MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2015

Forsyth – Northwest
West Site (Site 1); Middle Site (Site 2);
East Site (Site 3); Treasure County Line Site (Site 4)
Rosebud County, Montana

Prepared for:

MONTANA MDT DEPARTMENT OF TRANSPORTATION

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October 2015

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MONTANA DEPARTMENT OF TRANSPORTATION (MDT)

WETLAND MITIGATION MONITORING REPORT:

YEAR 2015

Forsyth - Northwest:
West Site (Site 1), Middle Site (Site 2),
East Site (Site 3), Treasure County Line Site (Site 4)
Treasure County Line Constructed: 1999
Forsyth East, Middle, West Constructed: 2012

MDT Project Number:
STPP 14-6 (9) 259 CN 4059 (Forsyth Northwest)

USACE Number:
NWO-2002-90-599 Control Number 1514 (Forsyth – NW)
NWO-2006-906-76 MTB (Forsyth – NW)

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TABLE OF CONTENTS

TABLES

CHARTS

FIGURES

APPENDICES

Cover: View of a breeding pair of Wilson's Phalaropes observed at the Forsyth-Northwest West Site in 2015.

1. INTRODUCTION

The 2015 Forsyth-Northwest (FNW) wetland monitoring report documents the third year of monitoring at the four FNW sites: West Site (1), Middle Site (2), East Site (3), and Treasure County Line Site (4). The FNW Wetland Mitigation Sites were developed to mitigate for a cumulative total of 8.98 acres of wetland impacts associated with two Montana Department of Transportation (MDT) highway construction projects; 1) Volborg – North and South project constructed in 2004, and 2) the Forsyth – Northwest project constructed in 2012. The 2015 Forsyth-Northwest Wetland Mitigation Monitoring Report includes monitoring results for each of the four sites and a discussion of the mitigation credits developed for the FNW project.

The four wetland mitigation sites are located in Rosebud County in the Sagebrush Steppe ecoregion of the Northwest Great Plains. The sites are within Watershed 14 (Middle Yellowstone). Three sites are located northwest of Forsyth along Montana Highway 12 at mile markers 262.3 (East-3), 261.9 (Middle-2), and 260 (West-1) within the Big Porcupine Creek sub-basin (Figure 1). Treasure County Line (Site 4), located approximately 12 miles west of Forsyth at Interstate 94 mile marker 81.75 (Figure 2), is situated southwest of the intersection of Interstate 94 and Reservation Road in the Lower Yellowstone River-Sunday Creek sub-basin. Figures 3 through 10 (Appendix A) show the monitoring activity locations and mapped site features for each site, respectively. Appendix B contains the MDT Wetland Mitigation Site Monitoring Forms, the USACE Great Plains Regional Supplement Wetland Determination Data Forms (USACE 2010), and the 2008 MDT Montana Wetland Assessment Forms (Berglund and McEldowney. 2008) for each site. Appendix C contains photographs of the project areas and Appendix D includes the project plan sheets.

1.1. Impacts and Mitigation

Wetland impacts for the Forsyth-Northwest project were identified in the US Army Corps of Engineers (USACE) permit #NWO-2006-90676-MTB and a wetland mitigation monitoring plan prepared by MDT and dated February 15, 2012. The wetland mitigation sites are intended to provide credits for impacts caused by the Volborg-N & S project, constructed in 2004, and the FNW project, completed in 2012. The Treasure County Line mitigation site was constructed in 1999, prior to the 2.18 acres of impact resulting from the FNW project. The 2012 mitigation plan outlined that this site had produced 1.78 acres of wetland credit, awarded at a 1:1 credit ratio. Applying standard wetland compensatory mitigation ratios (Montana Regulatory Program, April 2005), the total area of required mitigation presented in the approved wetland mitigation plan was 11 acres. Table 1 provides a summary of the impacts, appropriate ratios, and anticipated mitigation requirements. The anticipated wetland mitigation acreages produced by the FNW project are listed by site and mitigation type in Table 2. Mitigation requirements and estimated credit development are discussed in more detail in the Comprehensive Credit Summary section of this report.

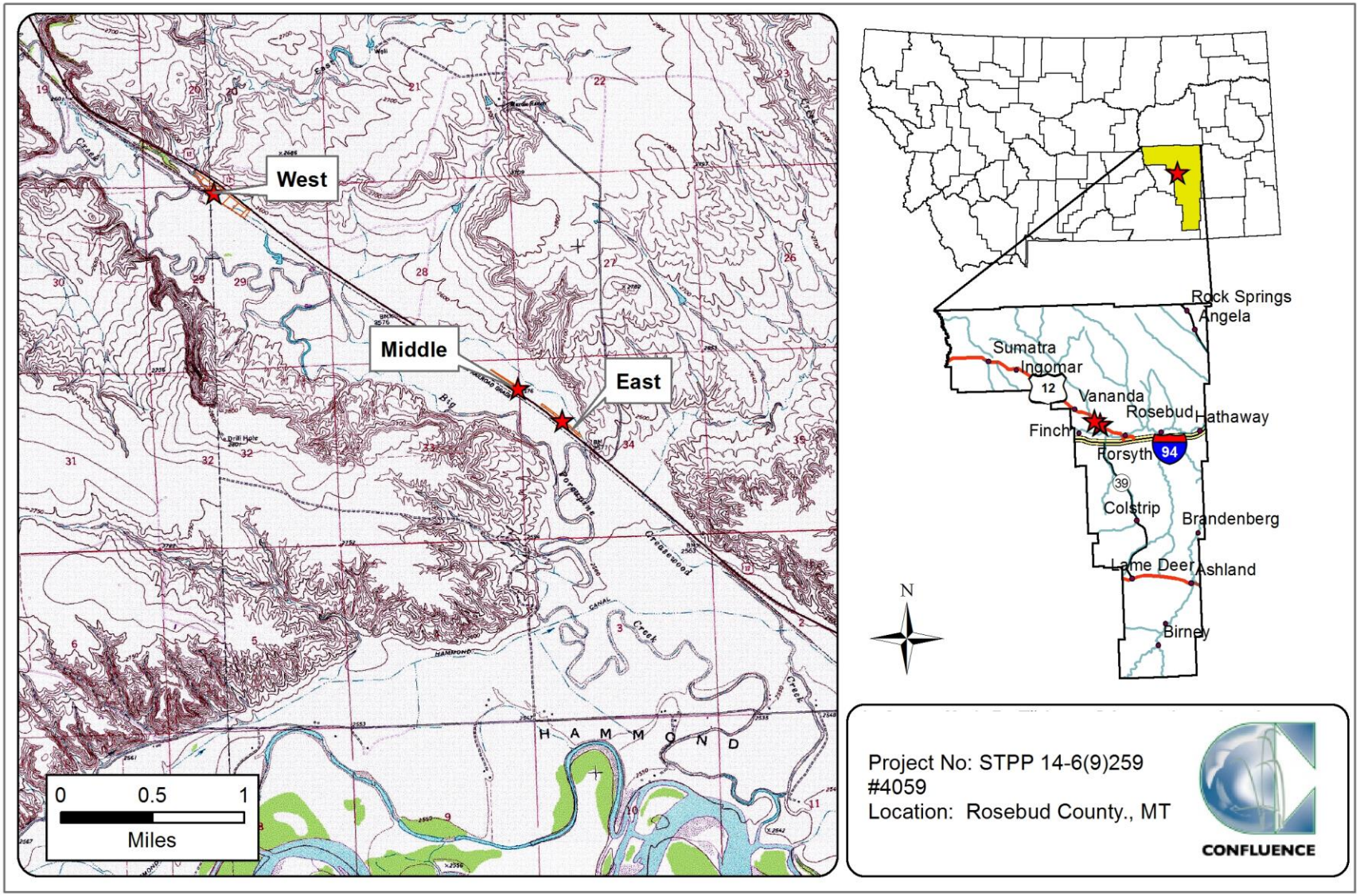

Figure 1. Project locations of Forsyth Northwest (FNW) Mitigation Sites: West (Site 1), Middle (Site 2), and East (Site 3).

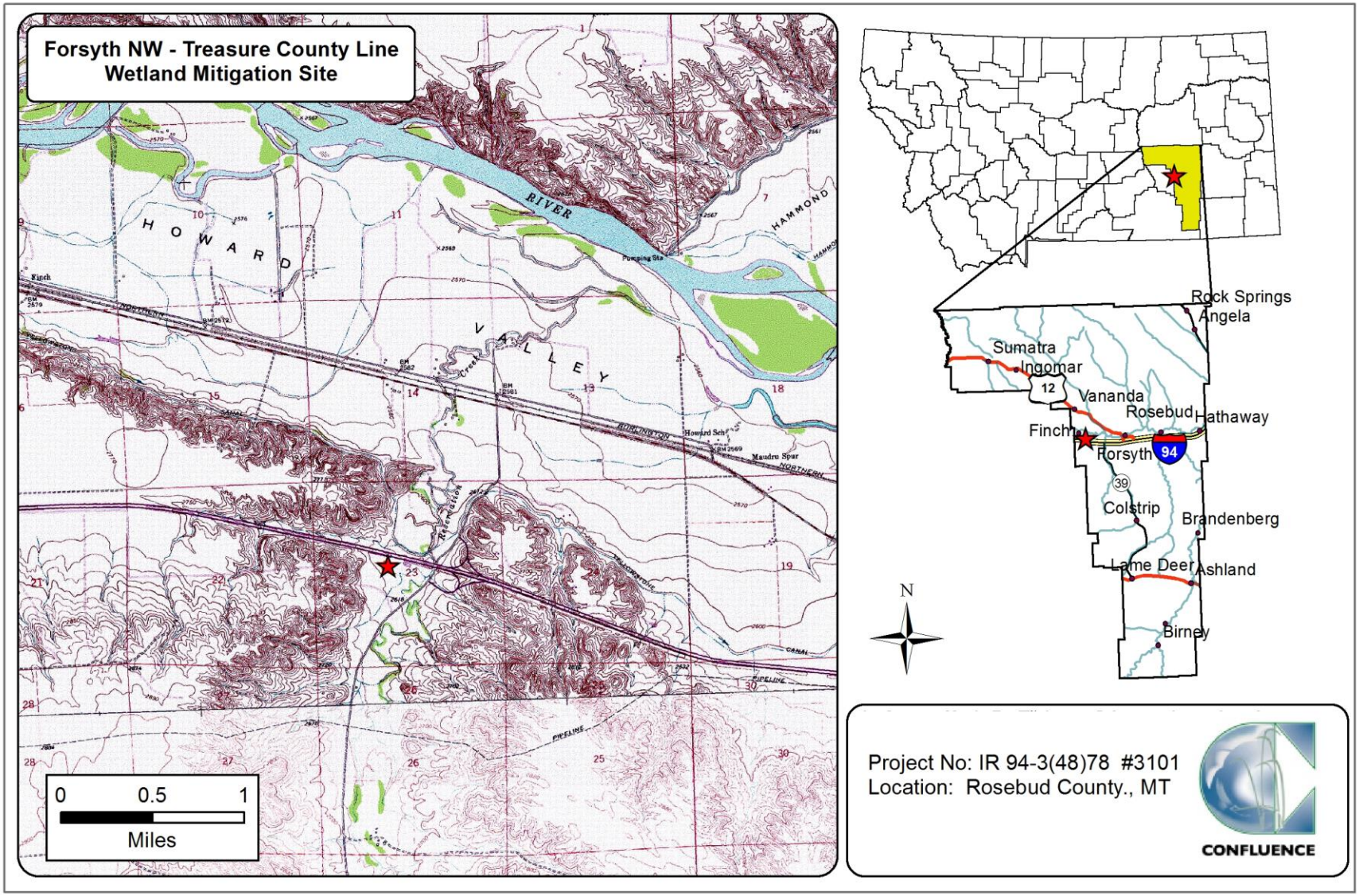

Figure 2. Project location of FNW - Treasure County Line (Site 4).

Table 1. Wetland impacts to be mitigated at FNW sites 1, 2, 3, and 4.

MDT PROJECT	IMPACTS (acres)	CREDITS (acres)	BALANCE REMAINING (acres)	RATIO	MITIGATION (acres)
Volborg - North & South	6.80	0.00	6.80	1.5:1	10.20
Forsyth - Northwest	2.18	1.78	0.40	2:1	0.80
TOTAL	**8.98**	**1.78**	**--**	**--**	**11.00**

Table 2. Anticipated wetland mitigation acreages for FNW sites 1, 2, 3, and 4.

WETLAND MITIGATION SITE	EXPECTED CREDITS*	
	Mitigation Type	Acre
West Site (Site 1)	Creation	9.09
	Preservation	1.29
	Sub-Total Site 1	**10.38**
Middle Site (Site 2)	Creation	0.34
East Site (Site 3)	Creation	1.07
	Total Sites 1, 2, and 3	**11.79**
Treasure County Line Site (Site 4)	Previous Creation (Credit)	1.78
	Total for all FNW sites (1-4)	**13.57**

1.2. General Mitigation Objectives

The MDT-developed performance standards and monitoring requirements (as presented in the approved mitigation plan) for the FNW sites are listed below. Aside from monitoring requirements, there are no quantitative metrics or criteria associated with the success of these mitigation sites.

1. **Vegetation community:**
   a. Establish permanent photo points
   b. Establish vegetation transects to monitor the development of each vegetative community and its diversity.
   c. Develop a plant species list during each monitoring visit.
   d. Plot vegetative communities on as-built plans.
   e. Determine areal coverage of vegetative community from as-built plans, aerial photographs, or by conventional or GPS survey every other year, starting in 2013.
   f. Monitor for, and control invasive weed species.
2. **Soils**
   a. Establish monitoring points for hydric soil development.
   b. Monitor and document the development of hydric soils utilizing a Munsell Soil Chart.
   c. Document the progression of reducing soil conditions as the soil transitions from an aerobic state, to an anaerobic (hydric) state.

3. **Hydrology:**
   a. Delineate area of inundation no earlier than the second weekend of June every other year, starting in 2013.
   b. Survey and document the hydrology within the new wetland area no earlier than the second weekend of June every other year, starting in 2013.
   c. Measure the horizontal and vertical extent of the soil saturation zone at the margins of the wetlands.
4. **Wildlife Community:**
   a. Birds:
      i. Create and maintain a cumulative bird list of species observed.
   b. Mammals:
      i. Create and maintain a list of mammalian species observed either directly or indirectly, i.e., tracks, scat, etc., during the biennial monitoring visits.
   c. Herpetiles:
      i. Create and maintain a list of the amphibian and reptile species observed either directly or indirectly, i.e., tracks, nests, etc., during the biennial monitoring visits.
5. **MDT Functional Assessment**
   a. A formal MDT Functional Assessment will be completed during each monitoring period.
6. **Routine Wetland Determination**
   a. A Routine Wetland Determination form will be completed during each monitoring period according to the 1987 Corps of Engineers Wetland Delineation Manual and to the terms most applicable "Regional Supplement", most likely the Western Great Plains (LRR G) supplement.

1.3. Mitigation Sites

The following sections provide a general discussion of the four wetland mitigation sites: West Site (1), Middle Site (2), East Site (3), and Treasure County Line (4). The discussion includes location, site topography, mitigation objectives, and targeted wetland community goals.

1.3.1. West Site – Site 1

The West mitigation site (1) is a 13.71-acre site owned by MDT and located at the mouth of East Spring Coulee in the floodplain of Big Porcupine Creek. The site is intended to provide 10.38 acres of compensatory wetland mitigation. Approximately 1.29 acres of pre-existing wetlands will be preserved at this site. The monitoring area boundary is shown on Figures 3 and 4: West Site – Site 1 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavation of new wetland areas with undulating bottoms.

- Create emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix.
- Constructing a water retention dike on the east end of the project site.

The targeted wetland community types included emergent, scrub-shrub, and forested classes dominated by herbaceous hydrophytes, willows, and cottonwoods. Site construction was completed in summer 2012 and the revegetation was completed from August through October 2012.

1.3.2. Middle Site – Site 2

The Middle mitigation site (2) is a 1.80-acre site owned by MDT. The site is adjacent to US Highway 12, situated among old meander scars across the Big Porcupine Creek floodplain. This area is intended to provide 0.34 acres of compensatory wetland mitigation. The monitoring area boundary is shown on Figures 5 and 6: Middle Site – Site 2 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavation of new wetland areas with undulating bottoms.
- Create emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix.

The proposed wetland community for this site is anticipated to be a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in summer 2012 and the revegetation was completed from August through October 2012.

1.3.3. East Site – Site 3

The East mitigation site (3) is a 2.74-acre site owned by MDT. The site is located approximately 1,000 feet from the Middle site (2) and is also directly adjacent to US Highway 12. The East site is intended to provide 1.07 acres of compensatory wetland mitigation. The monitoring area boundary is shown on Figures 7 and 8: East Site – Site 3 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavation of new wetland areas with undulating bottoms.
- Create emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix.

The proposed wetland community for this site is anticipated to be a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in summer 2012 and the revegetation was completed from August through October 2012.

1.3.4. Treasure County Line Site – Site 4

The Treasure County Line mitigation site (4) is a 5.89-acre site owned by MDT. The site is located adjacent to US Interstate 94 and an existing wetland complex along Reservation Creek. It is intended to provide 1.78 acres of compensatory wetland mitigation. The monitoring area boundary is shown on Figure 9 and 10: Treasure County Line Site – Site 4 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavation of new wetland areas with undulating bottoms.
- Create emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated areas and seeding with wetland grass mix.

The proposed wetland community for this site is anticipated to be a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in 1999.

2. METHODS

The Forsyth NW – West, Middle, and East Sites were monitored on June 9, 2015; the Treasure County Line Site was monitored on June 10, 2015. Information contained on the Mitigation Monitoring Forms and Wetland Data Forms was entered directly into an electronic tablet during the field investigation (Appendix B). Monitoring activity locations for West, Middle, East, and Treasure County Line Sites were mapped with a global positioning system (GPS) as illustrated on Figures 3, 5, 7 and 9, respectively (Appendix A). Information collected included wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data, bird and wildlife use documentation, photographic documentation, functional assessments, 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 Data Forms was documented at two data points within the West Site, two data points within the Middle Site, three data points within the East Site, and two data points within the Treasure County Line Site. Hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on the electronic Wetland Data Forms (Appendix B). Hydrologic assessments allow evaluation of mitigation goals 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 classified as 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 degrees Fahrenheit (Environmental Laboratory 1987). Temperature data recorded for the meteorological station at Forsyth, Montana (243098), 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 general dominant species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2015 aerial photographs. The percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (less than 1 percent), 1 (1 to 5 percent), 2 (6 to 10 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 predominant vegetation species that characterized each mapped polygon (Figures 4, 6, 8, and 10, Appendix A).

Temporal changes in vegetation were evaluated through annual assessments of static belt transects (Figures 3, 5, 7 and 9, Appendix A). Vegetation composition was assessed and recorded along vegetation belt transects established at all sites during the 2013 reconnaissance site visits. Transects are 10 feet wide and vary in length at each site. The transect endpoints were recorded with a resource-grade GPS unit.

Spatial changes in the dominant vegetation communities were documented along the stationed transect. The percent cover of each vegetation species within transects was estimated using the same values and cover ranges listed for the community polygon data (Appendix B). Photographs were taken at the endpoints of each transect during the monitoring event (Appendix C). The number of live individuals observed for each woody species planted was recorded during the monitoring event.

The Montana Noxious Weed List (July 2015), prepared by the Montana Department of Agriculture, was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field during the investigation and mapped on the 2015 aerial photos (Figures 4, 6, 8 and 10, Appendix A). The noxious weed species identified are color-coded. The locations are denoted with the symbol "**x**", "▲", or "■" representing 0.0 to 0.1 acres, 0.1 to 1.0 acres, or greater than 1.0 acre in extent, respectively. The letters T, L, M, or H, represent the cover classes, standing for 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 Rosebud County* and *in situ* soil descriptions (NRCS 2010). Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 Manual and 2010 Great Plains Regional Supplement (USACE 2010). A description of the soil profile, including hydric 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 2010 Great Plains Regional Supplement (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). 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 electronically 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 boundary was surveyed and identified on the 2015 aerial photographs. Wetland areas were estimated using geographic information system (GIS) methods.

2.5. Wildlife

Observations and other positive indicators of use of mammal, reptile, amphibian, and bird species were recorded on the wetland monitoring form during each of the site visits. Indirect use indicators, including tracks, scat, burrows, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive list of wildlife species observed on the sites each year is compiled and updated annually in each report.

2.6. Functional Assessment

The MDT Montana Wetland Assessment Method (Berglund and McEldowney 2008) was used to evaluate functions and values on the sites. This method provides an objective means of assigning wetlands an overall rating and provides regulators 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. One Wetland Assessment Form was completed at each mitigation site (assessment area (AA) (Appendix B).

2.7. Photo Documentation

Monitoring at photo points provided supplemental information documenting wetland and upland conditions, site trends, current land uses surrounding the site, and the status of the vegetation transects. Photographs were taken at established photo points and at transect endpoints throughout each of the mitigation sites during the field survey (Appendix C). Photo point locations were recorded with a resource-grade GPS unit (Figures 3, 5, 7 and 9, Appendix A).

2.8. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS (Global Positioning System) 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, subsequently exported into GIS, and drawn in Montana State Plane Single Zone NAD 83 meters. In addition to GPS, some site features within the site were hand-mapped onto the 2015 aerial photographs and digitized. Site features and survey points that were mapped included fence boundaries, photographic points, transect endpoints, wetland boundaries, vegetation community boundaries, and soil sample locations.

2.9. Maintenance Needs

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

3. RESULTS

3.1. West Site – Site 1

3.1.1. Hydrology

The average total annual precipitation recorded at the Forsyth, Montana weather station (243098), from January 1975 to September 2015 was 14.58 inches (WRCC 2015). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year on record at this station. Total precipitation in 2013 was 19.47 inches, making it the third wettest year on record at this station, exceeding the average by five inches. Total precipitation in 2014 was 18.34 inches. The precipitation between January and August totaled 13.85 inches in 2013, 15.63 in 2014, and 7.96 in 2015. Precipitation in both 2013 and 2014 exceeded the long-term average of 10.64 inches for this same period while 2015 was below the long-term average. The main source of hydrology at the FNW - West site is a seasonal high water table and occasional overbank flooding from East Spring Coulee and Big Porcupine Creek. Additional hydrology is provided by surface water from precipitation events.

Mitigation activities included excavation to lower the ground surface of uplands to match adjacent existing wetlands and the construction of a dike across two wetland/ephemeral swales along the lower end of the site (east side) to impound periodic surface water. High surface water flows at the site in 2013 breached a portion of the dike. MDT completed repairs on the structure in July 2013. This failure was repeated in 2014 when the fill placed across the swale was eroded to its former elevation, exposing the gravel/cobble substrate along the ephemeral channel bed (PP 2, page C-2, Appendix C). The dike had not been repaired during the 2015 site visit, but MDT is in the process of developing a longer term solution to this issue.

Inundation was observed across a majority of the excavated areas during the 2015 field survey. Additional evidence of site hydrology included high water table (12 inches), saturation to surface, water marks, salt crust, hydrogen sulfide odor, and geomorphic position. Some of the lower-lying depressions were inundated during the 2015 field visit. Approximately 60 percent of the wetlands on site were inundated to an average depth of one foot during the 2015 field survey, a notable increase since 2013, which had approximately five percent of the wetlands inundated to an average depth of 0.25 feet.

Two data points, We-1w and We-1u, were assessed to determine the upland and wetland boundaries (Wetland Determination Data Forms, Appendix B). Data point We-1w was located in an excavated wetland depression, approximately 80 feet southwest of MT Highway 12. Positive indicators of wetland hydrology at We-1w included one inch of surface water, high water table to 12 inches, saturation to the ground surface, water marks, salt crust, hydrogen sulfide odor, FAC-Neutral Test, saturation visible on aerial imagery, and geomorphic position. No primary or secondary indicators of wetland hydrology were observed at We-

1u, located in upland community Type 6, approximately 30 feet northeast of We-1w and 50 feet southwest of MT Highway 12.

3.1.2. Vegetation

Seventy plant species were identified during the 2013 through 2015 field surveys (Table 3). The mitigation area contains several mature eastern cottonwoods (*Populus deltoides*) near the center of the site and a few large peach-leaf willows (*Salix amygdaloides*) along the undisturbed existing wetland swales. While several hundred cottonwood seedlings were observed within the recently excavated wetland areas in 2013, only a few seedlings were observed in these areas during the 2015 survey. Greasewood (*Sarcobatus vermiculatus*) was present within the undisturbed uplands on the site. Seven vegetation communities have been mapped across the site from 2013 through 2015. In general, the communities can be classified as undisturbed wetland, disturbed (recently constructed) wetland, undisturbed upland, and disturbed upland. The seven community types were upland Type 1 – *Bromus tectorum/Sarcobatus vermiculatus*, upland Type 5 – *Symphoricarpos albus*/*Pascopyrum smithii,* upland Type 6 – *Pascopyrum smithii/Bromus* spp., upland Type 7 – *Puccinellia nuttalliana/Hordeum jubatum*, wetland Type 8 – *Typha* spp*./Eleocharis palustris*, wetland Type 9 – *Eleocharis palustris*/Open Water, and wetland Type 10 – *Hordeum jubatum/Puccinellia nuttalliana.* The species composition for each community is included on the FNW-West Monitoring Form (Appendix B) and discussed below. Vegetation community boundaries are shown in Figure 4 of Appendix A.

Upland community Type 1 – *Bromus tectorum/Sarcobatus vermiculatus* was located on 2.61 acres of undisturbed upland on the side slope of the railroad grade along the southwest boundary. This community decreased in size by 2.73 acres in 2015 as a result of differences in species composition and their associated cover classes, creating new upland community Types 5 – *Symphoricarpos albus/Pascopyrum smithii* and 6 – *Pascopyrum smithii/Bromus* spp. Twenty-four species were identified within the community. Dominant species included cheatgrass (*Bromus tectorum*), greasewood, western-wheat grass (*Pascopyrum smithii*), and false meadow rye grass (*Schedonorus pratensis*).

Upland community Type 5 – *Symphoricarpos albus/Pascopyrum smithii* was located on 1.25 acres of undisturbed upland along the southern boundary of the project area. This community replaced a portion of upland community Type 1 – *Bromus tectorum/Sarcobatus vermiculatus* due to a shift in species composition and their associated cover classes. Nineteen species were identified within the community. Dominant species included common snowberry (*Symphoricarpos albus*)*,* western-wheat grass *(Pascopyrum smithii*)*,* Mexican-fireweed (*Bassia scoparia*)*,* and Japanese brome (*Bromus japonicus*).

Upland community Type 6 – *Pascopyrum smithii/Bromus* spp. was located on 1.51 acres of undisturbed upland adjacent to MT Highway 12 along the northeast boundary. This community replaced a portion of upland community Type 1 – *Bromus tectorum/Sarcobatus vermiculatus* as a result of changes in species composition and their associated cover classes. Nineteen species were identified within the community. The community was dominated by Japanese brome, cheatgrass, Mexican-fireweed, yellow sweet-clover (*Melilotus officinalis*), and western-wheat grass, slender wild rye (*Elymus trachycaulus*), and nodding wild rye (*Elymus canadensis*).

Upland community Type 7 – *Puccinellia nuttalliana/Hordeum jubatum* was identified on 2.33 acres of upland located within the excavated footprint. This community replaced community Type 2 – *Helianthus annuus/Bassia scoparia* in 2015 as primary colonizing species decreased in dominance and more persistent, perennial plants increased in cover. Twenty-two species were identified within the community. The most abundant species in the community were Nuttall's alkali grass (*Puccinellia nuttalliana*), fox-tail barely (*Hordeum jubatum*), and yellow sweet-clover.

Wetland community Type 8 – *Typha* spp./*Eleocharis palustris* was originally designated as undisturbed, pre-existing wetland community Type 3 – *Spartina pectinata/Eleocharis palustris* in previous year surveys. Species composition and cover classes had shifted during the 2015 field survey, creating a new wetland vegetation community type on 1.07 acres. Sixteen species were identified within the community. The community was dominated by common spike-rush (*Eleocharis palustris*), broad-leaf cat-tail (*Typha latifolia*), and narrow-leaf cat-tail (*Typha angustifolia*). Open water accounted for between six and ten percent of the community cover.

Wetland community Type 9 – *Eleocharis palustris*/Open Water was located on 4.77 acres of the site and replaces disturbed wetland community Type 4 – *Eleocharis palustris/Chenopodium album* from previous surveys. Fourteen species were identified within the community. The most abundant species in the community were common spike-rush, aquatic macrophytes, and saltmarsh club-rush (*Schoenoplectus maritimus*). Open water accounted for greater than 50 percent of the community cover.

Wetland community Type 10 – *Hordeum jubatum/Puccinellia nuttalliana* was observed in 2015 as a new wetland community type located on 0.17 acres originally designated as a portion of upland community Type 2 – *Helianthus annuus/Bassia scoparia*. Twenty species were identified within the community. The most abundant species in the community were fox-tail barley and Nuttall's alkali grass. Bare ground accounted for between 21 and 50 percent of the community cover.

Table 3. Vegetation species observed at the FNW-West Site in 2013, 2014, and 2015.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	NL
Alisma triviale	Northern Water-Plantain	OBL
Amaranthus retroflexus	Red-Root	FACU
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Aquatic macrophytes	**Aquatic macrophytes**	**NL**
Asclepias speciosa	Showy Milkweed	FAC
Atriplex argentea	Silverscale	FAC
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	California Brome	NL
Bromus inermis	Smooth Brome	UPL
Bromus japonicus	**Japanese Brome**	**NL**
Bromus tectorum	Cheatgrass	NL
Carex sp.	Sedge	NL
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium sp.	Goosefoot	NL
Cichorium intybus	Chicory	FACU
Cirsium arvense	Canadian Thistle	FACU
Convolvulus arvensis	Field Bindweed	NL
Deschampsia caespitosa	**Tufted Hair Grass**	**FACW**
Descurainia sophia	Herb Sophia	NL
Echinochloa crus-galli	Large Barnyard Grass	FAC
Elaeagnus angustifolia	Russian-Olive	FACU
Eleocharis palustris	Common Spike-Rush	OBL
Elymus canadensis	**Nodding Wild Rye**	**FACU**
Elymus hispidus	Intermediate Wheatgrass	NL
Elymus repens	Creeping Wild Rye	FACU
Elymus sp.	Wild Rye	NL
Elymus trachycaulus	**Slender Wild Rye**	**FACU**
Euphorbia esula	Leafy Spurge	NL
Glyceria elata	Tall Manna Grass	OBL
Glycyrrhiza lepidota	American Licorice	FACU
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum brachyantherum	Meadow Barley	FAC
Hordeum jubatum	Fox-Tail Barley	FACW
Hordeum marinum	**Seaside Barley**	**FACU**
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	Prairie Flax	NL
Melilotus officinalis	Yellow Sweet-Clover	FACU

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

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

Table 3 (continued). Vegetation species observed at the FNW-West Site in 2013, 2014, and 2015.

Scientific Names	Common Names	GP Indicator Status[1]
Pascopyrum smithii	Western-Wheat Grass	FACU
Phalaris arundinacea	Reed Canary Grass	FACW
Poa compressa	Flat-Stem Blue Grass	FACU
Poa palustris	Fowl Blue Grass	FACW
Poa pratensis	Kentucky Blue Grass	FACU
Polygonum aviculare	**Yard Knotweed**	**FACU**
Populus deltoides	Eastern Cottonwood	FAC
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Ribes aureum	Golden Currant	FACU
Rosa arkansana	Prairie Rose	FACU
Rumex crispus	Curly Dock	FAC
Sagittaria cuneata	Arum-Leaf Arrowhead	OBL
Salix amygdaloides	Peach-Leaf Willow	FACW
Salix sp.	Willow	NL
Sarcobatus vermiculatus	Greasewood	FAC
Schedonorus pratensis	False Meadow Rye Grass	FACU
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Setaria pumila	Yellow Bristle Grass	FACU
Sonchus arvensis	Field Sow-Thistle	FAC
Spartina pectinata	Freshwater Cord Grass	FACW
Symphoricarpos albus	Common Snowberry	UPL
Tamarix ramosissima	Salt-cedar	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
Xanthium strumarium	Rough Cockleburr	FAC

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

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

Vegetation cover was measured along two transects at the FNW-West Mitigation Site in 2015 (Figure 3, Appendix A). The data recorded on Transects 1 and 2 (Monitoring Forms, Appendix B) are summarized in tabular and graphical formats in Tables 4 and 5 and Charts 1 through 4. Photographs of the FNW - West transect start and end points are shown on pages C-6 through C-9 in Appendix C.

Vegetation Transect 1, T-1, located in the east half of the site, extends 282 feet from southwest to northeast, with intervals alternating between upland community Types 1 – *Bromus tectorum/Sarcobatus vermiculatus*, 7 – *Puccinellia nuttalliana/Hordeum jubatum*, and 6 – *Pascopyrum smithii/Bromus* spp, and wetland community Types 8 – *Typha* spp./*Eleocharis palustris* and 10 – *Hordeum jubatum/Puccinellia nuttalliana*. Ten hydrophytic and 27 upland species were

identified along the transect. Hydrophytic vegetation communities comprised 37 percent of T-1 in 2015, an increase of 18.2 percent since 2014. Wetland habitat is expected to continue to develop along this transect once the dike has been repaired and seasonal wetland hydrology can be established.

Table 4. Transect 1 data summary for FNW-West Site in 2013, 2014, and 2015.

Monitoring Year	2013	2014	2015
Transect Length (feet)	**282**	**282**	**282**
Vegetation Community Transitions along Transect	6	6	7
Vegetation Communities along Transect	3	3	5
Hydrophytic Vegetation Communities along Transect	1	1	2
Total Vegetative Species	27	35	37
Total Hydrophytic Species	10	10	10
Total Upland Species	17	25	27
Estimated % Total Vegetative Cover	75	80	80
Estimated % Unvegetated	25	20	20
% Transect Length Comprising Hydrophytic Vegetation Communities	15.6	18.8	37
% Transect Length Comprising Upland Vegetation Communities	84.4	81.2	63
% Transect Length Comprising Unvegetated Open Water	0	0	0
% Transect Length Comprising Mudflat	0	0	0

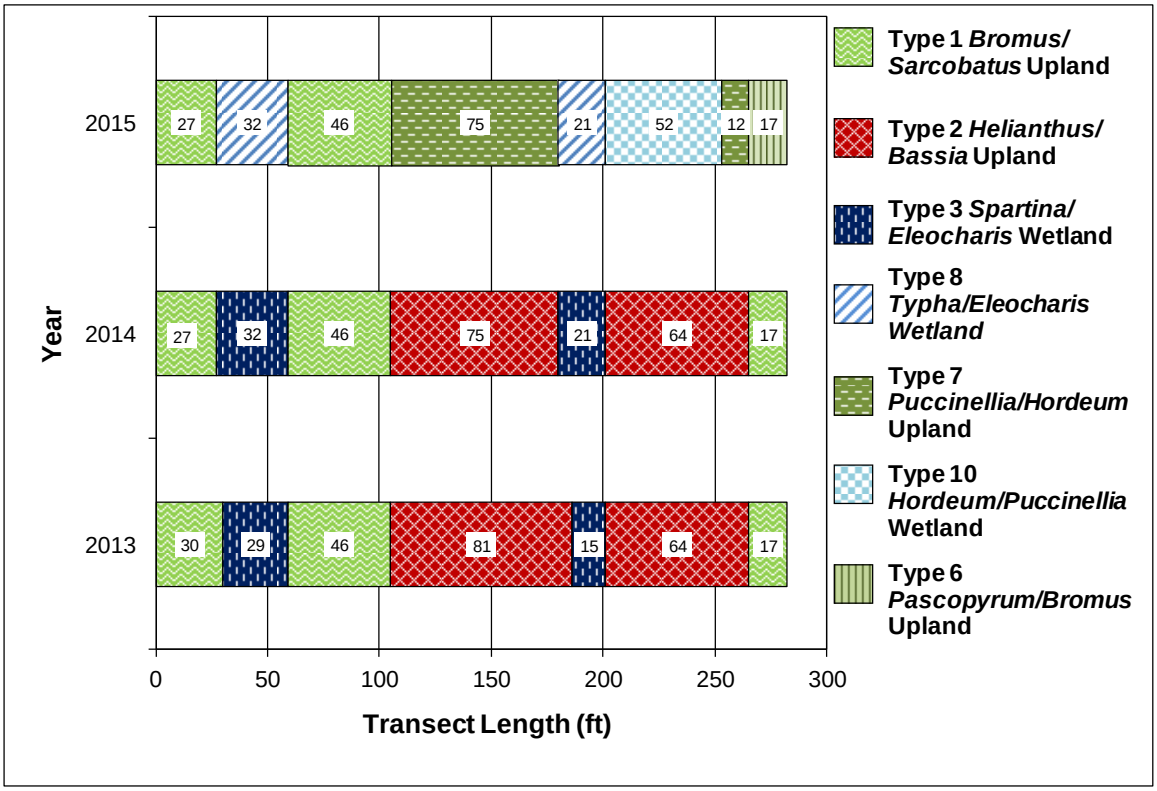

Chart 1. Transect 1 map for FNW-West Site showing vegetation types from transect start (0 feet) to finish (282 feet) in 2013, 2014, and 2015.

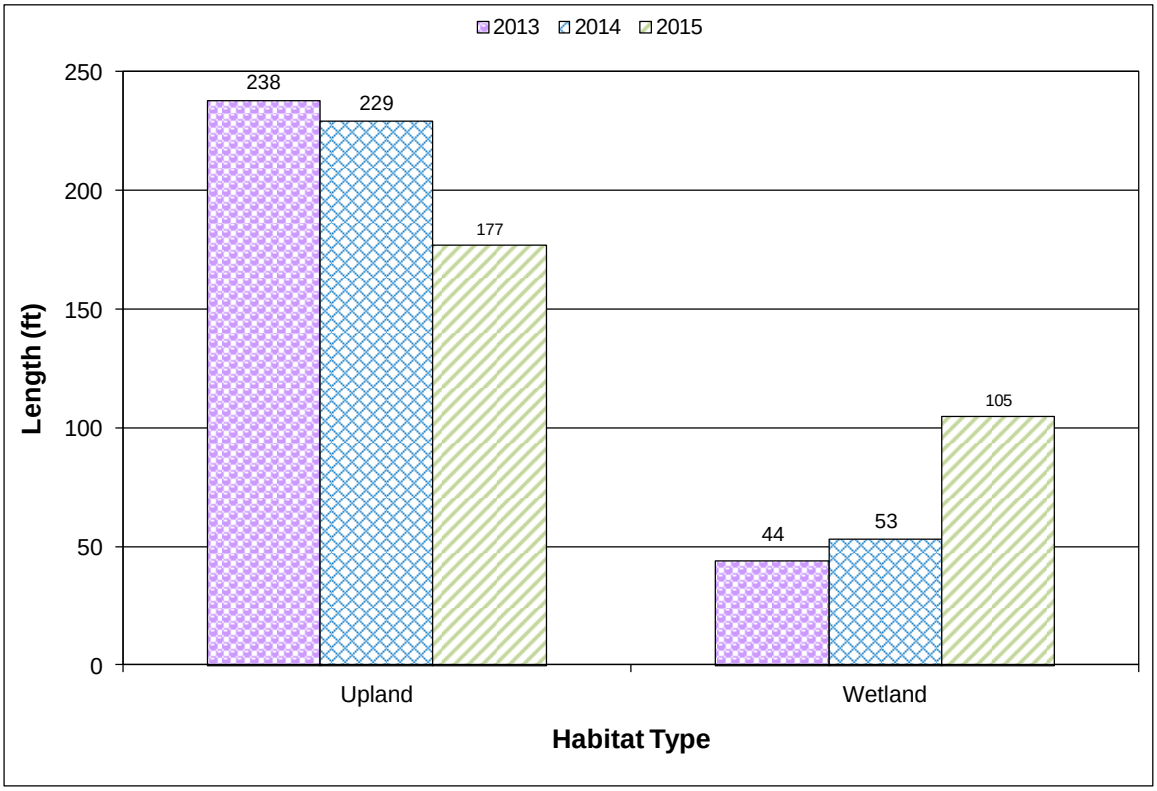

Chart 2. Length of vegetation communities within Transect 1 at FNW-West Site in 2013, 2014, and 2015.

Vegetation Transect 2, T-2, located in the west half of the site, extends 261 feet from southwest to northeast, with intervals alternating between upland community Types 5 – *Symphoricarpos albus/Pascopyrum smithii* and 6 – *Pascopyrum smithii/Bromus* spp, and wetland community Type 9 – *Eleocharis palustris*/Open Water. Nine hydrophytic and 20 upland species were identified along the transect. Hydrophytic vegetation communities comprised 87 percent of T-2 in 2013, 2014, and 2015.

Table 5. Transect 2 data summary for FNW-West Site in 2013, 2014, and 2015.

Monitoring Year	2013	2014	2015
Transect Length (feet)	**261**	**261**	**261**
Vegetation Community Transitions along Transect	2	2	2
Vegetation Communities along Transect	2	2	3
Hydrophytic Vegetation Communities along Transect	1	1	1
Total Vegetative Species	21	26	29
Total Hydrophytic Species	8	11	9
Total Upland Species	13	15	20
Estimated % Total Vegetative Cover	10	20	20
Estimated % Unvegetated	90	80	80
% Transect Length Comprising Hydrophytic Vegetation Communities	87.0	87.0	87
% Transect Length Comprising Upland Vegetation Communities	13.0	13.0	13
% Transect Length Comprising Unvegetated Open Water	0	0	0
% Transect Length Comprising Mudflat	0	0	0

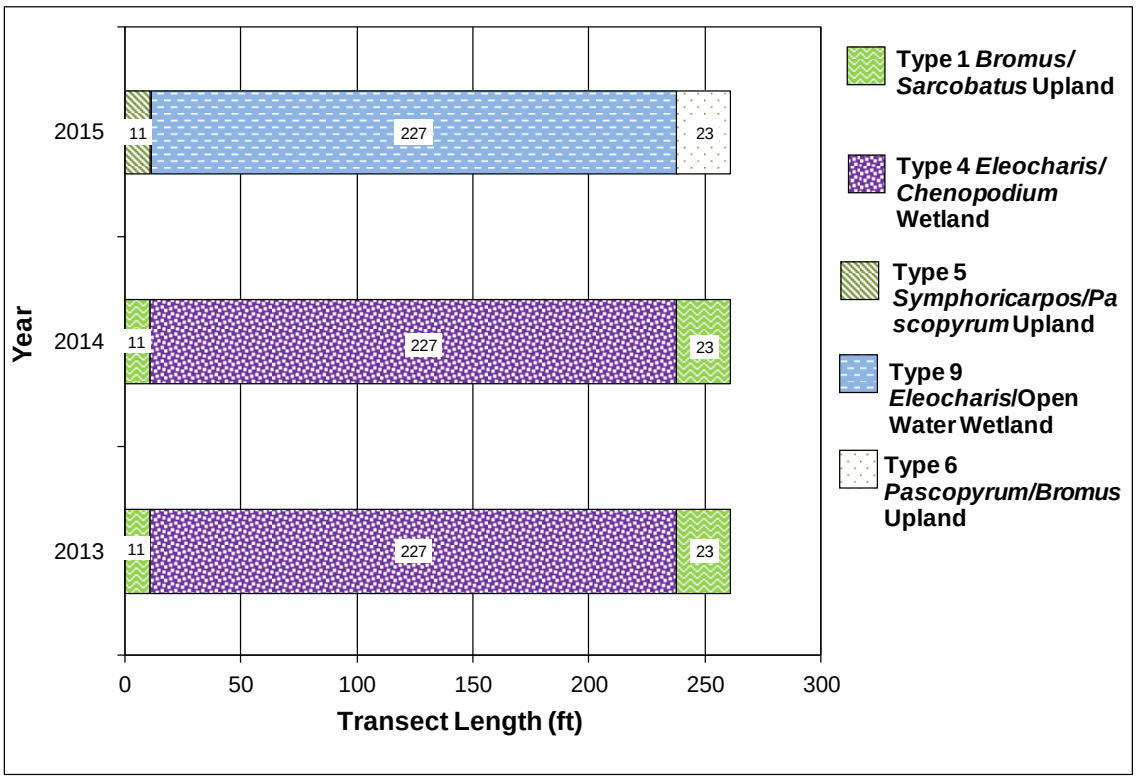

Chart 3. Transect 2 map for FNW-West Site showing vegetation types from transect start (0 feet) to finish (261 feet) in 2013, 2014, and 2015.

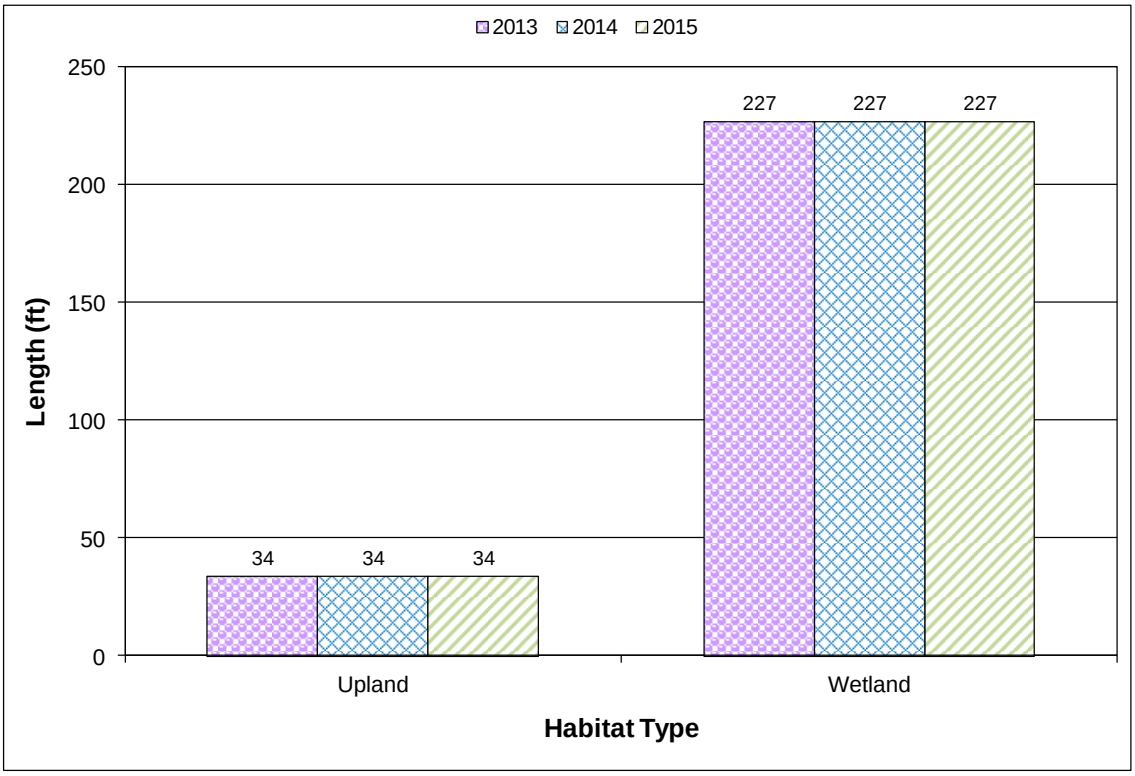

Chart 4. Length of vegetation communities within Transect 2 for FNW-West Site in 2013, 2014, and 2015.

Infestations of four Priority 2B noxious weeds, including Canadian thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), field bindweed (*Convolvulus arvensis*), and salt-cedar (*Tamarix ramosissima*), were mapped in nineteen locations, shown on Figure 4 (Appendix A). Canadian thistle was identified in nine locations within the project area. The size of the infestations ranged from less than 0.1 acre to 1 acre with a cover class that ranged from trace (less than 1 percent) to high (26 to 100 percent). Field bindweed was identified in three locations of less than 0.1 acre in size with a trace cover class (less than 1 percent). The project area contained five infestations of leafy spurge that ranged from low (less than 0.1 acre) to moderate (0.1 to 1.0 acre) in size with cover classes of trace (less than 1 percent) to high (26 to 100 percent). Two infestations of salt-cedar, less than 0.1 acre in size with a trace (less than 1 percent) to low cover class (1 to 5 percent), were present in the project area.

No containerized shrubs or trees were installed at this site. Revegetation efforts included a combination of wetland sod placement and seeding following construction disturbance. The seeding mixture included wand panic grass (*Panicum virgatum*), American mannagrass (*Glyceria grandis*), Baltic rush (*Juncus balticus*), Nebraska sedge (*Carex nebrascensis*), and Nuttall's alkali grass (*Puccinellia nuttalliana*). Woody species are regenerating naturally within the site. While several hundred cottonwood seedlings were observed within the recently excavated wetland areas in 2013, only a few seedlings were observed in these areas during the 2015 survey. Although only moderate survival of these seedlings were noted (<25 percent), the living seedlings exhibited increased growth in both height and thickness.

3.1.3. Soil

Soils on the site were mapped in the *Rosebud County Soil Survey* as Borollic Camborthids-Ustic Torrifluvents complex (0 to 8 percent slope) in the northwest corner of the site and Marvan silty clay. (0 to 2 percent slope) throughout the majority of the mitigation area. The Borollic Camborthids-Ustic Torrifluvents complex and Marvan sitly clay map units are located on the National Hydric Soil List (2012) and also on the Montana Hydric Soil List (USDA 2010). The Marvan series consist of very deep well drained light brownish gray clay mapped on alluvial fans, stream terraces, and drainage ways.

Soil test pits were excavated at two locations, both within what was originally mapped as the Marvan silty clay soil series (We-1w and We-1u, Figure 3, Appendix A). Data point We-1w was located in an excavated wetland depression, approximately 80 feet southwest of MT Highway 12, in an area that met the hydric soil criteria. The soil profile revealed an olive brown (2.5Y 4/3) clay. The soil met the criteria for hydrogen sulfide (A4). Data point We-1u was located in on a hillside in upland community Type 6, approximately 30 feet northeast of We-1w and 50 feet southwest of MT Highway 12. The soil profile revealed an olive brown (2.5Y 4/3) clay and did not meet the criteria for any hydric soil indicators.

3.1.4. Wetland Delineation

Two data points were used to determine the wetland and upland boundaries in 2015 (FNW-West Figures 3 and 4, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data Forms (Appendix B). The total acreage of aquatic habitat at the West site (1) in 2015 was 6.01 acres, an increase of 0.16 wetland acres since 2014. This included approximately 1.29 acres of pre-existing wetland and 4.72 acres of created wetland within the recently excavated areas that have developed wetland characteristics in response to the decreased ground surface elevation. Water levels in the created wetlands support an establishing emergent plant community, although open water accounts for a majority of the disturbed area. Hydrophytic plants include common spike-rush, aquatic macrophytes, saltmarsh club-rush, Nuttall's alkali grass, freshwater cord grass, and fox-tail barley. The existing wetlands included the low-lying swales dominated by common spike-rush, broad-leaf cat-tail, and narrow-leaf cat-tail.

Table 6. Wetland habitat acreages delineated at the FNW-West Site.

WETLAND AND UPLAND HABITATS	2013 (acres)	2014 (acres)	2015 (acres)
Existing Wetland	1.29	1.29	1.29
Created Wetland	4.15	4.56	4.72
Total	5.44	5.85	6.01

3.1.5. Wildlife

A list of wildlife species observed directly or indirectly during the 2013, 2014, and 2015 field surveys is presented in Table 7 and the monitoring form (Appendix B). Eleven bird species were identified in 2015. The presence of large trees and shrubs provide habitat for the diversity of birds observed at the site. Deer (*Odocoileus* sp.) and coyote (*Canis latrans*) tracks, one meadow vole (*Microtus pennsylvanicus*), and one three inch unidentified fish sp. were observed on the site. No nesting structures have been installed at the site.

Table 7. Wildlife species observed at the FNW-West Site in 2013, 2014, and 2015.

COMMON NAME	SCIENTIFIC NAME
BIRDS	
American Avocet	***Recurvirostra americana***
American Goldfinch	*Spinus tristus*
Bald Eagle	***Haliaeetus leucocephalus***
Bank Swallow	*Riparia riparia*
Barn Swallow	***Hirundo rustica***
Belted Kingfisher	*Megaceryle alcyon*
Blue-winged Teal	*Anas discors*
Brown Thrasher	*Toxostoma rufum*
Cedar Waxwing	*Bombycilla cedrorum*
Cliff Swallow	***Petrochelidon pyrrhonota***
Common Nighthawk	*Chordeiles minor*
Eastern Kingbird	*Tyrannus tyrannus*
Golden Eagle	***Aquila chrysaetos***
Grasshopper Sparrow	*Ammodramus savannarum*
Great Blue Heron	*Ardea herodias*
Killdeer	***Charadrius vociferus***
Lark Bunting	*Calamospiza melanocorys*
Mallard	***Anas platyrhynchos***
Mourning Dove	***Zenaida macroura***
Northern Harrier	*Circus cyaneus*
Orchard Oriole	*Icterus spurius*

COMMON NAME	SCIENTIFIC NAME
BIRDS	
Red-winged Blackbird	***Agelaius phoeniceus***
Rock Wren	*Salpinctes obsoletus*
Song Sparrow	*Melospiza melodia*
Swainson's Hawk	*Buteo swainsoni*
Turkey Vulture	*Cathartes aura*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
Western Sandpiper	*Calidris mauri*
Wilson's Phalarope	***Phalaropus tricolor***
Yellow Warbler	***Dendroica petechia***
FISH	
Fish sp.	
MAMMALS	
Coyote	***Canis latrans***
Deer sp.	***Odocoileus* sp.**
Meadow Vole	***Microtus pennsylvanicus***
Porcupine	*Erethizon dorsatum*
Raccoon	*Procyon lotor*
White-tailed Deer	*Odocoileus virginianus*
REPTILES	
Plains Gartersnake	*Thamnophis radix*

Species identified in 2015 are **bolded**.

3.1.6. Functional Assessment

Results of the 2013, 2014, and 2015 functional assessments are summarized in Table 8. The completed FNW-West Wetland Assessment Form is included in Appendix B. The FNW-West site was evaluated as one assessment area (AA-1) that encompassed 6.01 acres in 2015. The AA was rated as a Category II wetland in 2015 with 69.6 percent of the total possible points. Ratings for general wildlife habitat, general fish/aquatic habitat, sediment/nutrient/toxicant removal, and uniqueness increased from 2014 to 2015 as a result of less disturbance and higher vegetation cover. The site received a high rating for MTNHP Species habitat based on the presence of grand redstem (*Ammannia robusta*) within the site, observed in 2013 and 2014. The site also received high ratings for short and long term surface water storage, production export/food chain support, and recreation/education potential. The site achieved 46 functional units (FU) in 2015, 6.5 more than in 2014, reflecting the increase in wetland acreage and the decrease in site disturbance as vegetation cover develops. The rating and functional units are expected to continue to improve as the site recovers from the recent excavation and develops increased vegetation cover.

Table 8. MWAM summary for the FNW-West Site in 2013, 2014, and 2015.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2013	2014	2015
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Mod (0.5)	Mod (0.7)	E (1)
General Fish/Aquatic Habitat	NA	NA	Mod (0.4)
Flood Attenuation	Mod (0.5)	Mod (0.5)	Mod (0.5)
Short and Long Term Surface Water Storage	High (1.0)	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	Mod (0.4)	Mod (0.4)	Mod (0.6)
Sediment/Shoreline Stabilization	Low (0.3)	Mod (0.7)	Mod (0.7)
Production Export/Food Chain Support	Mod (0.6)	High (0.9)	High (0.9)
Groundwater Discharge/Recharge	Mod (0.7)	High (1.0)	High (1.0)
Uniqueness	Mod (0.4)	Mod (0.5)	Mod (0.6)
Recreation/Education Potential (bonus points)	High (0.15)	High (0.15)	High (0.15)
Actual Points/Possible Points	**5.45 / 10**	**6.75 / 10**	**7.65 / 11**
% of Possible Score Achieved	**54.5%**	**67.5%**	**69.6%**
Overall Category	**III**	**III**	**II**
Total Acreage of Assessed Wetlands within Site Boundaries	**5.44**	**5.85**	**6.01**
Functional Units (acreage x actual points)	**29.6**	**39.5**	**46.0**

3.1.7. Photo Documentation

Photographs from photo points PP1 to PP5 (Figure 3, Appendix A), the transect start and end points, and wetland determination data points are shown on pages C-1 to C-10 of Appendix C.

3.1.8. Maintenance Needs

Infestations of four Priority 2B noxious weeds, including Canadian thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), field bindweed (*Convolvulus arvensis*), and salt-cedar (*Tamarix ramosissima*), were mapped in nineteen locations, shown on Figure 4 (Appendix A). Canadian thistle was identified in nine locations within the project area. The size of the infestations ranged from less than 0.1 acre to 1 acre with a cover class that ranged from trace (less than 1 percent) to high (26 to 100 percent). Field bindweed was identified in three locations of less than 0.1 acre in size with a trace cover class (less than 1 percent). The project area contained five infestations of leafy spurge that ranged from low (less than 0.1 acre) to moderate (0.1 to 1.0 acre) in size with cover classes of trace (less than 1 percent) to high (26 to 100 percent). Two infestations of salt-cedar, less than 0.1 acre in size with a trace (less than 1 percent) to low cover class (1 to 5 percent), were present in the project area. The MDT has an on-going weed control program that assesses and employs weed-control measures within their wetland mitigation sites on a yearly basis.

The dike failure that occurred at the site during high flows in 2013 was repaired by MDT prior to the 2013 field survey and was intact when inspected in 2013. However, the structure appeared to be inadequately stabilized and susceptible to future failure. An examination of this structure in June 2014 indicated that the structure did fail again during high spring flows, eroding a channel down to the

elevation of the original ephemeral thalweg. The dike had not been repaired during the 2015 site visit. Photo point 2, shown on page C-2 of Appendix C, shows the repaired dike in 2013 and the failed dike following 2014 spring runoff. Even though wetland acreage has increased on site, we recommend the structure be redesigned and the upstream and downstream ends of the dike be reinforced with rip-rap and/or fabric for protection against future washouts based on the high volume of water that flows from the coulees at the west end of the site. A dike with reinforced spillway that functions to impound surface water during the spring would result in an increase of wetland habitat throughout the eastern part of the site. MDT has retained a contractor to evaluate this recommendation, and a fix will be completed pending design review and USACE approvals. The fence around the perimeter of the monitoring areas was in good condition.

3.1.9. Current Credit Summary

Approximately 6.01 aquatic habitat acres consisting of approximately 1.29 acres of pre-existing wetland habitat and 4.72 acres of recently created wetlands were delineated in 2015. Approximately 7.70 acres of upland habitat was mapped on the site in 2015. Table 9 presents the calculated credit acres for individual mitigation types with appropriate credit ratios applied using the USACE crediting system. The FNW-West mitigation types and ratios included creation (1:1), preservation (4:1), and upland buffer (5:1). The credit acres accrued at the FNW-West site in 2015 totaled 6.58, 0.13 more credit acres than in 2014.

Table 9. Credit summary for the FNW-West Site.

WETLAND	Ratio	2013 Delineated Acres	2013 Estimated Credit Acres	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Estimated Credit Acres
Preserved Wetland	4:1	1.29	0.32	1.29	0.32	1.29	0.32
Created Wetland	1:1	4.15	4.15	4.56	4.56	4.72	4.72
Upland Buffer	5:1	8.27	1.65	7.86	1.57	7.70	1.54
TOTAL		**13.71**	**6.13**	**13.71**	**6.45**	**13.71**	**6.58**

There were no quantitative performance measures or success criteria established for this wetland mitigation area. Monitoring requirements listed within the approved wetland mitigation plan are being satisfied. In general, the areas delineated as wetlands met the criteria for hydrophytic vegetation, hydric soil, and wetland hydrology. Noxious weed cover in 2015 was less than 10 percent site wide.

3.2. Middle Site – Site 2

3.2.1. Hydrology

The average total annual precipitation recorded at the Forsyth, Montana weather station (243098), from January 1975 to September 2015 was 14.58 inches (WRCC 2015). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year on record at this station. Total precipitation in 2013 totaled 19.47 inches and was the third wettest year on record at this station exceeding the average by five inches. Total precipitation in 2014 was 18.34. The precipitation between January and August totaled 13.85 inches in 2013, 15.63 inches in 2014, and 7.96 in 2015. Precipitation in both 2013 and 2014 exceeded the long-term average of 10.64 inches for this same period while 2015 was below the long-term average. The main sources of hydrology at this mitigation site are direct precipitation, surface runoff from adjacent uplands, and shallow groundwater.

The site is situated near abandoned meander bends associated with Big Porcupine Creek that exhibit wetland characteristics. The site may experience occasional flooding during high flows in Big Porcupine Creek, but is not intended to exhibit perennial hydrology due to its proximity to MT Hwy 12. The newly excavated depression exhibited signs of inundation persisting for an extended period prior to the field survey. Positive hydrologic indicators observed at this site included surface soil cracks, oxidized rhizospheres on living roots, geomorphic position, and a positive FAC-neutral test. The site was not inundated at the time of the 2015 field survey.

Two data points, SP1-w and SP2-u, were assessed to determine the upland and wetland boundaries (Wetland Determination Data Forms, Appendix B). Data point SP1-w was located in an area of the excavated depression that met the wetland criteria. Hydrologic indicators at the data point included surface soil cracks, oxidized rhizospheres on living roots, geomorphic position and a positive FAC-neutral test. Data point SP2-u did not meet the wetland hydrology criteria.

3.2.2. Vegetation

A comprehensive list of the fifty-five species identified onsite in 2013 through 2015 is presented in Table 10. Upland community Type 1 – *Pascopyrum smithii/Helianthus annuus* and wetland community Type 2 – *Rumex crispus/Eleocharis palustris,* that were identified in 2013 and 2014, have transitioned into upland community Type 3 – *Pascopyrum smithii/Elymus canadensis* and wetland community Type 4 – *Puccinellia nuttalliana/Hordeum jubatum*, respectively. The vegetation community boundaries are shown on Figure 6 of Appendix A. The species composition for each community is discussed below and included on the FNW-Middle Monitoring Form (Appendix B).

Table 10. Vegetation species observed at the FNW-Middle Site in 2013, 2014, and 2015.

Scientific Names	Common Names	GP Indicator Status[1]
Alisma triviale	Northern Water-Plantain	OBL
Alopecurus pratensis	Field Meadow-Foxtail	FACW
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Avena fatua	Wild Oats	NL
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	California Brome	NL
Bromus japonicus	**Japanese Brome**	**NL**
Bromus tectorum	Cheatgrass	NL
Chenopodium album	Lamb's-Quarters	FACU
Cirsium arvense	**Canadian Thistle**	**FACU**
Convolvulus arvensis	Field Bindweed	NL
Deschampsia caespitosa	**Tufted Hair Grass**	**FACW**
Deschampsia elongata	**Slender Hair Grass**	**FAC**
Echinochloa crus-galli	Large Barnyard Grass	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elymus canadensis	**Nodding Wild Rye**	**FACU**
Elymus repens	Creeping Wild Rye	FACU
Elymus sp.	Wild Rye	NL
Elymus trachycaulus	**Slender Wild Rye**	**FACU**
Euphorbia esula	**Leafy Spurge**	**NL**
Filago arvensis	**Field Fluffweed**	**NL**
Glyceria grandis	American Manna Grass	OBL
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	Prairie Flax	NL
Melilotus officinalis	Yellow Sweet-Clover	FACU
Panicum capillare	Common Panic Grass	FAC
Pascopyrum smithii	Western-Wheat Grass	FACU
Poa compressa	**Flat-Stem Blue Grass**	**FACU**
Poa palustris	Fowl Blue Grass	FACW
Polygonum aviculare	Yard Knotweed	FACU
Populus deltoides	Eastern Cottonwood	FAC
Puccinellia nuttalliana	**Nuttall's Alkali Grass**	**OBL**
Ratibida columnifera	Prairie Coneflower	NL
Rosa arkansana	Prairie Rose	FACU
Rumex acetosella	Common Sheep Sorrel	FAC
Rumex crispus	Curly Dock	FAC
Salix amygdaloides	Peach-Leaf Willow	FACW
Salix exigua	**Narrow-Leaf Willow**	**FACW**
Salix sp.	Willow	NL
Sarcobatus vermiculatus	Greasewood	FAC
Schedonorus pratensis	Meadow False Rye Grass	FACU
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Setaria pumila	Yellow Bristle Grass	FACU
Solanum rostratum	Buffalo Bur	NL
Symphoricarpos albus	Common Snowberry	UPL
Tamarix ramosissima	Salt-cedar	NL
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-beard	NL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Xanthium strumarium	Rough Cockleburr	FAC

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

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

Upland Type 3 - *Pascopyrum smithii/Elymus canadensis* was located on 1.31 acres of upland surrounding the excavated depression, adjacent to MT Highway 12 and within the monitoring boundary. This community replaced upland community Type 1 – *Pascopyrum smithii/Helianthus annuus* due to a shift in species composition and their associated cover classes. The community was dominated by western-wheat grass (*Pascopyrum smithii*), nodding wild rye (*Elymus canadensis*), slender wild rye (*Elymus trachycaulus*), yellow sweet-clover (*Melilotus officinalis*), and Japanese brome (*Bromus japonicus*), and Eastern cottonwood (*Populus deltoides*). Twenty-one other species were observed at five percent or less in this community

Wetland Type 4 – *Puccinellia nuttaliana/Hordeum jubatum* was identified on 0.49 acres within the excavated depression. This community replaced wetland community Type 2 – *Rumex crispus/Eleocharis palustris* due to a shift in species composition and their associated cover classes. Bare ground declined to 11-20% percent of total cover in 2015. A total of 21 species were identified within the community. Common species included Nuttall's alkali grass (*Puccinellia nuttaliana*), fox-tail barley (*Hordeum jubatum*), Japanese brome, tufted hair grass (*Deschampsia caespitosa*), field fluffweed (*Filago arvensis*), clasping pepperwort (*Lepidium perfoliatum*), and curly dock (*Rumex crispus*).

One vegetation transect, T-1, was established at the site that runs perpendicular to the linear excavated wetland. The transect began at a fence post along the northeast boundary of the site, followed an azimuth of 205 degrees for 50 feet, then ended at an existing Eastern cottonwood. A total of 21 species were identified on the transect including seven hydrophytes and 14 upland species. Thirty percent of the transect was located in wetland habitat. Approximately 10 percent of the transect is unvegetated bare ground, a result of increased vegetation establishment following construction activities. Vegetation transect results are detailed on the FNW-Middle Monitoring Form (Appendix B) and are summarized in Table 11 and Charts 5 and 6. Photographs of the transect start and end points are shown on pages C-13 and C-14 in Appendix C.

Infestations of four Priority 2B noxious weeds were identified at the site and included trace (less than 1 percent) cover of field bindweed (*Convolvulus arvensis*), salt-cedar (*Tamarix ramosissima*), and leafy spurge (*Euphorbia esula*) in areas less than 0.1 acre in size, and two small areas (less than 0.1 acre) of Canadian thistle (*Cirsium arvense*) with a trace to low cover class (Figure 6, Appendix A). No woody vegetation was installed within the mitigation wetland. Revegetation efforts at the site included seeding a mixture of wand panic grass (*Panicum virgatum*), American mannagrass (*Glyceria grandis*), Baltic rush (*Juncus balticus*), Nebraska sedge (*Carex nebrascensis*), and Nuttall's alkali grass (*Puccinellia nuttalliana*) following construction disturbance. Several hundred cottonwood seedlings were observed along the margin of the wetland at the apparent edge of early-season inundation during the 2013 field survey. A relatively high percentage of these seedlings were still living during the 2014 and 2015 site visits.

Table 11. Transect 1 data summary for FNW-Middle Site in 2013, 2014, and 2015.

Monitoring Year	2013	2014	2015
Transect Length (feet)	**50**	**50**	**50**
Vegetation Community Transitions along Transect	2	2	2
Vegetation Communities along Transect	2	2	2
Hydrophytic Vegetation Communities along Transect	1	1	1
Total Vegetative Species	16	20	21
Total Hydrophytic Species	6	8	7
Total Upland Species	10	12	14
Estimated % Total Vegetative Cover	40	50	90
Estimated % Unvegetated	60	50	10
% Transect Length Comprising Hydrophytic Vegetation Communities	52	52	30
% Transect Length Comprising Upland Vegetation Communities	48	48	70
% Transect Length Comprising Unvegetated Open Water	0.0	0	0
% Transect Length Comprising Mudflat	0	0	0

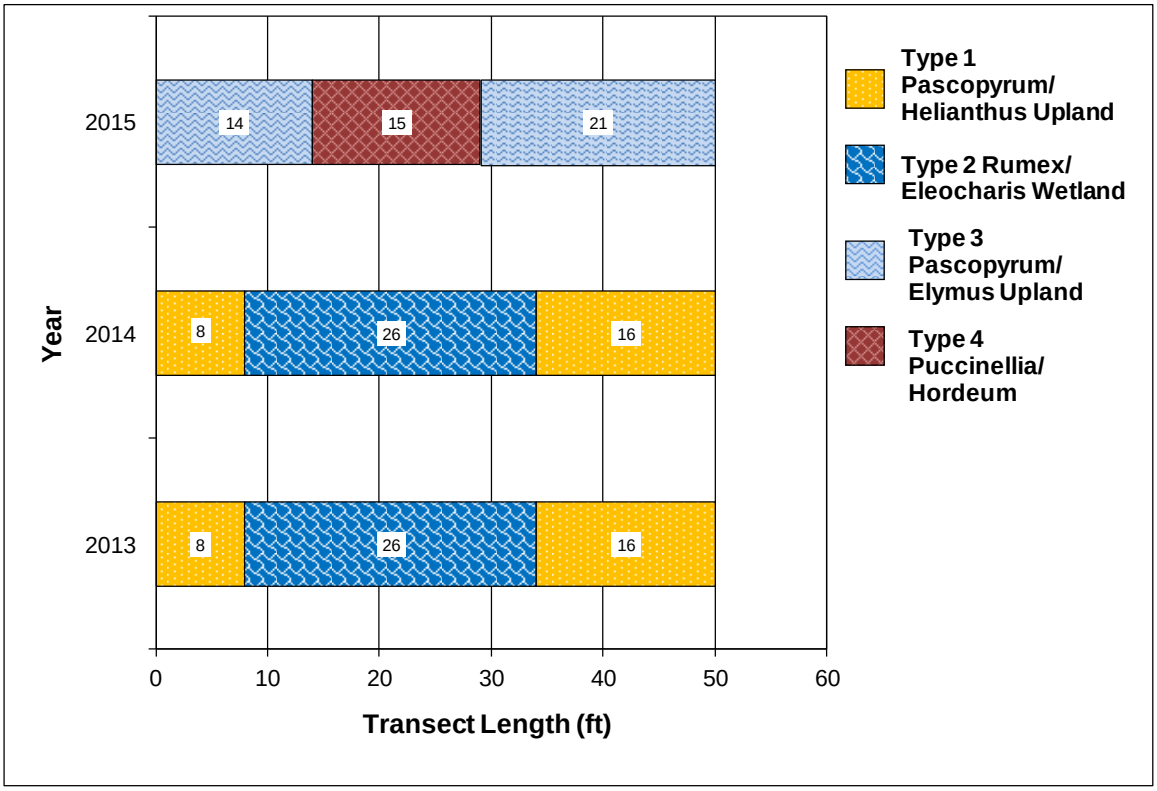

Chart 5. Transect 1 map for FNW-Middle Site showing vegetation types from transect start (0 feet) to finish (50 feet) in 2013, 2014, and 2015.

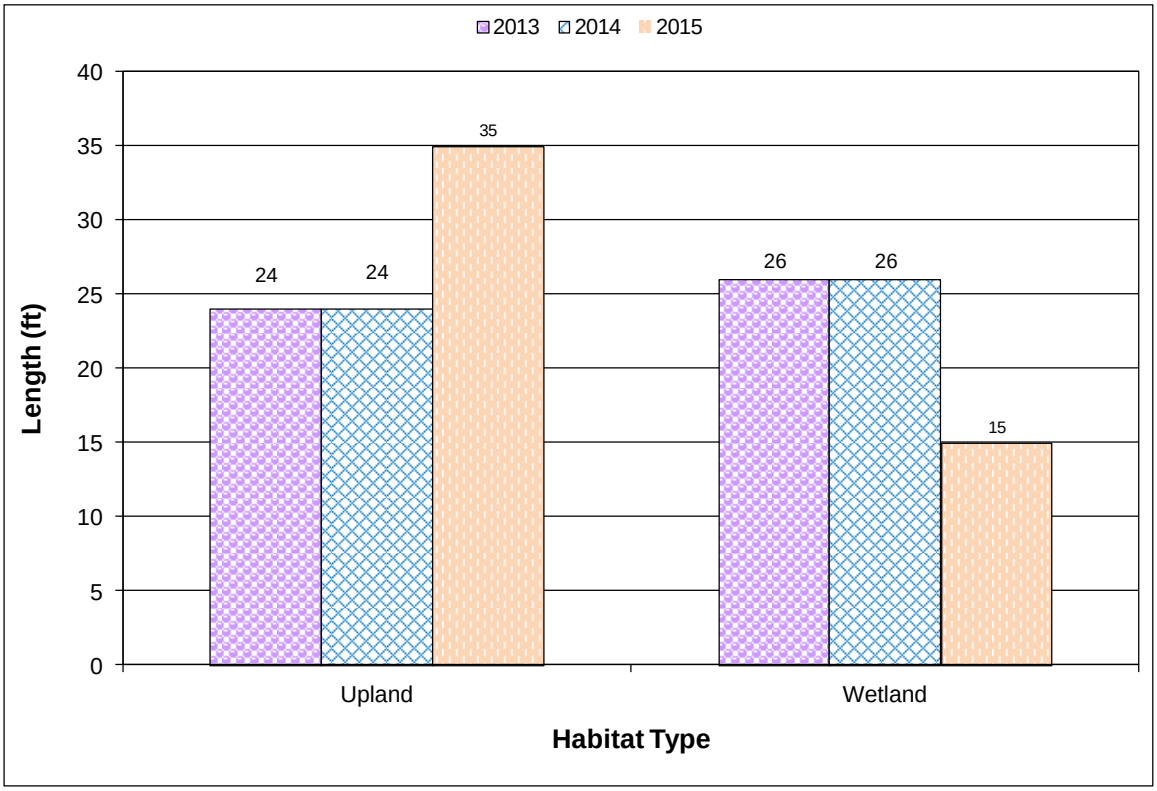

Chart 6. Length of vegetation communities within Transect 1 at FNW-Middle Site in 2013, 2014, and 2015.

3.2.3. Soil

Soils at the FNW-Middle site were mapped in the *Rosebud County Soil Survey* as Harlem silty clay (0 to 2 percent slopes). These very deep well-drained soils are seen on floodplains and are occasionally flooded. This map unit series is identified on the Montana Hydric Soil List (USDA 2010).

Soil test pits were examined at two locations, both within what was originally mapped as the Harlem silty clay soil series (SP1-w and SP2-u, Figure 5, Appendix A). Data point SP1-w was located in an excavated depression near the center of the site, in an area that met the hydric soil criteria. The soil profile revealed a dark grayish brown (10YR 4/2) silty clay with 25 percent strong brown (7.5YR 4/6) redoximorphic concentrations along pore linings. The soil met the criteria for depleted matrix (F3) and classification as a hydric soil. Data point SP2-u was located in upland community Type 3, approximately 10 feet northeast of SP1-w. The soil profile revealed a dark grayish brown (10YR 4/2) silty clay and did not meet the criteria for any hydric soil indicators.

3.2.4. Wetland Delineation

Two data points were used to determine the upland and wetland boundaries in 2015 (Figures 5 and 6, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data Forms (Appendix B). The total acreage of aquatic habitat at the Middle site (2) in 2015

was 0.49 acres within the 1.8-acre project area (Table 12). The floor of the excavated depression was identified as wetland based on the presence of positive wetland hydrology indicators, hydric soil, and the predominance of hydrophytic species. The wetland boundary may extend slightly up the side slopes of the excavated basin in subsequent growing seasons based on the hydrological indicators (seasonal inundation) observed during the field surveys in previous years.

Table 12. Wetland/upland habitat acreages delineated at the FNW-Middle Site in 2013 , 2014, and 2015.

WETLAND AND UPLAND HABITATS	2013 (acres)	2014 (acres)	2015 (acres)
Project Area	1.80	1.80	1.80
Created Wetland	0.49	0.49	0.49
Upland Buffer	1.31	1.31	1.31

3.2.5. Wildlife

A list of wildlife species observed directly and indirectly during the 2013, 2014, and 2015 field survey is shown in Table 13 (Monitoring Form, Appendix B). An Eastern kingbird (*Tyrannus* tyrannus) was identified within the mitigation site.

Table 13. Wildlife species observed at the FNW-Middle Site in 2013, 2014, and 2015.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Frog sp.	
BIRDS	
American Goldfinch	*Spinus tristus*
Common Nighthawk	*Chordeiles minor*
Eastern Bluebird	*Sialia sialis*
Eastern Kingbird	***Tyrannus tyrannus***
Killdeer	*Charadrius vociferus*
Mourning Dove	*Zenaida macroura*
Turkey Vulture	*Cathartes aura*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
MAMMALS	
Coyote	*Canis latrans*
Deer sp.	*Odocoileus* sp.
Raccoon	*Procyon lotor*
REPTILES	
Plains Gartersnake	*Thamnophis radix*

Species identified in 2015 are **bolded**.

3.2.6. Functional Assessment

Results of the 2013, 2014, and 2015 functional assessments are summarized in Table 14. The completed FNW-Middle Wetland Assessment Form is provided in Appendix B. The FNW-Middle site was evaluated as one assessment area and encompassed 0.49 acres. The prominent factor adversely impacting the overall score and functional units at the site in 2013 was the general condition of the AA including high percentage of bare ground, low vegetation cover, and low quality of wildlife habitat. The disturbance rating went from high in 2013 to moderate in 2014 based on the increased vegetation cover in disturbed areas. The Montana-listed S2 species of concern, grand redstem (*Ammannia robusta*), was documented growing within the constructed wetland in 2013 and provided a high MTNHP rating. The flood attenuation rating was modified based on lack of connection to Big Porcupine Creek. The sediment/shoreline stabilization increased in 2015 to reflect the increase in percent cover of wetland species with stability ratings greater than or equal to six. Ratings for general wildlife habitat, general fish/aquatic habitat, sediment/nutrient/toxicant removal, and uniqueness increased from 2014 to 2015 as a result of less disturbance and higher wetland vegetation cover. This site achieved 42.2 percent of the possible score and a total of 1.9 functional units in 2015. Continued development of the vegetation cover will result in increased functional units although the small size of the AA will limit the total score.

Table 14. MWAM summary for the FNW-Middle Site in 2013, 2014, and 2015.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2013	2014	2015
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Low (0.2)	Mod (0.4)	Mod (0.4)
General Fish/Aquatic Habitat	NA	NA	NA
Flood Attenuation	High (1.0)	NA	NA
Short and Long Term Surface Water Storage	Mod (0.6)	Mod (0.6)	Mod (0.6)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	Mod (0.7)	HIgh (0.8)
Sediment/Shoreline Stabilization	Low (0.2)	Low (0.2)	Mod (0.6)
Production Export/Food Chain Support	Low (0.2)	Low (0.3)	Low (0.3)
Groundwater Discharge/Recharge	NA	NA	NA
Uniqueness	Low (0.1)	Low (0.2)	Low (0.2)
Recreation/Education Potential (bonus points)	NA	NA	NA
Actual Points/Possible Points	**3.9 / 9**	**3.3 / 9**	**3.8 / 9**
% of Possible Score Achieved	**43.3%**	**36.7%**	**42.2%**
Overall Category	**III**	**III**	**III**
Total Acreage of Assessed Wetlands within Site	**0.49**	**0.49**	**0.49**
Functional Units (acreage x actual points)	**1.9**	**1.6**	**1.9**

3.2.7. Photo Documentation

Photographs from photo points PP1 and PP2 (Figure 5, Appendix A), the transect start and end points, and wetland determination data points are shown on pages C-11 to C-15 of Appendix C.

3.2.8. Maintenance Needs

Infestations of four Priority 2B noxious weeds, including field bindweed, Canadian thistle, leafy spurge, and salt-cedar, were identified at this site in 2015 (Figure 6, Appendix A) and should be controlled to prevent further spread and colonization. The fence along the mitigation area was in good condition. There were no man-made water control structures or bird boxes installed at this site.

3.2.9. Current Credit Summary

Table 15 shows the total delineated acres and credit acres estimated for the FNW-Middle site in 2013, 2014, and 2015. The 2015 wetland delineation identified 0.49 acres of created emergent wetlands and 1.31 acres of upland buffer, the same acreages identified in 2013 and 2014. The site accrued 0.75 estimated credit acres in 2015. There are no performance standards identified for this site. Four noxious weeds were identified within the mitigation site boundaries yet exhibited very low percent areal cover (1-5%). The percent cover of native hydrophytes was low. The cover of wetland vegetation will increase as favorable wetland conditions persist and as the site recovers from the 2012 construction.

Table 15. Credit summary for the FNW-Middle Site.

Habitat Type	Mitigation Ratio	2013 Delineated Acres	2013 Estimated Credit Acres	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Estimated Credit Acres
Created Wetland	1:1	0.49	0.49	0.49	0.49	0.49	0.49
Upland Buffer	5:1	1.31	0.26	1.31	0.26	1.31	0.26
TOTAL		**1.80**	**0.75**	**1.80**	**0.75**	**1.80**	**0.75**

3.3. East Site – Site 3

3.3.1. Hydrology

The average total annual precipitation recorded at the Forsyth, Montana weather station (243098), from January 1975 to September 2015 was 14.58 inches (WRCC 2015). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year on record at this station. Total precipitation in 2013 totaled 19.47 inches and was the third wettest year on record at this station, exceeding the average by five inches. Total precipitation in 2014 was 18.34 inches. The precipitation between January and August totaled 13.85 inches in 2013, 15.63 inches in 2014, and 7.96 in 2015. Precipitation in both 2013 and 2014 exceeded the long-term average of 10.64 inches for this same period while 2015 was below the long-term average.

This site is very similar to the FNW-Middle site. The main sources of hydrology at this FNW-East are shallow groundwater, direct precipitation, and surface runoff from adjacent uplands. Old meander scars of Big Porcupine Creek with relic and contemporary wetland characteristics are located directly adjacent to the site. The newly excavated depression exhibited signs of inundation persisting for an extended period prior to the field survey. Positive hydrologic indicators observed at this site included oxidized rhizospheres on living roots, surface soil cracks, geomorphic position, and a positive FAC-neutral test. The site was not inundated at the time of the 2015 field survey.

Three data points, SP1-w, SP2-u, and SP3-u were assessed to determine the upland and wetland boundaries (Wetland Determination Data Forms, Appendix B). Data point SP1-w was located in an excavated wetland depression, near the western edge of the site, within an area that met the wetland criteria. Positive indicators of wetland hydrology at this data point included oxidized rhizospheres on living roots, surface soil cracks, geomorphic position, and a positive FAC-neutral test. No signs of wetland hydrology were observed at SP2-u, located approximately 10 feet southwest of SP1-w along the side slope of the excavated basin, above the seasonal saturation zone of the impounded water. No signs of wetland hydrology were observed at SP3-u, located in the excavated wetland depression near the center of the site.

3.3.2. Vegetation

A comprehensive list of 54 species compiled during the 2013, 2014, and 2015 field surveys is presented in Table 16. Two community types were identified and mapped at this site in 2015 (Figure 8, Appendix A) and included upland Type 3 – *Pascopyrum smithii/Elymus* spp. and wetland Type 2 – *Rumex crispus/Eleocharis palustris*. The species composition for each community is included on the FNW-East Monitoring Form (Appendix B) and discussed below.

Table 16. Vegetation species observed at the FNW-East Site in 2013, 2014, and 2015.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	NL
Algae, green	Algae, green	NL
Alisma triviale	Northern Water-Plantain	OBL
Alopecurus pratensis	Field Meadow-Foxtail	FACW
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Artemisia frigida	**Fringed Sage**	**NL**
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	California Brome	NL
Bromus inermis	**Smooth Brome**	**UPL**
Bromus japonicus	**Japanese Brome**	**NL**
Bromus tectorum	Cheatgrass	NL
Chenopodium album	Lamb's-Quarters	FACU
Convolvulus arvensis	Field Bindweed	NL
Descurainia sophia	**Herb Sophia**	**NL**
Echinochloa crus-galli	Large Barnyard Grass	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elymus canadensis	**Nodding Wild Rye**	**FACU**
Elymus repens	Creeping Wild Rye	FACU
Elymus trachycaulus	**Slender Wild Rye**	**FACU**
Elymus sp.	Wild Rye	NL
Filago arvensis	**Field Fluffweed**	**NL**
Glyceria elata	Tall Manna Grass	OBL
Grindelia squarrosa	**Curly-Cup Gumweed**	**UPL**
Helianthus annuus	Common Sunflower	FACU
Hesperostipa comata	Needle-and-Thread	NL
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	Prairie Flax	NL
Medicago sativa	Alfalfa	UPL
Melilotus officinalis	Yellow Sweet-Clover	FACU
Pascopyrum smithii	Western-Wheat Grass	FACU
Poa pratensis	**Kentucky Blue Grass**	**FACU**
Polygonum aviculare	Yard Knotweed	FACU
Populus deltoides	Eastern Cottonwood	FAC
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Ratibida columnifera	Prairie Coneflower	NL
Rumex acetosella	Common Sheep Sorrel	FAC
Rumex crispus	Curly Dock	FAC
Sagittaria cuneata	Arum-Leaf Arrowhead	OBL
Salix amygdaloides	Peach-Leaf Willow	FACW
Salix exigua	Narrow-Leaf Willow	FACW
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Solanum rostratum	Buffalo Bur	NL
Stipa comata	**Needle-and-Thread**	**NL**
Tamarix ramosissima	Salt-cedar	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
***Veronica* sp.**	**Speedwell**	**NL**

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

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

Upland community Type 3 – *Pascopyrum smithii/Elymus* spp. represented the upland areas surrounding the excavated wetland, as well as a newly observed upland area in the center of the excavated depression. This community replaced upland community Type 1 – *Helianthus annuus/Thlaspi arvense* in 2015 as primary colonizing species decreased in dominance and more persistent, perennial plants increased in cover. This 2.28-acre community increased in size by 0.73 acres in 2015 as a result of the contraction of wetland community Type 2. Thirty-five species were identified within the community. Dominant species included western-wheat grass (*Pascopyrum smithii*), nodding wild rye (*Elymus canadensis*), slender wild rye (*Elymus trachycaulus*), yellow sweet-clover (*Melilotus officinalis*), and Japanese brome (*Bromus japonicus*).

Wetland Type 2 - *Rumex crispus/Eleocharis palustris* was identified on 0.46 acres within the excavated depression in the east and west portions of the site. This community decreased in size by 0.73 acres as a result of changes in species composition and their associated cover classes. Twenty-three species were identified within the community. The community was dominated by curly dock (*Rumex crispus*), common spike-rush (*Eleocharis palustris*), and western-wheat grass. Other species observed included saltmarsh clubrush (*Schoenoplectus maritimus*), fox-tail barley (*Hordeum jubataum*), field meadow-foxtail (*Alopecurus pratensis*), and Kentucky blue grass (*Poa pratensis*). Grand redstem (*Ammannia robusta*) was identified in trace amounts in the wetland community in 2013 but not observed in 2014 or 2015. Seedlings of various willows (*Salix exigua* and *Salix amygdaloides*) and cottonwood (*Populus deltoides*) were also present within this community in 2015.

Vegetation cover was measured along two transects, one on each end of the FNW-East site (Figure 7, Appendix B). The data recorded for Transects 1 and 2 are detailed on the FNW-East Monitoring Form (Monitoring Forms, Appendix B) and summarized in Tables 17 and 18 and Charts 7 through 10. Photographs of the transect start and end points are shown on pages C-19 to C-22 in Appendix C.

Vegetation Transect 1, T-1, located at the northwest end of the site, extends 125 feet. This transect begins at the fenced boundary in upland community Type 3 – *Pascopyrum smithii/Elymus* spp., crosses wetland community Type 2 - *Rumex crispus/Eleocharis palustris*, and terminates in upland community Type 3 (Chart 7). Twenty-six species, including eight hydrophytes and 18 upland species, were identified along the transect in 2015, an increase of two species since 2014. Wetland habitat along this transect is not expected to increase considerably due to the distinct topographic break defining the wetland boundary.

Table 17. Transect 1 data summary for FNW-East Site in 2013, 2014, and 2015.

Monitoring Year	2013	2014	2015
Transect Length (feet)	**125**	**125**	**125**
Vegetation Community Transitions along Transect	2	2	2
Vegetation Communities along Transect	2	2	2
Hydrophytic Vegetation Communities along Transect	1	1	1
Total Vegetative Species	16	24	26
Total Hydrophytic Species	5	7	8
Total Upland Species	11	17	18
Estimated % Total Vegetative Cover	40	40	90
Estimated % Unvegetated	60	60	10
% Transect Length Comprising Hydrophytic Vegetation Communities	51.2	52	50
% Transect Length Comprising Upland Vegetation Communities	48.8	48	50
% Transect Length Comprising Unvegetated Open Water	0.0	0	0
% Transect Length Comprising Mudflat	0	0	0

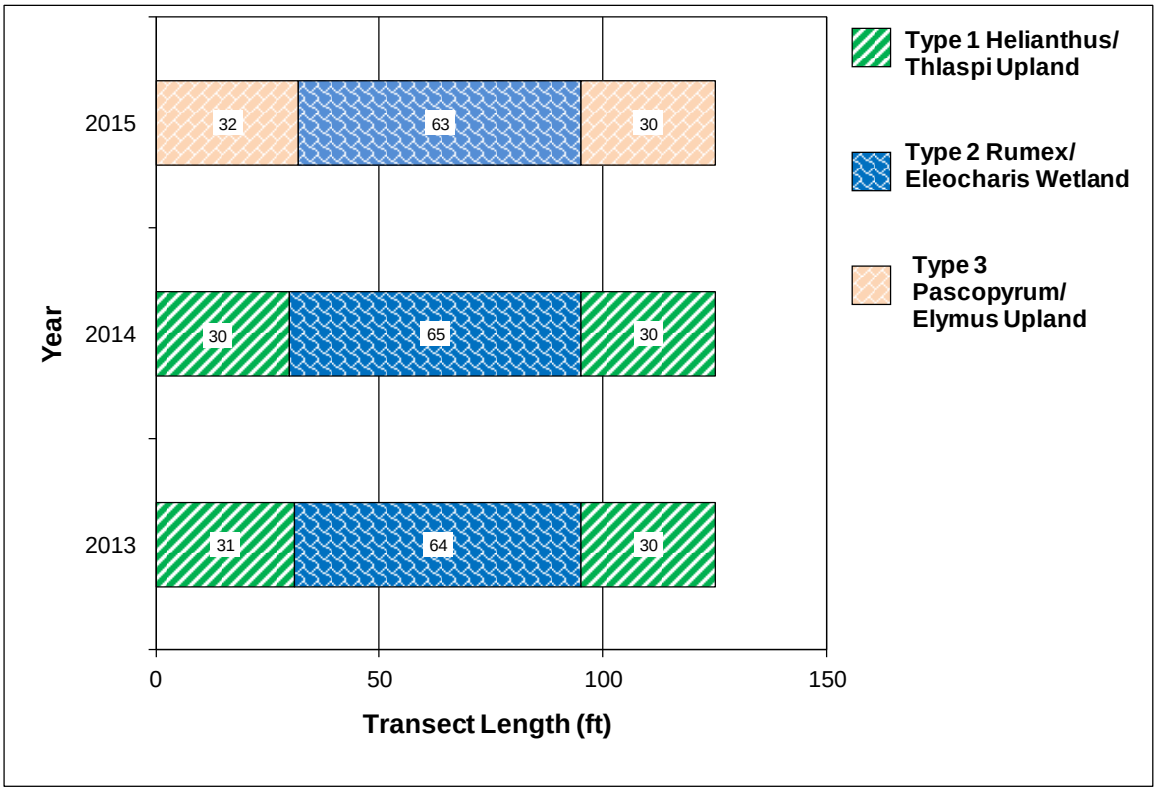

Chart 7. Transect 1 map for FNW-East Site showing vegetation types from transect start (0 feet) to finish (125 feet) in 2013, 2014, and 2015.

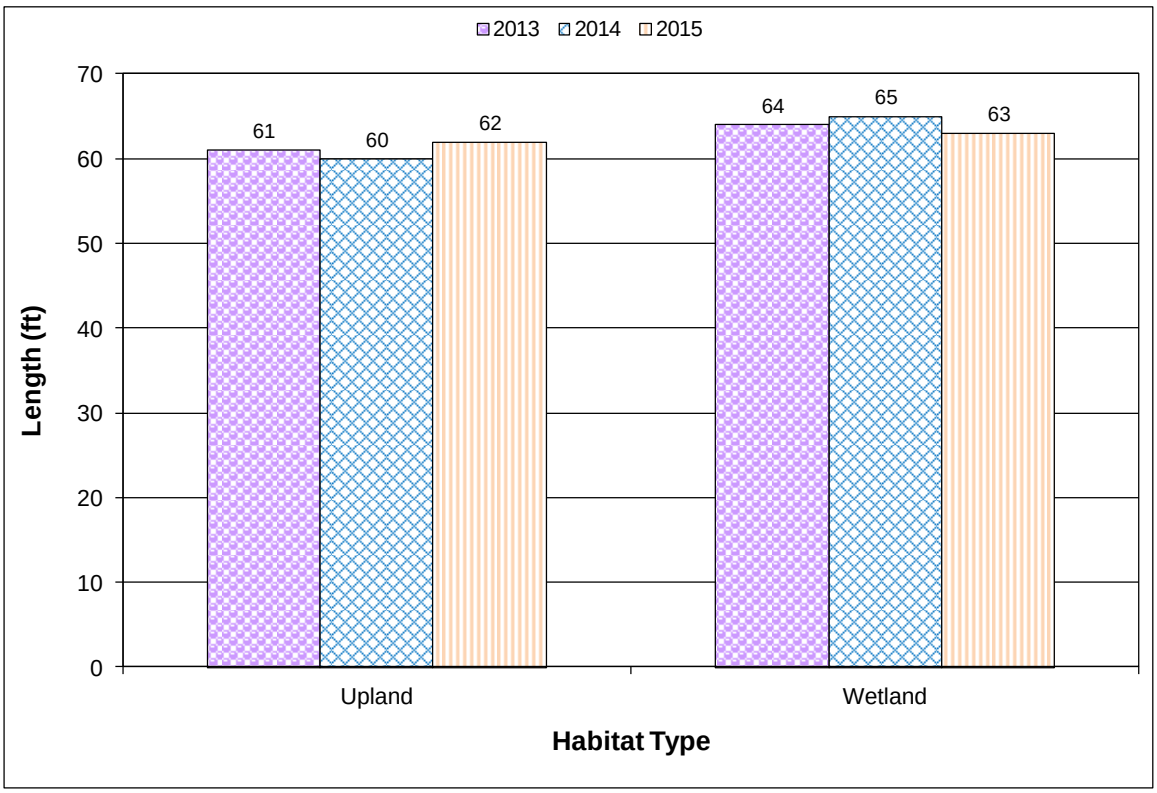

Chart 8. Length of vegetation communities within Transect 1 for FNW-East Site in 2013, 2014, and 2015.

Vegetation Transect 2, T-2, is very similar to T-1, and located at the southeast end of the site. This transect begins at the fenced boundary in upland community Type 3 – *Pascopyrum smithii/Elymus* spp., crosses wetland community Type 2 - *Rumex crispus/Eleocharis palustris*, and terminates in upland community Type 3 (Chart 9). A total of 26 species, including eight hydrophytes and 18 upland species, were identified along this 181-foot transect. Although total vegetative cover along the transect increased from 55 percent in 2014 to 90 percent in 2015, wetland habitat decreased substantially as a result of the wetland boundary contraction.

Table 18. Transect 2 data summary for FNW-East Site in 2013, 2014, and 2015.

Monitoring Year	2013	2014	2015
Transect Length (feet)	**181**	**181**	**181**
Vegetation Community Transitions along Transect	2	2	2
Vegetation Communities along Transect	2	2	2
Hydrophytic Vegetation Communities along Transect	1	1	1
Total Vegetative Species	12	24	26
Total Hydrophytic Species	5	9	8
Total Upland Species	7	15	18
Estimated % Total Vegetative Cover	40	55	90
Estimated % Unvegetated	60	45	10
% Transect Length Comprising Hydrophytic Vegetation Communities	63	63	44
% Transect Length Comprising Upland Vegetation Communities	37	37	56
% Transect Length Comprising Unvegetated Open Water	0.0	0	0
% Transect Length Comprising Mudflat	0	0	0

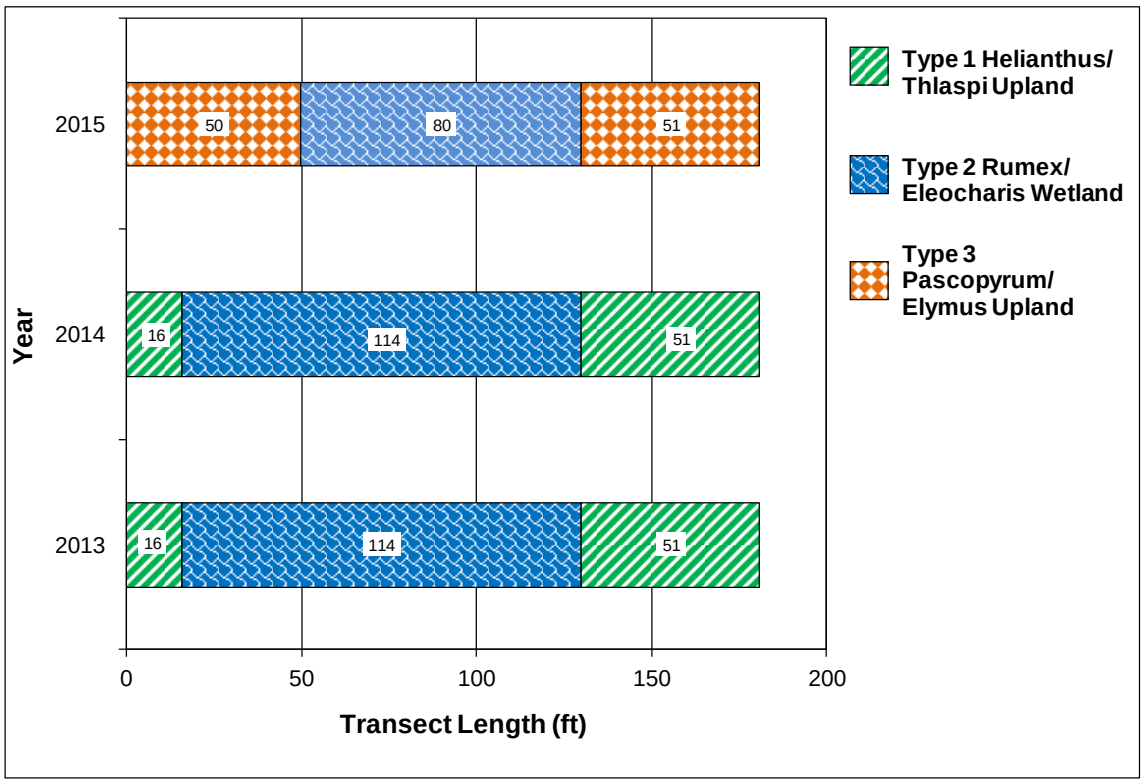

Chart 9. Transect 2 map for FNW-East Site showing vegetation types from transect start (0 feet) to finish (181 feet) in 2013, 2014, and 2015.

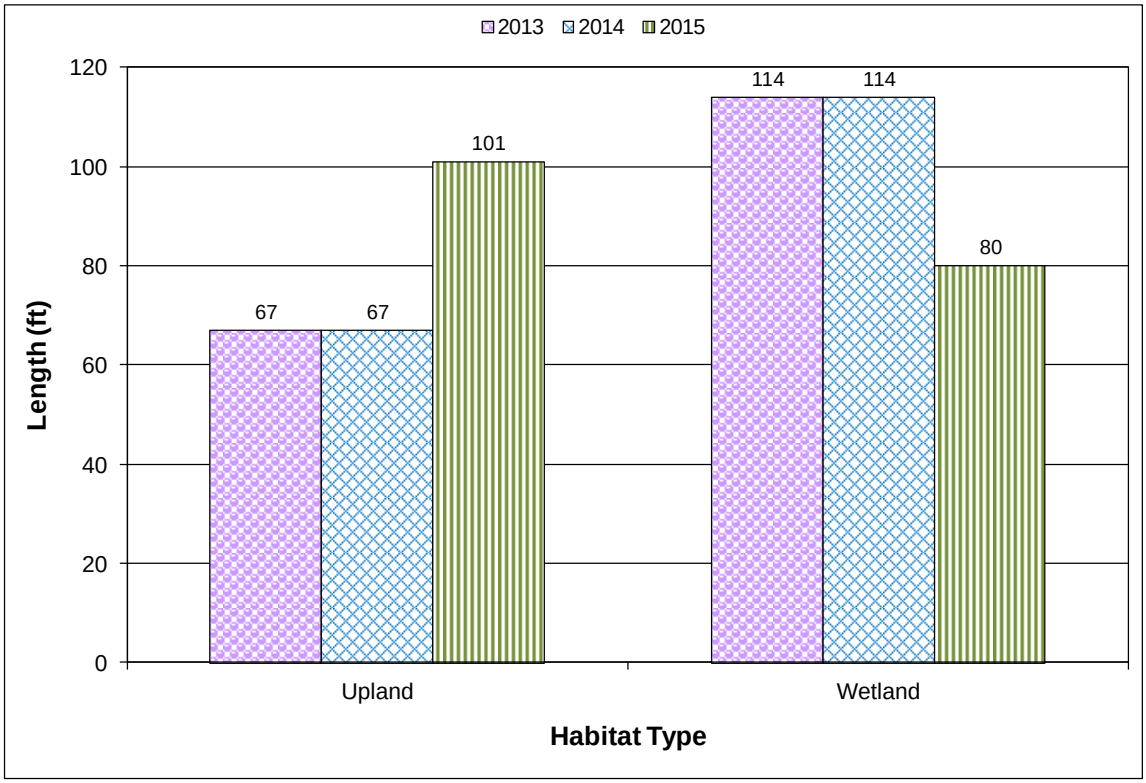

Chart 10. Length of vegetation communities within Transect 2 for FNW-East Site in 2013, 2014, and 2015.

Infestations of two Priority 2B noxious weeds, including field bindweed (*Convolvulus arvensis*) and salt-cedar (*Tamarix ramosissima*), were mapped in five locations, shown on Figure 8 (Appendix A). Field bindweed was identified in three locations of less than 0.1 acre in size with a trace (less than 1 percent) to moderate cover class (6 to 25 percent). Two infestations of salt-cedar seedlings, less than 0.1 acre in size with a trace cover class (less than 1 percent), were present in the project area. Although the site was seeded with hydrophytic species following construction, it has continued to exhibit increased areal coverage by upland plant species and decreased hydrophytic vegetation development within the constructed basin; likely a result of below-average precipitation levels in 2015. No woody plants were installed at FNW-East. Mature cottonwoods and willows in the area appear to be providing natural regeneration of cottonwoods and willows as seedlings of both genera were documented within the wetland community.

3.3.3. Soil

Soils at the FNW-East site were mapped in the *Rosebud County Soil Survey* as Harlem silty clay (0 to 2 percent slopes). These very deep well-drained soils are seen on floodplains and are occasionally flooded. This map unit series is identified on the Montana Hydric Soil List (USDA 2010).

Soil test pits were examined at three locations, all within what was originally mapped as the Harlem silty clay soil series (SP1-w, SP2-u, and SP3-u; Figure 7, Appendix A). Data point SP1-w was located in an excavated wetland depression, near the western edge of the site, within an area that met the wetland criteria. The soil profile revealed a dark grayish brown (10YR 4/2) silty clay with five percent pale brown (10YR 6/3) redoximorphic concentrations along pore linings. The soil met the criteria for depleted matrix (F3) and classification as a hydric soil. Data point SP2-u was located approximately 10 feet southwest of SP1-w along the side slope of the excavated basin, in the adjacent uplands. The soil profile revealed a dark grayish brown (10YR 4/2) silty clay and did not meet the criteria for any hydric soil indicators. Data point SP3-u was located in the excavated wetland depression near the center of the site. The soil profile revealed a very dark grayish brown (2.5Y 3/2) silty clay and did not meet the criteria for any hydric soil indicators.

3.3.4. Wetland Delineation

Three data points were evaluated in 2015 to determine the wetland and upland boundaries at the site (FNW-East Figures 7 and 8, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data Forms (Appendix B). The total acreage of aquatic habitat at the East site (3) in 2015 was 0.46 acres, a decrease of 0.73 acres since 2014. The upland area expanded to 2.28 acres (Table 19) within the project boundary. The wetland acreage contraction was likely a result of the below-average precipitation

received in 2015, as the main sources of hydrology at this site are primarily precipitation driven.

Table 19. Wetland/upland habitat acreages delineated at the FNW-East Site in 2013, 2014, and 2015.

WETLAND AND UPLAND HABITATS	2013 (acres)	2014 (acres)	2015 (acres)
Project Area	2.74	2.74	2.74
Created Wetland	1.19	1.19	0.46
Upland Buffer	1.55	1.55	2.28

3.3.5. Wildlife

A list of wildlife species observed directly and indirectly at the site during the field survey in 2013, 2014, and 2015 is presented in Table 20 and the monitoring form (Appendix B). Three bird species were observed within or directly over the mitigation site in 2015 and included American robin (*Turdus migratorius*), bald eagle (*Haliaeetus leucocephalus*), and western meadowlark (*Sturnella neglecta*). One western hog-nosed snake (*Heterodon nasicus*), a Montana-listed S2 species of concern, and the tracks of deer (*Odocoileus* sp.) were observed at this site.

Table 20. Wildlife species observed at the FNW-East Site in 2013, 2014, and 2015.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Northern Leopard Frog	*Rana pipiens*
BIRDS	
American Goldfinch	*Spinus tristus*
American Robin	***Turdus migratorius***
Bald Eagle	***Haliaeetus leucocephalus***
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Cliff Swallow	*Petrochelidon pyrrhonota*
Common Nighthawk	*Chordeiles minor*
Eastern Kingbird	*Tyrannus tyrannus*
Killdeer	*Charadrius vociferus*
Lark Sparrow	*Chondestes grammacus*
Mourning Dove	*Zenaida macroura*
Red-winged Blackbird	*Agelaius phoeniceus*
Turkey Vulture	*Cathartes aura*
Vesper Sparrow	*Pooecetes gramineus*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	***Sturnella neglecta***
Western Sandpiper	*Calidris mauri*
MAMMALS	
Coyote	*Canis latrans*
Deer sp.	***Odocoileus* sp.**
Raccoon	*Procyon lotor*
REPTILES	
Western Hog-nosed Snake	***Heterodon nasicus***

Species identified in 2015 are **bolded**.

3.3.6. Functional Assessment

Results of the 2013, 2014, and 2015 functional assessments are summarized in Table 21. The completed FNW-East Wetland Assessment Form is included in Appendix B. The total aquatic habitat developed to date within the 2.74-acre project area is 0.46 acres. The site was evaluated as one assessment area. The AA was rated as a Category III wetland with 48.89 percent of the total possible points. The Montana-listed S2 species of concern, grand redstem and western hog-nosed snake were documented in 2013 and 2015, respectively, and provided a high MTNHP species habitat rating. The disturbance rating improved from high in 2013 to moderate in 2014 and 2015. Sediment/shoreline stabilization improved from a low to moderate rating in 2015 due to an increase in percent cover of wetland species with stability ratings greater than or equal to six. Short and long term surface water storage was given a low rating in 2015 as a result of the decrease in water contained in the AA's wetlands subject to periodic flooding/ponding. The site achieved 2.0 functional units, a decrease of 3.1 units since 2014. The decrease in functional units was primarily related to the wetland acreage contraction, which was likely driven by the below-average precipitation received at the site during 2015.

3.3.7. Photo Documentation

Photographs of photo points PP1 to PP3, the transect start and end points, and the wetland determination data points (Figure 7, Appendix A) are shown on pages C-16 through C-23 in Appendix C.

Table 21. MWAM Summary for the FNW-East Site in 2013, 2014, and 2015.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2013	2014	2015
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Low (0.2)	Mod (0.4)	Mod (0.4)
General Fish/Aquatic Habitat	NA	NA	NA
Flood Attenuation	NA	NA	NA
Short and Long Term Surface Water Storage	Mod (0.6)	Mod (0.6)	Low (0.3)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Low (0.2)	Low (0.2)	Mod (0.6)
Production Export/Food Chain Support	Low (0.2)	Low (0.3)	Low (0.3)
Groundwater Discharge/Recharge	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.1)	Low (0.2)	Low (0.2)
Recreation/Education Potential (bonus points)	NA	NA	NA
Actual Points/Possible Points	**3.6 / 9**	**4.3 / 9**	**4.4 / 9**
% of Possible Score Achieved	**40.0%**	**47.8%**	**48.9%**
Overall Category	**III**	**III**	**III**
Total Acreage of Assessed Wetlands within Site	**1.19**	**1.19**	**0.46**
Functional Units (acreage x actual points)	**4.3**	**5.1**	**2.0**

3.3.8. Maintenance Needs

Infestations of two Priority 2B noxious weeds, including field bindweed (*Convolvulus arvensis*) and salt-cedar (*Tamarix ramosissima*), were mapped in five locations, shown on Figure 8 (Appendix A). Field bindweed was identified in three locations of less than 0.1 acre in size with a trace (less than 1 percent) to moderate cover class (6 to 25 percent). Two infestations of salt-cedar seedlings, less than 0.1 acre in size with a trace cover class (less than 1 percent), were present in the project area. These infestations should be controlled to prevent further colonization and establishment. The recently constructed fence along the site was in good-working order. There were no man-made water control structures installed at FNW-East.

3.3.9. Current Credit Summary

The wetland acreage delineated in 2015 totaled 0.46 acres, a decrease of 0.73 acres since 2014. This decrease was likely driven by the below-average precipitation received at the site during 2015. It is expected, following a return to higher precipitation levels in subsequent monitoring years, the site will exhibit increased desirable hydrophytic vegetation cover and an expansion of wetland acreage. Upland buffer accounted for 2.28 acres within the FNW-East monitoring boundary. Applying standard wetland compensatory mitigation ratios (Montana Regulatory Program, April 2005), the site attained an estimated 0.92 credit acres, a decrease of 0.58 credit acres since 2014 (Table 22). There are no established performance standards for this site.

Table 22. Credit summary for the FNW-East Site.

Habitat Type	Mitigation Ratio	2013 Delineated Acres	2013 Estimated Credit Acres	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Credit Acres
Created Wetland	1:1	1.19	1.19	1.19	1.19	0.46	0.46
Upland Buffer	5:1	1.55	0.31	1.55	0.31	2.28	0.46
Total		**2.74**	**1.50**	**2.74**	**1.50**	**2.74**	**0.92**

3.4. Treasure County Line Site – Site 4

3.4.1. Hydrology

The average total annual precipitation recorded at the Forsyth, Montana weather station (243098), from January 1975 to September 2015 was 14.58 inches (WRCC 2015). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year on record at this station. Total precipitation in 2013 totaled 19.47 inches and was the third wettest year on record at this station, exceeding the average by five inches. Total precipitation in 2014 was 18.34. The precipitation between January and August totaled 13.85 inches in 2013, 15.63 inches in 2014, and 7.96 in 2015. Precipitation in both 2013 and 2014 exceeded the long-term average of 10.64 inches for this same period while 2015 was below the long-term average.

The FNW-Treasure Co Line site was constructed in 1999 adjacent to an existing wetland along Reservation Creek. The main source of wetland hydrology is a perennial high groundwater table. Occasional overbank flooding, direct precipitation and surface water runoff provide additional hydrologic contributions. Approximately 90 percent of the wetland was inundated during the 2015 survey, with the remaining wetland area exhibiting saturation to the surface. Hydrologic indicators recorded at this site include surface water, saturation, and hydrogen sulfide odor, salt crust, saturation visible on aerial imagery, geomorphic position, and a positive FAC-neutral test.

Two data points, SP1-w and SP2-u were assessed to determine the upland and wetland boundaries (Wetland Determination Data Forms, Appendix B). Data point SP1-w was located near the northeastern project boundary in a newly observed wetland area that successfully met all three wetland criteria. Positive wetland hydrology indicators recorded at this data point included saturation to the soil surface, hydrogen sulfide odor, salt crust, geomorphic position, saturation visible on aerial imagery, and a positive FAC-neutral test. The wetland had standing water in areas, such as pugs from hoof prints. No primary or secondary indicators of wetland hydrology were observed at SP2-u, located approximately 13 feet south-southeast of SP1-w, in upland community Type 5.

3.4.2. Vegetation

A comprehensive list of 47 species identified during the 2013, 2014, and 2015 field surveys in presented in Table 23. Two upland communities and one wetland vegetation community were identified and mapped at the FNW-Treasure Co Line site (Figure 10, Appendix A). These communities included upland Type 4 – *Artemisia cana/Bromus japonicus*, upland Type 5 – *Pascopyrum smithii/Bromus japonicus*, and wetland Type 3 – *Schoenoplectus* spp. The species composition for each community is included on the FNW-Treasure Co Line Monitoring Form (Appendix B) and discussed below.

Table 23. Vegetation species observed at the FNW-Treasure County Line Site in 2013, 2014, and 2015.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	NL
Algae, green	Algae, green	NL
Alopecurus pratensis	**Field Meadow-Foxtail**	**FACW**
Artemisia cana	**Coaltown Sagebrush**	**FACU**
Artemisia tridentata	Big Sagebrush	NL
Asclepias speciosa	Showy Milkweed	FAC
Bassia scoparia	Mexican-Fireweed	FACU
Bromus japonicus	**Japanese Brome**	**NL**
Bromus tectorum	Cheatgrass	NL
***Carex* sp.**	**Sedge**	**NL**
Chenopodium album	Lamb's-Quarters	FACU
Cirsium arvense	Canadian Thistle	FACU
Cirsium vulgare	Bull Thistle	UPL
Distichlis spicata	**Coastal Salt Grass**	**FACW**
Elaeagnus angustifolia	Russian-Olive	FACU
Eleocharis palustris	**Common Spike-Rush**	**OBL**
Elymus canadensis	Nodding Wild Rye	FACU
Elymus junceus	**Russian Wildrye**	**NL**
Elymus repens	**Creeping Wild Rye**	**FACU**
Filago arvensis	**Field Fluffweed**	**NL**
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Lycopus asper	**Rough Water-Horehound**	**OBL**
Medicago sativa	Alfalfa	UPL
Melilotus officinalis	Yellow Sweet-Clover	FACU
Opuntia polyacantha	Plains Pricklypear	NL
Panicum capillare	Common Panic Grass	FAC
Pascopyrum smithii	**Western-Wheat Grass**	**FACU**
Poa pratensis	Kentucky Blue Grass	FACU
Polygonum majus	**Wiry Knotweed**	**NL**
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Rumex crispus	Curly Dock	FAC
Salicornia rubra	**Red Saltwort**	**OBL**
Schedonorus pratensis	Meadow False Rye Grass	FACU
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Sonchus arvensis	Field Sow-Thistle	FAC
Sporobolus airoides	**Alkali-Sacaton**	**FAC**
Symphoricarpos albus	Common Snowberry	UPL
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	**Field Pennycress**	**FACU**
Tragopogon dubius	Meadow Goat's-beard	NL
Typha latifolia	Broad-Leaf Cat-Tail	OBL

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

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

Upland community Type 4 – *Artemisia cana/Bromus japonicus* was mapped across 1.91 acres within the upland perimeter of the monitoring area. This community replaced upland community Type 1 – *Artemisia tridentata/Chenopodium album* due to a shift in species composition and their associated cover classes. Coaltown sagebrush (*Artemisia cana*), Japanese brome (*Bromus japonicus*), clasping pepperwort (*Lepidium perfoliatum*), western-wheat grass (*Pascopyrum smithii*), Mexican-fireweed (*Bassia scoparia*), fox-tail barley (*Hordeum jubatum*), Kentucky bluegrass (*Poa pratensis*), and 20 other species were identified in this community.

Upland community Type 5 – *Pascopyrum smithii/Bromus japonicus* was identified across 2.31 acres in upland areas not dominated by Coaltown sagebrush. This community replaced upland community Type 2 – *Elymus canadensis/Bromus tectorum* as a result of changes in species composition and their associated cover classes. Thirty species were identified within the community. Dominant species included Japanese brome, western-wheat grass, and Russian wildrye (*Elymus junceus*). This community was also identified on the two upland islands that remained intact during construction at this site.

Wetland community Type 3 – *Schoenoplectus* spp. was mapped across 1.67 acres within the excavated wetland cell as well as a newly observed wetland area near the northeastern project boundary. The community was dominated by three-square club-rush (*Schoenoplectus pungens*), with lesser amounts of saltmarsh club-rush (*Schoenoplectus maritimus*), fox-tail barley, broad-leaf cat-tail (*Typha latifolia*), coastal salt grass (*Distichlis spicata*), common spike-rush (*Eleocharis palustris*) and 21 other species. Approximately 90 percent of this community was inundated to an average depth of 0.4 feet.

Vegetation cover was measured along one transect at the FNW-Treasure Co Line Mitigation Site in 2015 (Figure 9, Appendix A). The data recorded on Transect 1 (Monitoring Forms, Appendix B) are summarized in tabular and graphical formats in Table 24 and Charts 11 and 12. Photographs of the transect start and end points are shown on pages C-28 and C-29 in Appendix C.

Vegetation Transect 1, T-1, located near the center of the site, starts at the fence line along the northern mitigation boundary, extends approximately 534 feet across the excavated wetland and one of the upland islands, and terminates along the southern boundary of the monitoring area. Transect intervals alternated between wetland community Type 3 – *Schoenoplectus* spp. and upland community Type 5 – *Pascopyrum smithii/Bromus japonicus*. Approximately 43 percent of the transect was dominated by hydrophytic vegetation in 2015, an increase of 13.8 percent since 2014. Thirty species were identified along the transect, including 10 hydrophytes and 20 upland species.

Table 24. Transect 1 data summary for the FNW-Treasure County Line Site in 2013, 2014, and 2015.

Monitoring Year	2013	2014	2015
Transect Length (feet)	**534**	**534**	**534**
Vegetation Community Transitions along Transect	4	4	5
Vegetation Communities along Transect	2	2	2
Hydrophytic Vegetation Communities along Transect	1	1	1
Total Vegetative Species	19	22	30
Total Hydrophytic Species	6	7	10
Total Upland Species	13	15	20
Estimated % Total Vegetative Cover	95	95	90
Estimated % Unvegetated	5	5	10
% Transect Length Comprising Hydrophytic Vegetation Communities	29.2	29.2	43
% Transect Length Comprising Upland Vegetation Communities	70.8	70.8	57
% Transect Length Comprising Unvegetated Open Water	0	0	0
% Transect Length Comprising Mudflat	0	0	0

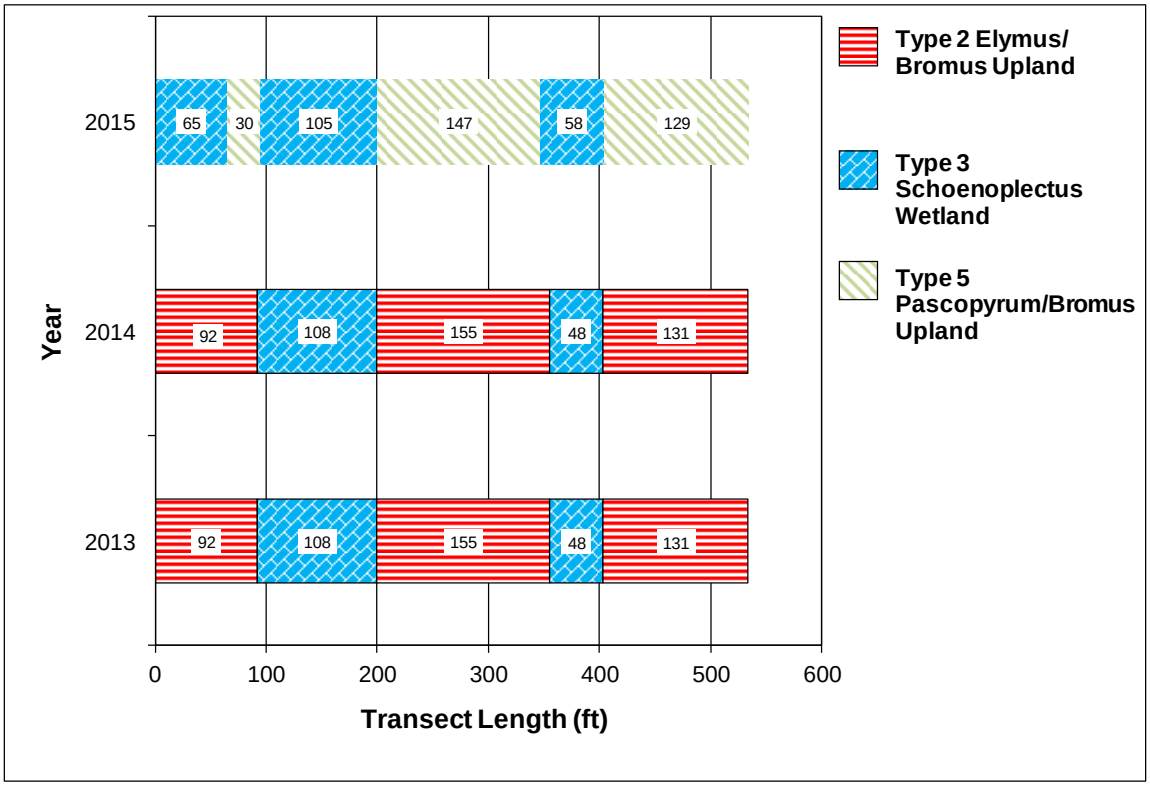

Chart 11. Transect 1 map for the FNW-Treasure County Line Site showing vegetation types from transect start (0 feet) to finish (534 feet)in 2013, 2014, and 2015.

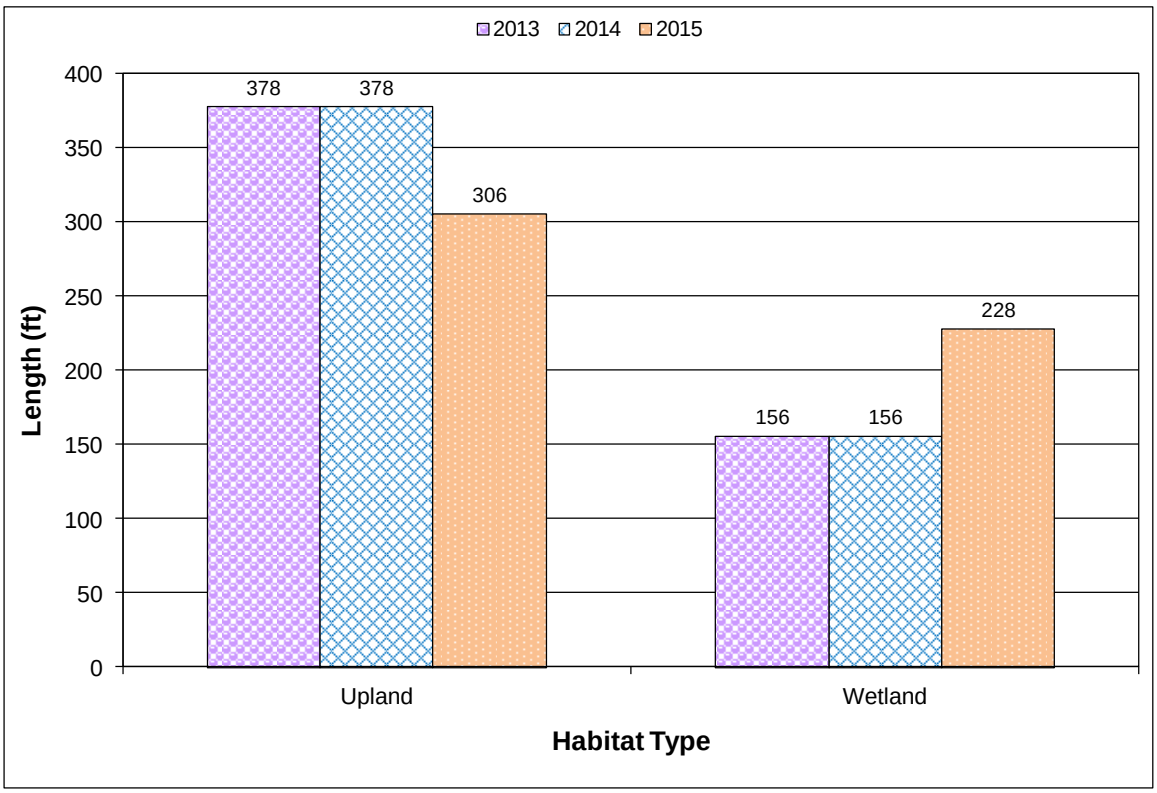

Chart 12. Length of vegetation communities within Transect 1 at the FNW-Treasure County Line Site in 2013, 2014, and 2015.

Three infestations of Canadian thistle (*Cirsium arvense*), a Priority 2B noxious weed, were identified within this site in 2015 and mapped on Figure 10 (Appendix A). The size of infestations ranged from less than 0.1-acre to 1 acre with a cover class that ranged from low (1 to 5 percent) to moderate (6 to 25 percent). No woody vegetation was installed at this site.

3.4.3. Soil

Soils on the site were mapped in the *Rosebud County Soil Survey* as Borollic Camborthids-Ustic Torrifluvents complex (0 to 8 percent slope) in the northeast corner of the site, Marvan silty clay. (2 to 8 percent slope) in the center of the site, and Gerdrum-Marvan silty clays (2 to 8 percent slope) in the western half of the mitigation area. The Borollic Camborthids-Ustic Torrifluvents complex and Marvan sitly clay map units are located on the National Hydric Soil List (2012) and also on the Montana Hydric Soil List (USDA 2010). The Gerdrum and Marvan series consist of very deep well-drained fine-textured soils developed in alluvium or glacial fluvial deposits.

Soil test pits were excavated at two locations, both within what was originally mapped as the Borollic Camborthids-Ustic Torrifluvents complex (SP1-w and SP2-u, Figure 9, Appendix A). Data point SP1-w was located near the northeastern project boundary in a newly observed wetland area that successfully met all three wetland criteria. The soil profile revealed a dark grayish

brown (10YR 4/2) clay with 15 percent gray (10YR 5/1) depletions and 5 percent dark yellowish brown (10YR 4/6) redoximorphic concentrations in the matrix. The soil met the criteria for hydrogen sulfide (A4), depleted matrix (F3), and redox depressions (F8). Data point SP2-u was located approximately 13 feet south-southeast of SP1-w, in upland community Type 5. The soil profile revealed a dark grayish brown (10YR 4/2) clay and no observation of hydric soil indicators.

3.4.4. Wetland Delineation

Two data points were evaluated in 2015 to determine the wetland and upland boundaries at the site (FNW-Treasure County Line Figures 9 and 10, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data Forms (Appendix B). The delineation identified 1.67 acres of wetland and 4.22 acres of upland buffer (Table 25). The excavated wetland basin supports a diversity of hydrophytic species and through observation of inundation during 2013, 2014 and 2015 site visits, this area is likely perennially inundated. This wetland mitigation area is adjacent to a pre-existing natural wetland and has effectively increased the size of the overall wetland complex. The wetland boundary expanded in 2015 by 0.17 acres to include a newly observed wetland area near the northeastern project boundary, outside of the excavated wetland basin.

Table 25. Wetland/upland habitat acreages delineated at the FNW-Treasure County Line Site in 2013, 2014, and 2015.

WETLAND AND UPLAND HABITATS	2013 (acres)	2014 (acres)	2015 (acres)
Project Area	5.89	5.89	5.89
Created Wetland	1.50	1.50	1.67
Upland Buffer	4.39	4.39	4.22

3.4.5. Wildlife

A list of wildlife species observed directly and indirectly at the site in 2013, 2014, and 2015 is presented in Table 26. Wildlife signs observed and bird activity codes were recorded on the Monitoring Form in Appendix B. Five bird species were identified, including a Northern harrier (*Circus cyaneus),* red-tailed hawk (*Buteo jamaicensis*), red-winged blackbird (*Agelaius pheniceus*), western meadowlark (*Sturnella neglecta*), and Wilson's snipe (*Gallinago delicata*). A frog species and the tracks of a muskrat were observed during the 2015 field survey.

Table 26. Wildlife species observed at the FNW-Treasure County Line Site in 2013, 2014, and 2015.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Frog sp.	***Rana* sp.**
Northern Leopard Frog	*Rana pipiens*
BIRDS	
American Goldfinch	*Spinus tristus*
Cliff Swallow	*Petrochelidon pyrrhonota*
Eastern Kingbird	*Tyrannus tyrannus*
Great Blue Heron	*Ardea herodias*
Mourning Dove	*Zenaida macroura*
Northern Harrier	***Circus cyaneus***
Red-tailed Hawk	***Buteo jamaicensis***
Red-winged Blackbird	***Agelaius phoeniceus***
Sandhill Crane	*Grus canadensis*
Song Sparrow	*Melospiza melodia*
Western Meadowlark	***Sturnella neglecta***
Wilson's Snipe	***Gallinago delicata***
MAMMALS	
Coyote	*Canis latrans*
Muskrat	***Ondatra zibethicus***

Species identified in 2015 are **bolded**.

3.4.6. Functional Assessment

Results of the 2013, 2014, and 2015 functional assessments are summarized in Table 27 and the completed FNW-Treasure County Line form is included in Appendix B. The total aquatic habitat developed to date within the 5.89-acre project area is 1.67 acres. The FNW-Treasure County Line site was evaluated as one assessment area (AA) that encompasses the entire constructed wetland. The AA was rated as a Category III wetland with 59.44 percent of the total possible points and 8.9 functional units. Ratings for general wildlife habitat, production export/food chain support, and uniqueness decreased in 2015 as a result of the change in disturbance rating from low to moderate. The AA was given a moderate disturbance rating due to the observation of moderate grazing that had occurred earlier in the spring of 2015. The site received high ratings for short/long term surface water storage, sediment/nutrient/toxicant removal, groundwater discharge/recharge and recreation/education potential, and moderate ratings for MTNHP species habitat, general wildlife habitat, flood attenuation, and production export/food chain support.

Table 27. MWAM Summary for the FNW-Treasure County Line Site in 2013, 2014, and 2015.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2013	2014	2015
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Mod (0.6)	Mod (0.6)	Mod (0.6)
General Wildlife Habitat	Mod (0.7)	High (0.9)	Mod (0.7)
General Fish/Aquatic Habitat	NA	NA	NA
Flood Attenuation	NA	Mod (0.4)	Mod (0.4)
Short and Long Term Surface Water Storage	High (0.8)	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	High (1.0)	High (0.9)	High (0.9)
Sediment/Shoreline Stabilization	NA	NA	NA
Production Export/Food Chain Support	Mod (0.4)	Mod (0.7)	Mod (0.5)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.3)	Mod (0.4)	Low (0.3)
Recreation/Education Potential (bonus points)	High (0.15)	High (0.15)	High (0.15)
Actual Points/Possible Points	**4.95 / 8**	**5.85 / 8**	**5.35 / 9**
% of Possible Score Achieved	**61.9%**	**73.1%**	**59.4%**
Overall Category	**III**	**II**	**III**
Total Acreage of Assessed Wetlands within Site	**1.50**	**1.50**	**1.67**
Functional Units (acreage x actual points)	**7.4**	**8.8**	**8.9**

3.4.7. Photo Documentation

Photographs of photo points PP1 to PP4, the transect start and end points, and wetland determination data points (Figure 9, Appendix A) are shown on pages C-24 through C-30 of Appendix C.

3.4.8. Maintenance Needs

Three infestations of Canadian thistle (*Cirsium arvense*), a Priority 2B noxious weed, were identified within this site in 2015 and mapped on Figure 10 (Appendix A). The size of infestations ranged from less than 0.1-acre to 1 acre with a cover class that ranged from low (1 to 5 percent) to moderate (6 to 25 percent). No woody vegetation or man-made water control structures were installed at this site. The fence surrounding the mitigation area was in good working order when inspected in 2015. Evidence of cattle grazing that occurred earlier in the year was observed during the 2015 field survey. CCI personnel informed MDT regarding this observation immediately after the 2015 field survey.

3.4.9. Current Credit Summary

The 5.89-acre FNW-Treasure County Line mitigation site includes 1.67 acres of created wetland and 4.22 acres of upland buffer. Applying standard wetland compensatory mitigation ratios (Montana Regulatory Program, April 2005), the site has attained an estimated 2.51 credit acres (Table 28), 0.13 more credit acres than in 2014.

Table 28. Credit summary for the FNW-Treasure County Line Site in 2013, 2014, and 2015.

Habitat Type	Mitigation Ratio	2013 Delineated Acres	2013 Estimated Credit Acres	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Estimated Credit Acres
Created Wetland	1:1	1.50	1.50	1.50	1.50	1.67	1.67
Upland Buffer	5:1	4.39	0.00	4.39	0.88	4.22	0.84
Total		**5.89**	**1.50**	**5.89**	**2.38**	**5.89**	**2.51**

3.5. Comprehensive Credit Summary for Forsyth NW

The wetland areas impacted during construction of the Volborg-N&S project in 2004 totaled 6.80 acres. Per the USACE requirement, the impacts were to be mitigated at a 1.5:1 ratio during the construction of the Forsyth-NW project (Corps File No.:NWO-2002-90-599; MDT control number 1514). An additional 2.18 acres of unavoidable wetland impacts that occurred during the construction of the Forsyth-NW project in 2012 has a required compensatory wetland mitigation per Corps File No.:NWO-2006-90-676, MDT control number 4059. Credits generated by the 1999 construction of the Forsyth NW-Treasure County Line mitigation site have been applied to the Forsyth-NW debits at a 1:1 ratio based on the development of this mitigation wetland site prior to impacts actually occurring.

MDT Right-of-Way agency has purchased the FNW properties resulting in MDT becoming the “fee title” landowner of the mitigation areas. As these properties are protected by legal instrument and MDT applies an active weed control management plan for the mitigation areas, upland credits have been estimated within the boundaries at each of these sites.

The credits generated at the Treasure County Line site totaled 2.51 acres in 2015, which did not meet the FNW debit requirement of 2.58 acres (Table 29). The total credits estimated for all four FNW sites in 2015 was 10.76 acres. This value was 2.02 credit acres short of the required 12.78 credit acres. Continued wetland development at the FNW-West site is possible with the installation of a functioning dike and will contribute over time to total credits generated by the FNW mitigation project. There is minimal potential for expansion of wetlands at the Middle, East, and Treasure County line sites as development has already extended to near the margins of the excavated footprint. There are no quantitative metrics or performance criteria associated with the success of these mitigation sites. The monitoring requirements identified within the approved mitigation plan are being satisfied.

Table 29. Credit/Debit summary for Forsyth-NW project.

PROJECT SITE	Actual Acres	Type	Debit Ratio	Debit Acres
Volborg-N&S	6.80	Debit	1.5:1	10.20
Forsyth-NW Previously Mitigated	1.78	Debit	1:1*	1.78
Forsyth-NW Remaining	0.4	Debit	2:1	0.80
Total	**8.98**		**Total Debits**	**12.78**
MITIGATION SITE	**Actual Acres**	**Mitigation Type**	**Credit Ratio**	**Credit Acres**
West Site (Site 1)	4.72	Creation Credit	1:1	4.72
	1.29	Preservation Credit	4:1	0.32
	7.70	Upland Buffer Credit	5:1	1.54
Middle Site (Site 2)	0.49	Creation Credit	1:1	0.49
	1.31	Upland Buffer Credit	5:1	0.26
East Site (Site 3)	0.46	Creation Credit	1:1	0.46
	2.28	Upland Buffer Credit	5:1	0.46
Treasure County Line (Site 4)	1.67	Previous Creation Credit	1:1	1.67
	4.22	Upland Buffer Credit	5:1	0.84
Total	**24.14**		**Total Credits**	**10.76**
			Net Credits	**-2.02**

*Wetland Mitigation Monitoring Plan, Forsyth-Northwest (2012) indicates credits created at the FNW-Treasure County Line site will be applied to FNW impacts at 1:1 ratio as mitigation site was constructed prior to impacts.

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Appendix A

Figures 3 through 10

MDT Wetland Mitigation Monitoring
West Site (1), Middle Site (2), and East Site (3), Treasure County Line Site (4)
Rosebud County, Montana

Figure 3: 2015 Monitoring Activity Locations

PP4
T-2, Finish
T-2, Start
PP3
We-1u
We-1w
PP5
T-1, Finish
T-1, Start
PP1
PP2
Breached Dike Structure

Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: July 2015

N

0 125 250 500

Feet

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: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/West/Monitor2015.mxd

Project Name
Forsyth NW - West Site

Drawing Title
2015 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As Shown

August 29, 2015

PROJ MGR: J Johnson

CONFLUENCE
consulting incorporated

Figure 3

Figure 4: 2015 Mapped Site Features

Vegetation Community Types

1. Bromus tectorum/Sarcobatus vermiculatus
5. Symphoricarpos albus/Pascopyrum smithii
6. Pascopyrum smithii/Bromus spp.
7. Puccinellia nuttalliana/Hordeum jubatum
8. Typha spp./Eleocharis palustris
9. Eleocharis palustris/Open Water
10. Hordeum jubatum/Puccinellia nuttalliana

ACREAGES

Project Area	13.71 acres
Total Wetlands	6.01 acres
Existing Wetlands	1.29 acres
Created Wetlands	4.72 acres
Upland	7.70 acres

Noxious Weeds
- Cirsium arvense
- Convolvulus arvensis
- Euphorbia esula
- Tamarix ramosissima

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)

Legend
- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: July 27, 2015

N

0 125 250 500

Feet

Breached Dike Structure

Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS ommunity

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: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/West/Veg2015.mxd

Project Name: Forsyth NW - West Site

Drawing Title: 2015 Mapped Site Features

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As Shown

Drawn: August 29, 2015

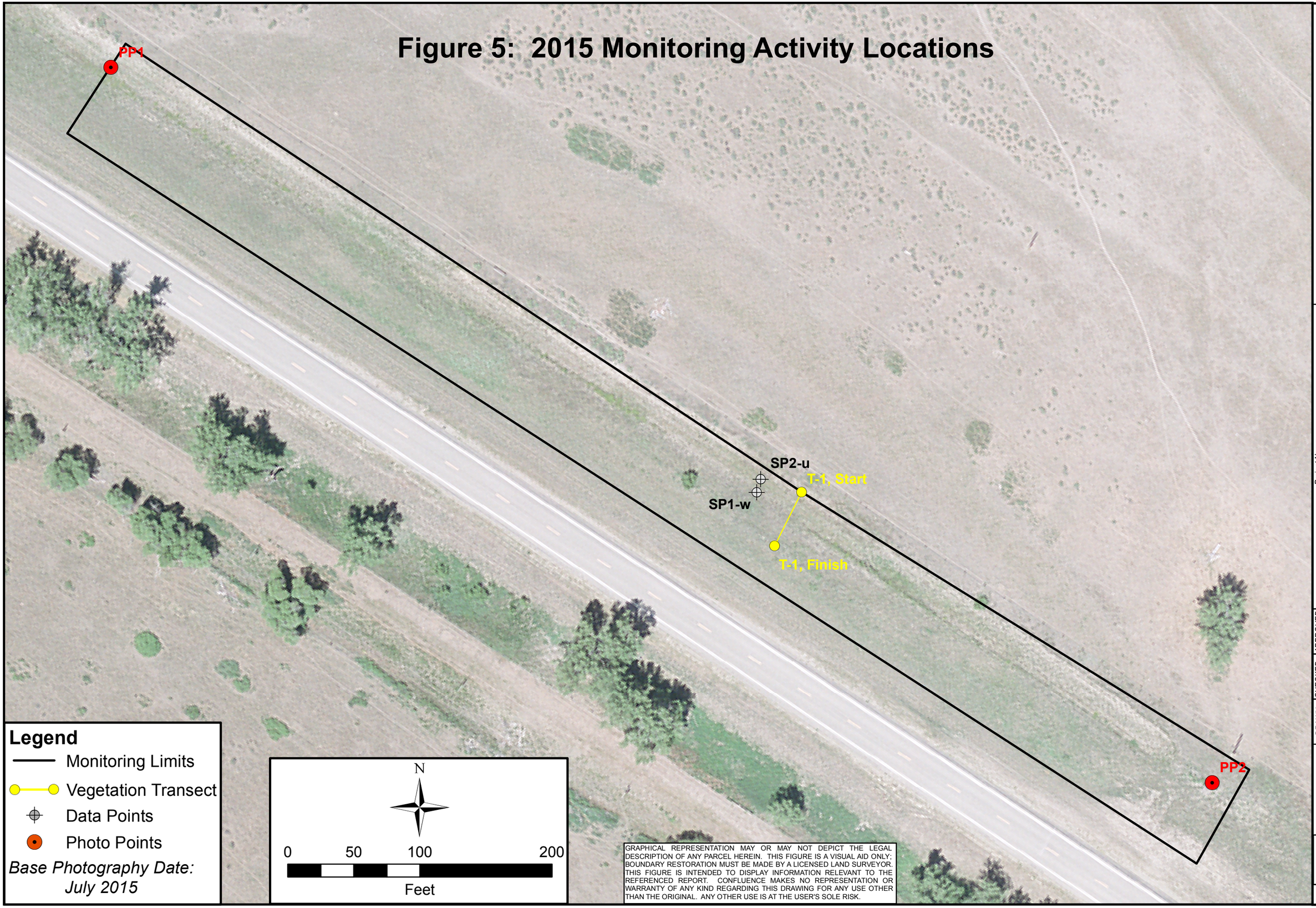
PROJ MGR: J Johnson

CONFLUENCE consulting incorporated

Figure 4

REV -

Figure 5: 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: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/East/Monitor2015.mxd

Project Name
Forsyth NW - Middle Site

Drawing Title
2015 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As Shown

Drawn: August 27, 2015

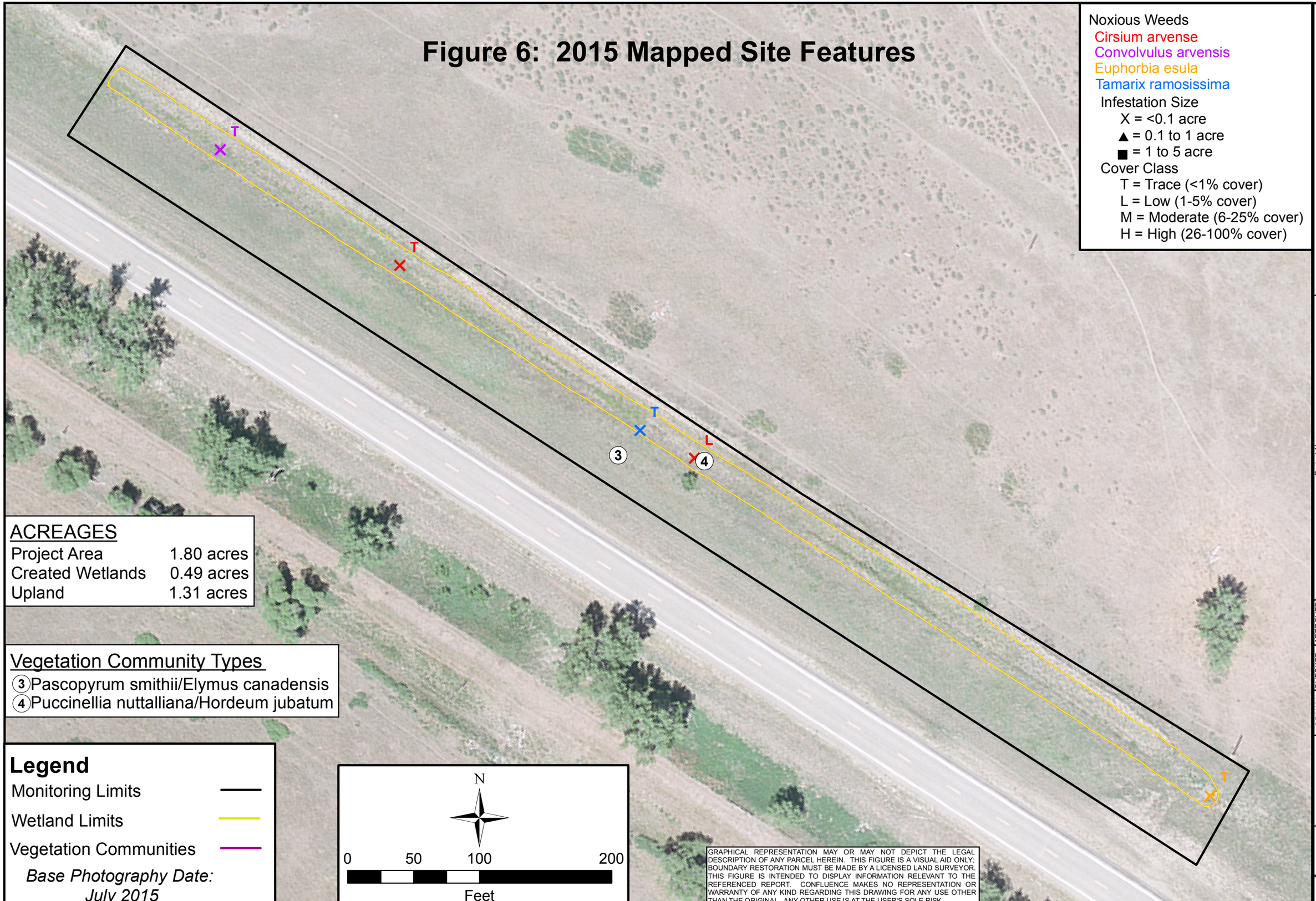
PROJ MGR: J Johnson

CONFLUENCE
consulting incorporated

Figure
5

REV -

Figure 6: 2015 Mapped Site Features



Noxious Weeds
- Cirsium arvense
- Convolvulus arvensis
- Euphorbia esula
- Tamarix ramosissima

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)

ACREAGES

Project Area	1.80 acres
Created Wetlands	0.49 acres
Upland	1.31 acres

Vegetation Community Types

(3) Pascopyrum smithii/Elymus canadensis
(4) Puccinellia nuttalliana/Hordeum jubatum

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: July 2015

N

0 50 100 200

Feet

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: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/Middle/Veg2015.mxd

Project Name: Forsyth NW - Middle Site

Drawing Title: 2015 Mapped Site Features

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As shown

Drawn: August 27, 2015

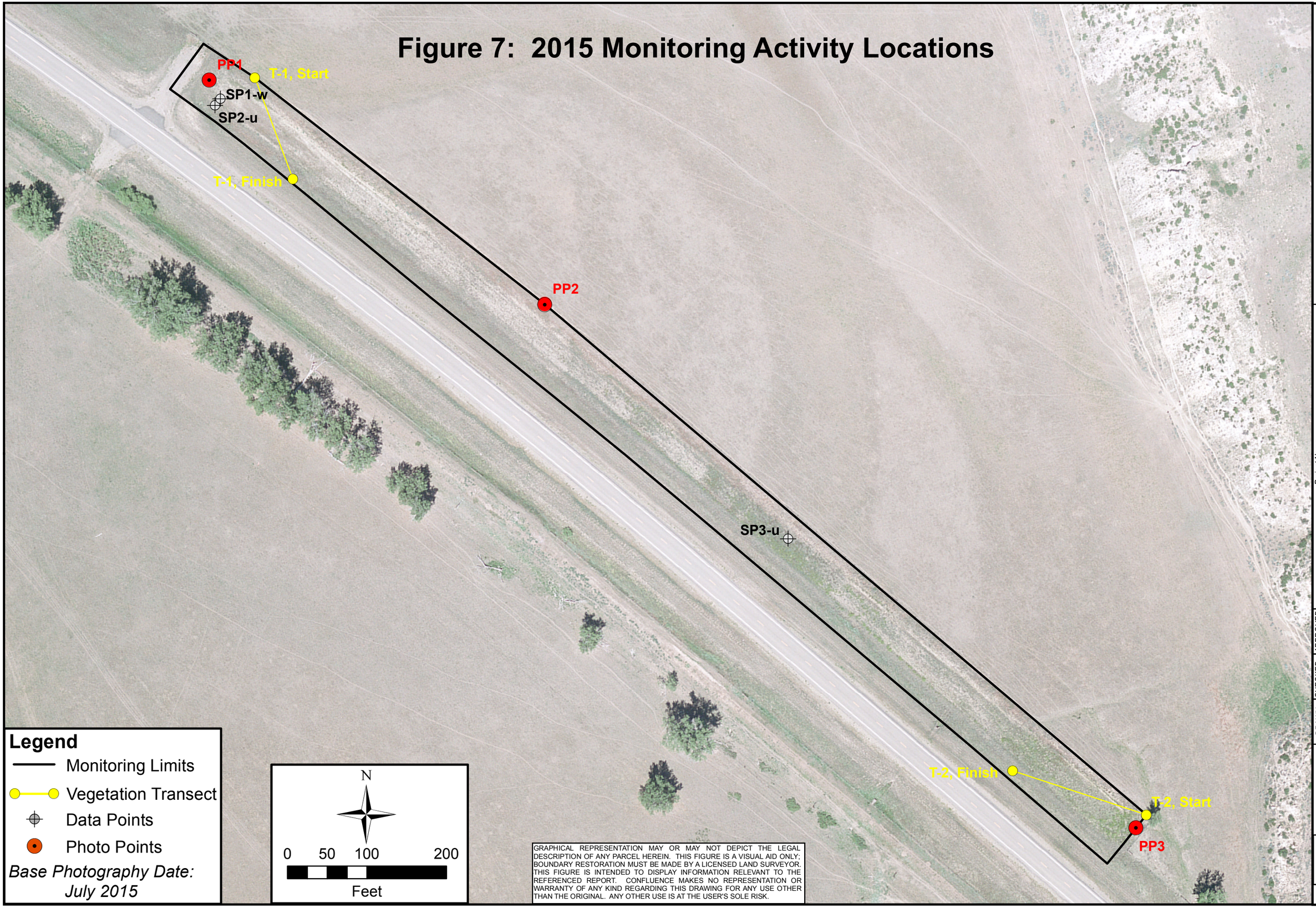
PROJ MGR: J Johnson

CONFLUENCE consulting incorporated

Figure 6

REV -

Figure 7: 2015 Monitoring Activity Locations



Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: July 2015

N

0 50 100 200

Feet

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: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/East/Monitor2015.mxd

Project Name Forsyth NW - East Site

Drawing Title 2015 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As shown

Drawn: August 26, 2015

PROJ MGR: J Johnson

CONFLUENCE consulting incorporated

Figure 7

REV -

Figure 8: 2015 Mapped Site Features

Noxious Weeds
Convolvulus arvensis
Tamarix ramosissima
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)

LOCATION: Rosebud Co., MT
PROJ NO: STPP 14-6(9)259
FILE: ForsythNW/East/Veg2015.mxd

Project Name: Forsyth NW - East Site
Drawing Title: 2015 Mapped Site Features

DRAWN JJ | CHECKED JJ | APPROVED JJ
SCALE: As Shown
Drawn: August 26, 2015
PROJ MGR: J Johnson

CONFLUENCE consulting incorporated

Figure 8

REV -

ACREAGES

Project Area	2.74 acres
Wetlands	0.46 acres
Upland	2.28 acres

Vegetation Community Types

(2) Rumex crispus/Eleocharis palustris
(3) Pascopyrum smithii/Elymus spp.

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: July 2015

N

0 50 100 200

Feet

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.

Figure 9: 2015 Monitoring Activity Locations

Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: July 2015

T-1, Start
SP1-w
SP2-u
PP2
PP1
PP3
PP4
T-2, Finish

N

0 62.5 125 250

Feet

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: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/Treasure/Monitor2015.mxd

Project Name
Forsyth NW - Treasure Co. Line Site

Drawing Title
2015 Monitoring Activity Locations

DRAWN JJ | CHECKED JJ | APPROVED JJ

SCALE: As Shown

Drawn: August 27, 2015

PROJ MGR: J Johnson

CONFLUENCE
consulting incorporated

Figure 9

REV -

Figure 10: 2015 Mapped Site Features

ACREAGES

Project Area	5.89 acres
Wetlands	1.67 acres
Upland	4.22 acres

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: July 2015

Vegetation Community Types

3 Schoenoplectus spp.
4 Artemisia cana/Bromus japonicus
5 Pascopyrum smithii/Bromus japonicus

Noxious Weeds

Cirsium arvense

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 62.5 125 250

Feet

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: Rosebud Co., MT
PROJ NO: STPP 14-6(9)259
FILE: ForsythNW/TreasureCo/Veg2015.mxd

Project Name: Forsyth NW - Treasure Line Co Site
Drawing Title: 2015 Mapped Site Features

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As Shown
Drawn: August 27, 2015
PROJ MGR: J Johnson

CONFLUENCE consulting incorporated

Figure 10

REV -

Appendix B

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

MDT Wetland Mitigation Monitoring
West Site (1), Middle Site (2), and East Site (3), Treasure County Line Site (4)
Rosebud County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Forsyth NW - West Assessment Date/Time 6/9/2015

Person(s) conducting the assessment: R McEldowney, R Quire

Weather: Warm and sunny Location: ~15 miles NW of Forsyth

MDT District: Glendive Milepost: RP 280 on US 12

Legal Description: T 7N R 39E Section(s) 20 & 29

Initial Evaluation Date: 8/15/2013 Monitoring Year: 3 #Visits in Year: 1

Size of Evaluation Area: 13.71 (acres)

Land use surrounding wetland:

Agriculture, grazing, US 12

HYDROLOGY

Surface Water Source: Periodic flooding from Big Porcupine Creek, seasonal high groundwater

Inundation: ☑ Average Depth: 1 **(ft)** Range of Depths: 0.5-3.5 **(ft)**

Percent of assessment area under inundation: 60 %

Depth at emergent vegetation-open water boundary: 0.2 **(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**:**

Surface soil cracks, sediment deposits, drain patterns, water stained leaves, salt crust, geomorphic position, drift deposits, algal mat/crust, hydrogen sulfide odor.

Groundwater Monitoring Wells

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

Well ID	Water Surface Depth (ft)
No wells	

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:

Mitigation area receives surface water when East Spring Creek Coulee produces surface flow and from periodic flooding of Big Porcupine Creek with potential for high water velocities through constructed wetland.

VEGETATION COMMUNITIES

Site Forsyth NW - West

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

Community # 1 **Community Type:** Bromus tectorum / Sarcobatus vermiculatus **Acres** 2.61

Species	Cover class	Species	Cover class
Bare Ground	1	Bassia scoparia	1
Bromus inermis	1	Bromus japonicus	1
Bromus tectorum	3	Chenopodium album	1
Chenopodium sp.	0	Cirsium arvense	0
Convolvulus arvensis	0	Descurainia sophia	1
Elymus repens	1	Elymus sp.	0
Euphorbia esula	1	Grindelia squarrosa	1
Helianthus annuus	0	Hordeum jubatum	1
Lactuca serriola	0	Lepidium perfoliatum	1
Melilotus officinalis	0	Pascopyrum smithii	3
Rumex crispus	0	Sarcobatus vermiculatus	3
Schedonorus pratensis	2	Symphoricarpos albus	1
Thlaspi arvense	1		

Comments:

Community # 5 **Community Type:** Symphoricarpos albus / Pascopyrum smithii **Acres** 1.25

Species	Cover class	Species	Cover class
Bassia scoparia	2	Bromus inermis	1
Bromus japonicus	2	Chenopodium sp.	1
Cirsium arvense	1	Elaeagnus angustifolia	1
Elymus hispidus	1	Glycyrrhiza lepidota	1
Hordeum jubatum	1	Lepidium perfoliatum	1
Melilotus officinalis	1	Pascopyrum smithii	4
Poa pratensis	1	Ribes aureum	1
Rosa arkansana	0	Salix amygdaloides	1
Sarcobatus vermiculatus	1	Symphoricarpos albus	4
Thlaspi arvense	1		

Comments:

New upland community located along the southern project boundary.

Community # 6 Community Type: Pascopyrum smithii / Bromus spp. **Acres** 1.51

Species	Cover class	Species	Cover class
Ambrosia psilostachya	0	Bare Ground	0
Bassia scoparia	2	Bromus japonicus	3
Bromus tectorum	3	Chenopodium album	0
Elymus canadensis	2	Elymus repens	0
Elymus trachycaulus	2	Helianthus annuus	0
Hordeum jubatum	1	Hordeum marinum	1
Lactuca serriola	0	Lepidium perfoliatum	2
Linum lewisii	1	Melilotus officinalis	3
Pascopyrum smithii	3	Rumex crispus	1
Thlaspi arvense	1	Tragopogon dubius	1

Comments:

New upland road side vegetation community.

Community # 7 Community Type: Puccinellia nuttalliana / Hordeum jubatum **Acres** 2.33

Species	Cover class	Species	Cover class
Ambrosia psilostachya	0	Bare Ground	1
Bassia scoparia	1	Chenopodium album	0
Convolvulus arvensis	0	Elymus repens	1
Glyceria elata	0	Glycyrrhiza lepidota	1
Grindelia squarrosa	1	Helianthus annuus	1
Hordeum jubatum	4	Hordeum marinum	0
Lactuca serriola	1	Lepidium perfoliatum	0
Melilotus officinalis	2	Pascopyrum smithii	1
Polygonum aviculare	0	Puccinellia nuttalliana	4
Rosa arkansana	0	Rumex crispus	1
Schedonorus pratensis	1	Schoenoplectus maritimus	0
Taraxacum officinale	0		

Comments:

Originally designated as disturbed upland vegetation community #2 in previous survey years. Species composition and cover classes were different during 2015 field survey, creating a new upland vegetation community type.

Community # 8 **Community Type:** Typha spp. / Eleocharis palustris **Acres** 1.07

Species	Cover class	Species	Cover class
Carex sp.	1	Chenopodium album	0
Eleocharis palustris	5	Elymus repens	1
Glycyrrhiza lepidota	0	Helianthus annuus	0
Hordeum jubatum	1	Open Water	2
Phalaris arundinacea	1	Poa compressa	1
Rosa arkansana	0	Rumex crispus	1
Salix amygdaloides	1	Schoenoplectus maritimus	0
Spartina pectinata	1	Typha angustifolia	2
Typha latifolia	3		

Comments:

Originally designated as undisturbed wetland vegetation community #3 in previous year surveys. Species composition and cover classes were different during 2015 field survey, creating a new wetland vegetation community type.

Community # 9 **Community Type:** Eleocharis palustris / Open Water **Acres** 4.77

Species	Cover class	Species	Cover class
Aquatic macrophytes	3	Bassia scoparia	0
Chenopodium album	0	Eleocharis palustris	3
Hordeum jubatum	1	Open Water	5
Poa palustris	0	Populus deltoides	0
Puccinellia nuttalliana	1	Rumex crispus	0
Salix amygdaloides	0	Schoenoplectus maritimus	2
Spartina pectinata	1	Tamarix ramosissima	0
Typha latifolia	0		

Comments:

Originally designated as disturbed wetland vegetation community #4 in previous year surveys. Species composition and cover classes were different during 2015 field survey, creating a new wetland vegetation community type.

Community # 10 **Community Type:** Hordeum jubatum / Puccinellia nuttalliana **Acres** 0.17

Species	Cover class	Species	Cover class
Bare Ground	4	Chenopodium album	0
Convolvulus arvensis	0	Deschampsia caespitosa	0
Elymus repens	0	Elymus trachycaulus	1
Glyceria elata	0	Glycyrrhiza lepidota	1
Grindelia squarrosa	0	Helianthus annuus	0
Hordeum jubatum	4	Lactuca serriola	0
Lepidium perfoliatum	0	Melilotus officinalis	0
Pascopyrum smithii	0	Polygonum aviculare	0
Populus deltoides	0	Puccinellia nuttalliana	3
Rumex crispus	1	Schoenoplectus maritimus	0
Xanthium strumarium	1		

Comments:

Total Vegetation Community Acreage **13.71**

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

VEGETATION TRANSECTS

Site: Forsyth NW - West Date: 6/9/2015

Transect Number: 1 **Compass Direction from Start:** 25

Interval Data:

Ending Station 27 **Community Type:** Bromus tectorum / Sarcobatus vermiculatus

Species	Cover class	Species	Cover class
Bassia scoparia	1	Bromus inermis	1
Bromus japonicus	2	Bromus tectorum	4
Chenopodium album	1	Convolvulus arvensis	0
Descurainia sophia	1	Elymus repens	1
Euphorbia esula	2	Hordeum jubatum	1
Lactuca serriola	0	Lepidium perfoliatum	1
Pascopyrum smithii	2	Rumex crispus	0
Thlaspi arvense	0		

Ending Station 59 **Community Type:** Typha spp. / Eleocharis palustris

Species	Cover class	Species	Cover class
Carex sp.	1	Chenopodium album	0
Eleocharis palustris	4	Elymus repens	1
Poa compressa	1	Rumex crispus	2
Spartina pectinata	3		

Ending Station 105 **Community Type:** Bromus tectorum / Sarcobatus vermiculatus

Species	Cover class	Species	Cover class
Bromus japonicus	2	Bromus tectorum	2
Elymus sp.	0	Grindelia squarrosa	0
Helianthus annuus	0	Hordeum jubatum	1
Lactuca serriola	0	Lepidium perfoliatum	1
Melilotus officinalis	0	Pascopyrum smithii	3
Rumex crispus	0	Sarcobatus vermiculatus	1
Schedonorus pratensis	3	Thlaspi arvense	1

Ending Station 180 **Community Type:** Puccinellia nuttalliana / Hordeum jubatum

Species	Cover class	Species	Cover class
Ambrosia psilostachya	0	Bare Ground	1
Elymus repens	1	Glyceria elata	0
Glycyrrhiza lepidota	0	Grindelia squarrosa	1
Helianthus annuus	1	Hordeum jubatum	3
Hordeum marinum	0	Lactuca serriola	0
Pascopyrum smithii	1	Puccinellia nuttalliana	4
Rosa arkansana	0	Rumex crispus	1
Schedonorus pratensis	2		

Ending Station 201 **Community Type:** Typha spp. / Eleocharis palustris

Species	Cover class	Species	Cover class
Eleocharis palustris	4	Elymus repens	3
Glycyrrhiza lepidota	0	Helianthus annuus	0
Open Water	3	Phalaris arundinacea	0
Rosa arkansana	1	Rumex crispus	1
Spartina pectinata	0		

Ending Station 253 **Community Type:** Hordeum jubatum / Puccinellia nuttalliana

Species	Cover class	Species	Cover class
Bare Ground	2	Chenopodium album	0
Convolvulus arvensis	0	Glyceria elata	0
Glycyrrhiza lepidota	1	Grindelia squarrosa	0
Helianthus annuus	1	Hordeum jubatum	4
Lactuca serriola	1	Lepidium perfoliatum	0
Melilotus officinalis	1	Pascopyrum smithii	1
Polygonum aviculare	1	Puccinellia nuttalliana	4
Rumex crispus	1	Schoenoplectus maritimus	0

Ending Station 265 **Community Type:** Puccinellia nuttalliana / Hordeum jubatum

Species	Cover class	Species	Cover class
Bare Ground	2	Chenopodium album	0
Convolvulus arvensis	0	Glyceria elata	0
Glycyrrhiza lepidota	1	Grindelia squarrosa	0
Helianthus annuus	1	Hordeum jubatum	4
Lactuca serriola	1	Lepidium perfoliatum	0
Melilotus officinalis	1	Pascopyrum smithii	1
Polygonum aviculare	1	Puccinellia nuttalliana	4
Rumex crispus	1	Schoenoplectus maritimus	0

Ending Station 282 **Community Type:** Pascopyrum smithii / Bromus spp.

Species	Cover class	Species	Cover class
Ambrosia psilostachya	1	Bassia scoparia	2
Bromus japonicus	3	Bromus tectorum	3
Chenopodium album	1	Elymus repens	2
Helianthus annuus	0	Lactuca serriola	1
Lepidium perfoliatum	1	Linum lewisii	1
Melilotus officinalis	2	Pascopyrum smithii	3
Rumex crispus	1	Thlaspi arvense	1

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 25

Interval Data:

Ending Station 11 **Community Type:** Symphoricarpos albus / Pascopyrum smithii

Species	Cover class	Species	Cover class
Bromus japonicus	1	Cirsium arvense	2
Glycyrrhiza lepidota	2	Pascopyrum smithii	1
Poa pratensis	0	Ribes aureum	1
Rosa arkansana	3	Sarcobatus vermiculatus	1
Symphoricarpos albus	4		

Ending Station 238 **Community Type:** Eleocharis palustris / Open Water

Species	Cover class	Species	Cover class
Aquatic macrophytes	3	Bassia scoparia	0
Chenopodium album	0	Eleocharis palustris	3
Hordeum jubatum	1	Open Water	5
Poa palustris	0	Populus deltoides	0
Puccinellia nuttalliana	1	Rumex crispus	0
Salix amygdaloides	0	Schoenoplectus maritimus	0
Tamarix ramosissima	0	Typha latifolia	0

Ending Station 261 **Community Type:** Pascopyrum smithii / Bromus japonicus

Species	Cover class	Species	Cover class
Bare Ground	3	Bassia scoparia	0
Bromus japonicus	0	Bromus tectorum	2
Elymus canadensis	1	Elymus trachycaulus	1
Hordeum jubatum	2	Lepidium perfoliatum	1
Melilotus officinalis	2	Pascopyrum smithii	1

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Forsyth NW - West

Planting Type	#Planted	#Alive	Notes
None			

Comments

No woody vegetation planted at site. Natural recruitment of cottonwood and willows.

Forsyth NW - West

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: 0

How many? 0

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
American Avocet	1		AB, AB, MA, OW,
Bald Eagle	1		FO, OW, SS, UP,
Barn Swallow	1		FO, OW, SS, UP,
Cliff Swallow	1		FO, OW, SS, UP,
Golden Eagle	1		FO, OW, SS, UP,
Killdeer	1		FO, SS, UP,
Mallard	1		OW,
Mourning Dove	1		FO, SS, UP,
Red-winged Blackbird	3		FO, OW, SS, UP,
Wilson's Phalarope	1		OW,
Yellow Warbler	1		SS,

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
Brook Stickleback	1	No	No	No	3" long
Coyote		Yes	No	No	
Deer sp.		Yes	No	No	
Meadow Vole	1	No	No	No	

Wildlife Comments:

Forsyth NW - West

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
1020035-0036	46.338328	-106.873779		We-1w
1020037-0038	46.338398	-106.87372		We-1u
8148	46.339088	-106.874611	230	PP-3 Pano
8149	46.340237	-106.877312	210	PP-4 Pano
8155	46.339561	-106.875854	205	T-2 end
8156	46.339001	-106.87645	25	T-2 start
8159	46.337456	-106.872063	205	T-1 end
8160	46.337817	-106.874587	45	PP-5 Pano
8165	46.33691	-106.872772	25	T-1 start
8166	46.336468	-106.871811	350	PP-2 Pano
8169	46.336914	-106.871132	270	PP-1 Pano

Comments:

Forsyth NW - West

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

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? No

If yes, do they need to be repaired?

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? Yes

If yes, are the structures in need of repair? No

If yes, describe the problems below.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West | City/County: Rosebud Co. | Sampling Date: 6/9/2015

Applicant/Owner: MDT | State: MT | Sampling Point: We-1u

Investigator(s): R Quire, R McEldowney | Section, Township, Range: 20 7N 39E

Landform (hillslope, terrace, etc.): Hillside | Local relief (concave, convex, none): flat | Slope (%): 15

Subregion (LRR): LRR G | Lat: 46.338398 | Long: -106.87372 | Datum: WGS84

Soil Map Unit Name: Marvan silty clay, 0-2 percent slopes | NWI classification: Not Mapped

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

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

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

Hydrophytic Vegetation Present?	Yes ☐	No ☑
Hydric Soil Present?	Yes ☐	No ☑
Wetland Hydrology Present?	Yes ☐	No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

Remarks: Sample point located on upland hillside with approximately 15% slope, between concave wetland depression and US Highway 12.

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
Bassia scoparia	2	☐	FACU
Bromus japonicus	4	☐	NL
Bromus tectorum	1	☐	NL
Chenopodium album	1	☐	FACU
Hordeum jubatum	6	☐	FACW
Hordeum marinum	2	☐	FACU
Lactuca serriola	1	☐	FAC
Lepidium perfoliatum	8	☐	FAC
Pascopyrum smithii	45	☑	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: 0 (A)

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

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

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	0	X 1	0
FACW species	6	X 2	12
FAC species	9	X 3	27
FACU species	50	X 4	200
UPL species	5	X 5	25
Column Totals	70 (A)		264 (B)

Prevalence Index = B/A = 3.77

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:

Litter=25%. Vegetation more characteristic of upland plant community during field observation.

SOIL

Sampling Point: We-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
0-16	2.5Y 4/3	100					Clay	

[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 indicators of hydric soils observed during field survey.

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 of wetland hydrology observed during field survey.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West | City/County: Rosebud Co. | Sampling Date: 6/9/2015

Applicant/Owner: MDT | State: MT | Sampling Point: We-1w

Investigator(s): R Quire, R McEldowney | Section, Township, Range: 20 7N 39E

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

Subregion (LRR): LRR G | Lat: 46.338328 | Long: -106.873779 | Datum: WGS84

Soil Map Unit Name: Marvan silty clay, 0-2 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 excavated, concave, PEM wetland cell, approximately 3 feet from open water (1 inch depth at edge). Pleasant, sunny conditions, approximately 75 degrees F. Abundant wildlife present.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Amaranthus retroflexus	1	☐	FACU
Deschampsia caespitosa	2	☐	FACW
Puccinellia nuttalliana	6	☑	OBL
Salicornia rubra	1	☐	OBL
Schoenoplectus maritimus	10	☑	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 80

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	17	X 1	17
FACW species	2	X 2	4
FAC species	0	X 3	0
FACU species	1	X 4	4
UPL species	0	X 5	0
Column Totals	20 (A)		25 (B)

Prevalence Index = B/A = 1.25

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: We-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
0-16	2.5Y 4/3	100					Clay	

[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: Soil was saturated to surface, had slight H2S smell, surface water within 3 feet of soil pit, and salt crust formation from surface water (adjacent to soil pit) drying out.

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): 1

Water Table Present? Yes ☑ No ☐ Depth (inches): 12

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Surface water within 3 ft. of soil pit.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Forsyth NW - West **2. MDT project#** STPP 14-6(9)259 **Control#** 4059

3. Evaluation Date 6/9/2015 **4. Evaluators** R Quire, R McEldowney **5. Wetland/Site# (s)** Forsyth NW - West

6. Wetland Location(s): T 7N **R** 39E **Sec1** 20 **T** 7N **R** 39E **Sec2** 29

Approx Stationing or Mileposts RP 280 on US 12

Watershed 10100002 **Watershed/County** Big Porcupine Creek, Rosebud County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 6.01

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 6.01

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Riverine	Emergent Wetland		Permanent/Perennial	17
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	45
Depressional	Forested Wetland		Seasonal/Intermittent	5
Depressional	Aquatic Bed	Excavated	Seasonal/Intermittent	30
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	3

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)

Impact to vegetation within AA from construction of mitigation area and US 12 road improvements recovering with time, improved disturbance rating from 2013 (high), and 2014 (moderate).

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

Euphorbia esula, Convolvulus arvensis, Cirsium arvense, Tamarix ramosissima

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA includes existing and constructed wetlands within floodplain of an Unnamed Tributary of Big Porcupine. Surrounding land includes US 12 and livestock grazing.

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 with occasional trees and shrubs, as well as open water with aquatic macrophytes.

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 USF&WS T&E database for Rosebud 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 Ammannia robusta (S2)

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ○ D ◉ S Great Blue Heron (S3)

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 Ammannia observed within AA in previous year.

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence): Substantial

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 Several bird species, tracks of a few mammal species, a diversity of insects, and a fish were observed during field survey.

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.) Warm Water

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**

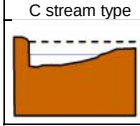
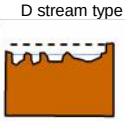
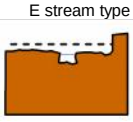
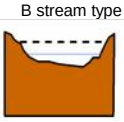
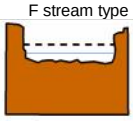
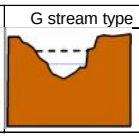
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

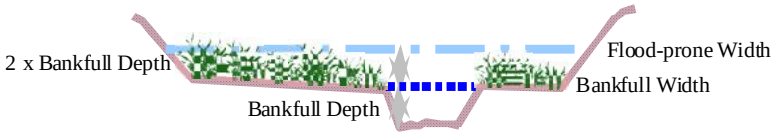
iii. Final Score and Rating: .3 L **Comments:** Unidentified 3-inch fish observed during field survey in 2015.

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: Surface water enters AA via box culvert and from overbank flow from Big Porcupine Creek.

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: A large area of the AA is seasonally flooded by an unnamed tributary of Big Porcupine Creek.

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: Open/standing water was present in depressional aquatic bed during field survey.

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: AA is subject to surface water flows during runoff in UT-Big Porcupine Creek.

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** .9H

Comments: Upland buffer between northern boundary of AA and highway greater than 50ft.

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: Approximately 12% of AA with perennial hydrology.

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: AA with several mature trees and is managed in a natural state.

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:

Property owned by MDT.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Forsyth NW - West

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	5.409	☑
C. General Wildlife Habitat	E	1	1	6.01	☑
D. General Fish Habitat	L	.3	1	1.803	☐
E. Flood Attenuation	M	.5	1	3.005	☐
F. Short and Long Term Surface Water Storage	H	1	1	6.01	☑
G. Sediment/Nutrient/Toxicant Removal	M	.6	1	3.606	☐
H. Sediment/Shoreline Stabilization	M	.7	1	4.207	☐
I. Production Export/Food Chain Support	H	.9	1	5.409	☐
J. Groundwater Discharge/Recharge	H	1	1	6.01	☑
K. Uniqueness	M	.6	1	3.606	☐
L. Recreation/Education Potential (bonus points)	H	.15	NA	0.9015	☐
Totals:		7.65	11	45.9765	
Percent of Possible Score			**69.55** %		

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 WETLAND MITIGATION SITE MONITORING FORM

Project Site: Forsyth NW - Middle Assessment Date/Time 6/9/2015

Person(s) conducting the assessment: R McEldowney, R Quire

Weather: Warm and sunny Location: ~8 miles NW of Forsyth

MDT District: Glendive Milepost: ~262 on US 12

Legal Description: T 7N R 39E Section(s) 33

Initial Evaluation Date: 8/15/2013 Monitoring Year: 3 #Visits in Year: 1

Size of Evaluation Area: 1.8 (acres)

Land use surrounding wetland:

Undeveloped ag land, grazing, US Hwy 12

HYDROLOGY

Surface Water Source: Precipitation, runoff, shallow groundwater

Inundation: ☐ Average Depth: 0 **(ft)** Range of Depths: 0 **(ft)**

Percent of assessment area under inundation: 0 %

Depth at emergent vegetation-open water boundary: 0 **(ft)**

If assessment area is not inundated then are the soils saturated within 12 inches of surface: No

Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc**:**

Geomorphic position, oxidized root channels, surface soil cracks

Groundwater Monitoring Wells

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

Well ID	Water Surface Depth (ft)
No Wells	

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:

Soil was moist within 12" of the soil surface at sample point 1.

VEGETATION COMMUNITIES

Site Forsyth NW - Middle

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

Community # 3 **Community Type:** Pascopyrum smithii / Elymus canadensis **Acres** 1.31

Species	Cover class	Species	Cover class
Alopecurus pratensis	0	Ambrosia psilostachya	0
Bare Ground	1	Bassia scoparia	1
Bromus japonicus	2	Bromus tectorum	1
Cirsium arvense	1	Convolvulus arvensis	0
Elymus canadensis	3	Elymus trachycaulus	2
Grindelia squarrosa	0	Helianthus annuus	1
Hordeum jubatum	1	Lactuca serriola	1
Lepidium perfoliatum	0	Linum lewisii	1
Melilotus officinalis	2	Pascopyrum smithii	4
Populus deltoides	2	Ratibida columnifera	0
Rosa arkansana	0	Rumex crispus	1
Salix amygdaloides	0	Salix exigua	0
Sarcobatus vermiculatus	1	Schedonorus pratensis	0
Symphoricarpos albus	2	Thlaspi arvense	1

Comments:

Originally designated as upland vegetation community #1 in previous survey years. Species composition and cover classes were different during 2015 field survey, creating a new upland vegetation community type. Populus deltoides seedlings occur as a band around wetland, but are primarily outside of wetland boundary.

Community # 4 **Community Type:** Puccinellia nuttalliana / Hordeum jubatum **Acres** 0.49

Species	Cover class	Species	Cover class
Bare Ground	3	Bassia scoparia	0
Bromus japonicus	2	Chenopodium album	0
Cirsium arvense	1	Convolvulus arvensis	0
Deschampsia caespitosa	2	Deschampsia elongata	0
Euphorbia esula	0	Filago arvensis	2
Grindelia squarrosa	1	Hordeum jubatum	4
Lactuca serriola	1	Lepidium perfoliatum	2
Melilotus officinalis	0	Poa compressa	1
Populus deltoides	0	Puccinellia nuttalliana	4
Rumex crispus	2	Schedonorus pratensis	0
Tamarix ramosissima	0	Thlaspi arvense	0

Comments:

Originally designated as wetland vegetation community #2 in previous survey years. Species composition and cover classes were different during 2015 field survey, creating a new wetland vegetation community type.

Total Vegetation Community Acreage **1.8**

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

VEGETATION TRANSECTS

Site: Forsyth NW - Middle Date: 6/9/2015

Transect Number: 1 **Compass Direction from Start:** 205

Interval Data:

Ending Station 14 **Community Type:** Pascopyrum smithii / Elymus canadensis

Species	Cover class	Species	Cover class
Bassia scoparia	1	Bromus japonicus	0
Cirsium arvense	0	Lepidium perfoliatum	1
Pascopyrum smithii	4	Populus deltoides	1
Salix amygdaloides	0	Salix exigua	0
Schedonorus pratensis	1		

Ending Station 29 **Community Type:** Puccinellia nuttalliana / Hordeum jubatum

Species	Cover class	Species	Cover class
Bare Ground	4	Bassia scoparia	0
Hordeum jubatum	1	Lactuca serriola	0
Populus deltoides	1	Puccinellia nuttalliana	5
Rumex crispus	1	Thlaspi arvense	0

Ending Station 50 **Community Type:** Pascopyrum smithii / Elymus canadensis

Species	Cover class	Species	Cover class
Bare Ground	1	Bassia scoparia	0
Bromus japonicus	0	Convolvulus arvensis	0
Elymus canadensis	2	Elymus trachycaulus	2
Hordeum jubatum	1	Lactuca serriola	0
Linum lewisii	0	Pascopyrum smithii	4
Ratibida columnifera	0	Rumex crispus	0
Schedonorus pratensis	1	Symphoricarpos albus	1
Thlaspi arvense	0		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Forsyth NW - Middle

Planting Type	#Planted	#Alive	Notes
None			

Comments

Forsyth NW - Middle

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: 0

How many? 0

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
Eastern Kingbird	1		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

Wildlife Comments:

Forsyth NW - Middle

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
1020040	46.322174	-106.840996	300	PP-1
1020041	46.323803	-106.844337	120	PP-2
8179	46.322948	-106.842323	205	T-1 start
8180	46.322754	-106.842438	25	T-1 end
8181-8182	46.322942	-106.842481		SP-1
8183-8184	46.322911	-106.842492		SP-2
8185-8186				W & E along road buffer

Comments:

Forsyth NW - Middle

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

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? No

If yes, do they need to be repaired?

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.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Middle City/County: Rosebud Co. Sampling Date: 6/9/2015

Applicant/Owner: MDT State: MT Sampling Point: SP1-w

Investigator(s): R Quire, R McEldowney Section, Township, Range: 33 7N 39E

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

Subregion (LRR): LRR G Lat: 46.322913 Long: -106.842487 Datum: WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded 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: Concave depressional wetland swale, sample point located within previously delineated wetland boundary, located adjacent to US Highway 12.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Convolvulus arvensis	1	☐	NL
Deschampsia caespitosa	1	☐	FACW
Hordeum jubatum	1	☐	FACW
Lactuca serriola	1	☐	FAC
Pascopyrum smithii	3	☐	FACU
Puccinellia nuttalliana	30	☑	OBL
Rumex crispus	2	☐	FAC
Schedonorus pratensis	1	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 60

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	30	X 1	30
FACW species	2	X 2	4
FAC species	3	X 3	9
FACU species	4	X 4	16
UPL species	1	X 5	5
Column Totals	40 (A)		64 (B)

Prevalence Index = B/A = 1.60

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:

Litter/Bare Ground=60%

SOIL

Sampling Point: SP1-w

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 4/2	75	7.5YR 4/6	25	C	PL	Silty Clay	

[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: Soil was moist during field survey.

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:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Middle City/County: Rosebud Co. Sampling Date: 6/9/2015

Applicant/Owner: MDT State: MT Sampling Point: SP2-u

Investigator(s): R Quire, R McEldowney Section, Township, Range: 33 7N 39E

Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): flat Slope (%): 5

Subregion (LRR): LRR G Lat: 46.322943 Long: -106.842479 Datum: WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded 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, located approximately 11 ft. North of SP01, adjacent to US Highway 12.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Populus deltoides	30	☑	FAC
Salix amygdaloides	2	☐	FACW
Salix exigua	1	☐	FACW

Herbaceous Stratum Plot size (5 Foot Radius)

Bassia scoparia	25	☑	FACU
Bromus japonicus	5	☐	NL
Lactuca serriola	1	☐	FAC
Lepidium perfoliatum	1	☐	FAC

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 35

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	3	X 2	6
FAC species	32	X 3	96
FACU species	25	X 4	100
UPL species	5	X 5	25
Column Totals	65 (A)		227 (B)

Prevalence Index = B/A = 3.49

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: SP2-u

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
0-14	10YR 4/2	100					Silty Clay	

[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 evidence of hydric soils observed during field survey.

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 evidence of wetland hydrology observed during field survey.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Forsyth NW - Middle **2. MDT project#** STPP 14-6(9)259 **Control#** 4059

3. Evaluation Date 6/9/2015 **4. Evaluators** R Quire, R McEldowney **5. Wetland/Site# (s)** Forsyth NW - Middle

6. Wetland Location(s): T 7N **R** 39E **Sec1** 33 **T** 7N **R** 39E **Sec2** 34

Approx Stationing or Mileposts ~262 on US 12

Watershed 10100001 **Watershed/County** Big Porcupine Creek, Rosebud Co.

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 0.49

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 0.49

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

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	100

11. Estimated Relative Abundance Abundant

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)

AA vegetation recovering from construction disturbance.

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

Convolvulus arvensis, Cirsium arvense, Tamarix ramosissima

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA very similar to Forsyth NW - East only smaller. AA includes a linear, excavated roadside depression parallel to US 12. Surrounding land includes agriculture (grazing) and highway.

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 veg class present. Several cottonwood seedlings present in herbaceous layer.

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 USF&WS T&E list for Rosebud 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 Scarlet Ammannia - Ammannia robusta (S2)

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ○ D ◉ S Great Blue Heron (S3)

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 MTNHP SOC report for T7N R39E, direct observation of Ammannia in 2013.

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence):

Low

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 Very few signs of wildlife observed during field survey. This area is close to the roadway and will likely never achieve a high wildlife habitat rating.

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**

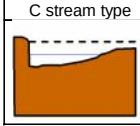
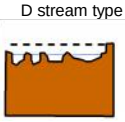
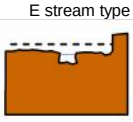
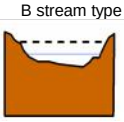
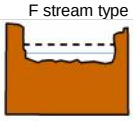
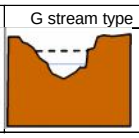
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

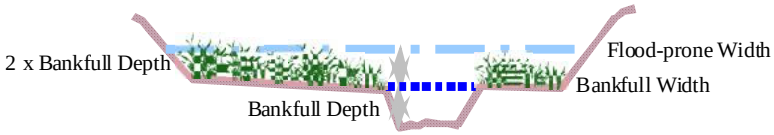
iii. Final Score and Rating: 0 NA **Comments:**

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: AA not subject to flooding from Big Porcupine Creek.

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: AA subject to pond from precipitation and upland surface flow, capacity to pond at depth >2.2ft.

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: AA more than 70% vegetated after two years of mitigation site construction.

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: In 2015, observed increased percent cover by wetland species with stability ratings greater than or equal to six.

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:

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: AA w/out permeable substrate, holds surface water eventually lost to evaporation.

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: Habitat within AA typical of roadside ditch.

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:

AA small, adjacent to highway, and with little to no recreation or education potential.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Forsyth NW - Middle

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	0.441	☑
C. General Wildlife Habitat	M	.4	1	0.196	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	NA	0	1	0	☐
F. Short and Long Term Surface Water Storage	M	.6	1	0.294	☑
G. Sediment/Nutrient/Toxicant Removal	H	.8	1	0.392	☑
H. Sediment/Shoreline Stabilization	M	.6	1	0.294	☑
I. Production Export/Food Chain Support	L	.3	1	0.147	☐
J. Groundwater Discharge/Recharge	NA	0	0	0	☐
K. Uniqueness	L	.2	1	0.098	☐
L. Recreation/Education Potential (bonus points)	NA	0	NA	0	☐
Totals:		3.8	9	1.862	
Percent of Possible Score			**42.22** %		

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 WETLAND MITIGATION SITE MONITORING FORM

Project Site: Forsyth NW -East Assessment Date/Time 6/9/2015

Person(s) conducting the assessment: R McEldowney, R Quire

Weather: Hot and sunny, very light breeze Location: ~8 miles NW of Forsyth

MDT District: Glendive Milepost: ~262.3 on US 12

Legal Description: T 7N R 39E Section(s) 34

Initial Evaluation Date: 8/15/2013 Monitoring Year: 3 #Visits in Year: 1

Size of Evaluation Area: 2.74 (acres)

Land use surrounding wetland:

Undeveloped ag land, US Highway 12.

HYDROLOGY

Surface Water Source: Precipitation, runoff, shallow groundwater

Inundation: ☐ Average Depth: 0 **(ft)** Range of Depths: 0 **(ft)**

Percent of assessment area under inundation: 0 %

Depth at emergent vegetation-open water boundary: 0 **(ft)**

If assessment area is not inundated then are the soils saturated within 12 inches of surface: No

Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc**:**

geomorphic position, surface soil cracks, oxidized rhizosphere on living roots

Groundwater Monitoring Wells

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

Well ID	Water Surface Depth (ft)
No Wells	

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:

Site appears to be drying out.

VEGETATION COMMUNITIES

Site Forsyth NW -East

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

Community # 2 **Community Type:** Rumex crispus / Eleocharis palustris **Acres** 0.46

Species	Cover class	Species	Cover class
Alopecurus pratensis	1	Ambrosia psilostachya	0
Bare Ground	1	Bromus japonicus	1
Chenopodium album	0	Convolvulus arvensis	1
Eleocharis palustris	4	Filago arvensis	1
Hordeum jubatum	1	Lactuca serriola	1
Melilotus officinalis	1	Pascopyrum smithii	2
Poa pratensis	1	Populus deltoides	1
Puccinellia nuttalliana	0	Rumex crispus	3
Salix amygdaloides	0	Salix exigua	0
Schoenoplectus maritimus	1	Tamarix ramosissima	1
Taraxacum officinale	1	Tragopogon dubius	0
Typha angustifolia	0	Veronica sp.	1

Comments:

Community # 3 **Community Type:** Pascopyrum smithii / Elymus spp. **Acres** 2.28

Species	Cover class	Species	Cover class
Agropyron cristatum	1	Alopecurus pratensis	0
Ambrosia psilostachya	1	Artemisia frigida	0
Bare Ground	1	Bromus inermis	0
Bromus japonicus	2	Bromus tectorum	1
Chenopodium album	1	Convolvulus arvensis	1
Descurainia sophia	0	Elymus canadensis	3
Elymus repens	1	Elymus trachycaulus	3
Filago arvensis	0	Grindelia squarrosa	0
Helianthus annuus	0	Hordeum jubatum	1
Lactuca serriola	1	Lepidium perfoliatum	0
Linum lewisii	1	Medicago sativa	0
Melilotus officinalis	3	Pascopyrum smithii	4
Poa pratensis	1	Polygonum aviculare	1
Populus deltoides	1	Ratibida columnifera	0
Rumex crispus	1	Salix amygdaloides	0
Salix exigua	0	Sisymbrium altissimum	0
Stipa comata	0	Taraxacum officinale	1
Thlaspi arvense	1	Tragopogon dubius	0

Comments:

Originally designated as upland vegetation community #1 in previous survey years. Species composition and cover classes were different during 2015 field survey, creating a new upland vegetation community type.

Total Vegetation Community Acreage **2.74**

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

VEGETATION TRANSECTS

Site: Forsyth NW -East Date: 6/9/2015

Transect Number: 1 **Compass Direction from Start:** 145

Interval Data:

Ending Station 32 **Community Type:** Pascopyrum smithii / Elymus spp.

Species	Cover class	Species	Cover class
Agropyron cristatum	1	Artemisia frigida	0
Bare Ground	0	Bromus japonicus	2
Elymus canadensis	0	Hordeum jubatum	1
Lactuca serriola	1	Lepidium perfoliatum	1
Pascopyrum smithii	3	Populus deltoides	1
Rumex crispus	1		

Ending Station 95 **Community Type:** Rumex crispus / Eleocharis palustris

Species	Cover class	Species	Cover class
Alopecurus pratensis	1	Eleocharis palustris	4
Hordeum jubatum	1	Populus deltoides	0
Puccinellia nuttalliana	0	Rumex crispus	3
Schoenoplectus maritimus	0	Tamarix ramosissima	0
Typha angustifolia	0	Veronica sp.	0

Ending Station 125 **Community Type:** Pascopyrum smithii / Elymus spp.

Species	Cover class	Species	Cover class
Alopecurus pratensis	0	Bromus japonicus	1
Chenopodium album	1	Convolvulus arvensis	1
Descurainia sophia	0	Elymus canadensis	1
Elymus trachycaulus	4	Filago arvensis	0
Helianthus annuus	1	Lactuca serriola	0
Lepidium perfoliatum	0	Linum lewisii	0
Melilotus officinalis	3	Pascopyrum smithii	3
Populus deltoides	0	Rumex crispus	0
Thlaspi arvense	1		

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 280

Interval Data:

Ending Station 50 **Community Type:** Pascopyrum smithii / Elymus spp.

Species	Cover class	Species	Cover class
Ambrosia psilostachya	0	Bare Ground	1
Bromus japonicus	1	Convolvulus arvensis	1
Filago arvensis	1	Grindelia squarrosa	1
Hordeum jubatum	2	Lactuca serriola	1
Melilotus officinalis	4	Pascopyrum smithii	1
Poa pratensis	1	Populus deltoides	2
Rumex crispus	1	Tragopogon dubius	0

Ending Station 130 **Community Type:** Rumex crispus / Eleocharis palustris

Species	Cover class	Species	Cover class
Ambrosia psilostachya	0	Bromus japonicus	1
Convolvulus arvensis	1	Eleocharis palustris	4
Hordeum jubatum	4	Lactuca serriola	1
Melilotus officinalis	1	Pascopyrum smithii	1
Poa pratensis	1	Puccinellia nuttalliana	1
Rumex crispus	4	Salix amygdaloides	0
Salix exigua	0	Schoenoplectus maritimus	0
Taraxacum officinale	1	Tragopogon dubius	0

Ending Station 181 **Community Type:** Pascopyrum smithii / Elymus spp.

Species	Cover class	Species	Cover class
Bare Ground	1	Elymus canadensis	2
Elymus repens	2	Helianthus annuus	0
Hordeum jubatum	1	Lactuca serriola	0
Linum lewisii	1	Melilotus officinalis	1
Pascopyrum smithii	3	Polygonum aviculare	1
Rumex crispus	1	Thlaspi arvense	0

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Forsyth NW -East

Planting Type	#Planted	#Alive	Notes
None planted			

Comments

Site has clusters of Populus deltoides seedlings likely originally established in 2013. Did not distinguish these patches as a separate community type but will observe and potentially map them out separately in 2016 if they survive.

Forsyth NW -East

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: 0

How many? 0

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
American Robin	1		UP,
Bald Eagle	1		UP,
Western Meadowlark	1		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
Deer sp.		Yes	No	No	
Western Hog-nosed Snake	1	No	No	No	

Wildlife Comments:

Forsyth NW -East

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
1020042-0043	46.319361	-106.835927		SP3-u
1020044	46.318417	-106.834923	100	T-2 end
1020045	46.318336	-106.834175	280	T-2 start
8187-8188	46.320943	-106.838674		SP1-w
8189-8190	46.32092	-106.838707		SP2-u
8193	46.321045	-106.838486	145	T-1 start
8194	46.320297	-106.838493	325	T-1 end
8195	46.321033	-106.838814	125	PP-1
8199	46.318233	-106.834335	305	PP-3
8201-8202	46.320068	-106.837128	210	PP-2

Comments:

Forsyth NW -East

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

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? No

If yes, do they need to be repaired?

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.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - East City/County: Rosebud Co. Sampling Date: 6/9/2015

Applicant/Owner: MDT State: MT Sampling Point: SP1-w

Investigator(s): R Quire, R McEldowney Section, Township, Range: 34 7N 39E

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

Subregion (LRR): LRR G Lat: 46.320943 Long: -106.838674 Datum: WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded 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: Concave wetland depression, adjacent to US Highway 12. Site appears to be drying out, as observed during field survey.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Eleocharis palustris	25	☑	OBL
Pascopyrum smithii	3	☐	FACU
Rumex crispus	5	☐	FAC
Schoenoplectus maritimus	1	☐	OBL
Veronica sp.	5	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 60

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	26	X 1	26
FACW species	0	X 2	0
FAC species	5	X 3	15
FACU species	8	X 4	32
UPL species	0	X 5	0
Column Totals	39 (A)		73 (B)

Prevalence Index = B/A = 1.87

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: SP1-w

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 4/2	95	10YR 6/3	5	C	PL	Silty Clay	

[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: Soil was moist when observed during field survey.

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:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - East City/County: Rosebud Co. Sampling Date: 6/9/2015

Applicant/Owner: MDT State: MT Sampling Point: SP2-u

Investigator(s): R Quire, R McEldowney Section, Township, Range: 34 7N 39E

Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): flat Slope (%): 10

Subregion (LRR): LRR G Lat: 46.32092 Long: -106.838707 Datum: WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded 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 site, located on flat slope between US Highway 12 and concave wetland depression.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Agropyron cristatum	30	☑	NL
Bromus japonicus	5	☐	NL
Elymus canadensis	5	☐	FACU
Hordeum jubatum	2	☐	FACW
Lepidium perfoliatum	1	☐	FAC
Melilotus officinalis	1	☐	FACU
Pascopyrum smithii	30	☑	FACU
Rumex crispus	1	☐	FAC

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 20

Dominance Test worksheet

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

Total Number of Dominant Species Across All Strata: 2 (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	2	X 2	4
FAC species	2	X 3	6
FACU species	36	X 4	144
UPL species	35	X 5	175
Column Totals	75 (A)		329 (B)

Prevalence Index = B/A = 4.39

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:

Populus deltoides observed in shrub/sapling stratum at 1% cover, excluded from dominance and prevalence index calculations. A stratum is defined as having 5% or more total plant cover (2010 Regional Supplement to the Corps of Engineers Manual: Great Plains Region (Version 2.0)).

SOIL

Sampling Point: SP2-u

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 4/2	100					Silty Clay	

[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 evidence of hydric soil indicators observed during field observation.

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 evidence of wetland hydrology observed during field observation.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - East City/County: Rosebud Co. Sampling Date: 6/10/2015

Applicant/Owner: MDT State: MT Sampling Point: SP3-u

Investigator(s): R Quire, R McEldowney Section, Township, Range: 34 7N 39E

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

Subregion (LRR): LRR G Lat: 46.319361 Long: -106.835927 Datum: WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded NWI classification: PEM

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

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

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

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

Remarks: Upland sample point located in excavated wetland cell, showing very little evidence of soil, vegetation, and hydrologic wetland indicators.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Chenopodium album	6	☐	FACU
Lactuca serriola	2	☐	FAC
Melilotus officinalis	15	☐	FACU
Pascopyrum smithii	60	☑	FACU
Rumex crispus	2	☐	FAC

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: 0 (A)

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

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

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	0	X 1	0
FACW species	0	X 2	0
FAC species	4	X 3	12
FACU species	81	X 4	324
UPL species	0	X 5	0
Column Totals	85 (A)		336 (B)

Prevalence Index = B/A = 3.95

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: SP3-u

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	2.5Y 3/2	100					Silty Clay	**Soil was very dry.**

[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 during field observation.

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: While two secondary wetland indicators were observed, it is unlikely wetland hydrology is present, as the soil at this data point was very dry and no positive indicators of hydric soils or hydrophytic vegetation were observed.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Forsyth NW - East **2. MDT project#** STPP 14-6(9)259 **Control#** 4059

3. Evaluation Date 6/9/2015 **4. Evaluators** R Quire, R McEldowney **5. Wetland/Site# (s)** Forsyth NW - East

6. Wetland Location(s): T 7N **R** 39E **Sec1** 34 **T** **R** **Sec2**

Approx Stationing or Mileposts ~262.3 on US 12

Watershed 10100001 **Watershed/County** Big Porcupine Creek, Rosebud Co.

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 0.46

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 0.46

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

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	100

11. Estimated Relative Abundance Abundant

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)

AA vegetation cover has continually increased since 2013, following construction of wetland basin, with little bare ground at time of 2015 sampling.

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

Convolvulus arvensis, Tamarix ramosissima

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA includes a linear, excavated roadside depression parallel to US 12. Surrounding land includes agriculture (grazing) and highway.

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 vegetation class present, with several cottonwood saplings present in herbaceous layer.

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 USF&WS T&E list for Rosebud 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 Scarlet Ammannia - Ammannia robusta (S2), Western Hog-nosed Snake - H

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ○ D ◉ S Great Blue Heron (S3)

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 MTNHP SOC report for T7N R39E, direct observation of Ammannia in 2013.

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence): Low

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 Minimal signs of wildlife observed during field survey. This area is close to the roadway and will likely never achieve a high wildlife habitat rating.

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**

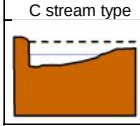
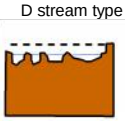
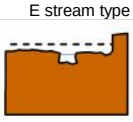
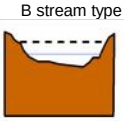
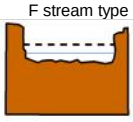
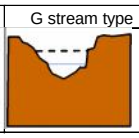
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

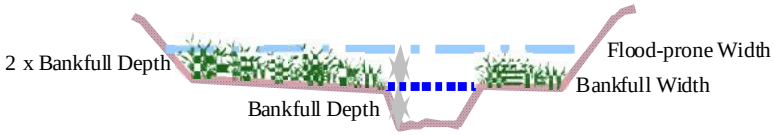
iii. Final Score and Rating: 0 NA **Comments:**

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: AA not subject to flooding from Big Porcupine Creek.

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: AA subject to ponding from precipitation and upland surface flow. Decreased rating in 2015 due to less than one acre-foot of water contained in wetlands within the AA subject to periodic flooding/ponding (reduction of wetland acreage contributed to

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: AA achieved greater than 70% vegetation cover, with early succession annuals, native perennial, rhizomotous and bunch grasses, and natural Populus deltoides recruitment.

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: AA with seasonal/ephemeral water. Vegetation transitioning from annuals to perennial rhizomotous grasses and bunchgrasses, along with natural Populus deltoides recruitment.

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:

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: AA hydrologically connected to a historic ox bow.

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: Ponding was observed on site in 2014, but not observed in 2015.

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: AA resembles a roadside ditch.

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:

AA small, adjacent to highway, and with little to no recreation or education potential.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Forsyth NW - East

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	0.414	☑
C. General Wildlife Habitat	M	.4	1	0.184	☐
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	0.138	☐
G. Sediment/Nutrient/Toxicant Removal	H	1	1	0.46	☑
H. Sediment/Shoreline Stabilization	M	.6	1	0.276	☑
I. Production Export/Food Chain Support	L	.3	1	0.138	☐
J. Groundwater Discharge/Recharge	M	.7	1	0.322	☑
K. Uniqueness	L	.2	1	0.092	☐
L. Recreation/Education Potential (bonus points)	NA	0	NA	0	☐
Totals:		4.4	9	2.024	
Percent of Possible Score			**48.89** %		

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 WETLAND MITIGATION SITE MONITORING FORM

Project Site: Forsyth NW - Treasure Co. Line Assessment Date/Time 6/10/2015
Person(s) conducting the assessment: R McEldowney, R Quire,
Weather: Warm and partly cloudy, light bre Location: ~17 miles west of Forsyth
MDT District: Glendive Milepost: ~RP 81.7 on I-94
Legal Description: T 6N R 38E Section(s) 23
Initial Evaluation Date: 8/14/2013 Monitoring Year: 3 #Visits in Year: 1
Size of Evaluation Area: 5.89 (acres)
Land use surrounding wetland:
I-94, Agriculture-grazing/pasture

HYDROLOGY

Surface Water Source: Groundwater, precipitation, surface runoff
Inundation: ☑ Average Depth: 0.4 **(ft)** Range of Depths: 0-1.2 **(ft)**
Percent of assessment area under inundation: 90 %
Depth at emergent vegetation-open water boundary: 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**:**
Surface water, H2S odor, geomorphic position, salt crust

Groundwater Monitoring Wells

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

Well ID	Water Surface Depth (ft)
No Wells	

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:

VEGETATION COMMUNITIES

Site Forsyth NW - Treasure Co. Line

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

Community # 3 **Community Type:** Schoenoplectus spp. / **Acres** 1.67

Species	Cover class	Species	Cover class
Algae, green	1	Alopecurus pratensis	0
Artemisia tridentata	0	Asclepias speciosa	0
Bare Ground	0	Bassia scoparia	0
Bromus japonicus	0	Carex sp.	1
Chenopodium album	0	Cirsium vulgare	0
Distichlis spicata	2	Elaeagnus angustifolia	0
Eleocharis palustris	2	Elymus junceus	0
Elymus repens	0	Hordeum jubatum	2
Lycopus asper	1	Open Water	1
Pascopyrum smithii	0	Polygonum majus	0
Puccinellia nuttalliana	0	Rumex crispus	1
Salicornia rubra	0	Schedonorus pratensis	1
Schoenoplectus maritimus	2	Schoenoplectus pungens	5
Sonchus arvensis	2	Sporobolus airoides	0
Typha latifolia	1		

Comments:

Community # 4 **Community Type:** Artemisia cana / Bromus japonicus **Acres** 1.91

Species	Cover class	Species	Cover class
Agropyron cristatum	1	Artemisia cana	3
Bare Ground	1	Bassia scoparia	2
Bromus japonicus	3	Chenopodium album	1
Cirsium arvense	1	Cirsium vulgare	0
Elaeagnus angustifolia	0	Elymus junceus	1
Filago arvensis	1	Grindelia squarrosa	1
Helianthus annuus	0	Hordeum jubatum	2
Lactuca serriola	0	Lepidium perfoliatum	3
Opuntia polyacantha	0	Pascopyrum smithii	3
Poa pratensis	2	Polygonum majus	0
Puccinellia nuttalliana	1	Rumex crispus	0
Sisymbrium altissimum	1	Sonchus arvensis	1
Sporobolus airoides	0	Symphoricarpos albus	0
Thlaspi arvense	0	Tragopogon dubius	0

Comments:

Originally designated as upland vegetation community #1 in previous survey years. Species composition and cover classes were different during 2015 field survey, creating a new upland vegetation community type.

Community # 5 **Community Type:** Pascopyrum smithii / Bromus japonicus **Acres** 2.31

Species	Cover class	Species	Cover class
Agropyron cristatum	0	Artemisia cana	1
Asclepias speciosa	0	Bare Ground	1
Bassia scoparia	1	Bromus japonicus	3
Chenopodium album	1	Cirsium arvense	0
Cirsium vulgare	0	Distichlis spicata	0
Elymus junceus	2	Filago arvensis	0
Grindelia squarrosa	1	Hordeum jubatum	1
Lactuca serriola	1	Lepidium perfoliatum	1
Medicago sativa	0	Melilotus officinalis	0
Opuntia polyacantha	0	Panicum capillare	0
Pascopyrum smithii	3	Poa pratensis	0
Polygonum majus	1	Puccinellia nuttalliana	1
Rumex crispus	0	Schedonorus pratensis	1
Sisymbrium altissimum	0	Sonchus arvensis	1
Sporobolus airoides	0	Symphoricarpos albus	0
Tragopogon dubius	0		

Comments:

Originally designated as upland vegetation community #2 in previous survey years. Species composition and cover classes were different during 2015 field survey, creating a new upland vegetation community type.

Total Vegetation Community Acreage **5.89**

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

VEGETATION TRANSECTS

Site: Forsyth NW - Treasure Co. Line **Date:** 6/10/2015

Transect Number: 1 **Compass Direction from Start:** 190

Interval Data:

Ending Station 65 **Community Type:** Schoenoplectus spp. /

Species	Cover class	Species	Cover class
Bare Ground	5	Bassia scoparia	1
Cirsium vulgare	1	Elymus repens	0
Hordeum jubatum	2	Polygonum majus	1
Puccinellia nuttalliana	1	Schedonorus pratensis	3
Sonchus arvensis	0	Sporobolus airoides	1

Ending Station 95 **Community Type:** Pascopyrum smithii / Bromus japonicus

Species	Cover class	Species	Cover class
Bare Ground	4	Bromus japonicus	1
Chenopodium album	1	Distichlis spicata	3
Hordeum jubatum	0	Lactuca serriola	0
Lepidium perfoliatum	4	Opuntia polyacantha	1
Pascopyrum smithii	1	Sisymbrium altissimum	0
Sonchus arvensis	0	Sporobolus airoides	1

Ending Station 200 **Community Type:** Schoenoplectus spp. /

Species	Cover class	Species	Cover class
Bare Ground	5	Bromus japonicus	0
Carex sp.	0	Chenopodium album	0
Hordeum jubatum	1	Pascopyrum smithii	0
Rumex crispus	0	Schedonorus pratensis	0
Schoenoplectus pungens	4	Sonchus arvensis	1
Typha latifolia	1		

Ending Station 347 **Community Type:** Pascopyrum smithii / Bromus japonicus

Species	Cover class	Species	Cover class
Bassia scoparia	0	Bromus japonicus	2
Chenopodium album	1	Cirsium arvense	1
Cirsium vulgare	0	Elymus junceus	2
Filago arvensis	1	Lactuca serriola	0
Lepidium perfoliatum	1	Pascopyrum smithii	4
Polygonum majus	0	Schedonorus pratensis	0
Sonchus arvensis	1		

Ending Station 405 **Community Type:** Schoenoplectus spp. /

Species	Cover class	Species	Cover class
Algae, green	3	Artemisia tridentata	0
Elymus junceus	2	Open Water	4
Schoenoplectus maritimus	1	Schoenoplectus pungens	4
Sonchus arvensis	1		

Ending Station 534 **Community Type:** Pascopyrum smithii / Bromus japonicus

Species	Cover class	Species	Cover class
Artemisia cana	1	Bare Ground	4
Bromus japonicus	2	Chenopodium album	1
Distichlis spicata	1	Hordeum jubatum	1
Lepidium perfoliatum	3	Pascopyrum smithii	4
Sisymbrium altissimum	1	Sonchus arvensis	1

Transect Notes:

Bare ground represented more than 50% of the first transect interval ending at 65 ft., much of this interval had standing water and a salt crust with an overwhelming H2S odor, thus it was considered a wetland and part of vegetation community number 3.

PLANTED WOODY VEGETATION SURVIVAL

Forsyth NW - Treasure Co. Line

Planting Type	#Planted	#Alive	Notes
None planted			

Comments

No woody vegetation planted at site.

Forsyth NW - Treasure Co. Line

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: 0

How many? 0

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
Northern Harrier	1		UP, WM,
Red-tailed Hawk	1		UP, WM,
Red-winged Blackbird	3		UP, WM,
Western Meadowlark	1		UP,
Wilson's Snipe	1		UP, WM,

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
Frog sp.	1	No	No	No	
Muskrat		Yes	No	No	

Wildlife Comments:

Forsyth NW - Treasure Co. Line

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
1015-1016	46.261292	-106.937012	180	PP-1
1017-1018	46.261398	-106.937569	140	PP-2
1019-1020	46.260593	-106.937988	45	PP-3
1021-1023	46.260349	-106.936935	315	PP-4
8208	46.260059	-106.937912	10	T-1 end
8212	46.261635	-106.937218	190	T-1 start
8213-8215	46.261483	-106.937079		SP1-w
8232-8234	46.26144	-106.937075		SP2-u

Comments:

Forsyth NW - Treasure Co. Line

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

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? No

If yes, do they need to be repaired?

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.

Observed soil pugging from livestock and grazed plant species that occurred earlier in the spring of 2015.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Treasure Co. Line City/County: Rosebud Co. Sampling Date: 6/10/2015

Applicant/Owner: MDT State: MT Sampling Point: SP1-w

Investigator(s): R Quire, R McEldowney Section, Township, Range: 23 6N 38E

Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): LRR G Lat: 46.261484 Long: -106.937079 Datum: WGS84

Soil Map Unit Name: Borollic Camborthids-Ustic Torrifluvents complex, 0 to 8 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: PEM, slope wetland, saline seep with white film floating on standing water. Sample point located in new wetland boundary, boundary expanded from previous sampling years.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Carex sp.	1	☐	NL
Distichlis spicata	10	☑	FACW
Hordeum jubatum	15	☑	FACW
Puccinellia nuttalliana	1	☐	OBL
Schedonorus pratensis	20	☑	FACU
Sonchus arvensis	1	☐	FAC

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 52

Dominance Test worksheet

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	1	X 1	1
FACW species	25	X 2	50
FAC species	1	X 3	3
FACU species	20	X 4	80
UPL species	1	X 5	5
Column Totals	48 (A)		139 (B)

Prevalence Index = B/A = 2.90

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: SP1-w

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
0-7	10YR 4/2	100					Clay	**Very Moist**
7-16	10YR 4/2	80	10YR 5/1	15	D	M	Clay	**Redox concentrations, deplete**
7-16	10YR 4/2	80	10YR 4/6	5	C	M	Clay	**Redox mottles, masses**

[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): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Wetland has standing water in areas, such as pugs from hoof prints. Very pungent H2S smell.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Treasure Co. Line City/County: Rosebud Co. Sampling Date: 6/10/2015

Applicant/Owner: MDT State: MT Sampling Point: SP2-u

Investigator(s): R Quire, R McEldowney Section, Township, Range: 23 6N 38E

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

Subregion (LRR): LRR G Lat: 46.261453 Long: -106.937073 Datum: WGS84

Soil Map Unit Name: Borollic Camborthids-Ustic Torrifluvents complex, 0 to 8 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: Data point located in upland, northern portion of project boundary, close to Interstate 94.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Agropyron cristatum	1	☐	NL
Bromus japonicus	1	☐	NL
Chenopodium sp.	1	☐	NL
Distichlis spicata	10	☑	FACW
Filago arvensis	5	☐	NL
Lepidium perfoliatum	1	☐	FAC
Pascopyrum smithii	20	☑	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 55

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	10	X 2	20
FAC species	1	X 3	3
FACU species	20	X 4	80
UPL species	8	X 5	40
Column Totals	39 (A)		143 (B)

Prevalence Index = B/A = 3.67

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: SP2-u

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 4/2	100					Clay	

[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 evidence of hydric soil indicators during field survey.

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 evidence of hydrologic indicators during field survey.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Forsyth NW - Treasure Co. Line **2. MDT project#** STPP 14-6(9)259 **Control#** 4059

3. Evaluation Date 6/10/2015 **4. Evaluators** R Quire, R McEldowney **5. Wetland/Site# (s)** Treasure Co. Line

6. Wetland Location(s): T 6N **R** 38E **Sec1** 23 **T** **R** **Sec2**

Approx Stationing or Mileposts ~RP 81.7 on I-94

Watershed 10100001 **Watershed/County** Lower Yellowstone River-Sunday Creek, Rosebud County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 1.67

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 1.67

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Emergent Wetland	Excavated	Permanent/Perennial	90
Depressional	Emergent Wetland		Seasonal/Intermittent	10

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)

Constructed AA with sufficient time for vegetation to establish. Changed to from low to moderate disturbance because there was evidence of moderate grazing that occurred earlier in the year within the AA.

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

Cirsium arvense

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA includes excavated wetland constructed adjacent to a larger wetland area. AA also includes depressional PEM wetland outside of excavated constructed wetland, along the northern edge of the project boundary, observed in 2015. Surrounding land use includes I-94, agriculture, and grazing.

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 with scattered shrubs.

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 USF&WS T&E list for Rosebud 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

Secondary habitat (list Species) ◉ D ◯ S Great Blue Heron (S3)

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 GBH observed on site in previous year.

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 Rating decreased from 2014 due to evidence of recent cattle grazing in AA.

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**

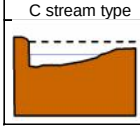
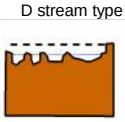
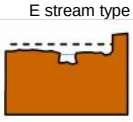
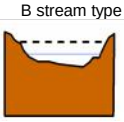
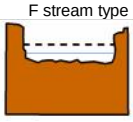
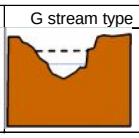
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

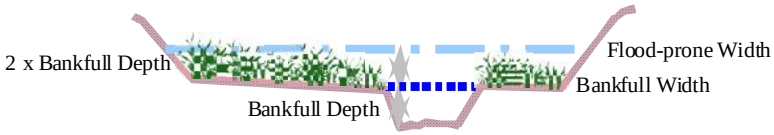
iii. Final Score and Rating: 0 NA **Comments:**

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:

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:

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:

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:

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** .5M

Comments: AA bordered by I-94 to north.

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:

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:

Site owned by MDT.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Treasure Co. Line

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	M	.6	1	1.002	☐
C. General Wildlife Habitat	M	.7	1	1.169	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.4	1	0.668	☐
F. Short and Long Term Surface Water Storage	H	.8	1	1.336	☑
G. Sediment/Nutrient/Toxicant Removal	H	.9	1	1.503	☑
H. Sediment/Shoreline Stabilization	NA	0	0	0	☐
I. Production Export/Food Chain Support	M	.5	1	0.835	☐
J. Groundwater Discharge/Recharge	H	1	1	1.67	☑
K. Uniqueness	L	.3	1	0.501	☐
L. Recreation/Education Potential (bonus points)	H	.15	NA	0.2505	☐
Totals:		5.35	9	8.9345	
Percent of Possible Score			**59.44** %		

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
West Site (1), Middle Site (2), and East Site (3), Treasure County Line Site (4)
Rosebud County, Montana

Forsyth Northwest-West

Photo Point 1 – *Panorama* **Location:** Northeast corner of southeast end

Bearing: 270 Degrees **Taken in 2013**

Photo Point 1 – *Panorama* **Location:** Northeast corner of southeast end

Bearing: 270 Degrees **Taken in 2014**

Photo Point 1 – *Panorama* **Location:** Northeast corner of southeast end

Bearing: 270 Degrees **Taken in 2015**

Photo Point 2 – *Panorama* **Location:** Southwest corner of southeast end, view of repaired dike.

Bearing: 350 Degrees **Taken in 2013**

Photo Point 2 – *Panorama* **Location:** Southwest corner of southeast end, view of failed dike.

Bearing: 350 Degrees **Taken in 2014**

Photo Point 2 – *Panorama* **Location:** Southwest corner of southeast end, view of failed dike.

Bearing: 350 Degrees **Taken in 2015**

Photo Point 3 – *Panorama* **Location:** Northeast side (along road) near middle of site

Bearing: 230 Degrees **Taken in 2013**

Photo Point 3 – *Panorama* **Location:** Northeast side (along road) near middle of site

Bearing: 230 Degrees **Taken in 2014**

Photo Point 3 – *Photo 1* **Location:** Northeast side (along road) near middle of site

Bearing: 230 Degrees **Taken in 2015**

Photo Point 4 – *Panorama* **Location:** Northeast corner of northwest end

Bearing: 210 Degrees **Taken in 2013**

Photo Point 4 – *Panorama* **Location:** Northeast corner of northwest end

Bearing: 210 Degrees **Taken in 2014**

Photo Point 4 – *Photo 1* **Location:** Northeast corner of northwest end

Bearing: 210 Degrees **Taken in 2015**

Forsyth Northwest-West

Photo Point 5 – *Panorama* **Location:** Southwest side near middle of site

Bearing: 45 Degrees **Taken in 2013**

Photo Point 5 – *Panorama* **Location:** Southwest side near middle of site

Bearing: 45 Degrees **Taken in 2014**

Photo Point 5 – *Panorama* **Location:** Southwest side near middle of site

Bearing: 45 Degrees **Taken in 2015**

Forsyth Northwest-West

Transect 1 – *Start* **Location:** Southeast end

Bearing: 25 Degrees **Taken in 2013**

Transect 1 – *Start* **Location:** Southeast end

Bearing: 25 Degrees **Taken in 2014**

Transect 1 – *Start* **Location:** Southeast end

Bearing: 25 Degrees **Taken in 2015**

Forsyth Northwest-West

Transect 1 – *End* **Location:** Southeast end

Bearing: 205 Degrees **Taken in 2013**

Transect 1 – *End* **Location:** Southeast end

Bearing: 205 Degrees **Taken in 2014**

Transect 1 – *End* **Location:** Southeast end

Bearing: 205 Degrees **Taken in 2015**

Forsyth Northwest-West

Transect 2 – *Start* **Location:** Northwest end

Bearing: 25 Degrees **Taken in 2013**

Transect 2 – *Start* **Location:** Northwest end

Bearing: 25 Degrees **Taken in 2014**

Transect 2 – *Start* **Location:** Northwest end

Bearing: 25 Degrees **Taken in 2015**

Forsyth Northwest-West

Transect 2 – *End* **Location:** Northwest end

Bearing: 205 Degrees **Taken in 2013**

Transect 2 – *End* **Location:** Northwest end

Bearing: 205 Degrees **Taken in 2014**

Transect 2 – *End* **Location:** Northwest end

Bearing: 205 Degrees **Taken in 2015**

Data Point – *We-1w* **Location:** Veg Community 9

Taken in 2015

Data Point – *We-1u* **Location:** Veg Community 6

Taken in 2015

Photo Point 1 – *Photo 1* **Location:** Northwest end

Bearing: 300 Degrees **Taken in 2013**

Photo Point 1 – *Photo 1* **Location:** Northwest end

Bearing: 300 Degrees **Taken in 2014**

Photo Point 1 – *Photo 1* **Location:** Northwest end

Bearing: 300 Degrees **Taken in 2015**

Photo Point 2 – *Photo 1* **Location:** Southeast end

Bearing: 120 Degrees **Taken in 2013**

Photo Point 2 – *Photo 1* **Location:** Southeast end

Bearing: 120 Degrees **Taken in 2014**

Photo Point 2 – *Photo 1* **Location:** Southeast end

Bearing: 120 Degrees **Taken in 2015**

Forsyth Northwest-Middle

Transect 1 – *Start* **Location:** Near middle of site

Bearing: 205 Degrees **Taken in 2013**

Transect 1 – *Start* **Location:** Near middle of site

Bearing: 205 Degrees **Taken in 2014**

Transect 1 – *Start* **Location:** Near middle of site

Bearing: 205 Degrees **Taken in 2015**

Forsyth Northwest-Middle

Transect 1 – *End* **Location:** Near middle of site

Bearing: 25 Degrees **Taken in 2013**

Transect 1 – *End* **Location:** Near middle of site

Bearing: 25 Degrees **Taken in 2014**

Transect 1 – *End* **Location:** Near middle of site

Bearing: 25 Degrees **Taken in 2015**

Data Point – *SP1-w* **Location:** Veg Community 4

Taken in 2015

Data Point – *SP2-u* **Location:** Veg Community 3

Taken in 2015

West along road buffer, 2015

East along road buffer, 2015

Forsyth Northwest-East

Photo Point 1 – *Photo 1* **Location:** Northwest end of site

Bearing: 125 Degrees **Taken in 2013**

Photo Point 1 – *Photo 1* **Location:** Northwest end of site

Bearing: 125 Degrees **Taken in 2014**

Photo Point 1 – *Photo 1* **Location:** Northwest end of site

Bearing: 125 Degrees **Taken in 2015**

Photo Point 2 – *Panorama* **Location:** Near center of site

Bearing: 210 Degrees **Taken in 2013**

Photo Point 2 – *Panorama* **Location:** Near center of site

Bearing: 210 Degrees **Taken in 2014**

Photo Point 2 – *Photo 1* **Location:** Near center of site

Bearing: 210 Degrees **Taken in 2015**

Photo Point 3 – *Photo 1* **Location:** Southeast end of site

Bearing: 305 Degrees **Taken in 2013**

Photo Point 3 – *Photo 1* **Location:** Southeast end of site

Bearing: 305 Degrees **Taken in 2014**

Photo Point 3 – *Photo 1* **Location:** Southeast end of site

Bearing: 305 Degrees **Taken in 2015**

Forsyth Northwest-East

Transect 1 – *Start* **Location:** Northwest end

Bearing: 145 Degrees **Taken in 2013**

Transect 1 – *Start* **Location:** Northwest end

Bearing: 145 Degrees **Taken in 2014**

Transect 1 – *Start* **Location:** Northwest end

Bearing: 145 Degrees **Taken in 2015**

Forsyth Northwest-East

Transect 1 – *End* **Location:** Northwest end

Bearing: 325 Degrees **Taken in 2013**

Transect 1 – *End* **Location:** Northwest end

Bearing: 325 Degrees **Taken in 2014**

Transect 1 – *End* **Location:** Northwest end

Bearing: 325 Degrees **Taken in 2015**

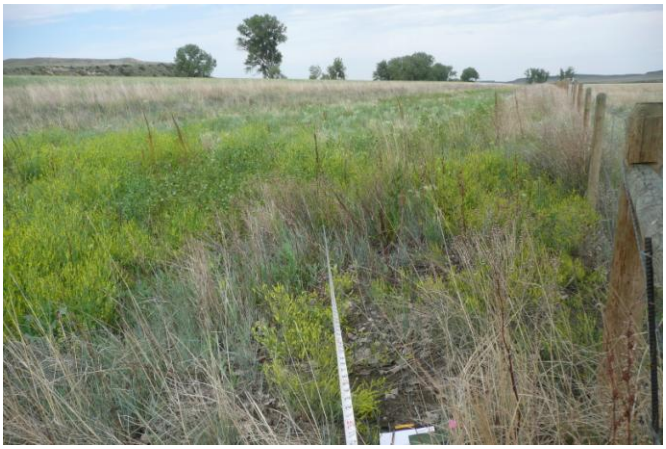
Forsyth Northwest-East

Transect 2 – *Start* **Location:** Southeast end

Bearing: 280 Degrees **Taken in 2013**

Transect 2 – *Start* **Location:** Southeast end

Bearing: 280 Degrees **Taken in 2014**



Transect 2 – *Start* **Location:** Southeast end

Bearing: 280 Degrees **Taken in 2015**

Transect 2 – *End* **Location:** Southeast end

Bearing: 100 Degrees **Taken in 2013**

Transect 2 – *End* **Location:** Southeast end

Bearing: 100 Degrees **Taken in 2014**

Transect 2 – *End* **Location:** Southeast end

Bearing: 100 Degrees **Taken in 2015**

Data Point – *SP1-w* **Location**: Veg Community 2

Taken in 2015

Data Point – *SP2-u* **Location: Veg Community 3**

Taken in 2015

Data Point – *SP3-u* **Location: Veg Community 3**

Taken in 2015

Data Point – *SP3-u (2)* **Location: Veg Community 3**

Taken in 2015

Photo Point 1 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2013**

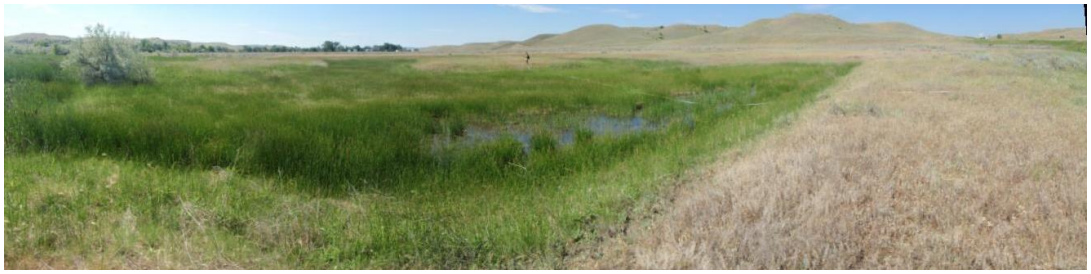


Photo Point 1 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2014**

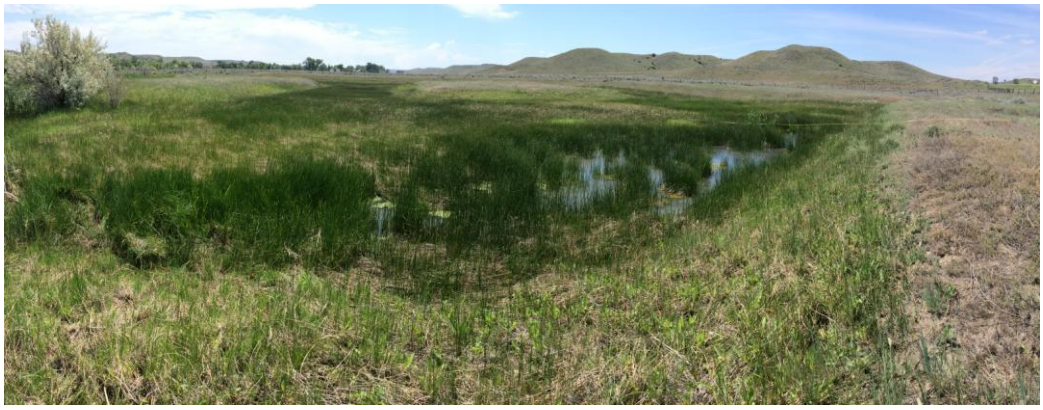


Photo Point 1 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2015**

Photo Point 2 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2013**

Photo Point 2 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2014**

Photo Point 2 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2015**

Photo Point 3 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2013**

Photo Point 3 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2014**

Photo Point 3 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2015**

Photo Point 4 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2013**

Photo Point 4 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2014**

Photo Point 4 – *Panorama* **Location:** Northeast corner of wetland

Bearing: 180 Degrees **Taken in 2015**

Transect 1 – *Start* **Location:** West half of wetland

Bearing: 190 Degrees **Taken in 2013**

Transect 1 – *Start* **Location:** West half of wetland

Bearing: 190 Degrees **Taken in 2014**

Transect 1 – *Start* **Location:** West half of wetland

Bearing: 190 Degrees **Taken in 2015**

Transect 1 – *End* **Location:** West half of wetland

Bearing: 10 Degrees **Taken in 2013**

Transect 1 – *End* **Location:** West half of wetland

Bearing: 10 Degrees **Taken in 2014**

Transect 1 – *End* **Location:** West half of wetland

Bearing: 10 Degrees **Taken in 2015**

Data Point – *SP1-w* **Location:** Veg Community 3

Taken in 2015

Data Point – *SP2-u* **Location:** Veg Community 5

Taken in 2015

Appendix D

Original Site Plans

MDT Wetland Mitigation Monitoring
West Site (1), Middle Site (2), and East Site (3), Treasure County Line Site (4)
Rosebud County, Montana

MDT MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. STPP 14–6(10)259

PMS OVERLAY, RECONSTRUCTION, PULVERIZATION

FORSYTH – NORTHWEST

ROSEBUD COUNTY

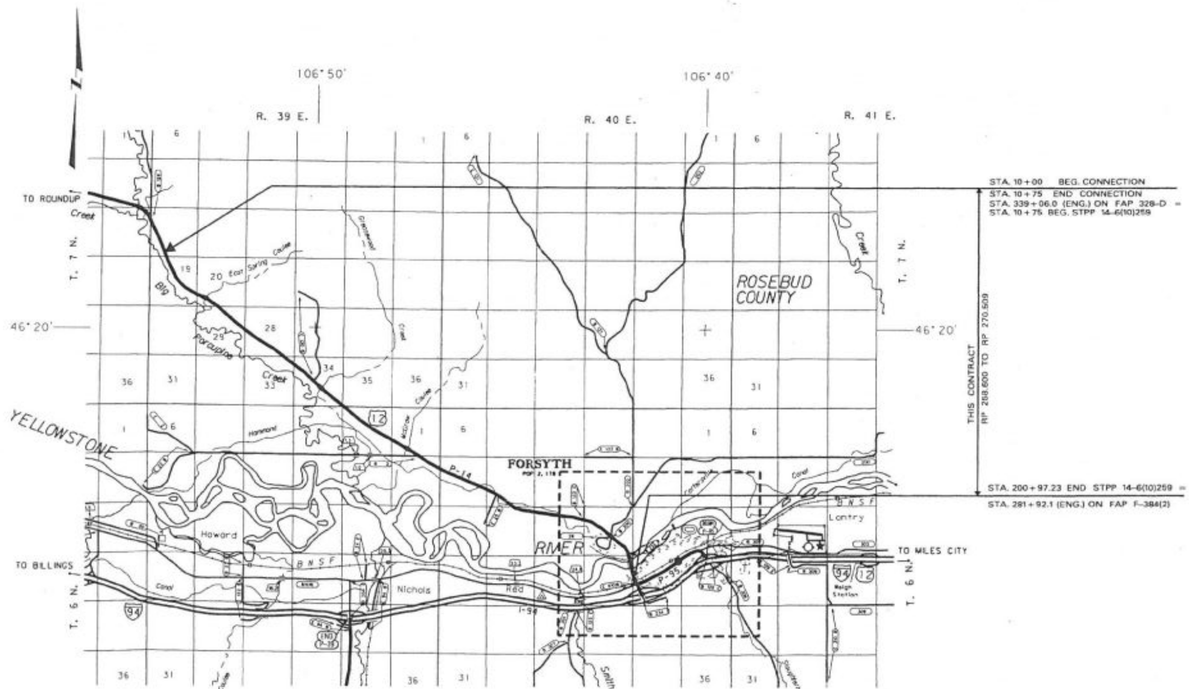
LENGTH 19.1 kilometers

DESIGN DATA
2005 A.D.T. = 240
2025 A.D.T. = 300
D.H.V. = 50
D. = 55% - 45%
T. = 19.6%
V. = 90 km/h
ALL TRUCKS = 47.0%
80 kN ESAL'S = 29.98
GROWTH RATE = 1.0%

LETTING DATE – ____________

SURFACING SOURCE – CONTRACTOR FURNISHED

CSF = 0.999347553



RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R/W & I.C.	STPP 14-6(13)259
P.E.	STPP 14-6(9)259

CONTROL NO. 4059

MONTANA DEPARTMENT OF TRANSPORTATION
APPROVED : OCTOBER 27, 20 11 TIM REARDON DIRECTOR OF TRANSPORTATION BY [signature] CONSULTANT DESIGN ENGINEER
MONTANA TIMOTHY J CONWAY 10426PE REGISTERED PROFESSIONAL ENGINEER
U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
APPROVED : DIVISION ADMINISTRATOR DATE

DESIGNED BY
REVIEWED BY
CHECKED BY
10/27/2011 10:43:14 AM

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	2

TABLE OF CONTENTS

MDT MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

g:\dgn\4059\rdtti201.dgn DESIGNED BY
11/1/2011 REVIEWED BY
4:22:06 PM CHECKED BY
PPS - U0208

SUMMARY

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	11

TOPSOIL & SEEDING

STATION FROM	STATION TO	cubic meters: TOPSOIL SALVAGING & PLACING	hectares: SEED NO. 1	SEED NO. 2	SEED NO. 3	FERTILIZER NO. 1	FERTILIZER NO. 2	CONDITION SEEDBED AREAS 1 & 3	MULCH AREA 2	REMARKS
10+00	20+00	2598	3.1	0.9	1.0	3.1	0.9	4.1	0.9	
20+00	30+00	2702	2.6	0.7	1.0	2.6	0.7	3.6	0.7	
30+00	40+00	2293	2.6	0.1	1.0	2.6	0.1	3.6	0.1	
40+00	50+00	1821	2.0		1.0	2.0		3.0		
50+00	60+00	2203	2.5	0.1	1.0	2.5	0.1	3.5	0.1	
60+00	70+00	2323	3.8	0.1	1.0	3.8	0.1	4.8	0.1	
70+00	80+00	2158	2.5	0.3	1.0	2.5	0.3	3.5	0.3	
80+00	90+00	2278	2.2	0.2	1.0	2.2	0.2	3.2	0.2	
90+00	100+00	2142	2.1	0.1	1.0	2.1	0.1	3.1	0.1	
100+00	110+00	2373	2.2	0.1	1.0	2.2	0.1	3.2	0.1	
110+00	120+00	2014	2.2		1.0	2.2		3.2		
120+00	130+00	1963	2.4	1.5	1.0	2.4	1.5	3.4	1.5	
130+00	140+00	2378	3.4	0.1	1.0	3.4	0.1	4.4	0.1	
140+00	150+00	2138	3.0	0.1	1.0	3.0	0.1	4.0	0.1	
150+00	160+00	2239	3.0		1.0	3.0		4.0		
160+00	170+00	1826	2.8		1.0	2.8		3.8		
170+00	180+00	2248	1.6		1.0	1.6		2.6		
180+00	190+00	2871	6.0	0.4	1.0	6.0	0.4	7.0	0.4	
190+00	197+00	2048	2.8	1.4	0.7	2.8	1.4	3.5	1.4	
TOTAL		42616	52.8	6.1	18.7	52.8	6.1	71.5	6.1	

FINISH GRADE CONTROL

STATION FROM	STATION TO	course kilometers: FINISH GRADE CONTROL	REMARKS
10+00	52+00	4.2	SUBGRADE
10+00	52+00	4.2	TOP CAC
52+00	72+20	2.0	SUBGRADE MAINLINE
52+00	72+20	2.0	BASE COURSE MAINLINE
72+20	196+98	12.5	SUBGRADE
72+20	196+98	12.5	TOP BASE COURSE
TOTAL		37.4	

APPROACH PIPE (INCLUDED IN CULVERT SUMMARY RECAP)

STATION	BASIC BID ITEMS: CULVERT PIPE mm	meters: LENGTH OF PIPE	meters: RELAY CULVERT	meters: CLEAN CULVERT	cubic meters: CULVERT EXCAVATION	PIPE OPTIONS mm: CONCRETE - CLASS 2	STEEL - 68 x 13 CORR. 1.63 THK.	ALUMINUM - 68 x 13 CORR. 1.52 THK.	CORRUGATED POLYETHYLENE PIPE	END SECTIONS LEFT	END SECTIONS RIGHT	meters: HEIGHT OF COVER	SKEW ANGLE	REMOVE CULVERT mm x m	REMARKS
14+93	450	11.0			5	450				FETS	FETS	0.3		-	APP. LT.
39+38	450	11.5			20	450			450	FETS	FETS	0.6		610 x 10.5 RCP	APP. LT.
39+38	600	11.5			20	600			600	FETS	FETS	0.6		610 x 10.0 RCP	APP. RT.
49+89	-	-			15	-				-	-	-		762 x 9.3 CSP	APP. LT.
49+89					10									381 x 9.3 RCP	APP. RT.
53+35	1200	13.5			25	1200				FETS	FETS	0.4		762 x 9.0 CSP	APP. LT.
53+35	600	14.0			15	600				FETS	FETS	1.2		610 x 9.0 CSP	APP. RT.
66+36	900	11.0			15	900				FETS	FETS	0.4		610 x 8.0 CSP	APP. RT.
66+37	450	11.0			5	450				FETS	FETS	0.5			
74+18	450	11.0			10	450				FETS	FETS	0.3		-	APP. LT.
77+84	600	11.5			30	600			600	FETS	FETS	0.8		610 x 12.5 RCP	APP. LT.
77+84	600	11.5			30	600				FETS	FETS	0.5		610 x 12.5 RCP	APP. RT.
84+34	-	-			10	-				-	-	-		457 x 12.5 RCP	LT.
101+30	450	11.0			25	450	450	450	450	FETS	FETS	0.6		254 x 18.7 CSP	APP. RT.
109+18	600	11.0			20	600	600	600		FETS	FETS	0.5		610 x 7.7 RCP	APP. LT.
109+18	600	11.0			20	600	600	600		FETS	FETS	0.5		610 x 8.2 CSP	APP. RT.
114+82	600	11.0			20	600	600	600		FETS	FETS	0.5		457 x 12.5 CSP	APP. LT.
114+95	750	16.5			5	-	750	750		FETS	FETS	0.3			APP. RT.
114+95	750	2.0			5	-	750	750		FETS	FETS	0.3		762 x 1.0 CSP	APP. RT. - REMOVE 1.0 m RT.
154+40	450	11.5			15	450	450	450	450	FETS	FETS	0.8		381 x 13.6 CSP	APP. LT.
161+36	450	11.0			20	450	450	450	450	FETS	FETS	0.6		457 x 12.2 CSP	APP. LT.
162+30	450	11.5			20	450	450	450	450	FETS	FETS	0.6		457 x 12.1 CSP	APP. LT.
170+66	450	11.0			20	450	450	450	450	FETS	FETS	0.7		381 x 12.2 CSP	APP. LT.
171+95	450	11.0			10	450	450	450	450	FETS	FETS	0.6		-	APP. LT.
173+24	450	11.0			10	450	450 -	450		FETS	FETS	0.3		-	APP. LT.
183+44	600	12.5			30	600	600	600	600	FETS	FETS	1.1		610 x 11.0 CSP	APP. LT.
185+33	600	20.0			25	600	600	600	600	FETS	FETS	1.1		-	APP. LT.
TOTAL	~	~			*	~	~	~	~	~	~	~	~	211.8	

* QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY

WATER LINE

STATION	meters: STEEL CASING SCH. 80 100 mm	REMARKS
12+07	57	MIN. 0.6 m COVER CAP ENDS
TOTAL	57	PLACE MARKER AT R/W LINE AT BOTH ENDS

WETLAND SITE

STATION FROM	STATION TO	LUMP SUM: WETLAND MITIGATION SITE	REMARKS (4,2 ha)
30+00	36+00	0.6	RT.
61+23	64+20	0.2	LT.
66+60	71+07	0.2	LT.
TOTAL		1.0	

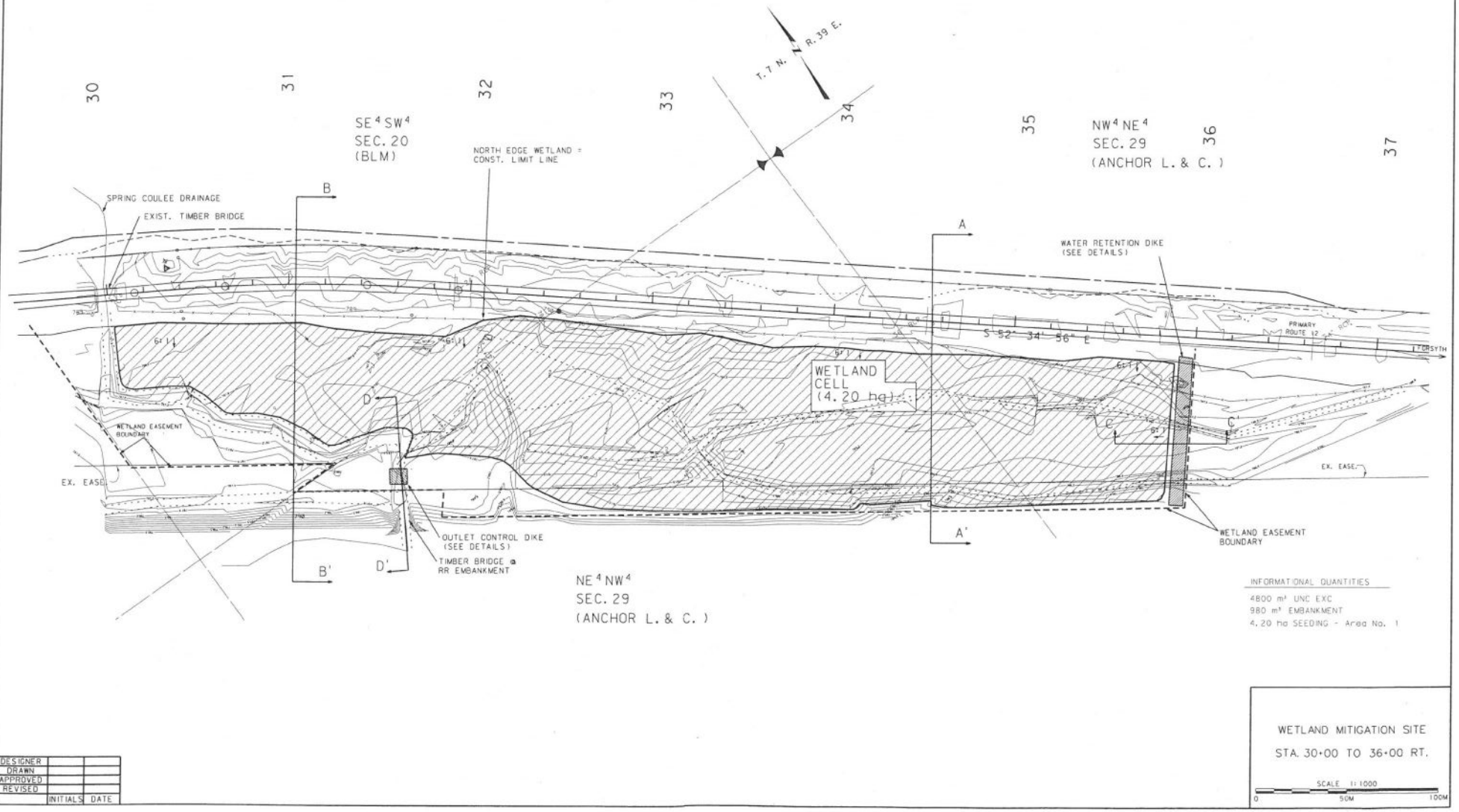
MDT MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

DELTA ENGINEERING P.C. CONSULTING ENGINEERS

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	26

CSF = 0.999347553



INFORMATIONAL QUANTITIES

4800 m³ UNC EXC
980 m³ EMBANKMENT
4.20 ha SEEDING - Area No. 1

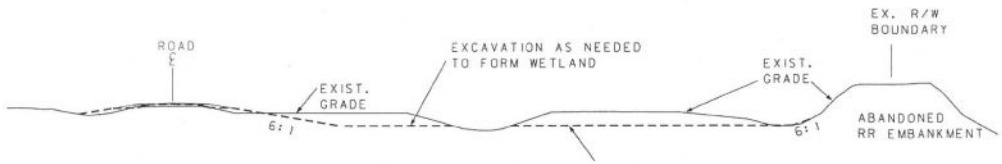
WETLAND MITIGATION SITE
STA. 30+00 TO 36+00 RT.

SCALE 1: 1000
0 50M 100M

DESIGNER		
DRAWN		
APPROVED		
REVISED		
	INITIALS	DATE

MONTANA DEPARTMENT OF TRANSPORTATION
MDT
MONTANA CADD

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	27

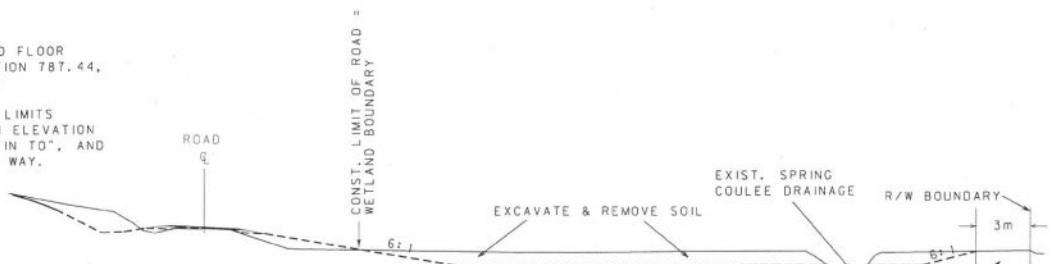


TYPICAL SECTION A-A'

NO SCALE

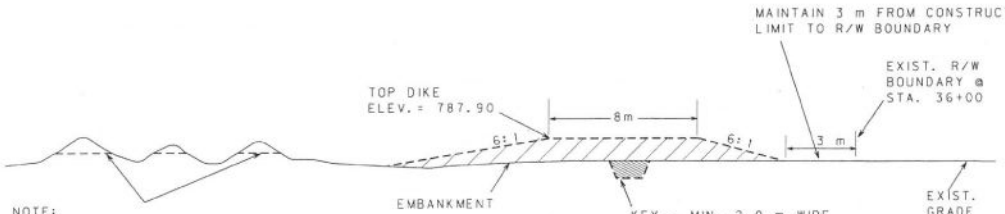
NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

AREAS WITHIN THE CONSTRUCTION LIMITS THAT ARE ALREADY BELOW DESIGN ELEVATION 787.44 ARE TO BE "DAYLIGHTED IN TO", AND ARE NOT TO BE "FILLED" IN ANY WAY.



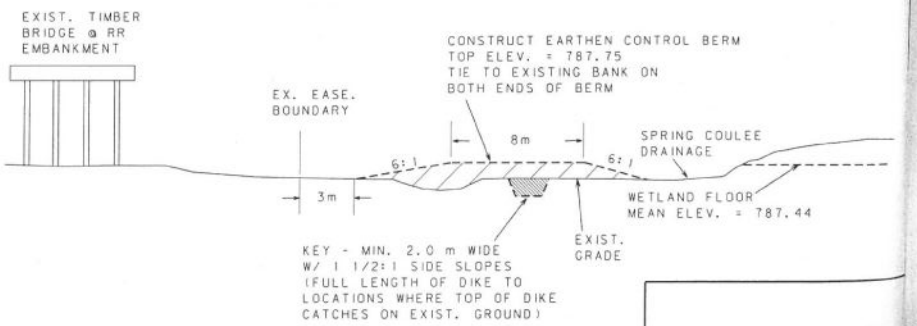
TYPICAL SECTION B-B'

NO SCALE



WATER RETENTION DIKE
TYPICAL SECTION C-C'

NO SCALE



OUTLET CONTROL DIKE
TYPICAL SECTION D-D'

NO SCALE

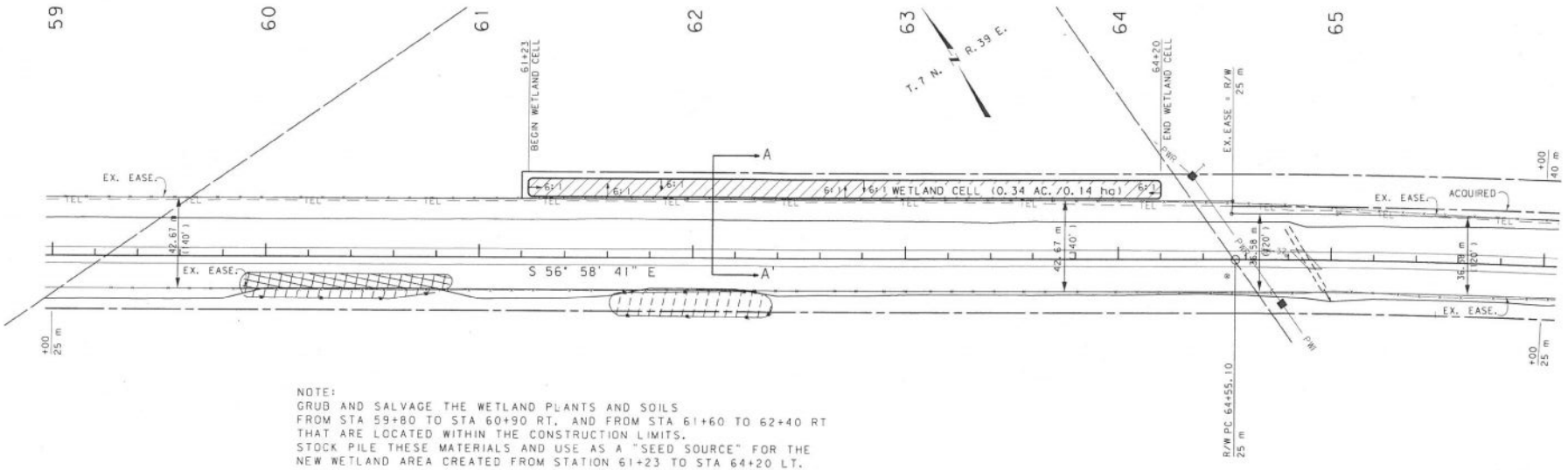
NOTE: USE A-7-6 SOIL TO CONSTRUCT EMBANKMENT FOR ALL DIKES AND KEYWAYS. CONSTRUCT EMBANKMENTS AS PER SECTION 203.03.2 IN THE STANDARD SPECIFICATIONS. COMPLETE MOISTURE AND DENSITY REQUIREMENTS AS PER SECTION 203.03.3 IN THE STANDARD SPECIFICATIONS.

	INITIALS	DATE
DESIGNER		
DRAWN		
APPROVED		
REVISED		

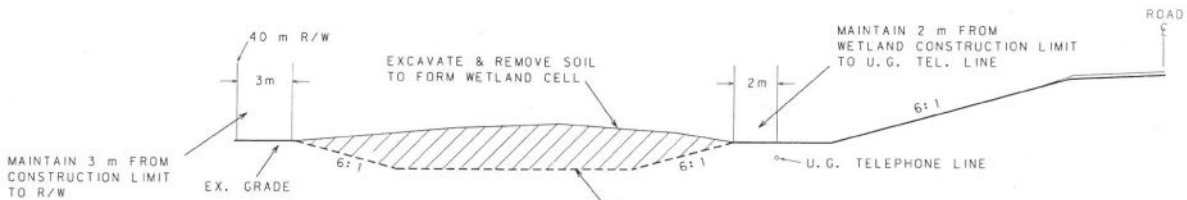
WETLAND MITIGATION SITE
STA. 30+00 TO 36+00 RT.
TYPICAL SECTIONS

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	28

CSF = 0.999347553



NOTE:
GRUB AND SALVAGE THE WETLAND PLANTS AND SOILS FROM STA 59+80 TO STA 60+90 RT. AND FROM STA 61+60 TO 62+40 RT THAT ARE LOCATED WITHIN THE CONSTRUCTION LIMITS.
STOCK PILE THESE MATERIALS AND USE AS A "SEED SOURCE" FOR THE NEW WETLAND AREA CREATED FROM STATION 61+23 TO STA 64+20 LT.



NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 783.00 CREATING AN UNDULATING BOTTOM.

INFORMATIONAL QUANTITIES

1325 m³ UNC EXC
0.14 ha SEEDING- AREA NO. 1

TYPICAL SECTION A-A'

NO SCALE

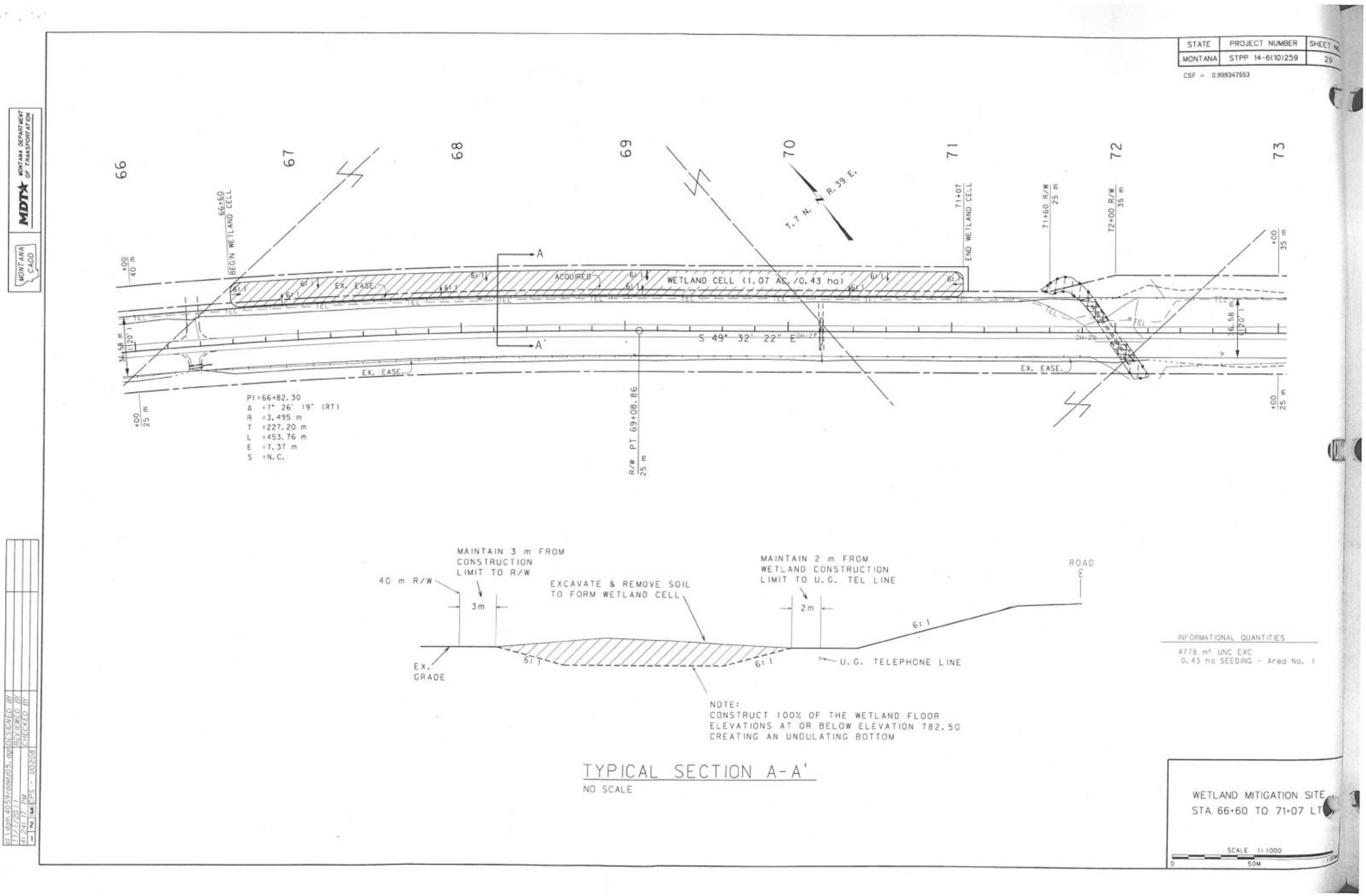
WETLAND MITIGATION SITE
STA. 61+23 TO 64+20 LT.

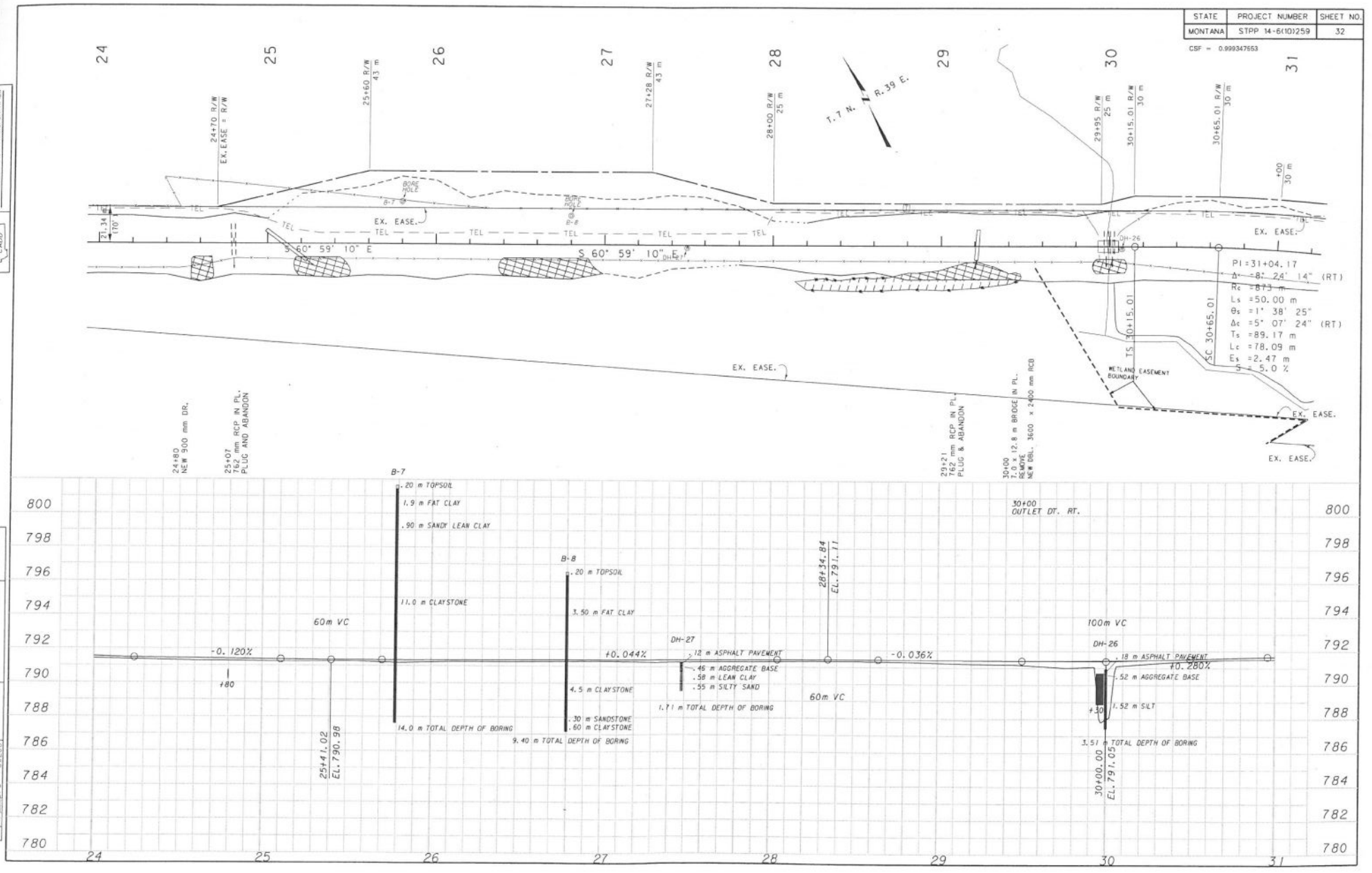
SCALE 1:1000
0 50M 100M

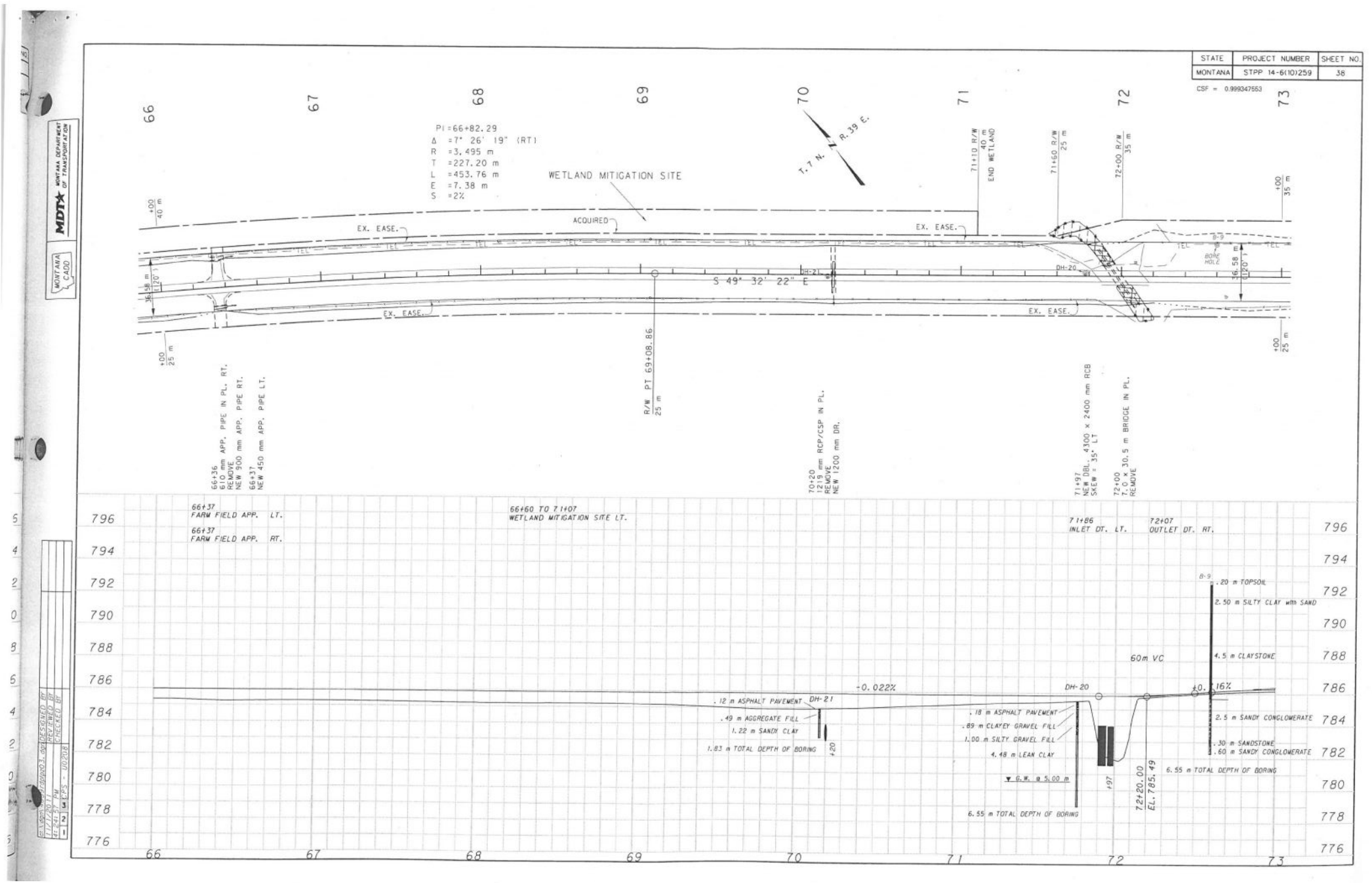
MONTANA DEPARTMENT OF TRANSPORTATION
MDT
MONTANA CADD

59-00 - 66-00

DESIGNED BY
REVIEWED BY
CHECKED BY


STATE
PROJECT NUMBER
SHEET NO.
MONTANA
STPP 14-6(10)259
29
CSF = 0.999347553
MDT MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADD
66
67
68
69
70
71
72
73
66+60 BEGIN WETLAND CELL
71+07 END WETLAND CELL
71+60 R/W 25 m
72+00 R/W 35 m
T. 7 N. R. 39 E.
WETLAND CELL (1.07 AC./0.43 ha)
ACQUIRED
EX. EASE.
TEL
S 49° 32' 22" E
R/W PT 69+08.86 25 m
+00 40 m
+00 25 m
+00 35 m
36.58 m (120')
PI=66+82.30
Δ =7° 26' 19" (RT)
R =3,495 m
T =227.20 m
L =453.76 m
E =7.37 m
S =N.C.
MAINTAIN 3 m FROM CONSTRUCTION LIMIT TO R/W
40 m R/W
3m
EXCAVATE & REMOVE SOIL TO FORM WETLAND CELL
MAINTAIN 2 m FROM WETLAND CONSTRUCTION LIMIT TO U.G. TEL LINE
2m
ROAD ℄
6:1
EX. GRADE
U.G. TELEPHONE LINE
NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 782.50 CREATING AN UNDULATING BOTTOM
TYPICAL SECTION A-A'
NO SCALE
INFORMATIONAL QUANTITIES
4778 m³ UNC EXC
0.43 ha SEEDING - Area No. 1
WETLAND MITIGATION SITE
STA. 66+60 TO 71+07 LT
SCALE 1:1000
DESIGNED BY
REVIEWED BY
CHECKED BY
11/1/2011


STATE
MONTANA
PROJECT NUMBER
STPP 14-6(10)259
SHEET NO.
32
CSF = 0.999347653
24+70 R/W
EX. EASE = R/W
25+60 R/W
43 m
27+28 R/W
43 m
28+00 R/W
25 m
29+95 R/W
25 m
30+15.01 R/W
30 m
30+65.01 R/W
30 m
T. 7 N.
R. 39 E.
EX. EASE.
S 60° 59' 10" E
PI = 31+04.17
Δ = 8° 24' 14" (RT)
Rc = 873 m
Ls = 50.00 m
θs = 1° 38' 25"
Δc = 5° 07' 24" (RT)
Ts = 89.17 m
Lc = 78.09 m
Es = 2.47 m
S = 5.0 %
TS 30+15.01
SC 30+65.01
WETLAND EASEMENT BOUNDARY
24+80
NEW 900 mm DR.
25+07
762 mm RCP IN PL.
PLUG AND ABANDON
29+21
762 mm RCP IN PL.
PLUG & ABANDON
30+00
7.0 x 12.8 m BRIDGE IN PL.
REMOVE & NEW DBL. 3600 x 2400 mm RCB
B-7
.20 m TOPSOIL
1.9 m FAT CLAY
.90 m SANDY LEAN CLAY
11.0 m CLAYSTONE
14.0 m TOTAL DEPTH OF BORING
B-8
.20 m TOPSOIL
3.50 m FAT CLAY
4.5 m CLAYSTONE
.30 m SANDSTONE
.60 m CLAYSTONE
9.40 m TOTAL DEPTH OF BORING
DH-27
.12 m ASPHALT PAVEMENT
.46 m AGGREGATE BASE
.58 m LEAN CLAY
.55 m SILTY SAND
1.71 m TOTAL DEPTH OF BORING
DH-26
.18 m ASPHALT PAVEMENT
.52 m AGGREGATE BASE
1.52 m SILT
3.51 m TOTAL DEPTH OF BORING
60m VC
100m VC
-0.120%
+0.044%
-0.036%
+0.280%
+80
+30
25+41.02
EL. 790.98
28+34.84
EL. 791.11
30+00.00
EL. 791.05
30+00
OUTLET DT. RT.
800
798
796
794
792
790
788
786
784
782
780
24
25
26
27
28
29
30
31


STATE
PROJECT NUMBER
SHEET NO.
MONTANA
STPP 14-6(10)259
38
CSF = 0.999347553
PI=66+82.29
Δ =7° 26' 19" (RT)
R =3,495 m
T =227.20 m
L =453.76 m
E =7.38 m
S =2%
WETLAND MITIGATION SITE
T. 7 N.
R. 39 E.
71+10 R/W 40 m END WETLAND
71+60 R/W 25 m
72+00 R/W 35 m
ACQUIRED
EX. EASE.
S 49° 32' 22" E
DH-21
DH-20
66+36 610 mm APP. PIPE IN PL. RT. REMOVE NEW 900 mm APP. PIPE RT.
66+37 NEW 450 mm APP. PIPE LT.
R/W PT 69+08.86
70+20 1219 mm RCP/CSP IN PL. REMOVE NEW 1200 mm DR.
71+97 NEW DBL. 4300 x 2400 mm RCB SKEW = 35° LT
72+00 TO 30.5 m BRIDGE IN PL. REMOVE
66+37 FARM FIELD APP. LT.
66+37 FARM FIELD APP. RT.
66+60 TO 71+07 WETLAND MITIGATION SITE LT.
71+86 INLET DT. LT.
72+07 OUTLET DT. RT.
.12 m ASPHALT PAVEMENT
.49 m AGGREGATE FILL
1.22 m SANDY CLAY
1.83 m TOTAL DEPTH OF BORING
-0.022%
.18 m ASPHALT PAVEMENT
.89 m CLAYEY GRAVEL FILL
1.00 m SILTY GRAVEL FILL
4.48 m LEAN CLAY
▼ G.W. @ 5.00 m
6.55 m TOTAL DEPTH OF BORING
60m VC
+0.016%
.20 m TOPSOIL
2.50 m SILTY CLAY with SAND
4.5 m CLAYSTONE
2.5 m SANDY CONGLOMERATE
.30 m SANDSTONE
1.60 m SANDY CONGLOMERATE
6.55 m TOTAL DEPTH OF BORING
72+20.00 EL. 785.49
796
794
792
790
788
786
784
782
780
778
776
66
67
68
69
70
71
72
73

MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. IM 94-3(49)78
MILL,FILL,PL.MIX OVERLAY,SEAL & COVER
TREASURE CO. LINE –EAST
ROSEBUD COUNTY

DESIGN DATA
1996 A.D.T. = 2860
1998 A.D.T. = 2920
D.H.V. = 530
D. = 55-45
T. = 29.9
V. = 110km
ALL TRUCKS = 48.1
8165 kg ESAL'S = 658.81
GROWTH RATE = 2%

LETTING DATE - APRIL 22,1999

LETTING DATE - JULY 7,2000

AS-BUILTS

LENGTH 11.5 kilometers

SCALES

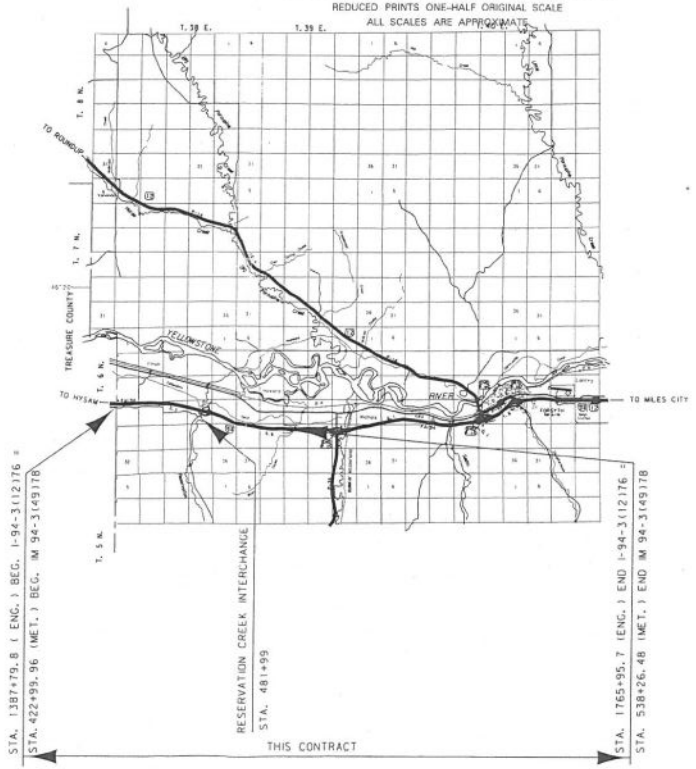
VERTICAL: 1 :

HORIZONTAL: 1 :

CROSS SECTION - HORIZONTAL & VERTICAL: 1 :

REDUCED PRINTS ONE-HALF ORIGINAL SCALE

ALL SCALES ARE APPROXIMATE



SURFACING MATERIALS - CONTRACTOR FURNISHED

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R/W & I.C.	
P.E.	IM94-3(48)78

CONTROL NO. 3101

8-11-2000
DALE BOEHNING

MONTANA DEPARTMENT OF TRANSPORTATION

APPROVED :

_____ 20____

TIM REARDON
DIRECTOR OF TRANSPORTATION

BY _____
PRECONSTRUCTION ENGINEER

CARL S. PEIL 2614PE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED :

_____ _____
DIVISION ADMINISTRATOR DATE

MDT MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

3101SU.ASB

C:\dgn\3101SU.ASB 2/9/2012 11:10:56 AM

DESIGNED BY
REVIEWED BY
CHECKED BY

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	IM 94-3(49)178	9

ADDENDUM NO. 1 **AS-BUILTS**
ATTACHMENT NO. 12

SUMMARY

PAVEMENT MARKINGS

ITEM	UNIT	INTERIM APPLICATION	FINAL APPLICATION	TOTAL
WHITE PAINT	LITERS	1 579		2710
YELLOW PAINT	LITERS	1 281		2273
WHITE WORDS & SYMBOLS	LITERS	124		4
TEMP. PAVEMENT MARKINGS - OVERLAY	km			730

RUMBLE STRIPS

STATION FROM	STATION TO	kilometers RUMBLE STRIP	REMARKS
422+99.84	538+26.95	11.5	WESTBOUND SHLD. - RT.
422+99.84	538+26.95	11.2	WESTBOUND SHLD. - LT.
423+00.08	538+26.40	11.5	EASTBOUND SHLD. - LT.
423+00.08	538+26.40	11.0	EASTBOUND SHLD. - RT.
TOTAL		45.1	

* WETLAND SITE (LUMP SUM)

STATION FROM	STATION TO	cubic meters UNCL. EXCAVATION #	cubic meters TOPSOIL SALVAGING AND PLACING		REMARKS
477+60.00	478+91.00	8 457			EB NEW WETLAND AREA RT
	TOTAL	1			

* SEE SPECIAL PROVISIONS
# FOR INFORMATION ONLY

CURB

STATION FROM	STATION TO	meters BITUMINOUS CURB LEFT	BITUMINOUS CURB RIGHT	REMOVE BITUMINOUS CURB * LEFT	REMOVE BITUMINOUS CURB * RIGHT	REMARKS
428+04	431+24		420.0		420.0	EASTBOUND SHLD. - RT.
480+56	481+72		116.0		116.0	EASTBOUND SHLD. - RT.
427+32	430+38	306.0		306.0		WESTBOUND SHLD. - LT.
480+28	481+72	144.0		144.0		WESTBOUND SHLD. - LT.
501+45	506+30	485.0		485.0		WESTBOUND SHLD. - LT.
SUBTOTAL		935.0	536.0	935.0	536.0	
TOTAL		1385.2		1371.0		

* SEE SPECIAL PROVISIONS FOR DISPOSAL

COLD MILLING

STATION FROM	STATION TO	square meters COLD MILLING	REMARKS
EASTBOUND			
422+60.08	423+00.08	463	FULL WIDTH - TAPER 0-45 mm
423+00.08	514+73.10	104 341	11.58 m FULL WIDTH O.G.F.C. ONLY
423+00.08	514+73.10	34 330	3.81 m WIDTH - 60 mm
514+73.10	538+26.40	27 272	FULL WIDTH - O.G.F.C. ONLY
481+21.90	481+71.90	579	FULL WIDTH - TAPER 90 - 150 mm
482+26.61 BE	482+76.61	579	FULL WIDTH - TAPER 90 - 150 mm
481+33.38	489+96.70	5 538	"R3" - FULL WIDTH - O.G.F.C. ONLY
482+19.46	485+67.36	2 101	"R4" - FULL WIDTH - O.G.F.C. ONLY
		329	"R2"-1 CAT.GRD.-FULL WIDTH-TAPER 0-45mm
538+26.40	538+66.40	463	FULL WIDTH - TAPER 0 - 45 mm
EASTBOUND	SUB-TOTAL	175995	
422+59.84	422+99.84	463	FULL WIDTH - TAPER 0 - 45 mm
422+99.84	514+73.10	104 376	7.77 m WIDTH - O.G.F.C. ONLY
422+99.84	514+73.10	34 341	3.81 m WIDTH - 60 mm
514+73.10	538+26.95	27 210	FULL WIDTH - O.G.F.C. ONLY
481+21.90	481+71.90 BE	579	FULL WIDTH - TAPER 90 - 150 mm
482+26.61 BE	482+76.61	579	FULL WIDTH - TAPER 90 - 150 mm
480+82.29	485+71.89	2 268	"R1" - FULL WIDTH - O.G.F.C. ONLY
482+30.34	487+98.58	4 258	"R2" - FULL WIDTH - O.G.F.C. ONLY
538+26.95EOP	538+66.95	463	FULL WIDTH - TAPER 0 - 45 mm
		329	"R2"-1 CAT.GRD.-FULL WIDTH-TAPER 0-45mm
WESTBOUND	SUB-TOTAL	174866	
TOTAL		285719	E.B. & W.B.

GRADING

STATION FROM	STATION TO	cubic meters UNCL. EXCAVATION *	cubic meters EMBANKMENT IN PLACE	REMARKS
428+61.00		1 217		OUTLET DITCH
469+37.00	471+09.30	99 578		EB. SLIDE AREA RT.
482+28.00	482+45.30		110	GRADE TO DRAIN MED. AH. RES. CK.
TOTAL		88272	** 110	

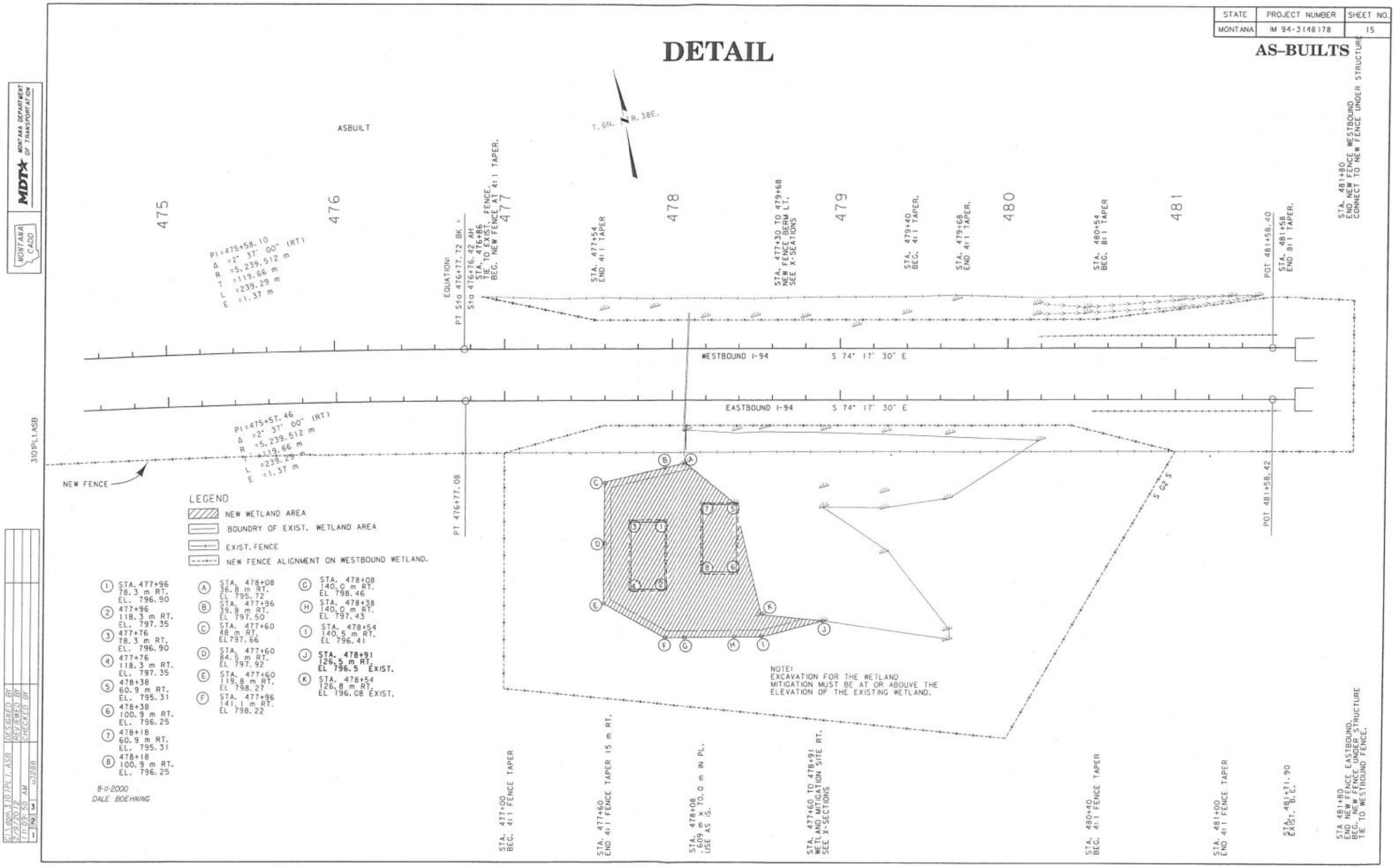
* CONTRACTOR TO WASTE MATERIAL
** TO BE INCLUDED IN OTHER ITEMS OF THE PROJECT FOR INFORMATION ONLY

CULVERTS

STATION	meters CSP-68 mm x 13mm 1.63 mm	meters CSP-75 x 25 mm 2.77 mm	meters SSPP-152 x 51 mm 2.82 mm	END SECTIONS LEFT	END SECTIONS RIGHT	cubic meters CEMENT GROUT	cubic meters C.T.S. GRAVEL GRADE 2A	cubic meters CLASS "DD" CONCRETE	cubic meters CULVERT RIPRAP CLASS 1	meters CLEAN CULVERT	meters REMOVE	COATING	IN PLACE mm X m	REMARKS
	600 mm	2700 mm	3.980 m											
422+99	6.0			RACET	RACET								600 mm x 16.3 mm	MEDIAN CROSSOVER - B.O.P.
428+61										145.7			3.66 m x 145.7 m	USE AS IS-ADD OUTLET DITCH
469+39		61.0		21 1STEP	21 1STEP	65.0	73.0	6.4	13.6	61.3	6.0	@ YES	3.0 m x 61.3 m	INSERTS WITH NEW END SECTIONS
478+00	6.0			RACET	RACET								600 mm x 16.9 mm	MEDIAN CROSSOVER
503+38			74.0	21 1STEP	21 1STEP	260.0	211.0	9.0	19.0	74.6	9.2	@ YES	4.57 m x 74.6 m	INSERTS WITH NEW END SECTIONS
TOTAL	120	0.0	0.0	~	~	5374	130.2	6.2	0.0	283	15.2			

@ SEE STANDARD SPEC. 709.04 FIELD COAT

8-11-2000
DALE BOEHNING


STATE | PROJECT NUMBER | SHEET NO.
MONTANA | IM 94-3(48)78 | 15
DETAIL
AS-BUILTS
MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADD
ASBUILT
T. 6N. R. 38E.
475
476
477
478
479
480
481
PI=475+58.10 Δ=2° 37' 00" (RT) R=5,239.512 m T=119.66 m L=239.29 m E=1.37 m
EQUATION: PT Sta 476+77.72 BK = Sta 476+76.42 AH
STA. 476+86 TIE TO EXIST. FENCE. BEG. NEW FENCE AT 4:1 TAPER.
STA. 477+54 END 4:1 TAPER
STA. 477+30 TO 479+68 NEW FENCE BERM LT. SEE X-SEATIONS
STA. 479+40 BEG. 4:1 TAPER.
STA. 479+68 END 4:1 TAPER.
STA. 480+54 BEG. 8:1 TAPER
POT 481+58.40
STA. 481+58 END 8:1 TAPER.
STA. 481+80 END NEW FENCE WESTBOUND CONNECT TO NEW FENCE UNDER STRUCTURE
WESTBOUND I-94
S 74° 17' 30" E
EASTBOUND I-94
S 74° 17' 30" E
PI=475+57.46 Δ=2° 37' 00" (RT) R=5,239.512 m T=119.66 m L=239.29 m E=1.37 m
NEW FENCE
PT 476+77.08
POT 481+58.42
S 62 S
LEGEND
NEW WETLAND AREA
BOUNDRY OF EXIST. WETLAND AREA
EXIST. FENCE
NEW FENCE ALIGNMENT ON WESTBOUND WETLAND.
1 STA. 477+96 78.3 m RT. EL. 796.90
2 477+96 118.3 m RT. EL. 797.35
3 477+76 78.3 m RT. EL. 796.90
4 477+76 118.3 m RT. EL. 797.35
5 478+38 60.9 m RT. EL. 795.31
6 478+38 100.9 m RT. EL. 796.25
7 478+18 60.9 m RT. EL. 795.31
8 478+18 100.9 m RT. EL. 796.25
A STA. 478+08 36.8 m RT. EL 795.72
B STA. 477+96 39.8 m RT. EL 797.50
C STA. 477+60 48 m RT. EL797.66
D STA. 477+60 84.5 m RT. EL 797.92
E STA. 477+60 119.8 m RT. EL 798.27
F STA. 477+96 141.1 m RT. EL 798.22
G STA. 478+08 140.0 m RT. EL 798.46
H STA. 478+38 140.0 m RT. EL 797.43
I STA. 478+54 140.5 m RT. EL 796.41
J STA. 478+91 126.5 m RT. EL 796.5 EXIST.
K STA. 478+54 126.8 m RT. EL 796.08 EXIST.
NOTE: EXCAVATION FOR THE WETLAND MITIGATION MUST BE AT OR ABOUVE THE ELEVATION OF THE EXISTING WETLAND.
8-11-2000
DALE BOEHNING
STA. 477+00 BEG. 4:1 FENCE TAPER
STA. 477+60 END 4:1 FENCE TAPER 15 m RT.
STA. 478+08 .609 m x 70.0 m IN PL. USE AS IS.
STA. 477+60 TO 478+91 WETLAND MITIGATION SITE RT. SEE X-SECTIONS
STA. 480+40 BEG. 4:1 FENCE TAPER
STA. 481+00 END 4:1 FENCE TAPER
STA. 481+71.90 EXIST. B.E.
STA 481+80 END NEW FENCE EASTBOUND. BEG. NEW FENCE UNDER STRUCTURE TIE TO WESTBOUND FENCE.
310PL1.ASB
DESIGNED BY
REVIEWED BY
CHECKED BY

STATE	PROJECT NO.	SHEET NO.
MONTANA	IM 94-3(49)178	4

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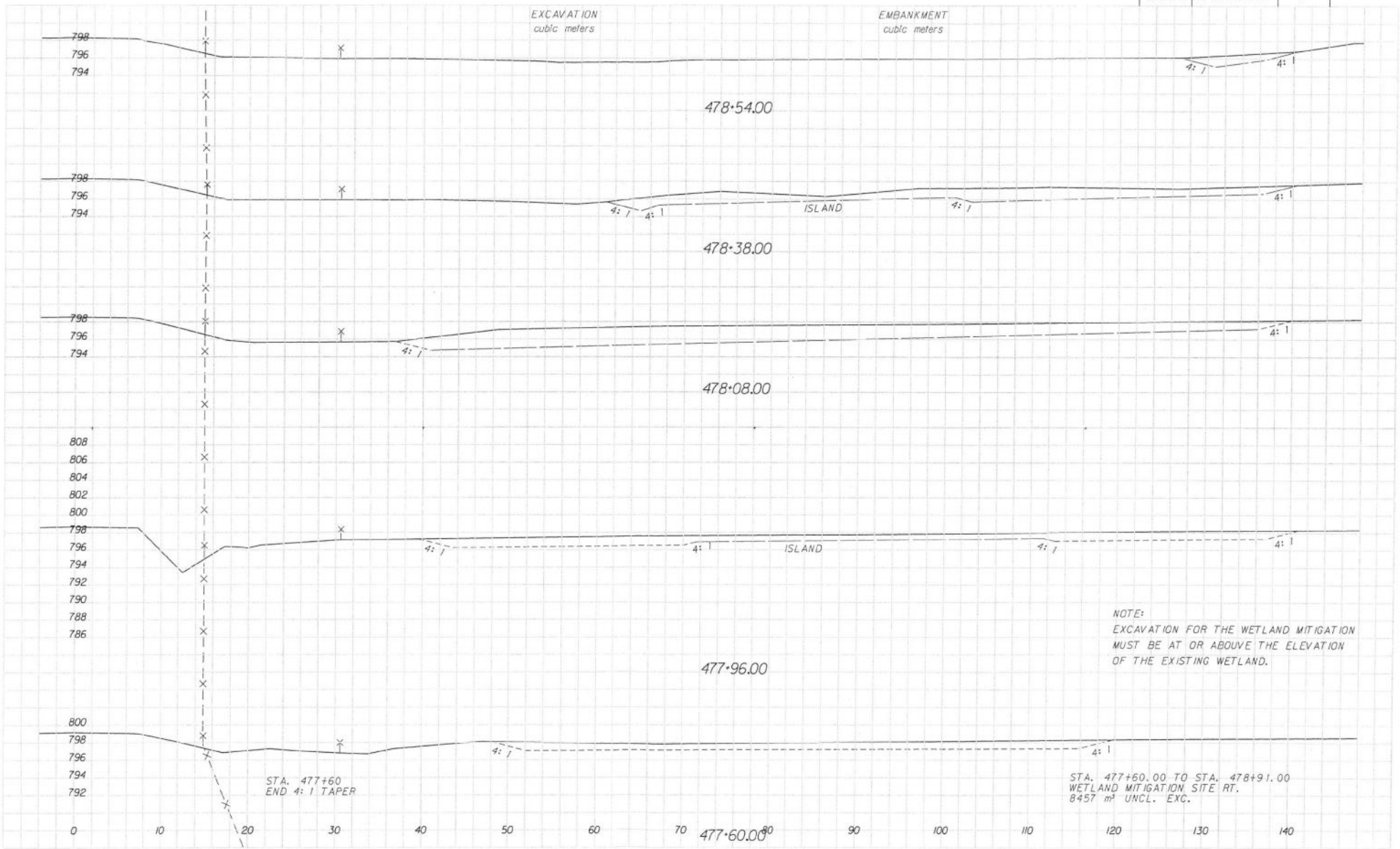

STATE	PROJECT NO.	SHEET NO.
MONTANA	IM 94-3(49)178	5

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