MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2012

Dodson East
Phillips County, Montana

Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION
2701 Prospect Ave
Helena, MT 59620-1001

Prepared by:

CONFLUENCE
PO Box 1133
Bozeman, MT 59771-1133

December 2012

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MDT Project Number: NH 1-8(15)454F
Control Number: 1516

USACE: NWO-2004-90-518

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2701 Prospect Ave
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Prepared by:

Confluence Consulting, Inc.
P.O. Box 1133
Bozeman, MT 59771

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Cover: Looking east at *Schoenplectus* community on edge of east wetland cell.

1. INTRODUCTION

The Dodson East 2012 Wetland Mitigation Monitoring Report presents the results of the second year of post-construction monitoring at the Dodson East Wetland Mitigation Site. The Montana Department of Transportation (MDT) wetland mitigation project is located in Sections 1 and 2, Township 30 North, Range 27 East, Phillips County, Montana, approximately four miles east of Dodson on US Highway 2 (Figure 1).The Dodson East wetland conservation easement area encompasses 14.92 fenced acres, situated north of the Milk River and Highway 2 and south of the railroad.

The wetland mitigation site is located within Watershed 11, the Milk River Basin. Wetlands developed at this location were designed to provide compensatory mitigation for approximately 4.4 acres of wetland impacts associated with the planned reconstruction of 4.4 miles of US Highway 2 east of Dodson.

Two cells were constructed in 2008 to create at least 4.92 acres of shallow water (palustrine), emergent, and aquatic bed wetland types. The bases of the wetland cells were constructed with an undulating bottom below the plan elevation. The final elevation of at least 75% of the cell area was to be at or below the plan elevation after the placement of salvaged wetland materials and topsoil (USACE Permit No. 2004-90-518 dated July 22, 2004).

The performance standards listed in the USACE Permit specified that the mitigation wetlands were to have at least 60 percent cover by desirable wetland species in the herbaceous layer after 3 years, and 75 percent cover after five years. Invasive and noxious species were to comprise no more than 10 percent of the relative cover, and not dominate the vegetation in any extensive area of the mitigation wetland. The wetland was to be inundated or saturated to the surface continuously for at least 12.5 percent of the growing season in most years. Mitigation construction was to be initiated prior to or concurrent with impacts.

Figures 2 and 3 in Appendix A show the 2012 Monitoring Activity Locations and 2012 Mapped Site Features, respectively. The MDT Mitigation Monitoring Form, US Army Corps of Engineers (USACE) Wetland Determination Data Forms – Great Plains Region (USACE 2010), and the 2008 MDT Montana Wetland Assessment Method (MWAM) Form (Berglund and McEldowney 2008) are included in Appendix B. Project area photographs are included in Appendix C.

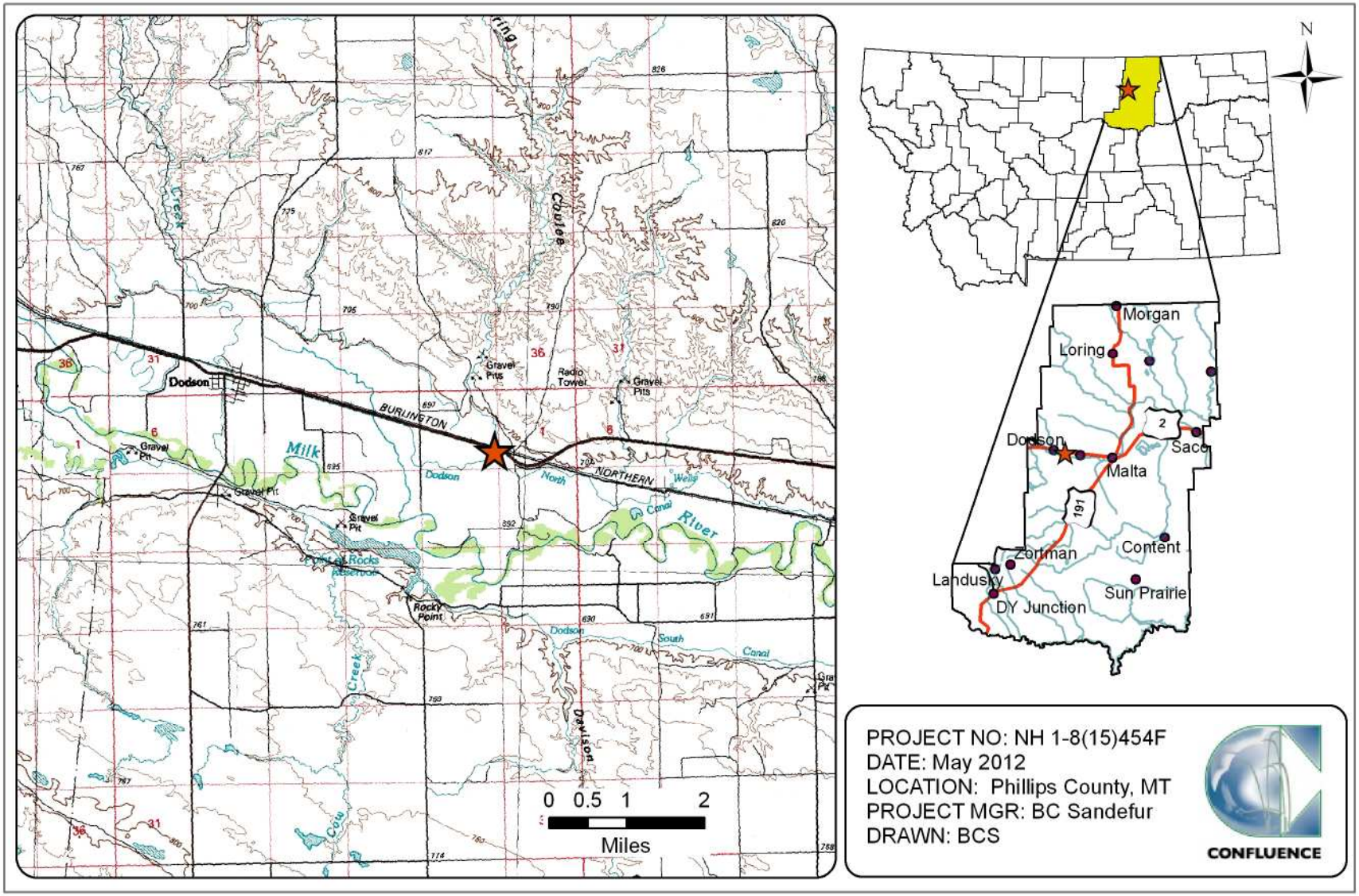

Figure 1. Project location of Dodson East Wetland Mitigation Site.

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2. METHODS

The second annual monitoring event at Dodson East was completed on August 15, 2012. Information for the Mitigation Monitoring Form and Wetland Determination Data Form was entered electronically in the field on a 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 collected included a wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data collection, bird and wildlife use documentation, photographic documentation, and a non-engineering examination of the infrastructure established within the mitigation project area.

2.1. Hydrology

The presence of hydrologic 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 the evaluation of mitigation criteria 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 classified as exhibiting wetland hydrology. The growing season is defined 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 degrees Fahrenheit (USACE 2010). The growing season recorded for the meteorological station at Dodson, Montana (242438), is approximately 121 days. Areas defined as wetlands would require at least 15 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 dominant species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2012 aerial photograph (Figure 3, Appendix A). The percent cover of dominant species within a community type was estimated and recorded using the following categories: 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).

Temporal changes in vegetation were evaluated through annual assessments of static belt transects established in August, 2011 (Figure 2, Appendix A). Vegetation composition was assessed and recorded along two vegetation belt transects (T-1 and T-2) approximately 10 feet wide and 244 and 207 feet long, respectively (Figure 2, Appendix A).

The transect locations were recorded with a resource-grade GPS unit. Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species within the belt transect was estimated using the same values and cover ranges used for the polygon data on the aerial photograph (Figure 3, Appendix B). Photographs were taken at the endpoints of each transect during the monitoring event (Appendix C).

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, 2 to 25 percent, and 25 to 100 percent, respectively.

2.3. Soil

Soil information was obtained via the *Soil Survey for Phillips County Area* (USDA 2010) and *in situ* soil descriptions. Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and 2010 Regional Supplement. A description of the soil profile, including hydric soil indicators when present, was recorded on the Wetland Determination Data Form for each profile (Appendix B).

2.4. Wetland Delineation

Waters of the U.S. including special aquatic sites and jurisdictional wetlands were delineated throughout the project area in accordance with criteria established in the 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 was derived from the Draft 2012 National Wetland Plant List (NWPL) (Lichvar and Kartesz. 2009). Previous years' reports used the 1988 National List of Plant Species that Occur in Wetlands: Northwest Region 4 (Reed 1988). The 2012 NWPL scientific plant names were used in this report. Many common names used in the 2012 NWPL appear incomplete or erroneous. When used in this report, 2012 NWPL common names that appear to be incomplete or erroneous are provided with parenthetical clarification. For example, the common given name for the plant *Agrostis exarata* in the 2012 NWPL is "spiked bent". As this is likely an error, this species' common name would be reported here as "spiked bent (grass)". The 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 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, based on the guidance in the 2010 Regional Supplement. The wetland boundary was delineated on the 2012 aerial photo and digitized into Geographic Information System (GIS) format. Wetland areas reported were estimated using GIS methods.

2.5. Wildlife

Observations and other positive indicators of mammal, reptile, amphibian, and bird use were recorded on the wetland 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 species observed in 2011 and 2012 was compiled for this report.

2.6. Functional Assessment

The 2008 MWAM was used to evaluate functions and values on the site in 2011 and 2012. 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. The wetland assessment area (AA) encompassed the two wetland cells and the pre-existing wetland located between the cells (Appendix B).

2.7. Photo Documentation

Photo documentation at established photo points provided supplemental information on wetland and upland conditions, trends, current land uses surrounding the site, and the vegetation transects. Photographs were taken during the site visit at six established photo points (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 2012 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, and wetland data points.

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 did not constitute an engineering-level structural inspection.

3. RESULTS

3.1. Hydrology

Climate data from the meteorological station at Dodson Coop, Montana (242438), recorded average annual precipitation rates of 10.48 inches from August 1883 thru December 2011 (WRCC 2011). Annual precipitation in 2010 and 2011 was 15.0 inches and 15.25, respectively. Precipitation totals from January to August were 8.71 inches (long-term average), 9.92 inches (2010), 13.53 inches (2011), and 10.13 inches (2012).

The wetland cells encompassing approximately 50 percent of the site were inundated during the 2012 site visit. The average depth site wide was 2.0 feet and the range of depths was 0.5 to 3.0 feet. The shoreline of the cells adjacent to the open water was saturated to the ground surface. The depth of water at the emergent vegetation and open water boundary was approximately 0.8 feet. The site has the potential to receive inundation from high water events from Spring Coulee, an ephemeral drainage that drains approximately 21 square miles to the north of the site.

Three data points were sampled to determine the wetland and upland boundaries. Data points DE-1 and DE-3 were located in upland community Type 3 – *Puccinellia nuttalliana*. Sample point DE-2 was located within wetland community Type 4 – *Alopecurus pratensis*. There were no hydrologic indicators at DE-1. The groundwater level appeared to be 20 inches below the ground surface for most of the growing season based on the soil profile in the test pit. Data point DE-3 exhibited surface soil cracks, which alone does not provide enough evidence of wetland hydrology. Data point DE-2 exhibited drift deposits, an algal mat, surface soil cracks, drainage patterns, and a positive FAC-neutral test. Aquatic invertebrates, an indicator of wetland hydrology, were found in select areas of the mitigation site affected by intermittent inundation.

3.2. Vegetation

Monitoring year 2012 marked the second year of monitoring on the Dodson East wetland mitigation site. Fifty-one plant species were observed site wide in 2011 and 2012 (Table 1). Vegetation plant communities were identified by plant

dominance, which was affected by topography, soil, and hydrology. The communities and individual species identified in each are listed on the Mitigation Monitoring Form (Appendix B). The community boundaries are presented on Figure 3 (Appendix A).

The wetland cells were seeded with a wetland mix consisting of slender wild rye (*Elymus trachycaulus*, called *Agropyron trachycaulum* on the 1988 list), saltmarsh club-rush (*Schoenoplectus maritimus,* called *Scirpus maritimus* on the 1988 list), Western-wheatgrass (*Pascopyrum smithii,* called *Agropyron smithii* on 1988 list), Great Basin lyme grass (*Leymus cinereus*, called *Elymus cinereus* on the 1988 list), and Nuttall's alkaligrass (*Puccinellia nuttaliana*). Salvaged wetland sod and soil were also used as a seed bank to augment species diversity. No woody species were planted. Six vegetation communities, two upland types and four wetland types, were identified in 2012 and are described below.

Upland community Type 1 – *Elymus* spp. characterized the 5.50 acre upland buffer surrounding the constructed wetland cells. Crested wheatgrass (*Agropyron cristatum*), creeping wild rye (*Elymus repens*), Western-wheatgrass, and curly-cup gumweed (*Grindelia squarrosa*) dominated the herbaceous cover.

Wetland community Type 2 – *Schoenoplectus* spp. (called *Scirpus* spp. In the 2011 monitoring report) was found on the 0.84 acre perimeter of the east cell. The dominant species were saltmarsh club-rush (*Schoenoplectus maritimus*), hard-stem club-rush (*Schoenoplectus acutus*), and fox-tail barley (*Hordeum jubatum*). Green algae (a protist) were observed on the water surface at the edge of the open water. Approximately 11 to 20 percent of the ground surface in the community was bare.

Upland community Type 3 – *Puccinellia nuttalliana* was located on 1.68 acres of the terrace on the north side of the east cell and along the perimeter of the west and east cells. This community may transition from upland to wetland if the groundwater elevation increases enough to saturate the soil for a sufficient duration during the growing season. Although the indicator status of Nuttall's alkaligrass is obligate (OBL), the soil and hydrology in the community did not meet the wetland criteria. Nuttall's alkali grass was the dominant species with less than five percent cover of fox-tail barley (*Hordeum jubatum*), curly dock (*Rumex crispus*), sow thistle (*Sonchus arvensis*), slender wheatgrass, curly-cup gumweed, prickly lettuce (*Lactuca serriola*), and yellow sweet-clover (*Melilotus officinalis*).

Table 1. Vegetation species observed in 2011 and 2012 at the Dodson East Wetland Mitigation Site.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	UPL
Algae, green	Algae, Green	NL
Alisma plantago-aquatica	European Water-Plantain	OBL
Alisma triviale	**Northern Water-Plantain**	**OBL**
Alopecurus pratensis	Field Meadow-Foxtail	FACW
Asclepias sp.	Milkweed	NL
Asclepias speciosa	Showy Milkweed	FAC
Avena fatua	Wild Oat	UPL
Axyris amaranthoides	Russian Pigweed	NL
Bassia scoparia	Mexican-Fireweed	FACU
Bouteloua dactyloides	Buffalo Grass	FACU
Bouteloua gracilis	Blue Grama	NL
Bromus inermis	**Smooth Brome**	**FAC**
Carex praegracilis	Clustered Field Sedge	FACW
Carex vulpinoidea	Common Fox Sedge	FACW
Chenopodium album	Lamb's-Quarters	FACU
Distichlis spicata	Coastal Salt Grass	FACW
Elaeagnus angustifolia	Russian-Olive	FACU
Eleocharis palustris	Common Spike-Rush	OBL
Elymus canadensis	Nodding Wild Rye	FACU
Elymus repens	Creeping Wild Rye	FACU
Elymus trachycaulus	Slender Wild Rye	FACU
Erigeron annuus	Eastern Daisy Fleabane	FACU
Festuca pratensis	**Meadow Fescue**	**FACU**
Festuca sp.	Fescue	NL
Glycyrrhiza lepidota	**American Licorice**	**FACU**
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Heliomeris multiflora	Showy Goldeneye	UPL
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lemna minor	**Common Duckweed**	**OBL**
Lepidium perfoliatum	Clasping Pepperwort	FAC
Leymus cinereus	Great Basin Lyme Grass	FAC
Melilotus officinalis	Yellow Sweet-Clover	FACU
Pascopyrum smithii	Western-Wheat Grass	FACU
Polygonum aviculare	Yard Knotweed	FACU
Populus deltoides	**Eastern Cottonwood**	**FAC**
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Rumex crispus	Curly Dock	FAC
Sarcobatus vermiculatus	**Greasewood**	**FAC**
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL

[1]Draft NWPL (Lichvar and Kartesz 2009).
New species identified in 2012 are bolded.

Table1. (Continued). Vegetation species observed in 2011 and 2012 at the Dodson East Wetland Mitigation Site.

Scientific Names	Common Names	GP Indicator Status[1]
Schoenoplectus pungens	Three-Square	OBL
Scutellaria galericulata	**Hooded Skullcap**	**OBL**
Solidago canadensis	Canadian Goldenrod	FACU
Sonchus arvensis	Field Sow-Thistle	FAC
Spartina pectinata	**Freshwater Cord Grass**	**FACW**
Suaeda calceoliformis	**Paiuteweed**	**FACW**
Symphoricarpos albus	**Common Snowberry**	**FACU**
Thlaspi arvense	Field Penny-Cress	FACU
Typha latifolia	Broad-Leaf Cat-Tail	OBL

[1]Draft NWPL (Lichvar and Kartesz 2009).
New species identified in 2012 are bolded.

Wetland community Type 4 – *Alopecurus pratensis* characterized the 0.68 acre existing wetland located between the cells. The project plan sheet indicated an ephemeral drainage previously flowed through this area. The creek drainage pattern was evident during the 2012 investigation. Field meadow-foxtail (*Alopecurus pratensis*) dominated while broad-leaf cattail (*Typha latifolia*), and eight other hydrophytic species were present in the plant community.

Wetland community Type 5 – *Alisma trivale/Schoenoplectus spp*. was identified within 3.86 acres of the west cell. The canopy cover of emergent vegetation within the west cell was approximately 70 percent. Northern water plantain (*Alisma trivale*, called *Alisma plantago-aquatic* on the 1988 list), aquatic macrophytes, saltmarsh club-rush, hardstem club rush, broad-leaf cattail, and green algae dominated the community.

Wetland community Type 6 – Aquatic macrophytes characterized 2.36 acres within the east cell. The community was classified as an aquatic bed vegetation class generally defined as being dominated by plants "that grow principally on or below the surface of the water for most of the growing season in almost all years (aquatic macrophytes) (Cowardin et al. 1979)." The Montana Natural Heritage Program (MTNHP) website further defines the Palustrine Aquatic Bed Class as having aquatic plants at greater than 30 percent cover and water depths between 0.5 and 2 meters (MTNHP 2011). The community encompassed saltmarsh club-rush, hard stem club rush, northern water plantain, and aquatic macrophytes. Green algae (protist kingdom) were also observed on the water surface. The water levels in the cell ranged from one to three feet deep in August, 2012.

Data collected on Transect 1 (Mitigation Monitoring Form, Appendix B) are summarized in tabular and graphic formats (Table 2, Charts 1 and 2, respectively). Photographs of the start and finish of Transect 1 are included on Page C-8 of Appendix C. As in 2011, the transect intersected wetland communities Type 2 and Type 6 and upland community Type 3. Hydrophytic vegetation communities comprised 65.2 percent of Transect 1 in 2011 and 67.6 percent in 2012. Some lower-lying areas within community 3 – *Puccinellia*

nuttalliana may develop wetland characteristics if the duration and extent of soil saturation in the community increases.

The data for Transect 2 (Mitigation Monitoring Form, Appendix B) is summarized on Table 3 and Charts 3 and 4. Photographs of the transect are shown on page C-9 of Appendix C. Wetland communities 2, 4, and 5 comprised 99.0 percent of the transect intervals. Little change was observed on either transect between years except for the development of a *Schoenoplectus* community on the shoreline of the east cell.

No Priority 2B noxious weeds were identified at the site in 2011 or 2012. Approximately ten Russian olive (*Elaegnus angustifolia*) trees were observed in the northwest corner of the project area inside the fenced mitigation boundary. Russian olive is considered a Priority 3 weed that has the potential to have significant negative impacts. The state recommends research, education and prevention to minimize the spread of this regulated plant.

Table 2. Data summary for Transect 1 in 2011 and 2012 at the Dodson East Wetland Mitigation Site.

Monitoring Year	**2011**	**2012**
Transect Length (feet)	**244**	**244**
Vegetation Community Transitions along Transect	4	4
Vegetation Communities along Transect	4	3
Hydrophytic Vegetation Communities along Transect	2	2
Total Vegetative Species	19	17
Total Hydrophytic Species	9	6
Total Upland Species	10	11
Estimated % Total Vegetative Cover	60	60
% Transect Length Comprising Hydrophytic Vegetation Communities	65.2	67.6
% Transect Length Comprising Upland Vegetation Communities	34.8	32.4
% Transect Length Comprising Unvegetated Open Water	0.0	0.0
% Transect Length Comprising Bare Substrate	0.0	0.0

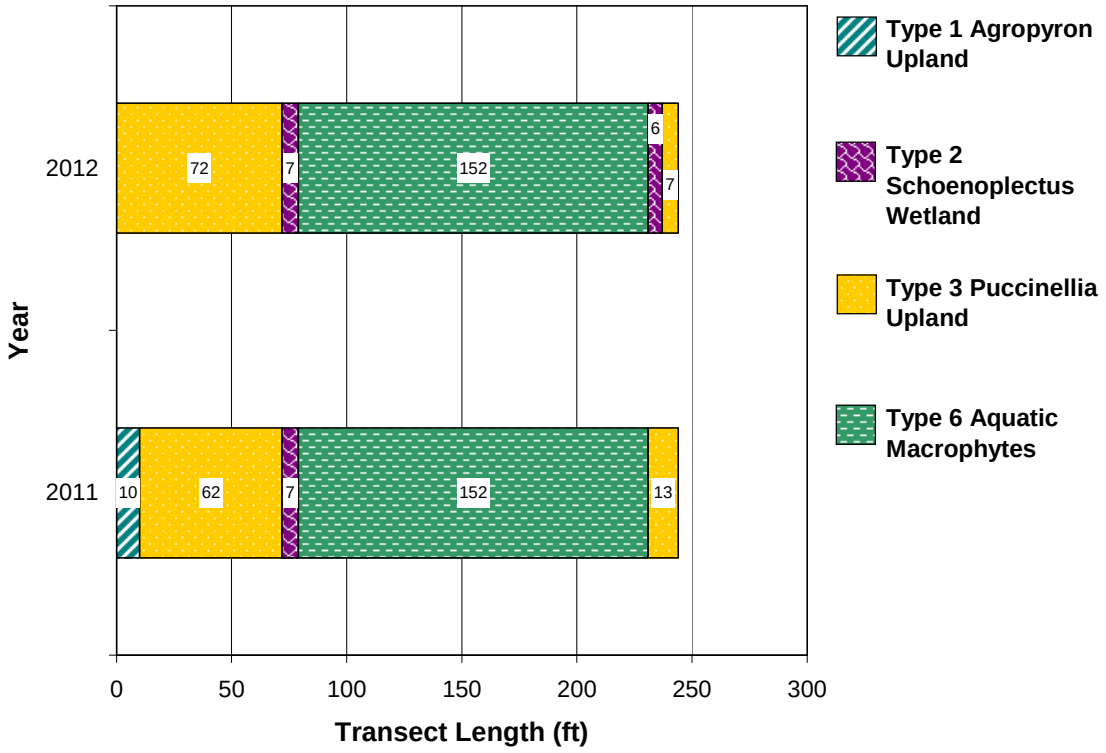

Chart 1.Transect map showing community types on Transect 1, East Cell, in 2011 and 2012 from start (0 feet) to finish (244 feet) at the Dodson East Wetland Mitigation Site.

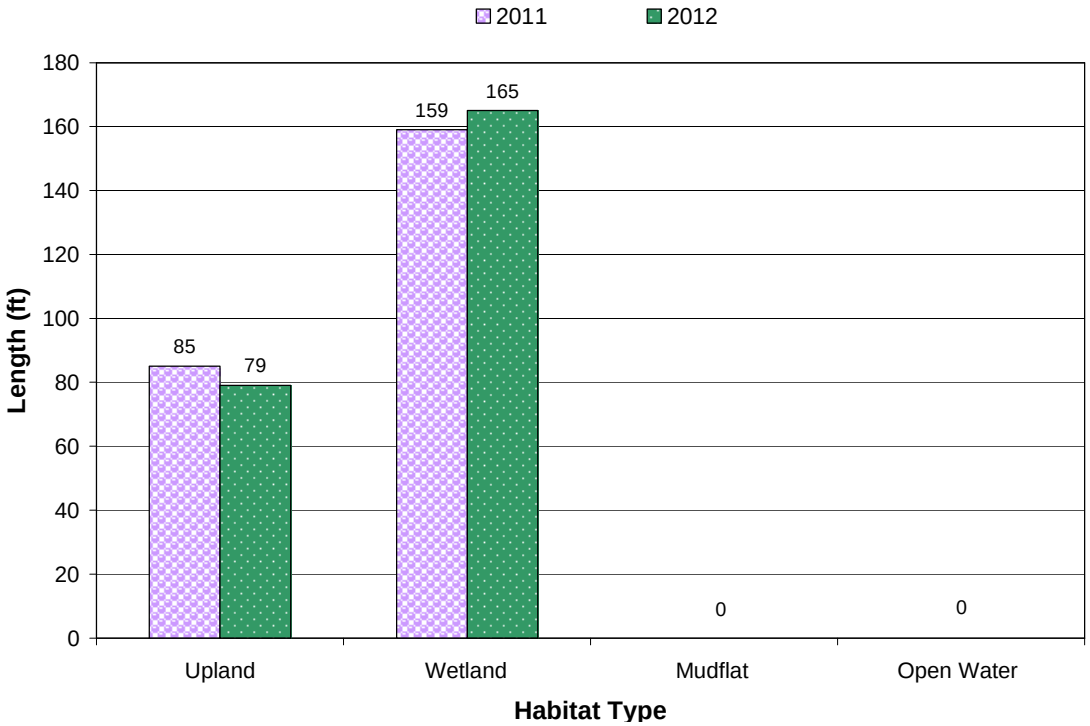

Chart 2. Length of habitat types within Transect 1, East Cell, in 2011 and 2012 at the Dodson East Wetland Mitigation Site.

Table 3. Data summary for Transect 2 in 2011 and 2012 at the Dodson East Wetland Mitigation Site.

Monitoring Year	2011	2012
Transect Length (feet)	**207**	**207**
Vegetation Community Transitions along Transect	2	4
Vegetation Communities along Transect	2	4
Hydrophytic Vegetation Communities along Transect	1	3
Total Vegetative Species	8	13
Total Hydrophytic Species	6	6
Total Upland Species	2	7
Estimated % Total Vegetative Cover	75	75
% Transect Length Comprising Hydrophytic Vegetation Communities	96.6	99.0
% Transect Length Comprising Upland Vegetation Communities	3.4	1.0
% Transect Length Comprising Unvegetated Open Water	0.0	0.0
% Transect Length Comprising Bare Substrate	0.0	0.0

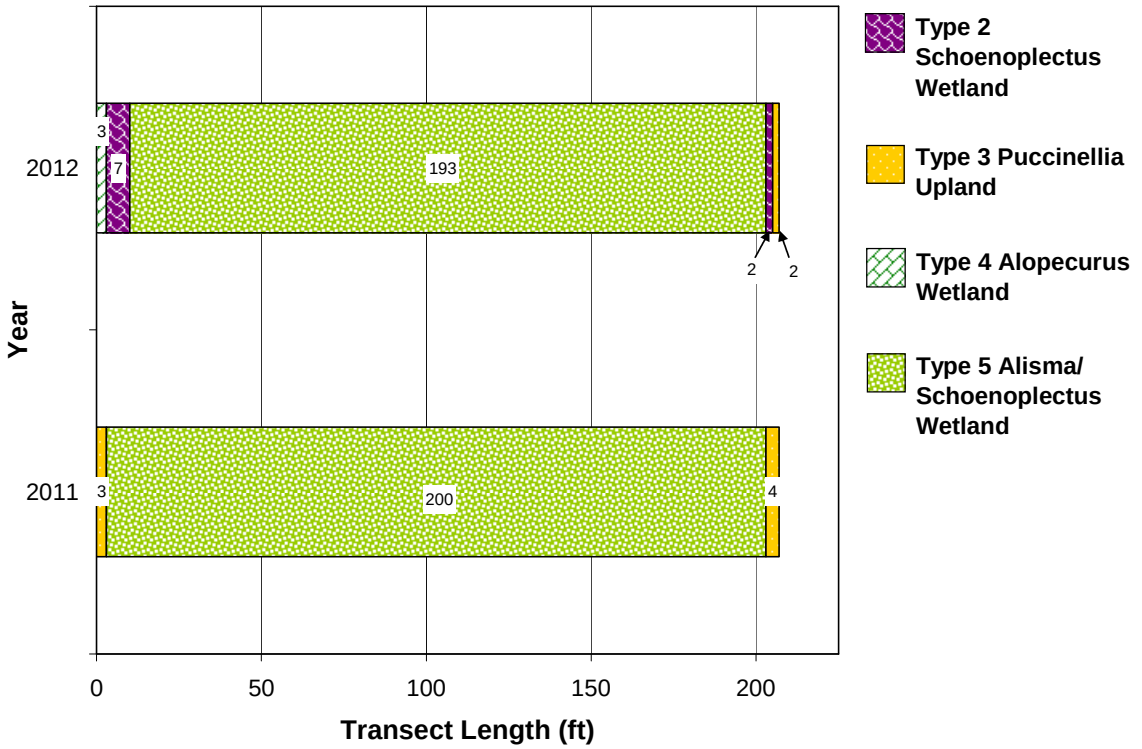

Chart 3. Transect map showing community types on Transect 2, West Cell, in 2011 and 2012 from start (0 feet) to finish (207 feet) at the Dodson East Wetland Mitigation Site.

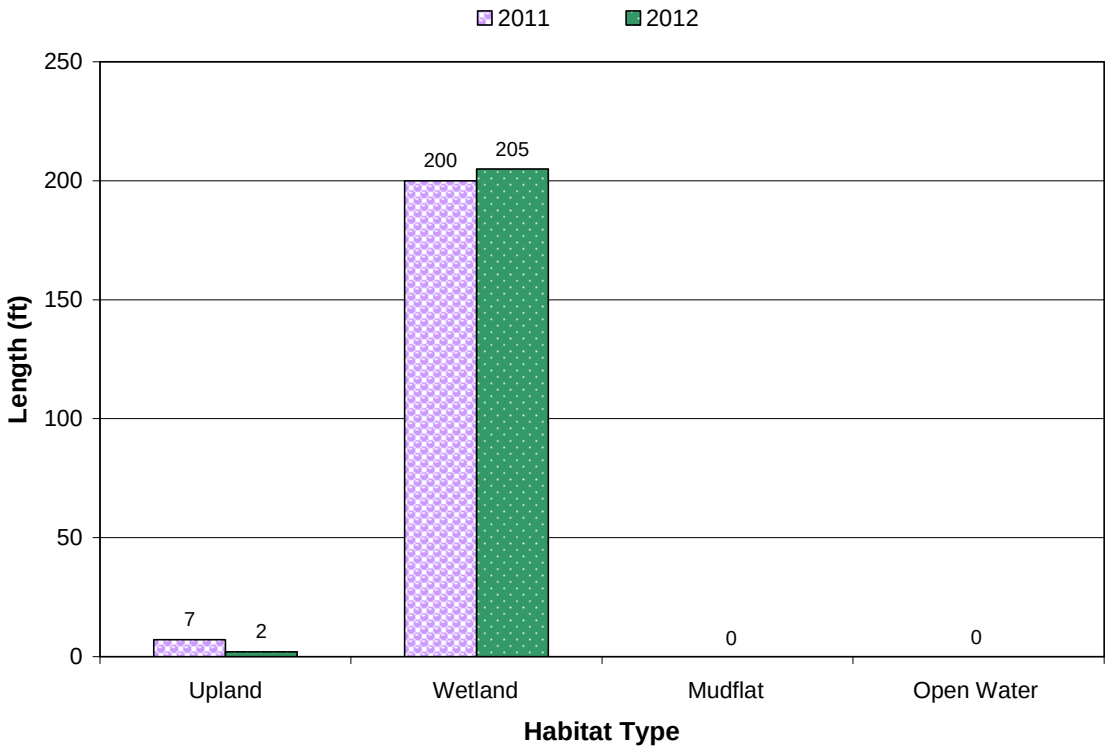

Chart 4. Length of habitat types within Transect 2, West Cell, in 2011 and 2012 at the Dodson East Wetland Mitigation Site.

3.3. Soil

The project site was mapped in the Phillips County Soil Survey (USDA 2011) within the Havre loam and Bigsag clay soil map units, both found on 0 to 2 percent slopes. The parent materials of the Havre loam and Big Sag clay soils are alluvium and glaciolacustrine deposits, respectively. The soil types are found on floodplain landforms. The Bigsag clay is a poorly drained hydric soil, taxonomically classified as a poorly drained frigid Typic Halaquept. The Lallie loam, a hydric component of the Havre loam map unit, is classified as a frigid Vertic Fluvaquent. The test pit soils generally confirmed the map units.

Data point DE-2 was located in wetland community Type 4. The soil profile revealed a dark grayish brown clay loam (10 YR 4/2) with five percent dark yellowish brown (10 YR 4/6) redoximorphic concentrations. The depleted matrix was a positive indicator of hydric soil. Data points DE-1 and DE-3 were located in upland community Type 3. The soil at DH-1 was a clay loam (10 YR 4/2) with gray (10 YR 6/1) depletions. The depletions were likely sodium concentrations. The soil profile in DE-3 revealed a brown (10 YR 5/3) silty clay with redox concentrations (10 YR 4/6) in the matrix. Data points DH-1 and DH-3 did not meet the hydric soil criteria.

3.4. Wetland Delineation

The total acreage of emergent and aquatic bed wetland delineated in 2012 was 7.74 acres (Table 4; Figure 3, Appendix B). This represented an increase of 0.45 wetland acres since 2011. The areal extent of wetland community 4 located between the cells and on the north boundary of the west cell was higher in 2012. The ephemeral creek located north of the site may be increasing groundwater levels in the west half of the mitigation site. An undisturbed upland buffer of 7.18 acres is present within the mitigation site.

Table 4. Total wetland and upland acres delineated in 2011 and 2012 at the Dodson East Wetland Mitigation Site.

WETLAND AND UPLAND HABITATS	2011 (acres)	2012 (acres)
Project Area	14.92	14.92
Created Wetland	7.29	7.74
Upland Buffer	7.63	7.18

3.5. Wildlife

A comprehensive list of bird and other wildlife species observed directly or indirectly during the 2011 and 2012 monitoring visits is presented in Table 5 (Appendix B). Five bird species were observed in 2012 including the American robin (*Turdus migratorius*), bank swallow (*Riparia riparia*), killdeer (*Charadrius vociferous*), mallard *(Anas platyrhynchos*), and red-winged blackbird (*Agelaius phoeniceus*). There are currently no nesting structures installed at the site. One Northern leopard frog (*Rana pipiens*) and tracks of a raccoon (*Procyon lotor*) and deer sp. (*Odocoileus* sp.) were seen onsite.

3.6. Functional Assessment

The 2011 functional assessment provided a baseline to gauge functional changes at the mitigation site (Table 6). The 2011 and 2012 assessments used the 2008 MDT MWAM to generate a functional score for one wetland assessment area (AA) (Appendix B). The singular AA encompassed the west and east cells and the pre-existing wetland located between the cells.

The 7.74-acre AA was rated as a Category II wetland with 68.5 percent of the total possible points and 53.0 functional units. This represented an increase in the overall rating from III to II and functional units from 45.2 to 53.0. The increases were the result of a higher vegetation cover on the shoreline of the wetland cells and a higher wetland acreage. The ratings were high for short and long term surface water storage, sediment/nutrient/toxicant removal, streambank/shoreline stabilization, production export/food chain support, and groundwater discharge/recharge and moderate for MTNHP Species Habitat, general wildlife habitat, and flood attenuation. The great blue heron, an S3 species, was identified by the MTNHP in the township and range of the site. The proximity of the highway and railroad grade limits the value of the wildlife habitat.

Table 5. Wildlife species observed within the Dodson East Wetland Mitigation Site in 2011 and 2012.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Northern Leopard Frog	***Rana pipiens***
BIRDS	
American Robin	***Turdus migratorius***
Bank Swallow	***Riparia riparia***
Killdeer	***Charadrius vociferus***
Mallard	***Anas platyrhynchos***
Red-winged Blackbird	***Agelaius phoeniceus***
Tree Swallow	*Tachycineta bicolor*
MAMMALS	
Deer Sp.	***Odocoileus* sp.**
Meadow Vole	*Microtus pennsylvanicus*
Raccoon	***Procyon lotor***
Striped Skunk	*Mephitis mephitis*
White-tailed Deer	*Odocoileus virginianus*
REPTILES	
Painted Turtle	*Chrysemys picta*
Plains Gartersnake	*Thamnophis radix*

Table 6. Functions and Values at the Dodson East Wetland Mitigation Site in 2011 and 2012.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2011	2012
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Mod (0.5)	Mod (0.5)
General Wildlife Habitat	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	NA	NA
Flood Attenuation	Mod (0.6)	Mod (0.6)
Short and Long Term Surface Water Storage	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (1.0)
Sediment/Shoreline Stabilization	Mod (0.7)	High (1.0)
Production Export/Food Chain Support	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)
Uniqueness	Low (0.2)	Low (0.2)
Recreation/Education Potential (bonus points)	NA	Low (.05)
Actual Points/Possible Points	**6.2/ 10**	**6.85/ 10**
% of Possible Score Achieved	**62.0%**	**68.5%**
Overall Category	**III**	**II**
Total Acreage of Assessed Wetlands within Site Boundaries	**7.29**	**7.74**
Functional Units (acreage x actual points)	**45.2**	**53.0**

3.7. Photo Documentation

Photographs taken at photo points one through seven (PP1 through PP7; Figure 2, Appendix A) are shown on pages C-1 to C-7 of Appendix C. Transect end points are shown on pages C-8 and C-9 and photographs of the data points are included on page C-10.

3.8. Maintenance Needs

No Priority 2B noxious weeds were identified at the site in 2012. Approximately ten Russian olive trees were observed in the northwest corner of the project area. Russian olive is considered a Priority 3 weed that has the potential to have significant negative impacts. The state recommends research, education and prevention to minimize the spread of this regulated plant. Measures should be taken to ensure that Russian olive seedlings do not establish within this mitigation site. There are no nesting structures or inlet/outlet structures controlling water levels installed at the site.

3.9. Current Credit Summary

The emergent and aquatic bed wetland acreage delineated in 2012 encompassed 7.74 acres, a 0.45 acre increase since 2011 (Table 7). The areal extent of wetland community 4 located between the cells and on the north boundary of the west cell was greater in 2012. An undisturbed upland buffer of 7.18 acres was delineated within the mitigation site boundaries. The credit ratio for wetland creation was assumed to be 1:1 (creation to impact) based on language in the USACE Permit Number 2004-90-518 requiring the creation of 4. 92 acres of wetland habitat. Credit for maintenance of an upland buffer has been calculated at a 5:1 ratio. The estimated credit acreage in 2012 was 7.74 credit acres for created wetland at a 1:1 credit ratio and 1.44 credit acres for the upland buffer at a 5:1 credit ratio.

With respect to the performance standards listed in USACE Permit Number 2004-90-518, the wetlands are to have at least 60 percent cover by desirable wetland species in the herbaceous layer after 3 years, and 75 percent cover after five years. The site was constructed in 2008 and has now been established for over 3 years. The 60% of desirable wetland species has been met. The cover of emergent vegetation and aquatic macrophytes currently exceeds 60 percent in the west cell. The cover of the emergent and aquatic macrophyte vegetation in the open water areas and shoreline of the east cell is approximately 60 percent. Invasive and noxious species were to comprise no more than 10 percent of the relative cover, and not dominate the vegetation in any extensive area of the mitigation wetland. There were no Priority 2 B noxious weeds observed at the site in 2012. Russian olive, an aggressive Priority 3 weed, was present onsite but did not exceed the 10% cover as defined in the performance standard. The wetland was to be inundated or saturated to the surface continuously for at least 12.5 percent of the growing season in most years. Based on current hydrologic indicators, it appears the majority of the footprint of the wetland cells has been inundated for most of the growing seasons since 2008. The acreage

requirement stipulating the creation of at least 4.92 acres of emergent and aquatic bed wetland has thus far been met.

Table 7. Summary of wetland credits in 2011 and 2012 at the Dodson East Wetland Mitigation Site.

WETLAND	Credit Ratio	2011 Wetland Acres	2011 Credit Acres	2012 Wetland Acres	2012 Credit Acres
Created Wetland	1:1	7.29	7.29	7.74	7.74
Upland Buffer	5:1	7.63	1.53	7.18	1.44
Total Credit Acres			**8.82**		**9.18**

4. REFERENCES

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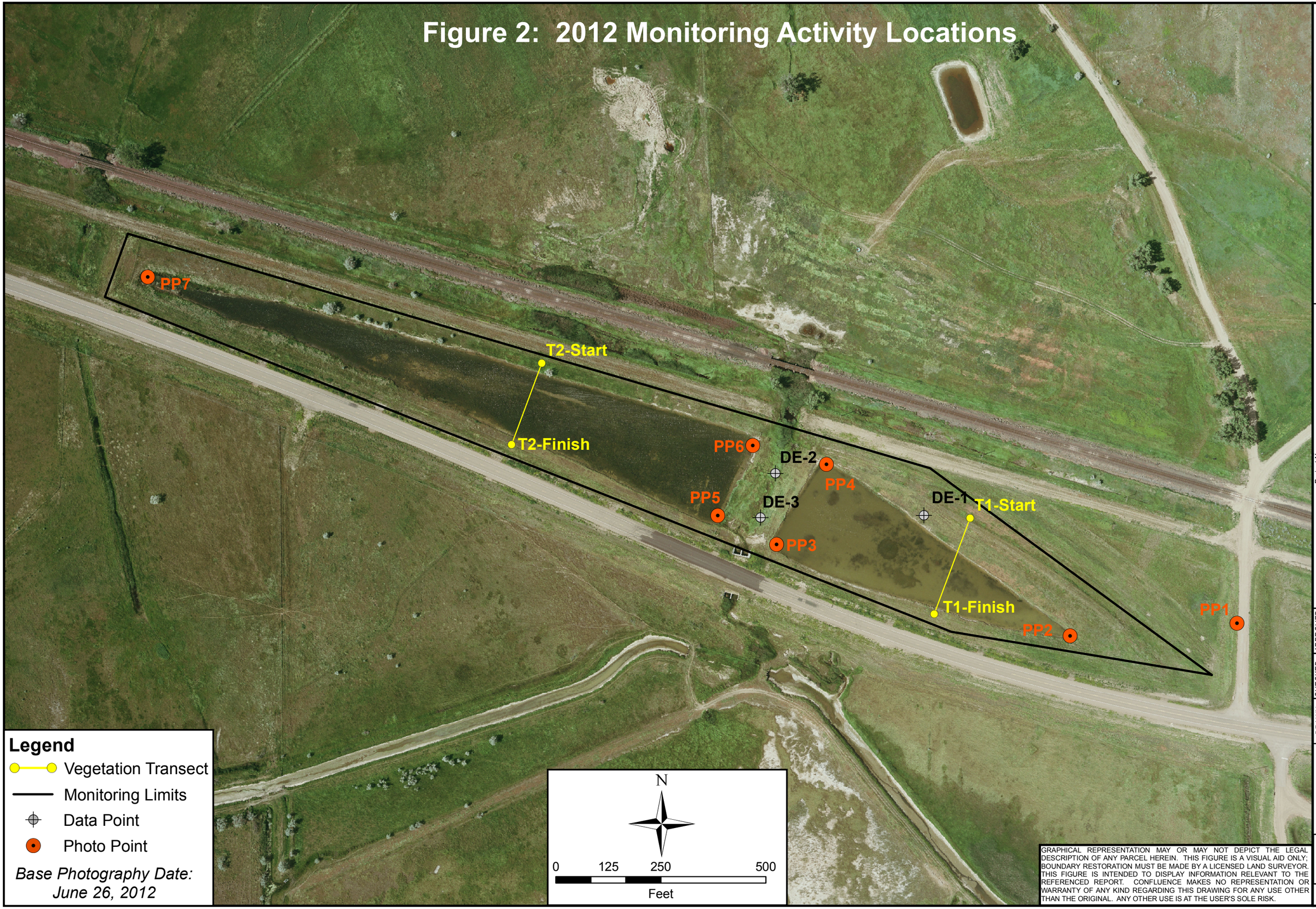
Appendix A

Project Area Maps
Figure 2 – 2012 Monitoring Activity Locations
Figure 3 – 2012 Mapped Site Features

MDT Wetland Mitigation Monitoring
Dodson East
Phillips County, Montana

Figure 2: 2012 Monitoring Activity Locations



Legend

- Vegetation Transect
- Monitoring Limits
- Data Point
- Photo Point

Base Photography Date: June 26, 2012

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: Phillips Co., MT

PROJECT NO: NH 1-8(15)454F

FILE: DodsonEast/Monitor2012.mxd

Project Name
Dodson East Mitigation Site

Drawing Title
2012 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BV	BCS	JJ

SCALE: Noted

Drawn: August 29, 2012

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 2

REV -

Figure 3: 2012 Mapped Site Features

Vegetation Community Types

1. Elymus spp.
2. Schoenoplectus spp.
3. Puccinellia nuttalliana
4. Alopecurus pratensis
5. Alisma trivale/Schoenoplectus spp.
6. Aquatic macrophytes

Acreages

Project Area	14.92 acres
Upland Buffer	7.18 acres
Created Wetlands	7.74 acres

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: June 27, 2012

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: Phillips Co., MT

PROJECT NO: NH 1-8(15)454F

FILE: DodsonEast/Veg2012.mxd

Project Name
Dodson East Mitigation Site

Drawing Title
2012 Mapped Site Features

DRAWN	CHECKED	APPROVED
BV	BCS	JJ

SCALE: Noted

Drawn: August 29, 2012

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 3

REV -

Appendix B

2012 MDT Wetland Mitigation Site Monitoring Form
2012 USACE Wetland Determination Data Form – Great Plains Region
2012 MDT Montana Wetland Assessment Form

MDT Wetland Mitigation Monitoring
Dodson East
Phillips County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Dodson-East Assessment Date/Time 8/15/2012 8:33:25 AM

Person(s) conducting the assessment: B Sandefur

Weather: Cool & mild, overcast Location: Approx. 4mi E of Dodson

MDT District: Glendive Milepost:

Legal Description: T 30N R 27E Section(s) 1 & 2

Initial Evaluation Date: 8/12/2011 Monitoring Year: 2 #Visits in Year: 1

Size of Evaluation Area: 14.9 (acres)

Land use surrounding wetland:

Agriculture (grazing),US Hwy 2

HYDROLOGY

Surface Water Source: Spring creek flood event, groundwater, surface runoff and precip.

Inundation: ☑ Average Depth: 2 **(ft)** Range of Depths: 0-3.0 **(ft)**

Percent of assessment area under inundation: 50 %

Depth at emergent vegetation-open water boundary: 0.8 **(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, saturation, drain patterns, algal mats, drift & sediment deposits, FAC-neutral vegetation, aquatic invertebrates

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:

Constructed cells inundated. Drain patterns between constructed cells, obvious signs of surface water drainage into cells and through culvert under US Hwy 2.

VEGETATION COMMUNITIES

Site Dodson-East

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

* Indicates accepted spp name not on '88 list.

Community # 1 **Community Type:** Elymus sp. / **Acres:** 5.51

Species	Cover class	Species	Cover class
Agropyron cristatum	3	Alopecurus pratensis	1
Bassia scoparia	1	Bromus inermis	1
Elaeagnus angustifolia	1	Elymus canadensis	1
Elymus repens	3	Elymus trachycaulus	1
Grindelia squarrosa	2	Hordeum jubatum	1
Lactuca serriola	1	Lepidium perfoliatum	0
Pascopyrum smithii	2	Puccinellia nuttalliana	1
Sarcobatus vermiculatus	1	Thlaspi arvense	0

Comments:

Community # 2 **Community Type:** Schoenoplectus spp. / **Acres:** 0.84

Species	Cover class	Species	Cover class
Algae, green	0	Alisma triviale	1
Avena fatua	0	Bare Ground	3
Eleocharis palustris	1	Elymus cinereus	0
Festuca pratensis	1	Glycyrrhiza lepidota	0
Hordeum jubatum	2	Populus deltoides	0
Rumex crispus	1	Schoenoplectus acutus	2
Schoenoplectus maritimus	4	Scutellaria galericulata	0

Comments:

Community # 3 **Community Type:** Puccinellia nuttalliana / **Acres:** 1.68

Species	Cover class	Species	Cover class
Agropyron cristatum	0	Asclepias speciosa	0
Avena fatua	0	Bassia scoparia	0
Bromus inermis	0	Chenopodium album	0
Elymus canadensis	0	Elymus cinereus	0
Elymus repens	0	Elymus trachycaulus	1
Festuca pratensis	0	Grindelia squarrosa	1
Hordeum jubatum	1	Lactuca serriola	1
Lepidium perfoliatum	0	Melilotus officinalis	1
Pascopyrum smithii	0	Puccinellia nuttalliana	5
Rumex crispus	1	Schoenoplectus maritimus	0
Sonchus arvensis	1	Spartina pectinata	0
Suaeda calceoliformis	0		

Comments:

Community # 4 **Community Type:** Alopecurus pratensis / **Acres:** 0.68

Species	Cover class	Species	Cover class
Alopecurus pratensis	5	Asclepias speciosa	0
Carex vulpinoidea	0	Elaeagnus angustifolia	1
Elymus trachycaulus	1	Glycyrrhiza lepidota	0
Lemna minor	1	Puccinellia nuttalliana	1
Schoenoplectus acutus	1	Schoenoplectus maritimus	1
Solidago canadensis	1	Sonchus arvensis	0
Spartina pectinata	1	Symphoricarpos albus	1
Typha latifolia	2		

Comments:

Community # 5 **Community Type:** Alisma triviale / Schoenoplectus spp. **Acres:** 3.86

Species	Cover class	Species	Cover class
Algae, green	1	Alisma triviale	4
Aquatic macrophytes	4	Open Water	5
Puccinellia nuttalliana	0	Schoenoplectus acutus	2
Schoenoplectus maritimus	2	Spartina pectinata	1
Typha latifolia	2		

Comments:

Community # 6 **Community Type:** Aquatic macrophytes / **Acres:** 2.36

Species	Cover class	Species	Cover class
Algae, green	2	Alisma triviale	1
Aquatic macrophytes	4	Open Water	5
Schoenoplectus acutus	0	Schoenoplectus maritimus	1

Comments:

Total Vegetation Community Acreage **14.93**

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

VEGETATION TRANSECTS

Site: Dodson-East Date: 8/15/2012 8:33:25 AM

Transect Number: 1 **Compass Direction from Start:** 225

Interval Data:

Ending Station 72 **Community Type:** Puccinellia nuttalliana /

Species	Cover class	Species	Cover class
Agropyron cristatum	1	Avena fatua	1
Chenopodium album	0	Elymus cinereus	0
Elymus trachycaulus	1	Festuca pratensis	1
Hordeum jubatum	2	Lepidium perfoliatum	1
Puccinellia nuttalliana	5		

Ending Station 79 **Community Type:** Schoenoplectus spp. /

Species	Cover class	Species	Cover class
Bare Ground	5	Hordeum jubatum	1
Schoenoplectus maritimus	1		

Ending Station 231 **Community Type:** Aquatic macrophytes /

Species	Cover class	Species	Cover class
Alisma triviale	0	Aquatic macrophytes	4
Open Water	5		

Ending Station 237 **Community Type:** Schoenoplectus spp. /

Species	Cover class	Species	Cover class
Alisma triviale	1	Bare Ground	5
Hordeum jubatum	1	Schoenoplectus maritimus	2

Ending Station 244 **Community Type:** Puccinellia nuttalliana /

Species	Cover class	Species	Cover class
Elymus canadensis	1	Elymus repens	1
Hordeum jubatum	2	Lactuca serriola	1
Puccinellia nuttalliana	5	Sonchus arvensis	0

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 195

Interval Data:

Ending Station 3 **Community Type:** Alopecurus pratensis /

Species	Cover class	Species	Cover class
Alopecurus pratensis	5	Sonchus arvensis	1
Spartina pectinata	1		

Ending Station 10 **Community Type:** Schoenoplectus spp. /

Species	Cover class	Species	Cover class
Algae, green	1	Alisma triviale	2
Bare Ground	4	Schoenoplectus maritimus	2

Ending Station 203 **Community Type:** Alisma triviale / Schoenoplectus spp.

Species	Cover class	Species	Cover class
Algae, green	2	Alisma triviale	3
Aquatic macrophytes	4	Open Water	5
Schoenoplectus maritimus	1		

Ending Station 205 **Community Type:** Schoenoplectus spp. /

Species	Cover class	Species	Cover class
Algae, green	1	Alisma triviale	2
Bare Ground	4	Schoenoplectus maritimus	4

Ending Station 207 **Community Type:** Puccinellia nuttalliana /

Species	Cover class	Species	Cover class
Hordeum jubatum	1	Lactuca serriola	2
Melilotus officinalis	1	Puccinellia nuttalliana	4
Schoenoplectus maritimus	0		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Dodson-East

Comments

Site vegetated with seeded and salvaged wetlands communities. No woody species planted.

Dodson-East

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
American Robin	2	L	UP, WM
Bank Swallow	15	F	OW, UP, WM
Killdeer	2	F	AB, OW, UP, WM, US
Mallard	3	L	OW
Red-winged Blackbird	5	L	MA, 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	
Northern Leopard Frog	2	No	No	No	
Raccoon		Yes	No	No	

Wildlife Comments:

Dodson-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
9752	48.381931	-108.170845	225	T-1, start
9757-61	48.381149	-108.169716	270	PP-2
9762	48.381371	-108.171371	24	T-1, end
9764-68	48.381828	-108.172684	45	PP-3
9769-73	48.382366	-108.172195	135	PP-4
9774-78	48.382542	-108.172729	225	PP-6
9780-85	48.382042	-108.173195	315	PP-5
9798	48.382973	-108.174911	195	T-2, start
9800-05	48.383656	-108.178825	90	PP-7
9809	48.382576	-108.175026	15	T-2, end
9810	48.381991666667	-108.17116		DE-1
9811	48.382281666667	-108.1726066667		DE-2
9812	48.381996666667	-108.1727583333		DE-3
9813-18	48.381226	-108.168152	270	PP-1

Comments:

Dodson-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: Dodson East City/County: Phillips Sampling Date: 8/15/2012

Applicant/Owner: MDT State: MT Sampling Point: DE-1

Investigator(s): B Sandefur Section, Township, Range: 1 30N 27E

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

Subregion (LRR): LRR F Lat: 48.3819916666667 Long: -108.17116 Datum: WGS84

Soil Map Unit Name: Havre Loam NWI classification:

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 in Puccinillia vegetation community 3. Water table appears to be at approx. 20 in. based on soil pit during most of growing season allowing the growth of Pucc. nutt. Remote GW well would provide info. on GW duration within 12 in. of soil surface.

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. Puccinellia nuttalliana	60	☑	OBL
2. Agropyron cristatum	20	☑	UPL
3. Elymus trachycaulus	20	☑	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−): 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.3333 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	20	x 5 =	100
Column Totals:	100 (A)		240 (B)

Prevalence Index = B/A = 2.4

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: DE-1

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
0-6	10YR 4/3	100					Clay	
6-12	10YR 4/2	95	D M	10YR	6/1	5	Clay	Depl likely sodium conc
12-20	10YR 4/3	100					Sandy Clay	Soil moist around 14in

[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 does not qualify hydric.

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: Suspect water table is within 2 ft. of ground surface during spring flows.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Dodson East City/County: Phillips Sampling Date: 8/15/2012

Applicant/Owner: MDT State: MT Sampling Point: DE-2

Investigator(s): B Sandefur Section, Township, Range: 2 30N 27E

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

Subregion (LRR): LRR F Lat: 48.3822816666667 Long: -108.172606666667 Datum: WGS84

Soil Map Unit Name: Havre Loam NWI classification:

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 in alo pra com. Area characterized by shallow swale between excavated cells, drains area to north. Typha dominates at slightly lower elev.

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. Alopecurus pratensis	90	☑	FACW
3.	0	☐	
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−): 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	100 (A)		220 (B)

Prevalence Index = B/A = 2.2

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: DE-2

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	10YR 4/2	95	C M	10YR	4/6	5	Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Dodson East City/County: Phillips Sampling Date: 8/15/2012

Applicant/Owner: MDT State: MT Sampling Point: DE-3

Investigator(s): B Sandefur Section, Township, Range: 2 30N 27E

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

Subregion (LRR): LRR F Lat: 48.3819966666667 Long: -108.172758333333 Datum: WGS84

Soil Map Unit Name: Havre Loam NWI classification:

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 located between excavated cells in Pucc. nutt. comm.

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. Bromus inermis	10	☐	UPL
2. Pascopyrum smithii	50	☑	FACU
3. Elymus trachycaulus	10	☐	FACU
4. Lactuca serriola	10	☐	FAC
5. Puccinellia nuttalliana	20	☑	OBL
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−): 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	60	x 4 =	240
UPL species	10	x 5 =	50
Column Totals:	100 (A)		340 (B)

Prevalence Index = B/A = 3.4

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: DE-3

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	10YR 5/3	95	C M	10YR	4/6	5	Silty Clay	
12-20	10YR 4/2	95	C PL	10YR	4/6	3	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: Soils with redox below 12in, does not qualify as hydric.

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: Water table fluctuates witin 1 ft of ground surface. Duration of groundwater likely not sufficient to meet wetland hydrology criteria.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Dodson-East **2. MDT project#** NH 1-8(15)454F **Control#** 1516

3. Evaluation Date 8/15/2012 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Wetland Cell Creation

6. Wetland Location(s): **T** 30 N **R** 27E **Sec1** 1 & 2 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed 10050004 **Watershed/County** Lower Missouri River Watershed/Phillips County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 7.74

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 7.74

☐ **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	65
Depressional	Aquatic Bed	Excavated	Permanent/Perennial	35

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	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)

Mitigation site is located between Hwy 2 and railroad. Surrounding land is agricultural/grazing. Wetland cells were constructed in 2008.

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

Russian olive

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

AA encompasses two wetland cells constructed between highway and railroad. A spring creek (signs of surface water flow apparent during site visit) historically bisected the two cells. A small remnant of an existing wetland that lies between the two cells was included in the AA.

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 and aquatic bed classes

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 database

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 MTNHP database

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 High-traffic area likely restricts wildlife usage, although box culverts under US Hwy 2 appears to be used as periodically as corridor under road. Birds are predominant wildlife group using site.

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**

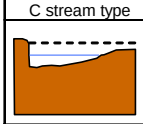
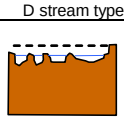
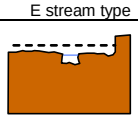
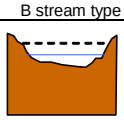
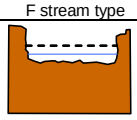
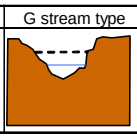
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

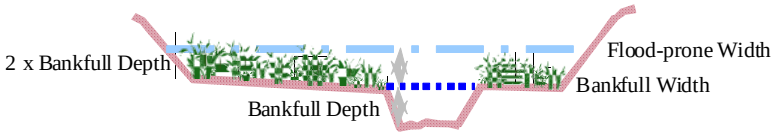
iii. Final Score and Rating: 0 NA **Comments:**

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
						



Floodrpone 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: Area subject to inundation from Spring Coulee channel overflow during flood events. Floodprone width and bankfull width not recorded for spring creek channel, assumed E-type stream.

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: Wetland cells inundated by groundwater and precipitation during August site visit. Assumes approximately 7 acres of wetland flooded to a depth of 2 feet.

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, click ☐ **NA** here and proceed to 14H.)

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

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: Cover of wetland veg (emergent and aquatic macrophytes) exceeds 70%. Depression w/o outlet.

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: Increased vegetation development along shore subject to wave action.

14I. Production Export/Food Chain Support:

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

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

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

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

Comments: Surface outlet via culvert under highway. Bordered by highway and railroad. Buffer <50 ft.

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: Wetland cells inundated during August investigation.

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:

Limited access from highway and limited upland within fence. Remainder of mitigation site is flooded.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Wetland Cell Creation

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	.5	1	3.87	☐
C. General Wildlife Habitat	M	.7	1	5.418	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.6	1	4.644	☐
F. Short and Long Term Surface Water Storage	H	1	1	7.74	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	7.74	☐
H. Sediment/Shoreline Stabilization	H	1	1	7.74	☑
I. Production Export/Food Chain Support	H	.8	1	6.192	☑
J. Groundwater Discharge/Recharge	H	1	1	7.74	☑
K. Uniqueness	L	.2	1	1.548	☐
L. Recreation/Education Potential (bonus points)	L	.05	NA	0.387	☐
Totals:		6.85	10	53.019	
Percent of Possible Score			**68.5** %		

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

I	II	III	IV

Appendix C

Project Area Photographs

MDT Wetland Mitigation Monitoring
Dodson East
Phillips County, Montana

Photo Point 1 – *Photo 1*
Bearing: 270 Degrees

Location: Looking west at mitigation site.
Taken in 2011

Photo Point 1 – *Photo 1*
Bearing: 270 Degrees

Location: Looking west at mitigation site.
Taken in 2012

Photo Point 2 – *Photo 1*
Bearing: 270 degrees

Location: Looking west from east edge of east cell.
Taken in 2011

Photo Point 2 – *Photo 1*
Bearing: 270 degrees

Location: Looking west from east edge of east cell.
Taken in 2012

Photo Point 3 – *Photo 1*
Bearing: 45 degrees

Location: Looking northeast at east cell.
Taken in 2011

Photo Point 3 – *Photo 1*
Bearing: 45 degrees

Location: Looking northeast at east cell.
Taken in 2012

Photo Point 4 – *Photo 1*
Bearing: 135 Degrees

Location: Looking southeast at east cell and Highway 2.
Taken in 2011

Photo Point 4 – *Photo 1*
Bearing: 135 Degrees

Location: Looking southeast at east cell and Highway 2.
Taken in 2012

Photo Point 5 – *Photo 1*
Bearing: 315 Degrees

Location: Looking northwest at west cell.
Taken in 2011

Photo Point 5 – *Photo 1*
Bearing: 315 Degrees

Location: Looking northwest at west cell.
Taken in 2012

Photo Point 6 – *Photo 1*
Bearing: 225 Degrees

Location: Looking southwest at west cell.
Taken in 2011

Photo Point 6 – *Photo 1*
Bearing: 225 Degrees

Location: Looking southwest at west cell.
Taken in 2012

Photo Point 7 – *Photo 1*
Bearing: 90 Degrees

Location: Looking east at west edge of west cell.
Taken in 2011

Photo Point 7 – *Photo 1*
Bearing: 90 Degrees

Location: Looking east at west edge of west cell.
Taken in 2012

Transect 1 – Beginning
Bearing: 225 Degrees

Location: East cell (north).
Taken in 2011

Transect 1 – Beginning
Bearing: 225 Degrees

Location: East cell (north).
Taken in 2012

Transect 1 – *End*
Bearing: 0 Degrees

Location: East cell (south).
Taken in 2011

Transect 1 – *End*
Bearing: 0 Degrees

Location: East cell (south).
Taken in 2012

Transect 2 – Beginning
Bearing: 195 Degrees

Location: West cell (north)
Taken in 2011

Transect 2 – Beginning
Bearing: 195 Degrees

Location: West cell (north)
Taken in 2012

Transect 2 – *End*
Bearing: Degrees

Location: West cell (south)
Taken in 2011

Transect 2 – *End*
Bearing: Degrees

Location: West cell (south)
Taken in 2012

Data Point – *DE-1*
Bearing:

Location: Community 5
Taken in 2012

Data Point 2 – *DE-2*
Bearing:

Location: Community 4
Taken in 2012

Data Point 3 – *DE-3*
Bearing:

Location: Community 5
Taken in 2012