MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2013

Redstone – East & West
Sheridan County, Montana



Prepared for:

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December 2013

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WETLAND MITIGATION MONITORING REPORT:

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Redstone East and West

Sheridan County, Montana

MDT Project Number STPP 22-1(5)14
Redstone – East & West
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USACE: NWO-2001-90723-MTH

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CCI Project No: MDT.006

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Cover: Photo is looking west across the inundated Redstone wetland mitigation site.

1. INTRODUCTION

The Redstone-East and West (E&W) wetland monitoring report documents the first year post-construction monitoring results at the Redstone-E&W wetland mitigation site. This site was developed to mitigate for impacts associated with the Redstone-E&W highway reconstruction project located in Sections 2, 4 and 7, Township 35 North, Range 51 East, in Daniels County; and Section 1, Township 35 North, Range 51 East; Section 31, Township 36 North, Range 52 East; and Sections 5 and 9, Township 35 North, Range 52 East, in Sheridan County, Montana. According to the US Army Corps of Engineers (USACE) permit (NWO-2001-90723-MTH) and the approved wetland mitigation and monitoring proposal prepared by Montana Department of Transportation (MDT) and dated February 4, 2010, this highway project resulted in approximately 0.17 acres of permitted wetland fill with a replacement ratio of 2:1, requiring 0.34 acres of compensatory wetland mitigation under authority of Section 404 of the Clean Water Act.

The Redstone-E&W wetland mitigation project is located 2.2 miles southeast of Redstone, directly along US Highway 5, in the Southwest corner of Section 10 and the Southeast Corner of Section 9, Township 35 North, Range 52 East, Sheridan County, Montana (Figure 1). The site is situated within Watershed 12, the Lower Missouri River Basin. The wetlands for this project were constructed in 2012 concurrent with the road project impacts.

The MDT completed an initial feasibility study in August 2009. The baseline delineation and Montana Wetland Assessment were completed by MDT staff in June 2002. The project site was agricultural land and had been historically farmed for grass and alfalfa production. A perennial stream known as Big Muddy Creek borders the project on the north and is hydraulically connected to the site via groundwater. The mitigation goal was to create and preserve 0.34 acres of new palustrine emergent/depressional wetland habitat in an existing upland area adjacent to Big Muddy Creek. MDT will hold the site in “Fee Title” as part of a long term management plan and will utilize MDT personnel and/or contractors to inspect and perform maintenance activities to ensure performance standards are met.

Figures 2 and 3 in Appendix A show the 2013 Monitoring Activity Locations and Mapped Site Features, respectively. The MDT Mitigation Monitoring Form, USACE Wetland Determination Data Forms for the Great Plains Region (USACE 2010), and the 2008 MDT Montana Wetland Assessment Forms (MWAM) (Berglund and McEldowney 2008) are included in Appendix B. Project site photographs are included in Appendix C and the MDT Preliminary Design – Plan is presented in Appendix D.

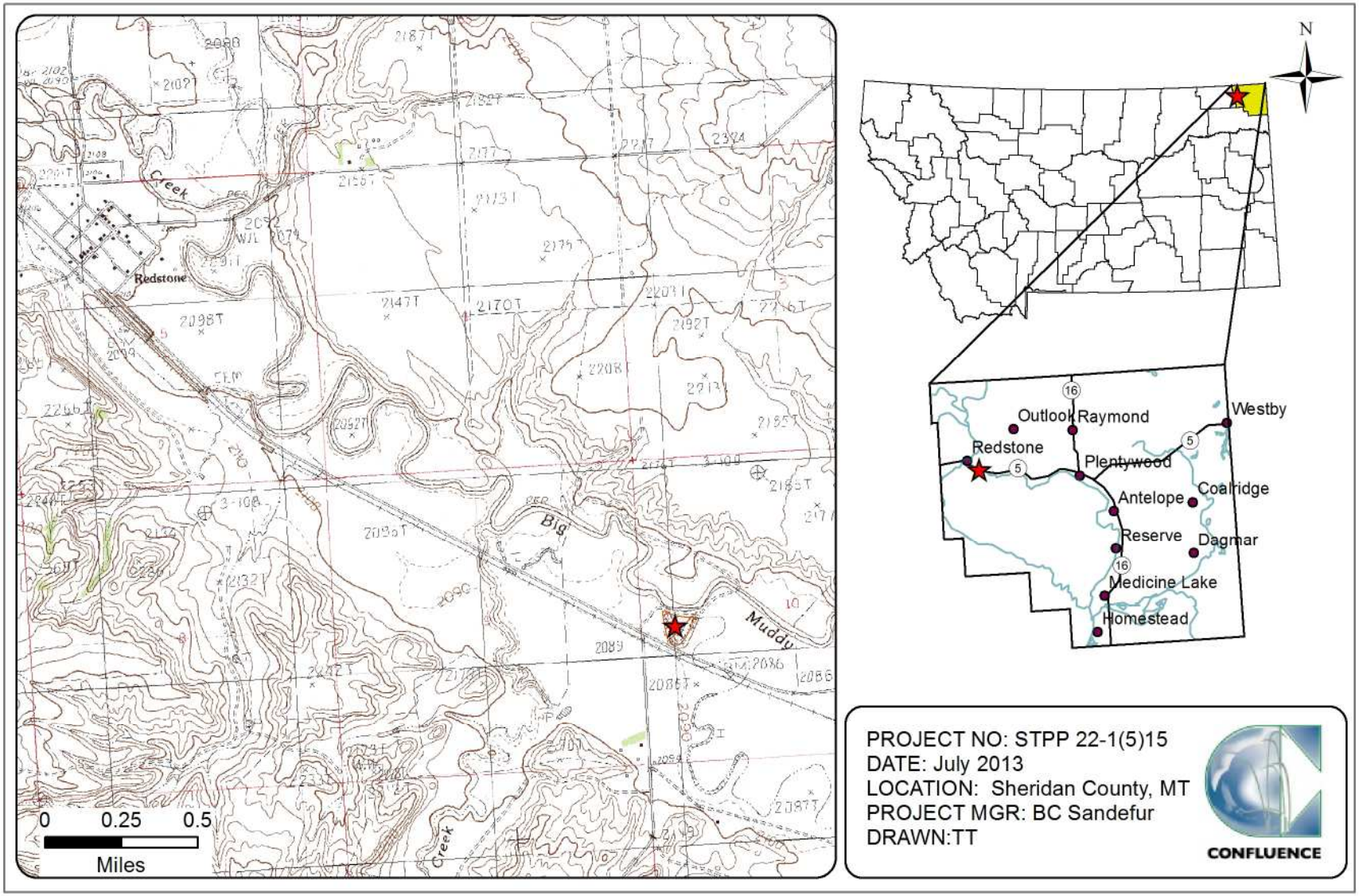


Figure 1. Project location of Redstone – East & West Wetland Mitigation Site.

2. METHODS

A monitoring site visit was performed on August 8, 2013. Information for the Mitigation Monitoring form and Wetland Determination Data Form was entered electronically in the field on a personal digital assistant (PDA) palmtop computer during the field investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) as shown on Figure 2 (Appendix A). Information included completion of a wetland delineation, vegetation community mapping, soil and hydrology data collection, bird and wildlife use, photo documentation, and a non-engineering examination of any infrastructure established within the mitigation project area.

2.1. Hydrology

The presence of hydrological indicators as outlined on the Wetland Determination Data Form was assessed at three data points established within the project area. The hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on the electronic Wetland Determination Data Form (Appendix B). Hydrologic assessments allow evaluation of mitigation goals addressing inundation/saturation requirements.

Technical criteria for wetland hydrology guidelines have been established as "permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season) during the growing season" (USACE 2010). Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered jurisdictional wetlands. The growing season is approximated for purposes of this report as the number of days where there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28.5 degrees Fahrenheit (USACE 2010). The Western Regional Climate Center (WRCC) identifies the average growing season recorded at the Redstone, Montana weather station (246927) as 137 days. Areas defined as wetlands would require 17 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

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

2.2. Vegetation

The boundaries of the dominant-species based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2013 aerial photograph. Percent cover of the 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 to10 percent), 3 (11 to 20 percent), 4 (21 to 50 percent), and 5 (greater than 50 percent) (Appendix B). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure 3, Appendix A).

No vegetation transect has been established at this site due to the perennially inundated conditions of the mitigation area and the deep-water nature of the area directly adjacent to the mitigation footprint.

The Montana State Noxious Weed List (September 2010), 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 and mapped on the aerial photo (Figure 3, Appendix A). The noxious weed species identified are color-coded. The locations are denoted with the symbol "**x**", "▲", or "■" representing 0 to 0.1 acre, .1 to 1 acre, or greater than 1 acre in extent, respectively. Cover classes are represented by T, L, M, or H, 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 Sheridan County Area* (USDA 2013) and *in situ* soil descriptions. Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 Manual and 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (USACE 2010). A description of the soil profile, including hydric soil indicators when present, was recorded on the Wetland Determination Data Form for each profile (Appendix B).

2.4. Wetland Delineation

Waters of the US including special aquatic sites and jurisdictional wetlands were delineated throughout the project area in accordance with criteria established in the 1987 Manual and the 2010 Great Plains Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology must be satisfied to delineate a representative area as jurisdictional. The name and indicator status of plant species were derived from the Draft 2012 National Wetland Plant List (NWPL) (Lichvar and Kartesz. 2009). The Routine Level-2 On-site Determination Method (Environmental Laboratory 1987) was used to delineate jurisdictional areas as documented 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 the 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 for vegetation, soil or hydrology, or special aquatic site, i.e., mudflat. The GPS-surveyed wetland boundary is shown on the 2013 aerial imagery (Figure 3, Appendix A). Wetland acreages 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 Mitigation Monitoring Form during the site visit. Indirect use indicators, including tracks, scat, burrow, 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 wildlife species list of animals observed in 2013 was compiled for this report.

2.6. Functional Assessment

The 2008 MDT MWAM (Berglund and McEldowney 2008) was used to evaluate functions and values on the site in 2013. 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. A Wetland Assessment Form was completed for one assessment area (AA) and included both the existing and created wetlands (Appendix B).

2.7. Photo Documentation

Monitoring at photo points provides supplemental information documenting conditions of the site wetlands, uplands, and vegetation transects; site trends; and current land uses surrounding the project. Photographs were taken at four photo points established in 2013 during the site visit (Appendix C). Photo point locations were recorded with a resource grade GPS unit (Figure 2, Appendix A).

2.8. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS unit during the 2013 monitoring season. Points were collected using WAAS-enabled differential correction satellites, typically improving resolution to sub-meter accuracy. The collected data were then transferred to a personal computer, imported into GIS, and presented in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with GPS included fence boundaries, photograph points, transect endpoints, wetland/upland boundaries, and wetland data points.

2.9. Maintenance Needs

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

3. RESULTS

3.1. Hydrology

Climate data from the meteorological station at Redstone, Montana (246927), recorded an average annual precipitation rate of 12.61 inches from December 1951 to December 2010. Precipitation data since 2011 is not available from this site. An additional meteorological station, located in approximately 15.6 miles to the west of the site in Plentywood, Montana (246586) recorded an average annual precipitation total of 12.99 inches from January 1947 to February 2013. The total precipitation from January to August 31 was 10.35 inches (long-term average), 10.09 inches (2012), and 11.23 inches (2013). These data indicate the region around the Redstone-E&W wetland mitigation site has received average precipitation prior to and during the 2012 and 2013 growing season.

The wetland mitigation area is contiguous with a 2+ acre open water isolated oxbow of Big Muddy Creek. Water levels within the oxbow are related to water elevations within the creek and fluctuate with seasonal stream flow. Approximately 75 percent of the site was inundated to an average depth of 2.5 feet during the 2013 investigation. Surface water depths ranged from 0.0 to 6.0 feet. The depth at the emergent vegetation/open water boundary was approximately one foot. Areas defined as wetlands that were not inundated exhibited saturation within 12 inches (1.0 foot) of the ground surface, water-stained leaves, high water table, and FAC-Neutral test.

Three data points, Re-1u, Re-1w and Re-2w, were sampled to determine the wetland and upland boundaries. Data points Re-1w and Re-2w were located in areas that met the wetland criteria. Data point Re-1w was located at the edge of the pre-existing wetland and exhibited approximately 4 inches of surface water, inundation visible on aerial imagery, and a positive FAC-Neutral test. Data point Re-2w was located in the newly constructed wetland and also included approximately 4 inches of surface water, a high water table, saturation to the surface, and a positive FAC-Neutral test. No hydrologic indicators were noted at data point Re-1u, which was located at a slightly higher elevation than the adjacent wetland data point Re-1w.

3.2. Vegetation

Monitoring year 2013 marked the first year of post-construction monitoring at the Redstone-E&W wetland mitigation site. Thirty plant species were observed site wide in 2013 (Table 1). Vegetation plant communities were mapped and named based on the dominant species within a community and the results of the wetland delineation data. The communities and associated species are listed on the Monitoring Form in Appendix B and mapped on Figure 3 in Appendix A.

Three vegetation communities were identified in 2013 and include one upland type and two wetland types. The communities were upland Type 1 – *Bromus inermis/Symphoricarpus albus*, wetland Type 2 – *Schoenoplectus* spp., and wetland Type 3 – Aquatic Macrophytes/Open Water. The communities are discussed below.

Table 1. Vegetation species observed in 2013 at the Redstone – East & West Wetland Mitigation Site.

Scientific Names	Common Names	GP Indicator Status[1]
Artemisia cana	Coaltown Sagebrush	FACU
Artemisia tridentata	Big Sagebrush	UPL
Bassia scoparia	Mexican-Fireweed	FACU
Bromus inermis	Smooth Brome	FAC
Bromus tectorum	Cheatgrass	UPL
Chenopodium album	Lamb's-Quarters	FACU
Cicuta douglasii	Western Water-Hemlock	OBL
Cirsium arvense	Canadian Thistle	FACU
Convolvulus arvensis	Field Bindweed	UPL
Descurainia sophia	Herb Sophia	UPL
Elymus repens	Creeping Wild Rye	FACU
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Marrubium vulgare	White Horehound	FACU
Medicago sativa	Alfalfa	UPL
Melilotus sp.	Sweetclover	UPL
Mentha arvensis	American Wild Mint	FACW
Ratibida columnifera	Upright Prairie Coneflower	UPL
Rumex crispus	Curly Dock	FAC
Ruppia maritima	Beaked Ditch-Grass	OBL
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Setaria viridis	Green Bristlegrass	UPL
Sonchus arvensis	Field Sow-Thistle	FAC
Spartina pectinata	Freshwater Cord Grass	FACW
Symphoricarpos albus	Common Snowberry	FACU
Thlaspi arvense	Field Penny-cress	FACU

[1]Draft NWPL 2012 (Lichvar and Kartesz, 2009).

Upland community Type 1 – *Bromus inermis/Symphoricarpus albus* was identified throughout the uplands surrounding the pre-existing and created wetlands. Areas of this community had been disturbed during construction and reseeded. Twenty-one species were identified in this community and primarily consisted of common pasture and roadside species. Smooth brome (*Bromus inermis*), common snowberry (*Symphoricarpus albus*), Mexican-fireweed (*Bassia scoparia*), lamb's-quarters (*Chenopodium album*), prickly lettuce (Lactuca serriola), green bristlegrass (*Setaria viridis*), curly-cup gumweed (*Grindelia*

squarrosa), fox-tail barley (*Hordeum jubatum*), alfalfa (*Medicago sativa*), and field sow-thistle (*Sonchus arvensis*) were common components of this 0.30-acre upland community.

Wetland community Type 2 – *Schoenoplectus* spp. characterized 0.14 acres within the shallower water depths surrounding community Type 3. This community was dominated by saltmarsh club-rush (*Schoenoplectus maritimus*) with hard-stem club-rush (*Schoenoplectus acutus*), three-square club-rush (*Schoenoplectus pungens*), and freshwater cord grass (*Spartina pectinata*) were identified in standing water with fox-tail barley, American wild mint (*Mentha arvensis*), white horehound (*Marrubiuim*) and western water-hemlock (*Cicuta douglasii*) along the margins of inundation. This community will likely expand into the recently constructed wetland area.

Wetland community Type 3 – Aquatic macrophytes/Open Water was identified across 0.82 acres within the 1.26-acre monitoring area. This community was characterized by 100 percent inundation and included green algae, beaked ditch-grass (*Ruppia maritima*), additional unidentified aquatic macrophytes, and saltmarsh club-rush along the transition of this community with Type 2. It appeared during the 2013 field survey that this area is perennially inundated.

No woody vegetation was installed at this site. Revegetation efforts primarily entailed seeding following construction. One infestation of Canadian thistle (*Cirsium arvense*), a Priority 2B weed, was observed along the southern edge of the site along the disturbed roadside in community Type 1. The infestation covered less than 0.1 acre with a moderate cover class of 5 to 25 percent. The MDT has an ongoing weed control program for their mitigation sites that includes an annual assessment of weeds at each site and periodic weed control efforts.

3.3. Soil

The entire project site was mapped in the *Sheridan County Soil Survey* (USDA 2013) as Havrelon silt loam. The Havrelon loam series is a moderately well drained loam, taxonomically classified as a frigid Typic Ustifluvents. The Haverlon series is found on floodplains of major streams and tributaries. This soil map unit is included on the Montana Hydric Soils list.

Three soil pits were excavated to characterize the site soil. Data points Re-1w (Community 2) and Re-2w (Community 3) were located in areas that met the wetland criteria. Data point Re-1w was located at the edge of the open water. The soil profile at this point revealed very dark gray (7.5YR 3/1) sandy clay with 5 percent dark yellowish brown (10YR 4/6) redoximorphic concentrations. The depleted matrix was a positive indicator for hydric soil. The presence of hydric soil at Re-2w was confirmed with a depleted matrix (F3). This clay soil exhibited a dark reddish gray (5YR 4/2) matrix with five percent reddish brown (7.5YR 4/4) redox concentrations. This data point was situated within the recently excavated soil. The presence of redox features to surface was likely the result of excavation to existing hydric soil. Sol pit Re-1u was located in upland community type 1 and consisted of dark reddish brown (5YR 3/2) and dark gray (5YR 4/1)

matrix with no redoximorphic characteristics within the upper 13 inches of the profile.

3.4. Wetland Delineation

Three wetland determination data points were evaluated to assess and confirm the 2013 wetland boundary at the Redstone-E&W mitigation site. Approximately 0.69 acres of wetlands existed within this mitigation site prior to construction. The 2013 wetland delineation identified a total of 0.96 acres of wetland and aquatic habitat within the site. A total of 0.27 acres of created wetland were identified in 2013 (Table 2). Additional wetlands may develop if water levels increase and the saturation zone is able to extend into the upland slope surrounding the excavated basin.

Table 2. Total wetland acres delineated in 2013 at the Redstone-E&W Wetland Mitigation Site.

Wetland and Aquatic Habitat	2013 (acres)
Created Wetland	0.27
Pre-Existing Wetland	0.69
Upland	0.30
Total Area	1.26

3.5. Wildlife

A comprehensive list of birds and other wildlife species observed directly or indirectly in 2013 is presented in Table 3 (Monitoring Form, Appendix B). Fifteen bird species were identified around the site including shore birds, swallows, waterfowl, and others. The abundant waterfowl observed on site include several ducklings that appeared to have been reared among the thick club-rush community that borders the open water. A muskrat (*Ondatra zibethicus*) was observed swimming across the oxbow during the August site visit. Several northern leopard frogs (*Rana pipiens*) were observed throughout the wetland and neighboring uplands. A healthy population of painted turtles (*Chrysemys picta*) was also observed in the mitigation area. A northern pike fry (*Esox lucius*) was identified patrolling the shallows along the fringe of the *Schoenoplectus* community. A couple Plains gartersnakes (*Thamnophis radix*) and a white-tailed deer (*Odocoileus virginianus*) were observed in the hayfield adjacent to the site.

Table 3. Wildlife species observed within the Redstone-E&W Wetland Mitigation Site in 2013.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Northern Leopard Frog	*Rana pipiens*
BIRDS	
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Blue-winged Teal	*Anas discors*
Eastern Kingbird	*Tyrannus tyrannus*
Gadwall	*Anas strepera*
Killdeer	*Charadrius vociferus*
Mallard	*Anas platyrhynchos*
Mourning Dove	*Zenaida macroura*
Northern Shoveler	*Anas clypeata*
Pied-billed Grebe	*Podilymbus podiceps*
Spotted Sandpiper	*Actitis macularius*
Swainson's Hawk	*Buteo swainsoni*
Turkey Vulture	*Cathartes aura*
Vesper Sparrow	*Pooecetes gramineus*
Western Meadowlark	*Sturnella neglecta*
MAMMALS	
Muskrat	*Ondatra zibethicus*
White-tailed Deer	*Odocoileus virginianus*
REPTILE	
Painted Turtle	*Chrysemys picta*
Plains Gartersnake	*Thamnophis radix*
FISH	
Northern Pike	*Esox lucius*

3.6. Functional Assessment

The boundary between the existing and created wetlands was indistinguishable and inundated with contiguous surface water. As such, the total wetland area (0.96 acre) identified within the Redstone-E&W wetland mitigation site was evaluated as a single assessment area (AA). The 2008 MWAM (Berglund and McEldowney) was used to evaluate the functions and values and calculate functional units of the site in 2013.

The Redstone E&W wetlands were rated as a Category III wetland with 52.7 percent of the total possible score and 5.57 functional units in 2013. The site received high ratings for short and long term surface water storage, sediment/shoreline stabilization and groundwater discharge/recharge and moderate ratings for general wildlife habitat, flood attenuation, sediment/nutrient/toxicant removal, and production export/food chain support. The limited size of the AA and the adjacent highway may limit the potential of this wetland to attain a Category II rating.

Table 4. Functions and Values of the Redstone-E&W Wetland Mitigation Site in 2013.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2013 AA Created & Existing
Listed/Proposed T&E Species Habitat	Low (0.0)
MTNHP Species Habitat	Low (0.1)
General Wildlife Habitat	Mod (0.5)
General Fish/Aquatic Habitat	Low (0.3)
Flood Attenuation	Mod (0.6)
Short and Long Term Surface Water Storage	High (0.8)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)
Sediment/Shoreline Stabilization	High (1.0)
Production Export/Food Chain Support	Mod (0.6)
Groundwater Discharge/Recharge	High (1.0)
Uniqueness	Low (0.2)
Recreation/Education Potential (bonus points[3])	NA
Actual Points/Possible Points	**5.8 / 11**
% of Possible Score Achieved	**52.7%**
Overall Category	**III**
Total Acreage of Assessed Wetlands within Site Boundaries	**0.96**
Functional Units (acreage x actual points)	**5.57**

3.7. Photo Documentation

Photographs taken at photo points 1 through 4 (PP-1 through PP-4) and the wetland determination data points (Figure 2, Appendix A) are shown in Appendix C.

3.8. Maintenance Needs

There are no man-made diversion structures installed at the site. One bluebird box had been recently installed and was not in use during the 2013 site visit. One infestation of Canadian thistle (*Cirsium arvense*), a Priority 2B weed, was observed along the roadside of Highway 5. The infestation covered less than 0.1 acre with a moderate cover class of 5 to 25 percent. The MDT has an ongoing weed control program for their mitigation sites that includes an annual assessment of weeds identified at each location and treatment to contain and control identified populations. The fence installed around the perimeter of the site was in good working order when inspected during the 2013 field survey.

3.9. Current Credit Summary

The proposed mitigation acreages and credit ratios were discussed in the February 2010 Wetland Mitigation Site Monitoring Plan. The USACE permit authorized a 2:1 ratio for mitigating unavoidable impacts associated with the construction of the Redstone-E&W highway reconstruction project. The approved mitigation plan proposed the concurrent creation of 0.34 acres of new, created wetland area.

Table 5 summarizes the calculated credit acreages based on the results of the 2013 wetland mitigation monitoring efforts. The total wetland acreages delineated at the Redstone E&W site were 0.96 acres and included approximately 0.69 acres of pre-existing wetlands and 0.27 acres of new, created wetland area. Using the mitigation ratios provided by the USACE Montana Regulatory Program for creation (2:1), preservation (4:1), and upland buffer (5:1), a total of 0.37 credit acres has been estimated for the Redstone site in 2013.

Table 5. Summary of wetland credits in 2013 at the Redstone-E&W Wetland Mitigation Site.

Compensatory Mitigation Type	USACE Mitigation Credit Ratio	Proposed Mitigation Acres	2013 Delineated Acres	2013 Credit Acres
Creation (Establishment)	2:1	0.34	0.27	0.14
Preservation (Protection)	4:1	*	0.69	0.17
Upland Buffer	5:1	*	0.30	0.06
Total		**0.34**	**1.26**	**0.37**

*Approved mitigation plan does not include acreage for these mitigation types.

4. REFERENCES

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Appendix A

PROJECT AREA MAPS

Figure 2 – Monitoring Activity Locations
Figure 3 – Mapped Site Features

MDT Wetland Mitigation Monitoring
Redstone – East & West
Sheridan County, Montana

Figure 2: 2013 Monitoring Activity Locations



Legend

- Monitoring Limits
- Data Points
- Photo Points
- Bluebird Box

Base Photography Date: July 15, 2013

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: Sheridan Co., MT

PROJ NO: STPP 14-6(9)259

FILE: Redstone/Monitor2013.mxd

Project Name: Redstone Wetland Mitigation Site

Drawing Title: 2013 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	JJ	LU

SCALE: Noted

Drawn: September 6, 2013

PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 2

REV -

Figure 3: 2013 Mapped Site Features

ACREAGES	
Project Area	1.26 acres
Total Wetlands	0.96 acres
Existing Wetlands	0.69 acres
Net Wetlands	0.27 acres
Upland	0.30 acres

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)

Legend
Monitoring Limits
Wetland Limits
Vegetation Communities
Base Photography Date: July 15, 2013

N
0 25 50 100
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: Sheridan Co., MT
PROJ NO: STPP 14-6(9)259
FILE: Redston/Veg2013.mxd

Project Name
Redstone Wetland Mitigation Site

Drawing Title
2013 Mapped Site Features

DRAWN BCS | CHECKED JJ | APPROVED LU
SCALE: Noted
Drawn: September 10, 2013
PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure
3

REV -

Appendix B

2013 MDT Wetland Mitigation Site Monitoring Form
2013 USACE Wetland Determination Data Forms
2013 MDT Montana Wetland Assessment Forms

MDT Wetland Mitigation Monitoring
Redstone – East & West
Sheridan County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Redstone Assessment Date/Time 8/8/2013 9:35:38 AM

Person(s) conducting the assessment: B Sandefur, E Sandefur

Weather: Cool & sunny Location: ~2.3 miles SE of Redstone

MDT District: Glendive Milepost: ~24.6 on Hwy 5

Legal Description: T 35N R 52E Section(s) 10

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

Size of Evaluation Area: 1.26 (acres)

Land use surrounding wetland:

Agriculture, rural residential

HYDROLOGY

Surface Water Source: Big Muddy Creek, precipitation

Inundation: ☑ Average Depth: 2.5 **(ft)** Range of Depths: 0-6 **(ft)**

Percent of assessment area under inundation: 75 %

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**:**

Inundation on aerial, water-stained leaves, saturation

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:

Entire constructed wetland inundated during field survey. This area will likely maintain perennial inundation.

VEGETATION COMMUNITIES

Site Redstone

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

Community # 1 **Community Type:** Bromus inermis / Symphoricarpos albus **Acres** 0.3

Species	Cover class	Species	Cover class
Artemisia cana	0	Artemisia tridentata	0
Bassia scoparia	1	Bromus inermis	5
Bromus tectorum	0	Chenopodium album	1
Cirsium arvense	0	Convolvulus arvensis	0
Descurainia sophia	0	Elymus repens	1
Grindelia squarrosa	1	Helianthus annuus	0
Hordeum jubatum	1	Lactuca serriola	1
Medicago sativa	1	Melilotus sp.	1
Ratibida columnifera	0	Setaria viridis	1
Sonchus arvensis	1	Symphoricarpos albus	3
Thlaspi arvense	0		

Comments:

Community # 2 **Community Type:** Schoenoplectus spp. / **Acres** 0.14

Species	Cover class	Species	Cover class
Cicuta douglasii	0	Hordeum jubatum	1
Marrubium vulgare	0	Mentha arvensis	0
Open Water	2	Rumex crispus	1
Schoenoplectus acutus	2	Schoenoplectus maritimus	4
Schoenoplectus pungens	1	Spartina pectinata	1

Comments:

Community # 3 **Community Type:** Aquatic macrophytes / Open Water **Acres** 0.82

Species	Cover class	Species	Cover class
Algae, green	2	Aquatic macrophytes	4
Open Water	5	Ruppia maritima	2
Schoenoplectus maritimus	1		

Comments:

Total Vegetation Community Acreage **1.26**

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

PLANTED WOODY VEGETATION SURVIVAL

Redstone

Planting Type	#Planted	#Alive	Notes
No planted woody veg			

Comments

Redstone

WILDLIFE

Birds

Were man-made nesting structures installed? Yes

If yes, type of structure: Bluebird Box

How many? 1

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
Bank Swallow	7	FO	UP
Barn Swallow	3	FO	UP
Blue-winged Teal	3	F, L, N	OW
Eastern Kingbird	2	FO	UP
Gadwall	5	F, L	OW
Killdeer	2	F	OW, US
Mallard	5	F, L, N	OW
Mourning Dove	4	FO	UP
Northern Shoveler	5	F, N	OW
Pied-billed Grebe	2	F, L	OW
Spotted Sandpiper	1	F	OW, US
Swainson's Hawk	1	FO	
Turkey Vulture	1	FO	
Vesper Sparrow	2	FO, L	UP
Western Meadowlark	1	FO	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
Muskrat	1	No	No	No	
Northern Leopard Frog	17	No	No	No	
Northern Pike	10	No	No	No	minnows
Painted Turtle	13	No	No	No	
Plains Gartersnake	2	No	No	No	
White-tailed Deer	1	No	No	No	

Wildlife Comments:

Redstone

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
1053-55	48.800556	-104.904221	240	PP-1
1060-63	48.800175	-104.904907	0	PP-2
1066-71	48.800591	-104.905739	75	PP-3
1072-73	48.800911	-104.90612	140	PP-4
1078	48.800381	-104.904671	0	R-1u
1079	48.80035	-104.904655	330	R-1w
1082	48.800573333	-104.90454833	215	R-2w

Comments:

Redstone

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? Yes

If yes, do they need to be repaired? No

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: Redstone City/County: Sheridan Sampling Date: 8/8/2013

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

Investigator(s): B Sandefur Section, Township, Range: 10 35N 52E

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): flat Slope (%): 5.24

Subregion (LRR): LRR F Lat: 48.8001383333333 Long: -104.904551666667 Datum: WGS84

Soil Map Unit Name: Havrelon silt loam NWI classification: Upland

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: DP with upland plant com, non-hydric soils, and groundwater elevation below 1ft.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Sonchus arvensis	10	☐	FAC
2. Bromus inermis	75	☑	UPL
3. Elymus trachycaulus	15	☐	FACU
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	15	x 4 =	60
UPL species	75	x 5 =	375
Column Totals	100 (A)		465 (B)

Prevalence Index = B/A = 4.65

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: Re-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
0-3	5YR 3/2	100					Sandy Clay	
3-13	5YR 4/1	100					Sandy 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 redox in upper 12in, soils saturated at 14in.

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: DP at slightly higher elevation than adjacent wetland along toe of slope.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Redstone City/County: Sheridan Sampling Date: 8/8/2013

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

Investigator(s): B Sandefur Section, Township, Range: 10 35N 52E

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): flat Slope (%): 5.24

Subregion (LRR): LRR F Lat: 48.8003733333333 Long: -104.904755 Datum: WGS84

Soil Map Unit Name: Havrelon silt loam NWI classification: Upland

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: DP at edge of open water in Schoeno community.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Elymus trachycaulus	10	☐	FACU
2. Lycopus asper	20	☑	OBL
3. Schoenoplectus maritimus	20	☑	OBL
4. Schoenoplectus acutus	25	☑	OBL
5. Scirpus microcarpus	15	☐	OBL
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	90 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals	90 (A)		120 (B)

Prevalence Index = B/A = 1.33333

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☑ 2 - Dominance Test is >50%

☑ 3 - Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: Re-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
0-12	7.5YR 3/1	95	C M	10YR	4/6	5	Sandy 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:

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): 4

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: Hydro from adjacent open water (abandoned oxbow/pond), recent precipitation.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Redstone City/County: Sheridan Sampling Date: 8/8/2013

Applicant/Owner: MDT State: MT Sampling Point: Re-2w

Investigator(s): B Sandefur Section, Township, Range: 10 35N 52E

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): flat Slope (%): 5.24

Subregion (LRR): LRR F Lat: 48.8005733333333 Long: -104.904548333333 Datum: WGS84

Soil Map Unit Name: Havrelon silt loam NWI classification: PEM

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

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

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Hydric Soil Present? Yes ☑ No ☐

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: DP at edge of wetland on excavated point.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Scirpus microcarpus	40	☑	OBL
2. Elymus repens	10	☑	FACU
3. Lycopus asper	10	☑	OBL
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	60 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 000.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals	60 (A)		90 (B)

Prevalence Index = B/A = 1.5

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☑ 2 - Dominance Test is >50%

☑ 3 - Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: 40% of veg plot open water.

SOIL

Sampling Point: Re-2w

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	5YR 4/2	95	C M	7.5YR	4/4	5	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: DP in recently excavated soil, redox to surface potentially result of excavation to hydric soil.

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): 4

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:

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Redstone **2. MDT project#** STPP 22-1(5)14 **Control#** 2024

3. Evaluation Date 8/8/2013 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Created and Existing

6. Wetland Location(s): **T** 35N **R** 52E **Sec1** 10 **T** **R** **Sec2**

Approx Stationing or Mileposts ~24.6 on Hwy 5

Watershed 10060006 **Watershed/County** Big Muddy Creek, Lower Missouri, Sheridan Co.

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 0.96

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 0.96

☐ **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	Aquatic Bed	Excavated	Permanent/Perennial	80
Depressional	Emergent Wetland	Excavated	Permanent/Perennial	20

11. Estimated Relative Abundance Common

12. General Condition of AA

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

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

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

AA recently excavated.

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

None

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

AA contiguous with isolated oxbow of Big Muddy Creek. Surrounding landuses include cultivated agriculture, Big Muddy Creek corridor.

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: AA includes aquatic bed and emergent wetlands.

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

Primary or critical habitat (list species) ◉ D ◉ S

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☑ S

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

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

Sources for documented use USFWS T&E list for Sheridan Co., MT

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

Incidental habitat (list species) ○ D ◉ S Ferruginous Hawk

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

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 ≥ 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 Numerous waterfowl observed within ox bow during 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** .3L

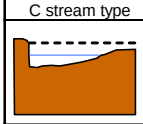
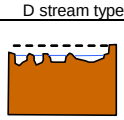
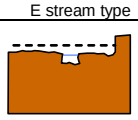
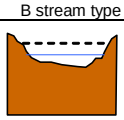
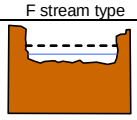
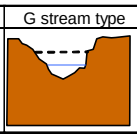
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ( ) **Y** (●) **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating .3L

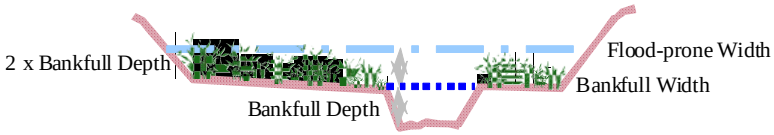
iii. Final Score and Rating: .3 L **Comments:** Northern pike frye observed.

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 150 **/** **Bankfull width** 70 **=** **Entrenchment ratio** 2.14285714285714

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 subject to flooding from Big Muddy Creek outside of assessment area.

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 **≥ 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: Average water depth within AA approx 4 ft.

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: Surface water into and out of AA restricted by culverts.

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

Comments: Open water likely subject to periodic wave action from high wind.

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [check])

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

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

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

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

Comments: AA bordered by Hwy 5 to south and farm access road east, decreasing average vegetated width to 40 feet.

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 maintained by surface water associated with Big Muddy Creek. Substrate silt loam and assume permeable.

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:

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Created and Existing

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	L	.1	1	0.096	☐
C. General Wildlife Habitat	M	.5	1	0.48	☐
D. General Fish Habitat	L	.3	1	0.288	☐
E. Flood Attenuation	M	.6	1	0.576	☑
F. Short and Long Term Surface Water Storage	H	.8	1	0.768	☑
G. Sediment/Nutrient/Toxicant Removal	M	.7	1	0.672	☑
H. Sediment/Shoreline Stabilization	H	1	1	0.96	☐
I. Production Export/Food Chain Support	M	.6	1	0.576	☑
J. Groundwater Discharge/Recharge	H	1	1	0.96	☐
K. Uniqueness	L	.2	1	0.192	☐
L. Recreation/Education Potential (bonus points)	NA	0	NA	0	☐
Totals:		5.8	11	5.568	
Percent of Possible Score			**52.73** %		

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
Redstone – East & West
Sheridan County, Montana



Photo Point 1 – *Panorama* **Location:** East fence corner
Bearing: 240 Degrees **Taken in 2013**



Photo Point 2 – *Panorama* **Location:** Southeast fence post
Bearing: 0 Degrees **Taken in 2013**



Photo Point 3 – *Panorama* **Location:** Southwest fence post
Bearing: 75 Degrees **Taken in 2013**



Photo Point 4 – Panorama **Location:** West fence corner
Bearing: 140 Degrees **Taken in 2013**



Data Point – Re-1u **Location:** Veg community 1
Bearing: 0 Degrees **Taken in 2013**



Data Point – Re-1w **Location:** Veg community 2
Bearing: 330 Degrees **Taken in 2013**

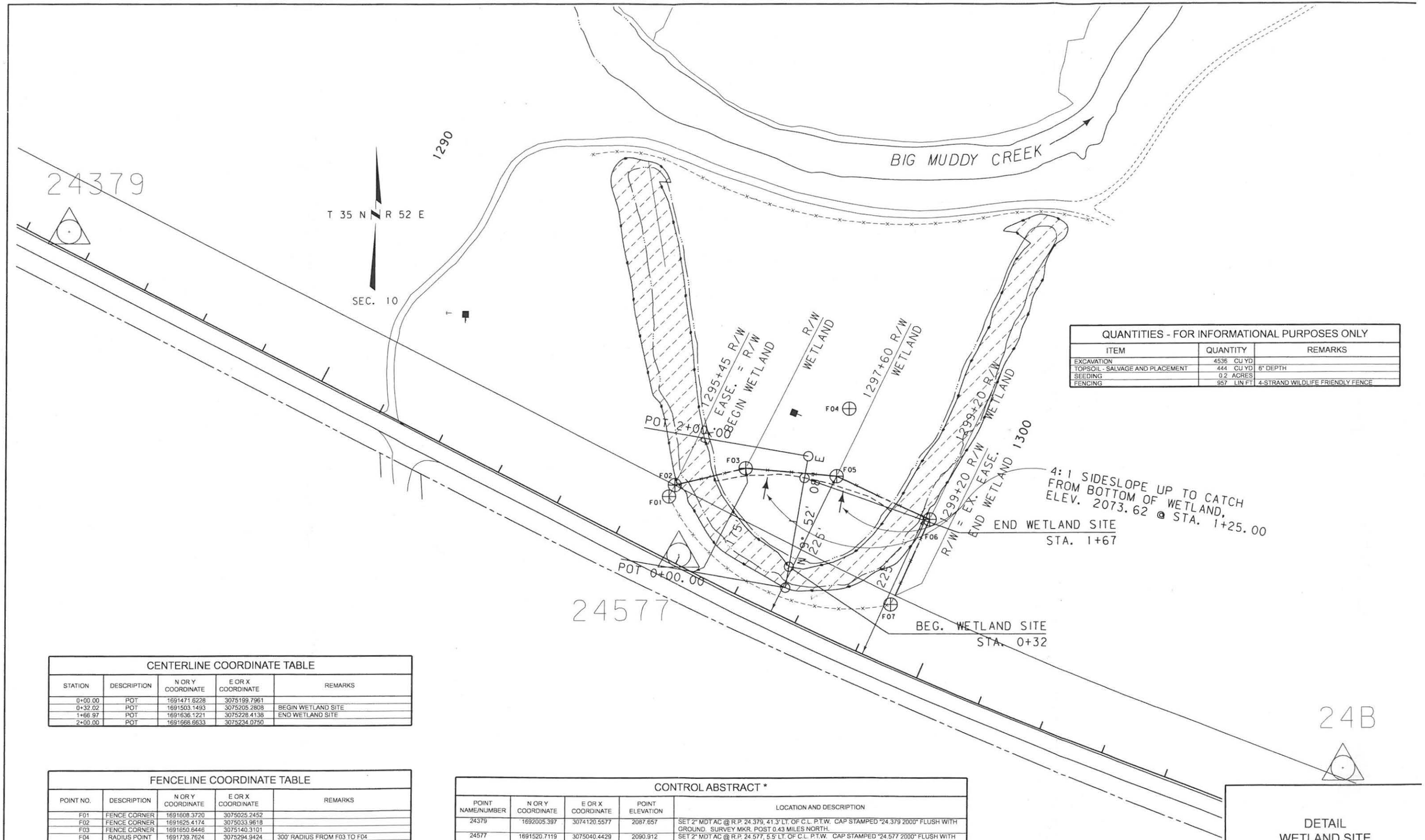


Data Point – Re-2w **Location:** Veg community 3
Bearing: 215 Degrees **Taken in 2013**

Appendix D

Project Plan Sheet

MDT Wetland Mitigation Monitoring
Redstone – East & West
Sheridan County, Montana



QUANTITIES - FOR INFORMATIONAL PURPOSES ONLY		
ITEM	QUANTITY	REMARKS
EXCAVATION	4536 CU YD	
TOPSOIL - SALVAGE AND PLACEMENT	444 CU YD	6" DEPTH
SEEDING	0.2 ACRES	
FENCING	957 LIN FT	4-STRAND WILDLIFE FRIENDLY FENCE

CENTERLINE COORDINATE TABLE				
STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
0+00.00	POT	1691471.6228	3075199.7961	
0+32.02	POT	1691503.1493	3075205.2808	BEGIN WETLAND SITE
1+66.97	POT	1691636.1221	3075228.4138	END WETLAND SITE
2+00.00	POT	1691668.6633	3075234.0750	

FENCELINE COORDINATE TABLE				
POINT NO.	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
F01	FENCE CORNER	1691608.3720	3075025.2452	
F02	FENCE CORNER	1691625.4174	3075033.9618	
F03	FENCE CORNER	1691650.6446	3075140.3101	
F04	RADIUS POINT	1691739.7624	3075294.9424	300' RADIUS FROM F03 TO F04
F05	FENCE CORNER	1691638.8206	3075276.4564	
F06	FENCE CORNER	1691573.9614	3075415.7965	
F07	FENCE CORNER	1691446.4103	3075357.7480	

CONTROL ABSTRACT *				
POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
24379	1692005.397	3074120.5577	2087.657	SET 2" MDT AC @ R.P. 24.379, 41.3' LT. OF C.L. P.T.W. CAP STAMPED "24.379 2000" FLUSH WITH GROUND. SURVEY MKR. POST 0.43 MILES NORTH.
24577	1691520.7119	3075040.4429	2090.912	SET 2" MDT AC @ R.P. 24.577, 5.5' LT. OF C.L. P.T.W. CAP STAMPED "24.577 2000" FLUSH WITH GROUND. SURVEY MKR. POST 0.37" NORTH.
24B	1692476.8734	3076036.6043	2090.413	SET 2" MDT AC @ R.P. 24.778, 124.0' LT. OF C.L. P.T.W. CAP STAMPED "24B 2000" FLUSH WITH GROUND. SURVEY MKR. POST 1.97" NORTH.

* NOTE: LOCATION AND DESCRIPTION ARE IN METRIC UNITS AND WILL STAY METRIC PER MDT SURVEY SECTION. COORDINATES AND ELEVATIONS ARE IN ENGLISH.

DETAIL
WETLAND SITE
RP 24.6, 57 FT. LT.

SCALE: 1" = 66.66'

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\2024rddet004.dgn	DESIGNED BY			ROAD PLANS	REDSTONE - E & W	STPP 22-1(11)15
2		5/10/2010	REVIEWED BY			DANIELS & SHERIDAN COUNTIES	CSF= 0.99978058	UPN 2024
1		3:12:39 PM CPS - U2160	CHECKED BY					27