | 3 = 11-20% | Medicago lupulina | 1 = 1-5% |
| Schoenoplectus pungens | 2 = 6-10% | Cirsium arvense | 1 = 1-5% |
| Polypogon monspeliensis | 1 = 1-5% | Elymus trachycaulus | + = < 1% |

Comments / Problems: **Natural encroachment of young Populus deltoides root suckers were the dominant species across several of the depressional wetlands.**

Community Number: **9** Community Title (main spp): **Salix exigua**

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Salix exigua | 4 = 21-50% | Juncus torreyi | 1 = 1-5% |
| Populus deltoides | 3 = 11-20% | Schoenoplectus pungens | 1 = 1-5% |
| Eleocharis palustris | 3 = 11-20% | Typha latifolia | 1 = 1-5% |
| Juncus balticus | 2 = 6-10% | Scirpus microcarpus | 1 = 1-5% |
| Poa palustris | 2 = 6-10% | Epilobium ciliatum | 1 = 1-5% |
| Juncus articulatus | 1 = 1-5% | Pascopyrum smithii | + = < 1% |

Comments / Problems: **New community type in 2016, this CT will likely increase within depressional wetland areas based on the density and coverage of Salix exigua root suckers noted during the June monitoring.**

## VEGETATION COMMUNITIES (continued)

Community Number: **10** Community Title (main spp): **Poa palustris**

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Poa palustris | 5 = > 50% | Eleocharis palustris | 1 = 1-5% |
| Elymus trachycaulus | 2 = 6-10% | Carex nebrascensis | 1 = 1-5% |
| Bromus arvensis | 2 = 6-10% | Cirsium arvense | + = < 1% |
| Alopecurus arundinaceus | 1 = 1-5% | Lactuca serriola | + = < 1% |
| Poa pratensis | 1 = 1-5% | Polypogon monspeliensis | + = < 1% |
| Salix exigua | 1 = 1-5% | Phalaris arundinacea | + = < 1% |

Comments / Problems: **Several of the restored wetland cells have converted from Community Type 2 (Eleocharis palustris/Bromus spp.) to a dominance of Poa palustris.**

Community Number: **11** Community Title (main spp): **Phalaris arundinacea**

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Phalaris arundinacea | 5 = > 50% | | |
| Elymus repens | 1 = 1-5% | | |
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Comments / Problems: **Two small areas noted at the southeastern and southwestern corners of the project site.**

Community Number: ___ Community Title (main spp): _____

| Dominant Species | % Cover | Dominant Species | % Cover |
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Comments / Problems: _____

Community Number: ___ Community Title (main spp): _____

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
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Comments / Problems: _____

**Additional Activities Checklist:**

☒ Record and map vegetative communities on aerial photograph.

## PLANTED WOODY VEGETATION SURVIVAL

| Plant Species | Number Originally Planted | Number Observed | Mortality Causes |
|---|---|---|---|
| Cornus alba | 130 | 3 | |
| Crataegus douglasii | 50 | 0 | |
| Juniperus scopulorum | 50 | 4 | |
| Populus spp. | 140 | 50 | |
| Prunus virginiana | 50 | 6 | |
| Rosa woodsii | 50 | 2 | |
| Salix spp. | 2800 | 202 | Salix exigua best survival |
| Shepherdia argentea | 50 | 0 | |
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| | 3320 | 263 | |

**Comments / Problems: Approximately 27 woody planting areas were mapped by MDT in 2013, generally located around the excavated basins. Locations for the planted vegetation are shown on Figure 2. During the 2016 monitoring, each individual planting group was monitored and live woody plants were counted by species. Approximately 9 percent of the woody plants were alive in 2016, mortality is likely due to lack of hydrology.**

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **June 20, 2016** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **1** Approximate Transect Length: **300 feet** Compass Direction from Start: **240˚** Note: _____

| Transect Interval Length: **16 ft (station 0 to 16)** | |
|---|---|
| Vegetation Community Type: Bromus tectorum/Agropyron cristatum | |
| **Plant Species** | **Cover** |
| Bromus tectorum | 4 = 21-50% |
| Agropyron cristatum | 1 = 1-5% |
| Bromus inermis | 1 = 1-5% |
| Marrubium vulgare | 1 = 1-5% |
| Stipa viridula | 1 = 1-5% |
| Brassica nigra | 1 = 1-5% |
| Verbena bracteata | + = < 1% |
| Tragopogon dubius | + = < 1% |
| Lactua serriola | + = < 1% |
| Sisymbrium altissimum | + = < 1% |
| Bare ground | 2 = 6-10% |
| Total Vegetative Cover: | % |

| Transect Interval Length: **36 ft (station 16 to 52)** | |
|---|---|
| Vegetation Community Type: Salix exigua | |
| **Plant Species** | **Cover** |
| Salix exigua | 3 = 11-20% |
| Eleocharis palustris | 3 = 11-20% |
| Populus deltoides | 3 = 11-20% |
| Poa palustris | 2 = 6-10% |
| Juncus balticus | 2 = 6-10% |
| Scirpus microcarpus | 1 = 1-5% |
| Typha latifolia | 1 = 1-5% |
| Juncus torreyi | 1 = 1-5% |
| Epilobium ciliatum | 1 = 1-5% |
| Hordeum jubatum | 1 = 1-5% |
| Bare ground | 1 = 1-5% |
| Total Vegetative Cover: | % |

| Transect Interval Length: **107 ft (station 52 to 159)** | |
|---|---|
| Vegetation Community Type: Bromus tectorum/Agropyron cristatum | |
| **Plant Species** | **Cover** |
| Bromus tectorum | 4 = 21-50% |
| Agropyron cristatum | 2 = 6-10% |
| Convolvulus arvensis | 2 = 6-10% |
| Melilotus officinalis | 1 = 1-5% |
| Medicago lupulina | 1 = 1-5% |
| Elymus trachycaulus | 1 = 1-5% |
| Artemisia frigida | + = < 1% |
| Filago arvense | + = < 1% |
| Stipa viridula | + = < 1% |
| Cirsium arvense | + = < 1% |
| Hyoscyamus niger | + = < 1% |
| Bare ground | 2 = 6-10% |
| Total Vegetative Cover: | % |

| Transect Interval Length: **85 ft (station 159 to 244)** | |
|---|---|
| Vegetation Community Type: Populus deltoides | |
| **Plant Species** | **Cover** |
| Populus deltoides | 4 = 21-50% |
| Salix exigua | 3 = 11-20% |
| Eleocharis palustris | 3 = 11-20% |
| Poa palustris | 3 = 11-20% |
| Juncus torreyi | 2 = 6-10% |
| Juncus articulatus | 1 = 1-5% |
| Cirsium arvense | 1 = 1-5% |
| Typha latifolia | + = < 1% |
| Schoenoplectus pungens | + = < 1% |
| Persicaria lapathifolia | + = < 1% |
| Elymus trachycaulus | + = < 1% |
| Bare ground | 2 = 6-10% |
| Total Vegetative Cover: | % |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **June 20, 2016** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **1** Approximate Transect Length: **300 feet** Compass Direction from Start: **240˚** Note: _____

| Transect Interval Length: **56 ft (station 244 to 300)** | |
|---|---|
| Vegetation Community Type: Elymus trachycaulus/Bromus spp. | |
| **Plant Species** | **Cover** |
| Elymus trachycaulus | 3 = 11-20% |
| Bromus tectorum | 3 = 11-20% |
| Stipa viridula | 2 = 6-10% |
| Bromus inermis | 2 = 6-10% |
| Poa palustris | 2 = 6-10% |
| Salsola tragus | 2 = 6-10% |
| Cirsium arvense | 2 = 6-10% |
| Convolvulus arvensis | 1 = 1-5% |
| Hyoscyamus niger | 1 = 1-5% |
| Medicago sativa | 1 = 1-5% |
| Bare ground | 2 = 6-10% |
| Total Vegetative Cover: | % |

| Transect Interval Length: | |
|---|---|
| Vegetation Community Type: | |
| **Plant Species** | **Cover** |
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| Total Vegetative Cover: | % |

| Transect Interval Length: | |
|---|---|
| Vegetation Community Type: | |
| **Plant Species** | **Cover** |
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| Total Vegetative Cover: | % |

| Transect Interval Length: | |
|---|---|
| Vegetation Community Type: | |
| **Plant Species** | **Cover** |
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| Total Vegetative Cover: | % |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **June 20, 2016** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **2** Approximate Transect Length: **388 feet** Compass Direction from Start: **255˚** Note: _____

| Transect Interval Length: **30 ft (station 0 to 30)** | |
|---|---|
| Vegetation Community Type: Alopecurus pratensis/Poa palustris | |
| **Plant Species** | **Cover** |
| Alopecurus pratensis | 2 = 6-10% |
| Poa palustris | 2 = 6-10% |
| Elymus trachycaulus | 1 = 1-5% |
| Poa pratensis | 1 = 1-5% |
| Elaeagnus commutata | 1 = 1-5% |
| Mentha arvensis | 1 = 1-5% |
| Elymus repens | 1 = 1-5% |
| Phalaris arundinacea | 1 = 1-5% |
| Lepidium perfoliatum | 1 = 1-5% |
| Hordeum jubatum | 1 = 1-5% |
| | |
| Total Vegetative Cover: | % |

| Transect Interval Length: **309 ft (station 30 to 339)** | |
|---|---|
| Vegetation Community Type: Populus deltoides | |
| **Plant Species** | **Cover** |
| Populus deltoides | 3 = 11-20% |
| Muhlenbergia asperifolia | 3 = 11-20% |
| Juncus balticus | 2 = 6-10% |
| Eleocharis palustris | 2 = 6-10% |
| Phalaris arundinacea | 1 = 1-5% |
| Hordeum jubatum | 1 = 1-5% |
| Salix exigua | 1 = 1-5% |
| Juncus articulatus | 1 = 1-5% |
| Mentha arvensis | 1 = 1-5% |
| Schoenoplectus pungens | 1 = 1-5% |
| Potentilla pensylvanica | 1 = 1-5% |
| Total Vegetative Cover: | % |

| Transect Interval Length: **49 ft (station 339 to 388)** | |
|---|---|
| Vegetation Community Type: Alopercurus pratenis/Poa palustris | |
| **Plant Species** | **Cover** |
| Alopecurus pratensis | 3 = 11-20% |
| Poa palustris | 2 = 6-10% |
| Poa pratensis | 1 = 1-5% |
| Conium maculatum | 1 = 1-5% |
| Schedonorus pratensis | 1 = 1-5% |
| Cirsium arvense | 1 = 1-5% |
| Sonchus arvensis | 1 = 1-5% |
| Typha latifolia | + = < 1% |
| Elymus trachycaulus | + = < 1% |
| Glycyrrhiza lepidota | + = < 1% |
| Cynoglossum officinale | + = < 1% |
| Chenopodium album | + = < 1% |
| Total Vegetative Cover: | % |

| Transect Interval Length: | |
|---|---|
| Vegetation Community Type: | |
| **Plant Species** | **Cover** |
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| Total Vegetative Cover: | % |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **June 20, 2016** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **3** Approximate Transect Length: **292 feet** Compass Direction from Start: **290˚** Note: _____

| Transect Interval Length: **262 ft (station 0 to 262)** | |
|---|---|
| Vegetation Community Type: Alopecurus pratensis/Poa palustris | |
| **Plant Species** | **Cover** |
| Alopecurus pratensis | 3 = 11-20% |
| Poa palustris | 2 = 6-10% |
| Typha latifolia | 2 = 6-10% |
| Carex utriculata | 1 = 1-5% |
| Hordeum jubatum | 1 = 1-5% |
| Eleocharis palustris | 1 = 1-5% |
| Sisymbrium loeselii, Cirsium arvense | 1 = 1-5% |
| Salix exigua, Populus deltoides | 1 = 1-5% |
| Juncus balticus. Juncus torreyi | 1 = 1-5% |
| Poa pratensis, Phalaris arundinacea | 1 = 1-5% |
| Bare ground | 1 = 1-5% |
| Total Vegetative Cover: | % |

| Transect Interval Length: **30 ft (station 262 to 292)** | |
|---|---|
| Vegetation Community Type: Elymus trachycaulus/Bromus spp. | |
| **Plant Species** | **Cover** |
| Elymus trachycaulus | 3 = 11-20% |
| Bromus tectorum | 2 = 6-10% |
| Elymus repens | 2 = 6-10% |
| Alopecurus pratensis | 1 = 1-5% |
| Schedonorus pratensis | 1 = 1-5% |
| Sisymbrium loeselii | 1 = 1-5% |
| Equisetum hyemale | 1 = 1-5% |
| Lactuca serriola | 1 = 1-5% |
| Thlaspi arvense | 1 = 1-5% |
| Sonchus arvensis | + = < 1% |
| Bare ground | 2 = 6-10% |
| Total Vegetative Cover: | % |

| Transect Interval Length: | |
|---|---|
| Vegetation Community Type: | |
| **Plant Species** | **Cover** |
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| Total Vegetative Cover: | % |

| Transect Interval Length: | |
|---|---|
| Vegetation Community Type: | |
| **Plant Species** | **Cover** |
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| Total Vegetative Cover: | % |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

| Cover Estimate | | Indicator Class | Source |
|---|---|---|---|
| + = < 1% | 3 = 11-10% | + = Obligate | P = Planted |
| 1 = 1-5% | 4 = 21-50% | - = Facultative/Wet | V = Volunteer |
| 2 = 6-10% | 5 = > 50% | 0 = Facultative | |

Percent of perimeter developing wetland vegetation (excluding dam/berm structures): ___ %

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 foot depth (in open water), or at the point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 foot wide "belt" along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

Comments: **A comprehensive species list for each transect interval length was recorded during the June 2016 monitoring. Typically species with less than 1 percent were not included on the forms but were used to calculate total upland and wetland species for the summary tables.**

## PHOTOGRAPHS

Take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

**Photograph Checklist:**

- ☐ One photograph for each of the four cardinal directions surrounding the wetland.
- ☒ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.
- ☒ At least one photograph showing the buffer surrounding the wetland.
- ☒ One photograph from each end of the vegetation transect, showing the transect.

| Location | Photograph Frame # | Photograph Description & Lat/Long | Compass Reading (°) |
|---|---|---|---|
| PP-1 | 1 | Wetland cell 14 45.69342/-108.690247 | 280 |
| PP-2 | 1 | Wetland cell 13 45.695136/-108.691839 | 280 |
| PP-3 | 1 | Wetland cell 9 45.694612/-108.69443 | 0 |
| PP-4 | 1 | Wetland cell 12 45.694935/-108.691902 | 200 |
| PP-5 | 1 | Wetland cell 11 45.694748/-108.694458 | 10 |
| PP-6 | 1 | Wetland cell 10 45.694084/-108.694321 | 150 |
| PP-7 | 1 | Wetland cell 5 45.698065/-108.698065 | 90 |
| PP-8 | 1 | Wetland cell 2 45.694939/-108.698429 | 315 |
| PP-9 | 1 | Wetland cell 1 45.694302/-108.698044 | 90 |
| PP-10 | 1 | Wetland cell 3 45.694847/-108.698418 | 140 |
| PP-11 | 1 | Wetland cell 7 45.695892/-108.697601 | 350 |
| PP-12 | 1 | Wetland cell 6 45.694939/-108.696663 | 230 |
| T-1-S | 1 | Transect 1 start 45.695357/-108.690285 | 240 |
| T-1-E | 1 | Transect 1 end 45.695072/-108.691437 | 50 |
| T-2-S | 1 | Transect 2 start 45.693763/-108.695288 | 225 |
| T-2-E | 1 | Transect 2 end 45.693184/-208.696573 | 40 |
| T-3-S | 1 | Transect 3 start 45.693317/-108.697517 | 290 |
| T-3-E | 1 | Transect 3 end 45.693317/-108.698486 | 110 |
| DP-1w<br>DP-1u | | 45.693313/-108.693455<br>45.693439/-108.693354 | |
| DP-2w<br>DP-2u | (was 2 w) | 45.696088/-108.697497<br>45.695972/-108.697454 | |
| DP-3w<br>DP-3u | | 45.695744/-108.698024<br>45.695723/-108.698052 | |
| DP-4w<br>DP-4u | | 45.695832/-108.698144<br>45.696015/-108.698242 | |

**Comments / Problems:** _____

## GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points set at a 5 second recording rate. Record file numbers for site in designated GPS field notebook.

GPS Checklist:

- ☒ Upland/wetland boundary.
- ☒ 4-6 landmarks that are recognizable on the aerial photograph.
- ☒ Start and End points of vegetation transect(s).
- ☒ Photograph reference points.
- ☐ Groundwater monitoring well locations.
- ☒ Bird nest boxes.

Comments / Problems: _____

## WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual and regional supplement.
- ☒ Delineate wetland – upland boundary onto aerial photograph.

Comments / Problems: _____

## FUNCTIONAL ASSESSMENT

- ☒ Complete and attach full MDT Montana Wetland Assessment Method field forms.

Comments / Problems: _____

## MAINTENANCE

Were man-made nesting structure installed at this site? **Yes**
If yes, do they need to be repaired? **Yes**
If yes, describe the problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: **Bird boxes need to be repaired**

## WILDLIFE

### Birds

Were man-made nesting structures installed? **Yes**
If yes, type of structure: **bird boxes** How many? **2**
Are the nesting structures being used? **No**
Do the nesting structures need repairs? **Yes**

### Mammals and Herptiles

| Mammal and Herptile Species | Number Observed | Indirect Indication of Use | | | |
|---|---|---|---|---|---|
| | | Tracks | Scat | Burrows | Other |
| White-tailed Deer | 5 | ☐ | ☐ | ☐ | |
| Raccoon | | ☒ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |

**Additional Activities Checklist:**
**NA** Macroinvertebrate Sampling (if required)

**Comments / Problems: The trees with the two bird boxes have fallen over.**

## BIRD SURVEY – FIELD DATA SHEET

Site: **Kindsfater** Date: **6/20/16**
Survey Time: **8 am** to **8 pm**

| Bird Species | # | Behavior | Habitat | Bird Species | # | Behavior | Habitat |
|---|---|---|---|---|---|---|---|
| Barn Swallow | 1 | L | UP | | | | |
| Common Grackle | 2 | F | SS UP | | | | |
| Collared Dove | 1 | F | UP | | | | |
| European Starling | 5 | F | FO UP | | | | |
| Lazuli Bunting | 2 | F | SS FO | | | | |
| Mourning Dove | 2 | F | UP FO | | | | |
| Red-tailed Hawk | 1 | FO | | | | | |
| Red-winged Blackbird | 3 | F | WM WM | | | | |
| Swainson's Hawk | 1 | FO | | | | | |
| Western Wood-pewee | 2 | F | FO | | | | |
| White-crowned Sparrow | 1 | F | UP | | | | |
| Yellow Warbler | 1 | F | SS | | | | |
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**BEHAVIOR CODES**
**BP** = One of a breeding pair
**BD** = Breeding display
**F** = Foraging
**FO** = Flyover
**L** = Loafing
**N** = Nesting

**HABITAT CODES**
**AB** = Aquatic bed
**FO** = Forested
**I** = Island
**MA** = Marsh
**MF** = Mud Flat
**OW** = Open Water
**SS** = Scrub/Shrub
**UP** = Upland buffer
**WM** = Wet meadow
**US** = Unconsolidated shore

Weather: **Very warm**

Notes: _____

## WETLAND DETERMINATION DATA FORM - Great Plains Region

**Project/Site:** Kindsfater **City/County:** Yellowstone **Sampling Date:** 20-Jun-16

**Applicant/Owner:** MDT **State:** MT **Sampling Point:** **DP-1U**

**Investigator(s):** Cindy Hoschouer **Section, Township, Range:** S 6 T 2S R 25E

**Landform (hillslope, terrace, etc.):** Bench **Local relief (concave, convex, none):** convex **Slope:** 1.0% 0.6 °

**Subregion (LRR):** LRR F **Lat.:** 45.693439 **Long.:** -108.693354 **Datum:** WGS84

**Soil Map Unit Name:** Larim gravelly loam, 15 to 35 percent slopes **NWI classification:** Not Mapped

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

**Are Vegetation** ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ 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 ◉

**Hydric Soil Present?** Yes ◉ No ○

**Wetland Hydrology Present?** Yes ○ No ◉

**Is the Sampled Area within a Wetland?** Yes ○ No ◉

**Remarks:**
Upland sample point. Formerly K-1u.

## VEGETATION - Use scientific names of plants

FWS Region: -?-

| | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| **Tree Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. Elaeagnus angustifolia | 5 | ☑ | 50.0% | FACU |
| 2. Populus deltoides | 5 | ☑ | 50.0% | FAC |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| | 10 | | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| 5. | 0 | ☐ | | |
| | 0 | | = Total Cover | |
| **Herb Stratum** (Plot size: 5 Foot Radius) | | | | |
| 1. Bromus tectorum | 80 | ☑ | 90.9% | UPL |
| 2. Convolvulus arvensis | 2 | ☐ | 2.3% | UPL |
| 3. Elymus trachycaulus | 5 | ☐ | 5.7% | FACU |
| 4. Tragopogon dubius | 1 | ☐ | 1.1% | UPL |
| 5. | 0 | ☐ | 0.0% | |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| 8. | 0 | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| | 88 | | = Total Cover | |
| **Woody Vine Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| | 0 | | = Total Cover | |

**% Bare Ground in Herb Stratum** 0

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

**Prevalence Index worksheet:**

| | Total % Cover of: | | Multiply by: |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 5 | x 3 = | 15 |
| FACU species | 10 | x 4 = | 40 |
| UPL species | 83 | x 5 = | 415 |
| Column Totals: | 98 | (A) | 470 (B) |

Prevalence Index = B/A = 4.796

**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.**

**Hydrophytic Vegetation Present?** Yes ○ No ◉

**Remarks:**
Upland vegetation includes a dominance of cheatgrass, only 33% hydrophytic vegetation and a prevalence index score of 4.8



*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point: DP-1U**

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

| Depth (inches) | Matrix Color (moist) | | % | Redox Features Color (moist) | | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 0-4 | 10YR | 4/2 | 100 | | | | | | Silty Clay Loam | |
| 4-18 | 10YR | 4/2 | 90 | 10YR | 5/6 | 10 | C | M | Sandy Loam | |

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

**Hydric Soil Indicators: (Applicable to all 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 Muck 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 and 73 of LRR H)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 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 ○

Remarks:

Hydric soil indicators were present.

## Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one 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 Invertebrates (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 ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

**Wetland Hydrology Present?** Yes ○ No ◉

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

Remarks:

No primary or secondary indicators were noted.

# WETLAND DETERMINATION DATA FORM - Great Plains Region

**Project/Site:** Kindsfater **City/County:** Yellowstone **Sampling Date:** 20-Jun-16

**Applicant/Owner:** MDT **State:** MT **Sampling Point:** DP-1W

**Investigator(s):** Cindy Hoschouer **Section, Township, Range:** S 6 T 2S R 25E

**Landform (hillslope, terrace, etc.):** Terrace **Local relief (concave, convex, none):** flat **Slope:** 0.5% 0.3 °

**Subregion (LRR):** LRR F **Lat.:** 45.693313 **Long.:** -108.693455 **Datum:** WGS84

**Soil Map Unit Name:** Larim gravelly loam, 15 to 35 percent slopes **NWI classification:** Not Mapped

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

**Are Vegetation** ☐ **, Soil** ☑ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ○ 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 ○

**Hydric Soil Present?** Yes ◉ No ○

**Wetland Hydrology Present?** Yes ◉ No ○

**Is the Sampled Area within a Wetland?** Yes ◉ No ○

**Remarks:**
Due to disturbed soils this area is classified as a wetland. Formerly K-1w.

## VEGETATION - Use scientific names of plants

FWS Region: GP

| | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| **Tree Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. Elaeagnus angustifolia | 10 | ☑ | 100.0% | FACU |
| 2. | 0 | ☐ | 0.0% | |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| | 10 | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| 5. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Herb Stratum** (Plot size: 5 Foot Radius) | | | | |
| 1. Cynoglossum officinale | 5 | ☐ | 6.9% | FACU |
| 2. Juncus balticus | 50 | ☑ | 69.4% | FACW |
| 3. Phalaris arundinacea | 5 | ☐ | 6.9% | FACW |
| 4. Solidago canadensis | 1 | ☐ | 1.4% | FACU |
| 5. Lepidium perfoliatum | 10 | ☐ | 13.9% | FAC |
| 6. Sisymbrium altissimum | 1 | ☐ | 1.4% | FACU |
| 7. | 0 | ☐ | 0.0% | |
| 8. | 0 | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| | 72 | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| | 0 | = Total Cover | | |

**% Bare Ground in Herb Stratum** 10

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

**Prevalence Index worksheet:**

| | Total % Cover of: | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 55 | x 2 = | 110 |
| FAC species | 10 | x 3 = | 30 |
| FACU species | 17 | x 4 = | 68 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 82 (A) | | 208 (B) |

Prevalence Index = B/A = 2.537

**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.**

**Hydrophytic Vegetation Present?** Yes ◉ No ○

**Remarks:**
Hydrophytic vegetation indicators include a prevalence index of 2.5.



*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point: DP-1W**

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

| Depth (inches) | Matrix Color (moist) | | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 0-4 | 10YR | 4/3 | 100 | | | | | Sandy Loam | |
| 4-12 | 10YR | 4/3 | 100 | | | | | Fine Sand | |
| 12+ | | | | | | | | | rock refusal |

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

**Hydric Soil Indicators: (Applicable to all 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 Muck 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 and 73 of LRR H)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 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 ○

Remarks:

No hydric soil indicators observed. Mitigation site construction may have modified soil profile and if hydrology remains, hydric soils may develop (Indicators for Problematic Hydric Soils- Recently Developed Wetland).

## Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one 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 Invertebrates (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 ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

**Wetland Hydrology Present?** Yes ◉ No ○

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

Remarks:

Signs of seasonal water in portions of this wetland. Drains to the south, southeast.

## WETLAND DETERMINATION DATA FORM - Great Plains Region

**Project/Site:** Kindsfater **City/County:** Yellowstone **Sampling Date:** 20-Jun-16

**Applicant/Owner:** MDT **State:** MT **Sampling Point:** **DP-2U**

**Investigator(s):** Cindy Hoschouer **Section, Township, Range:** **S** 6 **T** 2S **R** 25E

**Landform (hillslope, terrace, etc.):** slope **Local relief (concave, convex, none):** concave **Slope:** 2.0% 1.1 °

**Subregion (LRR):** LRR F **Lat.:** 45.695972 **Long.:** -108.69745 **Datum:** WGS84

**Soil Map Unit Name:** Bew silty clay loam, 0 to 1 percent slopes **NWI classification:** Not Mapped

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

**Are Vegetation** ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ 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 ◉

**Hydric Soil Present?** Yes ○ No ◉

**Wetland Hydrology Present?** Yes ○ No ◉

**Is the Sampled Area within a Wetland?** Yes ○ No ◉

**Remarks:**
Upland sample point. Formerly K-2u.

### VEGETATION - Use scientific names of plants

FWS Region: -?-

| | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| **Tree Stratum** (Plot size: 30 Foot Radius ) | | | | |
| 1. Elaeagnus angustifolia | 1 | ☐ | 100.0% | FACU |
| 2. | 0 | ☐ | 0.0% | |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| | 1 | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15 Foot Radius ) | | | | |
| 1. | | ☐ | | |
| 2. | | ☐ | | |
| 3. | | ☐ | | |
| 4. | | ☐ | | |
| 5. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Herb Stratum** (Plot size: 5 Foot Radius ) | | | | |
| 1. Bromus inermis | 20 | ☑ | 22.2% | UPL |
| 2. Bromus tectorum | 40 | ☑ | 44.4% | UPL |
| 3. Elymus trachycaulus | 30 | ☑ | 33.3% | FACU |
| 4. | 0 | ☐ | 0.0% | |
| 5. | 0 | ☐ | 0.0% | |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| 8. | 0 | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| | 90 | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30 Foot Radius ) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| | 0 | = Total Cover | | |

**% Bare Ground in Herb Stratum** 4

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

**Prevalence Index worksheet:**

| | Total % Cover of: | | Multiply by: | |
|---|---|---|---|---|
| OBL species | 0 | x 1 = | 0 | |
| FACW species | 0 | x 2 = | 0 | |
| FAC species | 0 | x 3 = | 0 | |
| FACU species | 31 | x 4 = | 124 | |
| UPL species | 60 | x 5 = | 300 | |
| Column Totals: | 91 | (A) | 424 | (B) |

Prevalence Index = B/A = 4.659

**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.**

**Hydrophytic Vegetation Present?** Yes ○ No ◉

**Remarks:**
Plot has a dominance of FACU and UPL species



*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point: DP-2U**

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

| Depth (inches) | Matrix Color (moist) | | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 0-16 | 10YR | 4/1 | 100 | | | | | Sandy Loam | |
| 16-21 | 10YR | 4/2 | 100 | | | | | Sandy Loam | |

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

**Hydric Soil Indicators: (Applicable to all 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 Muck 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 and 73 of LRR H)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 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 ◉

Remarks:

No hydric soil indicators observed.

## Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one 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 Invertebrates (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 ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

**Wetland Hydrology Present?** Yes ○ No ◉

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

Remarks:

No primary or secondary indicators observed.

# WETLAND DETERMINATION DATA FORM - Great Plains Region

**Project/Site:** Kindsfater **City/County:** Yellowstone **Sampling Date:** 20-Jun-16

**Applicant/Owner:** MDT **State:** MT **Sampling Point:** **DP-2U(V2)**

**Investigator(s):** Cindy Hoschouer **Section, Township, Range:** **S** 6 **T** 2S **R** 25E

**Landform (hillslope, terrace, etc.):** Excavated depression **Local relief (concave, convex, none):** concave **Slope:** 1.5% 0.9 °

**Subregion (LRR):** LRR F **Lat.:** 45.696088 **Long.:** -108.697497 **Datum:** WGS84

**Soil Map Unit Name:** Bew silty clay loam, 0 to 1 percent slopes **NWI classification:** Not Mapped

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

**Are Vegetation** ☐ **, Soil** ☑ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ○ 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 ◉

**Hydric Soil Present?** Yes ◉ No ○

**Wetland Hydrology Present?** Yes ○ No ◉

**Is the Sampled Area within a Wetland?** Yes ○ No ◉

**Remarks:**

In 2015 this data point was located in a wetland depression. Dry spring and summer conditions in 2016 have resulted in a dominance of upland vegetation and changes in hydrology. Formerly K-2w.

## VEGETATION - Use scientific names of plants

FWS Region: GP

| | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| **Tree Stratum** (Plot size: 30 Foot Radius ) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15 Foot Radius ) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| 5. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Herb Stratum** (Plot size: 5 Foot Radius ) | | | | |
| 1. Bromus arvensis | 10 | ☐ | 10.2% | FACU |
| 2. Bromus tectorum | 80 | ☑ | 81.6% | UPL |
| 3. Elymus trachycaulus | 5 | ☐ | 5.1% | FACU |
| 4. Sisymbrium altissimum | 2 | ☐ | 2.0% | FACU |
| 5. Tragopogon dubius | 1 | ☐ | 1.0% | UPL |
| 6. | | ☐ | 0.0% | |
| 7. | | ☐ | 0.0% | |
| 8. | | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| | 98 | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30 Foot Radius ) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| | 0 | = Total Cover | | |

**% Bare Ground in Herb Stratum** 0

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

**Prevalence Index worksheet:**

| | Total % Cover of: | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 17 | x 4 = | 68 |
| UPL species | 81 | x 5 = | 405 |
| Column Totals: | 98 (A) | | 473 (B) |

Prevalence Index = B/A = 4.827

**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.**

**Hydrophytic Vegetation Present?** Yes ○ No ◉

**Remarks:**

A dominance of UPL vegtation within this sample/data point. Prevalence index greater than 3.0.



*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point: DP-2U(V2)**

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

| Depth (inches) | Matrix Color (moist) | | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 0-16 | 10YR | 4/1 | 100 | | | | | Sandy Loam | |
| 16-18 | 10YR | 4/2 | 100 | | | | | Loamy Sand | |

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

**Hydric Soil Indicators: (Applicable to all 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 Muck 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 and 73 of LRR H)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 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 ○

Remarks:

Hydric soils not observed but expected to develop if site hydrology remains (Indicators for Problematic Hydric Soils- Recently Developed Wetland).

## Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one 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 Invertebrates (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 ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

**Wetland Hydrology Present?** Yes ○ No ◉

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

Remarks:

This data point will continue to be monitored to track changes in vegetation and hydrology.

# WETLAND DETERMINATION DATA FORM - Great Plains Region

**Project/Site:** Kindsfater **City/County:** Yellowstone **Sampling Date:** 20-Jun-16

**Applicant/Owner:** MDT **State:** MT **Sampling Point:** DP-3U

**Investigator(s):** Cindy Hoschouer **Section, Township, Range:** S 6 T 2S R 25E

**Landform (hillslope, terrace, etc.):** Bench **Local relief (concave, convex, none):** none **Slope:** 1.0% 0.6 °

**Subregion (LRR):** LRR F **Lat.:** 45.695823 **Long.:** -108.698208 **Datum:** WGS84

**Soil Map Unit Name:** Bew silty clay loam, 0 to 1 percent slopes **NWI classification:** Not Mapped

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

**Are Vegetation** ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ 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 ◉

**Hydric Soil Present?** Yes ○ No ◉

**Wetland Hydrology Present?** Yes ○ No ◉

**Is the Sampled Area within a Wetland?** Yes ○ No ◉

**Remarks:**
New data point in 2016. Upland sample point paired with DP-3W.

## VEGETATION - Use scientific names of plants

FWS Region: GP

| | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| **Tree Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. Elaeagnus angustifolia | 10 | ☑ | 100.0% | FACU |
| 2. | 0 | ☐ | 0.0% | |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| | 10 | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| 5. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Herb Stratum** (Plot size: 5 Foot Radius) | | | | |
| 1. Bromus tectorum | 5 | ☐ | 5.9% | UPL |
| 2. Elymus trachycaulus | 5 | ☐ | 5.9% | FACU |
| 3. Lepidium perfoliatum | 20 | ☑ | 23.5% | FAC |
| 4. Cirsium arvense | 5 | ☐ | 5.9% | FACU |
| 5. Descurainia sophia | 40 | ☑ | 47.1% | UPL |
| 6. Schedonorus pratensis | 10 | ☐ | 11.8% | FACU |
| 7. | 0 | ☐ | 0.0% | |
| 8. | 0 | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| | 85 | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| | 0 | = Total Cover | | |

**% Bare Ground in Herb Stratum** 10

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

**Prevalence Index worksheet:**

| | Total % Cover of: | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 20 | x 3 = | 60 |
| FACU species | 30 | x 4 = | 120 |
| UPL species | 45 | x 5 = | 225 |
| Column Totals: | 95 (A) | | 405 (B) |

Prevalence Index = B/A = 4.263

**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.**

**Hydrophytic Vegetation Present?** Yes ○ No ◉

**Remarks:**

Only 33.3% cover by hydrophytic vegetation and a prevalence index value that exceeds 3.0.



*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point: DP-3U**

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-18 | 10YR 4/2 | 100 | | | | | Sandy Loam | |

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

**Hydric Soil Indicators: (Applicable to all 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 Muck 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 and 73 of LRR H)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 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 ◉

Remarks:

Hydric soil indicators were not present.

## Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one 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 Invertebrates (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 ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

**Wetland Hydrology Present?** Yes ○ No ◉

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

Remarks:

Soils were very dry. No primary or seconday hydrology indicators noted.

# WETLAND DETERMINATION DATA FORM - Great Plains Region

**Project/Site:** Kindsfater **City/County:** Yellowstone **Sampling Date:** 20-Jun-16

**Applicant/Owner:** MDT **State:** MT **Sampling Point:** DP-3W

**Investigator(s):** Cindy Hoschouer **Section, Township, Range:** S 6 T 2S R 25E

**Landform (hillslope, terrace, etc.):** Lowland **Local relief (concave, convex, none):** concave **Slope:** 1.0% 0.6 °

**Subregion (LRR):** LRR F **Lat.:** 45.695744 **Long.:** -108.698024 **Datum:** WGS84

**Soil Map Unit Name:** Bew silty clay loam, 0 to 1 percent slopes **NWI classification:** PEM

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

**Are Vegetation** ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ 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 ○

**Hydric Soil Present?** Yes ◉ No ○

**Wetland Hydrology Present?** Yes ◉ No ○

**Is the Sampled Area within a Wetland?** Yes ◉ No ○

**Remarks:**
Wetland data point along the perimeter of a Typha latifolia wetland.

## VEGETATION - Use scientific names of plants

FWS Region: GP

| | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| **Tree Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| 5. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Herb Stratum** (Plot size: 5 Foot Radius) | | | | |
| 1. Alopecurus arundinaceus | 50 | ☑ | 52.6% | FACW |
| 2. Phalaris arundinacea | 30 | ☑ | 31.6% | FACW |
| 3. Bromus inermis | 5 | ☐ | 5.3% | UPL |
| 4. Eleocharis palustris | 5 | ☐ | 5.3% | OBL |
| 5. Carex nebrascensis | 5 | ☐ | 5.3% | OBL |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| 8. | 0 | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| | 95 | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| | 0 | = Total Cover | | |

**% Bare Ground in Herb Stratum** 5

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| | Total % Cover of: | | Multiply by: | |
|---|---|---|---|---|
| OBL species | 10 | x 1 = | 10 | |
| FACW species | 80 | x 2 = | 160 | |
| FAC species | 0 | x 3 = | 0 | |
| FACU species | 0 | x 4 = | 0 | |
| UPL species | 5 | x 5 = | 25 | |
| Column Totals: | 95 | (A) | 195 | (B) |

Prevalence Index = B/A = 2.053

**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.**

**Hydrophytic Vegetation Present?** Yes ◉ No ○

**Remarks:**

A dominance of hydrophytic vegetation, primarily FACW species.



*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point: DP-3W**

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

| Depth (inches) | Matrix Color (moist) | | % | Redox Features Color (moist) | | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 0-20 | 10YR | 4/2 | 85 | 10YR | 5/6 | 15 | C | M | Clay Loam | |

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

**Hydric Soil Indicators: (Applicable to all 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 Muck 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 and 73 of LRR H)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 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 ○

Remarks:

Hydric soils were present.

## Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one 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 Invertebrates (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 ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

**Wetland Hydrology Present?** Yes ◉ No ○

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

Remarks:

4 secondary indicators observed. Soils were moist within the upper 14 inches and saturated below 14.

## WETLAND DETERMINATION DATA FORM - Great Plains Region

**Project/Site:** Kindsfater **City/County:** Yellowstone **Sampling Date:** 20-Jun-16

**Applicant/Owner:** MDT **State:** MT **Sampling Point:** **DP-4U**

**Investigator(s):** Cindy Hoschouer **Section, Township, Range:** **S** 6 **T** 2S **R** 25E

**Landform (hillslope, terrace, etc.):** Slope **Local relief (concave, convex, none):** convex **Slope:** 3.0% 1.7 °

**Subregion (LRR):** LRR F **Lat.:** 45.695587 **Long.:** -108.696954 **Datum:** WGS84

**Soil Map Unit Name:** Bew silty clay loam, 0 to 1 percent slopes **NWI classification:** Not Mapped

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

**Are Vegetation** ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ 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 ◉

**Hydric Soil Present?** Yes ○ No ◉

**Wetland Hydrology Present?** Yes ○ No ◉

**Is the Sampled Area within a Wetland?** Yes ○ No ◉

**Remarks:**
New data point in 2016. Upland sample point.

## VEGETATION - Use scientific names of plants

FWS Region: GP

| | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| **Tree Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| 5. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Herb Stratum** (Plot size: 5 Foot Radius) | | | | |
| 1. Bromus tectorum | 75 | ☑ | 83.3% | UPL |
| 2. Elymus trachycaulus | 5 | ☐ | 5.6% | FACU |
| 3. Elymus lanceolatus | 10 | ☐ | 11.1% | FACU |
| 4. | 0 | ☐ | 0.0% | |
| 5. | 0 | ☐ | 0.0% | |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| 8. | 0 | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| | 90 | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| | 0 | = Total Cover | | |

**% Bare Ground in Herb Stratum** 10

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

**Prevalence Index worksheet:**

| | Total % Cover of: | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 15 | x 4 = | 60 |
| UPL species | 75 | x 5 = | 375 |
| Column Totals: | 90 | (A) | 435 (B) |

Prevalence Index = B/A = 4.833

**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.**

**Hydrophytic Vegetation Present?** Yes ○ No ◉

**Remarks:**
Cheatgrass represents the majority of the cover across this data point



*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point:** DP-4U

**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 |
|---|---|---|---|---|---|---|---|---|
| 0-1 | | | | | | | | duff, cheatgrass litter |
| 1-18 | 10YR 4/3 | 100 | | | | | Sandy Silt Loam | |

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

**Hydric Soil Indicators: (Applicable to all 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 Muck 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 and 73 of LRR H)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 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 ◉

Remarks:

Hydric soil indicators were not present.

## Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one 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 Invertebrates (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 ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

**Wetland Hydrology Present?** Yes ○ No ◉

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

Remarks:

No primary or secondary indicators observed.

# WETLAND DETERMINATION DATA FORM - Great Plains Region

**Project/Site:** Kindsfater **City/County:** Yellowstone **Sampling Date:** 20-Jun-16

**Applicant/Owner:** MDT **State:** MT **Sampling Point:** DP-4W

**Investigator(s):** Cindy Hoschouer **Section, Township, Range:** S 6 T 2S R 25E

**Landform (hillslope, terrace, etc.):** Excavated depression **Local relief (concave, convex, none):** concave **Slope:** 1.0% 0.6 °

**Subregion (LRR):** LRR F **Lat.:** 45.695590 **Long.:** -108.697120 **Datum:** WGS84

**Soil Map Unit Name:** Bew silty clay loam, 0 to 1 percent slopes **NWI classification:** Not Mapped

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

**Are Vegetation** ☐ **, Soil** ☑ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ○ 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 ○

**Hydric Soil Present?** Yes ◉ No ○

**Wetland Hydrology Present?** Yes ◉ No ○

**Is the Sampled Area within a Wetland?** Yes ◉ No ○

**Remarks:**
New data point in 2016. Constructed depressional wetland.

## VEGETATION - Use scientific names of plants

FWS Region: GP

| | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| **Tree Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| 3. | 0 | ☐ | | |
| 4. | 0 | ☐ | | |
| 5. | 0 | ☐ | | |
| | 0 | = Total Cover | | |
| **Herb Stratum** (Plot size: 5 Foot Radius) | | | | |
| 1. Poa palustris | 80 | ☑ | 93.0% | FACW |
| 2. Sonchus arvensis | 5 | ☐ | 5.8% | FAC |
| 3. Taraxacum officinale | 1 | ☐ | 1.2% | FACU |
| 4. | 0 | ☐ | 0.0% | |
| 5. | 0 | ☐ | 0.0% | |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| 8. | 0 | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| | 86 | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30 Foot Radius) | | | | |
| 1. | 0 | ☐ | | |
| 2. | 0 | ☐ | | |
| | 0 | = Total Cover | | |

**% Bare Ground in Herb Stratum** 0

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| | Total % Cover of: | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 80 | x 2 = | 160 |
| FAC species | 5 | x 3 = | 15 |
| FACU species | 1 | x 4 = | 4 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 86 (A) | | 179 (B) |

Prevalence Index = B/A = 2.081

**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.**

**Hydrophytic Vegetation Present?** Yes ◉ No ○

**Remarks:**
Litter is approximately 15% of the ground cover.



*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point: DP-4W**

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-18 | 10YR 4/3 | 100 | | | | | Silty Loam | |

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

**Hydric Soil Indicators: (Applicable to all 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 Muck 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 and 73 of LRR H)**

**Indicators for Problematic Hydric Soils[3]:**

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 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 ○

Remarks:

No hydric soil indicators observed. Mitigation site construction may have modified soil profile and if hydrology remains, hydric soils may develop (indicators for Problematic Hydric Soils- Recently Developed Wetland).

## Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one 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 Invertebrates (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 ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

**Wetland Hydrology Present?** Yes ◉ No ○

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

Remarks:

Three secondary hydrology indicators.

# MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

**1. Project Name:** Kindsfater **2. MDT Project #:** STPX-0056(56) **3. Control #:** 5034

**3. Evaluation Date:** 6/20/2016 **4. Evaluator(s):** C. Hoschouer, C. Seibert **5. Wetland/Site #(s):** Kindsfater - created wetland

**6. Wetland Location(s):** Township 2 S, Range 25 E, Section 6; Township ___ N, Range ___ E, Section _____

**Approximate Stationing or Roadposts:** _____

**Watershed:** 13 - Upper Yellowstone **County:** _ _ Yellowstone _____

**7. Evaluating Agency:** RESPEC for MDT

**Purpose of Evaluation:**

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

**8. Wetland Size (acre):** _____ (visually estimated)
2.0 (measured, e.g. GPS)

**9. Assessment Area (AA) Size (acre):** _____ (visually estimated)
(see manual for determining AA) 2.0 (measured, e.g. GPS)

**10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA** (See manual for definitions.)

| HGM Class (Brinson) | Class (Cowardin) | Modifier (Cowardin) | Water Regime | % OF AA |
|---|---|---|---|---|
| Depressional | Emergent Wetland | Excavated | Seasonal / Intermittent | 50 |
| Depressional | Scrub-Shrub Wetland | Excavated | Seasonal / Intermittent | 50 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Comments:** _____

**11. ESTIMATED RELATIVE ABUNDANCE** (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
common

**12. GENERAL CONDITION OF AA**

**i. Disturbance:** Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

| Conditions within AA | Predominant Conditions Adjacent to (within 500 feet of) AA | | |
|---|---|---|---|
| | Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is 15%. | Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is 30%. | Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%. |
| AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is 15%. | --- | --- | --- |
| AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is 30%. | --- | moderate disturbance | --- |
| AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%. | --- | --- | --- |

**Comments** (types of disturbance, intensity, season, etc.)**:** The wetland mitigation site was constructed in 2012/2013 and included substantial excavation, modification/rehabilitation to existing wetlands, and revegetation. Based on review of previous data and reports, the preserved wetland areas at higher elevations appear to be losing hydrology with excavated wetland cells retaining hydrology but also drying out. Site will need to be re-evaluated in 2017 specifically for preserved wetlands and for existing wetland areas outside of excavated cells.

**ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species:** Euphorbia esula, Cirsium arvense, Cynoglossum officinale, Centaurea stoebe, and Convolvulus arvensis.

**iii. Provide brief descriptive summary of AA and surrounding land use/habitat:** The AA consists of excavated depressional wetland cells within a historic gravel pit/wetland site. Wetland mitigation construction was completed in 2013 and 2016 is the fourth monitoring year for the expanded wetland site. Land use surrounding the AA includes commerical developments, agriculture (grazing), transportation (railroad and interstate), and a shooting range within the site.

**13. STRUCTURAL DIVERSITY** (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

| Existing # of "Cowardin" Vegetated Classes in AA | Initial Rating | Is current management preventing (passive) existence of additional vegetated classes? | | Modified Rating |
|---|---|---|---|---|
| 3 (or 2 if one is forested) classes | --- | NA | NA | NA |
| 2 (or 1 if forested) classes | mod | NA | NA | NA |
| 1 class, but not a monoculture | --- | ←NO | YES→ | --- |
| 1 class, monoculture (1 species comprises 90% of total cover) | --- | NA | NA | NA |

**Comments:** Palustrine emergent vegetation and young palustrine scrub-shrub communities developing.

Wetland/Site #(s): Kindsfater - created wetland

**14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS**

**i. AA is Documented (D) or Suspected (S) to contain:** Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

**ii. Rating:** Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

| Highest Habitat Level | Doc/Primary | Sus/Primary | Doc/Secondary | Sus/Secondary | Doc/Incidental | Sus/Incidental | None |
|---|---|---|---|---|---|---|---|
| **Functional Point/Rating** | --- | --- | --- | --- | --- | --- | 0L |

**Sources for documented use** (e.g. observations, records): USFWS list for species in Yellowstone County; no habitat specifications/known occurrences

**14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM**
Do not include species listed in 14A above.

**i. AA is Documented (D) or Suspected (S) to contain:** Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☒ D ☐ S Plains spadefoot
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☐ S

**ii. Rating:** Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

| Highest Habitat Level | Doc/Primary | Sus/Primary | Doc/Secondary | Sus/Secondary | Doc/Incidental | Sus/Incidental | None |
|---|---|---|---|---|---|---|---|
| **S1 Species Functional Point/Rating** | --- | --- | --- | --- | --- | --- | --- |
| **S2 and S3 Species Functional Point/Rating** | .9H | --- | --- | --- | --- | --- | --- |

**Sources for documented use** (e.g. observations, records): Observed approximately 40 plains spadefoot during the 2013 site investigation; none observed in 2014, 2015 or 2016.

**14C. GENERAL WILDLIFE HABITAT RATING**

**i. Evidence of Overall Wildlife Use in the AA:** Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☒ ***Moderate:*** Based on any of the following [check].
- ☒ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☒ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☒ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

**ii. Wildlife Habitat Features:** Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

| **Structural Diversity** (see #13) | ☐ **High** | | | | | | | | ☒ **Moderate** | | | | | | | | ☐ **Low** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Class Cover Distribution** (all vegetated classes) | ☐ **Even** | | | | ☐ **Uneven** | | | | ☐ **Even** | | | | ☒ **Uneven** | | | | ☐ **Even** | | | |
| **Duration of Surface Water in ≥ 10% of AA** | **P/P** | **S/I** | **T/E** | **A** | **P/P** | **S/I** | **T/E** | **A** | **P/P** | **S/I** | **T/E** | **A** | **P/P** | **S/I** | **T/E** | **A** | **P/P** | **S/I** | **T/E** | **A** |
| ☐ **Low Disturbance** at AA (see #12i) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ☐ **Moderate Disturbance** at AA (see #12i) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | M | --- | --- | --- | --- | --- | --- |
| ☒ **High Disturbance** at AA (see #12i) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**iii. Rating:** Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

| **Evidence of Wildlife Use (i)** | **Wildlife Habitat Features Rating (ii)** ☐ **Exceptional** | ☐ **High** | ☒ **Moderate** | ☐ **Low** |
|---|---|---|---|---|
| ☐ **Substantial** | --- | --- | --- | --- |
| ☒ **Moderate** | --- | --- | .5M | --- |
| ☐ **Minimal** | --- | --- | --- | --- |

**Comments:** Wildlife rating is expected to increase in subsequent monitoring years.

Wetland/Site #(s): Kindsfater - created wetland

**14D. GENERAL FISH HABITAT** ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

**Type of Fishery:** ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

**i. Habitat Quality and Known / Suspected Fish Species in AA:** Use matrix to select the functional point and rating.

| **Duration of Surface Water in AA** | ☐ **Permanent / Perennial** | | | | | | ☐ **Seasonal / Intermittent** | | | | | | ☐ **Temporary / Ephemeral** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Aquatic Hiding / Resting / Escape Cover** | ☐ **Optimal** | | ☐ **Adequate** | | ☐ **Poor** | | ☐ **Optimal** | | ☐ **Adequate** | | ☐ **Poor** | | ☐ **Optimal** | | ☐ **Adequate** | | ☐ **Poor** | |
| **Thermal Cover: optimal / suboptimal** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** |
| **FWP Tier I** fish species | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FWP Tier II** or **Native Game** fish species | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FWP Tier III** or **Introduced Game** fish | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FWP Non-Game Tier IV** or **No** fish species | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Sources used for identifying fish spp. potentially found in AA:** _____

**ii. Modified Rating:** NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

*a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity,* ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

*b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish?* ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

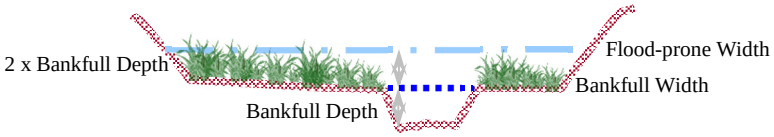
**iii. Final Score and Rating:** _ **Comments:** No fish habitat within mitigation site; no perennial water

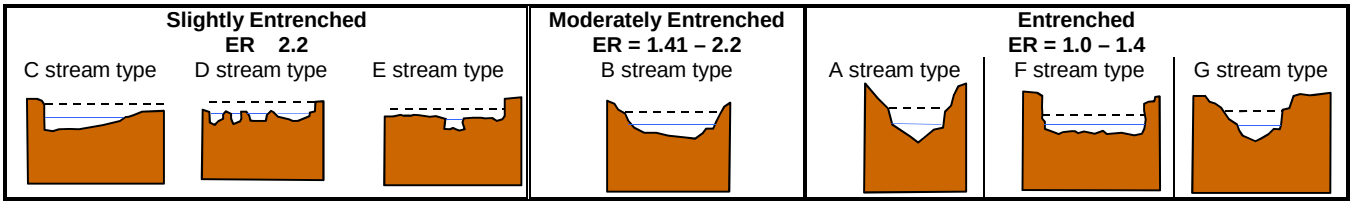
**14E. FLOOD ATTENUATION** ☒ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

**Entrenchment Ratio (ER) Estimation** (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio




**i. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating.

| **Estimated or Calculated Entrenchment** (Rosgen 1994, 1996) | ☐ Slightly Entrenched C, D, E stream types | | | ☐ Moderately Entrenched B stream type | | | ☐ Entrenched A, F, G stream types | | |
|---|---|---|---|---|---|---|---|---|---|
| **Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub** | ☐ 75% | ☐ 25-75% | ☐ <25% | ☐ 75% | ☐ 25-75% | ☐ <25% | ☐ 75% | ☐ 25-75% | ☐ <25% |
| AA contains **no outlet or restricted outlet** | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AA contains **unrestricted outlet** | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**ii. Are 10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA?** ☐ YES ☒ NO **Comments:** Flooding does not occur on the site as groundwater is the primary hyrdology sources; no flooding occurs from in channel or overbank flow.

Wetland/Site #(s): Kindsfater - created wetland

**14F. SHORT AND LONG TERM SURFACE WATER STORAGE** ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

**i. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual for further definitions of these terms].

| **Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding** | ☐ **>5 acre feet** | | | ☐ **1.1 to 5 acre feet** | | | ☒ **≤1 acre foot** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Duration of Surface Water at Wetlands within the AA** | ☐ **P/P** | ☐ **S/I** | ☐ **T/E** | ☐ **P/P** | ☐ **S/I** | ☐ **T/E** | ☐ **P/P** | ☒ **S/I** | ☐ **T/E** |
| Wetlands in AA flood or pond **≥ 5 out of 10 years** | --- | --- | --- | --- | --- | --- | --- | .3L | --- |
| Wetlands in AA flood or pond **< 5 out of 10 years** | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Comments:** Estimated that AA ponds greater than 5 out of 10 years with approximately 2.0 acres inundated to approximatley 0.5 feet.

**14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVAL** ☐ **NA** (proceed to 14H)

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

**i. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating.

| **Sediment, Nutrient, and Toxicant Input Levels within AA** | **AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.** | | | | **Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.** | | | |
|---|---|---|---|---|---|---|---|---|
| **% Cover of Wetland Vegetation in AA** | ☒ **≥ 70%** | | ☐ **< 70%** | | ☐ **≥ 70%** | | ☐ **< 70%** | |
| **Evidence of Flooding / Ponding in AA** | ☒ **Yes** | ☐ **No** | ☐ **Yes** | ☐ **No** | ☐ **Yes** | ☐ **No** | ☐ **Yes** | ☐ **No** |
| AA contains **no or restricted outlet** | 1H | --- | --- | --- | --- | --- | --- | --- |
| AA contains **unrestricted outlet** | --- | --- | --- | --- | --- | --- | --- | --- |

**Comments:** Isolated depressional wetland cells do not have outlets. Percent cover of wetland vegetation increased slightly to greater than 70%.

**14H. SEDIMENT / SHORELINE STABILIZATION** ☒ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

| **% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of 6** (see Appendix F). | **Duration of Surface Water Adjacent to Rooted Vegetation** | | |
|---|---|---|---|
| | ☐ **Permanent / Perennial** | ☐ **Seasonal / Intermittent** | ☐ **Temporary / Ephemeral** |
| ☐ **≥ 65%** | --- | --- | --- |
| ☐ **35-64%** | --- | --- | --- |
| ☐ **< 35%** | --- | --- | --- |

**Comments:** The AA does not occur on a stream bank or drainage. No wave action occurs in depression wetland areas when inundated.

**14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT**

**i. Level of Biological Activity:** Synthesis of wildlife and fish habitat rates (select).

| **General Fish Habitat Rating (14Diii)** | **General Wildlife Habitat Rating (14Ciii)** | | |
|---|---|---|---|
| | ☐ **E/H** | ☐ **M** | ☒ **L** |
| ☐ **E/H** | --- | --- | --- |
| ☐ **M** | --- | --- | --- |
| ☐ **L** | --- | --- | --- |
| ☒ **NA** | --- | --- | L |

**ii. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

| **A** | ☐ **Vegetated Component >5 acres** | | | | | | ☒ **Vegetated Component 1-5 acres** | | | | | | ☐ **Vegetated Component <1 acre** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **B** | ☐ **High** | | ☐ **Moderate** | | ☐ **Low** | | ☐ **High** | | ☐ **Moderate** | | ☒ **Low** | | ☐ **High** | | ☐ **Moderate** | | ☐ **Low** | |
| **C** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** |
| **P/P** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/I** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | .2L | --- | --- | --- | --- | --- | --- |
| **T/E/A** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

Wetland/Site #(s): Kindsfater - created wetland

**14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT** (continued)

**iii. Modified Rating:** Note: Modified score cannot exceed 1.0 or be less than 0.1.

***Vegetated Upland Buffer:*** Area with 30% plant cover, 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
*Is there an average 50-foot wide vegetated upland buffer around 75% of the AA's perimeter?* ☒ **YES**, add 0.1 to score in **ii** = 0.30 ☐ **NO**

**iv. Final Score and Rating:** .3L **Comments:** Adjacent upland buffer with greater than 30% plant cover.

**14J. GROUNDWATER DISCHARGE / RECHARGE**
Check the appropriate indicators in i and ii below.

**i. Discharge Indicators**
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☒ Vegetation growing during dormant season/drought.
- ☐ Wetland occurs at the toe of a natural slope.
- ☐ Seeps are present at the wetland edge.
- ☐ AA permanently flooded during drought periods.
- ☐ Wetland contains an outlet, but no inlet.
- ☐ Shallow water table and the site is saturated to the surface.
- ☐ Other: _____

**ii. Recharge Indicators**
- ☒ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

**iii. Rating:** Use the information from i and ii above and the table below to select the functional point and rating.

| Criteria | Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☐ **P/P** | ☒ **S/I** | ☐ **T** | ☐ **None** |
|---|---|---|---|---|
| ☒ **Groundwater Discharge or Recharge** | --- | .7M | --- | --- |
| ☐ **Insufficient Data/Information** | --- | | | |

**Comments:** Vegetation observed to be growing following regional drought conditions; gravel substrate in created depressional wetland areas.

**14K. UNIQUENESS**

**i. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating.

| **Replacement Potential** | **AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP** | | | **AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP** | | | **AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Estimated Relative Abundance** (#11) | ☐ Rare | ☐ Common | ☐ Abundant | ☐ Rare | ☐ Common | ☐ Abundant | ☐ Rare | ☒ Common | ☐ Abundant |
| ☐ **Low Disturbance** at AA (#12i) | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ☐ **Moderate Disturbance** at AA (#12i) | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ☒ **High Disturbance** at AA (#12i) | --- | --- | --- | --- | --- | --- | --- | .2L | --- |

**Comments:** _____

**14L. RECREATION / EDUCATION POTENTIAL** ☐ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

**i. Is the AA a known or potential recreational or educational site?** ☒ **YES**, go to ii. ☐ **NO**, check the NA box.

**ii. Check categories that apply to the AA:** ☒ Educational/Scientific Study ☐ Consumptive Recreational ☒ Non-consumptive recreational ☐ Other: _____

**iii. Rating:** Use the matrix below to select the functional point and rating.

| **Known or Potential Recreational or Educational Area** | **Known** | **Potential** |
|---|---|---|
| **Public ownership or public easement with general public access (no permission required)** | .2H | --- |
| **Private ownership with general public access (no permission required)** | --- | --- |
| **Private or public ownership without general public access, or requiring permission for public access** | --- | --- |

**Comments:** Access is permitted without permission with the exception of the police shooting range.

**15. GENERAL SITE NOTES:** Anticipate higher wildlife ratings in subsequent monitoring years. Wetland acreage is less in 2016 due to transitioning hydrology and plant communities.

Wetland/Site #(s): Kindsfater - created wetland

| Function & Value Variables | Rating – Actual Functional Points | Possible Functional Points | Functional Units: Actual Points x Estimated AA Acreage | Indicate the Four Most Prominent Functions with an Asterisk |
|---|---|---|---|---|
| A. Listed / Proposed T&E Species Habitat | low 0.00 | 1.00 | 0 | |
| B. MT Natural Heritage Program Species Habitat | high 0.90 | 1.00 | 1.8 | * |
| C. General Wildlife Habitat | mod 0.5 | 1.00 | 1.0 | |
| D. General Fish Habitat | NA | NA | 0 | |
| E. Flood Attenuation | NA | NA | 0 | |
| F. Short and Long Term Surface Water Storage | low 0.30 | 1.00 | 0.6 | |
| G. Sediment / Nutrient / Toxicant Removal | high 1.00 | 1.00 | 2.0 | * |
| H. Sediment / Shoreline Stabilization | NA | NA | 0 | |
| I. Production Export / Food Chain Support | low 0.30 | 1.00 | 0.6 | |
| J. Groundwater Discharge / Recharge | mod 0.70 | 1.00 | 1.4 | * |
| K. Uniqueness | low 0.20 | 1.00 | 0.4 | |
| L. Recreation / Education Potential (bonus point) | high 0.20 | | 0.4 | |
| **Total Points** | **4.1** | **8** | **8.2 Total Functional Units** | |
| **Percent of Possible Score 51%** (round to nearest whole number) | | | | |

**Category I Wetland:** (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

**Category II Wetland:** (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

☒ **Category III Wetland:** (Criteria for Categories I, II, or IV not satisfied)

**Category IV Wetland:** (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

## OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

# MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

**1. Project Name:** Kindsfater **2. MDT Project #:** STPX-0056(56) **3. Control #:** 5034

**3. Evaluation Date:** 6/20/2016 **4. Evaluator(s):** C. Hoschouer, C. Seibert **5. Wetland/Site #(s):** Kindsfater - existing wetland/preservation wetland

**6. Wetland Location(s):** Township 2 S, Range 25 E, Section 6; Township ___ N, Range ___ E, Section _____

**Approximate Stationing or Roadposts:** _____

**Watershed:** 13 - Upper Yellowstone **County:** _ _ Yellowstone _____

**7. Evaluating Agency:** RESPEC for MDT

**Purpose of Evaluation:**

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

**8. Wetland Size (acre):** _____ (visually estimated)
32.4 (measured, e.g. GPS)

**9. Assessment Area (AA) Size (acre):** _____ (visually estimated)
(see manual for determining AA) 32.4 (measured, e.g. GPS)

**10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA** (See manual for definitions.)

| HGM Class (Brinson) | Class (Cowardin) | Modifier (Cowardin) | Water Regime | % OF AA |
|---|---|---|---|---|
| Slope | Emergent Wetland | Partly Drained | Seasonal / Intermittent | 80 |
| Slope | Scrub-Shrub Wetland | Partly Drained | Seasonal / Intermittent | 20 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Comments:** _____

**11. ESTIMATED RELATIVE ABUNDANCE** (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
common

**12. GENERAL CONDITION OF AA**

**i. Disturbance:** Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

| Conditions within AA | Predominant Conditions Adjacent to (within 500 feet of) AA | | |
|---|---|---|---|
| | Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is 15%. | Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is 30%. | Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%. |
| AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is 15%. | --- | --- | --- |
| AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is 30%. | --- | moderate disturbance | --- |
| AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%. | --- | --- | --- |

**Comments** (types of disturbance, intensity, season, etc.)**:** The wetland mitigation site was constructed in 2012 and 2013 which consisted of substantial excavation, modification/rehabilitation of existing wetlands, and revegetation. Existing wetlands (pre-construction) were preserved and rehabilitated. Preserved wetland areas at higher elevations appear to be losing hydrology and transitioning into upland communities with some excavated wetland cells retaining hydrology.

**ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species:** Euphorbia esula, Cirsium arvense, Cynoglossum officinale, Centaurea stoebe, Convolvulus arvensis and Verbascum thapsus.

**iii. Provide brief descriptive summary of AA and surrounding land use/habitat:** The AA consists of pre-existing slope/depressional wetland areas located within a historic gravel pit/wetland site. Wetland mitigation constructed was completed in early spring 2013 and 2016 is the fourth monitoring year for the expanded wetland site. Land use surrounding the AA includes commercial developments, agriculture (grazing), transportation (railroad and interstate), and a shooting range within the site.

**13. STRUCTURAL DIVERSITY** (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

| Existing # of "Cowardin" Vegetated Classes in AA | Initial Rating | Is current management preventing (passive) existence of additional vegetated classes? | | Modified Rating |
|---|---|---|---|---|
| 3 (or 2 if one is forested) classes | --- | NA | NA | NA |
| 2 (or 1 if forested) classes | mod | NA | NA | NA |
| 1 class, but not a monoculture | --- | ←NO | YES→ | --- |
| 1 class, monoculture (1 species comprises 90% of total cover) | --- | NA | NA | NA |

**Comments:** Emergent wetland community is dominant with areas of scrub-shrub wetland.

Wetland/Site #(s): Kindsfater - existing wetland/preservation wetland

**14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS**

**i. AA is Documented (D) or Suspected (S) to contain:** Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

**ii. Rating:** Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

| Highest Habitat Level | Doc/Primary | Sus/Primary | Doc/Secondary | Sus/Secondary | Doc/Incidental | Sus/Incidental | None |
|---|---|---|---|---|---|---|---|
| **Functional Point/Rating** | --- | --- | --- | --- | --- | --- | 0L |

**Sources for documented use** (e.g. observations, records): USFWS list for species in Yellowstone County

**14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM**
Do not include species listed in 14A above.

**i. AA is Documented (D) or Suspected (S) to contain:** Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☒ D ☐ S Plains spadefoot (S3)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☐ S

**ii. Rating:** Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

| Highest Habitat Level | Doc/Primary | Sus/Primary | Doc/Secondary | Sus/Secondary | Doc/Incidental | Sus/Incidental | None |
|---|---|---|---|---|---|---|---|
| **S1 Species Functional Point/Rating** | --- | --- | --- | --- | --- | --- | --- |
| **S2 and S3 Species Functional Point/Rating** | .9H | --- | --- | --- | --- | --- | --- |

**Sources for documented use** (e.g. observations, records): Observed approximately 40 plains spadefoot during the 2013 site investigation; none observed in subsequent site visits.

**14C. GENERAL WILDLIFE HABITAT RATING**

**i. Evidence of Overall Wildlife Use in the AA:** Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☒ ***Moderate:*** Based on any of the following [check].
- ☒ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☒ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☒ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

**ii. Wildlife Habitat Features:** Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

| **Structural Diversity** (see #13) | ☐ **High** | | | | | | | | ☒ **Moderate** | | | | | | | | ☐ **Low** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Class Cover Distribution** (all vegetated classes) | ☐ **Even** | | | | ☐ **Uneven** | | | | ☐ **Even** | | | | ☒ **Uneven** | | | | ☐ **Even** | | | |
| **Duration of Surface Water in ≥ 10% of AA** | **P/P** | **S/I** | **T/E** | **A** | **P/P** | **S/I** | **T/E** | **A** | **P/P** | **S/I** | **T/E** | **A** | **P/P** | **S/I** | **T/E** | **A** | **P/P** | **S/I** | **T/E** | **A** |
| ☐ **Low Disturbance** at AA (see #12i) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ☐ **Moderate Disturbance** at AA (see #12i) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | M | --- | --- | --- | --- | --- | --- |
| ☒ **High Disturbance** at AA (see #12i) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**iii. Rating:** Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

| **Evidence of Wildlife Use (i)** | **Wildlife Habitat Features Rating (ii)** | | | |
|---|---|---|---|---|
| | ☐ **Exceptional** | ☐ **High** | ☒ **Moderate** | ☐**Low** |
| ☐ **Substantial** | --- | --- | --- | --- |
| ☒ **Moderate** | --- | --- | .5M--- | --- |
| ☐ **Minimal** | --- | --- | --- | --- |

**Comments:** Expect wildlife use/rating to increase for subsequent monitoring years as vegetation becomes more established and weed control efforts are implemented.

Wetland/Site #(s): Kindsfater - existing wetland/preservation wetland

**14D. GENERAL FISH HABITAT** ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

**Type of Fishery:** ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

**i. Habitat Quality and Known / Suspected Fish Species in AA:** Use matrix to select the functional point and rating.

| **Duration of Surface Water in AA** | ☐ **Permanent / Perennial** | | | | | | ☐ **Seasonal / Intermittent** | | | | | | ☐ **Temporary / Ephemeral** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Aquatic Hiding / Resting / Escape Cover** | ☐ **Optimal** | | ☐ **Adequate** | | ☐ **Poor** | | ☐ **Optimal** | | ☐ **Adequate** | | ☐ **Poor** | | ☐ **Optimal** | | ☐ **Adequate** | | ☐ **Poor** | |
| **Thermal Cover: optimal / suboptimal** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** | **O** | **S** |
| **FWP Tier I** fish species | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FWP Tier II** or **Native Game** fish species | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FWP Tier III** or **Introduced Game** fish | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FWP Non-Game Tier IV** or **No** fish species | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Sources used for identifying fish spp. potentially found in AA:** _____

**ii. Modified Rating:** NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

*a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity,* ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

*b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish?* ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

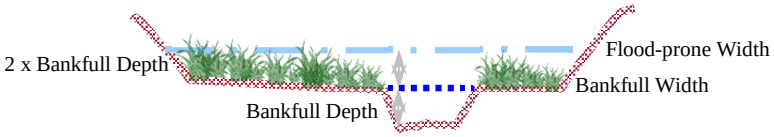
**iii. Final Score and Rating:** _ **Comments:** No fish habitat within mitigation site; no perennial water

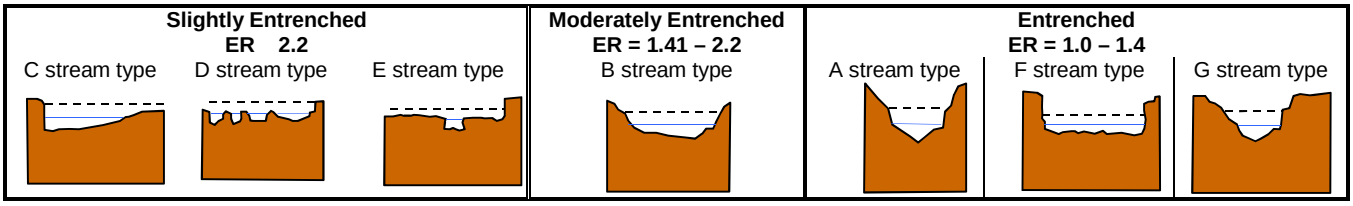
**14E. FLOOD ATTENUATION** ☒ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

**Entrenchment Ratio (ER) Estimation** (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio




**i. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating.

| **Estimated or Calculated Entrenchment** (Rosgen 1994, 1996) | ☐ Slightly Entrenched C, D, E stream types | | | ☐ Moderately Entrenched B stream type | | | ☐ Entrenched A, F, G stream types | | |
|---|---|---|---|---|---|---|---|---|---|
| **Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub** | ☐ 75% | ☐ 25-75% | ☐ <25% | ☐ 75% | ☐ 25-75% | ☐ <25% | ☐ 75% | ☐ 25-75% | ☐ <25% |
| AA contains **no outlet or restricted outlet** | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AA contains **unrestricted outlet** | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**ii. Are 10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA?** ☐ YES ☒ NO **Comments:** Wetlands are not subject to flooding via in-channel or overbank flow as there are no waterways on site.

Wetland/Site #(s): Kindsfater - existing wetland/preservation wetland

**14F. SHORT AND LONG TERM SURFACE WATER STORAGE** ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

**i. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual for further definitions of these terms].

| **Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding** | ☒ **>5 acre feet** | | | ☐ **1.1 to 5 acre feet** | | | ☐ **≤1 acre foot** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Duration of Surface Water at Wetlands within the AA** | ☐ **P/P** | ☒ **S/I** | ☐ **T/E** | ☐ **P/P** | ☐ **S/I** | ☐ **T/E** | ☐ **P/P** | ☐ **S/I** | ☐ **T/E** |
| Wetlands in AA flood or pond **≥ 5 out of 10 years** | --- | .9H | --- | --- | --- | --- | --- | --- | --- |
| Wetlands in AA flood or pond **< 5 out of 10 years** | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Comments:** Estimated that AA ponds greater than 5 out of 10 years with approixmately 25 acres inundated to approximately 0.5 feet.

**14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVAL** ☐ **NA** (proceed to 14H)

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

**i. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating.

| **Sediment, Nutrient, and Toxicant Input Levels within AA** | **AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.** | | | | **Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.** | | | |
|---|---|---|---|---|---|---|---|---|
| **% Cover of Wetland Vegetation in AA** | ☒ **≥ 70%** | | ☐ **< 70%** | | ☐ **≥ 70%** | | ☐ **< 70%** | |
| **Evidence of Flooding / Ponding in AA** | ☒ **Yes** | ☐ **No** | ☐ **Yes** | ☐ **No** | ☐ **Yes** | ☐ **No** | ☐ **Yes** | ☐ **No** |
| AA contains **no or restricted outlet** | --- | --- | --- | --- | --- | --- | --- | --- |
| AA contains **unrestricted outlet** | .9H | --- | --- | --- | --- | --- | --- | --- |

**Comments:** Unrestricted drainage from the bench down to meadow below.

**14H. SEDIMENT / SHORELINE STABILIZATION** ☒ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

| **% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of 6** (see Appendix F). | **Duration of Surface Water Adjacent to Rooted Vegetation** | | |
|---|---|---|---|
| | ☐ **Permanent / Perennial** | ☐ **Seasonal / Intermittent** | ☐ **Temporary / Ephemeral** |
| ☐ **≥ 65%** | --- | --- | --- |
| ☐ **35-64%** | --- | --- | --- |
| ☐ **< 35%** | --- | --- | --- |

**Comments:** Wetlands do not occur along stream bank, open water not likely subject to wave action.

**14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT**

**i. Level of Biological Activity:** Synthesis of wildlife and fish habitat rates (select).

| **General Fish Habitat Rating (14Diii)** | **General Wildlife Habitat Rating (14Ciii)** | | |
|---|---|---|---|
| | ☐ **E/H** | ☐ **M** | ☒ **L** |
| ☐ **E/H** | --- | --- | --- |
| ☐ **M** | --- | --- | --- |
| ☐ **L** | --- | --- | --- |
| ☒ **NA** | --- | --- | L |

**ii. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

| **A** | ☒ **Vegetated Component >5 acres** | | | | | | ☐ **Vegetated Component 1-5 acres** | | | | | | ☐ **Vegetated Component <1 acre** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **B** | ☐ **High** | | ☐ **Moderate** | | ☒ **Low** | | ☐ **High** | | ☐ **Moderate** | | ☐ **Low** | | ☐ **High** | | ☐ **Moderate** | | ☐ **Low** | |
| **C** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** |
| **P/P** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/I** | --- | --- | --- | --- | .5M | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T/E/A** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

Wetland/Site #(s): Kindsfater - existing wetland/preservation wetland

**14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT** (continued)

**iii. Modified Rating:** Note: Modified score cannot exceed 1.0 or be less than 0.1.

***Vegetated Upland Buffer:*** Area with 30% plant cover, 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
*Is there an average 50-foot wide vegetated upland buffer around 75% of the AA's perimeter?* ☒ **YES**, add 0.1 to score in **ii** = 0.60 ☐ **NO**

**iv. Final Score and Rating:** .6M **Comments:** Surface outlet draining wetlands down-slope to meadow below site.

**14J. GROUNDWATER DISCHARGE / RECHARGE**
Check the appropriate indicators in i and ii below.

**i. Discharge Indicators**
- ☒ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☒ Vegetation growing during dormant season/drought.
- ☒ Wetland occurs at the toe of a natural slope.
- ☐ Seeps are present at the wetland edge.
- ☐ AA permanently flooded during drought periods.
- ☒ Wetland contains an outlet, but no inlet.
- ☐ Shallow water table and the site is saturated to the surface.
- ☐ Other: _____

**ii. Recharge Indicators**
- ☐ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

**iii. Rating:** Use the information from i and ii above and the table below to select the functional point and rating.

| Criteria | Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** | | | |
|---|---|---|---|---|
| | ☐ **P/P** | ☒ **S/I** | ☐ **T** | ☐ **None** |
| ☒ **Groundwater Discharge or Recharge** | --- | .7M | --- | --- |
| ☐ **Insufficient Data/Information** | --- | | | |

**Comments:** Saturation observed in portions of AA during dry season/drought conditions.

**14K. UNIQUENESS**

**i. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating.

| **Replacement Potential** | **AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP** | | | **AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP** | | | **AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Estimated Relative Abundance** (#11) | ☐ Rare | ☐ Common | ☐ Abundant | ☐ Rare | ☐ Common | ☐ Abundant | ☐ Rare | ☒ Common | ☐ Abundant |
| ☐ **Low Disturbance** at AA (#12i) | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ☐ **Moderate Disturbance** at AA (#12i) | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ☒ **High Disturbance** at AA (#12i) | --- | --- | --- | --- | --- | --- | --- | .2L | --- |

**Comments:** _____

**14L. RECREATION / EDUCATION POTENTIAL** ☐ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

**i. Is the AA a known or potential recreational or educational site?** ☒ **YES**, go to ii. ☐ **NO**, check the NA box.

**ii. Check categories that apply to the AA:** ☒ Educational/Scientific Study ☐ Consumptive Recreational ☒ Non-consumptive recreational
☐ Other: _____

**iii. Rating:** Use the matrix below to select the functional point and rating.

| Known or Potential Recreational or Educational Area | Known | Potential |
|---|---|---|
| **Public ownership or public easement with general public access (no permission required)** | .2H | --- |
| **Private ownership with general public access (no permission required)** | --- | --- |
| **Private or public ownership without general public access, or requiring permission for public access** | --- | --- |

**Comments:** Access is permitted without permission with the exception of the police shooting range.

**15. GENERAL SITE NOTES:** Constructed wetland areas were generally drier in 2016 as the site appears to be losing hydrology and the vegetation communities are transitioning into upland.

Wetland/Site #(s): Kindsfater - existing wetland/preservation wetland

| Function & Value Variables | Rating – Actual Functional Points | Possible Functional Points | Functional Units: Actual Points x Estimated AA Acreage | Indicate the Four Most Prominent Functions with an Asterisk |
|---|---|---|---|---|
| A. Listed / Proposed T&E Species Habitat | low 0.00 | 1.00 | 0 | |
| B. MT Natural Heritage Program Species Habitat | high 0.90 | 1.00 | 29.16 | * |
| C. General Wildlife Habitat | mod 0.50 | 1.00 | 16.20 | |
| D. General Fish Habitat | NA | NA | 0 | |
| E. Flood Attenuation | NA | NA | 0 | |
| F. Short and Long Term Surface Water Storage | high 0.90 | 1.00 | 29.16 | * |
| G. Sediment / Nutrient / Toxicant Removal | high 0.90 | 1.00 | 29.16 | * |
| H. Sediment / Shoreline Stabilization | NA | NA | 0 | |
| I. Production Export / Food Chain Support | mod 0.60 | 1.00 | 19.44 | |
| J. Groundwater Discharge / Recharge | mod 0.70 | 1.00 | 22.68 | * |
| K. Uniqueness | low 0.20 | 1.00 | 6.48 | |
| L. Recreation / Education Potential (bonus point) | high 0.20 | | 6.48 | |
| **Total Points** | **4.9** | **8** | **158.76 Total Functional Units** | |
| **Percent of Possible Score 61%** (round to nearest whole number) | | | | |

**Category I Wetland:** (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

**Category II Wetland:** (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

☒ **Category III Wetland:** (Criteria for Categories I, II, or IV not satisfied)

**Category IV Wetland:** (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

## OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

# APPENDIX C
# PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana



Photo Point: 1 Location: Wetland Cell 14
Bearing: 280 degrees Year: 2013



Photo Point: 1 Location: Wetland Cell 14
Bearing: 280 degrees Year: 2014



Photo Point: 1 Location: Wetland Cell 14
Bearing: 280 degrees Year: 2015



Photo Point: 1 Location: Wetland Cell 14
Bearing: 280 degrees Year: 2016



Photo Point: 2 Location:  Wetland Cell 13
Bearing: 280 degrees Year: 2013



Photo Point: 2 Location:  Wetland Cell 13
Bearing: 280 degrees Year: 2014



Photo Point: 2 Location:  Wetland Cell 13
Bearing: 280 degrees Year: 2015



Photo Point: 2 Location:  Wetland Cell 13
Bearing: 280 degrees Year: 2016



Photo Point: 3 Location: Wetland Cell 9
Bearing: 0 degrees Year: 2013



Photo Point: 3 Location: Wetland Cell 9
Bearing: 0 degrees Year: 2014



Photo Point: 3 Location: Wetland Cell 9
Bearing: 0 degrees Year: 2015



Photo Point: 3 Location: Wetland Cell 9
Bearing: 0 degrees Year: 2016



Photo Point: 4 Location: Wetland Cell 12
Bearing: 200 degrees Year: 2013



Photo Point: 4 Location: Wetland Cell 12
Bearing: 200 degrees Year: 2014



Photo Point: 4 Location: Wetland Cell 12
Bearing: 200 degrees Year: 2015



Photo Point: 4 Location: Wetland Cell 12
Bearing: 200 degrees Year: 2016



Photo Point: 5 Location:  Wetland Cell 11
Bearing: 10 degrees Year: 2013



Photo Point: 5 Location:  Wetland Cell 11
Bearing: 10 degrees Year: 2014



Photo Point: 5 Location:  Wetland Cell 11
Bearing: 10 degrees Year: 2015



Photo Point: 5 Location:  Wetland Cell 11
Bearing: 10 degrees Year: 2016



Photo Point: 6 Location:  Wetland Cell 10
Bearing: 150 degrees Year: 2013



Photo Point: 6 Location:  Wetland Cell 10
Bearing: 150 degrees Year: 2014



Photo Point: 6 Location:  Wetland Cell 10
Bearing: 150 degrees Year: 2015



Photo Point: 6 Location:  Wetland Cell 10
Bearing: 150 degrees Year: 2016



Photo Point: 7 Location:  Wetland Cell 5
Bearing: 90 degrees Year: 2013



Photo Point: 7 Location:  Wetland Cell 5
Bearing: 90 degrees Year: 2014



Photo Point: 7 Location:  Wetland Cell 5
Bearing: 90 degrees Year: 2015



Photo Point: 7 Location:  Wetland Cell 5
Bearing: 90 degrees Year: 2016



Photo Point: 8 Location:  Wetland Cell 2
Bearing: 315 degrees Year: 2013



Photo Point: 8 Location:  Wetland Cell 2
Bearing: 315 degrees Year: 2014



Photo Point: 8 Location:  Wetland Cell 2
Bearing: 315 degrees Year: 2015



Photo Point: 8 Location:  Wetland Cell 2
Bearing: 315 degrees Year: 2016



Photo Point: 9 Location:  Wetland Cell 1
Bearing: 90 degrees Year: 2013



Photo Point: 9 Location:  Wetland Cell 1
Bearing: 90 degrees Year: 2014



Photo Point: 9 Location:  Wetland Cell 1
Bearing 90 degrees Year: 2015



Photo Point: 9 Location:  Wetland Cell 1
Bearing: 90 degrees Year: 2016



Photo Point: 10 Location:  Wetland Cell 3
Bearing: 140 degrees Year: 2013



Photo Point: 10 Location:  Wetland Cell 3
Bearing: 140 degrees Year: 2014



Photo Point: 10 Location:  Wetland Cell 3
Bearing: 140 degrees Year: 2015



Photo Point: 10 Location:  Wetland Cell 3
Bearing: 140 degrees Year: 2016



Photo Point: 11 Location:  Wetland Cell 7
Bearing: 150 degrees Year: 2013



Photo Point: 11 Location:  Wetland Cell 7
Bearing: 150 degrees Year: 2014



Photo Point: 11 Location:  Wetland Cell 7
Bearing: 150 degrees Year: 2015



Photo Point: 11 Location:  Wetland Cell 7
Bearing: 150 degrees Year: 2016



Photo Point: 12 Location:  Wetland Cell 6
Bearing: 230 degrees Year: 2013



Photo Point: 12 Location:  Wetland Cell 6
Bearing: 230 degrees Year: 2014



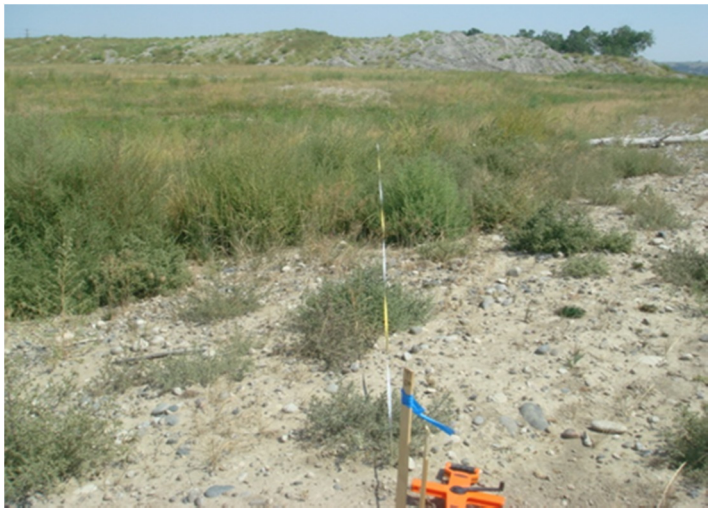
Photo Point: 12 Location:  Wetland Cell 6
Bearing: 230 degrees Year: 2015



Photo Point: 12 Location:  Wetland Cell 6
Bearing: 230 degrees Year: 2016



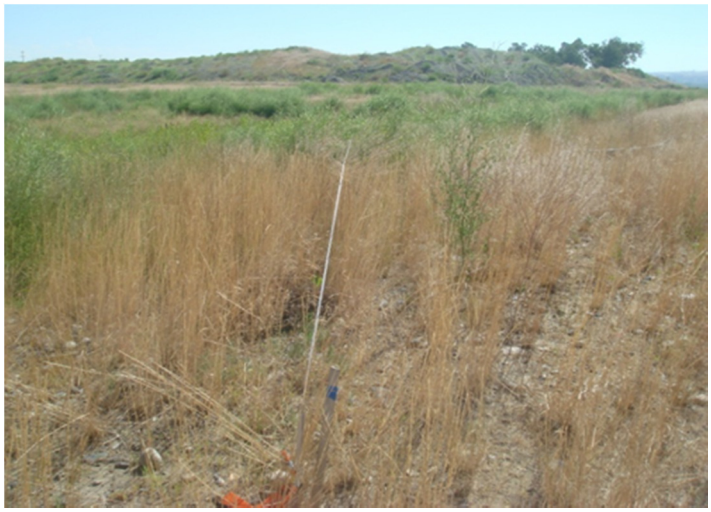
Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2013



Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2013



Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2014



Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2014



Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2015



Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2015



Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2016



Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2016



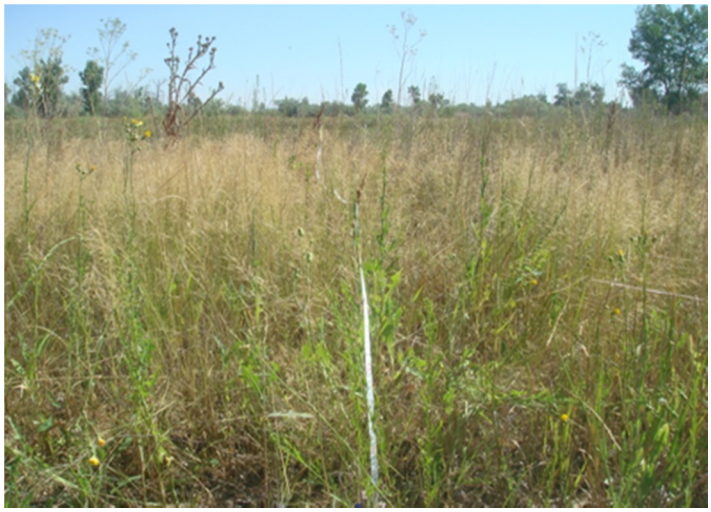
Transect 2: Start Location: Wetland Cell 8
Bearing: 225 degrees Year 2013



Transect 2: End Location: Wetland Cell 8
Bearing: 40 degrees Year 2013



Transect 2: Start Location: Wetland Cell 8
Bearing: 225 degrees Year 2014



Transect 2: End Location: Wetland Cell 8
Bearing: 40 degrees Year 2014



Transect 2: Start Location: Wetland Cell 8
Bearing: 225 degrees Year 2015



Transect 2: End Location: Wetland Cell 8
Bearing: 40 degrees Year 2015



Transect 2: Start Location: Wetland Cell 8
Bearing: 225 degrees Year 2016



Transect 2: End Location: Wetland Cell 8
Bearing: 40 degrees Year 2016



Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2013



Transect 3: End Location: Wetland Cell 4
Bearing: 290 degrees Year 2013



Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2014



Transect 3: End Location: Wetland Cell 4
Bearing 290 degrees Year 2014



Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2015



Transect 3: End Location: Wetland Cell 4
Bearing: 290 degrees Year 2015

| | |
|---|---|
|  |  |
| Transect 3: Start Location: Wetland Cell 4<br>Bearing: 290 degrees Year 2016 | Transect 3: End Location: Wetland Cell 4<br>Bearing: 290 degrees Year 2016 |



Data Point: DP1W Location: Veg Community 5
Year 2016



Data Point: DP1U Location: Veg Community 4/7
Year 2016



Data Point: DP2U (formerly K2w) Location: Veg Community 7 Year 2016



Data Point: DP2U Location: Veg Community 7
Year 2016



Data Point: DP3W Location: Veg Community 3
Year 2016

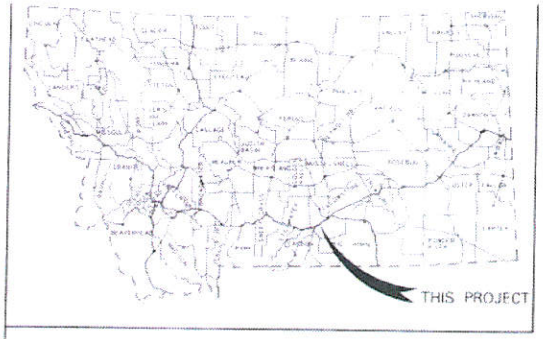


Data Point: DP3U Location: Veg Community 4/7
Year 2016

| | |
|---|---|
|  |  |
| Data Point: DP4W Location: Veg Community 10<br>Year 2016 | Data Point: DP4U Location: Veg Community 7<br>Year 2016 |

# APPENDIX D
# PROJECT PLAN SHEETS

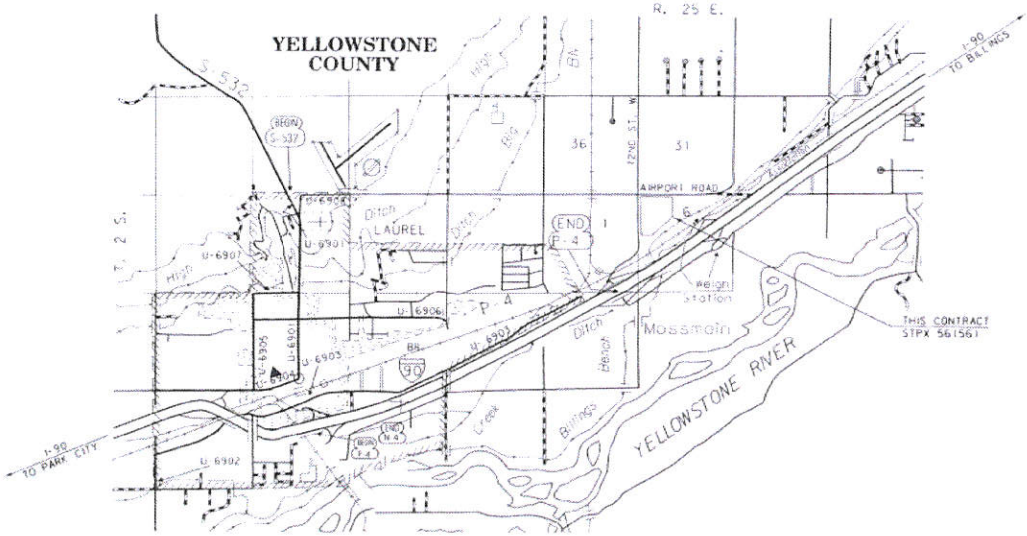
MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana




# MONTANA DEPARTMENT OF TRANSPORTATION

## FEDERAL AID PROJECT NO. STPX 56(56)
## AQUATIC RESOURCES MITIGATION
## KINDSFATER WETLAND
## YELLOWSTONE COUNTY

LETTING DATE




PLANS PREPARED BY

MORRISON-MAIERLE, INC.
1 ENGINEERING PLACE
P.O. BOX 6347
HELENA, MT 59604
PHONE (406) 442-3656
FAX (406) 442-7663

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS

| | |
|---|---|
| R/W & I.C. | |
| P.E. | |

MORRISON-MAIERLE, INC.

Phillip J Forbes

DATE 08-29-12

MONTANA DEPARTMENT OF TRANSPORTATION

RECEIVED

BY _____ August 30, 2012
CONSULTANT DESIGN ENGINEER DATE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

_____ _____
DIVISION ADMINISTRATOR DATE

MDT MONTANA DEPARTMENT OF TRANSPORTATION

| | | | |
|---|---|---|---|
| D:\3034\PDS\3034SHORDTTL251.DGN | DESIGNED BY | | WETLAND PLANS |
| 8/29/2012 | REVIEWED BY | | |
| 11:16:15 AM | CHECKED BY | | UPN NUMBER 5034008 |

D-2

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# NOTES

## TEMPORARY EROSION AND SEDIMENT CONTROL

REFER TO SECTION 208 OF THE MDT DETAILED DRAWINGS FOR EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES.

ALL INSTALLED TEMPORARY EROSION CONTROL MATERIALS IN OR ADJACENT TO WATERS OF THE U.S. MUST BE COMPOSED AND CONSTRUCTED OF 100% BIODEGRADABLE FIBERS, NETTING AND STITCHING.

## CLEARING AND GRUBBING

CLEAR AND GRUB TO STAKED GRADING LIMITS. INCLUDE THE COST OF CLEARING AND GRUBBING IN THE UNIT PRICE BID FOR UNCLASSIFIED EXCAVATION.

## WETLANDS

WETLANDS EXIST ADJACENT TO THE ROADWAY AND BEYOND THE PROJECT LIMITS. WETLAND AREAS AND PERMITTED WETLAND IMPACT AREAS WITHIN THE PROJECT LIMITS HAVE BEEN DELINEATED AND ARE SHOWN ON THE PLANS. ANY ACTION IMPACTING WETLAND AREAS WITHOUT THE APPROPRIATE PERMITTING IS THE RESPONSIBILITY OF THE CONTRACTOR.

DELINEATED WETLAND AREAS

PERMITTED WETLAND IMPACTED AREAS

## SOILS INFORMATION

THE PLAN SHEETS INCLUDE MONITORING WELL LOCATIONS WHERE SOIL INFORMATION HAS BEEN RECORDED. THE COMPLETE SOIL BORING LOGS FOR THESE LOCATIONS ARE INCLUDED IN THE SPECIAL PROVISIONS. TO OBTAIN ANY ADDITIONAL AVAILABLE INFORMATION, CONTACT THE MDT GEOTECHNICAL SECTION AT (406) 444-6281.

## UTILITIES

CALL THE UTILITIES UNDERGROUND LOCATION CENTER (1-800-424-5555) OR OTHER NOTIFICATION SYSTEM FOR THE MARKING AND LOCATION OF ALL LINES AND SERVICES BEFORE EXCAVATING.

## SURVEY DATA

DTM FILES FORMATTED FOR TRIMBLE, LEICA, AND TOPCON SURVEY CONTROLLERS ARE AVAILABLE UPON REQUEST. CONTACT WADE SALYARDS, MDT WETLAND ENGINEER, AT 444-0451.

## COMBINATION SCALE FACTOR

ALL COORDINATES ARE STATE PLANE (SEE CONTROL DIAGRAM). CSF FOR THE PROJECT IS 0.99948695.

## TOPSOIL SALVAGING AND PLACING

TOPSOIL QUANTITIES SHOWN IN THE PLANS ARE SUFFICIENT TO RE-TOPSOIL IN AREAS WHERE CUTS OR FILLS EXCEED 1 FOOT. ALL REMAINING GRADING IS CONSIDERED UNCLASSIFIED EXCAVATION. COORDINATE TABLE ELEVATIONS ARE TO FINISHED GRADE FOLLOWING TOPSOIL PLACEMENT.

## MONITORING WELLS

ALL MONITOR WELLS ARE TO BE LEFT IN PLACE UNDISTURBED.

# LINEAR & LEVEL DATA

## BEARING SOURCE

NAD 83

## LEVEL DATUM SOURCE

NAVD 88

## BENCH MARKS

SEE CONTROL TRAVERSE ABSTRACT FOR BENCHMARK INFORMATION

D-3

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\dgn\5934000-sht001.sgn | DESIGNED BY | | WETLAND PLANS | KINDSFATER WETLAND | PROJECT NO. STPX 56(56) |
| 2 | | 9/12/2012 | REVIEWED BY | | | | |
| 1 | | 9:59:45 AM CRS U216 | CHECKED BY | | YELLOWSTONE COUNTY | CSF - 0.99948695 UPN NUMBER 5034000 | SHEET 2 OF 25 |

# CONTROL DIAGRAM

Q 44 △

THIS PROJECT WAS CONTROLLED USING GPS. TRIMBLE GEOMATIC OFFICE VERISON 1.63 WAS USED FOR THE ADJUSTMENT. THE FOLLOWING WERE HELD FIXED IN THE FINAL WEIGHTED LEAST SQUARES ADJUSTMENT:

| MARK | Y | X | Z |
|---|---|---|---|
| Q 44 | X | X | X |
| A5174 | X | X | X |
| D5174 | X | X | X |

IN ADDITION, ALL NEW PROJECT MARKS ESTABLISHED IN THIS SURVEY (A5034 THROUGH J5034) WERE CONSTRAINED VERTICALLY, USING THE ORTHOMETRIC HEIGHTS DERIVED FROM DIFFERENTIAL LEVELING.

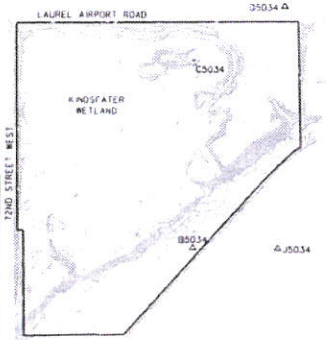
NOTE: FILE 5034SUCONTOP.IF3 CONTAINS FINAL STATE PLANE COORDINATES OF MARKS IN THE VICINITY OF THIS PROJECT. HORIZONTAL COORDINATES IN THIS FILE ARE INTERNATIONAL FEET AND ELEVATIONS ARE US SURVEY FEET.

ELEVATIONS ARE BASED ON NAVD88 DATUM. THIS DATUM IS APPROXIMATELY 2.64 FEET HIGHER THAN NGVD29 DATUM. HYDRAULICS SHOULD BE AWARE OF THIS IF A DESIGNATED FLOODPLAIN IS INVOLVED. THE GEOID WAS MODELED USING GEOID03.

IN ORDER TO MAINTAIN A RELATIVE ACCURACY OF 1:50000, ONE COMBINATION SCALE FACTOR CAN BE USED FOR THIS PROJECT. THIS COMBINATION SCALE FACTOR IS 0.99948655, AND IS IDENTICAL TO THE CSF USED FOR ON 5174 (MOSSMAN INTERCHANGE EAST).
THIS CSF MUST BE USED FOR ALL PICK UP SURVEYS, COORDINATE CALCULATIONS, ETC. AS WELL AS STAKING OF THE PROJECT. ALL MEASURED DISTANCES X CSF=GRID DISTANCE AND GRID DISTANCE OR PLANE DISTANCE/CSF=DISTANCE TO STAKE.

## CONTROL MARK ABSTRACT

| POINT NAME/NUMBER | N OR Y COORDINATE | E OR X COORDINATE | POINT ELEVATION | LOCATION AND DESCRIPTION |
|---|---|---|---|---|
| A5174 | 523,803.624 | 2,172,357.202 | 3,256.70 | FOUND 2" ALUMINUM MDT CAP FLUSH WITH GROUND STAMPED A5174 2006, AT MP 0.1 ON FRONTAGE ROAD (ACCESS TO SHOTGUN WILLIE'S), 29' SOUTH OF CENTER LINE OF DITCH BANK. |
| D5174 | 529,332.412 | 2,180,147.638 | 3,232.42 | FOUND 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED D5174 2006, AT MP 1.9 ON FRONTAGE ROAD, 31' SOUTH OF CENTERLINE OF FRONTAGE ROAD, 8' WEST OF WITNESS POST IN EAST/WEST FENCE. |
| A5034 | 524,852.310 | 2,173,106.557 | 3,254.86 | SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED A5034, ON EAST SIDE OF 72ND STREET APROX. 150 FEET SOUTH OF RAIL ROAD CROSSING AND 20 FEET SOUTH OF CHEVRON SIGN. CAP IS 4.9 FEET EAST OF A MARKED "A GUARDRAIL", 0.4 MILES EAST OF EXIT OVER PASS. |
| B5034 | 526,651.162 | 2,173,080.639 | 3,286.48 | SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED B5034 2006, 0.8 MILES EAST OF EXIT OVERPASS, ON EAST SIDE OF 72ND STREET, ACROSS THE ROAD FROM DRIVE WAY. A GATE POST BEARS SOUTHWEST 80.5 FEET. TO THE SOUTHWEST 76.0 FEET IS ANOTHER GATE POST. CAP FALLS 8.6 FEET EAST OF EDGE OF PAVEMENT. |
| C5034 | 528,208.189 | 2,173,072.093 | 3,297.52 | SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED C5034 2006, 486 FEET SOUTH OF INTERSECTION TO 72ND AND AIRPORT ROAD. 21.4 FEET TO EDGE OF PAVEMENT, AND 25.2 FEET NORTH EAST OF SIGN POST. |
| D5034 | 528,684.449 | 2,173,841.523 | 3,295.61 | SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED D5034 2006, ON SOUTH SIDE OF AIRPORT ROAD, 780 FEET EAST OF INTERSECTION OF AIRPORT ROAD AND 72ND STREET, 16.4 FEET FROM EDGE OF PAVEMENT. A POWER POLE IS 43.2 FEET WEST OF CAP. |
| E5034 | 528,653.209 | 2,174,616.514 | 3,309.16 | SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED E5034 2006, ON TOP OF BERM ON SOUTH SIDE OF AIRPORT ROAD, AND ACROSS FROM THE CEMENT PLANT. POWER POLE IS S56°36 W, 71.1 FEET, AND ANOTHER AT N64°E, 92.2 FEET. |
| F5034 | 528,704.559 | 2,176,801.405 | 3,289.05 | SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED F5034 2006, ON SOUTH SIDE OF AIRPORT ROAD, APPROX. 15 FEET WEST OF GATE ON FENCE LINE, 5 FEET NORTH OF FENCE, AND 0.7 MILES EAST OF INTERSECTION TO 72ND STREET AND AIRPORT ROAD. |
| G5034 | 528,245.611 | 2,175,462.622 | 3,293.61 | SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED G5034 2006, ON SOUTH SIDE OF AIRPORT ROAD, APROX. 15 FEET WEST OF GATE ON FENCE LINE, 5 FEET NORTH OF FENCE, AND 0.7 MILES EAST OF INTERSECTION TO 72ND STREET AND AIRPORT ROAD. |
| H5034 | 527,548.136 | 2,174,827.935 | 3,294.80 | SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED H5034 2006, ON TOP OF SMALL BLUFF 404 FEET EAST OF THE TOP OF SLOPE, AND 77 FEET SOUTH OF THE TOP OF SLOPE LOOKING TOWARD THE RAIL ROAD TRACKS. |
| J5034 | 526,653.715 | 2,173,801.670 | 3,274.02 | SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED J5234, ON THE TOP OF A SMALL BLUFF 200 FEET EAST OF SMALL CREEK COMING OUT OF THE MAIN WETLAND AREA. A PATCH OF COTTONWOOD TREES ARE ABOUT 40 FEET SOUTH OF CAP. FROM WHICH YOU CAN SEE A5034, NEAR THE RAIL ROAD TRACKS. |
| Q 44 | 533,384.189 | 2,170,421.066 | 3,304.07 | FOUND NGS BENCH MARK DISK MARKED "Q 44 1937" IN TOP OF CONCRETE MONUMENT PER DATA SHEET. |




SCALE: 1" = 1,000

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | C:\dgn\5034000ttpvp01.dgn | DESIGNED BY | | | WETLAND PLANS | KINDSFATER WETLAND | PROJECT NO. STPX 56(56) |
| 2 | | 9/12/2012 | DRAWN BY | | | | CSF = 0.99948655 UPN NUMBER 5034000 | SHEET 3 OF 25 |
| 1 | | 8:50:54 AM CDT | CHECKED BY | | | YELLOWSTONE COUNTY | | |

D-4

# SUMMARY

## GRADING

| STATION | cubic yards* UNCL. EXC. | UNCL. BORROW | EMB. | REMARKS |
|---|---|---|---|---|
| | | | 230 | SHOOTING RANGE BERM |
| | 6,710 | | | WETLAND CELL 1 |
| | 3,890 | | | WETLAND CELL 2 |
| | 3,275 | | | WETLAND CELL 3 |
| | 6,670 | | | WETLAND CELL 4 |
| | 3,715 | | | WETLAND CELL 5 |
| | 4,265 | | | WETLAND CELL 6 |
| | 3,560 | | | WETLAND CELL 7 |
| | 5,375 | | | WETLAND CELL 8 |
| | 4,355 | | | WETLAND CELL 9 |
| | 2,330 | | | WETLAND CELL 10 |
| | 1,660 | | | WETLAND CELL 11 |
| | 3,360 | | | WETLAND CELL 12 |
| | 985 | | 65 | SWALES |
| TOTAL | 49,190 | | # 295 | |

* QUANTITIES SHOWN ARE IN PLACE. NO SHRINK/SWELL FACTORS HAVE BEEN APPLIED
# FOR INFORMATION ONLY

## REVEGETATION

| STATION | cubic yards* WETLAND SOIL SALVAGE | TOPSOIL SALVAGING & PLACING | acres WETLAND SEEDING: WETLAND | UPLAND | CONDITION SEEDBED | lump sum TREE & SHRUB PLANTING | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | | | 1.0 | BASE BID AREA |
| | | 40 | | | | | SHOOTING RANGE BERM** |
| | | 750 | | | | | WETLAND CELL 1 |
| | | 660 | | | | | WETLAND CELL 2 |
| | | 560 | | | | | WETLAND CELL 3 |
| | | 1,375 | | | | | WETLAND CELL 4 |
| | | 720 | | | | | WETLAND CELL 5 |
| | | 660 | | | | | WETLAND CELL 6 |
| | | 600 | | | | | WETLAND CELL 7 |
| | | 1,790 | | | | | WETLAND CELL 8 |
| | | 820 | | | | | WETLAND CELL 9 |
| | | 600 | | | | | WETLAND CELL 10 |
| | | 540 | | | | | WETLAND CELL 11 |
| | | 850 | | | | | WETLAND CELL 12 |
| | | 560 | | | | | SWALES |
| | | | 28.1 | | 28.1 | | WETLAND AREAS |
| TOTAL | | 10,440 | 28.1 | | 28.1 | 1.0*** | |

* 6-INCH SALVAGE DEPTH
** SALVAGE AND PLACE TOPSOIL FROM THE STOCKPILES ALONG LAUREL AIRPORT ROAD (SEE SPECIAL PROVISIONS)
*** SEE SHEET 5

## CONSTRUCTION SURVEY & LAYOUT

| STATION FROM | STATION TO | lump sum | REMARKS |
|---|---|---|---|
| | | 1.0 | BASE BID SURVEY |
| TOTAL | | 1.0 | |

## SURFACING

| linear feet GROSS | linear feet NET | linear feet + | linear feet | FOR | tons HYDRATED LIME | AGGREGATE: square yards COVER GRADE 4A | tons PLANT MIX BIT. SURF. GRADE D | cubic yards CRUSHED AGG. COURSE | cubic yards TRAFFIC GRAVEL | BITUMINOUS MATERIAL: tons ASPHALT CEMENT PG 64-28 | tons SEAL CRS-2P | AGG. TREATMENT: tons DUST PALLIATIVE | square yards BIT. PAVEMENT REMOVAL | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 25 | | | | | | EXISTING ACCESS ROAD |
| TOTAL | | | | | | | | 25 | | | | | | |

NOTE: SEE ACCESS ROAD SECTION FOR CRUSHED AGGREGATE THICKNESS

## FENCING

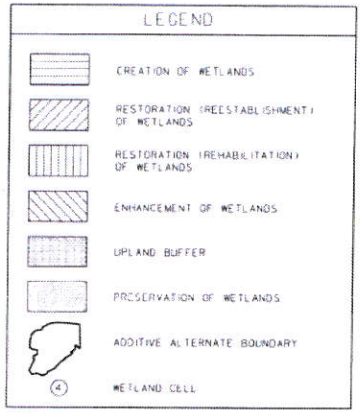
| STATION | linear feet CHAIN LINK FENCE 48" | 50" | 60" | FARM FENCE | each CHAIN LINK PANEL SINGLE | DOUBLE | FARM FENCE PANEL SINGLE | DOUBLE | linear feet REMOVE FENCE* | CHAIN LINK GATE SINGLE | DOUBLE | FARM GATE METAL TYPE G-3 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 480 | | 4 | 11 | | | 1,179 | | 24 | | SHOOTING RANGE |
| TOTAL | | | 480 | | 4 | 11 | | | | | 24 | | |

* FOR INFORMATION ONLY

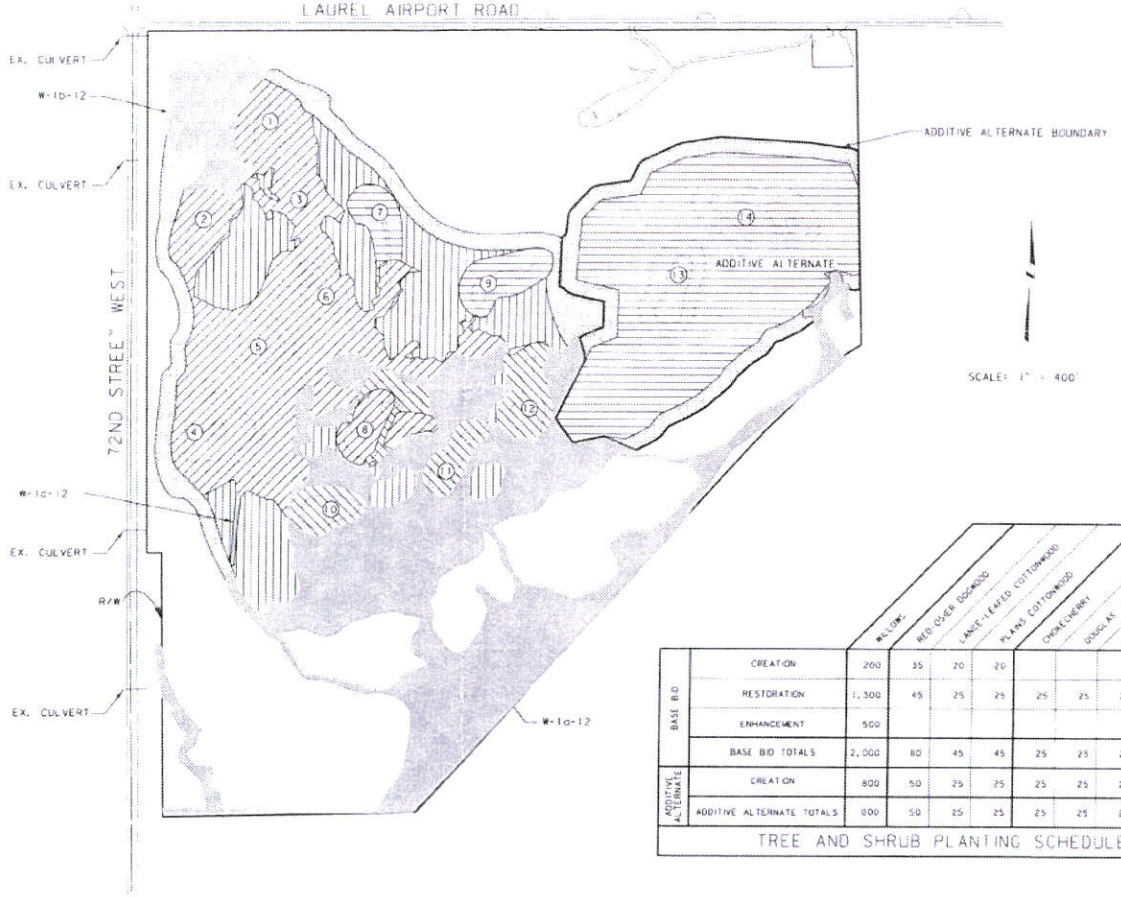
D-5

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\dgn\5034000\plt\wetl01.dgn | DESIGNED BY | WETLAND PLANS | KINDSFATER WETLAND | | PROJECT NO. STPX 56(56) |
| 2 | | 3/12/2012 | REVISED BY | | | | |
| 1 | | 8:16:02 AM CPH-UZ1st | CHECKED BY | YELLOWSTONE COUNTY | CSF = 0.99948655 | UPN NUMBER 5034000 | SHEET 4 OF 25 |

RECEIVED
OCT 24 2012
ENVIRONMENTAL




NOTES:
1. SEE REVEGETATION SPECIAL PROVISION FOR TREE AND SHRUB PLANTINGS AND WETLAND AND UPLAND SEED MIXTURES.
2. PLANT LOCATIONS TO BE DETERMINED IN THE FIELD BY MDT BOTANIST.
3. DO NOT DISTURB EXISTING WETLANDS BEYOND AREAS OF WORK INDICATED IN THE PLANS.



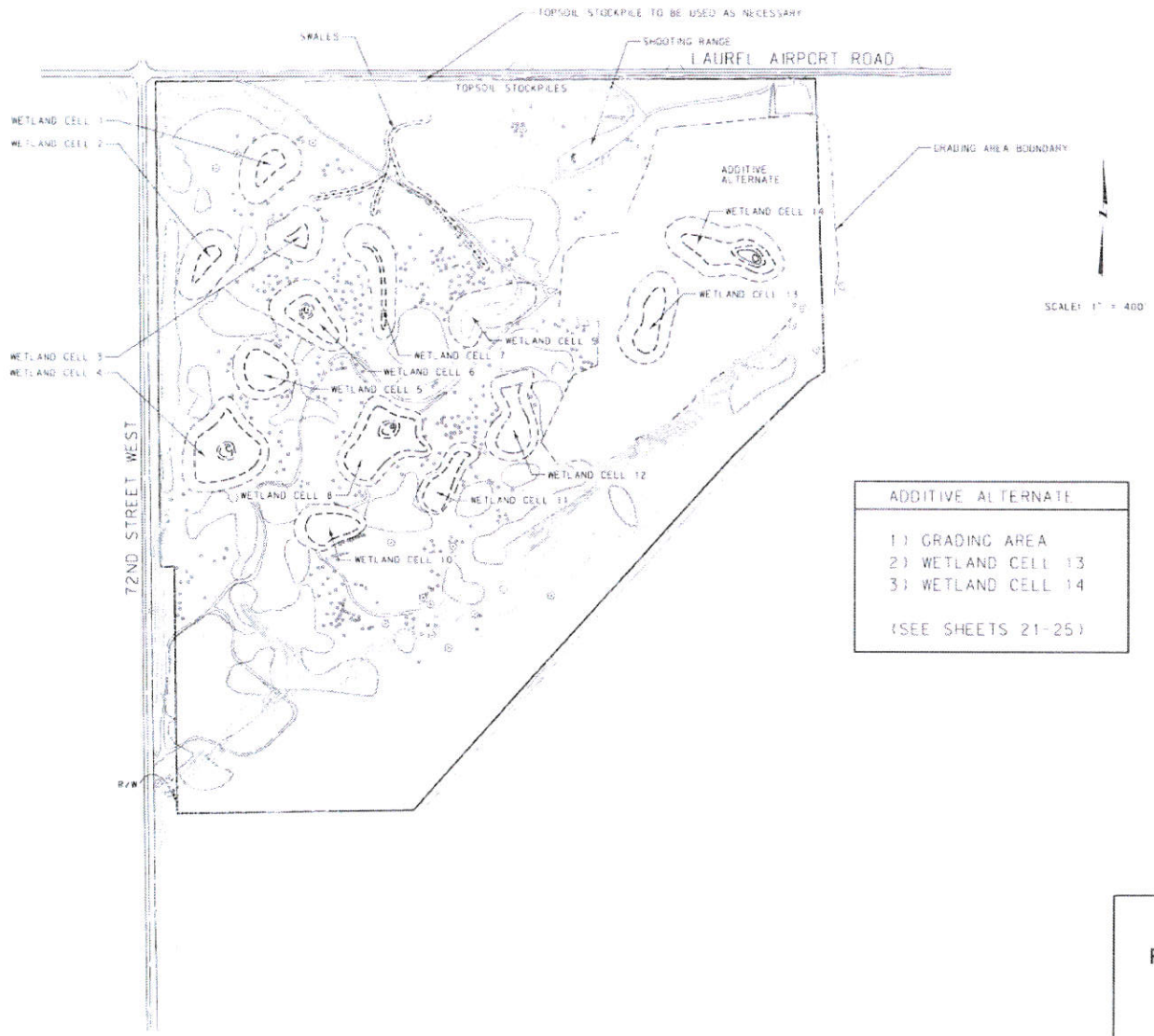

| | | WILLOW | RED OSIER DOGWOOD | LANCE-LEAFED COTTONWOOD | PLAINS COTTONWOOD | CHOKECHERRY | DOUGLAS HAWTHORN | BUFFALOBERRY | WOOD'S ROSE | ROCKY MOUNTAIN JUNIPER |
|---|---|---|---|---|---|---|---|---|---|---|
| BASE BID | CREATION | 200 | 35 | 20 | 20 | | | | | |
| | RESTORATION | 1,300 | 45 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| | ENHANCEMENT | 500 | | | | | | | | |
| | BASE BID TOTALS | 2,000 | 80 | 45 | 45 | 25 | 25 | 25 | 25 | 25 |
| ADDITIVE ALTERNATE | CREATION | 800 | 50 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| | ADDITIVE ALTERNATE TOTALS | 800 | 50 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |

TREE AND SHRUB PLANTING SCHEDULE

## REVEGETATION OVERVIEW

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\dgn\5634000revegt01.dgn | DESIGNED BY | | WETLAND PLANS | KINDSFATER WETLAND | PROJECT NO. STPX 56(56) |
| 2 | | 9/12/2012 | DRAWN BY | | YELLOWSTONE COUNTY | CSF = 0.99948655 UPN NUMBER 5034000 | SHEET 5 OF 26 |
| 1 | | 9:58:16 AM CDS 12.1 | CHECKED BY | | | | |

MORRISON MAIERLE, INC

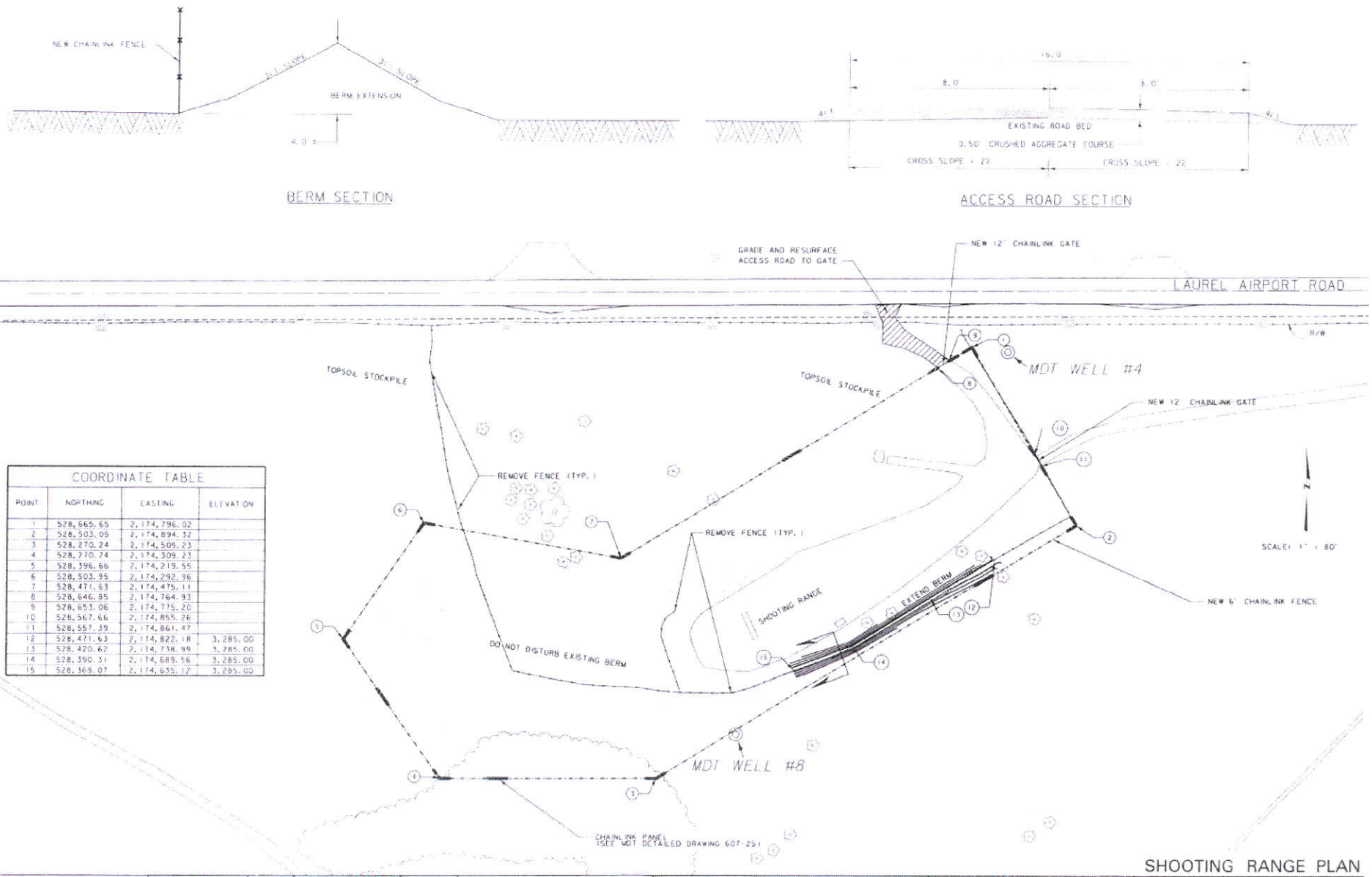



| ADDITIVE ALTERNATE |
|---|
| 1) GRADING AREA<br>2) WETLAND CELL 13<br>3) WETLAND CELL 14<br><br>(SEE SHEETS 21-25) |

# PROPOSED SITE OVERVIEW

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\dgn\5034000\mswtb01.dgn | DESIGNED BY | | | WETLAND PLANS | KINDSFATER WETLAND | | PROJECT NO. STPX 56(56) |
| 2 | | 9/12/2012 | REVIEWED BY | | | YELLOWSTONE COUNTY | CSF = 0.99948855 | UPN NUMBER 5034000 | SHEET 6 OF 25 |
| 1 | | 8:58:22 AM CDT | CHECKED BY | | | | | | |

D-7




| COORDINATE TABLE | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| 1 | 528,665.65 | 2,174,796.02 | |
| 2 | 528,503.05 | 2,174,894.32 | |
| 3 | 528,270.24 | 2,174,509.23 | |
| 4 | 528,770.74 | 2,174,309.23 | |
| 5 | 528,396.66 | 2,174,219.55 | |
| 6 | 528,503.95 | 2,174,292.96 | |
| 7 | 528,471.63 | 2,174,475.11 | |
| 8 | 528,646.85 | 2,174,764.93 | |
| 9 | 528,653.06 | 2,174,775.20 | |
| 10 | 528,567.66 | 2,174,855.26 | |
| 11 | 528,557.39 | 2,174,861.47 | |
| 12 | 528,471.63 | 2,174,822.18 | 3,285.00 |
| 13 | 528,420.62 | 2,174,738.99 | 3,285.00 |
| 14 | 528,390.31 | 2,174,689.56 | 3,285.00 |
| 15 | 528,369.07 | 2,174,635.12 | 3,285.00 |

MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION

C:\MDT\5034000\plans\05.dgn
9/13/2012
9:56:41 AM
SIPS U216

DESIGNED BY
REVIEWED BY
CHECKED BY

WETLAND PLANS
YELLOWSTONE COUNTY

KINDSFATER WETLAND
CSF = 0.99948655
UPN NUMBER 5034000

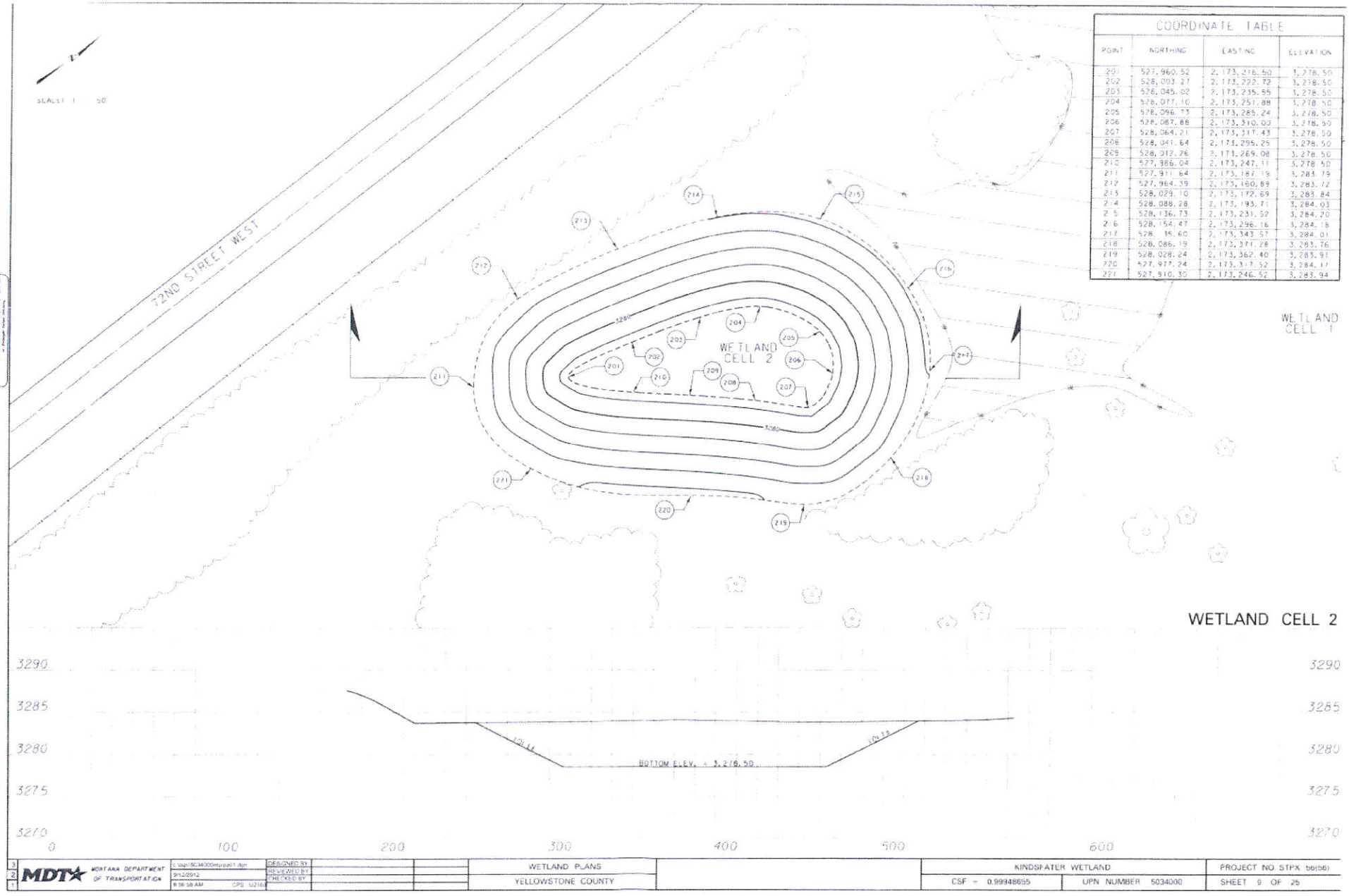
PROJECT NO. STPX 56(56)
SHEET 7 OF 25

# SHOOTING RANGE PLAN




| COORDINATE TABLE | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| 101 | 528,309.25 | 2,173,448.71 | 3,278.50 |
| 102 | 528,344.44 | 2,173,444.68 | 3,278.50 |
| 103 | 528,382.06 | 2,173,450.33 | 3,278.50 |
| 104 | 528,415.39 | 2,173,465.92 | 3,278.50 |
| 105 | 528,439.33 | 2,173,514.13 | 3,278.50 |
| 106 | 528,420.61 | 2,173,540.89 | 3,278.50 |
| 107 | 528,390.27 | 2,173,548.17 | 3,278.50 |
| 108 | 528,368.81 | 2,173,521.19 | 3,278.50 |
| 109 | 528,350.02 | 2,173,497.57 | 3,278.50 |
| 110 | 528,330.60 | 2,173,477.52 | 3,278.50 |
| 111 | 528,255.63 | 2,173,414.88 | 3,284.47 |
| 112 | 528,300.68 | 2,173,385.10 | 3,284.54 |
| 113 | 528,366.78 | 2,173,383.92 | 3,284.77 |
| 114 | 528,434.56 | 2,173,404.51 | 3,284.68 |
| 115 | 528,493.23 | 2,173,477.56 | 3,284.46 |
| 116 | 528,492.36 | 2,173,519.84 | 3,284.21 |
| 117 | 528,460.36 | 2,173,585.90 | 3,284.12 |
| 118 | 528,406.91 | 2,173,609.34 | 3,284.26 |
| 119 | 528,358.02 | 2,173,599.61 | 3,284.21 |
| 120 | 528,317.88 | 2,173,551.14 | 3,284.22 |
| 121 | 528,260.60 | 2,173,484.13 | 3,284.23 |

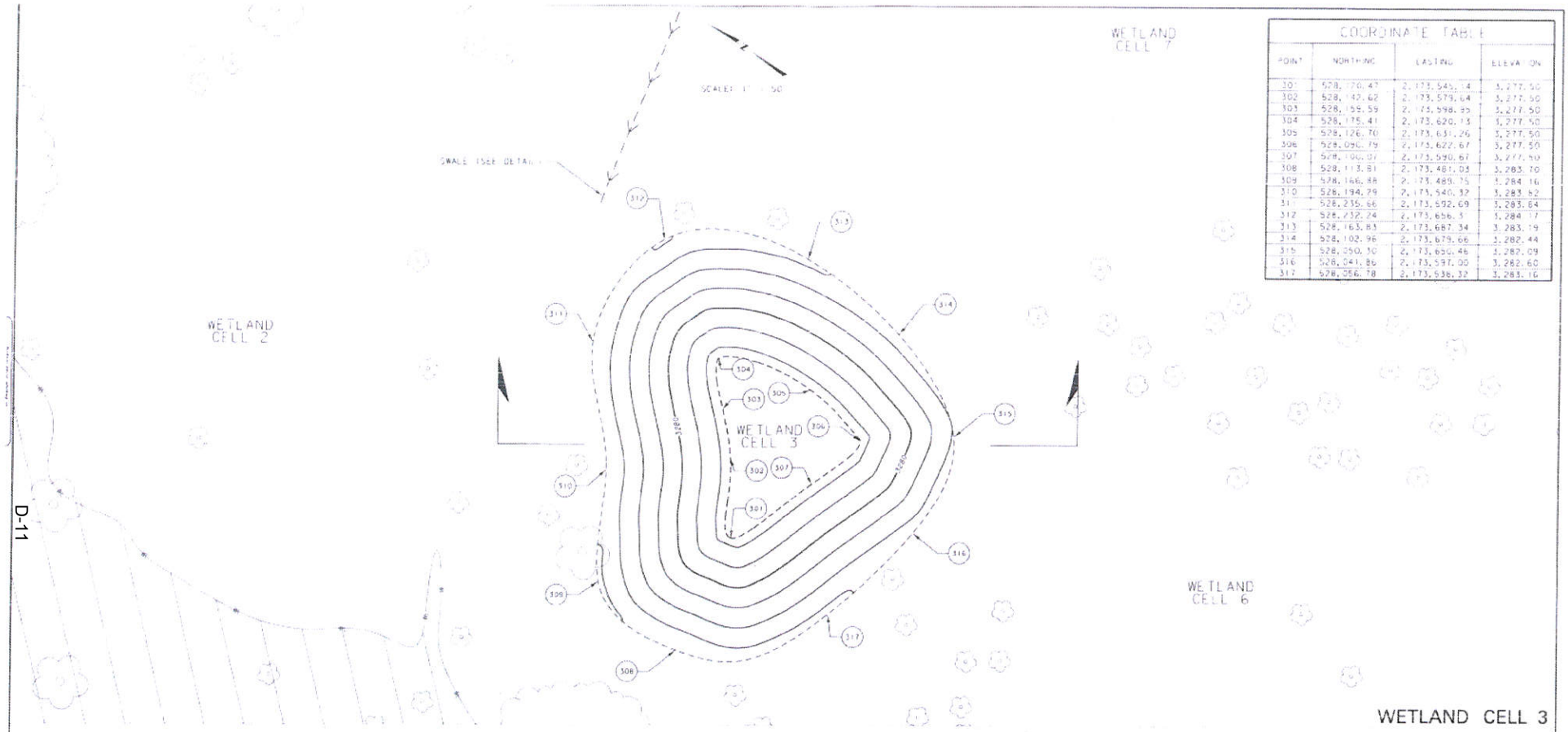
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\eigen\634800\dgn\pc01.dgn | DESIGNED BY | | WETLAND PLANS | KINDSFATER WETLAND | PROJECT NO. STPX 56(56) |
| 2 | | 9/12/2012 | REVIEWED BY | | YELLOWSTONE COUNTY | CSF = 0.99948655 UPN NUMBER 5034000 | SHEET 8 OF 25 |
| 1 | | 8:56:53 AM CDS U2150 | CHECKED BY | | | | |




| COORDINATE TABLE | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| 201 | 527,960.52 | 2,173,216.50 | 3,278.50 |
| 202 | 528,003.27 | 2,173,222.72 | 3,278.50 |
| 203 | 528,045.92 | 2,173,235.55 | 3,278.50 |
| 204 | 528,077.10 | 2,173,251.88 | 3,278.50 |
| 205 | 528,096.73 | 2,173,285.24 | 3,278.50 |
| 206 | 528,087.88 | 2,173,310.03 | 3,278.50 |
| 207 | 528,064.21 | 2,173,317.43 | 3,278.50 |
| 208 | 528,041.64 | 2,173,295.25 | 3,278.50 |
| 209 | 528,012.26 | 2,173,269.08 | 3,278.50 |
| 210 | 527,986.04 | 2,173,247.11 | 3,278.50 |
| 211 | 527,911.64 | 2,173,187.19 | 3,283.79 |
| 212 | 527,964.39 | 2,173,160.89 | 3,283.72 |
| 213 | 528,029.10 | 2,173,172.69 | 3,283.84 |
| 214 | 528,088.28 | 2,173,193.71 | 3,284.03 |
| 215 | 528,136.73 | 2,173,231.52 | 3,284.20 |
| 216 | 528,154.47 | 2,173,296.16 | 3,284.18 |
| 217 | 528, 36.60 | 2,173,343.57 | 3,284.01 |
| 218 | 528,086.19 | 2,173,371.28 | 3,283.76 |
| 219 | 528,028.24 | 2,173,362.40 | 3,283.91 |
| 220 | 527,977.24 | 2,173,317.52 | 3,284.17 |
| 221 | 527,910.30 | 2,173,246.52 | 3,283.94 |

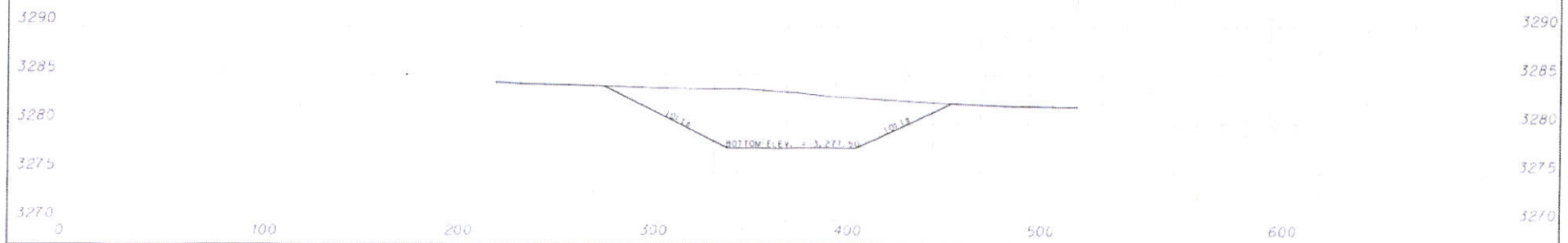
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MDT MONTANA DEPARTMENT OF TRANSPORTATION | C:\dgn\SC34000\mtp\sht1.dgn<br>9/12/2012<br>8:58:58 AM CPS U218 | DESIGNED BY<br>REVIEWED BY<br>CHECKED BY | WETLAND PLANS<br>YELLOWSTONE COUNTY | | KINDSFATER WETLAND<br>CSF = 0.99948655 | UPN NUMBER 5034000 | PROJECT NO. STPX 56(56)<br>SHEET 9 OF 25 |

MORRISON MAIERLE, INC.

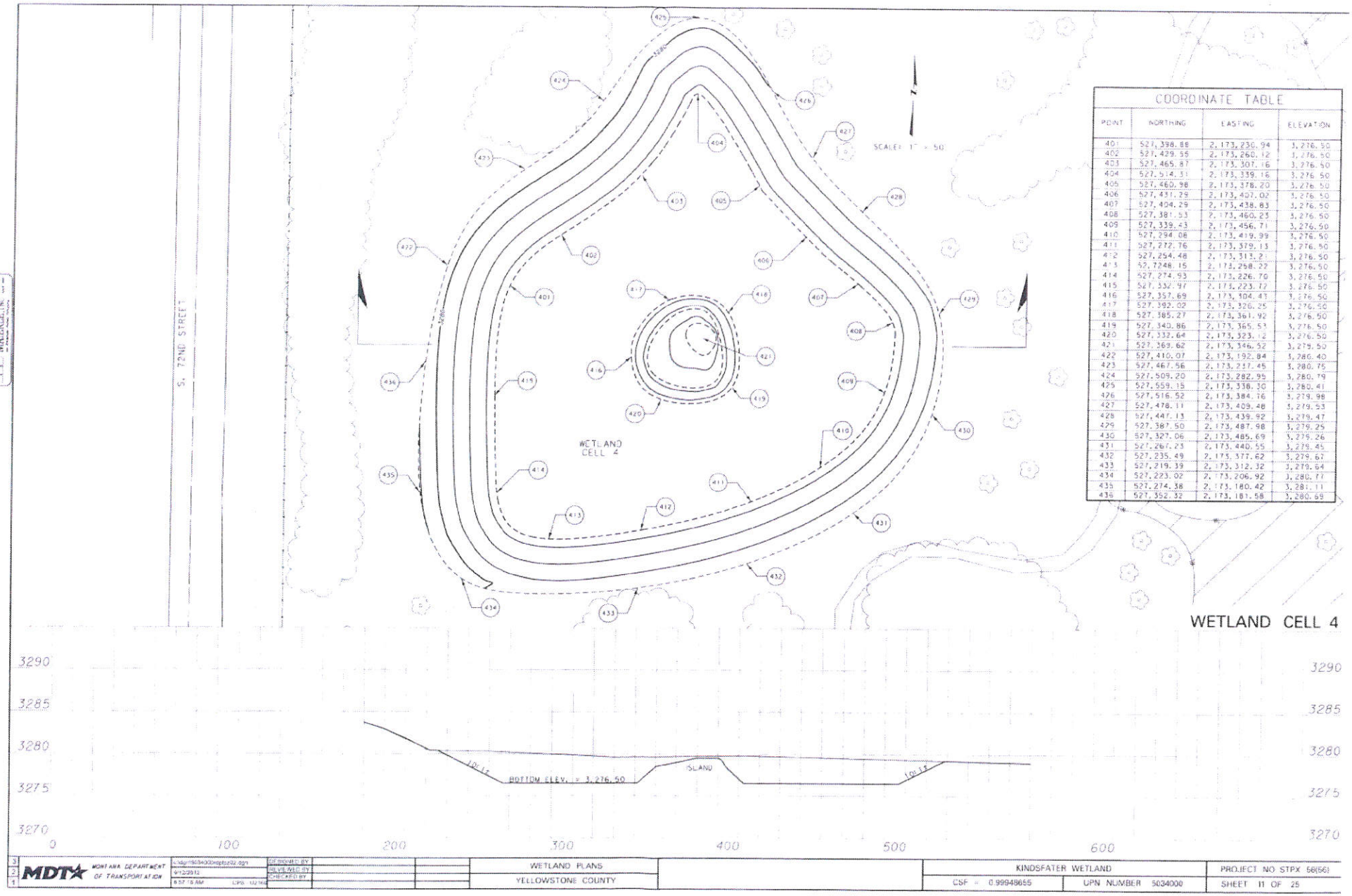



| COORDINATE TABLE | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| 301 | 528,170.41 | 2,173,545.14 | 3,277.50 |
| 302 | 528,147.62 | 2,173,579.64 | 3,277.50 |
| 303 | 528,159.55 | 2,173,598.35 | 3,277.50 |
| 304 | 528,175.41 | 2,173,620.15 | 3,277.50 |
| 305 | 528,126.70 | 2,173,631.26 | 3,277.50 |
| 306 | 528,090.79 | 2,173,622.67 | 3,277.50 |
| 307 | 528,100.01 | 2,173,590.67 | 3,277.50 |
| 308 | 528,113.81 | 2,173,481.05 | 3,283.70 |
| 309 | 528,166.88 | 2,173,489.75 | 3,284.16 |
| 310 | 528,194.29 | 2,173,540.32 | 3,283.62 |
| 311 | 528,235.66 | 2,173,592.69 | 3,283.84 |
| 312 | 528,232.24 | 2,173,656.3 | 3,284.17 |
| 313 | 528,163.83 | 2,173,687.34 | 3,283.19 |
| 314 | 528,102.96 | 2,173,679.66 | 3,282.44 |
| 315 | 528,050.30 | 2,173,630.46 | 3,282.09 |
| 316 | 528,041.86 | 2,173,597.00 | 3,282.60 |
| 317 | 528,056.78 | 2,173,536.32 | 3,283.16 |

WETLAND CELL 3

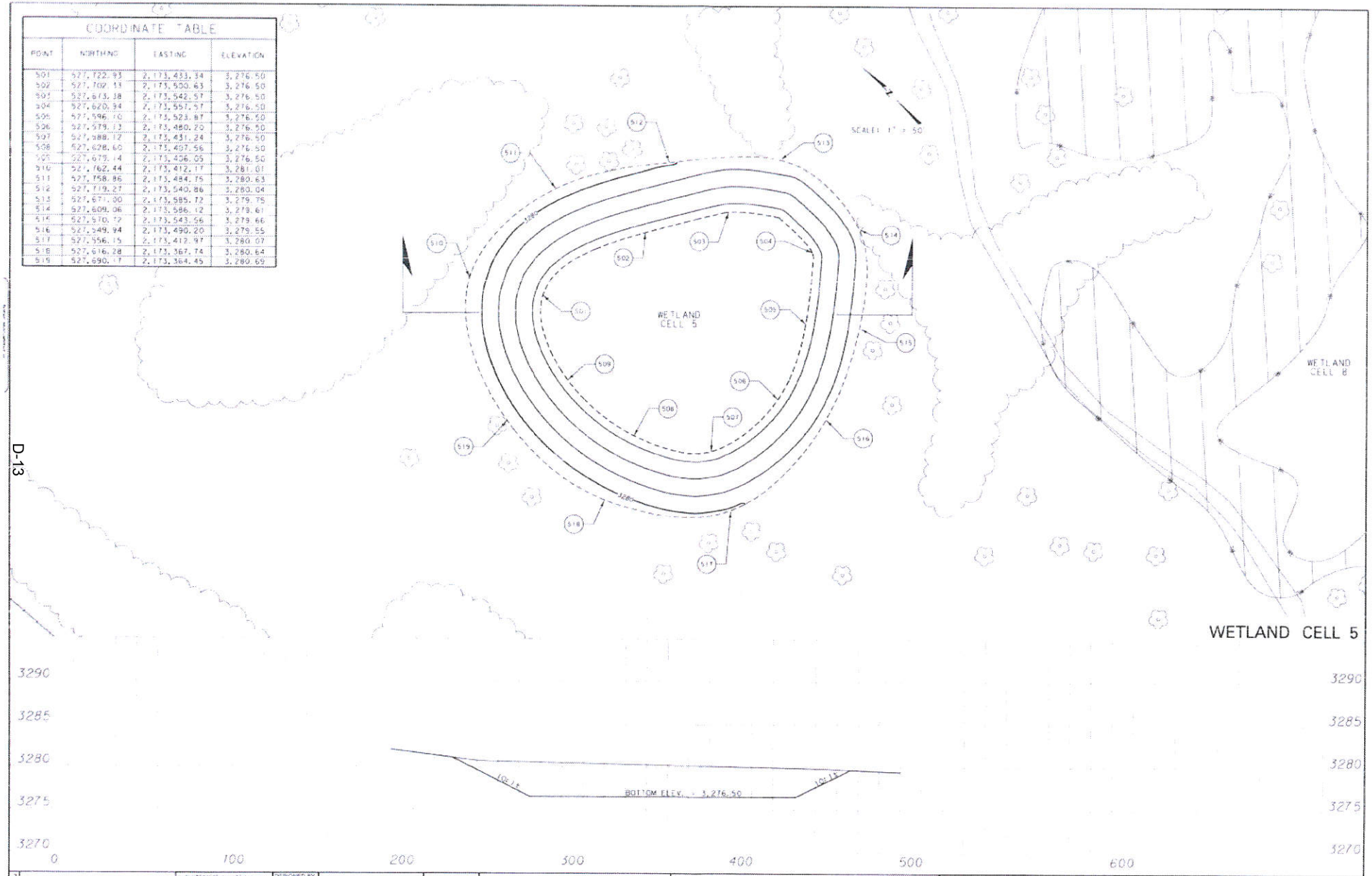



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\dgn\503400\pppp01.dgn | DESIGNED BY | | WETLAND PLANS | KINDSFATER WETLAND | PROJECT NO STPX 59(56) |
| 2 | | 9/12/2012 | REVIEWED BY | | YELLOWSTONE COUNTY | CSF = 0.99948695 UPN NUMBER 5034000 | SHEET 10 OF 25 |
| 1 | | 8:57:03 AM OPS: \\2160 | CHECKED BY | | | | |

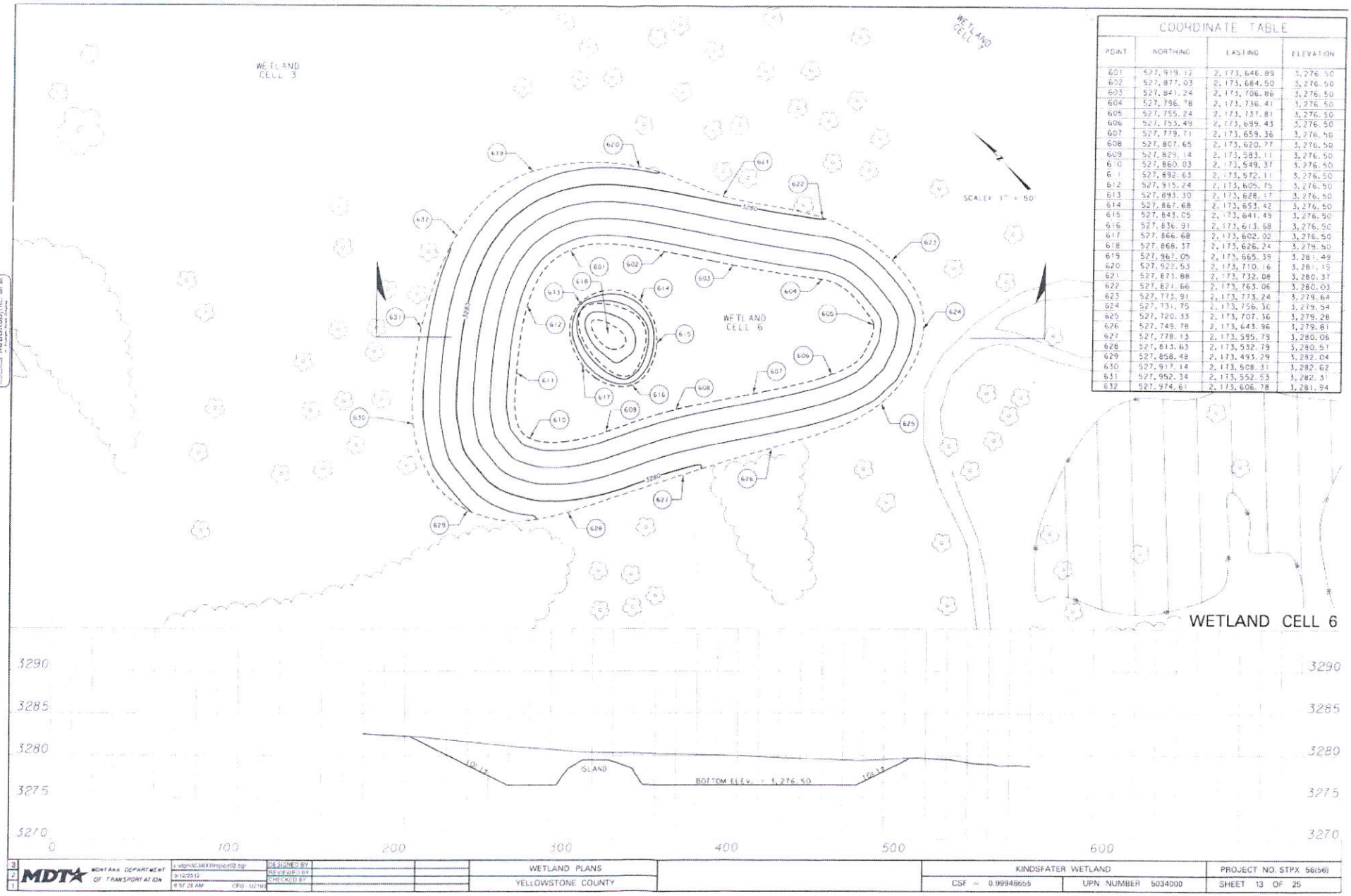

S. 72ND STREET
WETLAND CELL 4
SCALE: 1" = 50'
COORDINATE TABLE
POINT | NORTHING | EASTING | ELEVATION
401 | 527,398.88 | 2,173,230.94 | 3,276.50
402 | 527,429.55 | 2,173,260.12 | 3,276.50
403 | 527,465.87 | 2,173,307.16 | 3,276.50
404 | 527,514.31 | 2,173,339.16 | 3,276.50
405 | 527,460.98 | 2,173,378.20 | 3,276.50
406 | 527,431.29 | 2,173,407.02 | 3,276.50
407 | 527,404.29 | 2,173,438.83 | 3,276.50
408 | 527,381.53 | 2,173,460.23 | 3,276.50
409 | 527,339.43 | 2,173,456.71 | 3,276.50
410 | 527,294.08 | 2,173,439.99 | 3,276.50
411 | 527,272.76 | 2,173,379.13 | 3,276.50
412 | 527,254.48 | 2,173,313.2 | 3,276.50
413 | 52,7248.15 | 2,173,258.22 | 3,276.50
414 | 527,274.93 | 2,173,226.70 | 3,276.50
415 | 527,332.97 | 2,173,223.72 | 3,276.50
416 | 527,357.69 | 2,173,304.43 | 3,276.50
417 | 527,392.02 | 2,173,326.25 | 3,276.50
418 | 527,385.27 | 2,173,361.92 | 3,276.50
419 | 527,340.86 | 2,173,365.53 | 3,276.50
420 | 527,332.64 | 2,173,323.12 | 3,276.50
421 | 527,363.62 | 2,173,346.52 | 3,279.50
422 | 527,410.07 | 2,173,192.84 | 3,280.40
423 | 527,467.56 | 2,173,237.45 | 3,280.75
424 | 527,509.20 | 2,173,282.95 | 3,280.79
425 | 527,559.15 | 2,173,338.30 | 3,280.41
426 | 527,516.52 | 2,173,384.76 | 3,279.98
427 | 527,478.11 | 2,173,409.48 | 3,279.53
428 | 527,447.13 | 2,173,439.92 | 3,279.47
429 | 527,387.50 | 2,173,487.98 | 3,279.25
430 | 527,327.06 | 2,173,485.69 | 3,279.26
431 | 527,267.23 | 2,173,440.55 | 3,279.45
432 | 527,235.49 | 2,173,377.62 | 3,279.67
433 | 527,219.39 | 2,173,312.32 | 3,279.64
434 | 527,223.02 | 2,173,206.92 | 3,280.77
435 | 527,274.38 | 2,173,180.42 | 3,281.11
436 | 527,352.32 | 2,173,181.58 | 3,280.69
TOP OF BANK
BOTTOM ELEV. = 3,276.50
ISLAND
TOP OF BANK
3290
3285
3280
3275
3270
0
100
200
300
400
500
600
MORRISON MAIERLE, INC.
MDT MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND PLANS
YELLOWSTONE COUNTY
KINDSFATER WETLAND
CSF = 0.99948655
UPN NUMBER 5034000
PROJECT NO STPX 56(66)
SHEET 11 OF 25

## COORDINATE TABLE

| POINT | NORTHING | EASTING | ELEVATION |
|---|---|---|---|
| 501 | 527,722.93 | 2,173,433.34 | 3,276.50 |
| 502 | 527,702.13 | 2,173,550.63 | 3,276.50 |
| 503 | 527,673.38 | 2,173,642.57 | 3,276.50 |
| 504 | 527,620.34 | 2,173,557.57 | 3,276.50 |
| 505 | 527,596.10 | 2,173,523.87 | 3,276.50 |
| 506 | 527,579.13 | 2,173,480.20 | 3,276.50 |
| 507 | 527,588.17 | 2,173,431.24 | 3,276.50 |
| 508 | 527,628.60 | 2,173,457.56 | 3,276.50 |
| 509 | 527,679.14 | 2,173,456.05 | 3,276.50 |
| 510 | 527,762.44 | 2,173,412.17 | 3,281.01 |
| 511 | 527,758.86 | 2,173,484.75 | 3,280.63 |
| 512 | 527,719.27 | 2,173,540.86 | 3,280.04 |
| 513 | 527,671.30 | 2,173,585.72 | 3,279.75 |
| 514 | 527,609.06 | 2,173,586.12 | 3,279.61 |
| 515 | 527,570.72 | 2,173,543.56 | 3,279.66 |
| 516 | 527,549.94 | 2,173,490.20 | 3,279.55 |
| 517 | 527,556.15 | 2,173,412.97 | 3,280.07 |
| 518 | 527,616.28 | 2,173,367.74 | 3,280.64 |
| 519 | 527,690.17 | 2,173,364.45 | 3,280.69 |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\dgn\5034000signsht.dgn | DESIGNED BY | | WETLAND PLANS | KINDSFATER WETLAND | | PROJECT NO. STPX 56(56) |
| | 9/12/2012 | REVIEWED BY | | YELLOWSTONE COUNTY | CSF - 0.99948655 | UPN NUMBER 5034000 | SHEET 12 OF 25 |
| | 8:57:31 AM CPS - V21.5 | CHECKED BY | | | | | |




COORDINATE TABLE

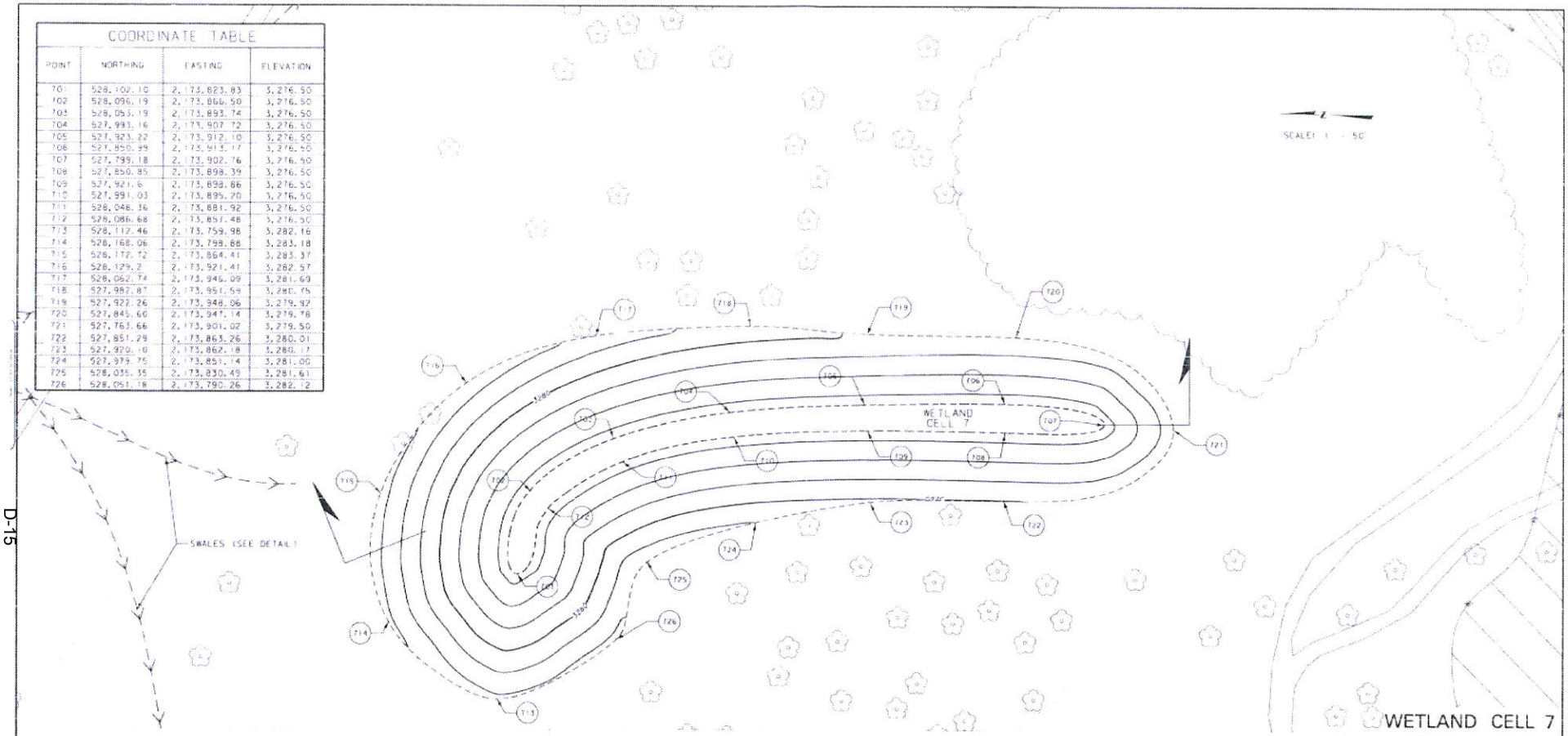
| POINT | NORTHING | EASTING | ELEVATION |
|---|---|---|---|
| 601 | 527,919.12 | 2,173,646.89 | 3,276.50 |
| 602 | 527,877.03 | 2,173,684.50 | 3,276.50 |
| 603 | 527,841.24 | 2,173,706.86 | 3,276.50 |
| 604 | 527,796.78 | 2,173,736.41 | 3,276.50 |
| 605 | 527,755.24 | 2,173,737.81 | 3,276.50 |
| 606 | 527,753.49 | 2,173,699.43 | 3,276.50 |
| 607 | 527,779.71 | 2,173,659.36 | 3,276.50 |
| 608 | 527,807.65 | 2,173,620.77 | 3,276.50 |
| 609 | 527,829.14 | 2,173,583.11 | 3,276.50 |
| 610 | 527,860.03 | 2,173,549.37 | 3,276.50 |
| 611 | 527,892.63 | 2,173,572.11 | 3,276.50 |
| 612 | 527,915.24 | 2,173,605.75 | 3,276.50 |
| 613 | 527,893.30 | 2,173,628.17 | 3,276.50 |
| 614 | 527,867.68 | 2,173,653.42 | 3,276.50 |
| 615 | 527,843.05 | 2,173,641.49 | 3,276.50 |
| 616 | 527,836.91 | 2,173,613.68 | 3,276.50 |
| 617 | 527,866.68 | 2,173,602.02 | 3,276.50 |
| 618 | 527,868.37 | 2,173,626.24 | 3,279.50 |
| 619 | 527,962.05 | 2,173,665.39 | 3,281.49 |
| 620 | 527,922.53 | 2,173,710.16 | 3,281.15 |
| 621 | 527,873.88 | 2,173,732.08 | 3,280.37 |
| 622 | 527,821.66 | 2,173,763.06 | 3,280.03 |
| 623 | 527,773.91 | 2,173,773.24 | 3,279.64 |
| 624 | 527,731.75 | 2,173,756.30 | 3,279.54 |
| 625 | 527,720.33 | 2,173,707.36 | 3,279.28 |
| 626 | 527,749.78 | 2,173,643.96 | 3,279.81 |
| 627 | 527,778.13 | 2,173,595.79 | 3,280.06 |
| 628 | 527,813.63 | 2,173,532.79 | 3,280.51 |
| 629 | 527,858.48 | 2,173,493.29 | 3,282.04 |
| 630 | 527,917.14 | 2,173,508.31 | 3,282.62 |
| 631 | 527,952.34 | 2,173,552.63 | 3,282.51 |
| 632 | 527,974.61 | 2,173,606.78 | 3,281.94 |

MORRISON MAIERLE, INC.

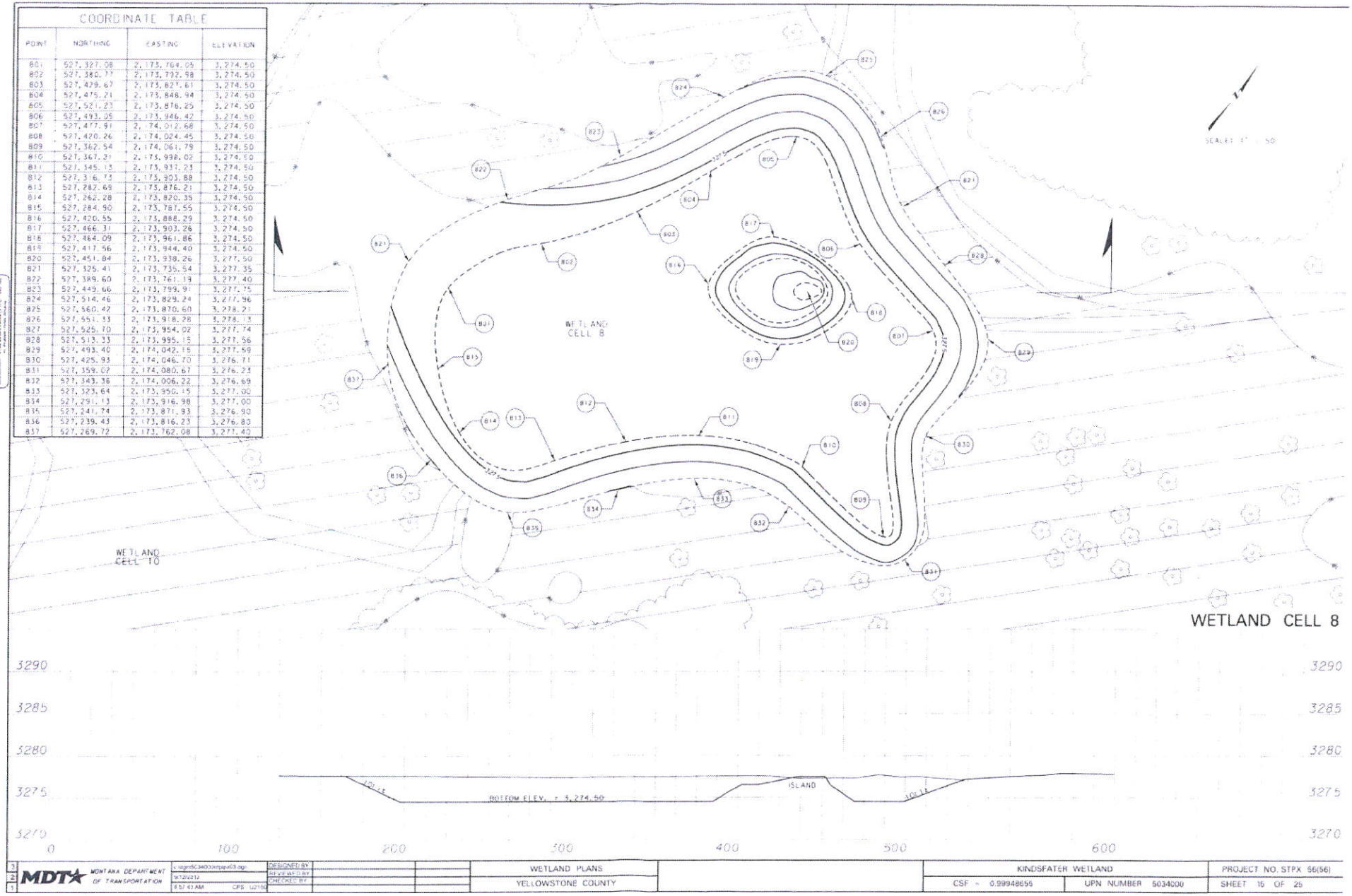
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\dgn\NC-3600\mpplot02.dgn | DESIGNED BY | | WETLAND PLANS | KINDSFATER WETLAND | PROJECT NO. STPX 56(56) |
| 2 | | 9/12/2012 | REVIEWED BY | | YELLOWSTONE COUNTY | CSF = 0.99948655 UPN NUMBER 5034000 | SHEET 13 OF 25 |
| 1 | | 8:57:29 AM CFG: 10/18 | CHECKED BY | | | | |

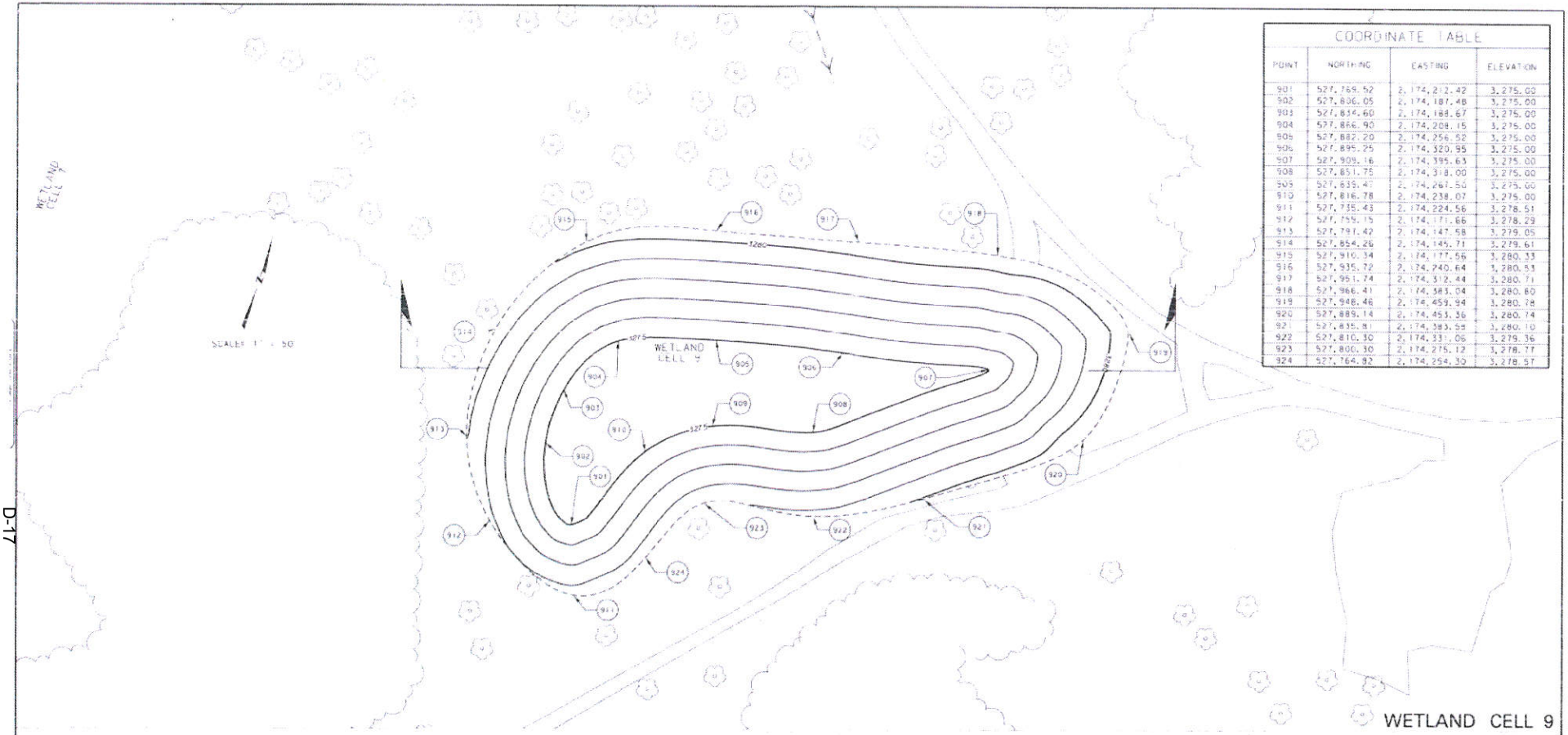
## COORDINATE TABLE

| POINT | NORTHING | EASTING | ELEVATION |
|---|---|---|---|
| 701 | 528,102.10 | 2,173,823.83 | 3,276.50 |
| 702 | 528,096.19 | 2,173,866.50 | 3,276.50 |
| 703 | 528,053.19 | 2,173,893.74 | 3,276.50 |
| 704 | 527,993.16 | 2,173,907.72 | 3,276.50 |
| 705 | 527,923.22 | 2,173,912.10 | 3,276.50 |
| 706 | 527,850.99 | 2,173,915.17 | 3,276.50 |
| 707 | 527,799.18 | 2,173,902.76 | 3,276.50 |
| 708 | 527,850.85 | 2,173,898.39 | 3,276.50 |
| 709 | 527,921.6 | 2,173,898.86 | 3,276.50 |
| 710 | 527,991.03 | 2,173,895.20 | 3,276.50 |
| 711 | 528,048.36 | 2,173,881.92 | 3,276.50 |
| 712 | 528,086.68 | 2,173,857.48 | 3,276.50 |
| 713 | 528,112.46 | 2,173,759.98 | 3,282.16 |
| 714 | 528,168.06 | 2,173,798.88 | 3,283.18 |
| 715 | 528,172.72 | 2,173,864.41 | 3,283.37 |
| 716 | 528,129.2 | 2,173,921.41 | 3,282.57 |
| 717 | 528,062.74 | 2,173,946.09 | 3,281.69 |
| 718 | 527,982.87 | 2,173,951.59 | 3,280.75 |
| 719 | 527,922.26 | 2,173,948.06 | 3,279.92 |
| 720 | 527,845.60 | 2,173,947.14 | 3,279.78 |
| 721 | 527,763.66 | 2,173,901.02 | 3,279.50 |
| 722 | 527,851.29 | 2,173,863.26 | 3,280.01 |
| 723 | 527,920.10 | 2,173,862.18 | 3,280.17 |
| 724 | 527,979.75 | 2,173,851.14 | 3,281.00 |
| 725 | 528,035.35 | 2,173,830.49 | 3,281.61 |
| 726 | 528,051.18 | 2,173,790.26 | 3,282.12 |




| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | DESIGNED BY | WETLAND PLANS | KINDSFATER WETLAND | | PROJECT NO. STPX 56(56) |
| 2 | 9/19/2012 | REVIEWED BY | YELLOWSTONE COUNTY | CSF 0.99948655 | UPN NUMBER 5034000 | SHEET 14 OF 25 |
| 1 | 8:57:38 AM | CHECKED BY | | | | |

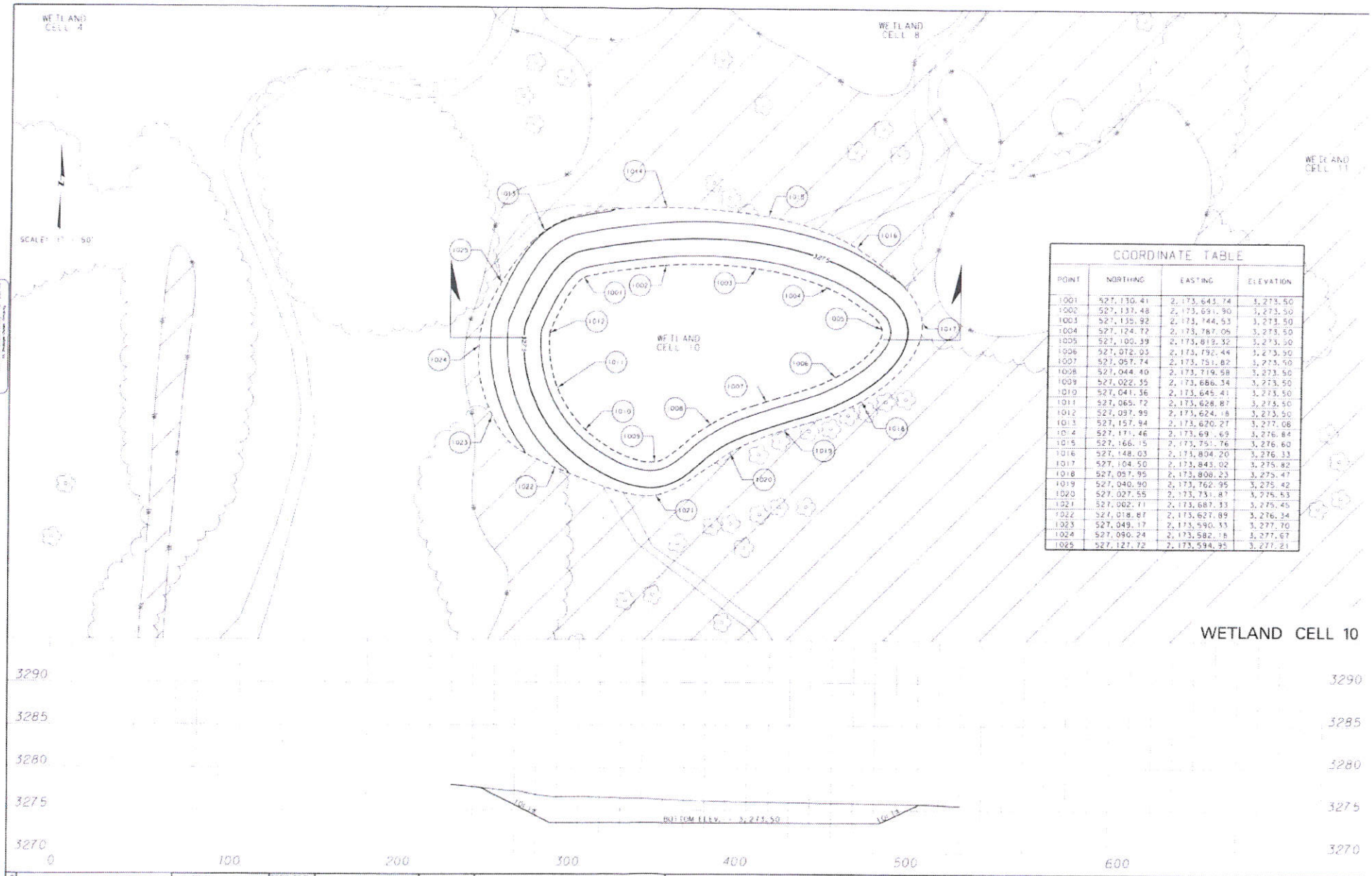

COORDINATE TABLE
POINT | NORTHING | EASTING | ELEVATION
801 | 527,327.08 | 2,173,764.05 | 3,274.50
802 | 527,380.77 | 2,173,792.98 | 3,274.50
803 | 527,429.67 | 2,173,827.61 | 3,274.50
804 | 527,475.21 | 2,173,848.94 | 3,274.50
805 | 527,521.23 | 2,173,878.25 | 3,274.50
806 | 527,493.05 | 2,173,946.42 | 3,274.50
807 | 527,477.91 | 2,174,012.68 | 3,274.50
808 | 527,420.26 | 2,174,024.45 | 3,274.50
809 | 527,362.54 | 2,174,061.79 | 3,274.50
810 | 527,367.31 | 2,173,938.02 | 3,274.50
811 | 527,345.13 | 2,173,937.23 | 3,274.50
812 | 527,316.73 | 2,173,903.88 | 3,274.50
813 | 527,282.69 | 2,173,876.21 | 3,274.50
814 | 527,262.28 | 2,173,820.35 | 3,274.50
815 | 527,284.90 | 2,173,787.55 | 3,274.50
816 | 527,420.55 | 2,173,888.29 | 3,274.50
817 | 527,466.31 | 2,173,903.26 | 3,274.50
818 | 527,464.09 | 2,173,961.86 | 3,274.50
819 | 527,417.56 | 2,173,944.40 | 3,274.50
820 | 523,451.84 | 2,173,938.26 | 3,277.50
821 | 527,325.41 | 2,173,735.54 | 3,277.35
822 | 527,389.60 | 2,173,761.19 | 3,277.40
823 | 527,449.66 | 2,173,799.91 | 3,277.75
824 | 527,514.46 | 2,173,829.24 | 3,277.96
825 | 527,560.42 | 2,173,870.60 | 3,278.21
826 | 527,551.53 | 2,173,918.28 | 3,278.13
827 | 527,525.70 | 2,173,954.02 | 3,277.74
828 | 527,513.33 | 2,173,995.15 | 3,277.56
829 | 527,493.40 | 2,174,042.15 | 3,277.59
830 | 527,425.93 | 2,174,046.70 | 3,276.71
831 | 527,359.02 | 2,174,080.67 | 3,276.23
832 | 527,343.36 | 2,174,006.22 | 3,276.69
833 | 527,323.64 | 2,173,950.15 | 3,277.00
834 | 527,291.13 | 2,173,916.98 | 3,277.00
835 | 527,241.74 | 2,173,871.93 | 3,276.90
836 | 527,239.43 | 2,173,816.23 | 3,276.83
837 | 527,269.72 | 2,173,762.08 | 3,277.40
WETLAND CELL 8
WETLAND CELL 10
SCALE: 1" = 50'
WETLAND CELL 8
3290
3285
3280
3275
3270
0
100
200
300
400
500
600
BOTTOM ELEV. = 3,274.50
ISLAND
MORRISON MAIERLE, INC.
MDT MONTANA DEPARTMENT OF TRANSPORTATION
DESIGNED BY
REVIEWED BY
CHECKED BY
WETLAND PLANS
YELLOWSTONE COUNTY
KINDSFATER WETLAND
CSF = 0.99948659
UPN NUMBER 5034000
PROJECT NO. STPX 56(56)
SHEET 15 OF 25




| COORDINATE TABLE | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| 901 | 527,769.52 | 2,174,212.42 | 3,275.00 |
| 902 | 527,806.05 | 2,174,187.48 | 3,275.00 |
| 903 | 527,834.60 | 2,174,188.67 | 3,275.00 |
| 904 | 527,866.90 | 2,174,208.15 | 3,275.00 |
| 905 | 527,882.20 | 2,174,256.52 | 3,275.00 |
| 906 | 527,895.25 | 2,174,320.95 | 3,275.00 |
| 907 | 527,909.16 | 2,174,395.63 | 3,275.00 |
| 908 | 527,851.75 | 2,174,318.00 | 3,275.00 |
| 909 | 527,835.47 | 2,174,261.50 | 3,275.00 |
| 910 | 527,816.78 | 2,174,238.07 | 3,275.00 |
| 911 | 527,735.43 | 2,174,224.56 | 3,278.51 |
| 912 | 527,755.15 | 2,174,171.66 | 3,278.29 |
| 913 | 527,791.42 | 2,174,147.58 | 3,279.05 |
| 914 | 527,854.26 | 2,174,145.71 | 3,279.61 |
| 915 | 527,910.34 | 2,174,177.56 | 3,280.33 |
| 916 | 527,935.72 | 2,174,240.64 | 3,280.53 |
| 917 | 527,951.74 | 2,174,312.44 | 3,280.71 |
| 918 | 527,966.41 | 2,174,383.04 | 3,280.80 |
| 919 | 527,948.46 | 2,174,459.94 | 3,280.78 |
| 920 | 527,889.14 | 2,174,453.36 | 3,280.74 |
| 921 | 527,835.81 | 2,174,383.55 | 3,280.10 |
| 922 | 527,810.30 | 2,174,331.06 | 3,279.36 |
| 923 | 527,800.30 | 2,174,275.12 | 3,278.77 |
| 924 | 527,764.92 | 2,174,254.30 | 3,278.57 |

WETLAND CELL 9

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | C:\cgi\450340\Graphics\3.dgn | DESIGNED BY | | WETLAND PLANS | KINDSFATER WETLAND | PROJECT NO. STPX 56(56) |
| 2 | | 9/12/2012 | REVIEWED BY | | YELLOWSTONE COUNTY | CSF = 0.99948655 UPN NUMBER 6034000 | SHEET 16 OF 25 |
| 1 | | 8:57:48 AM CPS U216 | CHECKED BY | | | | |




COORDINATE TABLE

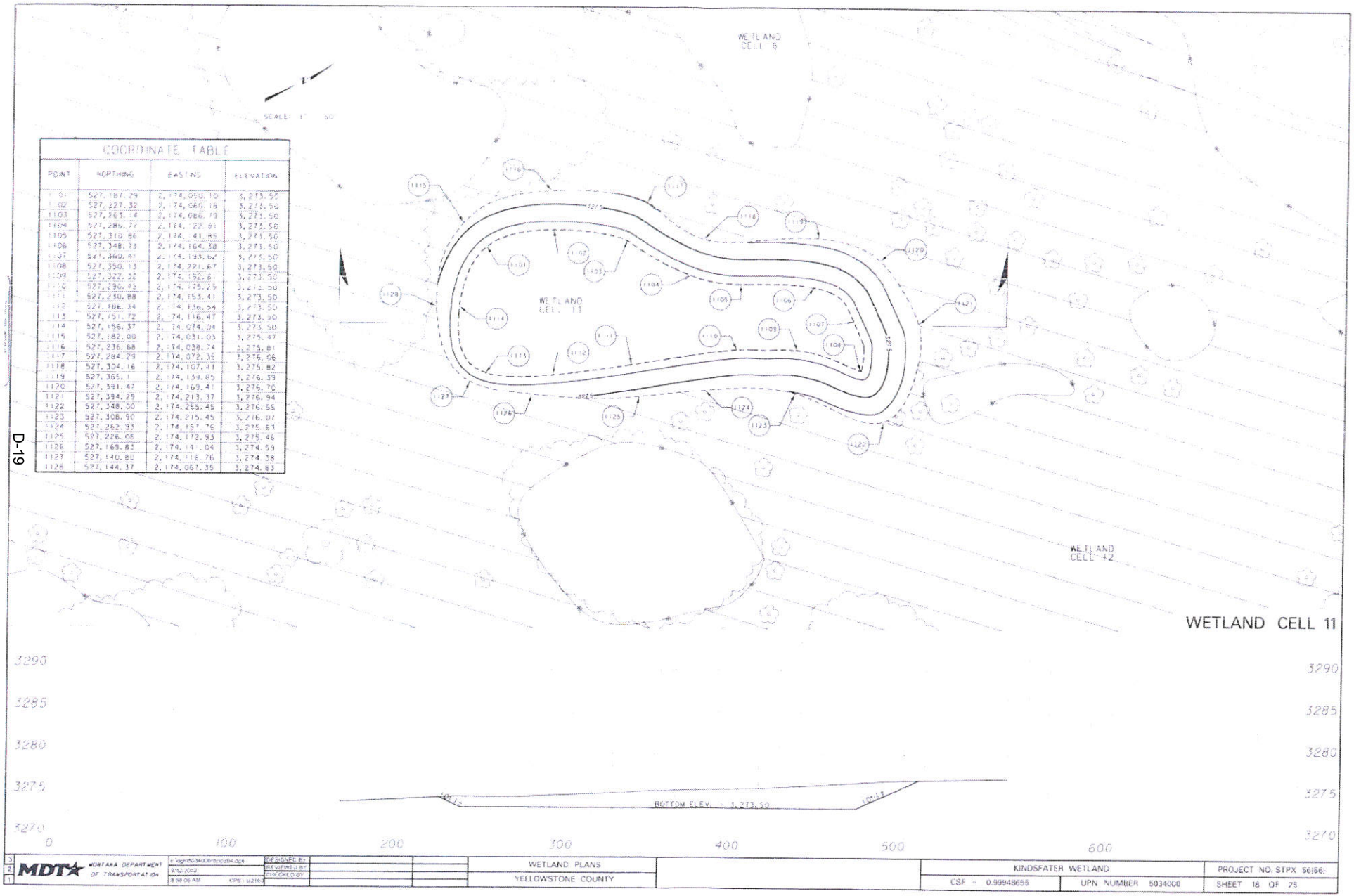
| POINT | NORTHING | EASTING | ELEVATION |
|---|---|---|---|
| 1001 | 527,130.41 | 2,173,643.74 | 3,273.50 |
| 1002 | 527,137.48 | 2,173,691.90 | 3,273.50 |
| 1003 | 527,135.92 | 2,173,744.53 | 3,273.50 |
| 1004 | 527,124.72 | 2,173,787.05 | 3,273.50 |
| 1005 | 527,100.39 | 2,173,813.32 | 3,273.50 |
| 1006 | 527,072.03 | 2,173,792.44 | 3,273.50 |
| 1007 | 527,057.74 | 2,173,751.82 | 3,273.50 |
| 1008 | 527,044.40 | 2,173,719.58 | 3,273.50 |
| 1009 | 527,022.35 | 2,173,686.34 | 3,273.50 |
| 1010 | 527,041.36 | 2,173,645.41 | 3,273.50 |
| 1011 | 527,065.72 | 2,173,628.87 | 3,273.50 |
| 1012 | 527,097.99 | 2,173,624.18 | 3,273.50 |
| 1013 | 527,157.94 | 2,173,620.27 | 3,277.08 |
| 1014 | 527,171.46 | 2,173,691.69 | 3,276.84 |
| 1015 | 527,166.15 | 2,173,751.76 | 3,276.60 |
| 1016 | 527,148.03 | 2,173,804.20 | 3,276.33 |
| 1017 | 527,104.50 | 2,173,843.02 | 3,275.82 |
| 1018 | 527,057.95 | 2,173,808.23 | 3,275.47 |
| 1019 | 527,040.90 | 2,173,762.95 | 3,275.42 |
| 1020 | 527,027.55 | 2,173,731.87 | 3,275.53 |
| 1021 | 527,002.71 | 2,173,687.33 | 3,275.45 |
| 1022 | 527,018.81 | 2,173,627.89 | 3,276.34 |
| 1023 | 527,049.17 | 2,173,590.33 | 3,277.70 |
| 1024 | 527,090.24 | 2,173,582.18 | 3,277.67 |
| 1025 | 527,127.72 | 2,173,594.95 | 3,277.21 |

WETLAND CELL 10

MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | c:\dgn\803400\mtpsm04.dgn | DESIGNED BY | | WETLAND PLANS | KINDSFATER WETLAND | | PROJECT NO. STPX 56(56) |
| 2 | 8/12/2012 | DRAWN BY | | YELLOWSTONE COUNTY | CSF - 0.99948655 | UPN NUMBER 5034000 | SHEET 17 OF 25 |
| 1 | 8:58:01 AM CPS - UZ1HC | CHECKED BY | | | | | |




COORDINATE TABLE

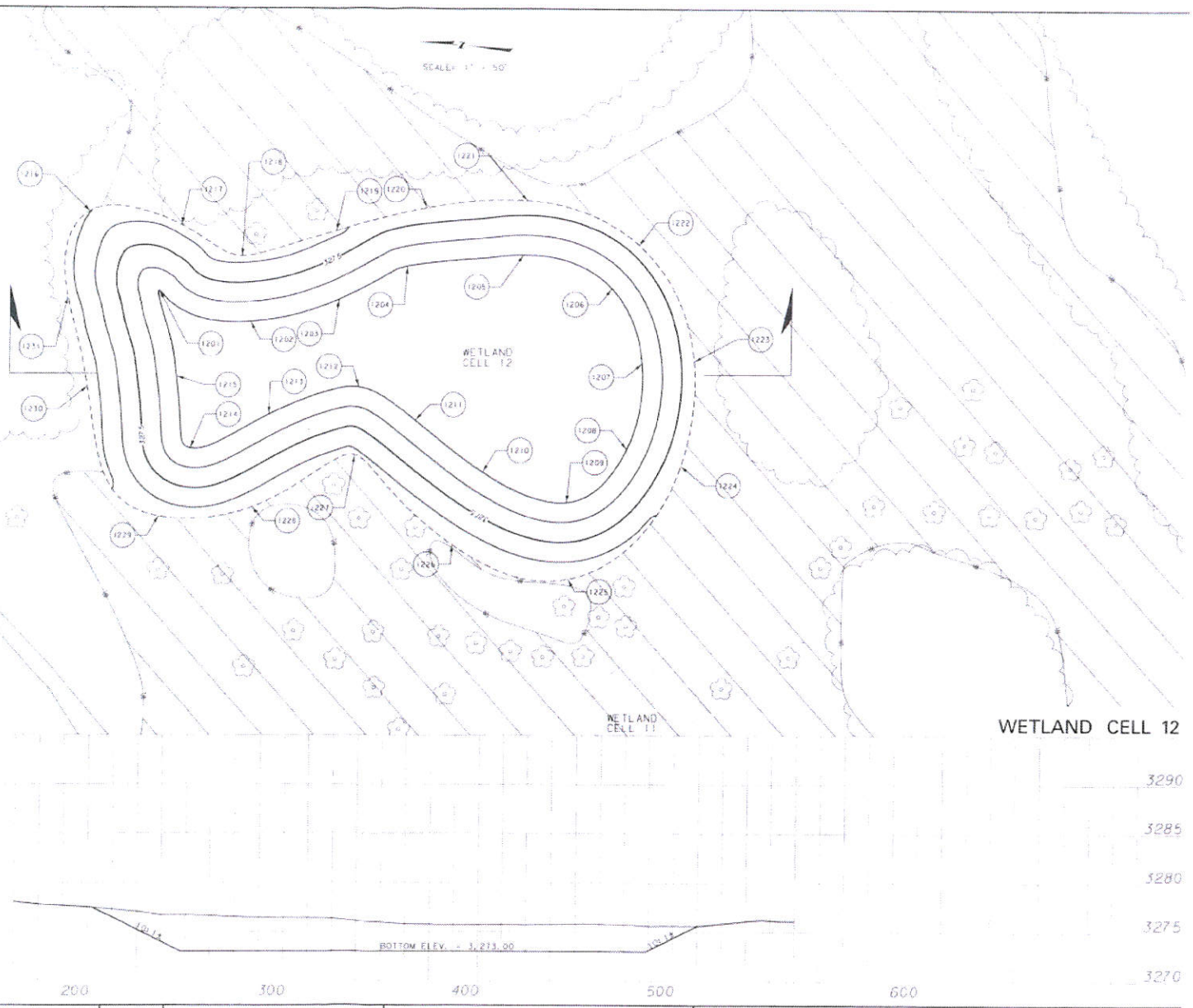
| POINT | NORTHING | EASTING | ELEVATION |
|---|---|---|---|
| 1 01 | 527, 187.29 | 2, 174, 050.10 | 3, 273.50 |
| 1 02 | 527, 227.32 | 2, 74, 066.18 | 3, 273.50 |
| 1103 | 527, 265.14 | 2, 174, 086.19 | 3, 273.50 |
| 1104 | 527, 286.77 | 2, 174, 22.81 | 3, 275.50 |
| 1105 | 527, 310.86 | 2, 174, 41.85 | 3, 275.50 |
| 1106 | 527, 348.73 | 2, 174, 164.38 | 3, 273.50 |
| 1107 | 527, 360.91 | 2, 174, 193.62 | 3, 275.50 |
| 1108 | 527, 350.13 | 2, 174, 221.67 | 3, 273.50 |
| 1109 | 527, 322.32 | 2, 174, 192.81 | 3, 273.50 |
| 1110 | 527, 290.45 | 2, 174, 175.29 | 3, 273.50 |
| 1111 | 527, 230.88 | 2, 174, 153.41 | 3, 273.50 |
| 112 | 527, 186.34 | 2, 74, 136.54 | 3, 273.50 |
| 113 | 527, 151.72 | 2, 74, 116.47 | 3, 273.50 |
| 114 | 527, 156.37 | 2, 74, 074.04 | 3, 273.50 |
| 115 | 527, 182.00 | 2, 74, 031.03 | 3, 275.47 |
| 116 | 527, 236.68 | 2, 174, 038.74 | 3, 275.81 |
| 117 | 527, 284.29 | 2, 174, 072.35 | 3, 276.06 |
| 118 | 527, 304.16 | 2, 174, 107.41 | 3, 276.82 |
| 119 | 527, 365, 1 | 2, 74, 139.85 | 3, 276.39 |
| 1120 | 527, 391.47 | 2, 174, 169.41 | 3, 276.70 |
| 1121 | 527, 394.29 | 2, 174, 213.37 | 3, 276.94 |
| 1122 | 527, 348.00 | 2, 174, 255.45 | 3, 276.55 |
| 1123 | 527, 308.90 | 2, 174, 215.45 | 3, 276.01 |
| 1124 | 527, 262.93 | 2, 174, 187.76 | 3, 275.61 |
| 1125 | 527, 226.06 | 2, 174, 172.93 | 3, 275.46 |
| 1126 | 527, 169.81 | 2, 174, 141.04 | 3, 274.59 |
| 1127 | 527, 140.80 | 2, 174, 116.76 | 3, 274.38 |
| 1128 | 527, 144, 37 | 2, 174, 067.35 | 3, 274.83 |

D-19

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\eginl50\34000\mpnl\e.dgn | DESIGNED BY | WETLAND PLANS | KINDSFATER WETLAND | | PROJECT NO. STPX 56(56) |
| | 8/12/2012 | REVIEWED BY | YELLOWSTONE COUNTY | CSF = 0.99948655 | UPN NUMBER 5034000 | SHEET 18 OF 25 |
| | 8:58:06 AM | CHECKED BY | | | | |
| | OPS: UZ16 | | | | | |

## COORDINATE TABLE

| POINT | NORTHING | EASTING | ELEVATION |
|---|---|---|---|
| 1201 | 527,607.4 | 2,174,411.59 | 3,273.00 |
| 1202 | 527,559.67 | 2,174,398.94 | 3,273.00 |
| 1203 | 527,515.33 | 2,174,412.85 | 3,273.00 |
| 1204 | 527,481.18 | 2,174,431.91 | 3,273.00 |
| 1205 | 527,423.60 | 2,174,441.17 | 3,273.00 |
| 1206 | 527,376.28 | 2,174,427.17 | 3,273.00 |
| 1207 | 527,357.86 | 2,174,390.07 | 3,273.00 |
| 1208 | 527,362.61 | 2,174,345.93 | 3,273.00 |
| 1209 | 527,391.26 | 2,174,316.98 | 3,273.00 |
| 1210 | 527,439.55 | 2,174,329.06 | 3,273.00 |
| 1211 | 527,471.57 | 2,174,353.96 | 3,273.00 |
| 1212 | 527,502.48 | 2,174,369.13 | 3,273.00 |
| 1213 | 527,546.85 | 2,174,352.40 | 3,273.00 |
| 1214 | 527,585.60 | 2,174,332.94 | 3,273.00 |
| 1215 | 527,595.34 | 2,174,368.84 | 3,273.00 |
| 1216 | 527,645.51 | 2,174,449.50 | 3,276.99 |
| 1217 | 527,598.32 | 2,174,445.35 | 3,276.43 |
| 1218 | 527,566.22 | 2,174,431.77 | 3,276.34 |
| 1219 | 527,519.30 | 2,174,447.34 | 3,276.10 |
| 1220 | 527,473.73 | 2,174,461.54 | 3,276.63 |
| 1221 | 527,422.14 | 2,174,468.45 | 3,276.83 |
| 1222 | 527,363.92 | 2,174,449.51 | 3,276.44 |
| 1223 | 527,331.51 | 2,174,392.61 | 3,275.57 |
| 1224 | 527,334.48 | 2,174,339.41 | 3,275.86 |
| 1225 | 527,387.98 | 2,174,278.32 | 3,276.67 |
| 1226 | 527,448.37 | 2,174,292.37 | 3,276.85 |
| 1227 | 527,501.70 | 2,174,334.77 | 3,276.26 |
| 1228 | 527,552.17 | 2,174,305.25 | 3,276.71 |
| 1229 | 527,599.24 | 2,174,297.69 | 3,276.67 |
| 230 | 527,640.27 | 2,174,360.82 | 3,277.46 |
| 231 | 527,652.33 | 2,174,406.22 | 3,277.38 |




MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION

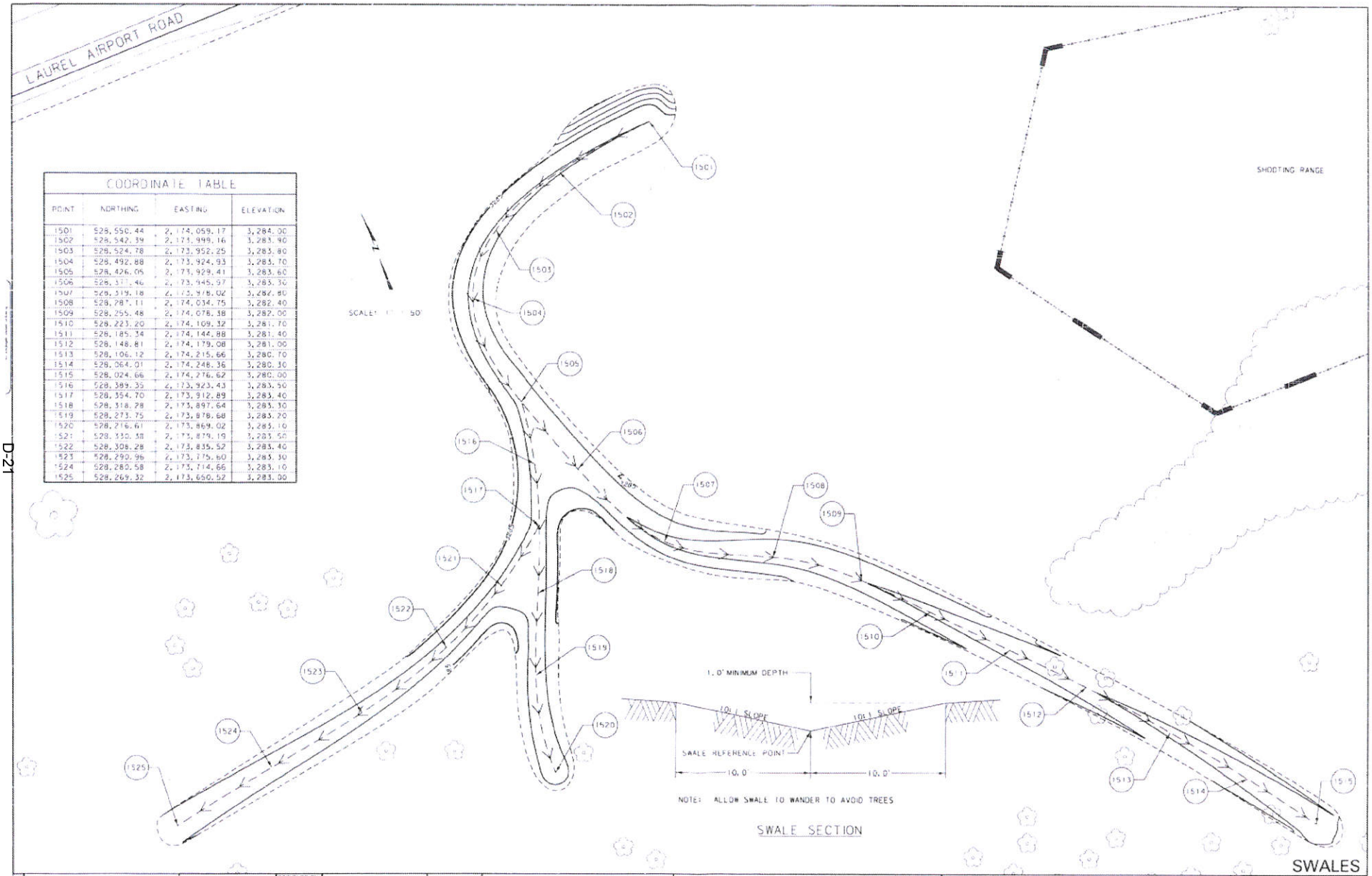
C:\dgn\5034000mspsht04.dgn
4/12/2012
8:58:11 AM
CPS U213

DESIGNED BY
RE-DRAWN BY
CHECKED BY

WETLAND PLANS
YELLOWSTONE COUNTY

KINDSFATER WETLAND
CSF = 0.99948655
UPN NUMBER 5034000

PROJECT NO. STPX 56(56)
SHEET 19 OF 25




SWALE SECTION

| COORDINATE TABLE | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| 1501 | 528,550.44 | 2,174,059.17 | 3,284.00 |
| 1502 | 528,542.39 | 2,174,999.16 | 3,283.90 |
| 1503 | 528,524.78 | 2,173,952.25 | 3,283.80 |
| 1504 | 528,492.88 | 2,173,924.93 | 3,283.70 |
| 1505 | 528,426.05 | 2,173,929.41 | 3,283.60 |
| 1506 | 528,377.46 | 2,173,945.97 | 3,283.30 |
| 1507 | 528,319.18 | 2,173,978.02 | 3,282.80 |
| 1508 | 528,287.11 | 2,174,034.75 | 3,282.40 |
| 1509 | 528,255.48 | 2,174,078.38 | 3,282.00 |
| 1510 | 528,223.20 | 2,174,109.32 | 3,281.70 |
| 1511 | 528,185.34 | 2,174,144.88 | 3,281.40 |
| 1512 | 528,148.81 | 2,174,179.08 | 3,281.00 |
| 1513 | 528,106.12 | 2,174,215.66 | 3,280.70 |
| 1514 | 528,064.01 | 2,174,248.36 | 3,280.30 |
| 1515 | 528,024.66 | 2,174,276.62 | 3,280.00 |
| 1516 | 528,389.35 | 2,173,923.43 | 3,283.50 |
| 1517 | 528,354.70 | 2,173,912.89 | 3,283.40 |
| 1518 | 528,318.28 | 2,173,897.64 | 3,283.30 |
| 1519 | 528,273.75 | 2,173,878.68 | 3,283.20 |
| 1520 | 528,216.61 | 2,173,869.02 | 3,283.10 |
| 1521 | 528,335.58 | 2,173,879.19 | 3,283.50 |
| 1522 | 528,308.28 | 2,173,835.52 | 3,283.40 |
| 1523 | 528,290.96 | 2,173,775.60 | 3,283.30 |
| 1524 | 528,280.58 | 2,173,714.66 | 3,283.10 |
| 1525 | 528,269.32 | 2,173,650.52 | 3,283.00 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\dgn\6034300rqplus05.dgn | DESIGNED BY | | WETLAND PLANS | KINDSFATER WETLAND | | PROJECT NO. STPX 56(56) |
| 2 | | 9/10/2012 | REVIEWED BY | | | | | |
| 1 | | 8:56:23 AM CDS U2140 | CHECKED BY | | YELLOWSTONE COUNTY | CSF = 0.99948655 | UPN NUMBER 5034000 | SHEET 20 OF 25 |

SWALES

# ADDITIVE ALTERNATE
# TABLE OF CONTENTS


| WETLAND PLANS | SHEET NO. |
|---|---|
| TABLE OF CONTENTS | 21 |
| SUMMARY FRAMES | 22 |
| GRADING OVERVIEW | 23 |
| WETLAND CELL 13 | 24 |
| WETLAND CELL 14 | 25 |


MORRISON MAIERLE, INC.

# SUMMARY

## GRADING

| STATION | cubic yards* UNCL EXC | UNCL BORROW | EMB | REMARKS |
|---|---|---|---|---|
| | 297,200 | | | GRADING AREA |
| | 5,665 | | | WETLAND CELL 13 |
| | 7,505 | | | WETLAND CELL 14 |
| TOTAL | 310,370 | | | |

* QUANTITIES SHOWN ARE IN-PLACE. NO SHRINK/SWELL FACTORS HAVE BEEN APPLIED.

## CONSTRUCTION SURVEY & LAYOUT

| STATION FROM | STATION TO | lump sum | REMARKS |
|---|---|---|---|
| | | 1.0 | ADDITIVE ALTERNATE SURVEY |
| TOTAL | | 1.0 | |

## REVEGETATION

| STATION | cubic yards WETLAND SOIL SALVAGE | cubic yards TOPSOIL SALVAGING & PLACING | acres WETLAND SEEDING WETLAND | acres WETLAND SEEDING UPLAND | acres CONDITION SEEDBED | lump sum TREE & SHRUB PLANTING | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | | | 1.0 | ADDITIVE ALTERNATE AREA |
| | | 7,525 | 15.9 | | 15.9 | | GRADING AREA |
| | | | 1.2 | | 1.2 | | WETLAND CELL 13 |
| | | | 1.6 | | 1.6 | | WETLAND CELL 14 |
| TOTAL | | 7,525 | 18.7 | | 18.7 | 1.0* | |

* SEE SHEET 5

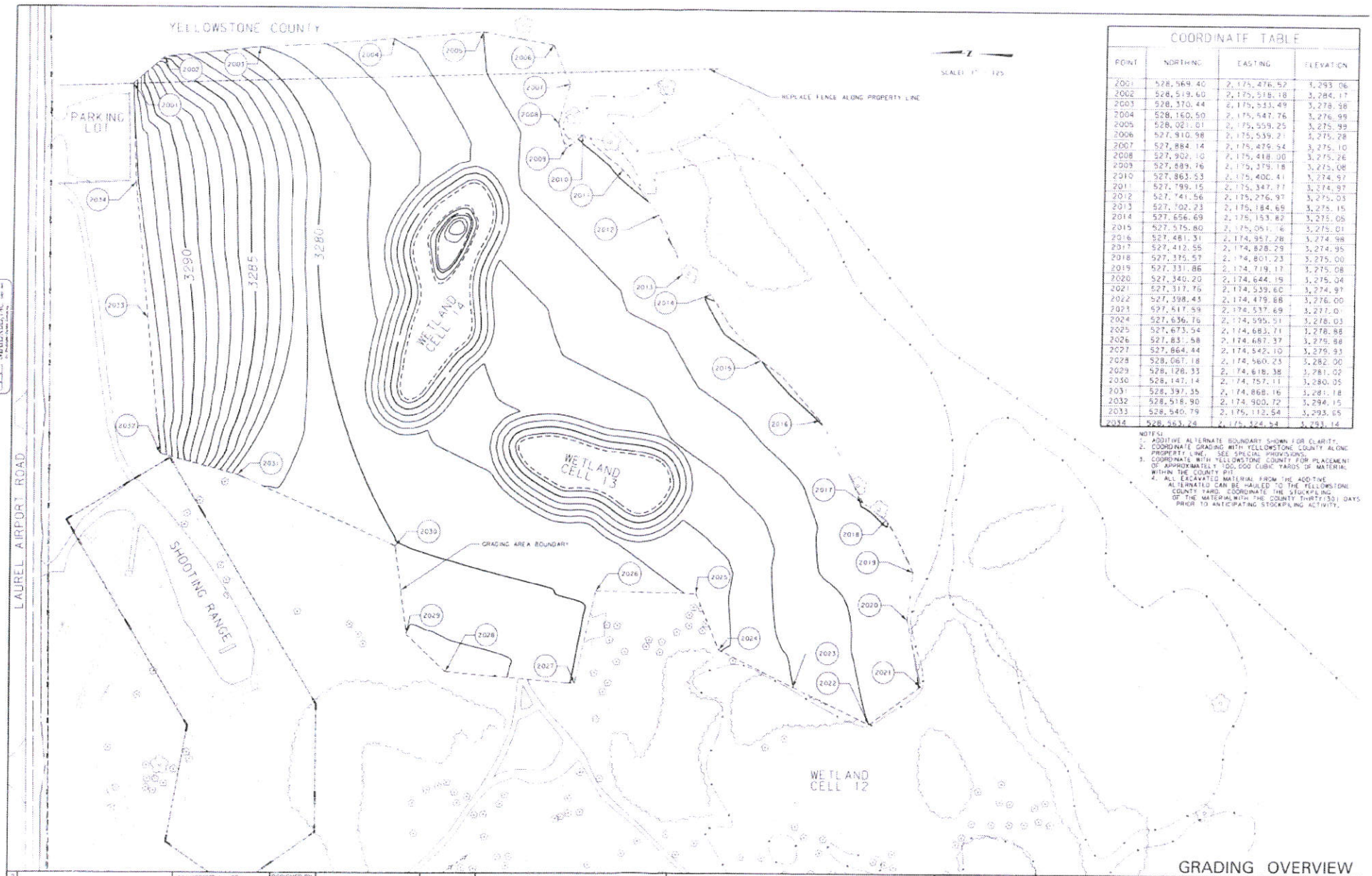
## FENCING

| STATION | linear feet CHAIN LINK FENCE 48" | 60" | WILDLIFE FRIENDLY FENCE (TYPE 1-FM)* | each CHAIN LINK PANEL SINGLE | DOUBLE | WILDLIFE FRIENDLY FENCE PANEL SINGLE | DOUBLE | linear feet REMOVE FENCE** | CHAIN LINK GATE SINGLE | DOUBLE | FARM GATE METAL TYPE G 3 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 458 | | | | |
| | | | 99 | | | 2 | 2 | 1,064 | | | | EAST BOUNDARY |
| TOTAL | | | 99 | | | 2 | 2 | | | | | |

* SMOOTH WIRE
** FOR INFORMATION ONLY

D-23

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | e:\dgn\5034000\sum201.dgn | DESIGNED BY | | | WETLAND PLANS | | KINDSFATER WETLAND | PROJECT NO. STPX 8699(6) |
| 2 | | 5/12/2012 | REVISED BY | | | YELLOWSTONE COUNTY | | CSF = 0.99948655 UPN NUMBER 5034000 | SHEET 22 OF 25 |
| 1 | | 8:54:38 AM CPS - U216 | CHECKED BY | | | | | | |




| COORDINATE TABLE | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| 2001 | 528,569.40 | 2,175,476.52 | 3,293.06 |
| 2002 | 528,519.60 | 2,175,518.18 | 3,284.17 |
| 2003 | 528,370.44 | 2,175,533.49 | 3,278.98 |
| 2004 | 528,160.50 | 2,175,547.76 | 3,276.99 |
| 2005 | 528,021.01 | 2,175,559.25 | 3,275.99 |
| 2006 | 527,910.98 | 2,175,539.21 | 3,275.28 |
| 2007 | 527,884.14 | 2,175,479.54 | 3,275.10 |
| 2008 | 527,902.10 | 2,175,418.00 | 3,275.26 |
| 2009 | 527,889.76 | 2,175,379.18 | 3,275.08 |
| 2010 | 527,863.53 | 2,175,400.41 | 3,274.97 |
| 2011 | 527,799.15 | 2,175,347.77 | 3,274.97 |
| 2012 | 527,741.56 | 2,175,276.97 | 3,275.03 |
| 2013 | 527,702.23 | 2,175,184.69 | 3,275.15 |
| 2014 | 527,656.69 | 2,175,153.82 | 3,275.06 |
| 2015 | 527,575.80 | 2,175,051.16 | 3,275.01 |
| 2016 | 527,481.31 | 2,174,957.28 | 3,274.98 |
| 2017 | 527,412.55 | 2,174,828.29 | 3,274.95 |
| 2018 | 527,375.57 | 2,174,801.23 | 3,275.00 |
| 2019 | 527,331.86 | 2,174,719.17 | 3,275.08 |
| 2020 | 527,340.20 | 2,174,644.19 | 3,275.04 |
| 2021 | 527,317.76 | 2,174,539.60 | 3,274.97 |
| 2022 | 527,398.43 | 2,174,479.88 | 3,276.00 |
| 2023 | 527,517.59 | 2,174,537.69 | 3,277.01 |
| 2024 | 527,636.76 | 2,174,595.51 | 3,278.03 |
| 2025 | 527,673.54 | 2,174,683.71 | 3,278.88 |
| 2026 | 527,831.58 | 2,174,687.37 | 3,279.88 |
| 2027 | 527,864.44 | 2,174,542.10 | 3,279.93 |
| 2028 | 528,067.18 | 2,174,560.23 | 3,282.00 |
| 2029 | 528,128.33 | 2,174,618.38 | 3,281.02 |
| 2030 | 528,147.14 | 2,174,757.11 | 3,280.05 |
| 2031 | 528,397.35 | 2,174,868.16 | 3,281.18 |
| 2032 | 528,518.90 | 2,174,900.72 | 3,294.15 |
| 2033 | 528,540.79 | 2,175,112.54 | 3,293.65 |
| 2034 | 528,563.24 | 2,175,324.54 | 3,293.14 |

NOTES:
1. ADDITIVE ALTERNATE BOUNDARY SHOWN FOR CLARITY.
2. COORDINATE GRADING WITH YELLOWSTONE COUNTY ALONG PROPERTY LINE. SEE SPECIAL PROVISIONS.
3. COORDINATE WITH YELLOWSTONE COUNTY FOR PLACEMENT OF APPROXIMATELY 100,000 CUBIC YARDS OF MATERIAL WITHIN THE COUNTY PIT.
4. ALL EXCAVATED MATERIAL FROM THE ADDITIVE ALTERNATE CAN BE HAULED TO THE YELLOWSTONE COUNTY YARD. COORDINATE THE STOCKPILING OF THE MATERIAL WITH THE COUNTY THIRTY (30) DAYS PRIOR TO ANTICIPATING STOCKPILING ACTIVITY.

MORRISON MAIERLE, INC.

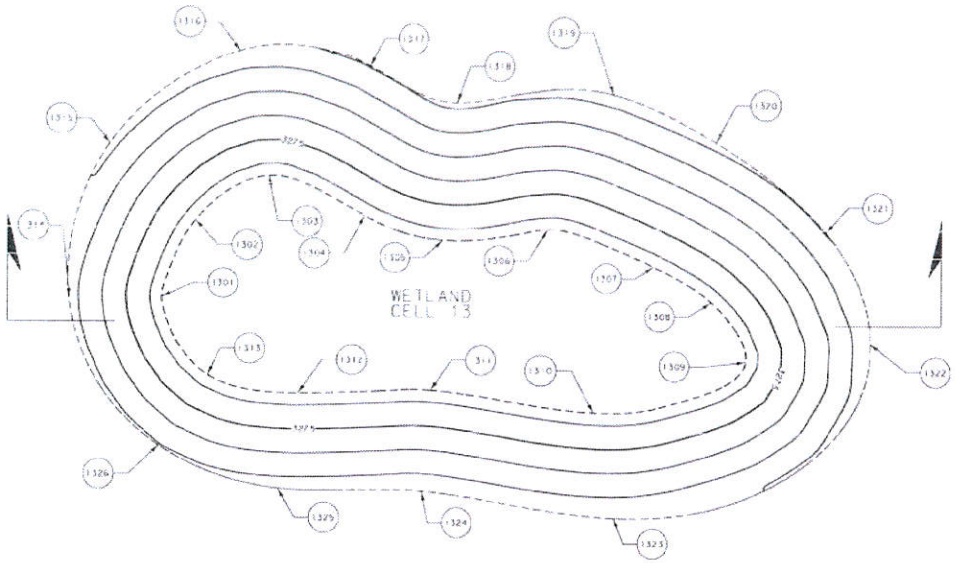
MDT MONTANA DEPARTMENT OF TRANSPORTATION

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | WETLAND PLANS | KINDSFATER WETLAND | PROJECT NO. STPX 56(56) |
| | | | | YELLOWSTONE COUNTY | CSF - 0.99948655 / UPN NUMBER 5034000 | SHEET 23 OF 25 |

GRADING OVERVIEW

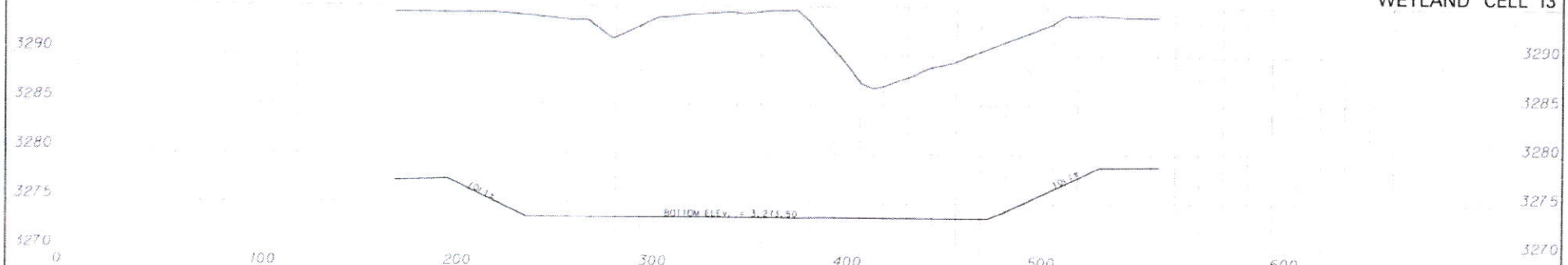
| COORDINATE TABLE | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| 1301 | 527,715.96 | 2,174,853.61 | 3,273.50 |
| 1302 | 527,734.74 | 2,174,823.80 | 3,273.50 |
| 1303 | 527,764.93 | 2,174,810.00 | 3,273.50 |
| 1304 | 527,804.84 | 2,174,832.35 | 3,273.50 |
| 1305 | 527,836.29 | 2,174,847.47 | 3,273.50 |
| 1306 | 527,880.54 | 2,174,849.37 | 3,273.50 |
| 1307 | 527,921.93 | 2,174,871.47 | 3,273.50 |
| 1308 | 527,943.98 | 2,174,890.18 | 3,273.50 |
| 1309 | 527,954.59 | 2,174,917.06 | 3,273.50 |
| 1310 | 527,887.71 | 2,174,928.58 | 3,273.50 |
| 1311 | 527,821.75 | 2,174,909.08 | 3,273.50 |
| 1312 | 527,766.30 | 2,174,902.04 | 3,273.50 |
| 1313 | 527,730.13 | 2,174,886.06 | 3,273.50 |
| 1314 | 527,677.68 | 2,174,848.35 | 3,277.37 |
| 1315 | 527,703.86 | 2,174,786.87 | 3,278.17 |
| 1316 | 527,763.87 | 2,174,757.32 | 3,278.75 |
| 1317 | 527,816.54 | 2,174,771.33 | 3,279.06 |
| 1318 | 527,851.11 | 2,174,791.97 | 3,279.08 |
| 1319 | 527,916.26 | 2,174,798.38 | 3,279.29 |
| 1320 | 527,955.68 | 2,174,824.48 | 3,279.24 |
| 1321 | 527,995.56 | 2,174,868.38 | 3,278.99 |
| 1322 | 528,007.63 | 2,174,917.31 | 3,278.67 |
| 1323 | 527,889.35 | 2,174,973.03 | 3,277.71 |
| 1324 | 527,811.71 | 2,174,949.88 | 3,277.58 |
| 1325 | 527,751.92 | 2,174,939.81 | 3,277.32 |
| 1326 | 527,705.51 | 2,174,914.87 | 3,277.04 |

SCALE: 1" = 50'




WETLAND
CELL 14

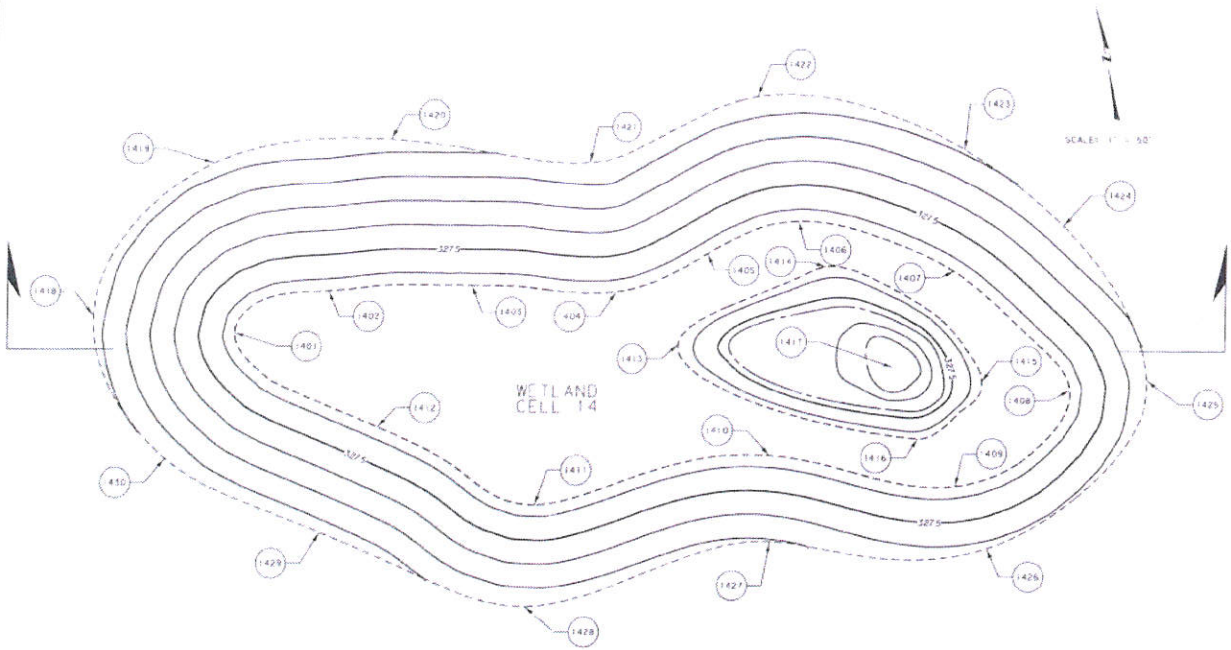
WETLAND CELL 13




D-25

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | MDT MONTANA DEPARTMENT OF TRANSPORTATION | c:\dgn\5034000mpipe06.dgn | DESIGNED BY | | WETLAND PLANS | KINDSFATER WETLAND | PROJECT NO. STPX 56(66) |
| 2 | | 8/12/2012 | REVIEWED BY | | | | |
| 1 | | 8:58:57 AM DPS: U2165 | CHECKED BY | | YELLOWSTONE COUNTY | CSF = 0.99948655 UPN NUMBER 5034000 | SHEET 24 OF 25 |

| COORDINATE TABLE | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| 1401 | 528, 131. 33 | 2, 174, 987. 50 | 3, 273. 50 |
| 1402 | 528, 139. 49 | 2, 175, 030. 04 | 3, 273. 50 |
| 1403 | 528, 138. 65 | 2, 175, 089. 12 | 3, 273. 50 |
| 1404 | 528, 112. 51 | 2, 175, 147. 65 | 3, 273. 50 |
| 1405 | 528, 119. 43 | 2, 175, 188. 93 | 3, 273. 50 |
| 1406 | 528, 124. 46 | 2, 175, 229. 14 | 3, 273. 50 |
| 1407 | 528, 089. 69 | 2, 175, 288. 30 | 3, 273. 50 |
| 1408 | 528, 030. 39 | 2, 175, 375. 76 | 3, 273. 50 |
| 1409 | 528, 001. 48 | 2, 175, 269. 95 | 3, 273. 50 |
| 1410 | 528, 031. 35 | 2, 175, 196. 45 | 3, 273. 50 |
| 1411 | 528, 032. 78 | 2, 175, 095. 48 | 3, 273. 50 |
| 1412 | 528, 079. 39 | 2, 175, 036. 10 | 3, 273. 50 |
| 1413 | 528, 085. 41 | 2, 175, 168. 90 | 3, 273. 50 |
| 1414 | 528, 103. 44 | 2, 175, 236. 16 | 3, 273. 50 |
| 1415 | 528, 042. 05 | 2, 175, 290. 35 | 3, 273. 50 |
| 1416 | 528, 024. 48 | 2, 175, 258. 76 | 3, 273. 50 |
| 1417 | 528, 056. 13 | 2, 175, 255. 20 | 3, 276. 50 |
| 1418 | 528, 151. 51 | 2, 174, 930. 7 | 3, 279. 43 |
| 1419 | 528, 202. 14 | 2, 174, 993. 58 | 3, 279. 61 |
| 1420 | 528, 195. 35 | 2, 175, 068. 75 | 3, 279. 41 |
| 1421 | 528, 167. 63 | 2, 175, 148. 06 | 3, 278. 76 |
| 1422 | 528, 178. 98 | 2, 175, 223. 17 | 3, 278. 78 |
| 1423 | 528, 138. 16 | 2, 175, 303. 63 | 3, 278. 70 |
| 1424 | 528, 098. 17 | 2, 175, 337. 60 | 3, 277. 75 |
| 1425 | 528, 027. 04 | 2, 175, 358. 58 | 3, 276. 75 |
| 1426 | 527, 972. 75 | 2, 175, 277. 66 | 3, 276. 34 |
| 1427 | 527, 995. 60 | 2, 175, 188. 97 | 3, 277. 12 |
| 1428 | 527, 991. 57 | 2, 175, 082. 36 | 3, 277. 74 |
| 1429 | 528, 041. 47 | 2, 175, 004. 53 | 3, 278. 35 |
| 1430 | 528, 086. 21 | 2, 174, 947. 68 | 3, 278. 88 |







MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION

| | | | | | | |
|---|---|---|---|---|---|---|
| C:\dgn\0034000\cpd\wl08.dgn | DESIGNED BY | WETLAND PLANS | | KINDSFATER WETLAND | | PROJECT NO. STPX 56(58) |
| 6/12/2012 | REVIEWED BY | YELLOWSTONE COUNTY | | CSF = 0.99948655 | UPN NUMBER 5034000 | SHEET 25 OF 25 |
| 8:59:02 AM CDS USTG | CHECKED BY | | | | | |