MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2015

Kindsfater
Yellowstone County, Montana



Prepared for:

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December 2015

MONTANA DEPARTMENT OF TRANSPORTATION

WETLAND MITIGATION MONITORING REPORT:

YEAR 2015

Kindsfater
Yellowstone County, Montana
Constructed: 2012

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

USACE: NWO-2007-00824-MTB

Prepared for:

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CCI Project No: MDT.006

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1. INTRODUCTION

The Kindsfater 2015 Wetland Mitigation Monitoring Report presents the results of the third 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 3.0 miles northeast of Laurel, Montana, and is adjacent to 72nd Street West and Laurel Airport Road (Figure 1). The wetland mitigation site is intended to provide 43.8 acres of wetland mitigation credits to assist the 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. The objectives of this project included the creation, restoration, enhancement, and preservation of 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 including 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 converted to upland between 2002 and 2012.

The project was designed for two phases of development, Base Project and Alternative Option. The Base Project would involve the creation, restoration, enhancement, and preservation of wetlands within the west half of the site. The Alternative Option would include the excavation and removal of gravel materials and the construction of new wetlands within the east half of the site. Credits to be developed as a result of both phases would total 43.8 credit acres under full build-out. The amount of wetland credits estimated for each phase as presented in the mitigation plan follows.

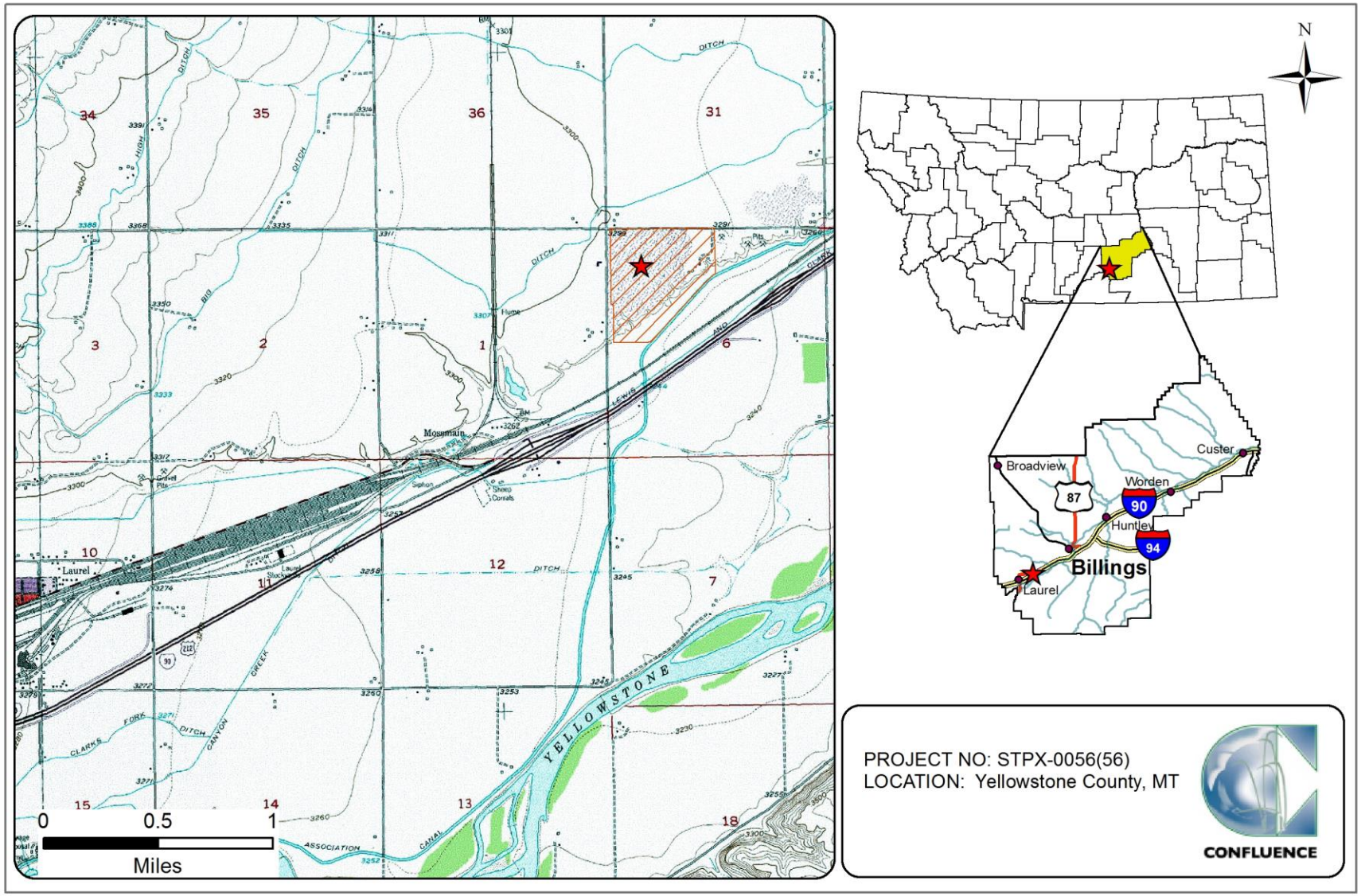


Figure 1. Project location of Kindsfater wetland mitigation site.

Base Project:

- Create (establishment) two emergent wetland areas (Cells 7 & 9) totaling 1.8 acres (1:1 mitigation ratio).
- Restore (rehabilitation) former wetland areas within the site (Cells 1 through 6 and a portion of Cell 8) with tree/shrub plantings totaling 14.0 acres (1:1 mitigation ratio).
- Restore (re-establishment) several depressional emergent wetland areas (adjacent to Cells 1 through 12) totaling 9.2 acres (1.5:1 mitigation ratio).
- Enhance 3.1 acres (3:1 mitigation ratio) of existing palustrine, emergent, scrub-shrub, forested wetland (Cells 10 through 12 and a portion of Cell 8).
- Preserve 21.9 acres (4:1 mitigation ratio) of existing palustrine emergent, scrub/shrub and forested wetlands.
- Designate a 50 feet wide upland buffer around the mitigation area that totals 4.3 acres (5:1 mitigation ratio).
- Temporary impacts during establishment of wetland Cells 10 through 12 and a portion of Cell 8 totaling 3.6 acres (0:1 mitigation ratio).

Alternative Option:

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

Table 1 provides a breakdown of the compensatory credits by bid phase and mitigation type including 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 by the completion of the base bid phase in the west half of the site. The additional alternative bid phase in the east 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 following completion of both phases.

The project was constructed during fall/winter 2012 and consisted of excavating a series of 14 cells ranging in size from 0.24 to 1.39 acres; each designed to expose the shallow groundwater table for limited portions of the year. Wetland Cells 1 through 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. Due to 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. As a result, the area around the excavated cells was not constructed to the bottom elevation of the pre-existing wetland areas.

The site consists of an upper terrace with a slope that descends into a lower terrace 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 required to sustain the wetland and open water areas. Revegetation of 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 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 hair grass (*Deschampsia caespitosa*), fowl blue grass (*Poa palustris*), and slender wild rye (*Elymus trachycaulus*). The locations of the willow planting areas are shown on Figure 2 of 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. Wetland credit determination for the Kindsfater wetland mitigation 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 & 9	Lacustrine emergent	1.8	1:1	1.8
Restoration (Re-establishment)	Wetland Cells 1-6 and partial 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 & partial 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 & partial Cell 8	N/A	3.6	0:1	0.0*
			Sub-total Mitigation Credit		**29.3**
ALTERNATIVE BID CREDITS					
Creation (Establishment)	Gravel Mining Area	Palustrine emergent, scrub-shrub	11.1**	1:1	11.1
Creation (Establishment)	Wetland Cells 13 & 14	Lacustrine emergent	2.8	1:1	2.8
Upland Buffer	50-foot wide upland perimeter	N/A	3.0	5:1	0.6
			Sub-total Mitigation Credit		**14.5**

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

**11.1 acres of creation wetlands in Alternative Bid Credits (gravel mining area) were not constructed.

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

1. **Wetland Characteristics**: All 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* (Environmental Laboratory 1987) and the *2010 Regional Supplement to the Corps of Engineers Manual: Great Plains Region* (Version 2.0) (2010 Regional Supplement). These methodologies were utilized 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 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% 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. Since 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 through the delineation of developing wetlands utilizing the technical guidelines established in the 1987 USACE Wetland Manual and the 2010 Regional Supplement and noxious weeds do not exceed 5% cover. The following concept of "dominance", as defined in the 1987 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% in created wetland areas within 5 years following 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 be dependent 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:** It is the intent of the project to provide seasonal open water in the wetland enhancement areas where excavation in the existing wetlands 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 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:** Implementation of weed control will be based upon 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 <5% absolute cover of noxious weed species occurs across the site.

5. **Fencing** of the proposed mitigation site 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 of this MDT mitigation site will be based upon the MDT standard monitoring protocols utilized for all MDT wetland mitigation sites for a minimum period of five 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 2 and 3 in Appendix A of this report show the site Monitoring Activity Locations and Mapped Site Features, respectively. The MDT Mitigation Monitoring Form, USACE Wetland Determination Data Forms – Great Plains Region (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 plans sheets for the Kindsfater wetland mitigation complex are located in Appendix D.

2. METHODS

The 2015 monitoring event was completed on June 16, 2015. Information for the Mitigation 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 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, and a non-engineering 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 Form was assessed at five 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 Form (Appendix B). Hydrologic assessments allow evaluation of mitigation criteria addressing 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 there is a 50 percent probability 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), 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 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 inches of the ground surface. The data were recorded on the Wetland Determination Data Form (Appendix B).

2.2. Vegetation

The boundaries of the dominant vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2015 aerial photograph. Percent cover of dominant species within a community type

was visually estimated and recorded using the following classification values: 0 (less than 1 percent), 1 (1 to 5 percent), 2 (6 to10 percent), 3 (11 to 20 percent), 4 (21 to 50 percent), and 5 (greater than 50 percent) (Appendix B). Community types were named based on the dominant vegetation species that characterized each mapped polygon (Figure 3, Appendix A).

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

Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent areal cover of each vegetation species within the belt transect was estimated using the same values and cover ranges used for the vegetation community polygon data (Figure 3, Appendix B). Photographs were taken at the endpoints of each transect during the monitoring event and are shown in Appendix C.

The survival of woody species planted onsite was recorded during monitoring. Survival rates will be evaluated annually. The Montana State Noxious Weed List (July 2015), prepared by the Montana Department of Agriculture and the Yellowstone County Noxious Weed List prepared by the Yellowstone County Weed Board (July 2015), was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field and mapped on the aerial photo with noxious weed species color-coded (Figure 3, Appendix A). The locations are denoted with the symbol "**x**", "▲", or "■" representing 0 to 0.1 acre, 0.1 to 1 acre, or greater than 1 acre in extent, respectively. Cover classes are shown on Figure 3 as T, L, M, or H, representing less than 1 percent, 1 to 5 percent, 6 to 25 percent, and 26 to 100 percent, respectively.

2.3. Soil

Soil information was obtained from the *Soil Survey for Yellowstone County Area* (SSURGO 2012) and *in situ* soil descriptions. Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 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 U.S. including special aquatic sites and jurisdictional wetlands were delineated throughout the project area in accordance with criteria established in the 1987 Manual and the 2010 Regional Supplement to the Corps of Engineers Manual: Great Plains Region (USACE 2010). 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 2014 National Wetland Plant List (NWPL) (Lichvar et al. 2014). Following USACE guidance, the 2014 NWPL scientific and common plant names were used in this report. 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 on the Wetland Determination Data Form (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 boundaries were surveyed using resource-grade GPS and imported into Geographic Information System (GIS) format. Wetland areas reported have been calculated using GIS spatial quantification methodology.

2.5. Wildlife

Observations of use by mammal, reptile, amphibian, and bird species were recorded on the Mitigation Monitoring form during the site visit. 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 species list of wildlife observed during the annual monitoring periods has been compiled and is provided in Section 3.5 (Table 7).

2.6. Functional Assessment

The 2008 MDT Montana Wetland Assessment Method (Berglund and McEldowney 2008) was used to evaluate functions and values of wetlands identified on the site during the 2015 site investigation. This method provides an objective means of assigning wetlands an overall rating and provides regulators 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. Wetland Assessment Forms were completed for two separate assessment areas (AA) within mitigation site (Appendix B).

2.7. Photo Documentation

Monitoring at photo points provide supplemental information documenting wetland, upland, and vegetation transect conditions; site trends; and current land uses surrounding the site. Photographs were taken at photo points throughout

the mitigation area that were established in coordination with the MDT Wetland Mitigation Specialist during the 2013 site visit (Appendix C). Photo point locations were recorded with a resource grade GPS unit (Figure 2, Appendix A).

2.8. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS unit during the 2015 monitoring season. Points were collected using WAAS-enabled differential correction satellites, typically improving resolution to sub-meter accuracy. The collected data were then transferred to a personal computer, imported into GIS, and presented in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with a GPS included fence boundaries, photograph points, transect endpoints, wetland boundaries 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 was a cursory examination and did not constitute an engineering-level structural inspection.

3. RESULTS

3.1. Hydrology

Climate data from the meteorological station at Laurel, Montana (244894), located approximately three 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), located approximately 10 miles northeast of the site, recorded an average annual precipitation rate of 14.2 inches from August 1934 through October 2015. The historic precipitation average from January to August was 10.31 inches. Precipitation in recent years for the same time period was 14.7 inches (2010), 17.1 inches (2011), 5.1 inches (2012), 8.2 inches (2013), 11.9 inches (2014), and 9.8 inches (2015). These data indicate that 2012, 2013, and 2015 were below the long-term average for precipitation, while 2010, 2011, and 2014 were above-average.

The site history (wetland area decreased by approximately 22 acres between 2002 and 2015, during an upward trend in precipitation –see Chart 1) suggests that direct precipitation can have little effect on this site's wetland development from year to year. Conversely, mid to long term drought may affect recharge of groundwater, which appears to be the primary hydrologic driver on this site.

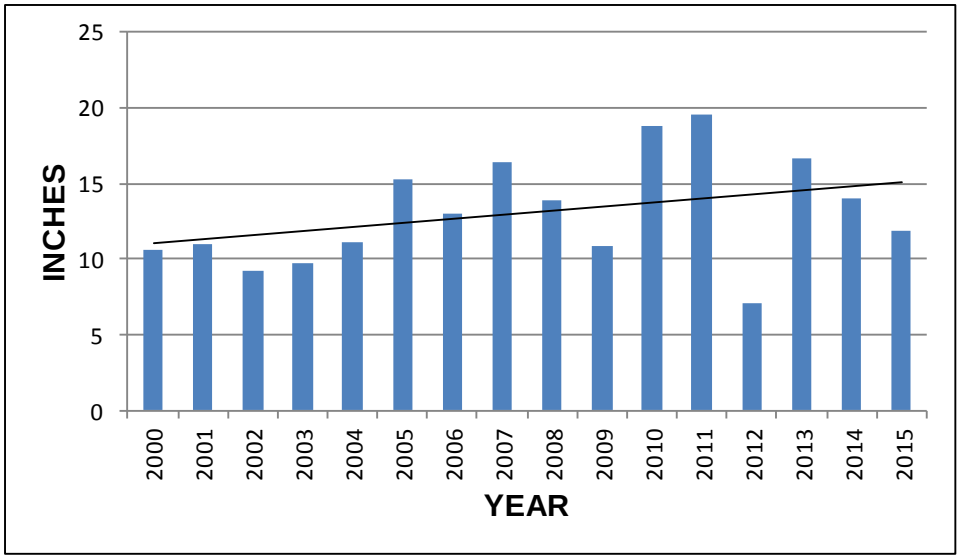


Chart 1. Average yearly precipitation totals from 2000 to 2015 at station 240807.

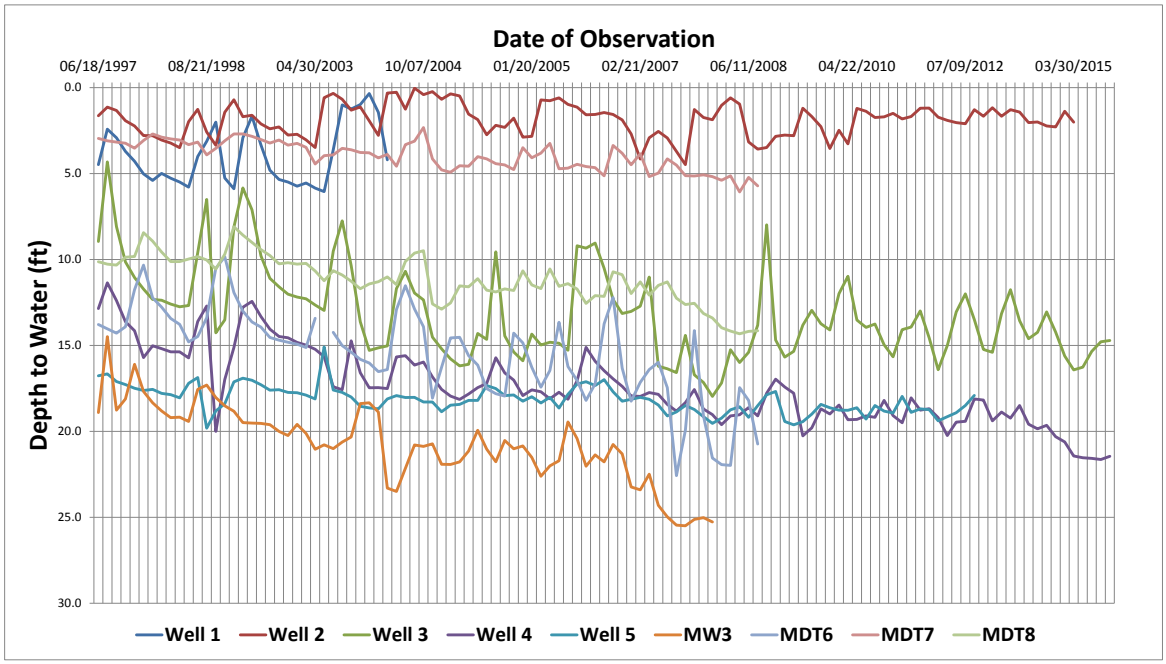


Chart 2. Groundwater level in monitoring wells local to the Kindsfater site.

Reductions in the areal extent of wetlands prior to implementation of the mitigation plan could be the result of several factors including less flood irrigation on fields west and north of the site, reduced recharge of groundwater due to 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 entering the Kindsfater mitigation site on a permanent basis. Although the trend in precipitation at this site over the last 15 years has been positive, this represents the climb out of statewide drought conditions, and precipitation for most years during that period remained well below the long term average, likely reducing groundwater recharge. The dewatering associated with the adjacent active gravel operation and resultant cone of depression has likely compounded this effect, further reducing the site's hydrology. Groundwater data from monitoring wells on and surrounding the project area are presented Chart 2. As shown in Chart 2, the predominant trend in groundwater elevation for these monitoring wells is downward over their period of record, lending support to the idea that below average precipitation and pumping may be negatively affecting recharge and suppressing groundwater levels, ultimately resulting in reduced opportunity for wetland development on this site.

Given the current recovery from the drought conditions of the early 2000s, the groundwater table may be expected to increase following termination of the gravel mining, unless that operation permanently alters the nature of the aquifer. This could occur if mining activities remove or increase the permeability of the aquifer's confining layers, such as the underlying Colorado shale.

Five data points were sampled to determine the wetland/upland boundaries. Data points K-1w, K-2w, and K-3w were located in areas that met the wetland criteria. Wetland hydrology indicators at K-1w and K-2w included saturation on aerial imagery and drainage patterns. Data point K-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 K-1u or K-2u, located in upland areas that did not meet the wetland criteria.

In 2015, one previously unmonitored groundwater well was observed on site. Groundwater could not be measured at the well because it was locked. Future monitoring efforts may consider measuring groundwater levels at this well, as the results provide additional information for assessing hydrologic conditions at the site.

Approximately 10 percent of the entire site was inundated during the 2015 survey. The depth of water within some of the excavated wetland cells averaged 0.2 feet with surface water depths up to 0.3 feet. Many areas defined as wetlands across the site were not inundated but exhibited signs of periodic saturation within 12 inches (1.0 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 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 2015 marked the third year of monitoring at the Kindsfater wetland mitigation site. Eighty-five plant species have been observed site wide from 2013 through 2015 (Table 2). Vegetation plant communities were identified by plant composition, species dominance, and the results of the wetland delineation. The community composition is provided on the Mitigation Monitoring form (Appendix B) and the community boundaries are shown on Figure 3 (Appendix A). Six vegetation community types were identified in 2015 including three upland communities and three wetland communities. The communities were upland Type 1 – *Chenopodium* spp./*Bromus* spp., wetland Type 2 – *Eleocharis palustris/Bromus* spp., wetland Type 3 – *Alopecurus pratensis*/*Poa palustris*, upland Type 4 – *Elaeagnus angustifolia*, wetland Type 5 – *Typha latifolia,* and upland Type 6 – *Elymus trachycaulus/Bromus* spp. These communities are discussed below.

Upland community Type 1 – *Chenopodium* spp./*Bromus* spp. represented upland areas that were disturbed by construction at the mitigation site in late 2012. This community type occupied approximately 37.1 acres and surrounded stands of upland community Type 4 – *Elaeagnus angustifolia*. Fifty-five species were identified within upland Type 1. Cheatgrass (*Bromus tectorum*) dominated this community, with lesser cover provided by lamb's-quarters (*Cheonopodium album*), crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), goosefoot (*Chenopodium* sp.), tall hedge-mustard (*Sisymbrium altissimum*), and slender wild rye. During the 2015 survey, percent cover by *Bromus* spp. increased, while percent cover by *Chenopodium* spp. decreased. Due to this community's composition of cover by primarily early successional species, and likelihood of shifts in species composition and their associated cover classes in subsequent monitoring years, this community Type was retained in 2015. *Bromus* spp. was added to the community Type following the 2015 survey, although this community will likely be replaced by a new community type in future surveys. Overall, this community was represented by primarily non-native species commonly found in recently disturbed and/or degraded landscapes.

Wetland community Type 2 – *Eleocharis palustris/Bromus* spp. was mapped across 9.0 acres of the project area in the fourteen excavated wetland cells. This community was dominated by common spike-rush (*Eleocharis palustris*), field brome (*Bromus arvensis*), cheatgrass, and fowl blue grass, with lesser cover provided by forty-five other species. This community exhibited only 1 to 5 percent bare ground, a result of the expansion of annual species since construction.

Wetland community Type 3 – *Alopecurus pratensis*/*Poa palustris* was identified across 16.2 acres of pre-existing wetland that remained relatively undisturbed

during the 2012 construction. This community was located on the upper and lower terraces along the eastern boundary and included the slope wetlands between the terraces. Field meadow-foxtail (*Alopecurus pratensis*) and fowl bluegrass dominated the community. Other species identified in this community included western-wheatgrass (*Pascopyrum smithii*), field brome, cheatgrass, Northwest Territory sedge (*Carex utriculata*), Nebraska sedge (*Carex nebrascensis*), lamb's-quarters, creeping wild rye (*Elymus repens*), annual rabbit's-foot grass (*Polypogon monspeliensis*), dock-leaf smartweed (*Persicaria lapathifolia*), curly dock (*Rumex crispus*), field sow-thistle (*Sonchus arvensis*), and 28 additional species in trace amounts. Bare ground declined to 1 to 5 percent of total cover.

Upland community Type 4 – *Elaeagnus angustifolia* was a scrub/shrub and forested community identified on 24.7 acres, scattered throughout upland community Type 1. Together, upland community Types 1 and 4 formed a mosaic across 61.8 acres of the site. Russian olive (*Elaeagnus angustifolia*), American silver-berry (*Elaeagnus commutata*), eastern cottonwood (*Populus deltoides*), and narrow-leaf cottonwood (*Populus angustifolia*) were the dominant mature woody species identified in this community.

Wetland community Type 5 – *Typha latifolia* characterized 9.8 acres of pre-existing wetlands that were dominated by broad-leaf cat-tail (*Typha latifolia*). This community type, undisturbed during 2012 construction, was characterized by seasonal/intermittent to permanent/perennial wetland hydrology. Hard-stem club-rush, common spike-rush, Baltic rush, dock-leaf smartweed, rough water-horehound (*Lycopus asper*), 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. Following 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. Fourteen species were identified within this community. Slender wild rye, field brome, cheatgrass, field bindweed (*Convolvulus arvensis*), and Canadian thistle (*Cirsium arvense*) dominated the vegetation cover. This community, similar to upland Type 1, was represented by primarily non-native species commonly found in recently disturbed and/or degraded landscapes.

Table 2. Vegetation species observed from 2013 to 2015 at the Kindsfater wetland mitigation site.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	NL
Alopecurus pratensis	Field Meadow-Foxtail	FACW
Amaranthus retroflexus	Red-Root	FACU
Artemisia frigida	**Fringed Sage**	**NL**
Asclepias speciosa	Showy Milkweed	FAC
Atriplex suckleyi	Suckley's Saltbush	NL
Bassia 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
Deschampsia caespitosa	Tufted Hair Grass	FACW
Descurainia sophia	Herb Sophia	NL
Elaeagnus angustifolia	Russian-Olive	FACU
Elaeagnus commutata	American Silver-Berry	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**
Filago arvensis	**Field Fluffweed**	**NL**
Glycyrrhiza lepidota	American Licorice	FACU
Heterotheca villosa	**Hairy Goldenaster**	**NL**
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

[1] 2014 NWPL (Lichvar *et al* ., 2014).

New species identified in 2015 are **bolded**.

Table 2. (Continued). Vegetation species observed from 2013 to 2015 at the Kindsfater wetland mitigation site.

Scientific Names	Common Names	GP Indicator Status1
Lactuca serriola	Prickly Lettuce	FAC
Lemna minor	Common Duckweed	OBL
Lycopus asper	Rough Water-Horehound	OBL
Medicago lupulina	Black Medick	FACU
Medicago sativa	Alfalfa	UPL
Melilotus albus	White Sweetclover	FACU
Melilotus officinalis	Yellow Sweet-Clover	FACU
Mentha arvensis	American Wild Mint	FACW
Opuntia polyacantha	Plains 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
Rumex crispus	Curly Dock	FAC
Salix exigua	Narrow-Leaf Willow	FACW
Salix lutea	Yellow Willow	FACW
Salix sp.	Willow	NL
Salsola tragus	Prickly Russian-Thistle	FACU
Schedonorus pratensis	False Meadow Rye	FACU
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Solanum dulcamara	Climbing Nightshade	FACU
Solidago canadensis	Canadian Goldenrod	FACU
Sonchus arvensis	Field Sow-Thistle	FAC
Stipa comata	**Needle-and-Thread**	**NL**
Taraxacum officinale	**Common Dandelion**	**FACU**
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-beard	NL
Typha angustifolia	Narrow-Leaf Cat-Tail	OBL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Verbascum thapsus	Great Mullein	UPL
Veronica peregrina	Neckweed	FACW
Vicia sativa	Garden Vetch	FACU
Xanthium strumarium	Rough Cockleburr	FAC

[1] 2014 NWPL (Lichvar *et al* ., 2014).

New species identified in 2015 are **bolded**.

Vegetation cover was measured along three transects at the Kindsfater mitigation site in 2015 (Figure 2, Appendix A). Baseline conditions were documented along the vegetation transects for the first time in 2013. The data recorded on Transect 1 (Monitoring Forms, Appendix B) are summarized in tabular and graphical formats in

Table 3 and Charts 2 and 3, respectively. Transect one (T-1) began in upland Type 1, extended 300 feet across excavated cell 14, intersected wetland Type 2, and ended in upland Type 1. Hydrophytic vegetation remained consistent with 2013 and 2014 observations, comprising approximately 40 percent of the transect during the 2015 survey. A total of 45 species were identified, including 14 hydrophytes and 31 upland species. Due to 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. Data summary for Transect T-1 for 2013 to 2015 at the Kindsfater wetland mitigation site.

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

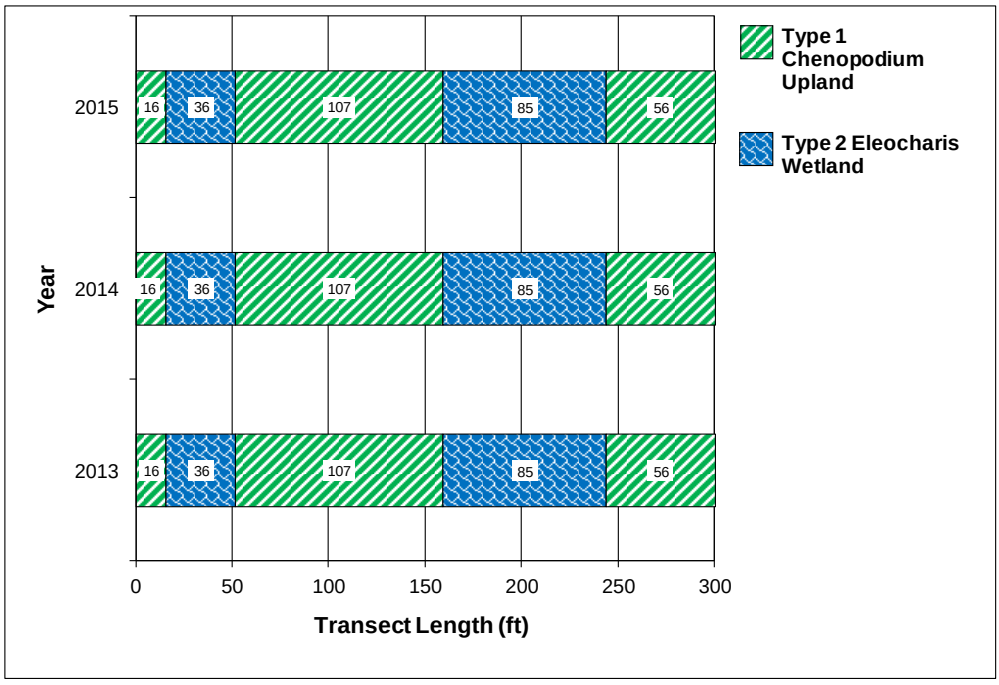


Chart 3. Transect map showing community types on Transect T-1 from start (0 feet) to finish (300 feet) at the Kindsfater wetland mitigation site from 2013 to 2015.

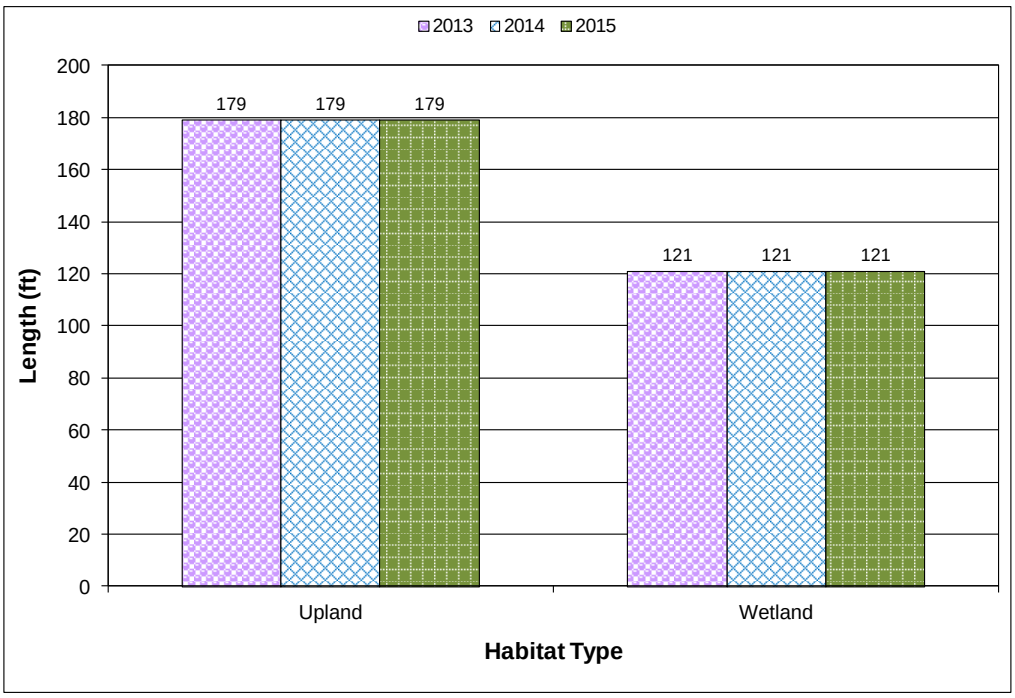


Chart 4. Length of habitat types within Transect T-1 for 2013 to 2015 at the Kindsfater wetland mitigation site.

Data collected on Transect T-2 (Monitoring Form, Appendix B) are summarized in tabular and graphical formats in Table 4 and Charts 4 and 5, respectively. This 388-foot transect began in pre-existing wetland Type 3, then bisected excavated cell 8 and wetland Type 2, and ended in wetland Type 3. Hydrophytic vegetation remained consistent with 2013 and 2014 observations, comprising 100 percent of the transect during the 2015 survey. A total of 39 species were identified, including 20 hydrophytes and 19 upland species. Approximately 40 percent of the transect that occurred primarily within the constructed basins, consisted of bare substrate as a result of excavation in 2012.

Table 4. Data summary for Transect T-2 for 2013 to 2015 at the Kindsfater wetland mitigation site.

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

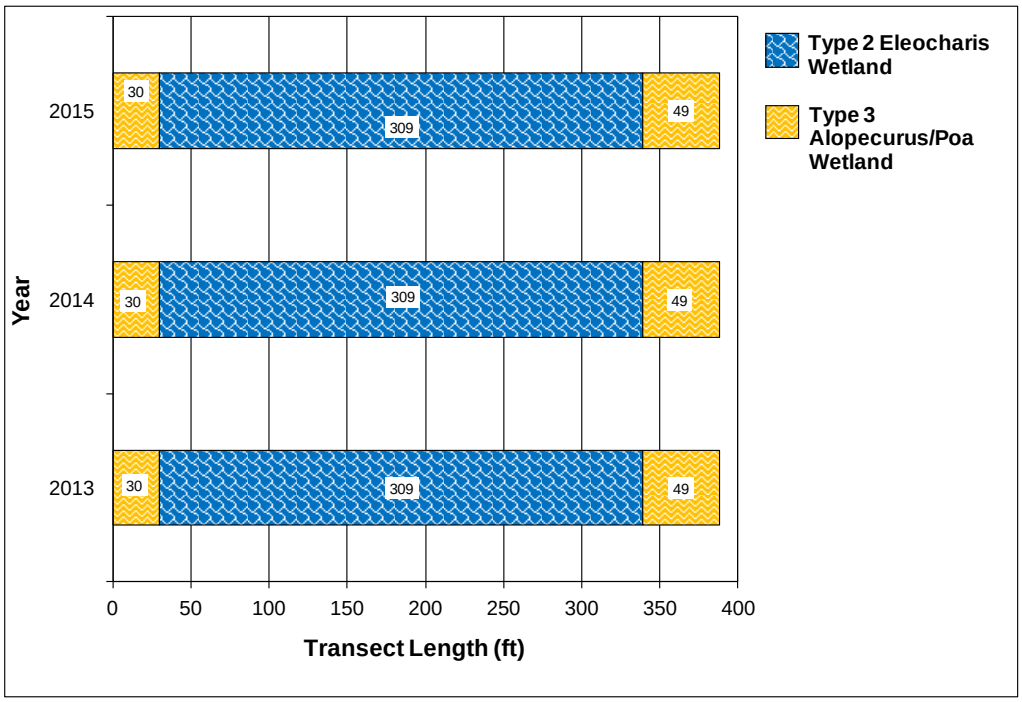


Chart 5. Transect map showing community types on Transect T-2 from start (0 feet) to finish (388 feet) at the Kindsfater wetland mitigation site from 2013 to 2015.

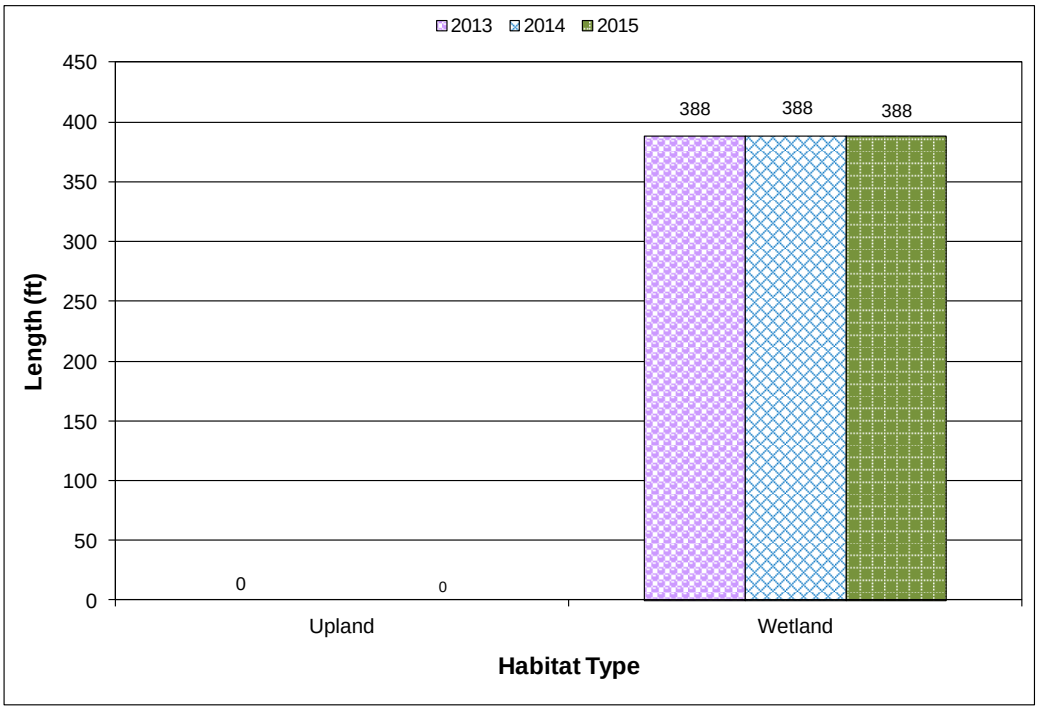


Chart 6. Length of habitat types within Transect T-2 for 2013 to 2015 at the Kindsfater wetland mitigation site.

Data collected on Transect T-3 (Monitoring Form, Appendix B) are summarized in tabular and graphic formats in Table 5 and Charts 6 and 7, respectively. This 292-foot transect began in pre-existing wetland Type 3, then bisected excavated cell 4 and wetland Type 2, and ended in upland Type 1. Hydrophytic vegetation remained consistent with 2013 and 2014 observations, comprising approximately 90 percent of the transect during the 2015 survey. A total of 32 species were identified, including 18 hydrophytes and 14 upland species.

Table 5. Data summary for Transect T-3 for 2013 to 2015 at the Kindsfater wetland mitigation site.

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

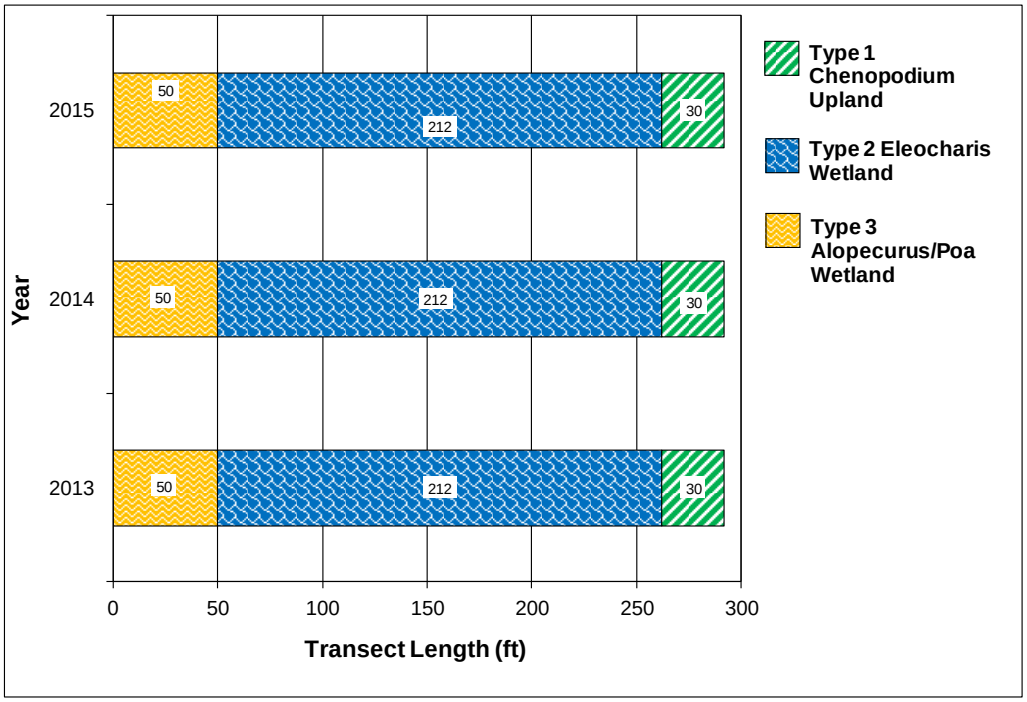


Chart 7. Transect map showing community types on Transect T-3 from start (0 feet) to finish (292 feet) at the Kindsfater wetland mitigation site from 2013 to 2015.

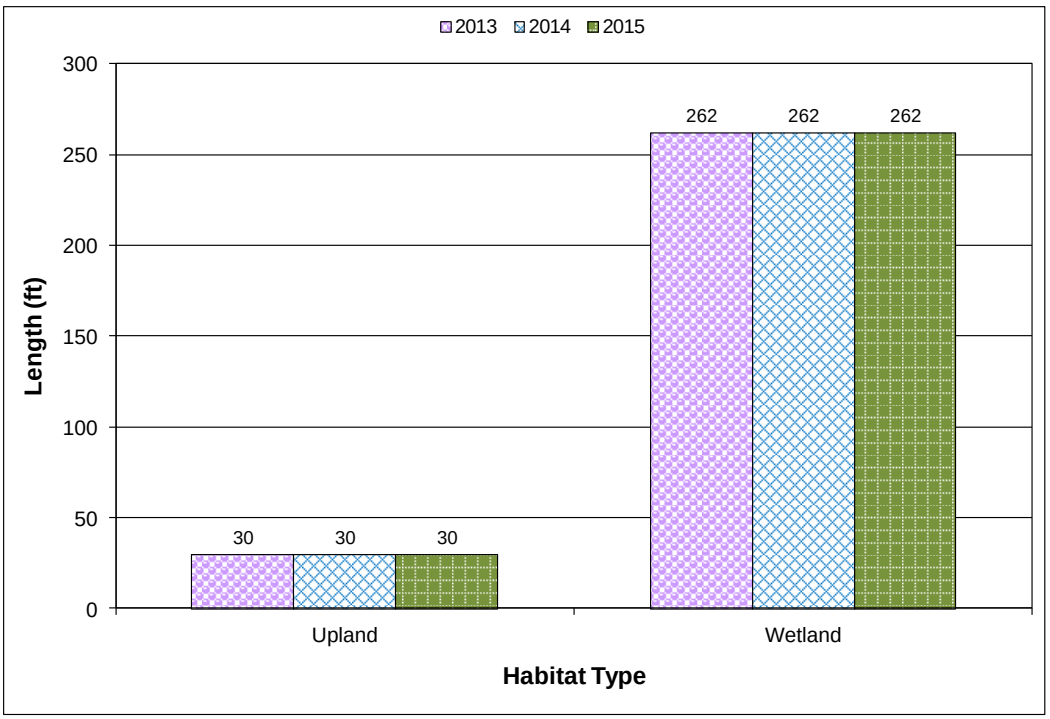


Chart 8. Length of habitat types within Transect T-3 for 2013 to 2015 at the Kindsfater wetland mitigation site.

Thirty-five infestations of Montana Listed Priority 2B noxious weeds were mapped at the Kindsfater wetland mitigation site (Figure 3, Appendix A). Ten infestations of Canadian thistle, eight infestations of gypsy-flower (houndstongue, *Cynoglossum officinale*), five infestations of spotted knapweed (*Centaurea stoebe*), five infestations of leafy spurge (*Euphorbia esula*), and seven infestations of field bindweed were identified in areas less than 1.0 acre in size with cover classes ranging from trace (less than 1 percent) to moderate (6 to 25 percent). In addition, common mullein (*Verbascum thapsus*), a Yellowstone County designated noxious weed, was observed in trace amounts in vegetation communities 1 and 6. The size and number of infestations are continuing to increase each year. The increased extent of weed infestations observed in 2015 exceeds the success criterion for weed population at less than five percent site-wide. A weed contractor with MDT treated this site in 2012 prior to construction. Eight acres of the site were treated again in July 2015, with treatment concentrated in areas of infestation by the five noxious weed species observed on site. The 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.

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. The Montana Department of Agriculture (July

2015) recommends research, education, and prevention to minimize the spread of regulated plant species.

A few thousand cuttings and containerized materials were planted in approximately 27 clusters (Figure 2, Appendix A) around the Kindsfater site. The woody planting zones were generally located around the excavated wetland cells. Only 35 percent of the observed plantings were alive during the 2015 evaluation. Low survival is due to lack of hydrology. The species planted are listed on the Mitigation Monitoring Form in Appendix B.

3.3. Soil

The project site was mapped in the *Yellowstone County Soil Survey* (USDA 2013). 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. 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 five locations (Figure 2, Appendix A). Data points K-1u and K-1w were located near the eastern site boundary while data points K-2w, K-2u, and K-3w were located in the northwestern corner of the site. The soil profile at K-1w, located in wetland Type 5, revealed a brown (10YR 4/3) fine sand. The soil profile at K-2w, located in wetland Type 2, exhibited a dark gray (10YR 4/1) sandy loam. No hydric soil indicators were observed for K-1w or K-2w, likely due to 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 K-3w, 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. The soil profile at K-1u, located in upland Type 1, 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 K-2u, located in upland Type 1, revealed a dark gray (10 YR 4/1) sandy loam without redox features, with no hydric soil indicators observed.

3.4. Wetland Delineation

Five data points were evaluated to confirm the wetland boundary determination in 2015 (Figure 2, Appendix A). The completed Wetland Determination Data Forms are located in Appendix B. Data points K-1w, K-2w, and K-3w were located in areas that were classified as wetlands. The total wetland acreage surveyed within the Kindsfater mitigation area in 2015 was 34.9 acres, the same as 2014. The delineation confirmed 8.80 acres in the restoration areas (re-establishment and rehabilitation), 3.0 acres in the enhancement area, and 1.8 acres of created wetland in the excavated cells (Table 6). Uplands accounted for 80.8 acres of the mitigation site.

Table 6. Wetland acres delineated in 2013 to 2015 at the Kindsfater Wetland Mitigation Site.

Habitat Type	2013 Acreage	2014 Acreage	2015 Acreage
Preservation	21.9	21.3	21.3
Re-establishment (Restoration)	7.9	7.9	7.9
Rehabilitation (Restoration)	0.9	0.9	0.9
Enhancement	3.0	3.0	3.0
Creation	1.8	1.8	1.8
Total Wetland Habitat	**35.5**	**34.9**	**34.9**

3.5. Wildlife

A comprehensive list of bird and other wildlife species observed directly or indirectly from 2013 through 2015 field survey is presented in Table 7 and noted on the Mitigation Monitoring form (Appendix B). Eight bird species were identified in 2015, including killdeer (*Charadrius vociferus*), mourning dove (*Zenaida macroura*), northern flicker (*Colaptes auratus*), northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), ring-necked pheasant (*Phasianus colchicus*), western tanager (*Piranga ludoviciana*), and yellow warbler (*Dendroica petechia*). Two white-tailed deer (*Odocoileus virginianus*) and two voles (vole sp.) were observed on site in 2015.

Table 7. Wildlife species observed from 2013 to 2015 at the Kindsfater Wetland Mitigation Site.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Boreal Chorus Frog	*Pseudacris maculata*
Plains Spadefoot	*Spea bombifrons*
Northern Leopard Frog	*Rana pipiens*
BIRDS	
American Goldfinch	*Spinus tristus*
Bank Swallow	*Riparia riparia*
Common Grackle	*Quiscalus quiscula*
Common Yellowthroat	*Geothlypis trichas*
Double-crested Cormorant	*Phalacrocorax auritus*
Downy Woodpecker	*Picoides pubescens*
European Starling	*Sturnus vulgaris*
Gray Catbird	*Dumetella carolinensis*
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***
MAMMALS	
White-tailed Deer	***Odocoileus virginianus***
Vole sp.	

Species observed in 2015 are **bolded**.

3.6. Functional Assessment

The 2008 MDT Montana Wetland Assessment Method (MWAM) (Berglund and McEldowney 2008) was used to evaluate two general assessment areas (AA), created and pre-existing (Table 8 and Appendix B). The findings of the assessment are described below.

The Existing Wetland AA included 33.1 acres of pre-existing wetland habitat identified in the 2012 wetland delineation conducted by MMI. This AA included 21.3 acres of preservation wetland habitat, 8.8 acres of restoration habitat, and 3.0 acres of enhancement habitat. The Existing Wetland AA was rated as a Category III wetland, scoring 59 percent of the possible points and 155.57 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 (S3) in its documented primary habitat.

The Created Wetlands AA encompassed 1.8 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 49 percent of the possible points and a total of 7.02 functional units. Disturbances from construction in 2012, adjacent gravel mine operations, and high recreational use was reflected in a high disturbance rating for the site from 2013 through 2015. The AA received a high rating for MTNHP species habitat owing to the documented primary habitat of the Plains Spadefoot (S3) observed in 2013. The AA was also given a high rating for recreation/education potential as access to the site is permitted to the public without permission. In 2015, hydrophytic vegetation cover increased to greater than 70% in the AA, resulting in a high rating for sediment/nutrient/toxicant removal. The rating for this AA is expected to increase as the disturbed areas recover, desirable vegetation cover increases, and if the site retains wetland hydrology.

3.7. Photo Documentation

Photographs taken at photo points one through twelve (PP1 through PP12; Figure 2, Appendix A) are shown on pages C-1 to C-12 of Appendix C**.** Photographs of the transect end points and wetland determination data points are shown on pages C-13 to C-15, and page C-16, respectively (Appendix C).

3.8. Maintenance Needs

No man-made water control structures were installed within the Kindsfater wetland mitigation site. The perimeter fence installed around the site was in good condition at the time of the 2015 investigation. Two bluebird boxes were installed on the site (Figure 2, Appendix A). The two trees that the bird boxes were mounted had fallen over prior to the 2015 survey rendering the boxes unusable. This site appears to be used by a high number of people for a diversity of recreational activities.

Table 8. Functions and Values of the Kindsfater Wetland Mitigation Site from 2013 to 2015.

Function and Value Parameters 2008 MDT Montana Wetland Assessment Method	2013 AA 1 (Existing Wetlands)	2014 AA 1 (Existing Wetlands)	2015 AA 1 (Existing Wetlands)	2013 AA 2 (Created Wetlands)	2014 AA 2 (Created Wetlands)	2015 AA 2 (Created Wetlands)
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	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)	Low (0.3)	Low (0.3)	Low (0.3)
General Fish/Aquatic Habitat	NA	NA	NA	NA	NA	NA
Flood Attenuation	NA	NA	NA	NA	NA	NA
Short and Long Term Surface Water Storage	High (0.9)	High (0.9)	High (0.9)	Mod (0.6)	Low (0.3)	Low (0.3)
Sediment/Nutrient/Toxicant Removal	High (0.9)	High (0.9)	High (0.9)	Mod (0.5)	Mod (0.7)	High (1.0)
Sediment/Shoreline Stabilization	NA	NA	NA	NA	NA	NA
Production Export/Food Chain Support	Mod (0.6)	Mod (0.6)	Mod (0.6)	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)
Uniqueness	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
Recreation/Education Potential	High (0.20)	High (0.20)	High (0.20)	High (0.20)	High (0.20)	High (0.20)
Actual Points / Possible Points	**4.7 / 8**	**4.7 / 8**	**4.7 / 8**	**3.7 / 8**	**3.6 / 8**	**3.9 / 8**
% of Possible Score Achieved	**59%**	**59%**	**59%**	**46%**	**45%**	**49%**
Overall Category	**III**	**III**	**III**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands within Site Boundaries (ac)	**33.7**	**33.1**	**33.1**	**1.8**	**1.8**	**1.8**
Functional Units (acreage x actual points)	**158.44**	**155.57**	**155.57**	**6.55**	**6.37**	**7.02**

As noted in the vegetation section of this report, thirty-five infestations of Montana Listed Priority 2B noxious weeds were mapped at the Kindsfater wetland mitigation site (Figure 3, Appendix A). Ten infestations of Canadian thistle, eight infestations of gypsy-flower, five infestations of spotted knapweed, five infestations of leafy spurge, and seven infestations of field bindweed were identified in areas less than 1.0 acre in size with cover classes ranging from trace (less than 1 percent) to moderate (6 to 25 percent). The size and number of infestations are continuing to increase each year. The increased extent of weed infestations observed in 2015 exceeds the success criterion for weed population at less than five percent site-wide. A weed contractor with MDT treated this site in 2012 prior to construction. Eight acres of the site were treated again in July 2015, with treatment concentrated in areas of infestation by the five noxious weed species observed on site. The 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.

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. 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 9 summarizes the current estimated wetland credits based on the USACE approved credit ratios (MDT 2008) and the wetland delineation completed in June 2015. A total of 57.8 acres were delineated at the Kindsfater site in 2015, including 1.8 acres of creation, 7.9 acres of re-establishment, 0.9 acres of rehabilitation, 3.0 acres of enhancement, 21.3 acres of wetland preservation, and 22.9 acres of upland buffer. Applying the USACE approved ratios to these values, a total of 21.2 acres of mitigation credit have been estimated in 2015, a value well below the targeted 32.7 acres anticipated at this site. Although 2015 represents only the third year of monitoring, the attainment of 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 9. Wetland mitigation credits estimated for Kindsfater from 2013 to 2015.

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)
Creation (Establishment)	Wetland Cells 7, 9, 13 & 14	Lacustrine emergent	4.6	1:1	4.6	1.8	1.8	1.8	1.8	1.8	1.8
Restoration (Re-establishment)	Wetland Cells 1-6 and partial Cell 18	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
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
Enhancement	Wetland Cells 10-12 & partial Cell 8	Palustrine emergent, scrub-shrub	3.1	3:1	1.0	3.0	1.0	3.0	1.0	3.0	1.0
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
Upland Buffer	50-foot wide upland perimeter	N/A	7.3	5:1	1.5	22.9	1.46*	22.8	4.56**	22.9	4.6**
		Totals	**60.1**		**32.7**	**58.4**	**18.2**	**57.7**	**21.1**	**57.8**	**21.2**

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

**Value calculated using GIS.

Table 10 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 measure desirable hydrophytic herbaceous plant cover across all wetlands, noxious weed cover, and woody plantings. All wetlands delineated within the Kindsfater site in 2015 met the three criteria outlined in the 1987 Manual and 2010 Regional Supplement, but exhibited less than 80 percent desirable hydrophytic vegetation cover and more than 5 percent cover of noxious weeds. Created wetland areas alone exhibited less than 5 percent cover from noxious weeds and greater than 80 percent hydrophytic vegetation cover. Upland buffer areas also exhibited more 5 percent cover of noxious weed infestations, increasing in number from 2013 to 2015. The 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 35% during the 2015 survey, well below the 50% threshold for success. Comprehensive site monitoring has occurred for three years and will be conducted for a minimum period of five years as determined by the USACE Montana Regulatory Office's review of annual monitoring reports for the site and attainment of wetland success criteria.

Table 10. Summary of performance standards and success criteria compared to existing site conditions.

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Wetland Characteristics	Meet the three parameter criteria for hydrology, vegetation, and soils as outlined in the 1987 Wetland Delineation Manual and 2010 Great Plains Region.	Y	Areas identified as wetland habitat within the mitigation site meet the three parameter criteria.
Wetland Hydrology	Soil saturation present for at least 12.5 percent of the growing season.	Y	Areas 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 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. Pre-existing hydric soil characteristics are present in several areas identified as wetland prior to 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	Achieved when wetlands delineated as hydrophytic utilizing technical guidelines.	Y	Areas 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 numerous noxious weed infestation have been mapped across this site, these infestations are generally located outside of excavated wetlands. Estimated noxious weed cover within delineated wetlands is above 5 percent.
	Hydrophytic vegetation success will include achieving a minimum overall vegetation cover of 80 percent in created wetland areas within 5 years following site construction.	Y	The majority of created wetlands exhibited more than 80 percent hydrophytic vegetation cover during the 2015 monitoring event. These areas generally showed increased vegetation cover, with hydophytic vegetation cover anticipated to increase in subsequent monitoring years.
Woody Plants	Plantings will be considered successful where they exceed 50 percent survival after 5 years.	N	Approximately 35 percent of the woody plantings observed were alive in 2015, not meeting the 50 percent survival criteria.
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 2015 monitoring event. These areas generally showed increased overall vegetation cover and are anticipated to meet this criteria within 5 years post-construction.
Open Water Areas	Open water that is established within the designated wetland cells will be considered successful and creditable.	NA	Although inundation was observed during the 2015 monitoring event, no areas of open water were mapped within the Kindsfater wetland complex.
Upland Buffer	Success will be achieved when noxious weeds do not exceed 5 percenct cover within the buffer areas on site.	N	Numerous noxious weed infestations, including field bindweed, leafy spurge, gypsy-flower, Canadian thistle, and spotted knapweed, have been mapped within the site and displayed an increase between 2013 and 2015. MDT will need to continue to implement weed control measure to meet this criteria.
	Any area disturbed within creditable buffer zone must have at least 50 percent aerial cover of non-weed species by end of monitoring period.	Y	Upland buffers surround wetland areas within the site exhibited greater than 50 percent aerial cover of non-weed species.
Weed Control	Success will be achieved where <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 below 5 percent, state-listed noxious weed species across the entire site has been estimated at greater than 5 percent absolute cover in 2015.
Fencing	Install wildlife-friendly fencing along the easement boundaries.	Y	Wildlife-friendly fencing has been installed around the easement boundaries and is in good condition.
Monitoring	Monitor the site for a minimum period of five years or longer as determined by the US Army Corps.	N	Comprehensive site monitoring has been on-going for 3 years.

4. REFERENCES

Berglund, J. and R. McEldowney. 2008. *MDT Montana Wetland Assessment Method.* Prepared for Montana Department of Transportation, Helena, Montana. Post, Buckley, Schuh, & Jernigan, Helena, Montana. 42pp.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States*. FWS/OBS-79/31. U.S.D.I Fish and Wildlife Service. Washington D.C.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. U.S. Army Corps of Engineers. Washington, DC.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. *The National Wetland Plant List. 2014 Update of Wetland Ratings*. Phytoneuron 2014-41:1-42.

Montana Department of Transportation and Morrison-Maierle, Inc, August 2012 Kindsfater Wetland Mitigation Plan, Watershed #13 – Upper Yellowstone River Basin, Yellowstone County, Montana.

U.S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3.Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Websites:

Montana Department of Agriculture. Montana Noxious Weed List. July 2015. Accessed in October 2015 at http://agr.mt.gov/agr/Programs/Weeds/PDF/2015WeedList.pdf

Montana Natural Heritage Program website. Accessed in October 2013 at http://mtnhp.org/nwi/PUB_PAB.asp.

USDA, Natural Resources Conservation Service Soil Survey Geographic (SSURGO) Data for Yellowstone County, Montana. Shapefile Stamped September 2011 downloaded from Montana Geographic Information Clearinghouse.

WRCC United States Historical Climatology Network. 2015. Accessed October 2015 at: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?mt0802.

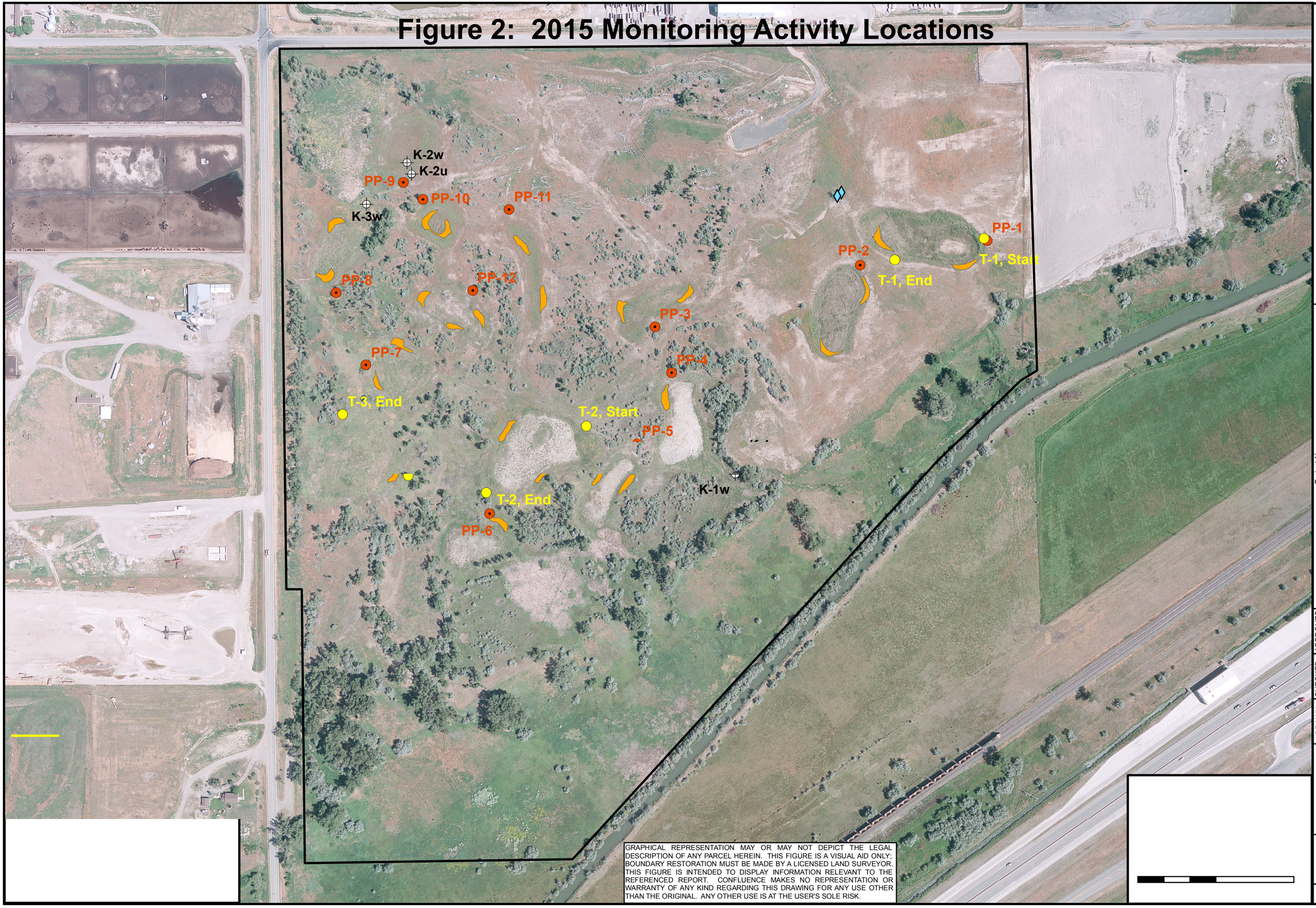
Yellowstone County Noxious Weed List. July 2015. Accessed in December 2015 at http://www.co.yellowstone.mt.gov/publicworks/weed/weeds.asp

Appendix A

Project Area Maps – Figures 2 and 3

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana

Figure 2: 2015 Monitoring Activity Locations



GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

LOCATION: Yellowstone Co., MT

PROJ NO: STPX-0056(56)

FILE: Kindsfater/Monitor2015.mxd

Project Name
Kindsfater Wetland Mitigation Site

Drawing Title
2015 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As Shown

Drawn: August 29, 2015

PROJ MGR: J Johnson

CONFLUENCE
consulting incorporated

Figure
2

Figure 3: 2015 Mapped Site Features

Noxious Weeds
- Convolvulus arvensis
- Euphorbia esula
- Cynoglossum officinale
- Cirsium arvense
- Centaurea stoebe

Infestation Size
- X = <0.1 acre
- ▲ = 0.1 to 1 acre
- ■ = 1 to 5 acre

Cover Class
- T = Trace (<1% cover)
- L = Low (1-5% cover)
- M = Moderate (6-25% cover)
- H = High (26-100% cover)

N

0

Legend
- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: June 2015

Vegetation Community Types
1. Chenopodium spp./Bromus spp.
2. Eleocharis palustris/Bromus spp.
3. Alopecurus pratensis/Poa palustris
4. Elaeagnus angustifolia
5. Typha latifolia
6. Elymus trachycaulus/Bromus spp.

ACREAGES

Project Area	115.7 acres
Total Wetlands	34.9 acres
Preserved Wetlands	21.3 acres
Enhanced Wetlands	3.0 acres
Re-established Wetlands	7.9 acres
Rehabilited Wetlands	0.9 acres
Created Wetlands	1.8 acres
Upland	80.8 acres

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

LOCATION: Yellowstone Co., MT

PROJ NO: STPX 0056(56)

FILE: Kindsfater/Veg2015.mxd

Project Name: Kindsfater Wetland Mitigation Site

Drawing Title: 2015 Mapped Site Features

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As Shown

Drawn: August 30, 2015

PROJ MGR: J Johnson

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2015 MDT Wetland Mitigation Site Monitoring Form
2015 USACE Wetland Determination Data Forms
2015 MDT Montana Wetland Assessment Forms

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Kindsfater Assessment Date/Time 6/16/2015

Person(s) conducting the assessment: Ryan Quire, Erik Nyquist

Weather: Sunny, clear approximately 75 de Location: Laurel, MT

MDT District: 5 Milepost:

Legal Description: T 2S R 25E Section(s) 6

Initial Evaluation Date: 8/22/2013 Monitoring Year: 3 #Visits in Year: 1

Size of Evaluation Area: 115.69 (acres)

Land use surrounding wetland:

Transportation, commercial, agriculture

HYDROLOGY

Surface Water Source: Groundwater

Inundation: ☑ Average Depth: 0.2 **(ft)** Range of Depths: 0.1-0.3 **(ft)**

Percent of assessment area under inundation: 10 %

Depth at emergent vegetation-open water boundary: 0.1 **(ft)**

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**:**

Inundation/saturation visible on aerial imagery, geomorphic position, drainage patterns.

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

Well ID	Water Surface Depth (ft)
7	

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.

Hydrology Notes:

Only located one of the four groundwater monitoring wells and it was locked.

VEGETATION COMMUNITIES

Site Kindsfater

(Cover Class Codes **0** = < 1%, **1** = 1-5%, **2** = 6-10%, **3** = 11-20%, **4** = 21-50% , **5** = >50%)

Community # 1 **Community Type:** Chenopodium spp. / Bromus spp. **Acres** 37.07

Species	Cover class	Species	Cover class
Achnatherum nelsonii	0	Agropyron cristatum	2
Alopecurus pratensis	0	Amaranthus retroflexus	0
Artemisia frigida	0	Asclepias speciosa	0
Bare Ground	0	Bassia scoparia	1
Brassica nigra	0	Bromus arvensis	1
Bromus inermis	2	Bromus tectorum	4
Calamagrostis canadensis	0	Chenopodium album	1
Chenopodium sp.	1	Cirsium arvense	1
Convolvulus arvensis	1	Cynoglossum officinale	0
Descurainia sophia	0	Elaeagnus angustifolia	1
Elaeagnus commutata	0	Elymus trachycaulus	2
Equisetum hyemale	1	Erigeron caespitosus	0
Erodium cicutarium	0	Filago arvensis	0
Heterotheca villosa	0	Hyoscyamus niger	0
Juncus balticus	0	Lactuca serriola	0
Lycopus asper	0	Medicago lupulina	0
Medicago sativa	1	Melilotus albus	0
Melilotus officinalis	0	Opuntia polyacantha	0
Panicum capillare	0	Pascopyrum smithii	0
Persicaria lapathifolia	0	Phalaris arundinacea	0
Poa palustris	1	Polypogon monspeliensis	0
Populus angustifolia	0	Populus deltoides	0
Salsola tragus	1	Schedonorus pratensis	1
Sisymbrium altissimum	2	Solanum dulcamara	0
Solidago canadensis	1	Sonchus arvensis	0
Stipa comata	0	Taraxacum officinale	0
Thlaspi arvense	1	Tragopogon dubius	1
Verbascum thapsus	1	Xanthium strumarium	0

Comments:

Upland community

Community # 2 **Community Type:** Eleocharis palustris / Bromus spp. **Acres** 8.97

Species	Cover class	Species	Cover class
Alopecurus pratensis	1	Atriplex suckleyi	0
Bare Ground	1	Bromus arvensis	2
Bromus tectorum	3	Calamagrostis canadensis	0
Carex nebrascensis	0	Chenopodium sp.	0
Cirsium arvense	1	Cirsium vulgare	0
Cornus alba	0	Deschampsia caespitosa	0
Elaeagnus commutata	0	Eleocharis palustris	3
Elymus trachycaulus	1	Epilobium ciliatum	1
Filago arvensis	0	Hordeum jubatum	0
Hyoscyamus niger	0	Juncus articulatus	0
Juncus balticus	1	Juncus ensifolius	0
Juncus torreyi	0	Lactuca serriola	1
Lemna minor	0	Lycopus asper	0
Medicago lupulina	0	Melilotus albus	0
Mentha arvensis	0	Panicum capillare	0
Persicaria lapathifolia	1	Phalaris arundinacea	0
Poa palustris	2	Polypogon monspeliensis	0
Populus deltoides	1	Rumex crispus	0
Salix exigua	1	Salix sp.	0
Schoenoplectus acutus	1	Schoenoplectus pungens	0
Scirpus microcarpus	1	Solanum dulcamara	0
Sonchus arvensis	1	Taraxacum officinale	0
Thlaspi arvense	0	Tragopogon dubius	0
Typha latifolia	0	Veronica peregrina	0
Vicia sativa	0	Xanthium strumarium	0

Comments:

Wetland community developed within excavated basins.

Community # 3 **Community Type:** Alopecurus pratensis / Poa palustris **Acres** 16.17

Species	Cover class	Species	Cover class
Alopecurus pratensis	4	Bare Ground	1
Bromus arvensis	1	Bromus tectorum	2
Carex nebrascensis	1	Carex utriculata	1
Chenopodium album	1	Chenopodium sp.	0
Cirsium arvense	0	Cirsium vulgare	0
Conium maculatum	0	Cynoglossum officinale	0
Deschampsia caespitosa	0	Elaeagnus commutata	0
Elymus repens	1	Elymus trachycaulus	0
Filago arvensis	0	Glycyrrhiza lepidota	0
Juncus balticus	0	Lactuca serriola	0
Lycopus asper	0	Medicago sativa	0
Melilotus albus	0	Mentha arvensis	0
Panicum capillare	0	Pascopyrum smithii	3
Persicaria lapathifolia	1	Poa palustris	4
Poa pratensis	0	Polypogon monspeliensis	1
Populus deltoides	0	Rumex crispus	1
Salix exigua	0	Salix lutea	0
Schedonorus pratensis	0	Scirpus microcarpus	0
Sonchus arvensis	1	Thlaspi arvense	0
Tragopogon dubius	0	Typha angustifolia	0
Typha latifolia	0	Xanthium strumarium	0

Comments:

Existing drier wetland area community.

Community # 4 **Community Type:** Elaeagnus angustifolia / **Acres** 24.71

Species	Cover class	Species	Cover class
Elaeagnus angustifolia	5	Elaeagnus commutata	1
Populus angustifolia	1	Populus deltoides	2

Comments:

Scrub/shrub and tree vegetation community, interspersed through upland community 1 (Chenopodium spp./Bromus spp.). Upland community is generally a mosaic of veg coms 1 & 4.

Community # 5 **Community Type:** Typha latifolia / **Acres** 9.76

Species	Cover class	Species	Cover class
Eleocharis palustris	1	Juncus balticus	1
Lycopus asper	1	Persicaria lapathifolia	1
Polypogon monspeliensis	1	Schoenoplectus acutus	2
Solanum dulcamara	1	Typha latifolia	5

Comments:

Pre-construction existing wetland community.

Community # 6 **Community Type:** Elymus trachycaulus / Bromus spp. **Acres** 19.01

Species	Cover class	Species	Cover class
Bare Ground	1	Bromus arvensis	3
Bromus tectorum	3	Chenopodium album	1
Cirsium arvense	2	Convolvulus arvensis	3
Elymus repens	1	Elymus trachycaulus	3
Equisetum hyemale	1	Euphorbia esula	0
Lactuca serriola	1	Sisymbrium altissimum	1
Solidago canadensis	0	Thlaspi arvense	1
Verbascum thapsus	0		

Comments:

Community generally located along the drier slope between the upper and lower terraces. Cheatgrass increasing in all but veg com 5.

Total Vegetation Community Acreage **115.69**

(Note: some area within the project bounds may be open water or other non-vegetative ground cover.)

VEGETATION TRANSECTS

Site: Kindsfater Date: 6/16/2015

Transect Number: 1 **Compass Direction from Start:** 240

Interval Data:

Ending Station 16 **Community Type:** Chenopodium spp. / Bromus spp.

Species	Cover class	Species	Cover class
Bare Ground	2	Brassica nigra	1
Bromus arvensis	1	Bromus tectorum	4
Chenopodium album	2	Hyoscyamus niger	0
Hyoscyamus niger	0	Lactuca serriola	1
Medicago sativa	1	Melilotus albus	4
Salsola tragus	1		

Ending Station 52 **Community Type:** Eleocharis palustris / Bromus spp.

Species	Cover class	Species	Cover class
Bare Ground	1	Bromus arvensis	0
Chenopodium sp.	1	Deschampsia caespitosa	1
Eleocharis palustris	3	Hordeum jubatum	0
Juncus articulatus	1	Juncus balticus	1
Juncus torreyi	1	Lactuca serriola	0
Mentha arvensis	0	Poa palustris	2
Polypogon monspeliensis	0	Populus deltoides	3
Salix exigua	3	Salix sp.	1
Schoenoplectus pungens	1	Scirpus microcarpus	1
Typha latifolia	1		

Ending Station 159 **Community Type:** Chenopodium spp. / Bromus spp.

Species	Cover class	Species	Cover class
Achnatherum nelsonii	0	Agropyron cristatum	0
Bare Ground	0	Bromus arvensis	2
Bromus inermis	0	Bromus tectorum	4
Chenopodium sp.	0	Cirsium arvense	0
Descurainia sophia	1	Erodium cicutarium	0
Hyoscyamus niger	0	Medicago lupulina	1
Melilotus officinalis	0	Salsola tragus	1
Sisymbrium altissimum	0	Solanum dulcamara	0

Ending Station 244 **Community Type:** Eleocharis palustris / Bromus spp.

Species	Cover class	Species	Cover class
Atriplex suckleyi	0	Bare Ground	1
Bromus arvensis	1	Cirsium arvense	1
Eleocharis palustris	3	Elymus trachycaulus	0
Hordeum jubatum	0	Hyoscyamus niger	0
Juncus articulatus	1	Juncus torreyi	1
Medicago lupulina	1	Persicaria lapathifolia	0
Poa palustris	3	Polypogon monspeliensis	1
Populus deltoides	3	Salix exigua	2
Salix sp.	1	Scirpus microcarpus	0
Tragopogon dubius	0	Typha latifolia	0
Typha latifolia	1	Vicia sativa	0

Ending Station 300 **Community Type:** Chenopodium spp. / Bromus spp.

Species	Cover class	Species	Cover class
Achnatherum nelsonii	0	Agropyron cristatum	0
Artemisia frigida	0	Bare Ground	2
Brassica nigra	1	Bromus inermis	1
Bromus tectorum	2	Cirsium arvense	1
Convolvulus arvensis	0	Elaeagnus commutata	0
Elymus trachycaulus	2	Hyoscyamus niger	1
Lactuca serriola	1	Medicago sativa	1
Melilotus officinalis	0	Poa palustris	3
Salsola tragus	2	Sisymbrium altissimum	0
Verbascum thapsus	0		

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 225

Interval Data:

Ending Station 30 **Community Type:** Alopecurus pratensis / Poa palustris

Species	Cover class	Species	Cover class
Alopecurus pratensis	2	Chenopodium sp.	2
Cirsium arvense	0	Cynoglossum officinale	1
Elaeagnus commutata	0	Elymus trachycaulus	1
Lactuca serriola	1	Lycopus asper	0
Medicago sativa	0	Melilotus albus	0
Mentha arvensis	1	Panicum capillare	2
Persicaria lapathifolia	1	Poa palustris	1
Rumex crispus	0	Sonchus arvensis	1
Thlaspi arvense	1	Xanthium strumarium	1

Ending Station 339 **Community Type:** Eleocharis palustris / Bromus spp.

Species	Cover class	Species	Cover class
Alopecurus pratensis	0	Bare Ground	3
Cirsium arvense	0	Cirsium arvense	1
Cirsium vulgare	0	Deschampsia caespitosa	1
Elaeagnus commutata	0	Eleocharis palustris	0
Hordeum jubatum	0	Juncus torreyi	1
Lycopus asper	0	Mentha arvensis	1
Panicum capillare	1	Phalaris arundinacea	1
Polypogon monspeliensis	0	Populus deltoides	2
Salix exigua	1	Schoenoplectus pungens	0
Scirpus microcarpus	0	Solanum dulcamara	0
Sonchus arvensis	1	Taraxacum officinale	0
Typha latifolia	0	Veronica peregrina	0
Xanthium strumarium	0		

Ending Station 388 **Community Type:** Alopecurus pratensis. / Poa palustris

Species	Cover class	Species	Cover class
Alopecurus pratensis	3	Chenopodium album	0
Cirsium arvense	1	Cirsium vulgare	0
Conium maculatum	0	Cynoglossum officinale	0
Deschampsia caespitosa	0	Glycyrrhiza lepidota	1
Juncus balticus	2	Lactuca serriola	0
Poa palustris	2	Polypogon monspeliensis	0
Rumex crispus	0	Salix exigua	0
Schedonorus pratensis	1	Sonchus arvensis	1
Thlaspi arvense	0	Typha latifolia	0

Transect Notes:

Transect Number: 3 **Compass Direction from Start:** 290

Interval Data:

Ending Station 50 **Community Type:** Alopecurus pratensis / Poa palustris

Species	Cover class	Species	Cover class
Alopecurus pratensis	3	Bare Ground	1
Bromus tectorum	1	Carex utriculata	1
Chenopodium sp.	2	Cirsium arvense	0
Filago arvensis	1	Juncus balticus	1
Lactuca serriola	0	Persicaria lapathifolia	1
Poa palustris	2	Poa pratensis	1
Rumex crispus	0	Thlaspi arvense	1
Tragopogon dubius	0		

Ending Station 262 **Community Type:** Eleocharis palustris / Bromus spp.

Species	Cover class	Species	Cover class
Alopecurus pratensis	3	Calamagrostis canadensis	1
Carex nebrascensis	0	Eleocharis palustris	1
Epilobium ciliatum	0	Juncus torreyi	0
Lactuca serriola	0	Mentha arvensis	0
Persicaria lapathifolia	1	Phalaris arundinacea	1
Polypogon monspeliensis	3	Populus deltoides	1
Rumex crispus	0	Salix exigua	1
Scirpus microcarpus	1	Thlaspi arvense	1
Typha latifolia	2		

Ending Station 292 **Community Type:** Chenopodium spp. / Bromus spp.

Species	Cover class	Species	Cover class
Alopecurus pratensis	2	Bare Ground	2
Bassia scoparia	2	Bromus tectorum	1
Chenopodium sp.	3	Equisetum hyemale	0
Juncus balticus	0	Lactuca serriola	1
Pascopyrum smithii	0	Schedonorus pratensis	2
Sisymbrium altissimum	0	Thlaspi arvense	1

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Kindsfater

Planting Type	#Planted	#Alive	Notes
Cornus alba	130		
Crataegus douglasii	50		
Juniperus scopulorum	50		
Populus sp.	140		
Prunus virginiana	50		
Rosa woodsii	50		
Salix sp.	2800		
Shepherdia sp.	50		

Comments

Approximately 27 woody planting areas were mapped by MDT in 2013 and are located around the excavated basins. Values for planted vegetation were drawn from the plan sheet. Approximately 35% of the woody plantings observed were alive in 2015. Site is drying out due to lack of hydrology.

Kindsfater

WILDLIFE

Birds

Were man-made nesting structures installed? Yes

If yes, type of structure: 0

How many? 2

Are the nesting structures being used? No

Do the nesting structures need repairs? Yes

Nesting Structure Comments:
The 2 trees that the bird boxes were mounted on have fallen over.

Species	#Observed	Behavior	Habitat
Killdeer	3		AB, AB, MF,
Mourning Dove	4		FO, SS, UP,
Northern Flicker	1		FO, SS,
Northern Harrier	1		UP, WM,
Red-tailed Hawk	1		FO, SS, UP, WM,
Ring-necked Pheasant	1		SS, UP,
Western Tanager	1		FO,
Yellow Warbler	1		SS, UP,

Bird Comments

BEHAVIOR CODES

BP = One of a breeding pair **BD** = Breeding display **F** = Foraging **FO** = Flyover **L** = Loafing **N** = Nesting

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Vole sp.	2	No	No	No	
White-tailed Deer	2	No	No	No	

Wildlife Comments:

Kindsfater

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.

Photo #	Latitude	Longitude	Bearing	Description
51	45.693317	-108.697517	290	T-3, start
52	45.693317	-108.698486	110	T-3, finish
53	45.698065	-108.698065	90	PP-7
54	45.694939	-108.698429	315	PP-8
55	45.695734	-108.698029	290	K-3w
56	45.694302	-108.698044	90	PP-9
57	45.696088	-108.697497	310	K-2w
58	45.695972	-108.69745	310	K-2u
59	45.694847	-108.698418	140	PP-10
60	45.695892	-108.697601	350	PP-11
61	45.694939	-108.696663	230	PP-12
62	45.694612	-108.69443	0	PP-3
63	45.695136	-108.691839	280	PP-2
64	45.695072	-108.691437	50	T-1, finish
65	45.695357	-108.690285	240	T-1, start
66	45.695342	-108.690247	280	PP-1, same location at T-1 start
67	45.693439	-108.693354	140	K-1u
68	45.693313	-108.693455	120	K-1w
69	45.694935	-108.691902	200	PP-4
70	45.694748	-108.694458	10	PP-5
71	45.693763	-108.695288	225	T-2, start
72	45.693184	-108.696573	40	T-2, finish
73	45.694084	-108.694321	150	PP-6

Comments:

Kindsfater

ADDITIONAL ITEMS CHECKLIST

Hydrology

☑ Map emergent vegetation/open water boundary on aerial photos.
☑ Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

☑ One photo from the wetland toward each of the four cardinal directions
☑ One photo showing upland use surrounding the wetland.
☑ One photo showing the buffer around the wetland
☑ One photo from each end of each vegetation transect, toward the transect

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

☑ Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
☑ Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

Site is getting drier due to lack of hydrology

Functional Assessments

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

Functional Assessment Comments:

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? No

If yes, are the structures in need of repair?

If yes, describe the problems below.

bird boxes need to be replaced

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Kindsfater City/County: Yellowstone Sampling Date: 6/16/2015

Applicant/Owner: MDT State: Montana Sampling Point: K-1u

Investigator(s): E. Nyquist Section, Township, Range: 6 2S 25E

Landform (hillslope, terrace, etc.): Bench Local relief (concave, convex, none): convex Slope (%): 1

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 ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks: Upland sample point.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status
Elaeagnus angustifolia	5	☑	FACU
Populus deltoides	5	☑	FAC

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus tectorum	75	☑	NL
Convolvulus arvensis	1	☐	NL
Elymus trachycaulus	5	☐	FACU
Tragopogon dubius	1	☐	NL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 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	77	X 5	385
Column Totals	92 (A)		440 (B)

Prevalence Index = B/A = 4.78

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

SOIL

Sampling Point: K-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	
4-20	10YR 4/2	90	10YR 5/6	10	C	M	Sandy Loam	

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

Hydric Soil Indicators: (Applicable to 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 Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: No indicators observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Kindsfater City/County: Yellowstone Sampling Date: 6/16/2015

Applicant/Owner: MDT State: Montana Sampling Point: K-1w

Investigator(s): E. Nyquist Section, Township, Range: 6 2S 25E

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

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 _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No ☐	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks: Due to disturbed soils this area is classified as a wetland.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)	Absolute % Cover:	Domiant Species?	Indicator Status
Elaeagnus angustifolia	10	☑	FACU

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Cynoglossum officinale	5	☐	FACU
Juncus balticus	50	☑	FACW
Phalaris arundinacea	10	☐	FACW
Solidago canadensis	5	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 5

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	60	X 2	120
FAC species	0	X 3	0
FACU species	20	X 4	80
UPL species	0	X 5	0
Column Totals	80 (A)		200 (B)

Prevalence Index = B/A = 2.50

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

SOIL

Sampling Point: K-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	
04-12	10YR 4/3	100					Fine Sand	
12+								rock refusal

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

Hydric Soil Indicators: (Applicable to 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 Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: 2 secondary indicators.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Kindsfater City/County: Yellowstone Sampling Date: 6/16/2015

Applicant/Owner: MDT State: Montana Sampling Point: K-2u

Investigator(s): E. Nyquist Section, Township, Range: 6 2S 25E

Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): concave Slope (%): 2

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 ✔	**Is the Sampled Area within a Wetland?** Yes ☐ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks: Upland sample point.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)	Absolute % Cover:	Domiant Species?	Indicator Status
Elaeagnus angustifolia	1	☑	FACU

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus arvensis	25	☑	FACU
Bromus inermis	15	☐	UPL
Bromus tectorum	25	☑	NL
Elymus trachycaulus	30	☑	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 4

Dominance Test worksheet

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

Total Number of Dominant Species Across All Strata: 4 (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	56	X 4	224
UPL species	40	X 5	200
Column Totals	96 (A)		424 (B)

Prevalence Index = B/A = 4.42

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

SOIL

Sampling Point: K-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	
16-20	10YR 4/2	100					Sandy Loam	

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

Hydric Soil Indicators: (Applicable to 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 Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: No indicators observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Kindsfater City/County: Yellowstone Sampling Date: 6/16/2015

Applicant/Owner: MDT State: Montana Sampling Point: K-2w

Investigator(s): E. Nyquist Section, Township, Range: 6 2S 25E

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

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 _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No ☐	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks: Sample point located in wetland depression.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status
Bromus arvensis	20	☑	FACU
Bromus tectorum	15	☐	NL
Eleocharis palustris	15	☐	OBL
Elymus trachycaulus	2	☐	FACU
Poa palustris	40	☑	FACW
Sisymbrium altissimum	2	☐	FACU
Thlaspi arvense	1	☐	FACU
Tragopogon dubius	1	☐	NL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 0

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	15	X 1	15
FACW species	40	X 2	80
FAC species	0	X 3	0
FACU species	25	X 4	100
UPL species	16	X 5	80
Column Totals	96 (A)		275 (B)

Prevalence Index = B/A = 2.86

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

SOIL

Sampling Point: K-2w

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	
16-20	10YR 4/2	100					Loamy Sand	

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

Hydric Soil Indicators: (Applicable to 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 Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: 2 secondary indicators observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Kindsfater City/County: Yellowstone Sampling Date: 6/16/2015

Applicant/Owner: MDT State: Montana Sampling Point: K-3w

Investigator(s): E. Nyquist Section, Township, Range: 6 2S 25E

Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): LRR F Lat: 45.695734 Long: -108.698029 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 _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No ☐	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks: Wetland sample point.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status
Alopecurus pratensis	55	☑	FACW
Carex nebrascensis	5	☐	OBL
Eleocharis palustris	10	☐	OBL
Phalaris arundinacea	15	☐	FACW
Thlaspi arvense	5	☐	FACU
Tragopogon dubius	1	☐	NL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 5

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	15	X 1	15
FACW species	70	X 2	140
FAC species	0	X 3	0
FACU species	5	X 4	20
UPL species	1	X 5	5
Column Totals	91 (A)		180 (B)

Prevalence Index = B/A = 1.98

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

SOIL

Sampling Point: K-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
0-22	10YR 4/2	85	10YR 5/6	15	C	M	Sandy Clay Loam	

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

Hydric Soil Indicators: (Applicable to 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 Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: 4 secondary indicators observed.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Kindsfater **2. MDT project#** STPX-0056(56) **Control#** 5034

3. Evaluation Date 6/16/2015 **4. Evaluators** E Nyquist, R Quire **5. Wetland/Site# (s)** Kindsfater - created wetland

6. Wetland Location(s): T 2S **R** 25E **Sec1** 6 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed 10070004 **Watershed/County** Upper Yellowstone Watershed, Yellowstone County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 1.8

How assessed: Measured e.g. by GPS

Purpose of Evaluation

- ☐ **Wetlands potentially affected by MDT project**
- ☐ **Mitigation Wetlands: pre-construction**
- ☑ **Mitigation Wetlands: post construction**
- ☐ **Other**

9. Assesssment area (AA) size (acres) 1.8

How assessed: Measured e.g. by GPS

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	95
Depressional	Scrub-Shrub Wetland	Excavated	Seasonal/Intermittent	5

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) 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%.	low disturbance	low disturbance	moderate disturbance
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	moderate disturbance	high 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%.	high disturbance	high disturbance	high disturbance

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. Preserved wetland areas with higher elevations appear to be losing hydrology and transitioning into upland communities with excavated wetland cells retaining hydrology but also drying out. Site will need to be re-evaluated in 2016, specifically for existing wetland areas (higher elevation) outside of excavated cells.

ii. Prominent noxious, aquatic nuisance, other exotic species:

Euphorbia esula, Cirsium arvense, Cynoglossum officinale, Centaurea stoebe, 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 2015 is the third 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 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Predominantly emergent vegetation with scrub-shrub communities around some margins

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMEN

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use USFWS list for species in Yellowstone County; no habitat specifications/known occurrences

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use Observed approximately 40 plains spadefoot during the 2013 site investigation; none observed in 2014 or 2015.

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
- ☐ interviews with local biologists 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
- ☐ interviews with local biologists with knowledge of the 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
- ☐ interviews with local biologists 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 instructions 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 ñ 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)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [check] the functional points and rating)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments Recently constructed/disturbed areas contributed to low rating. Expect wildlife rating to increase for subsequent monitoring years.

14D. General Fish Habitat Rating: (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, etc.]. 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 ☑ **NA** here and proceed to 14E.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points 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	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 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?* **Y** ○ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

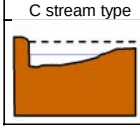
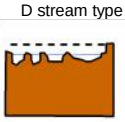
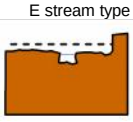
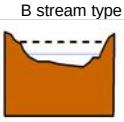
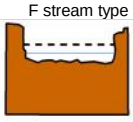
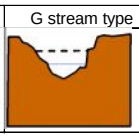
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat within mitigation site; no perennial water

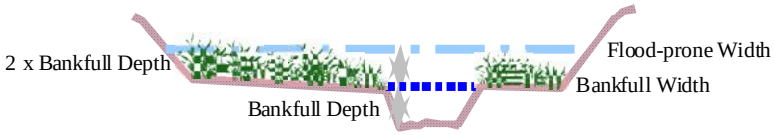
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14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☑ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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		
% 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**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width _____ **/ Bankfull width** _____ **= Entrenchment ratio** _____

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 (check)? **Y** ○ **N** ◉

Comments: Flooding does not occur on the site as groundwater is the primary hyrdology sources; no flooding occurs from in-channel or overbank flow.

14F. Short and Long Term Surface Water Storage: (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, click ☐ **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions 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 ñ **5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: Estimated that AA ponds greater than 5 out of 10 years with approximately 1.8 acres inundated to approximatley 0.5 feet.

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands 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, click ☐ **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of 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 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 with 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	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: Isolated depressional wetland cells do not have outlets. Percent cover of wetland vegetation increased in 2015 to greater than 70%.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or 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, click ☑ **NA** here and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

*% 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
ñ **65%**	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

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 ratings [check])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions 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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: 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).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .3L

Comments: Adjacent upland buffer with greater than 30% plant cover.

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & 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 arrive at [check] the functional points and rating)

	Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*			
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	NA			

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 arrive at [check] the functional points 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)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (check) **Y** ◉ **N** ○ (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ☑ Educational/scientific study; ☐ Consumptive rec.; ☑ Non-consumptive rec.; ☐ Other

iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

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

General Site Notes

Anticipate higher wildlife ratings in subsequent monitoring years. Wetland acreage may be less in 2016 due to transitioning hydrology and plant communities.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR 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	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	1.62	☑
C. General Wildlife Habitat	L	.3	1	0.54	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	NA	0	0	0	☐
F. Short and Long Term Surface Water Storage	L	.3	1	0.54	☐
G. Sediment/Nutrient/Toxicant Removal	H	1	1	1.8	☑
H. Sediment/Shoreline Stabilization	NA	0	0	0	☐
I. Production Export/Food Chain Support	L	.3	1	0.54	☐
J. Groundwater Discharge/Recharge	M	.7	1	1.26	☑
K. Uniqueness	L	.2	1	0.36	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	0.36	☐
Totals:		3.9	8	7.02	
Percent of Possible Score			**48.75** %		

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; otherwise 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 RATING:
(check 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) **Control#** 5034

3. Evaluation Date 6/16/2015 **4. Evaluators** E Nyquist, R Quire **5. Wetland/Site# (s)** Kindsfater - existing wetland/preservation wetland

6. Wetland Location(s): **T** 2S **R** 25E **Sec1** 6 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed 10070004 **Watershed/County** Upper Yellowstone Watershed/Yellowstone County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 33.1

How assessed: Measured e.g. by GPS

Purpose of Evaluation

- ☐ **Wetlands potentially affected by MDT project**
- ☐ **Mitigation Wetlands: pre-construction**
- ☑ **Mitigation Wetlands: post construction**
- ☐ **Other**

9. Assesssment area (AA) size (acres) 33.1

How assessed: Measured e.g. by GPS

10. Classification of Wetland and Aquatic Habitats in AA

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

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) 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%.	low disturbance	low disturbance	moderate disturbance
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	moderate disturbance	high 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%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc)

The wetland mitigation site was recently constructed (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 with higher elevations appear to be losing hydrology and transitioning into upland communities with excavated wetland cells retaining hydrology.

ii. Prominent noxious, aquatic nuisance, other exotic species:

Euphorbia esula, Cirsium arvense, Cynoglossum officinale, Centaurea stoebe, Convolvulus arvensis

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 2015 is the third 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 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

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

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMEN

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use USFWS list for species in Yellowstone County

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use Observed approximately 40 plains spadefoot during the 2013 site visit, 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): Moderate

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
- ☐ interviews with local biologists 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
- ☐ interviews with local biologists with knowledge of the 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
- ☐ interviews with local biologists 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 instructions 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 ñ 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)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [check] the functional points and rating)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

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

14D. General Fish Habitat Rating: (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, etc.]. 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 ☑ **NA** here and proceed to 14E.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points 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	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 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?* **Y** ○ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

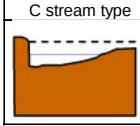
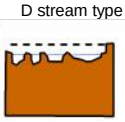
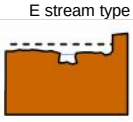
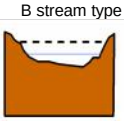
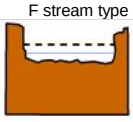
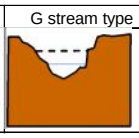
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat present within the site; no perennial water

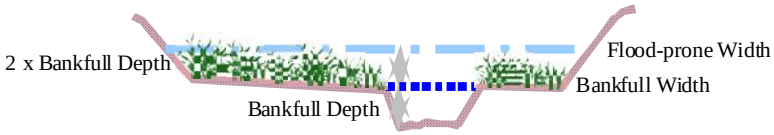
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14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☑ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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		
% 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**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width _____ **/ Bankfull width** _____ **= Entrenchment ratio** _____

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 (check)? **Y** ○ **N** ◉

Comments: Wetlands are not subject to flooding via in-channel or overbank flow as there are no waterways on site.

14F. Short and Long Term Surface Water Storage: (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, click ☐ **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions 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 ñ **5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

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

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands 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, click ☐ **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of 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 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 with 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	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

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

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or 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, click ☑ **NA** here and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

*% 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
ñ **65%**	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

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 ratings [check])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions 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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: 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).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .6M

Comments: Surface outlet draining wetlands down-slope to meadow below site.

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators

- [x] The AA is a slope wetland
- [ ] Springs or seeps are known or observed
- [x] Vegetation growing during dormant season/drought
- [x] Wetland occurs at the toe of a natural slope
- [ ] Seeps are present at the wetland edge
- [ ] AA permanently flooded during drought periods
- [x] 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 arrive at [check] the functional points and rating)

	Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*			
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	NA			

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 arrive at [check] the functional points 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)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (check) **Y** (●) **N** (○) (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ☑ Educational/scientific study; ☐ Consumptive rec.; ☑ Non-consumptive rec.; ☐ Other

iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

Access is permitting without permission with the exception of the police shooting range.

General Site Notes

Pre-construction wetland areas appear to be transitioning into upland as the site appears to be losing hydrology and the vegetation communities are transitioning into upland.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Kindsfater - existing wetland/preservation w

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	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	29.79	☑
C. General Wildlife Habitat	L	.3	1	9.93	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	NA	0	0	0	☐
F. Short and Long Term Surface Water Storage	H	.9	1	29.79	☑
G. Sediment/Nutrient/Toxicant Removal	H	.9	1	29.79	☑
H. Sediment/Shoreline Stabilization	NA	0	0	0	☐
I. Production Export/Food Chain Support	M	.6	1	19.86	☐
J. Groundwater Discharge/Recharge	M	.7	1	23.17	☑
K. Uniqueness	L	.2	1	6.62	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	6.62	☐
Totals:		4.7	8	155.57	
Percent of Possible Score			**58.75** %		

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; otherwise 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 RATING:
(check 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 **Taken in 2013**



Photo Point 1 **Location:** Wetland Cell 14

Bearing: 280 Degrees **Taken in 2014**



Photo Point 1 **Location:** Wetland Cell 14

Bearing: 280 Degrees **Taken in 2015**



Photo Point 2 **Location:** Wetland Cell 13

Bearing: 280 Degrees **Taken in 2013**



Photo Point 2 **Location:** Wetland Cell 13

Bearing: 280 Degrees **Taken in 2014**



Photo Point 2 **Location:** Wetland Cell 13

Bearing: 280 Degrees **Taken in 2015**



Photo Point 3 **Location:** Wetland Cell 9

Bearing: 0 Degrees **Taken in 2013**



Photo Point 3 **Location:** Wetland Cell 9

Bearing: 0 Degrees **Taken in 2014**



Photo Point 3 **Location:** Wetland Cell 9

Bearing: 0 Degrees **Taken in 2015**



Photo Point 4 **Location:** Wetland Cell 12

Bearing: 200 Degrees **Taken in 2013**



Photo Point 4 **Location:** Wetland Cell 12

Bearing: 200 Degrees **Taken in 2014**



Photo Point 4 **Location:** Wetland Cell 12

Bearing: 200 Degrees **Taken in 2015**



Photo Point 5 **Location:** Wetland Cell 11

Bearing: 10 Degrees **Taken in 2013**



Photo Point 5 **Location:** Wetland Cell 11

Bearing: 10 Degrees **Taken in 2014**



Photo Point 5 **Location:** Wetland Cell 11

Bearing: 10 Degrees **Taken in 2015**



Photo Point 6 **Location:** Wetland Cell 10

Bearing: 150 Degrees **Taken in 2013**



Photo Point 6 **Location:** Wetland Cell 10

Bearing: 150 Degrees **Taken in 2014**



Photo Point 6 **Location:** Wetland Cell 10

Bearing: 150 Degrees **Taken in 2015**



Photo Point 7 **Location:** Wetland Cell 5

Bearing: 90 Degrees **Taken in 2013**



Photo Point 7 **Location:** Wetland Cell 5

Bearing: 90 Degrees **Taken in 2014**



Photo Point 7 **Location:** Wetland Cell 5

Bearing: 90 Degrees **Taken in 2015**



Photo Point 8 **Location:** Wetland Cell 2

Bearing: 315 Degrees **Taken in 2013**



Photo Point 8 **Location:** Wetland Cell 2

Bearing: 315 Degrees **Taken in 2014**



Photo Point 8 **Location:** Wetland Cell 2

Bearing: 315 Degrees **Taken in 2015**



Photo Point 9 **Location:** Wetland Cell 1

Bearing: 90 Degrees **Taken in 2013**



Photo Point 9 **Location:** Wetland Cell 1

Bearing: 90 Degrees **Taken in 2014**



Photo Point 9 **Location:** Wetland Cell 1

Bearing: 90 Degrees **Taken in 2015**



Photo Point 10 **Location:** Wetland Cell 3

Bearing: 140 Degrees **Taken in 2013**



Photo Point 10 **Location:** Wetland Cell 3

Bearing: 140 Degrees **Taken in 2014**



Photo Point 10 **Location:** Wetland Cell 3

Bearing: 140 Degrees **Taken in 2015**



Photo Point 11 **Location:** Wetland Cell 7

Bearing: 150 Degrees **Taken in 2013**



Photo Point 11 **Location:** Wetland Cell 7

Bearing: 150 Degrees **Taken in 2014**



Photo Point 11 **Location:** Wetland Cell 7

Bearing: 150 Degrees **Taken in 2015**



Photo Point 12 **Location:** Wetland Cell 6

Bearing: 230 Degrees **Taken in 2013**



Photo Point 12 **Location:** Wetland Cell 6

Bearing: 230 Degrees **Taken in 2014**



Photo Point 12 **Location:** Wetland Cell 6

Bearing: 230 Degrees **Taken in 2015**



Transect 1 – *Start* **Location:** Wetland Cell 14

Bearing: 240 Degrees **Taken in 2013**



Transect 1 – *Finish* **Location:** Wetland Cell 14

Bearing: 50 Degrees **Taken in 2013**



Transect 1 – *Start* **Location:** Wetland Cell 14

Bearing: 240 Degrees **Taken in 2014**



Transect 1 – *Finish* **Location:** Wetland Cell 14

Bearing: 50 Degrees **Taken in 2014**



Transect 1 – *Start* **Location:** Wetland Cell 14

Bearing: 240 Degrees **Taken in 2015**



Transect 1 – *Finish* **Location:** Wetland Cell 14

Bearing: 50 Degrees **Taken in 2015**



Transect 2 – *Start* **Location:** Wetland Cell 8

Bearing: 225 Degrees **Taken in 2013**



Transect 2 – *Finish* **Location:** Wetland Cell 8

Bearing: 40 Degrees **Taken in 2013**



Transect 2 – *Start* **Location:** Wetland Cell 8

Bearing: 225 Degrees **Taken in 2014**



Transect 2 – *Finish* **Location:** Wetland Cell 8

Bearing: 40 Degrees **Taken in 2014**



Transect 2 – *Start* **Location:** Wetland Cell 8

Bearing: 225 Degrees **Taken in 2015**



Transect 2 – *Finish* **Location:** Wetland Cell 8

Bearing: 40 Degrees **Taken in 2015**



Transect 3 – *Start* **Location:** Wetland Cell 4

Bearing: 290 Degrees **Taken in 2013**



Transect 3 – *Finish* **Location:** Wetland Cell 8

Bearing: 110 Degrees **Taken in 2013**



Transect 3 – *Start* **Location:** Wetland Cell 4

Bearing: 290 Degrees **Taken in 2014**



Transect 3 – *Finish* **Location:** Wetland Cell 8

Bearing: 110 Degrees **Taken in 2014**



Transect 3 – *Start* **Location:** Wetland Cell 4

Bearing: 290 Degrees **Taken in 2015**



Transect 3 – *Finish* **Location:** Wetland Cell 8

Bearing: 110 Degrees **Taken in 2015**



Data point: K-1w **Location:** Veg community 5

Taken in 2015



Data point: K-1u Location: Veg community 1

Taken in 2015



Data point: K-2w **Location:** Veg community 2

Taken in 2015



Data point: K-2u **Location:** Veg community 1

Taken in 2015



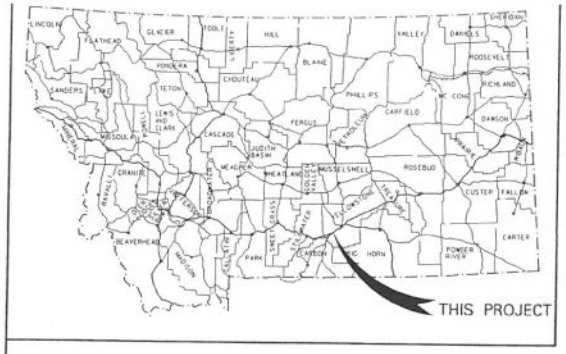
Data point: K-2w **Location:** Veg community 2

Taken in 2015

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 - _____



MORRISON MAIERLE, INC.

PLANS PREPARED BY
MORRISON-MAIERLE, INC. 1 ENGINEERING PLACE P.O. BOX 6147 HELENA, MT 59604 PHONE (406) 442-3050 FAX (406) 442-7862

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R/W & I.C.	
P. E.	

MORRISON-MAIERLE, INC.

By Phillip J. Forbes

DATE 08-29-12

PHILLIP J. FORBES 9112 PE REGISTERED PROFESSIONAL ENGINEER STATE OF MONTANA

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

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	\5034\RD\5034000RDTTLZ01.DGN	DESIGNED BY			WETLAND PLANS	
2		8/29/2012	REVIEWED BY			UPN NUMBER 5034000	
1		11:16:15 AM csallo	CHECKED BY				

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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 0.99948655.

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

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000-dtlz01.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 2 OF 25
1		8:55:45 AM CPS - U2160	CHECKED BY					

CONTROL DIAGRAM

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.

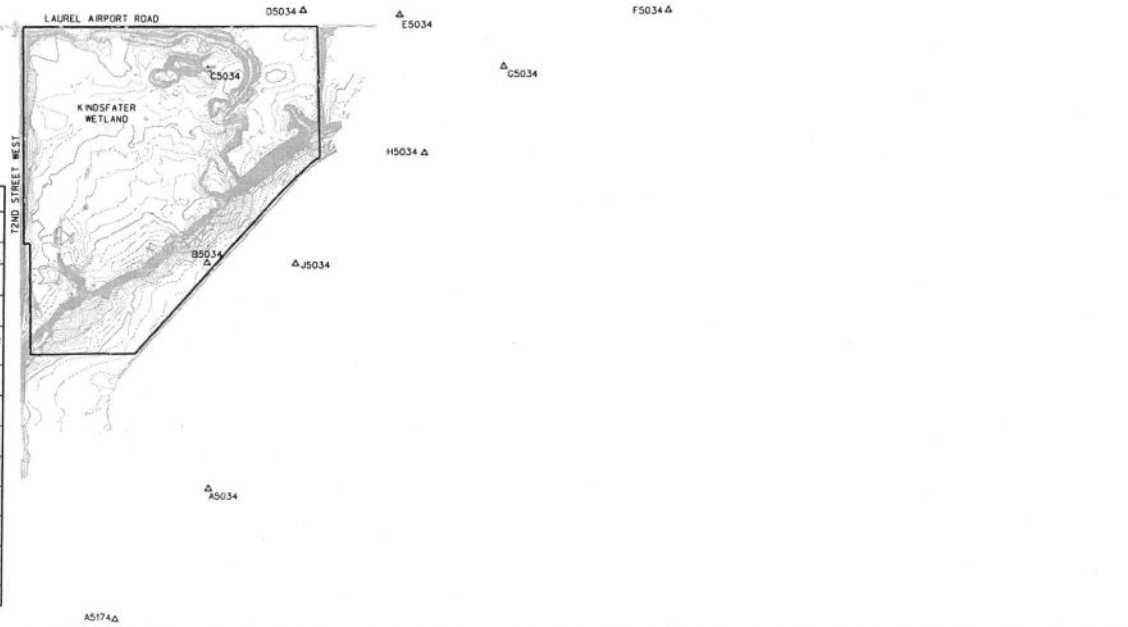
NOTE: FILE 5034SUCONZ02.IFT CONTAINS FINAL STATE PLANE COORDINATES OF MARKS IN THE VICINITY OF THIS PROJECT. HORIZONTAL COORDINATES IN THIS FILE ARE INTERNATIONAL FEET AND ELEVATIONS ARE US SURVEY FEET.

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 (MOSSMAIN 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 4.5 FEET EAST OF X MARKED IN GUARDRAIL, 0.4 MILES EAST OF EXIT OVER PASS.
B5034	526,657.762	2,173,080.639	3,296.48	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	528,704.550	2,176,801.405	3,289.05	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED F5034 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.
G5034	528,245.613	2,175,462.622	3,293.63	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 71 FEET SOUTH OF THE TOP OF SLOPE LOOKING TOWARD THE RAIL ROAD TRACKS.
J5034	526,653.710	2,173,801.670	3,274.02	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED J5034, 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	2,170,421.056	3,304.07	FOUND NGS BENCH MARK DISC MARKED "Q 44 1931" IN TOP OF CONCRETE MONUMENT PER DATA SHEET.



3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rdtrvz01.dgn	DESIGNED BY			WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY					
1		8:55:54 AM CPS - U2180	CHECKED BY			YELLOWSTONE COUNTY	CSF = 0.99948655 UPN NUMBER 5034000	SHEET 3 OF 25

SUMMARY

GRADING

STATION	cubic yards*			REMARKS
	UNCL. EXC.	UNCL. BORROW	EMB.	
			230	SHOOTING RANGE BERM
	4,710			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
	3,500			WETLAND CELL 12
	885		65	SWALES
TOTAL	48,190		# 295	

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

REVEGETATION

STATION	cubic yards*		acres			lump sum	REMARKS
	WETLAND SOIL SALVAGE	TOPSOIL SALVAGING & PLACING	WETLAND SEEDING		CONDITION SEEDBED	TREE & SHRUB PLANTING	
			WETLAND	UPLAND			
						1.0	BASE BID AREA
		50					SHOOTING RANGE BERM**
		750					WETLAND CELL 1
		660					WETLAND CELL 2
		560					WETLAND CELL 3
		1,375					WETLAND CELL 4
		720					WETLAND CELL 5
		860					WETLAND CELL 6
		800					WETLAND CELL 7
		1,290					WETLAND CELL 8
		820					WETLAND CELL 9
		600					WETLAND CELL 10
		540					WETLAND CELL 11
		850					WETLAND CELL 12
		565					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		lump sum	REMARKS
FROM	TO		
		1.0	BASE BID SURVEY
TOTAL		1.0	

SURFACING

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

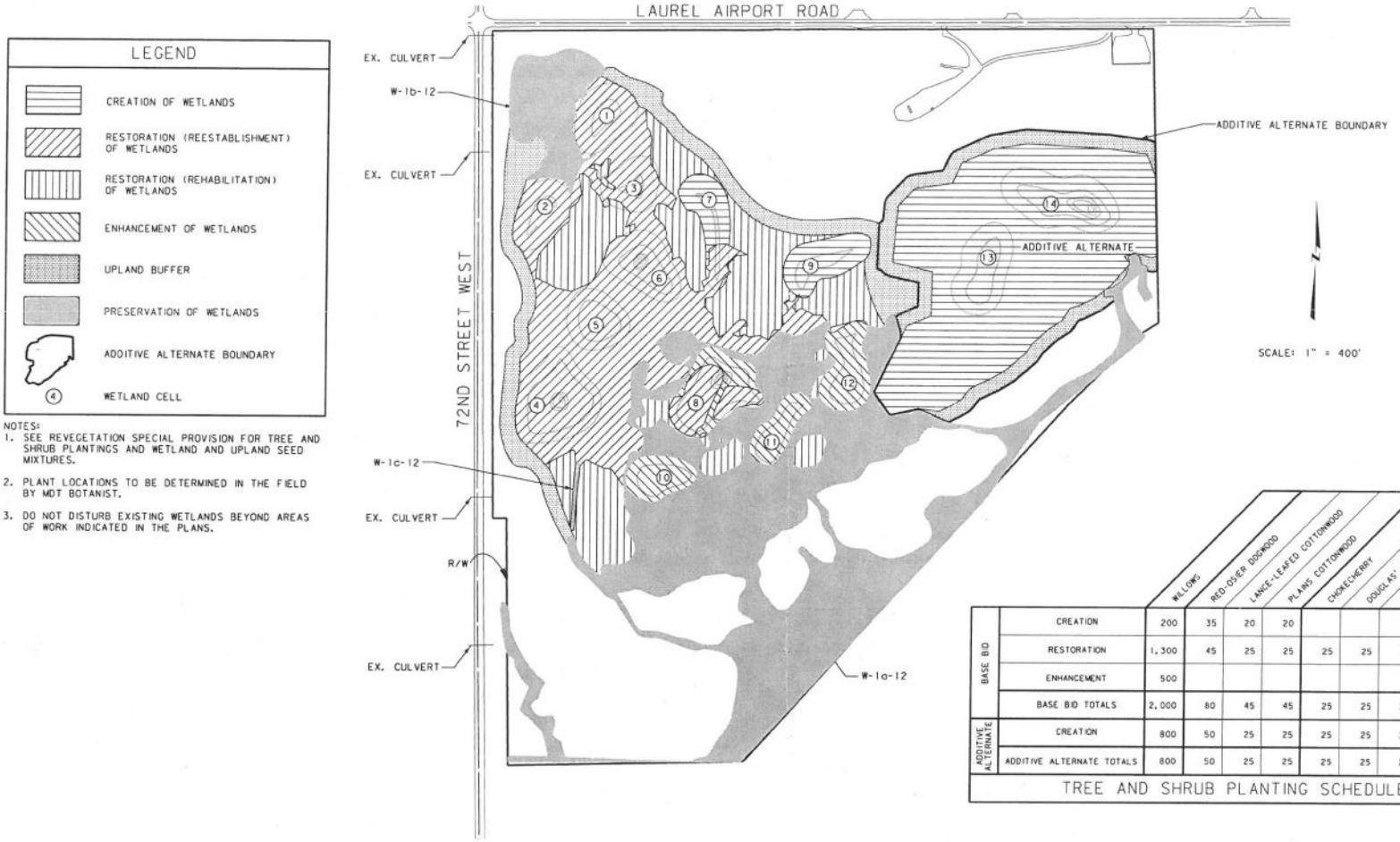
NOTE: SEE ACCESS ROAD SECTION FOR CRUSHED AGGREGATE THICKNESS

FENCING

STATION	linear feet			FARM FENCE	each				linear feet				REMARKS
	CHAIN LINK FENCE				CHAIN LINK PANEL		FARM FENCE PANEL		REMOVE FENCE*	CHAIN LINK GATE		FARM GATE METAL TYPE G-3	
	4'0"	5'0"	6'0"		SINGLE	DOUBLE	SINGLE	DOUBLE		SINGLE	DOUBLE		
			1,401		4	11			1,179		24		SHOOTING RANGE
TOTAL			1,401		4	11			~		24		

* FOR INFORMATION ONLY

RECEIVED
OCT 24 2012
ENVIRONMENTAL



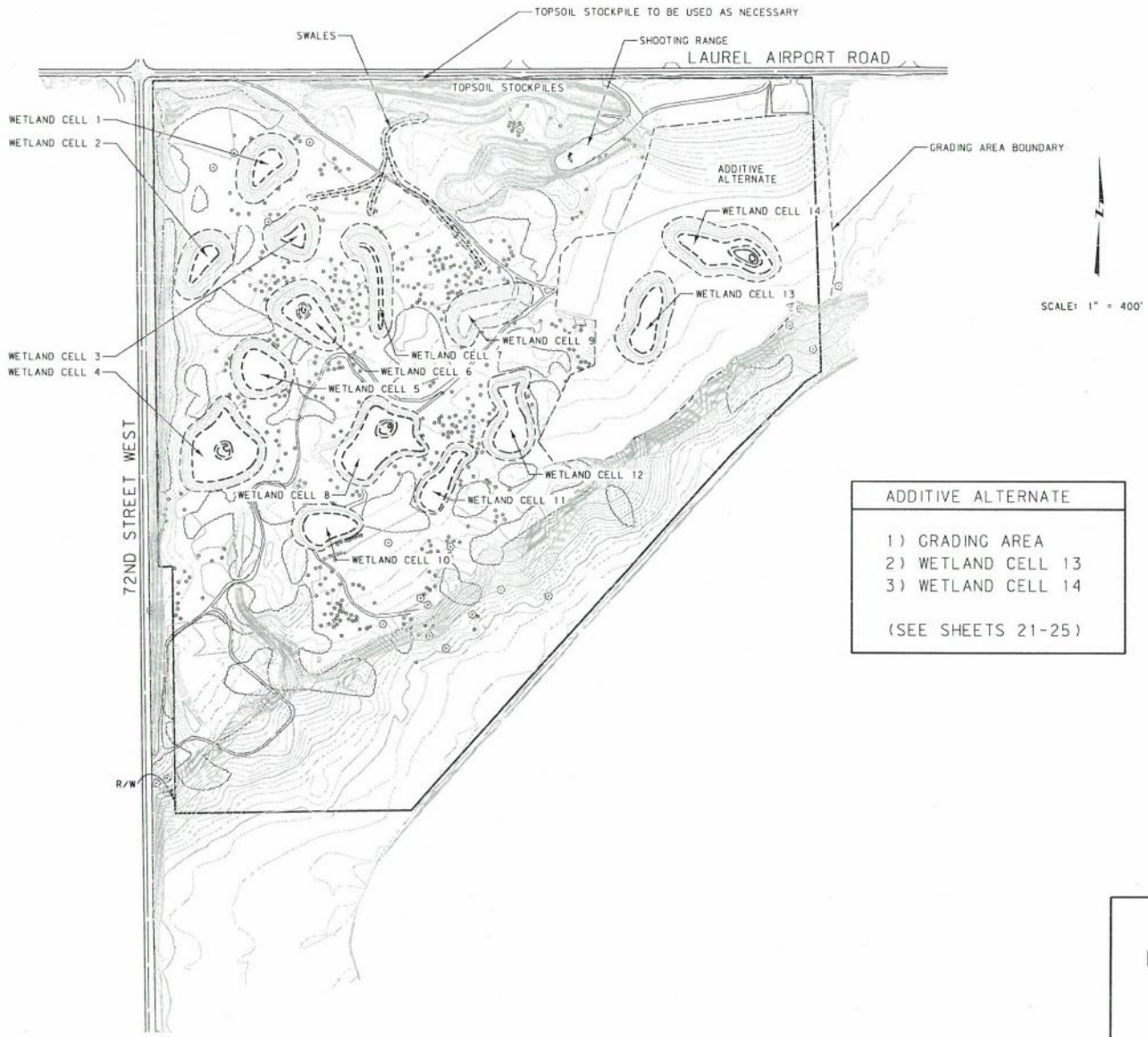
NOTES:
1. SEE REVEGETATION SPECIAL PROVISION FOR TREE AND SHRUB PLANTINGS AND WETLAND AND UPLAND SEED MIXTURES.
2. PLANT LOCATIONS TO BE DETERMINED IN THE FIELD BY MDT BOTANIST.
3. DO NOT DISTURB EXISTING WETLANDS BEYOND AREAS OF WORK INDICATED IN THE PLANS.

		WILLOWS	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

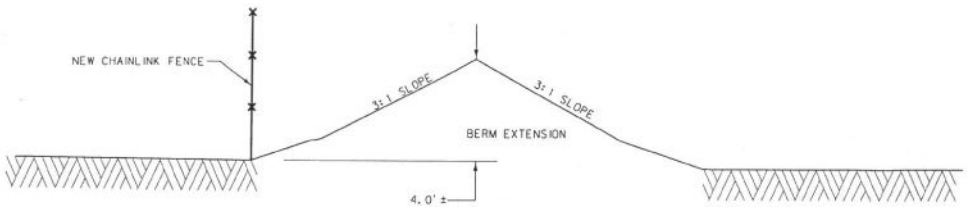
REVEGETATION OVERVIEW

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rddetz01.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 5 OF 25
1		5:56:16 AM CPS - U2160	CHECKED BY						

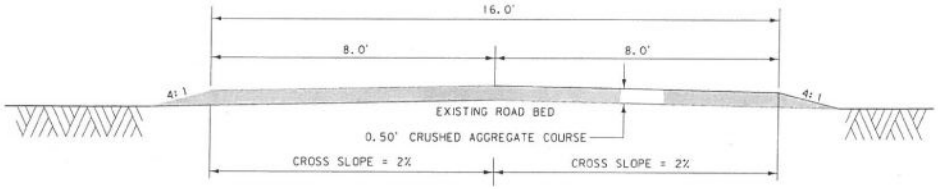


PROPOSED SITE OVERVIEW

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000ddetz01.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 6 OF 25
1		8:56:22 AM CPS - U216	CHECKED BY				



BERM SECTION



ACCESS ROAD SECTION

MORRISON MAIERLE, INC.

GRADE AND RESURFACE ACCESS ROAD TO GATE

NEW 12' CHAINLINK GATE

LAUREL AIRPORT ROAD

R/W

MDT WELL #4

TOPSOIL STOCKPILE

TOPSOIL STOCKPILE

NEW 12' CHAINLINK GATE

REMOVE FENCE (TYP.)

REMOVE FENCE (TYP.)

SCALE: 1" = 80'

NEW 6' CHAINLINK FENCE

SHOOTING RANGE

EXTEND BERM

DO NOT DISTURB EXISTING BERM

MDT WELL #8

CHAINLINK PANEL (SEE MDT DETAILED DRAWING 607-25)

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	528,270.24	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

MDT MONTANA DEPARTMENT OF TRANSPORTATION

c:\dgn\5034000ndplsz05.dgn
5/12/2012
8:56:41 AM CPS - U2160

DESIGNED BY
REVIEWED BY
CHECKED BY

WETLAND PLANS
YELLOWSTONE COUNTY

KINDSFATER WETLAND
CSF = 0.99948655
UPN NUMBER 5034000

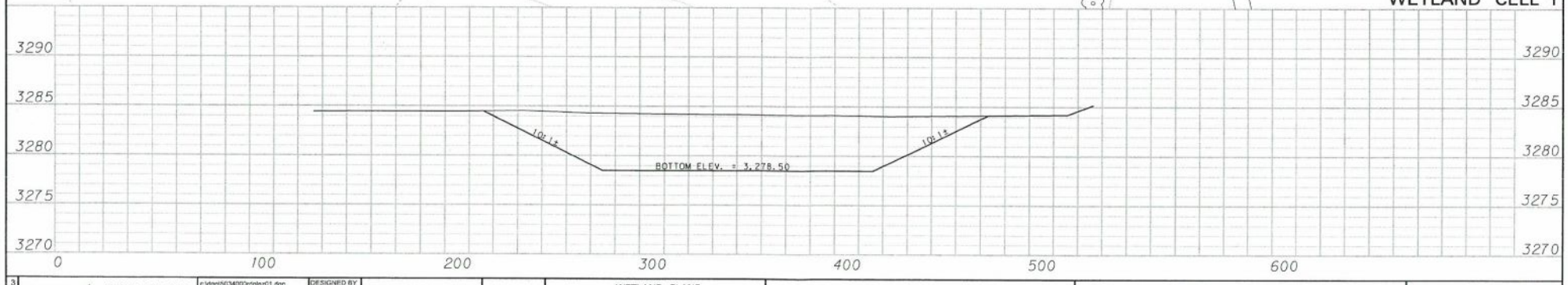
PROJECT NO. STPX 56(56)
SHEET 7 OF 25

SHOOTING RANGE PLAN

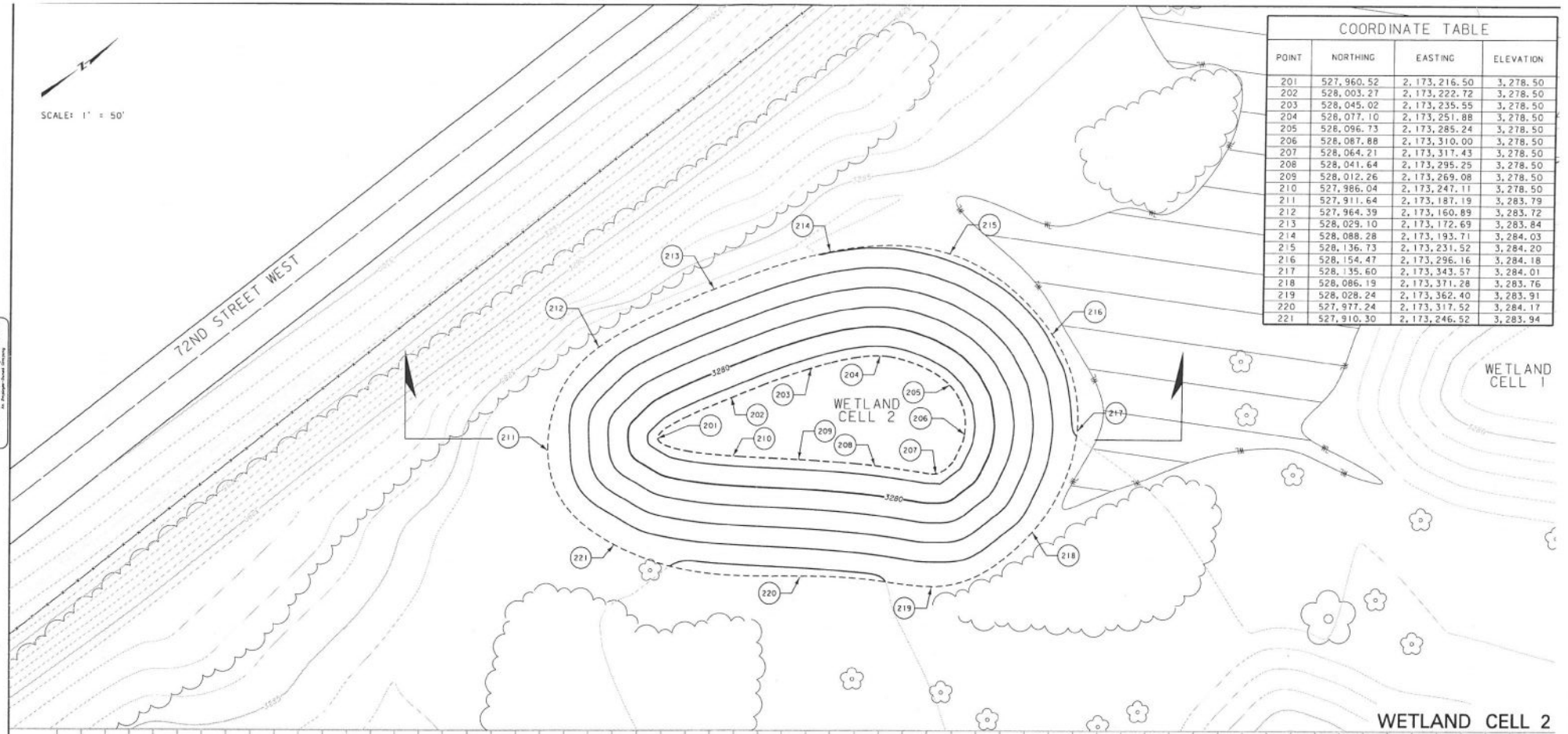


COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
101	528,309.25	2,173,448.71	3,278.50
102	528,344.44	2,173,444.68	3,278.50
103	528,382.06	2,173,450.33	3,278.50
104	528,415.39	2,173,465.92	3,278.50
105	528,439.33	2,173,514.13	3,278.50
106	528,420.61	2,173,540.89	3,278.50
107	528,390.27	2,173,548.77	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	2,173,539.84	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

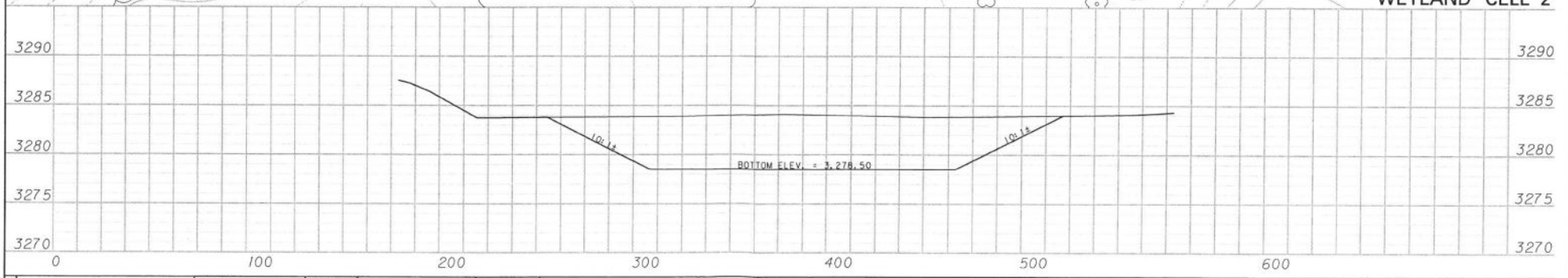
WETLAND CELL 1



MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000\rdplpa01.dgn 9/12/2012 8:56:53 AM CPS - U2150	DESIGNED BY REVIEWED BY CHECKED BY		WETLAND PLANS YELLOWSTONE COUNTY		KINDSFATER WETLAND CSF = 0.99948655 UPN NUMBER 5034000	PROJECT NO. STPX 56(56) SHEET 8 OF 25



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	528,045.02	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	2,173,310.00	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	528,135.60	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



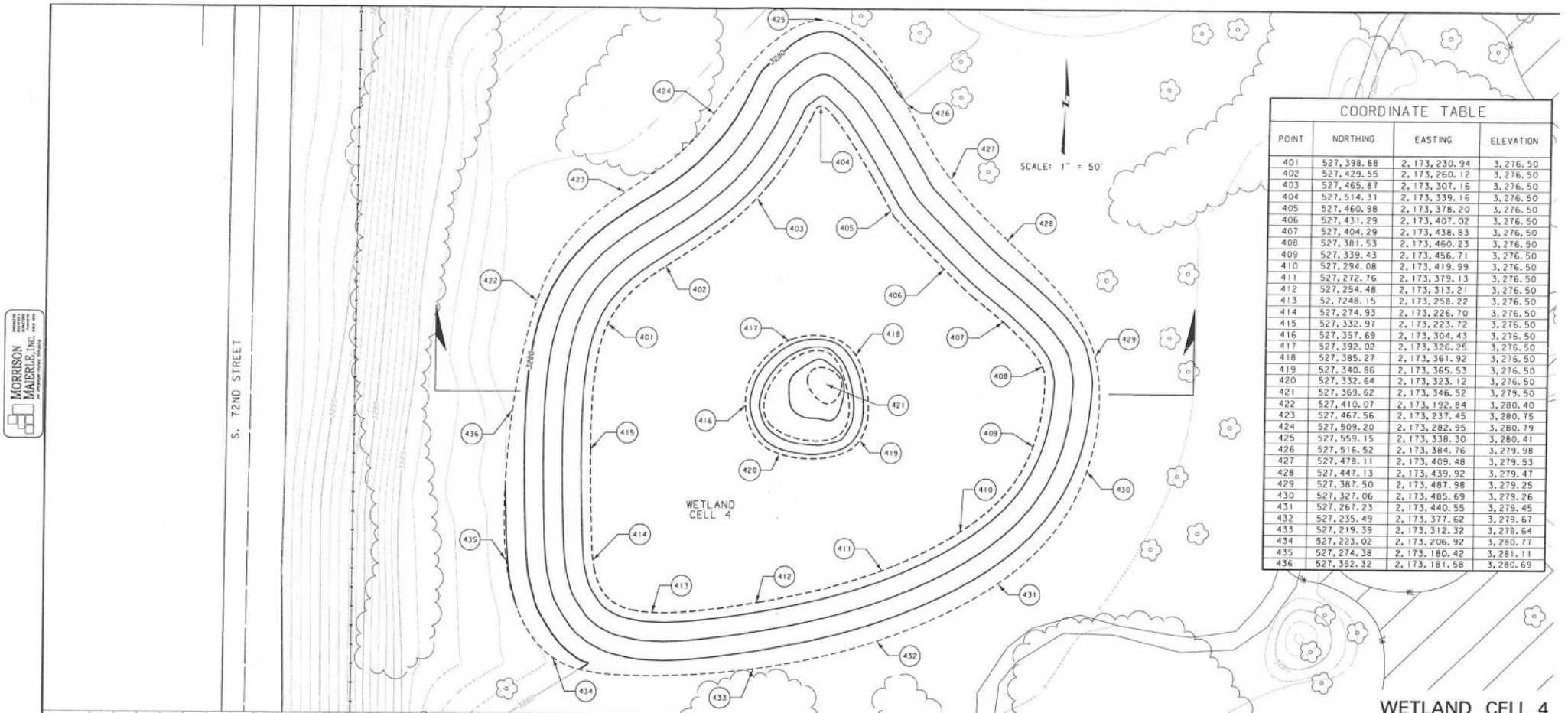
MORRISON MAIERLE, INC.

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rdplpz01.dgn	DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY				
1		8:56:58 AM CPS - U2166	CHECKED BY		YELLOWSTONE COUNTY	CSF = 0.99948655 UPN NUMBER 5034000	SHEET 9 OF 25



COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
301	528,120.47	2,173,545.14	3,277.50
302	528,142.62	2,173,579.64	3,277.50
303	528,159.59	2,173,598.95	3,277.50
304	528,175.41	2,173,620.13	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	528,100.07	2,173,590.67	3,277.50
308	528,113.81	2,173,481.03	3,283.70
309	528,166.88	2,173,489.75	3,284.16
310	528,194.29	2,173,540.32	3,283.82
311	528,235.66	2,173,592.69	3,283.84
312	528,232.24	2,173,656.31	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	2,173,650.46	3,282.09
316	528,041.86	2,173,597.00	3,282.60
317	528,056.78	2,173,538.32	3,283.16

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rdplpz01.dgn	DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY				
1		8:57:03 AM CPS - U216D	CHECKED BY		YELLOWSTONE COUNTY	CSF = 0.99948655 UPN NUMBER 5034000	SHEET 10 OF 25



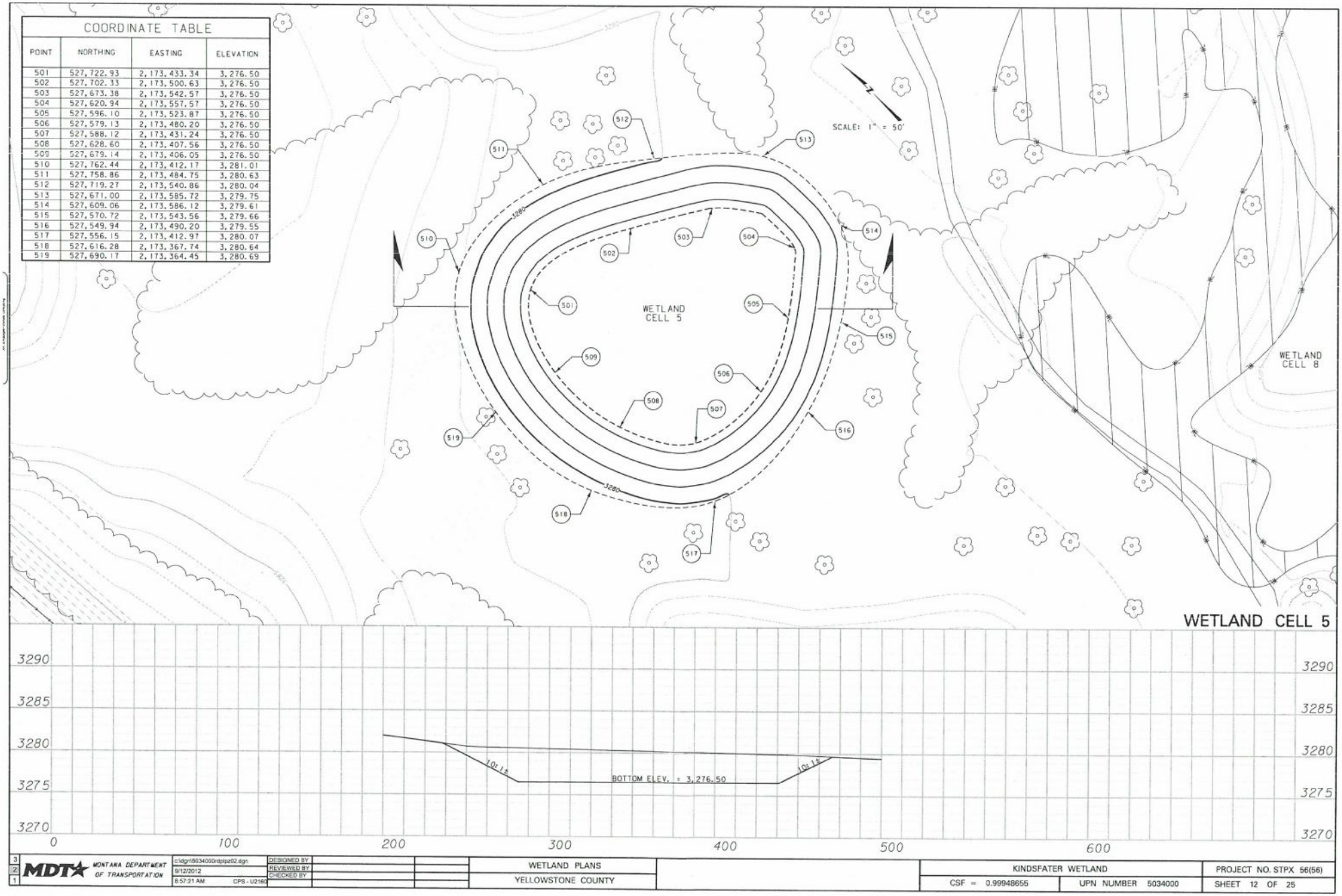
COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
401	527,398.88	2,173,230.94	3,276.50
402	527,429.55	2,173,260.12	3,276.50
403	527,465.87	2,173,307.16	3,276.50
404	527,514.31	2,173,339.16	3,276.50
405	527,460.98	2,173,378.20	3,276.50
406	527,431.29	2,173,407.02	3,276.50
407	527,404.29	2,173,438.83	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	2,173,419.99	3,276.50
411	527,272.76	2,173,379.13	3,276.50
412	527,254.48	2,173,313.21	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	527,369.62	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

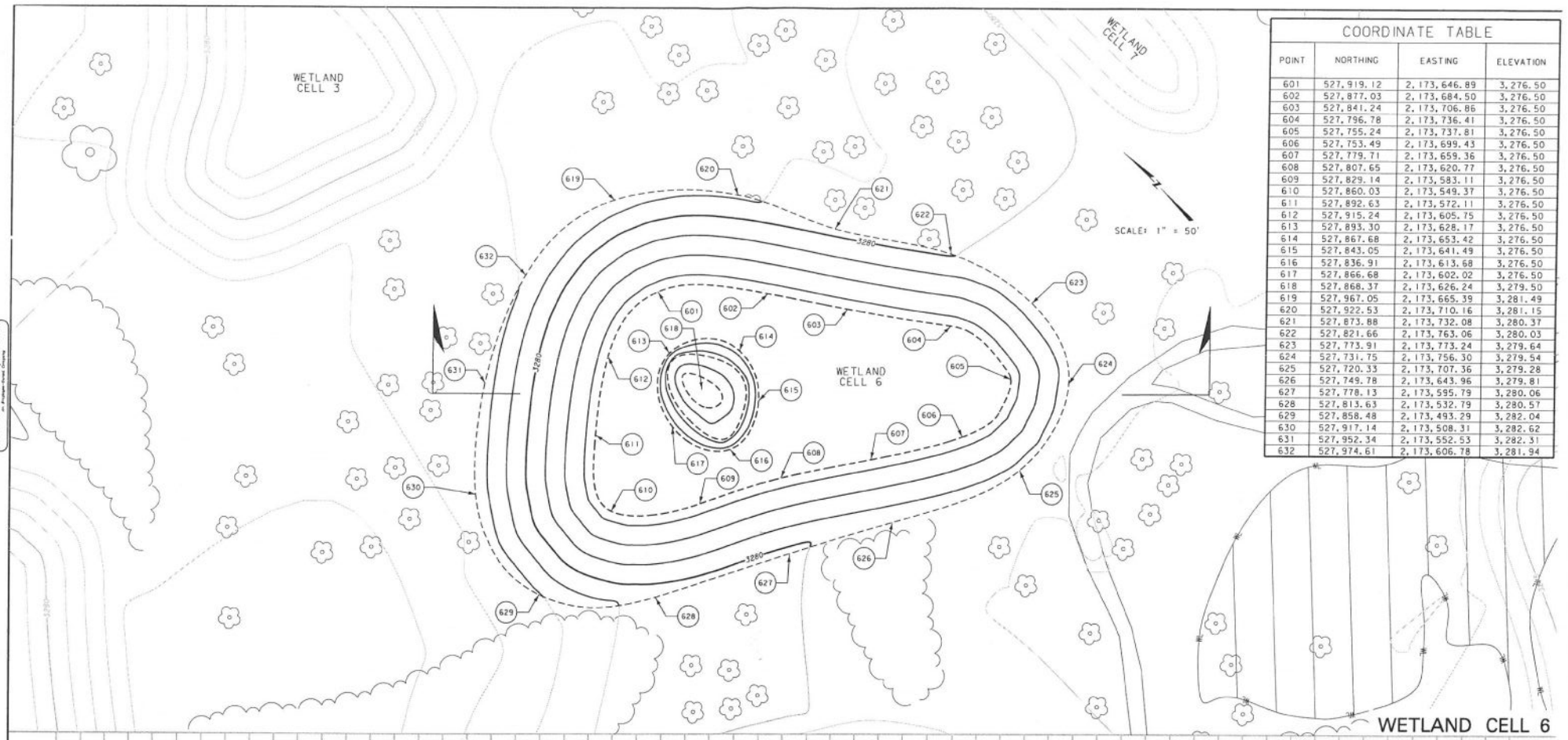
MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION

c:\dgn\5034000rdplpz02.dgn	DESIGNED BY	WETLAND PLANS	KINDSFATER WETLAND
9/12/2012	REVIEWED BY	YELLOWSTONE COUNTY	CSF = 0.99948655
8:57:16 AM CPS - U2160	CHECKED BY		UPN NUMBER 5034000

PROJECT NO. STPX 56(56)
SHEET 11 OF 25


COORDINATE TABLE
POINT | NORTHING | EASTING | ELEVATION
501 | 527,722.93 | 2,173,433.34 | 3,276.50
502 | 527,702.33 | 2,173,500.63 | 3,276.50
503 | 527,673.38 | 2,173,542.57 | 3,276.50
504 | 527,620.94 | 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 | 527,588.12 | 2,173,431.24 | 3,276.50
508 | 527,628.60 | 2,173,407.56 | 3,276.50
509 | 527,679.14 | 2,173,406.05 | 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 | 527,671.00 | 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
SCALE: 1" = 50'
WETLAND CELL 5
WETLAND CELL 8
3280
3290
3285
3280
3275
3270
10:1±
BOTTOM ELEV. = 3,276.50
10:1±
0
100
200
300
400
500
600
WETLAND CELL 5
MDT MONTANA DEPARTMENT OF TRANSPORTATION
c:\dgn\5034000rdplpz02.dgn
9/12/2012
8:57:21 AM CPS - U2160
DESIGNED BY
REVIEWED BY
CHECKED BY
WETLAND PLANS
YELLOWSTONE COUNTY
KINDSFATER WETLAND
CSF = 0.99948655
UPN NUMBER 5034000
PROJECT NO. STPX 56(56)
SHEET 12 OF 25



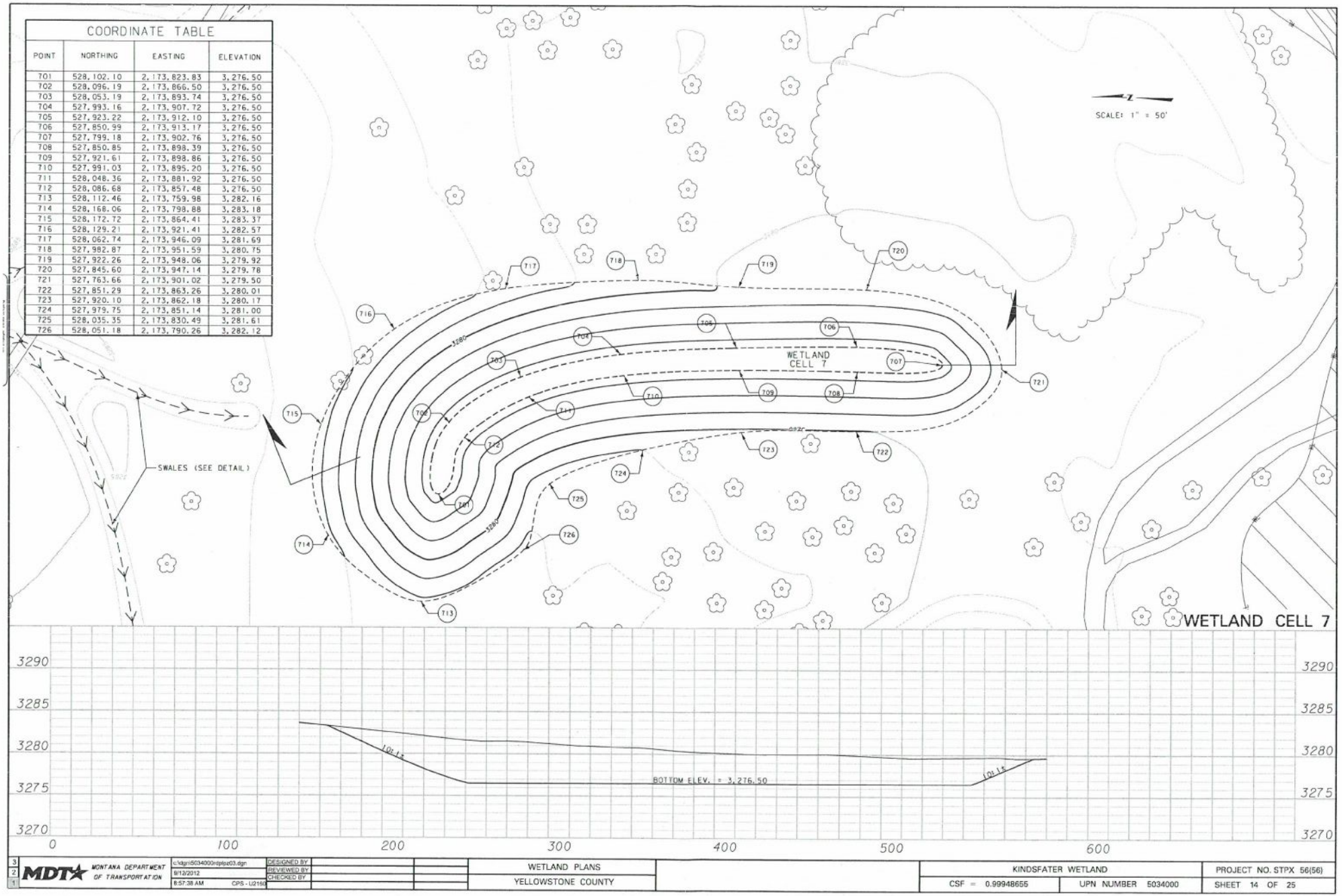
COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
601	527,919.12	2,173,646.89	3,276.50
602	527,877.03	2,173,684.50	3,276.50
603	527,841.24	2,173,706.86	3,276.50
604	527,796.78	2,173,736.41	3,276.50
605	527,755.24	2,173,737.81	3,276.50
606	527,753.49	2,173,699.43	3,276.50
607	527,779.71	2,173,659.36	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	527,967.05	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	3,280.57
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	2,173,552.53	3,282.31
632	527,974.61	2,173,606.78	3,281.94

MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION

c:\dgn\5034000rdplpz02.dgn	DESIGNED BY	WETLAND PLANS	KINDSFATER WETLAND
9/12/2012	REVIEWED BY	YELLOWSTONE COUNTY	CSF = 0.99948655
8:57:26 AM CPS - U2160	CHECKED BY		UPN NUMBER 5034000

PROJECT NO. STPX 56(56)
SHEET 13 OF 25


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 | 2,173,913.17 | 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 | 527,921.61 | 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 | 528,129.21 | 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
SCALE: 1" = 50'
WETLAND CELL 7
SWALES (SEE DETAIL)
3290
3285
3280
3275
3270
10:1
BOTTOM ELEV. = 3,276.50
0
100
200
300
400
500
600
MDT MONTANA DEPARTMENT OF TRANSPORTATION
c:\dgn\5034000\rdplpx03.dgn
9/12/2012
8:57:38 AM
CPS - U2160
DESIGNED BY
REVIEWED BY
CHECKED BY
WETLAND PLANS
YELLOWSTONE COUNTY
KINDSFATER WETLAND
CSF = 0.99948655
UPN NUMBER 5034000
PROJECT NO. STPX 56(56)
SHEET 14 OF 25

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	527,367.21	2,173,998.02	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	527,451.84	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	527,551.33	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	3,276.80
837	527,269.72	2,173,762.08	3,277.40

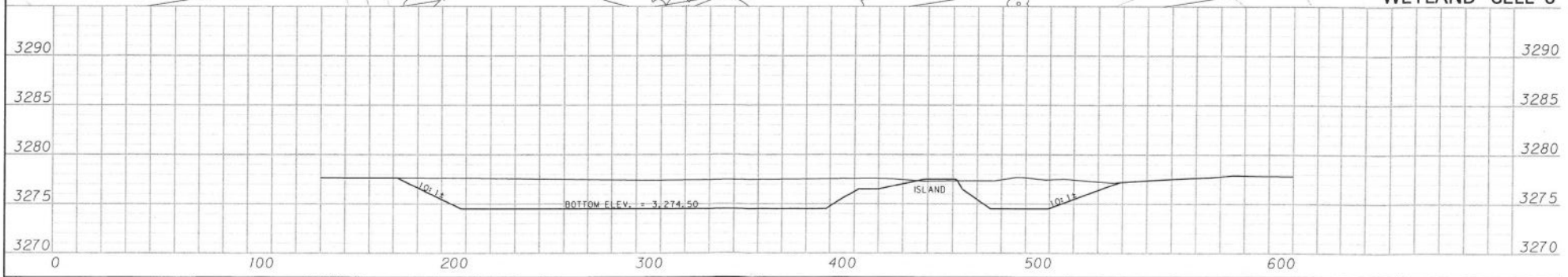
MORRISON MAIERLE, INC.

SCALE: 1" = 50'

WETLAND CELL 8

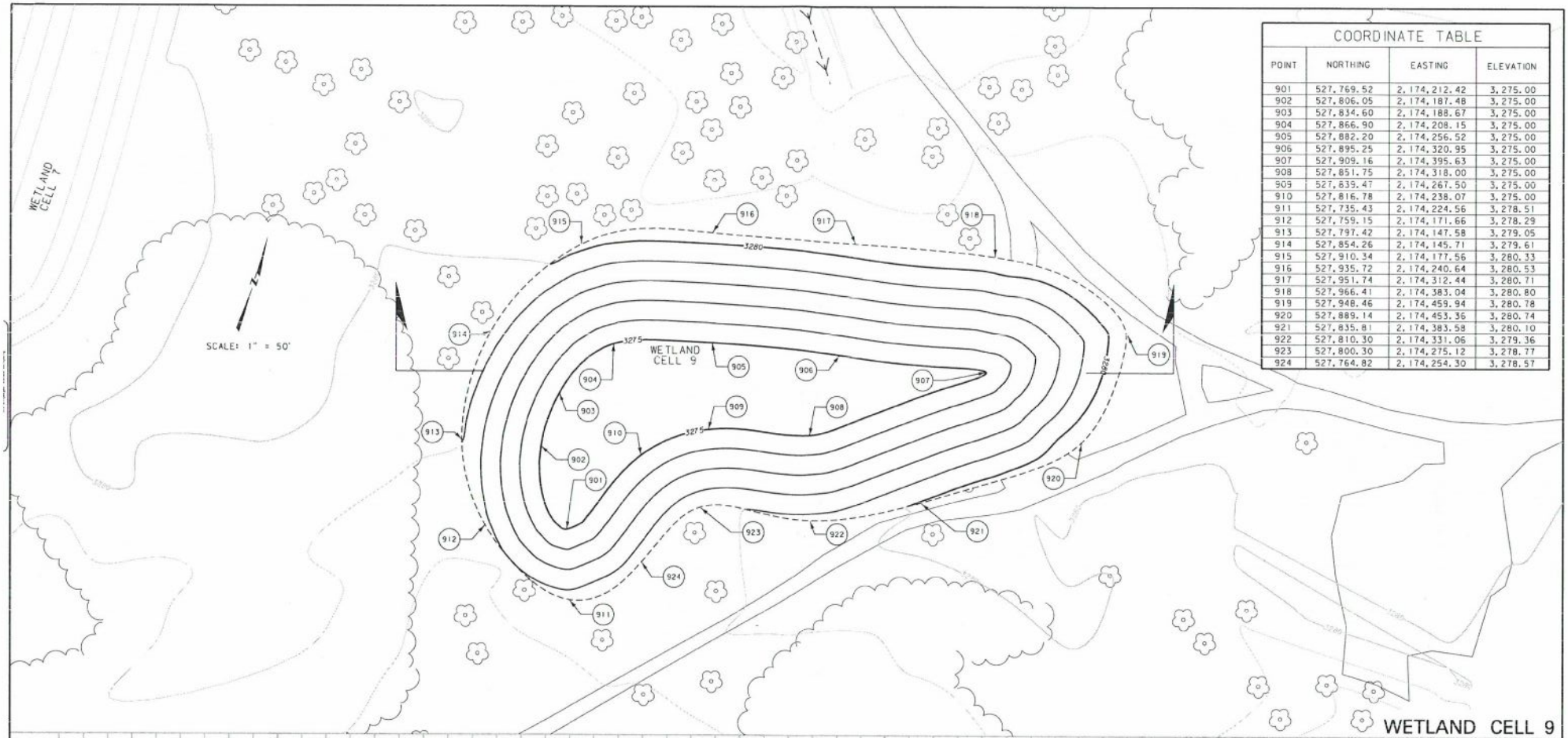
WETLAND CELL 10

3275



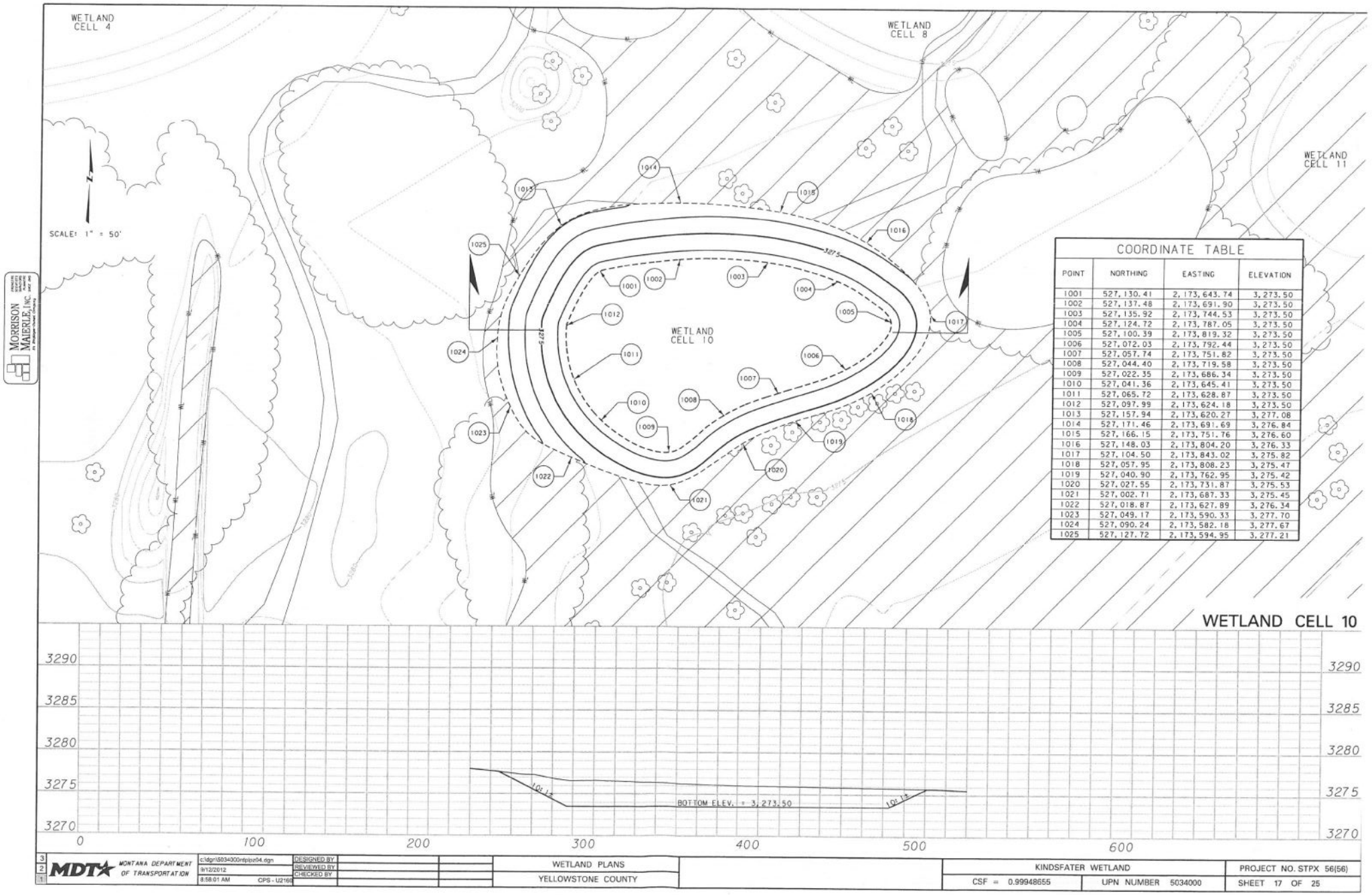
WETLAND CELL 8

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rdplpa03.dgn	DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY				
1		8:57:43 AM CPS - U2190	CHECKED BY		YELLOWSTONE COUNTY	CSF = 0.99948655 UPN NUMBER 5034000	SHEET 15 OF 25



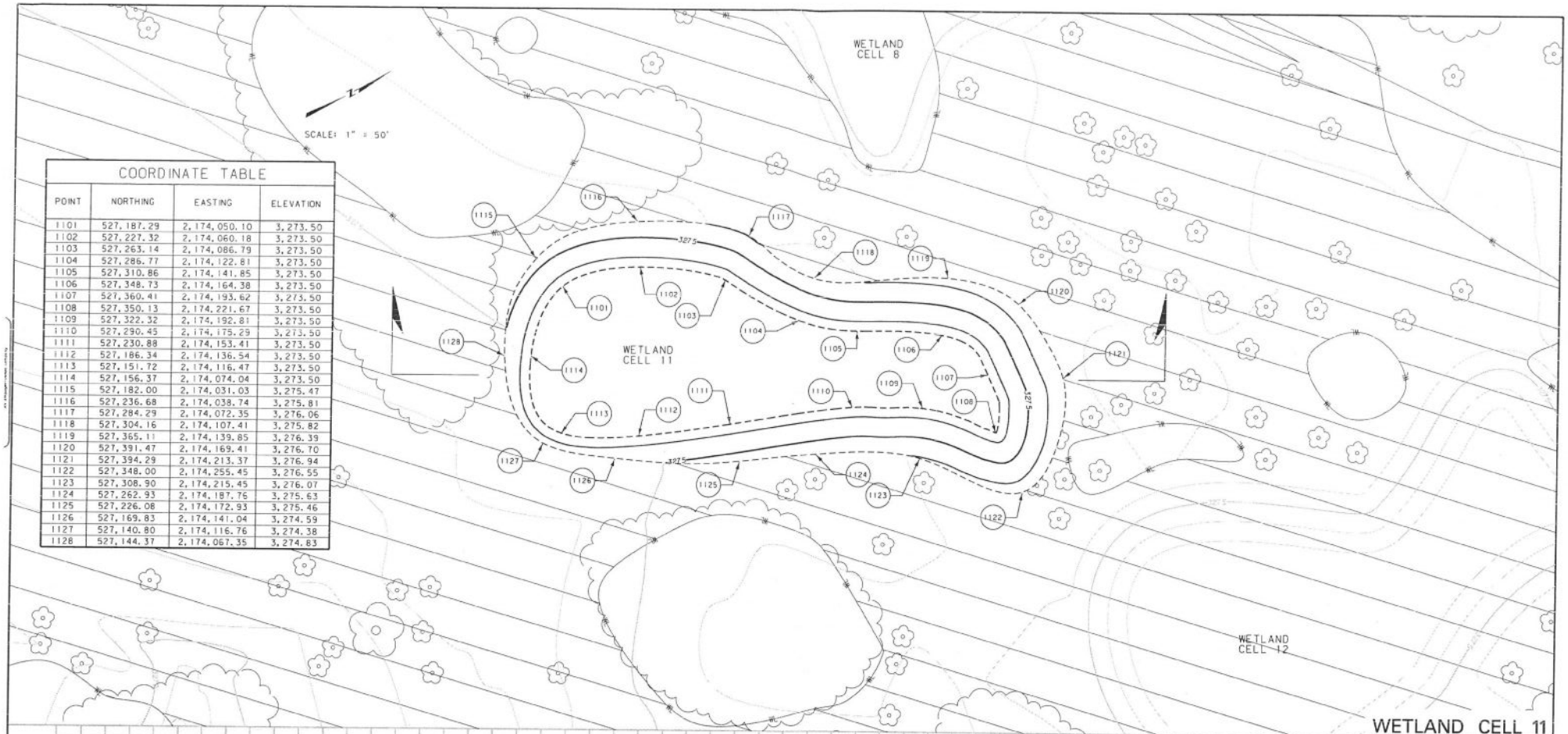
COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
901	527,769.52	2,174,212.42	3,275.00
902	527,806.05	2,174,187.48	3,275.00
903	527,834.60	2,174,188.67	3,275.00
904	527,866.90	2,174,208.15	3,275.00
905	527,882.20	2,174,256.52	3,275.00
906	527,895.25	2,174,320.95	3,275.00
907	527,909.16	2,174,395.63	3,275.00
908	527,851.75	2,174,318.00	3,275.00
909	527,839.47	2,174,267.50	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	527,759.15	2,174,171.66	3,278.29
913	527,797.42	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	2,174,383.58	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	527,764.82	2,174,254.30	3,278.57

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000\dplpz03.dgn	DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY			CSF = 0.99948655 UPN NUMBER 5034000	SHEET 16 OF 25
1		8:57:48 AM CPS - U2166	CHECKED BY		YELLOWSTONE COUNTY		



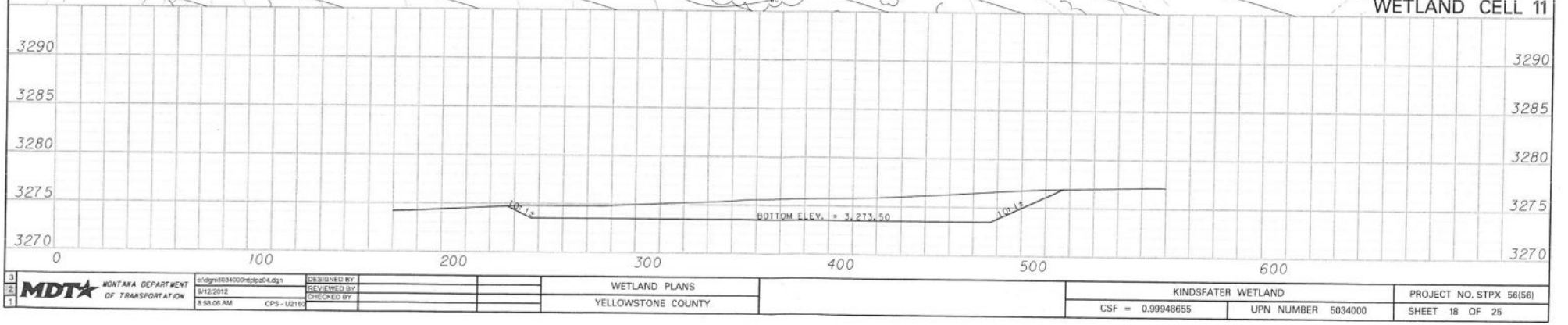
COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
1001	527, 130.41	2, 173, 643.74	3, 273.50
1002	527, 137.48	2, 173, 691.90	3, 273.50
1003	527, 135.92	2, 173, 744.53	3, 273.50
1004	527, 124.72	2, 173, 787.05	3, 273.50
1005	527, 100.39	2, 173, 819.32	3, 273.50
1006	527, 072.03	2, 173, 792.44	3, 273.50
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, 018.87	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

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rdplpx04.dgn	DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND
2		9/12/2012	REVIEWED BY		YELLOWSTONE COUNTY	CSF = 0.99948655 UPN NUMBER 5034000
1		8:58:01 AM CPS - U2166	CHECKED BY			PROJECT NO. STPX 56(56) SHEET 17 OF 25

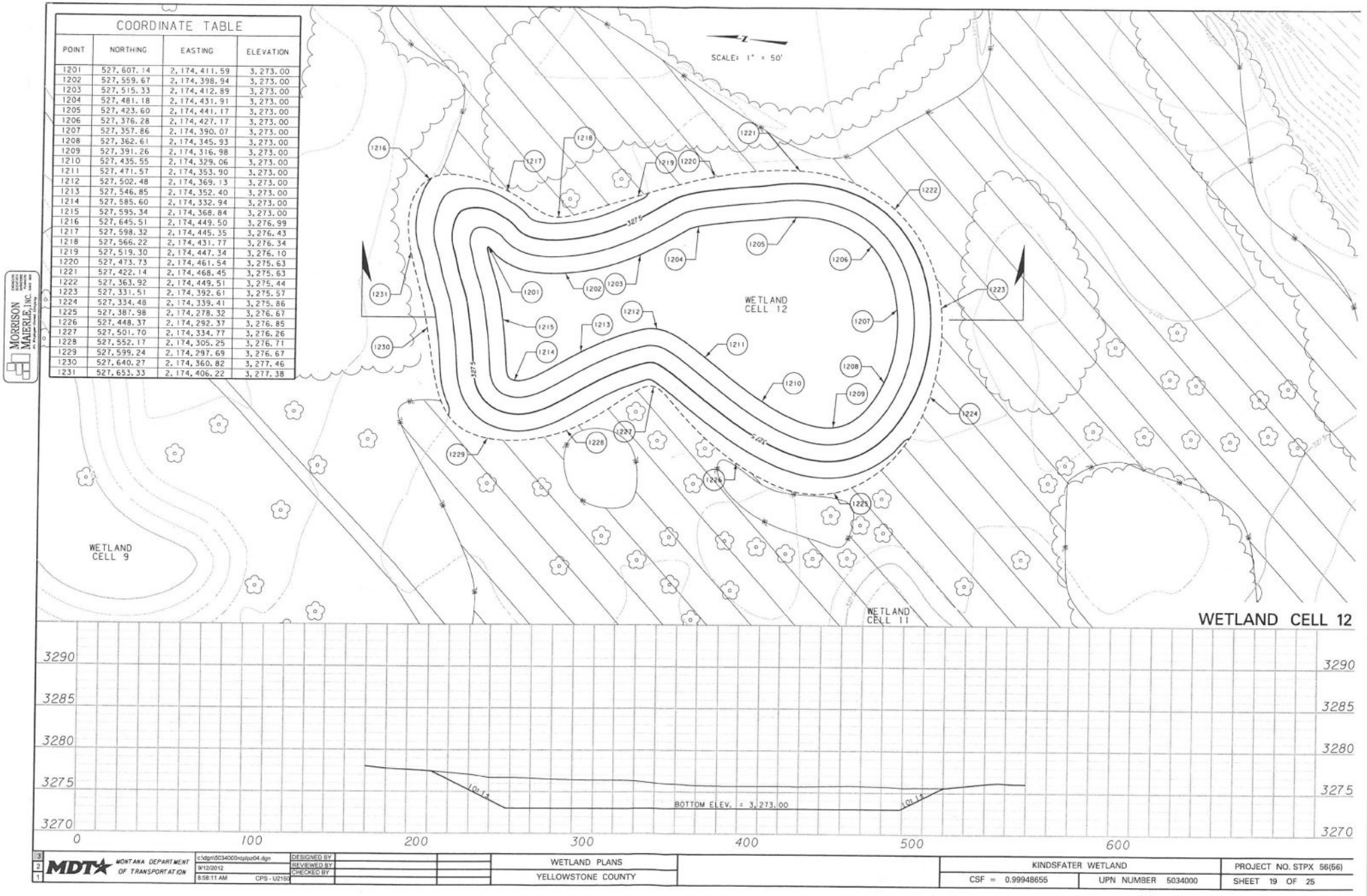


COORDINATE TABLE

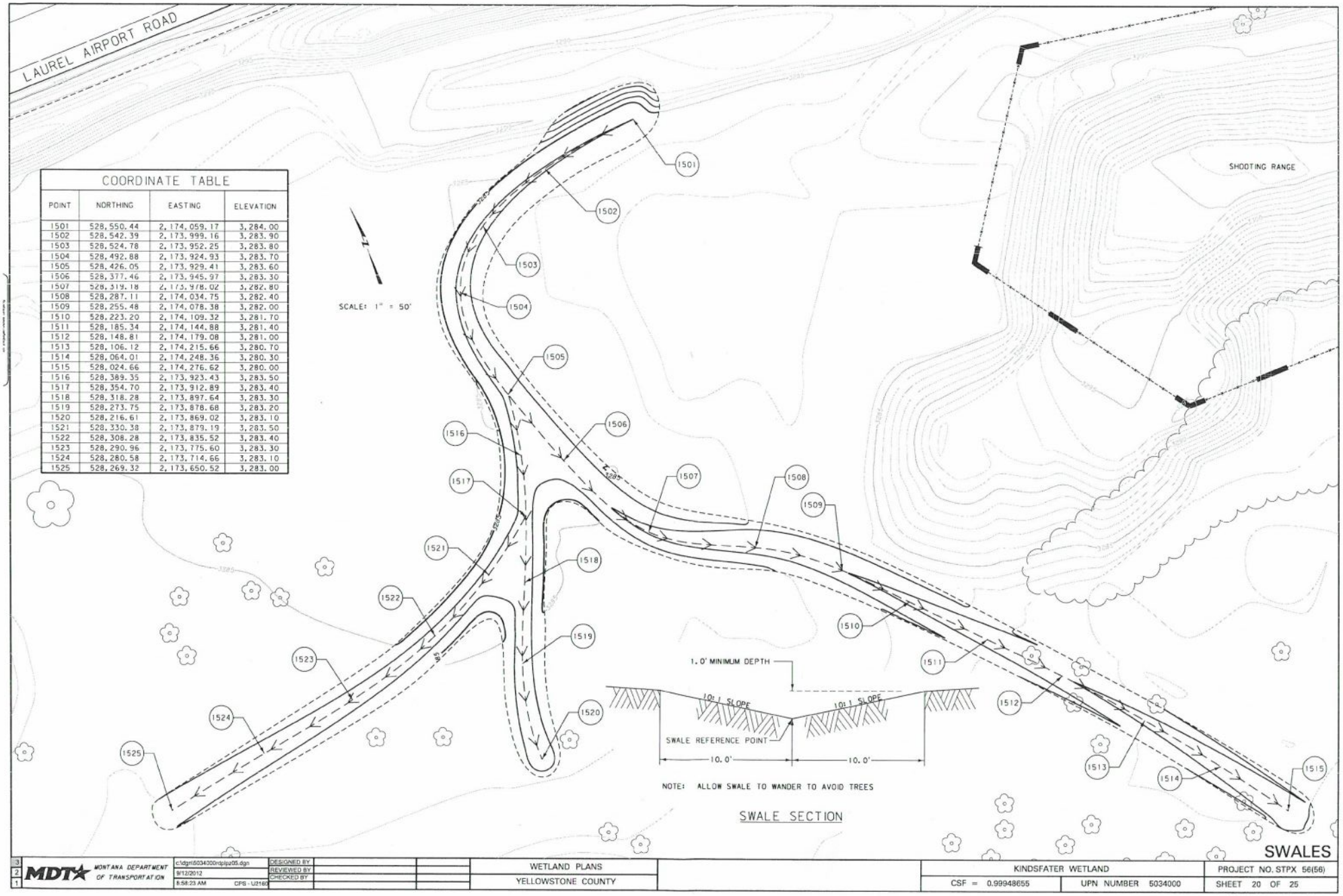
POINT	NORTHING	EASTING	ELEVATION
1101	527,187.29	2,174,050.10	3,273.50
1102	527,227.32	2,174,060.18	3,273.50
1103	527,263.14	2,174,086.79	3,273.50
1104	527,286.77	2,174,122.81	3,273.50
1105	527,310.86	2,174,141.85	3,273.50
1106	527,348.73	2,174,164.38	3,273.50
1107	527,360.41	2,174,193.62	3,273.50
1108	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
1112	527,186.34	2,174,136.54	3,273.50
1113	527,151.72	2,174,116.47	3,273.50
1114	527,156.37	2,174,074.04	3,273.50
1115	527,182.00	2,174,031.03	3,275.47
1116	527,236.68	2,174,038.74	3,275.81
1117	527,284.29	2,174,072.35	3,276.06
1118	527,304.16	2,174,107.41	3,275.82
1119	527,365.11	2,174,139.85	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	3,276.07
1124	527,262.93	2,174,187.76	3,275.63
1125	527,226.08	2,174,172.93	3,275.46
1126	527,169.83	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



3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rdplpz04.dgn	DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY				
1		8:58:06 AM CPS - U216	CHECKED BY		YELLOWSTONE COUNTY	CSF = 0.99948655 UPN NUMBER 5034000	SHEET 18 OF 25



WETLAND CELL 12



COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
1501	528,550.44	2,174,059.17	3,284.00
1502	528,542.39	2,173,999.16	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	528,330.38	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

SWALES

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rdplpz05.dgn	DESIGNED BY			WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY					
1		8:58:23 AM CPS - U2160	CHECKED BY			YELLOWSTONE COUNTY	CSF = 0.99948655 UPN NUMBER 5034000	SHEET 20 OF 25

ADDITIVE ALTERNATE
TABLE OF CONTENTS

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GRADING OVERVIEW	23
WETLAND CELL 13	24
WETLAND CELL 14	25

MORRISON MAIERLE, INC.

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rdtltz01.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 21 OF 25
1		8:58:31 AM CPS - U2160	CHECKED BY							

SUMMARY

GRADING

STATION	cubic yards*			REMARKS
	UNCL. EXC.	UNCL. BORROW	EMB.	
	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		lump sum	REMARKS
FROM	TO		
		1.0	ADDITIVE ALTERNATE SURVEY
TOTAL		1.0	

REVEGETATION

STATION	cubic yards		acres			lump sum	REMARKS
	WETLAND SOIL SALVAGE	TOPSOIL SALVAGING & PLACING	WETLAND SEEDING		CONDITION SEEDBED	TREE & SHRUB PLANTING	
			WETLAND	UPLAND			
						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				each				linear feet				REMARKS
	CHAIN LINK FENCE			WILDLIFE FRIENDLY FENCE (TYPE 1-FM)*	CHAIN LINK PANEL		WILDLIFE FRIENDLY FENCE PANEL		REMOVE FENCE**	CHAIN LINK GATE		FARM GATE METAL TYPE G-3	
	4'0"	5'0"	6'0"		SINGLE	DOUBLE	SINGLE	DOUBLE		SINGLE	DOUBLE		
									498				
				991			2	2	1,064				EAST BOUNDARY
TOTAL				991			2	2	~				

* SMOOTH WIRE
** FOR INFORMATION ONLY

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rdsumz01.dgn	DESIGNED BY			WETLAND PLANS		KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY					CSF = 0.99948655	UPN NUMBER 5034000	SHEET 22 OF 25
1		8:58:38 AM CPS - U2160	CHECKED BY			YELLOWSTONE COUNTY			



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	3,275.05
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 ALTERNATED 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.

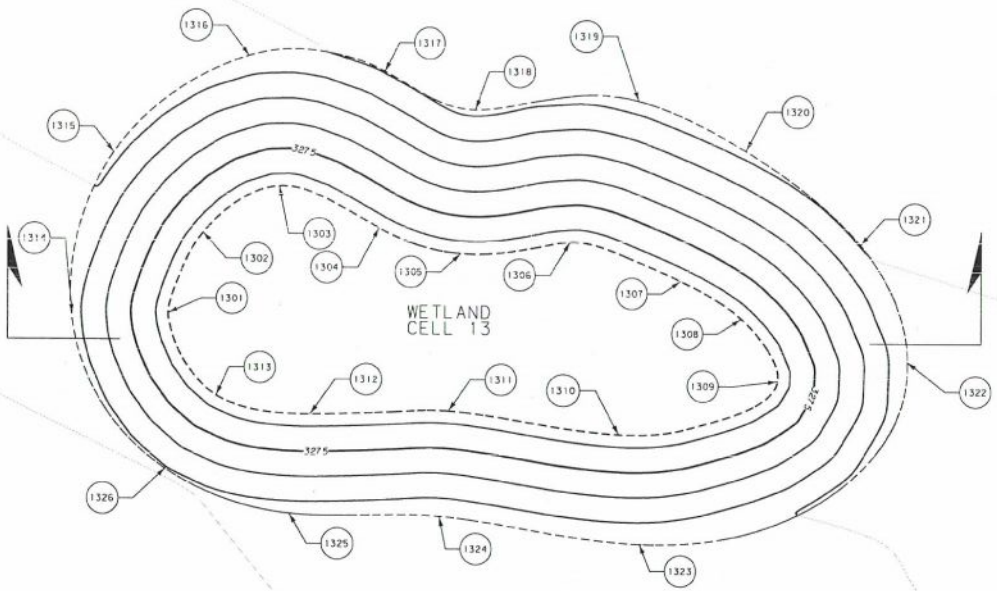
GRADING OVERVIEW

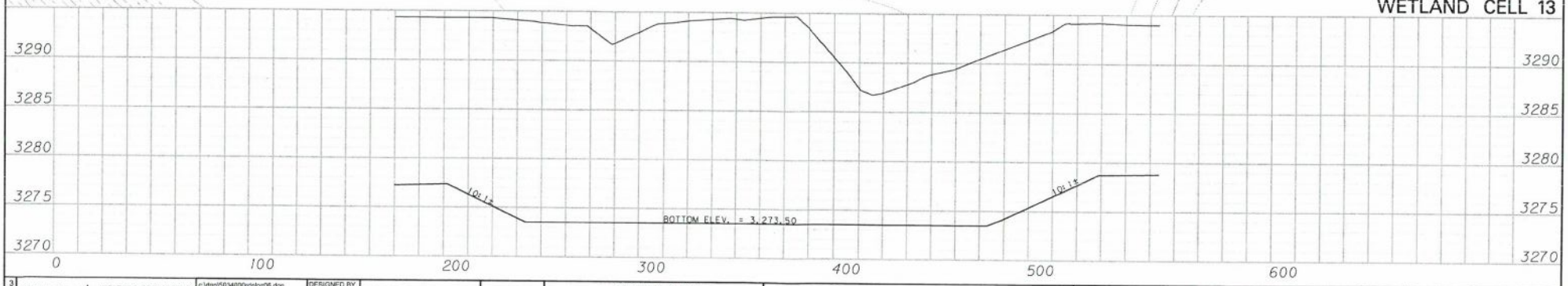
MDT MONTANA DEPARTMENT OF TRANSPORTATION

c:\dgn\5034000rdplpz06.dgn	DESIGNED BY	WETLAND PLANS	KINDSFATER WETLAND
9/12/2012	REVIEWED BY	YELLOWSTONE COUNTY	CSF = 0.99948655
8:58:52 AM CPS - U2160	CHECKED BY		UPN NUMBER 5034000

PROJECT NO. STPX 56(56)
SHEET 23 OF 25

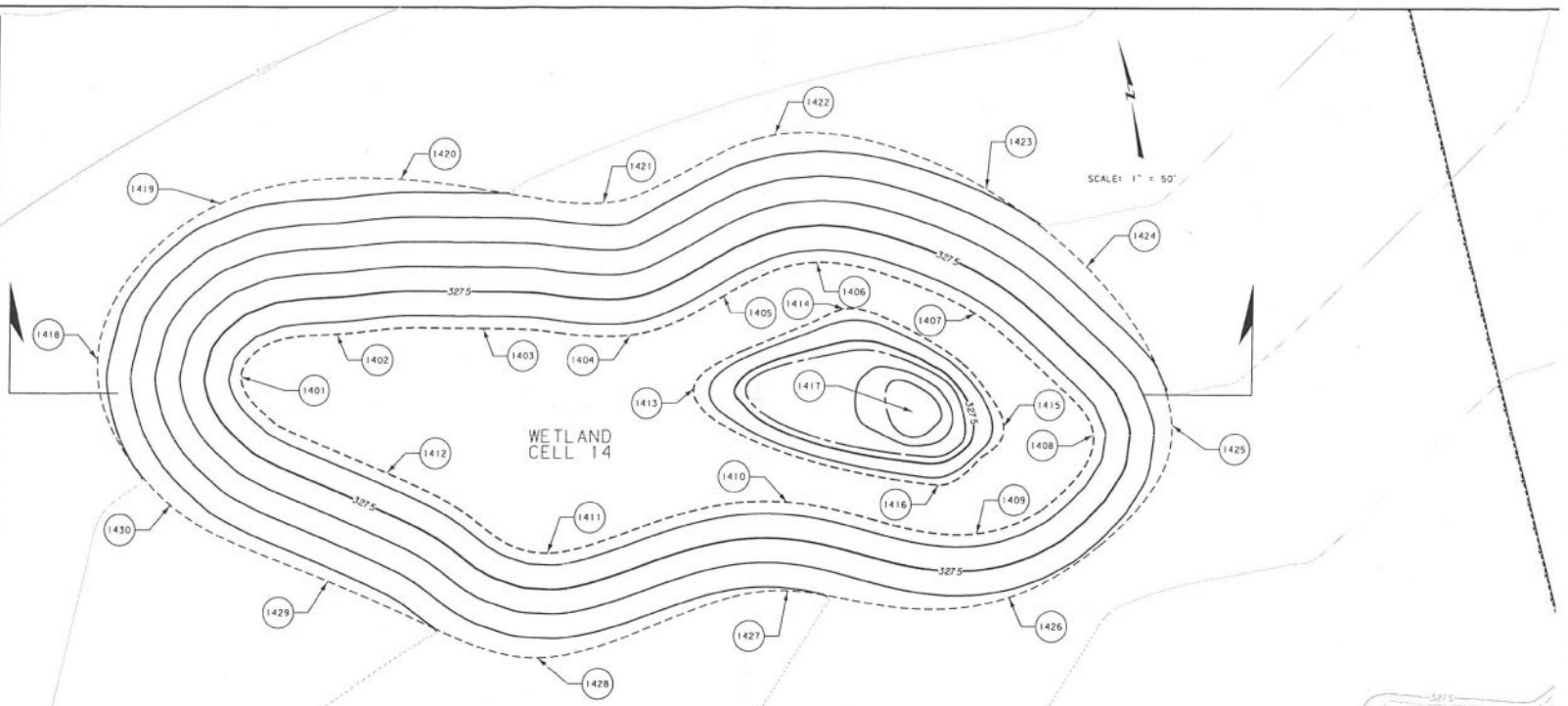
COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
1301	527,715.96	2,174,853.61	3,273.50
1302	527,734.74	2,174,823.80	3,273.50
1303	527,767.93	2,174,810.00	3,273.50
1304	527,804.84	2,174,832.35	3,273.50
1305	527,836.29	2,174,847.47	3,273.50
1306	527,880.54	2,174,849.37	3,273.50
1307	527,921.93	2,174,871.47	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	2,174,889.06	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	2,174,917.11	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

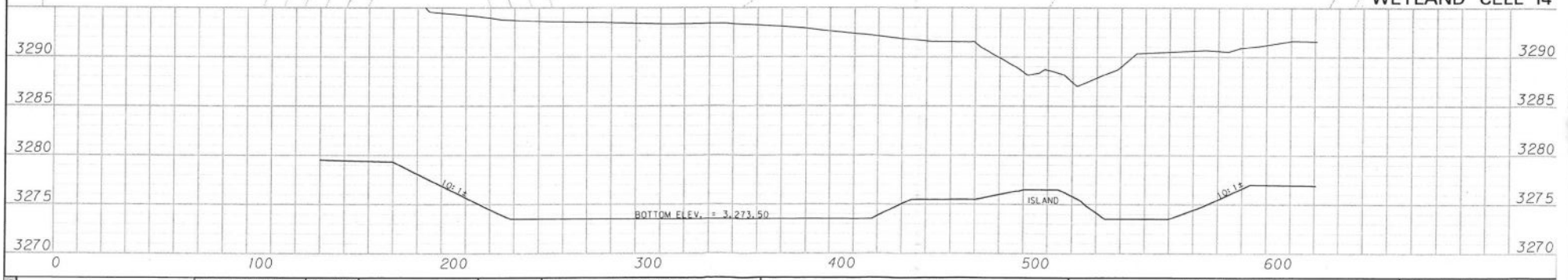




3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000\dplpc06.dgn	DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY				
1		8:58:57 AM CPS - U2160	CHECKED BY		YELLOWSTONE COUNTY	CSF = 0.99948655 UPN NUMBER 5034000	SHEET 24 OF 25

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	528,128.65	2,175,089.12	3,273.50
1404	528,112.51	2,175,147.65	3,273.50
1405	528,119.43	2,175,188.90	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	2,175,325.76	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	2,175,038.10	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	2,174,930.71	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	3,278.20
1424	528,098.17	2,175,337.60	3,277.75
1425	528,027.04	2,175,358.38	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	2,174,947.66	3,278.88





MORRISON MAIERLE, INC.

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000rcplpz06.dgn	DESIGNED BY	WETLAND PLANS	KINDSFATER WETLAND		PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY				
1		8:59:02 AM CPS - U2160	CHECKED BY	YELLOWSTONE COUNTY	CSF = 0.99948655	UPN NUMBER 5034000	SHEET 25 OF 25