MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2010

Meriwether East
Glacier County, Montana

Prepared for:

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

Prepared by:

CONFLUENCE
PO Box 1133
Bozeman, MT 59771-1133

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MORRISON MAIERLE, INC.
An Employee-Owned Company

December 2010

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MDT Project Number NH 1-3(36)234 F
Control Number B594

Prepared for:

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

Prepared by:

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

Morrison-Maierle, Inc.
2880 Technology Blvd. West
Bozeman, MT 59771

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1. INTRODUCTION

The Meriwether East Wetland Mitigation 2010 Monitoring report documents the results of the fifth year of monitoring at the Meriwether East mitigation site. The Meriwether-East Wetland Mitigation Site was constructed during 2005 to partially mitigate for wetland impacts associated with the Montana Department of Transportation (MDT) Meriwether-East project NH 1-3(36)234F. The mitigation project constructed along Highway 2 in Glacier County consists of two areas. Site 1 was built near milepost 236 and was designed to encompass approximately 2.67 acres. Site 2 was built near milepost 239 and was designed to encompass approximately 6.62 acres (Figure 1). Combined, the Meriwether East mitigation projects were designed to create 9.29 acres of wetland in areas that did not contain wetlands historically. A credit ratio of 1:1 was to be applied to wetland creation. No performance standards were available for this site.

Figures 2 and 3 (Appendix A) of the monitoring report show the mapped site features and monitoring activity locations, respectively. Appendix B contains the Montana Department of Transportation (MDT) Mitigation Monitoring Forms, the US Army Corps of Engineers (USACE) Routine Wetland Determination Data Forms (Environmental Laboratory 1987), and the MDT Montana Wetland Assessment Forms. Appendix C contains relevant site photographs and Appendix D includes the project plan sheet.

2. METHODS

Sites 1 and 2 were reviewed on July 20, 2009 to document vegetation, soil, and hydrologic conditions (PBJ&J 2009). Site 1 showed no indication of wetland development after four consecutive years of monitoring. Per MDT's instruction, Site 1 was not monitored any further and no report was produced. In contrast to Site 1, Site 2 did show wetland development and monitoring at this site has continued.

Site 2 was visited on July 30, 2010. Information contained on the Wetland Mitigation Site Monitoring Form and USACE Routine Wetland Determination Data Form (Environmental Laboratory 1987) was entered electronically in the field on a personal digital assistant (PDA) palmtop computer during the field investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) (Figure 2, Appendix A). Information collected included: wetland delineation, vegetation community mapping, vegetation transect monitoring, soils data collection, hydrology data collection, bird and wildlife use documentation, photographs, and a non-engineering examination of the infrastructure established within the mitigation project area.

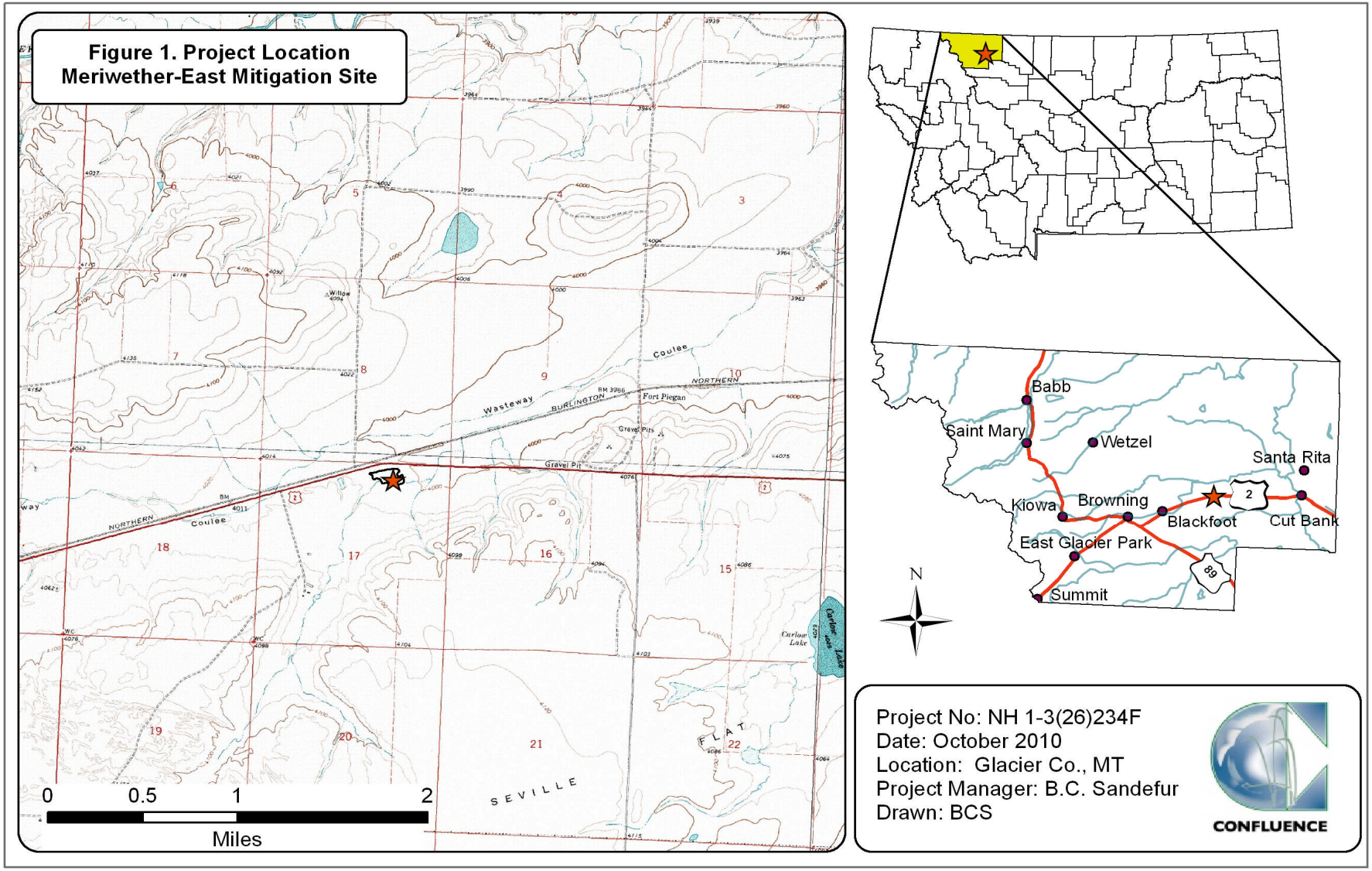

Figure 1. Project location Meriwether East Mitigation Site.

2.1. Hydrology

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 (usually 14 days or more or 12.5 percent) during the growing season" (Environmental Laboratory 1987). Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered wetlands. 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 (Environmental Laboratory 1987).

Hydrological indicators as outlined on the USACE wetland determination form were documented at five points established within the project area. Hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on electronic field data sheets (Appendix B). Hydrologic assessments allow evaluation of mitigation goals addressing inundation/ saturation requirements.

No groundwater monitoring wells were present at the site. Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data was recorded electronically on the wetland 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 aerial photographs. The percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (<1%), 1 (1-5%), 2 (6-10%), 3 (11-20%), 4 (21-50%), and 5 (>50%) (Appendix B).

Temporal changes in vegetation were evaluated through annual assessments of a static belt transect (Figure 2, Appendix A). Vegetation composition was assessed and recorded along a single vegetation belt transect approximately 10 feet wide and 500 feet long (Figure 2, Appendix A). The transect location was recorded with a GPS unit. Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent cover of each vegetation species within the "belt" was estimated using the same values and cover listed for the community polygon data on the aerial photograph (Appendix B). Photographs were taken at the endpoints of the transect during the monitoring event (Appendix C). No woody species were planted at the site.

The location of noxious weeds was noted in the field and mapped on the aerial photo (Figure 3, Appendix A). The noxious weed species identified are color-coded. The locations are denoted with the symbol "+", "▲", or "■" representing 0 to 0.1 acre, 0.1 to 1.0 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, as listed on Figure 3 (Appendix A).

2.3. Soil

Soil information was obtained from the Soil Survey for Glacier County and in situ soil descriptions. Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the USACE 1987 Wetland Delineation Manual. A description of the soil profile, including hydric indicators when present, was recorded on the USACE wetland determination form for each profile (Appendix B).

2.4. Wetland Delineation

Waters of the U.S. including special aquatic sites and wetlands were delineated throughout the project area in accordance with criteria established in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987). In order to delineate a representative area as jurisdictional, the technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology, as described in the 1987 manual, must be satisfied. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). A Routine Level-2 on-site Determination Method was used to delineate jurisdictional areas within the project boundaries. The information was recorded electronically on the USACE Routine Wetland Determination Data Form (Appendix B).

Consultation with the USACE (PBS&J 2009 Monitoring Report) determined that the 1987 manual should continue to be used at MDT mitigation sites where baseline wetland conditions had been established prior to 2008. Consequently, the use of the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010) was not required.

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

2.5. Wildlife

Observations and other positive indicators of use by mammal, reptile, amphibian, and bird species 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 from 2006 to 2010 was compiled (Table 4).

2.6. Functional Assessment

Functional assessments were completed in 2006 and 2007 using the 1999 MDT Montana Wetland Assessment Method (Berglund 1999). The 2008 MDT Montana Wetland Assessment Method (Berglund and McEldowney 2008) was used to evaluate functions and values from 2008 through the remainder of the monitoring period. This method provides an objective means of assigning wetlands an overall rating and gives 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). The 2008 revision refines ratings for some wetland functions, land management, and fish and wildlife habitat.

Field data for this assessment were collected during the site visit. A Functional Assessment Form was completed for each wetland or group of wetlands (Assessment Areas, Appendix B).

2.7. Photo Documentation

Monitoring at photo points provides supplemental information documenting wetland condition, trends, current land use surrounding the site, the upland buffer, the monitored area, and the vegetation transects. Photographs were taken at established photo points throughout the mitigation site during the site visit (Appendix C). Photo point locations were recorded with a resource grade GPS unit (Figure 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 2010 monitoring season. Points were collected using WAAS-enabled differential corrected satellites, typically improving resolution to sub-meter accuracy. The collected data were then transferred to a personal computer, exported into GIS, and drawn in Montana State Plane Single Zone NAD 83 meters. In addition to GPS, some site features within the site were hand-mapped onto an aerial photograph and then digitized. Site features and survey points that were mapped included fence boundaries, photograph points, transect beginnings and endings, wetland boundaries, and vegetation community boundaries.

2.9. Maintenance Needs

The boundaries of Site 2 were inspected for obvious signs of problems. This was a cursory examination and did not constitute an engineering-level structural inspection.

3. RESULTS

3.1. Hydrology

The growing season recorded for the area characterized by an adjacent soil map unit, Fairfield, is 70-125 days (USDA 2010). Areas definded as wetlands would require a minimum of 11 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

The average total annual precipitation recorded at the Cut Bank Federal Aviation Administration (FAA) Airport (242173) from December 1903 to July 2010 was 11.38 inches (WRCC 2010). Monthly precipitation totals recorded from January to June in 2009, 2010, and historically were 3.04, 5.1, and 6.39 inches, respectively (WRCC 2010). This indicates that recent precipitation levels have been well below the long-term average.

Hydrology at the Meriwether East Mitigation Site was designed to be supplied by groundwater seepage from the adjacent wetland, surface runoff from snow melt, and direct precipitation. About 5% of Site 2's surface was inundated during the site evaluation. The average depth of inundation was 0.2 feet, with a range in depths of zero to six inches. The large, green algal mat of *Rhizoclomium* observed in 2007 occurred as very small patches in 2008, 2009, and 2010 and suggest an increased area of inundation from conditions observed during the site visit. Soils throughout were saturated in the upper 12 inches of the profile during the monitoring visit.

Five data points, SP-1 through SP-5 were sampled in 2010 to determine the wetland and upland boundaries. All data points were located in areas which met the wetland criteria. The primary indicator at SP-1 and SP-4 was saturation within in the upper 12 inches of the soil profile. Secondary indicators were the FAC-neutral test and oxidized rhizospheres along living roots. Primary indicators at SP-2 were inundation to a depth of 3 inches and saturated soils. A secondary indicator was the FAC-neutral test. Primary indicators at SP-3 were saturated soils at eight inches, sediment deposits, and drainage patterns in wetlands. A secondary indicator was the FAC-neutral test. Primary wetland indicators at SP-5 included three inches of inundation. A secondary indicator was the FAC-neutral test.

3.2. Vegetation

Vegetation community types were based on topography, hydrology, and plant composition and dominance. Vegetation community data and individual plant species identified were recorded for Site 2 (Monitoring Forms, Appendix B). A comprehensive plant list of 87 vegetation species was compiled for the Meriwether East Site 2 from 2006 to 2010 (Table 1).

At Site 2, three vegetation community types were documented within the project boundaries in 2010. Two other vegetation communities were identified directly adjacent to the site and have been included in this evaluation. The one upland and four wetland community types identified and mapped (Figure 3, Appendix A)

included Type 3 – *Agropyron smithii*/*Poa juncifolia* upland, Type 5 – *Puccinellia nuttalliana*/*Eleocharis palustris* wetland, Type 6 – *Hordeum jubatum*/*Puccinelllia nuttalliana* wetland, Type 7 – *Poa juncifolia*/*Juncus balticus* wetland, and Type 8 – *Typha latifolia*/*Eleocharis palustris* wetland. Wetland Type 7 was present before construction of this project.

Community Type 3 is an upland grassland that borders Site 2 to the west and southwest. This community contained 46 identified species (Appendix B). Dominant species within this community include foxtail barley (*Hordeum jubatum*), alkali bluegrass (*Poa juncifolia*), American licorice (*Glycyrrhiza lepidota*), yellow sweetclover (*Melilotus officinalis*), and a multitude of upland and facultative upland species at lower percent coverage.

Type 6 is wetland that has been dominated since 2008 by foxtail barley and Nuttall's alkali grass (*Puccinellia nuttalliana*). A total of 28 species, predominantly hydrophytic, were identified within this community in 2010 (Appendix B).

Type 5 wetland was located in an area with an increase in wetland hydrology from the adjacent Type 6 community and was dominated by Nuttall's alkali grass and Baltic rush (*Juncus balticus*). Foxtail barley, three square bulrush (*Scirpus pungens*), American sloughgrass (*Beckmannia syzigachne*), and sixteen other species were present within this community.

The Type 8 community was inundated by a few inches of water and was occupied by a rich assemblage of bulrushes (*Scirpus maritimus*, *S. acutus*, and *S. pungens*), rush (*Juncus balticus*), willows (*Salix exigua* and *Salix lutea*), creeping spikerush (*Eleocharis palustris*), and cattail (*Typha latifolia*).

Type 7 is an undisturbed wetland that was delineated in October of 2002 by URS-BRW, Inc. (2003 that borders Site 2 to the east (Figure 3, Appendix A). Dominant plants found in Type 7 during July 2010 included alkali bluegrass, Baltic rush, Nuttall's alkali grass, western wheatgrass (*Agropyron smithii*), and foxtail barley.

One noxious weed, Canada thistle (*Cirsium arvens*), was found in community 3 in 2010 (Figure 3, Appendix A) and indicates a decrease from the levels identified in 2008 and 2009. This site was sprayed for noxious weeds in 2010.

The 2010 transect data for Site 2 were summarized in Table 2 and Charts 1 and 2 and detailed on the Monitoring Forms (Appendix B). Photographs were taken at the start and end of Transect 1 at Site 2 (Appendix C). Transect 1 traverses an upland community, two hydrophytic vegetation communities within the wetland mitigation area, and the existing adjacent wetland community to the east (Chart 1). Hydrophytic species dominated nearly 100% of the vegetation transect, very similar to the two prior years. A boundary between the prominent community Type 5/6 identified in 2008 and 2009 was identified along the transect at station 336(ft).

Table 1. Vegetation species observed from 2006 through 2010 at the Meriwether-East Wetland Mitigation Site 2.

SCIENTIFIC NAME	COMMON NAME	REGION 9 INDICATOR SPECIES[1]
Achillea millefolium	yarrow,common	FACU
Agoseris glauca	**false-dandelion,pale**	FAC
Agropyron smithii	wheatgrass,Western	FACU
Agropyron spicatum	**wheatgrass,blue-bunch**	FACU-
Agropyron trachycaulum	wheatgrass,slender	FAC
Agrostis alba	redtop	FACW
Algae, green	algae, green	NL
Alisma gramineum	water-plantain,narrow-leaf	OBL
Alopecurus pratensis	foxtail,meadow	FACW
Antennaria rosea	**rosy pussy toes**	NL
Arabis spp.		NL
Artemisia frigida	prairie sagewort	NL
Artemisia ludoviciana	**sagebrush,white**	UPL
Aster campestris	Western meadow aster	NL
Aster pansus	aster,many-flowered	FAC+
Aster spp.		NL
Astragalus agrestis	**milkvetch,field**	FACW-
Beckmannia syzigachne	sloughgrass,American	OBL
Bouteloua gracilis	blue grama	NL
Bromus inermis	**smooth brome**	NL
Carex spp.		NL
Chenopodium album	goosefoot,white	FAC
Chenopodium glaucum	goosefoot,oakleaf	FAC
Chenopodium hybridum	mapleleaf goosefoot	NL
Cirsium arvense	thistle,creeping	FACU+
Crepis runcinata	hawksbeard,dandelion	FACU
Deschampsia cespitosa	**hairgrass,tufted**	FACW
Distichlis spicata	saltgrass,seashore	FAC+
Dodecatheon pulchellum	**shooting-star,few-flower**	FACW
Eleocharis palustris	spikerush,creeping	OBL
Elymus spp.		NL
Elymus trachycaulus	**slender wheatgrass**	NL
Epilobium palustre	**willow-herb,marsh**	OBL
Erigeron caespitosus	**tufted fleabane**	NL
Gaillardia aristata	common gaillardia	NL
Galium boreale	**bedstraw,Northern**	FACU
Glycyrrhiza lepidota	licorice,American	FAC+
Grindelia squarrosa	gumweed,curly-cup	FACU
Gutierrezia sarothrae	**broom snakeweed**	NL
Hordeum brachyantherum	barley,meadow	FACW
Hordeum jubatum	barley,fox-tail	FAC+
Juncus balticus	rush,Baltic	OBL
Juncus tenuis	**rush,slender**	FAC

[1]Region 9 Northwest (Reed 1988).
New species identified in 2010 are show in **bold** type.

SCIENTIFIC NAME	COMMON NAME	REGION 9 INDICATOR SPECIES[1]
Kochia scoparia	summer-cypress,Mexican	FAC
Koeleria macrantha	**prairie junegrass**	NL
Lactuca serriola	lettuce,prickly	FAC-
Lepidium perfoliatum	**pepper-grass,clasping**	FACU+
Lomatium spp.		NL
Medicago sativa	**alfalfa**	NL
Melilotus alba	sweetclover,white	FACU
Melilotus officinalis	sweetclover,yellow	FACU
Oxytropis spp.		NL
Plantago lanceolata	**plantain,English**	FACU+
Poa juncifolia	bluegrass,alkali	FACU+
Poa palustris	bluegrass,fowl	FAC
Poa pratensis	**bluegrass,Kentucky**	FACU+
Polygonum spp.		NL
Polypogon monspeliensis	grass,annual rabbit-foot	FACW+
Populus tremula (tremuloides)*	quaking aspen	FAC+
Potentilla anserina	silverweed	OBL
Potentilla concinna	**early cinquefoil**	NL
Potentilla hippiana	**wooly cinquefoil**	NL
Puccinellia nuttalliana	grass,Nuttall's alkali	OBL
Ranunculus cymbalaria	butter-cup,seaside	OBL
Ranunculus sceleratus	butter-cup,celery-leaf	OBL
Ratibida columnifera	upright prairie coneflower	NL
Rosa spp.		NL
Rosa woodsii	**rose,Wood's**	FACU
Rumex crispus	**dock,curly**	FACW
Salicornia rubra	saltwort,red	OBL
Salix exigua	willow,sandbar	OBL
Salix lutea	willow,yellow	OBL
Salsola kali	thistle,Russian	FACU
Scirpus acutus	bulrush,hard-stem	OBL
Scirpus maritimus	bulrush,saltmarsh	OBL
Scirpus pungens	bulrush,three-square	OBL
Sisyrinchium montanum	**blue-eye-grass,strict**	NI
Solidago multiradiata	**golden-rod,mountain**	FACU
Spergularia marina	sandspurry,saltmarsh	OBL
Stipa nelsonii	**Nelson's needlegrass**	NL
Suaeda depressa	seepweed,pursh	FACW-
Taraxacum officinale	**dandelion,common**	FACU
Thermopsis rhombifolia	**false-lupine,round-leaf**	FACU
Tragopogon dubius	**yellow salsify**	NL
Triglochin maritimum	arrow-grass,seaside	OBL
Typha latifolia	cattail,broad-leaf	OBL
Vicia americana	**vetch, American purple**	NI

[1]Region 9 Northwest (reed 1988).
New species identified in 2010 are shown in **bold** type.

Table 2. Data summary for Transect 1 at the Meriwether-East Wetland Mitigation Site 2.

Monitoring Year	2006	2007	2008	2009	2010
Transect Length (feet)	500	500	500	500	500
Vegetation Community Transitions along Transect	7	2	2	2	3
Vegetation Communities along Transect	5	3	3	3	4
Hydrophytic Vegetation Communities along Transect	2	2	2	2	3
Total Vegetative Species	18	18	19	19	34
Total Hydrophytic Species	12	13	13	12	19
Total Upland Species	6	5	6	7	15
Estimated % Total Vegetative Cover	30	50	75	85	87
% Transect Length Comprising Hydrophytic Vegetation Communities	48	48	97	97	97.6
% Transect Length Comprising Upland Vegetation Communities	0	3	3	3	2.4
% Transect Length Comprising Unvegetated Open Water / Mudflat	49	49	0	0	0
% Transect Length Comprising Bare Substrate	3	0	0	0	0

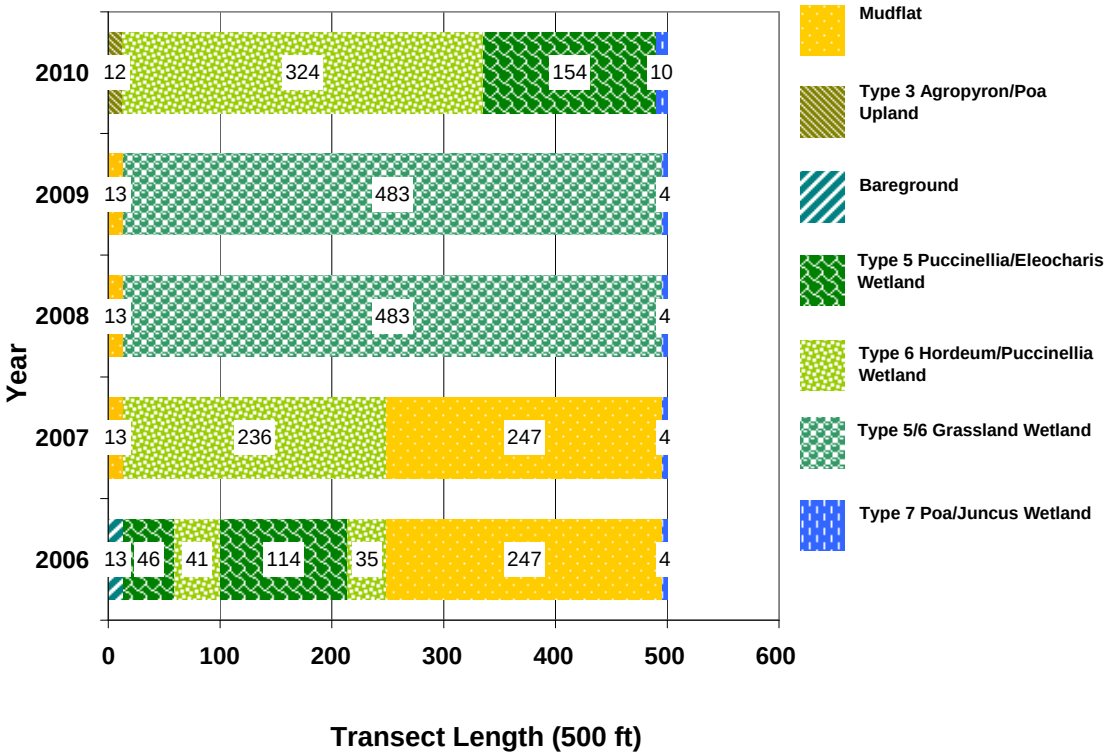

Chart 1. Transect map showing vegetation community types on Transect 1 from start (0 feet) to end (500 feet).

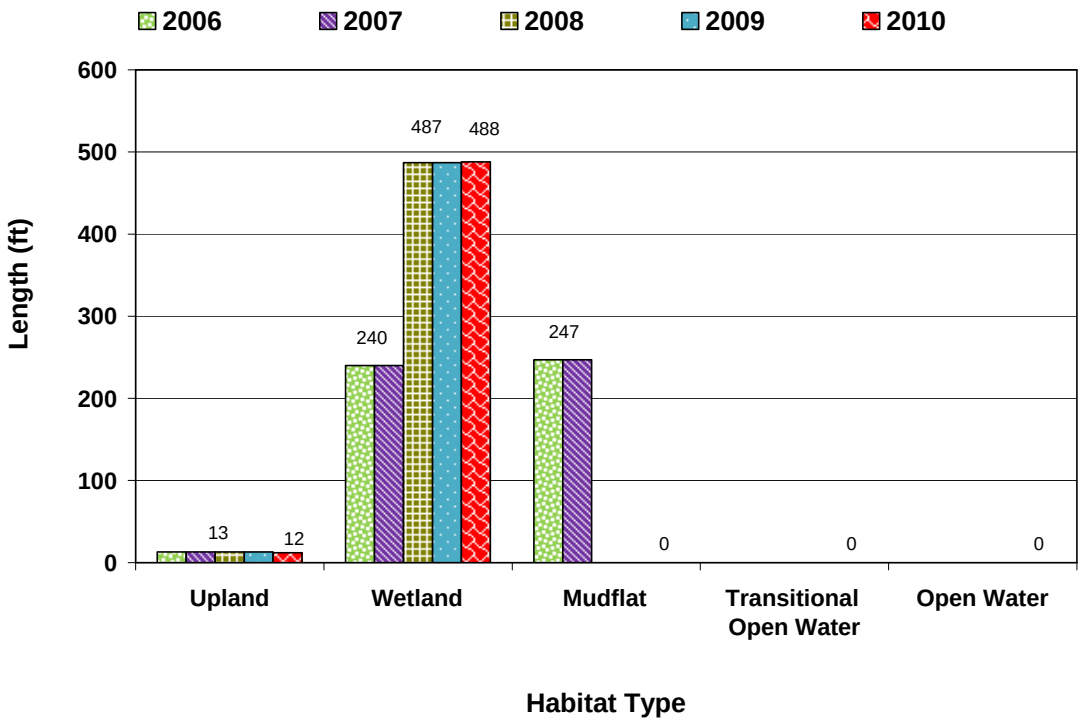

Chart 2. Length of vegetation communities within Transect 1 at Site 2 from 2006 to 2010.

3.3. Soil

Soils at the Meriwether East mitigation site are mapped by the NRCS as saline land. There were five test pit locations, SP-1 to SP-5, located within the site. All five evaluated soil pits contained indicators of hydric soil and were situated in areas that were classified as wetlands. The test pit at SP-1 revealed a black (10YR 2/1) clay loam with yellowish brown (10YR 5/6) redoximorphic features. The hydric soil indicator was gleyed or low chroma colors. The soils at SP-2 consisted of a dark gray (10 YR 4/1) clay soil. Hydric soil indicators included gleyed or low chroma colors and a sulfidic odor providing positive indication for reducing conditions. SP-3 revealed very dark grayish brown (10YR 3/2) clay loam soils with grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) redoximorphic features. The hydric soil indicator was gleyed or low chroma colors. The test pit at SP-4 revealed a dark grayish brown (10YR 3/2) clay loam soil with yellowish brown (10YR 5/6) redox features. Hydric soil indictors were gleyed or low chroma colors and a sulfidic odor indicating reduced conditions. The SP-5 site contained a dark gray (2.5Y 4/1) silty clay soil. Hydric soil indicators were gleyed or low chroma colors, sulfidic odor, and reducing conditions.

3.4. Wetland Delineation

Wetland development throughout Site 2 was achieved in 2009 and has persisted through 2010 (Figure 3, Appendix A). Unlike conditions noted within the site in 2007, wetland plant growth was not suppressed by the *Rhizoclonium* mat; rather, plants were germinating or establishing where soils were inundated or saturated. Wetland habitat covered 6.62 acres, which accounts for the entire site. However, a strip along the northern boundary (along the highway) and a mound in the center of the site was colonized by a variety of plants that indicated more marginal wetland conditions.

3.5. Wildlife

A comprehensive list of wildlife species observed directly or indirectly since initiation of monitoring has been compiled for Meriwether East Site 2 (Table 3). Specific information on wildlife sightings at Site 2 can be found in the Monitoring Forms in Appendix B.

Table 3. Wildlife species observed at the Meriwether-East Wetland Mitigation Site 2 from 2006 to 2010.

COMMON NAME	SCIENTIFIC NAME
BIRD	
American Avocet	*Recurvirostra americana*
Dark-eyed Junco	*Junco hyemalis*
Horned Lark	*Eremophila alpestris*
Killdeer	*Charadrius vociferus*
Red-winged Blackbird	*Agelaius phoeniceus*
Sandpiper Spp.	
Sparrow Spp.	
Willet	*Tringa semipalmata*
Wilson's Phalarope	*Phalaropus tricolor*
MAMMAL	
Deer Spp.	
Pronghorn	Antilocapra americana

3.6. Functional Assessment

The revised 2008 Montana Wetland Assessment Method (MWAM) for MDT projects was used from 2008 to 2010 to assess the values and functions of the wetland at Site 2 (Functional Assessment Form, Appendix B). The 1999 version of the Montana Wetland Assessment Form was used in 2006 and 2007 to assess the values and functions of the wetland area. The 1999 and 2008 MWAMs differ, although general comparisons can be made.

Site 2 continued to rate as a Category III wetland (Table 4). Notable functions and values included General Wildlife Habitat, Flood Attenuation, Short and Long Term Water Storage, Sediment / Nutrient / Toxicant Removal, Production / Export Food Chain Support, and Groundwater Discharge/Recharge (Table 4). The functional assessment score increased by over seven points between 2007 and 2008 as a result of changes in the MWAM and better conditions for

developing wetland habitat. Functional units increased slightly in 2009 due to a decrease in disturbance associated with construction impact. There was no change in functional units from 2009 to 2010.

Table 4. Summary of 2006 to 2010 wetland function/value ratings and functional points at Site 2 of the Meriwether-East Wetland Mitigation Project.

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2006[1] Site 2	2007[1] Site 2	2008[2] Site 2	2009[2] Site 2	2010[2] Site 2
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
General Wildlife Habitat	Mod (0.5)	Low (0.2)	Mod (0.7)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	NA	NA	NA	NA	NA
Flood Attenuation	Mod (0.5)	Mod (0.5)	High (0.9)	High (0.9)	High (0.9)
Short and Long Term Surface Water Storage	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Sediment / Nutrient / Toxicant Removal	Mod (0.7)	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)
Sediment / Shoreline Stabilization	NA	NA	NA	NA	NA
Production Export / Food Chain Support	Mod (0.6)	Mod (0.6)	High (0.8)	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.3)	Low (0.3)	Low (0.3)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential	Low (0.1)	Low (0.1)	NA	NA	NA
Actual Points/Possible Points	4/6/2010	4/3/2010	5.3 / 9.0	5.4 / 9.0	5.4 / 9.0
% of Possible Score Achieved	46%	43%	59%	60%	60%
Overall Category	III	III	III	III	III
Total Acreage of Delineated Wetlands and Other Aquatic Habitats	**6.62**	**6.64**	**6.62**	**6.62**	**6.62**
Functional Units (acreage x actual points)	**30.45**	**28.5**	**35.1**	**35.7**	**35.7**

[1]Conducted using the 1999 version of the MDT Montana Wetland Assessment Method.
[2]Conducted using the 2008 version of the MDT Montana Wetland Assessment Method.

3.7. Photo Documentation

An aerial photograph taken on July 15, 2010, was used as background imagery for Figures 2 and 3 in Appendix A. A panoramic photo was taken at Photo Point 1 (Appendix C). Representative single frame photographs were taken of the transect and conditions within Site 2 (Appendix C).

3.8. Current Credit Summary

No wetlands were present onsite prior to construction of Site 2. The goal was to create 6.62 acres of wetland habitat within the project boundaries. No specific performance criteria were required to be met at this site in order to document its success (PBS&J 2009). The goal at Site 2 was achieved in 2009 with the delineation of 6.62 acres. Consistent wetland hydrology and a seed source from adjacent natural wetlands were integral to the development and maintenance of this wetland habitat. The quality of this aquatic habitat equated to a gain of 35.7 functional units (Table 4).

3.9. Maintenance Needs

Aside from a fence around the greater perimeter of the Meriwether East site, no structures are present within the wetland mitigation area. One small population of Canada thistle, was located along the western boundary of the site. Weed spraying to control this noxious weed was conducted at this site during 2010 and should be continued in the future to ensure noxious weed control.

4. REFERENCES

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Reed, P.B. 1988. *National list of plant species that occur in wetlands: North West (Region 9)*. Biological Report 88(26.9), May 1988. U.S. Fish and Wildlife Service, Washington, DC.

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USDA. Natural Resource Conservation Service (NRCS) 2010. Official Soil Series Description for Glacier County accessed from the world wide web at http://soildatamart.nrcs.usda.gov/County.aspx?State=MT

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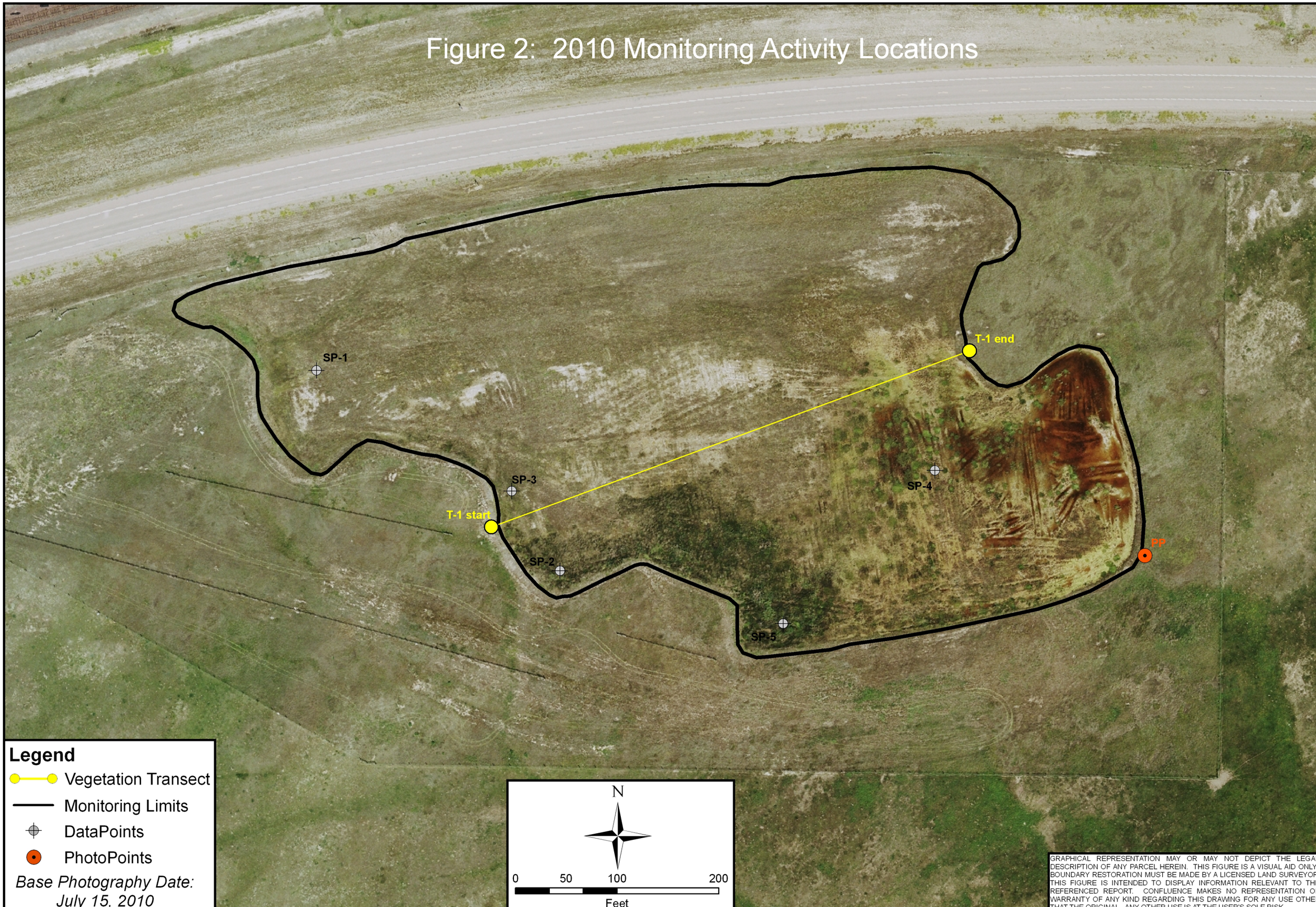
Appendix A

Figures 2 and 3

MDT Wetland Mitigation Monitoring
Meriwether East
Glacier County, Montana

Figure 2: 2010 Monitoring Activity Locations



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

LOCATION: Glacier Co., MT

PROJECT NO: NH 1-3(26)234F

FILE: Meriwether/Monitor2010.mxd

Project Name
Meriwether-East Mitigation Site 2

Drawing Title
2010 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	JL

SCALE: Noted

Drawn: November 8, 2010

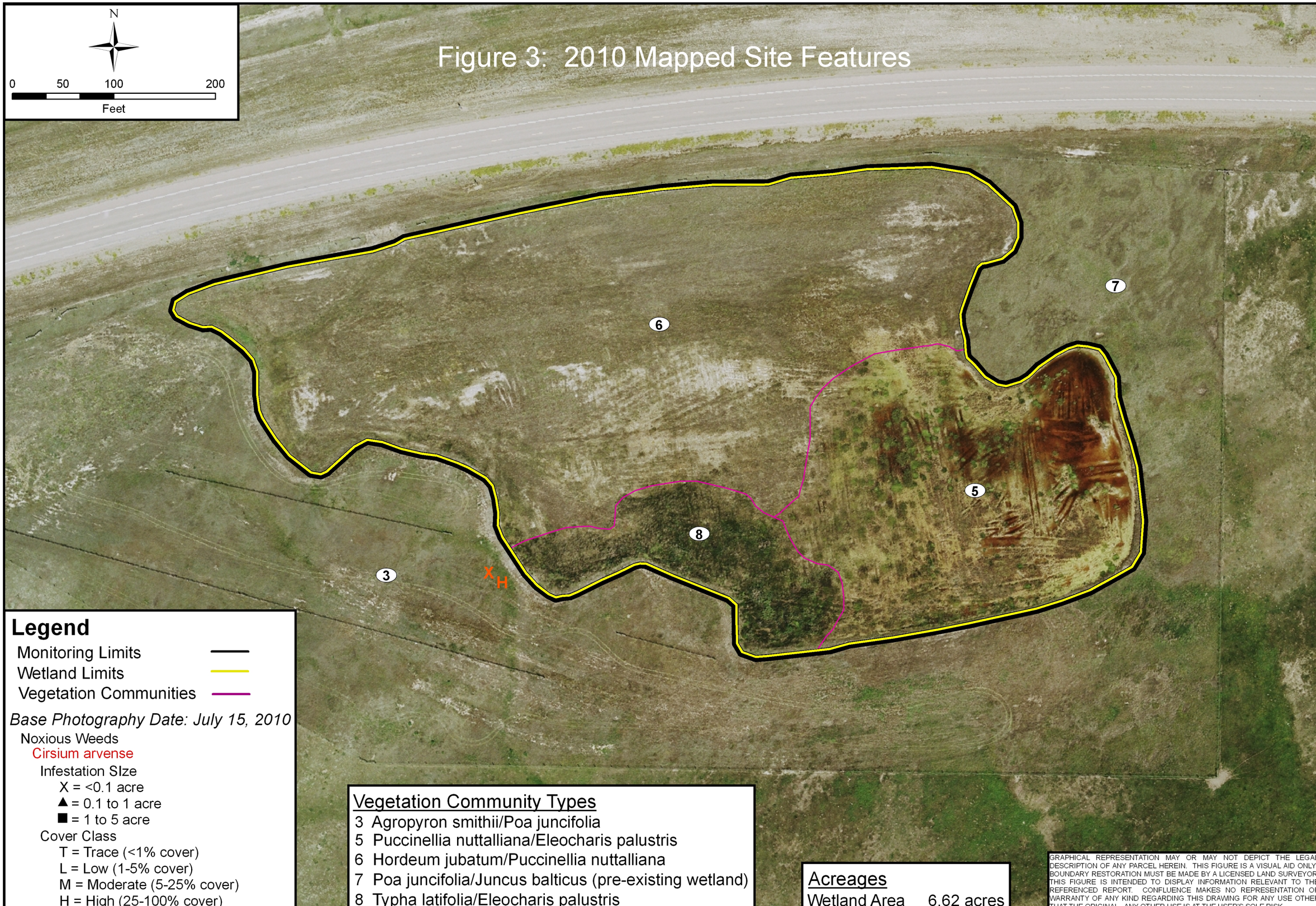
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 2

REV -

Figure 3: 2010 Mapped Site Features



Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: July 15, 2010

Noxious Weeds
Cirsium arvense
Infestation SIze
X = <0.1 acre
▲ = 0.1 to 1 acre
■ = 1 to 5 acre
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (5-25% cover)
H = High (25-100% cover)

Vegetation Community Types

3 Agropyron smithii/Poa juncifolia
5 Puccinellia nuttalliana/Eleocharis palustris
6 Hordeum jubatum/Puccinellia nuttalliana
7 Poa juncifolia/Juncus balticus (pre-existing wetland)
8 Typha latifolia/Eleocharis palustris

Acreages

Wetland Area 6.62 acres

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

LOCATION: Glacier Co., MT
PROJECT NO: NH 1-3(26)234F
FILE: Meriwether/Veg2010.mxd

Project Name
Meriwether-East Mitigation Site 2

Drawing Title
2010 Mapped Site Features

DRAWN BCS | CHECKED BV | APPROVED JL
SCALE: Noted
Drawn: November 8, 2010
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2010 Wetland Mitigation Site Monitoring Form
2010 USACE Wetland Delineation Form
2010 MDT Functional Assessment Form

MDT Wetland Mitigation Monitoring
Meriwether East
Glacier County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Meriwether East Assessment Date/Time 7/30/2010

Person(s) conducting the assessment: J. Asebrook, J. Hintz

Weather: cloudy, cool but warming, breezy Location: Highway 2, west of Cut Bank

MDT District: Great Falls Milepost: 239

Legal Description: T 33N R 8W Section(s) 8

Initial Evaluation Date: 8/8/2006 Monitoring Year: 5 #Visits in Year: 1

Size of Evaluation Area: 6.64 (acres)

Land use surrounding wetland:

highway, railroad, rangeland

HYDROLOGY

Surface Water Source: groundwater & precipitation

Inundation: ☑ Average Depth: 0.2 **(ft)** Range of Depths: 0-0.5 **(ft)**

Percent of assessment area under inundation: 5 %

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

If assessment area is not inundated then are the soils saturated within 12 inches of surface: Yes

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

Algal mats, water-stained leaves

Groundwater Monitoring Wells

Record depth of water surface below ground

Additional Activities Checklist:

☑ Map emergent vegetation-open water boundary on aerial photograph.

☑ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)

☐ Use GPS to survey groundwater monitoring well locations, if present.

Hydrology Notes:

VEGETATION COMMUNITIES

Site Meriwether 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 # 3 **Community Type:** Agropyron smithii / Poa juncifolia

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agoseris glauca	0
Agropyron smithii	5	Agropyron spicatum	0
Antennaria rosea	0	Arabis spp.	0
Artemisia frigida	1	Artemisia ludoviciana	0
Aster campestris	1	Aster pansus	0
Astragalus agrestis	0	Bromus inermis	0
Carex spp.	0	Chenopodium album	0
Crepis runcinata	0	Distichlis spicata	0
Elymus spp.	0	Elymus trachycaulus	0
Erigeron caespitosus	0	Gaillardia aristata	0
Glycyrrhiza lepidota	3	Grindelia squarrosa	1
Gutierrezia sarothrae	0	Hordeum jubatum	4
Juncus balticus	1	Koeleria macrantha	1
Lactuca serriola	0	Lepidium perfoliatum	0
Lomatium spp.	0	Medicago sativa	0
Melilotus officinalis	2	Oxytropis spp.	0
Poa juncifolia	5	Poa pratensis	1
Potentilla concinna	0	Potentilla hippiana	0
Ratibida columnifera	0	Rosa woodsii	0
Sisyrinchium montanum	0	Solidago multiradiata	0
Stipa nelsonii	0	Suaeda depressa	0
Taraxacum officinale	1	Thermopsis rhombifolia	0
Tragopogon dubius	0	Vicia americana	0

Comments:

Community # 5 Community Type: Puccinellia nuttalliana / Eleocharis palustris

Species	Cover class	Species	Cover class
Agropyron smithii	0	Alisma gramineum	1
Alopecurus pratensis	0	Aster pansus	0
Aster spp.	0	Beckmannia syzigachne	1
Carex spp.	0	Chenopodium glaucum	1
Eleocharis palustris	4	Hordeum jubatum	4
Juncus balticus	2	Polypogon monspeliensis	0
Potentilla anserina	0	Puccinellia nuttalliana	4
Ranunculus cymbalaria	1	Ranunculus sceleratus	0
Rumex crispus	0	Scirpus acutus	1
Scirpus pungens	2	Triglochin maritimum	0
Typha latifolia	1		

Comments:

Community # 6 Community Type: Hordeum jubatum / Puccinellia nuttalliana

Species	Cover class	Species	Cover class
Agropyron spicatum	0	Alopecurus pratensis	1
Aster campestris	0	Aster pansus	1
Aster spp.	0	Carex spp.	1
Crepis runcinata	1	Distichlis spicata	1
Eleocharis palustris	0	Elymus spp.	0
Glycyrrhiza lepidota	0	Grindelia squarrosa	0
Hordeum jubatum	5	Juncus balticus	2
Juncus tenuis	0	Lepidium perfoliatum	0
Melilotus officinalis	0	Plantago lanceolata	0
Poa juncifolia	0	Populus tremuloides*	0
Puccinellia nuttalliana	5	Ranunculus cymbalaria	1
Salix exigua	0	Scirpus pungens	0
Suaeda depressa	0	Triglochin maritimum	0
Typha latifolia	0		

Comments:

previous COMM 5/6.

Community # 7 Community Type: Poa juncifolia / Juncus balticus

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agoseris glauca	0
Agropyron smithii	3	Alopecurus pratensis	0
Artemisia frigida	0	Aster campestris	1
Aster pansus	0	Aster spp.	1
Astragalus agrestis	0	Bromus inermis	0
Crepis runcinata	0	Distichlis spicata	0
Dodecatheon pulchellum	0	Elymus spp.	0
Elymus trachycaulus	0	Galium boreale	0
Glycyrrhiza lepidota	2	Grindelia squarrosa	0
Hordeum jubatum	3	Juncus balticus	4
Lepidium perfoliatum	0	Melilotus officinalis	0
Poa juncifolia	4	Poa pratensis	0
Potentilla concinna	0	Puccinellia nuttalliana	3
Rosa woodsii	2	Suaeda depressa	0
Taraxacum officinale	2	Tragopogon dubius	0
Triglochin maritimum	0		

Comments:

More POAJUN here and less HORJUB

Community # 8 Community Type: Typha latifolia / Eleocharis palustris

Species	Cover class	Species	Cover class
Algae, green	1	Alisma gramineum	0
Alopecurus pratensis	0	Aster spp.	0
Bare Ground	1	Beckmannia syzigachne	1
Crepis runcinata	1	Deschampsia cespitosa	0
Distichlis spicata	1	Eleocharis palustris	4
Epilobium palustre	0	Hordeum jubatum	1
Juncus balticus	4	Open Water	2
Polypogon monspeliensis	0	Puccinellia nuttalliana	0
Ranunculus cymbalaria	1	Ranunculus sceleratus	0
Salix exigua	0	Salix lutea	0
Scirpus acutus	1	Scirpus pungens	1
Triglochin maritimum	0	Typha latifolia	4

Comments:

VEGETATION TRANSECTS

Site: Meriwether East Date: 7/30/2010

Transect Number: _____ **Compass Direction from Start:** _____

Interval Data:

Transect Notes:

Transect Number: 1 **Compass Direction from Start:** 59

Interval Data:

Ending Station 12 **Community Type:** Agropyron smithii / Poa juncifolia

Species	Cover class	Species	Cover class
Agoseris glauca	0	Agropyron smithii	4
Agropyron spicatum	0	Aster pansus	1
Bare Ground	3	Carex spp.	0
Crepis runcinata	2	Distichlis spicata	0
Elymus spp.	1	Gaillardia aristata	0
Grindelia squarrosa	0	Hordeum jubatum	2
Juncus balticus	1	Lactuca serriola	0
Medicago sativa	0	Puccinellia nuttalliana	1
Ratibida columnifera	1	Sisyrinchium montanum	0
Taraxacum officinale	0		

Ending Station 336 **Community Type:** Hordeum jubatum / Puccinellia nuttalliana

Species	Cover class	Species	Cover class
Alopecurus pratensis	0	Aster pansus	0
Carex sp.	0	Crepis runcinata	1
Distichlis spicata	1	Eleocharis palustris	0
Elymus spp.	0	Glycyrrhiza lepidota	0
Grindelia squarrosa	0	Hordeum jubatum	5
Juncus balticus	3	Juncus tenuis	1
Poa juncifolia	0	Puccinellia nuttalliana	4
Ranunculus cymbalaria	2	Scirpus pungens	0
Suaeda depressa	0	Triglochin maritimum	0
Typha latifolia	0		

Ending Station 490 **Community Type:** Puccinellia nuttalliana / Eleocharis palustris

Species	Cover class	Species	Cover class
Agropyron smithii	0	Algae, green	3
Alisma gramineum	0	Alopecurus pratensis	0
Aster pansus	0	Beckmannia syzigachne	1
Carex spp.	0	Crepis runcinata	1
Distichlis spicata	1	Eleocharis palustris	2
Elymus spp.	0	Glycyrrhiza lepidota	0
Grindelia squarrosa	0	Hordeum jubatum	4
Juncus balticus	2	Juncus tenuis	1
Poa juncifolia	0	Puccinellia nuttalliana	1
Ranunculus cymbalaria	0	Rumex crispus	0
Scirpus acutus	0	Scirpus pungens	0
Suaeda depressa	0	Triglochin maritimum	0
Typha latifolia	0		

Ending Station 500 **Community Type:** Poa juncifolia / Juncus balticus

Species	Cover class	Species	Cover class
Agoseris glauca	0	Agropyron smithii	1
Aster pansus	0	Crepis runcinata	0
Distichlis spicata	0	Grindelia squarrosa	0
Hordeum jubatum	1	Juncus balticus	3
Poa juncifolia	4	Potentilla concinna	0
Puccinellia nuttalliana	2	Taraxacum officinale	0

Transect Notes:

0 degree declination on compass
500 foot transect
Make transect go 12 feet upland of stake on slope/bank - otherwise veg will not make sense.
There are still many small herbaceous germinants that were not able to be identified.

PLANTED WOODY VEGETATION SURVIVAL

Meriwether East

Planting Type	#Planted	#Alive	Notes
None Planted			

Comments

Meriwether 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

Bird Comments

BEHAVIOR CODES

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

HABITAT CODES

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

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

Mammals and Herptiles

Wildlife Comments:
No wildlife species noted in field notes

Meriwether 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
P1.jpg				Data Pnt 1
P10.jpg				Data Pnt 2
P2.jgp				P2-P5, PP pano
P6B.jpg				T-1, end
P7.jpg				Data Pnt 4
P8.jpg				Data Pnt 3
P9.jpg				T-1, start

Comments:

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? No

If yes, describe the problems below and indicate if any actions were taken to remedy the problems

Were man-made structures built or installed to impound water or control water flow

into or out of the wetland? No

If yes, are the structures working properly and in good working order? No

If no, describe the problems below.

WETLAND DETERMINATION DATA FORM – Routine Weltand Delineation, 1987 COE Protocol

Project/Site: Meriwether East City/County: Glacier Sampling Date: 7/30/2010

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

Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S 8 T 33N R 8W

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

Subregion (LRR): LRR E Lat: 48.62332609 Long: -112.67779022 Datum: NAD83

Soil Map Unit Name: Saline land

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Salix exigua	1	☑	OBL
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size: ____)			
1. Hordeum jubatum	40	☑	FAC
2. Puccinellia nuttalliana	40	☑	OBL
3. Juncus balticus	25	☑	OBL
4. Ranunculus cymbalaria	5	☐	OBL
5. Crepis runcinata	3	☐	FACU
6. Glycerhiza	3	☐	FAC
7. Alopecurus pratensis	1	☐	FACW
8. Carex spp.	1	☐	
9. Distichlis spicata	1	☐	FAC
10. Aster pansus	1	☐	FAC
11.		☐	
	120 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Dominance Test is >50% ☐

Hydrophytic Vegetation Present? **Yes ☑ No ☐**

Remarks:
Area is dominated by hydrophytic vegetation - passes Dom Test and Prev Index.

SOIL

Sampling Point: Soil Pit 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR 2/1	97	10YR 5/6	3	C	M	Clay Loam	
11-16	10YR 5/4	100					Sandy Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☑ Other (explain in remarks)

Taxonomy Subgroup: NA

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Due to saturation at this late date, area was clearly inundated in the spring and early summer. Soils meet the NRCS hydric soil criteria #3, "Soils that are frequently ponded for long duration or very long duration during the growing season." Other hydric soil indicators have not yet developed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☑ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): 11

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Meets criteria for wetland hydrology. Area was inundated in the spring and early summer.

WETLAND DETERMINATION DATA FORM – Routine Weltand Delineation, 1987 COE Protocol

Project/Site: Meriwether East City/County: Glacier Sampling Date: 7/30/2010

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

Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S 8 T 33N R 8W

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

Subregion (LRR): LRR E Lat: 48.62275788 Long: -112.67698405 Datum: NAD83

Soil Map Unit Name: Saline land

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Salix exigua	1	☑	OBL
2. Salix lutea	1	☑	OBL
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size: ____)			
1. Juncus balticus	70	☑	FACW
2. Hordeum jubatum	5	☐	FAC
3. Ranunculus cymbalaria	10	☐	OBL
4. Typha latifolia	3	☐	OBL
5. Eleocharis palustris	3	☐	OBL
6. Polypogon monspeliensis	3	☐	FACW
7. Puccinellia nuttalliana	1	☐	FACW
8. Alopecurus pratensis	1	☐	FACW
9. Scirpus pungens	1	☐	OBL
10. Beckmannia syzigachne	1	☐	OBL
11. Deschampsia cespitosa	1	☐	FACW
	98 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

Remarks:
Area is dominated by hydrophytic vegetation - passes Dom Test and Prev Index. Also present: Aster spp. (1%), Triglochin maritima (T), Crepis runcinata (T)

SOIL

Sampling Point: Soil Pit 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/1	100					Mucky Mineral	
1-16	10YR 4/1	100					Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☑ Sulfidic Odor
- ☐ Aquatic Moisture Regime
- ☑ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☑ Other (explain in remarks)

Taxonomy Subgroup: NA

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Anoxic conditions result in hydrogen sulfide smell - meeting hydric soil criteria. Due to inundation, soils also meet the NRCS hydric soil criteria #3, "Soils that are frequently ponded for long duration or very long duration during the growing season." Other hydric soil indicators have not yet developed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☑ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Field Observations:

Surface Water Present?	Yes ☑	No ☐	Depth (inches): 3
Water Table Present?	Yes ☑	No ☐	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Inundation present - meets criteria for wetland hydrology.

WETLAND DETERMINATION DATA FORM – Routine Weltand Delineation, 1987 COE Protocol

Project/Site: Meriwether East City/County: Glacier Sampling Date: 7/30/2010

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

Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S 8 T 33N R 8W

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

Subregion (LRR): LRR E Lat: 48.62289165 Long: -112.67698405 Datum: NAD83

Soil Map Unit Name: Saline land

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Ranunculus cymbalaria	60	☑	OBL
2. Hordeum jubatum	40	☑	FAC
3. Puccinellia nuttalliana	20	☐	FACW
4. Juncus balticus	20	☐	FACW
5. Agropyron smithii	5	☐	FACU
6. Eleocharis palustris	5	☐	OBL
7. Distichlis spicata	2	☐	FAC
8. Alopecurus pratensis	1	☐	FACW
9. Aster pansus	1	☐	FAC
10. Typha latifolia	1	☐	OBL
11. Triglochin maritimum	1	☐	OBL
	155 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Area is dominated by hydrophytic vegetation - passes Dom Test and Prev Index.

SOIL

Sampling Point: Soil Pit 3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	90	10YR 5/2	10	D	M	Clay Loam	other light mottles with color 2.5YR 6/1
8-16	10YR 5/2	90	10YR 5/6	10	D	M	Silty Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: NA

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

The top layer meets the criteria for a redox dark surface, while the subsurface soils meets the criteria for a depleted matrix. Meets hydric soil criteria. Due to inundation earlier in the summer, soils also meet the NRCS hydric soil criteria #3, "Soils that are frequently ponded for long duration or very long duration during the growing season."

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☑ Sediment Deposits
- ☑ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☑	No ☐	Depth (inches): 11
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 8

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Meets criteria for wetland hydrology. Was clearly inundated earlier in spring and early summer.

WETLAND DETERMINATION DATA FORM – Routine Weltand Delineation, 1987 COE Protocol

Project/Site: Meriwether East City/County: Glacier Sampling Date: 7/30/2010

Applicant/Owner: MDT State: MT Sampling Point: SP-4

Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S 8 T 33N R 8W

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

Subregion (LRR): LRR E Lat: 48.62310841 Long: -112.67502218 Datum: NAD83

Soil Map Unit Name: Saline land

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Eleocharis palustris	25	☑	OBL
2. Scirpus pungens	10	☑	OBL
3. Hordeum jubatum	10	☑	FAC
4. Scirpus acutus	3	☐	OBL
5. Alisma gramineum	3	☐	OBL
6. Polypogon monspeliensis	2	☐	FACW
7. Typha latifolia	1	☐	OBL
8.		☐	
9.		☐	
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum 70

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

Remarks:
Area is dominated by hydrophytic vegetation - passes Dom Test and Prev Index.

SOIL

Sampling Point: Soil Pit 4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-0.5	10YR 4/3	100					salt crust	
0.5-7	10YR 3/2	90	10YR 5/6	10	D	M	Clay Loam	also has ligher mottles or depletions wit
7-16	10YR 4/2	90	10YR 5/6	10			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:

- ☐ Histosol
- ☐ Histic Epipedon
- ☑ Sulfidic Odor
- ☐ Aquatic Moisture Regime
- ☑ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: NA

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:
With redoximorphic features and a hydrogen sulfide smell, this area meets the criteria for hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☑ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): 12

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Meets criteria for wetland hydrology. Due to presence of soil cracking and saturation this late in the season, this area was clearly inundated in the spring and early summer.

WETLAND DETERMINATION DATA FORM – Routine Weltand Delineation, 1987 COE Protocol

Project/Site: Meriwether East City/County: Glacier Sampling Date: 7/30/2010

Applicant/Owner: MDT State: MT Sampling Point: SP-5

Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S 8 T 33N R 8W

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

Subregion (LRR): LRR E Lat: Long: Datum: NAD83

Soil Map Unit Name: Saline land

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Juncus balticus	40	☑	FACW
2. Typha latifolia	30	☑	OBL
3. Scirpus acutus	10	☐	OBL
4. Ranunculus cymbalaria	10	☐	OBL
5. Eleocharis palustris	5	☐	OBL
6. Hordeum jubatum	5	☐	FAC
7. Puccinellia nuttalliana	5	☐	FACW
8. Beckmannia syzigachne	2	☐	OBL
9. Alisma gramineum	1	☐	OBL
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

Remarks:
Area is dominated by hydrophytic vegetation - passes Dom Test and Prev Index.

SOIL

Sampling Point: Soil Pit 5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					Muck	
2-16	2.5Y 4/1	100					Silty Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☑ Sulfidic Odor
- ☐ Aquatic Moisture Regime
- ☑ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: NA

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Anoxic conditions producing hydrogen sulfide smell, meeting hydric soil criteria. Also, due to inundation, soils also meet the NRCS hydric soil criteria #3, "Soils that are frequently ponded for long duration or very long duration during the growing season."

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☑ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Field Observations:

Surface Water Present?	Yes ☑	No ☐	Depth (inches): 3
Water Table Present?	Yes ☑	No ☐	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Wetland hydrology present - inundated.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Meriwether East **2. MDT project#** STPX-NH 0037(26) **Control#** B594

3. Evaluation Date 7/30/2010 **4. Evaluators** J. Asebrook, J. Hintz **5. Wetland/Site# (s)** Site 2

6. Wetland Location(s): T 33N **R** 8W **Sec1** 17 **T** **R** **Sec2**

Approx Stationing or Mileposts ST 284+40 to ST 287+50 R; approximately at MP 239.

Watershed 8 - Marias **County** Glacier

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 6.62

How assessed: Measured e.g. by GPS

9. Assesssment area (AA) size (acres) 6.62

How assessed: Measured e.g. by GPS

Purpose of Evaluation

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

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittant	100

11. Estimated Relative Abundance Common

12. General Condition of AA

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

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

Livestock grazing occurs nearby. Grazing occurred at the wetland mitigation site prior to construction but has been fenced and discontinued.

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

CIRARV present in upland

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

AA is an excavated area bordering an existing wetland. Highway 2 occurs on the immediate north boundary. Rangeland occurs on all boundaries although livestock is now excluded by fences.

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: Willow shrubs continue to increase but are not large enough yet to form a scrub shrub component

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 observations, MNHP

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

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

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

Secondary habitat (list Species) ◯ D ◯ S

Incidental habitat (list species) ◯ D ◯ S

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 observations, MNHP

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 Deer, occassional pronghorn, and several species of birds use recorded in this area in prior monitoring efforts.

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 _____

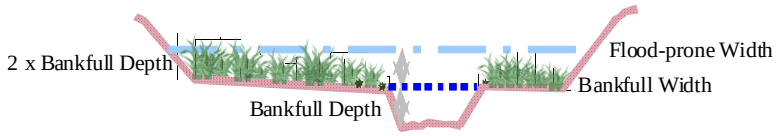
iii. Final Score and Rating: _____ **Comments:**

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: Site connects to a wetland which borders a drainage. When the drainage floods, water can back up into this site.

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, click ☐ **NA** here and proceed to 14G.)

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond **≥ 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: Site floods each year now.

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

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

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

Comments:

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, click ☑ **NA** here and proceed to 14I.)

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

*% Cover of **wetland** streambank or shoreline by species with stability ratings of ≥6 (see **Appendix F**).*	*Duration of surface water adjacent to rooted vegetation*		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: Although inundation noted within area, the amount of vegetation and lack of depth likely protects area from wave action.

14I. Production Export/Food Chain Support:

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

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

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

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

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

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .8H

Comments:

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

i. Discharge Indicators

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

ii. Recharge Indicators

- ☐ Permeable substrate present without underlying impeding layer
- ☐ Wetland contains inlet but no outlet
- ☐ Stream is a known 'losing' stream; discharge volume decreases
- ☐ Other:

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

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

Comments:

14K. Uniqueness:

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

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

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

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

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

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

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

Comments:

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Site 2

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	L	0	1	0	☐
C. General Wildlife Habitat	M	.7	1	4.634	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.6	1	3.972	☐
F. Short and Long Term Surface Water Storage	H	.9	1	5.958	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	6.62	☑
H. Sediment/Shoreline Stabilization	NA	0	0	0	☐
I. Production Export/Food Chain Support	H	.8	1	5.296	☑
J. Groundwater Discharge/Recharge	M	.7	1	4.634	☐
K. Uniqueness	M	.4	1	2.648	☐
L. Recreation/Education Potential (bonus points)	NA	0	NA	0	☐
Totals:		5.1	9	33.762	
Percent of Possible Score			**56.67** %		

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

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

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

☑

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

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined above)

I **II** **III** **IV**

Appendix C

Project Area Photographs

MDT Wetland Mitigation Monitoring
Meriwether East
Glacier County, Montana

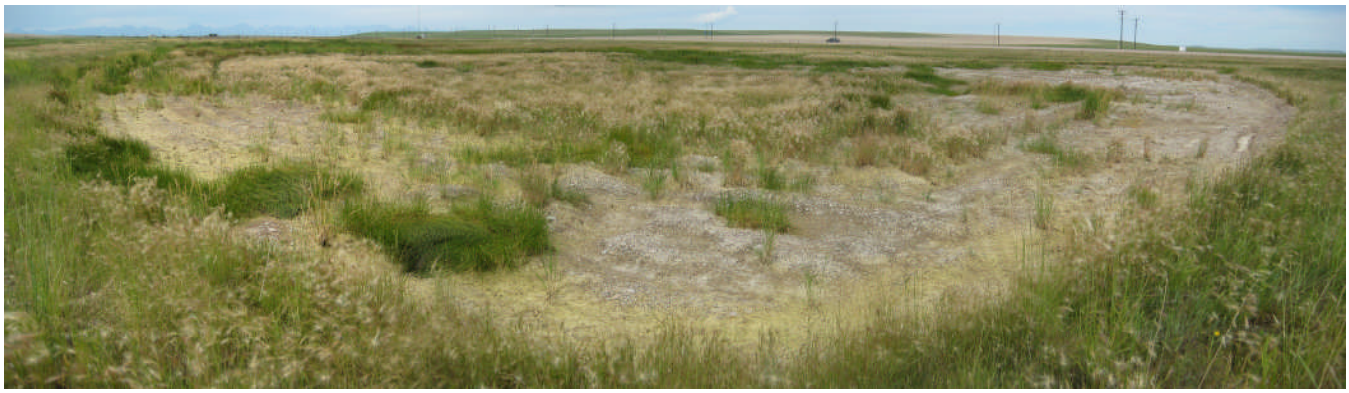
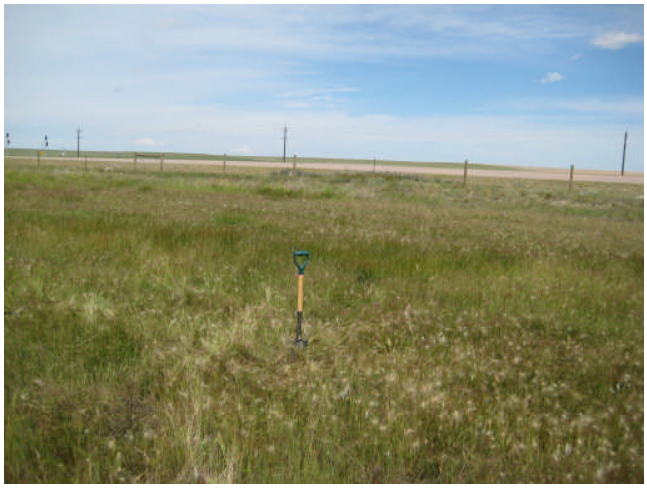


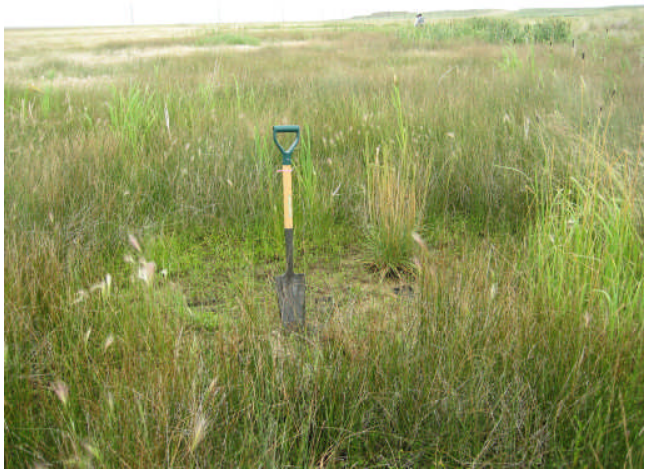
Photo Point 1 – *Photo 1*
Bearing:
Location:
Taken in 2010

Transect 1 – *Start*
Bearing:
Location:
Taken in 2010

Transect 1 – *End*
Bearing:
Location:
Taken in 2010



Soil Pit 1 – *Photo 1*
Bearing:
Location:
Taken in 2010



Soil Pit 2 – *Photo* 1
Bearing:
Location:
Taken in 2010

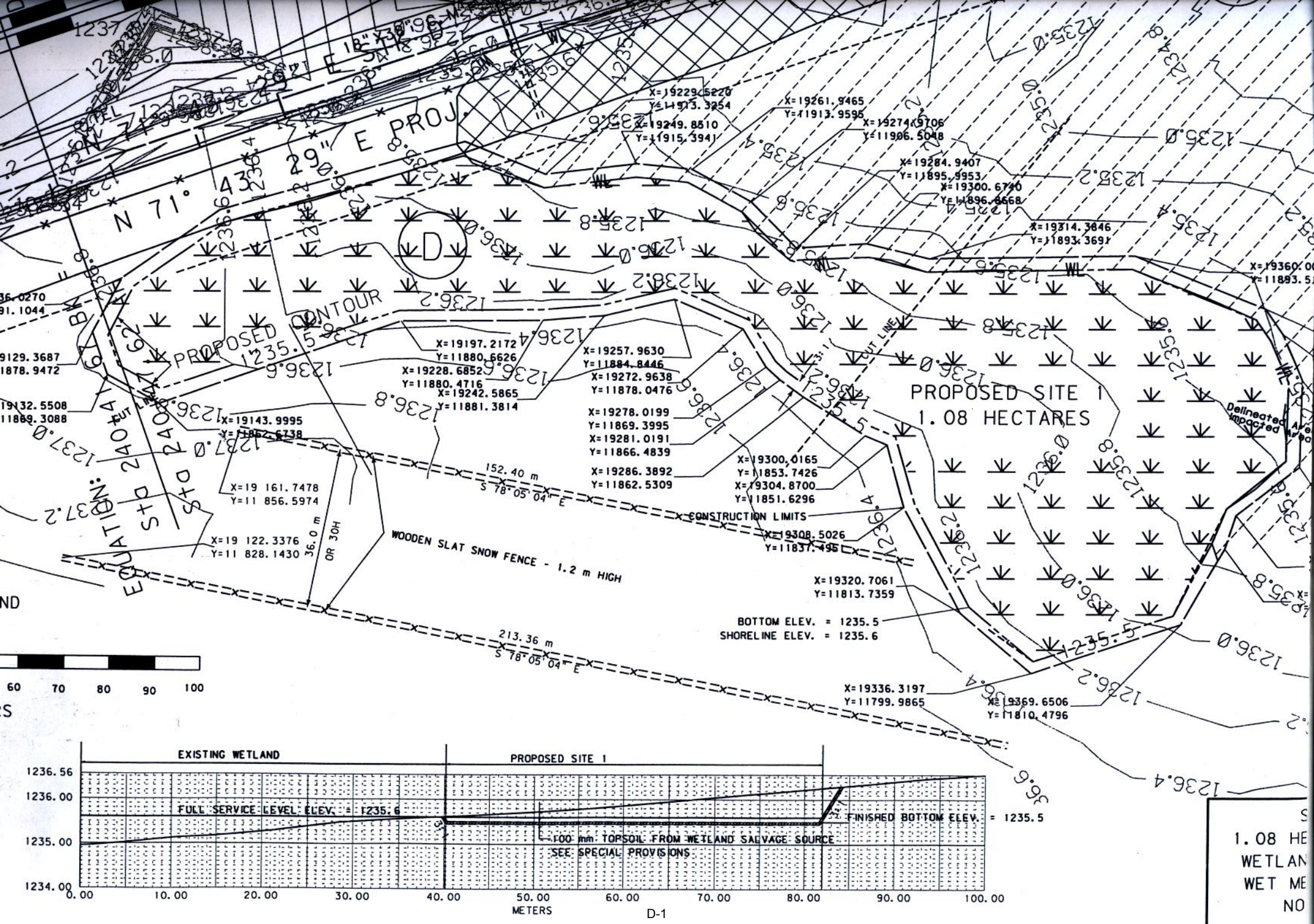
Soil Pit 3 – *Photo 1* **Location:**
Bearing: **Taken in 2010**

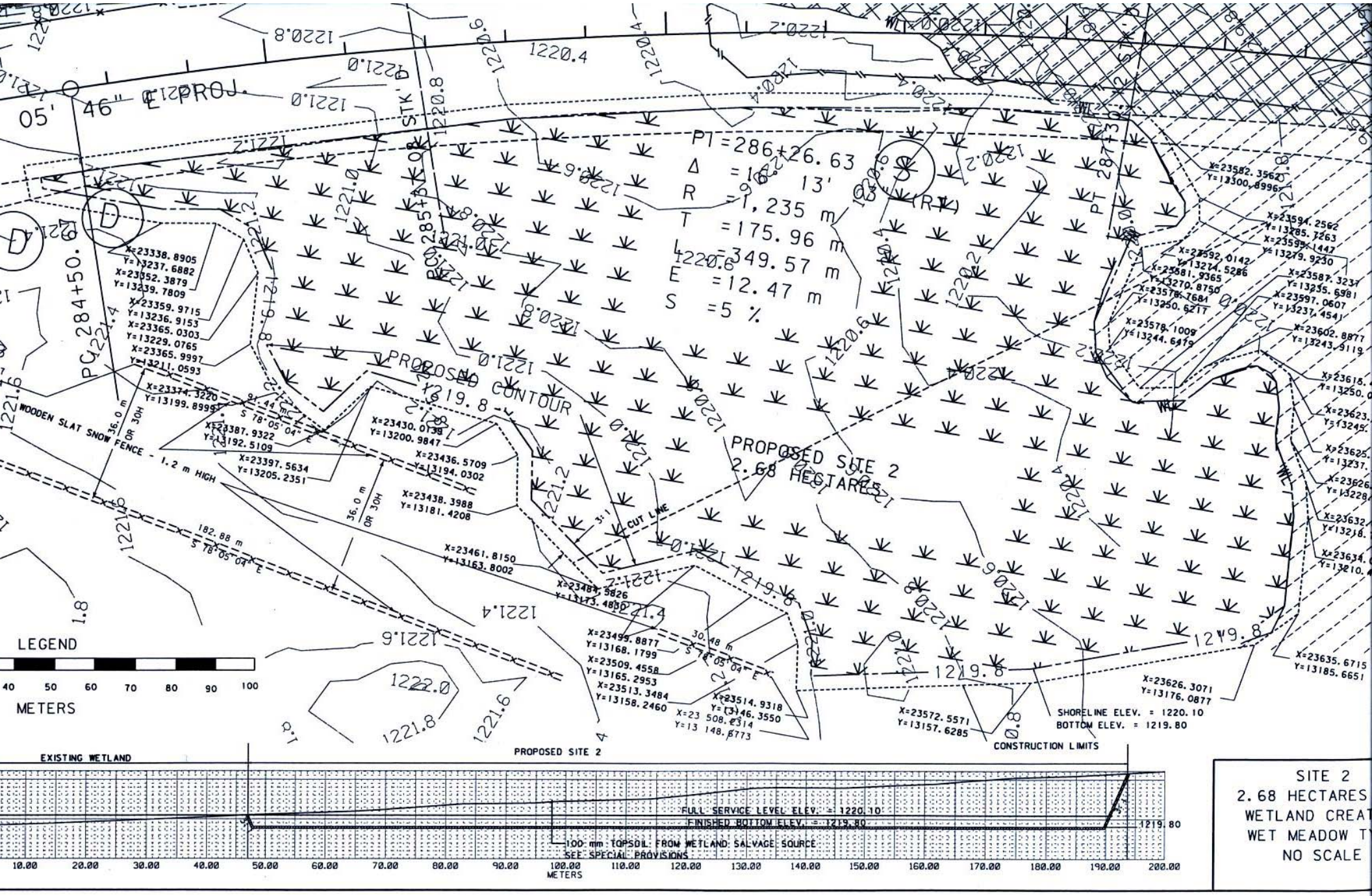
Soil Pit 4 – *Photo 1* **Location:**
Bearing: **Taken in 2010**

Appendix D

Project Plan Sheet

MDT Wetland Mitigation Monitoring
Meriwether East
Glacier County, Montana


PROPOSED SITE 1
1.08 HECTARES
PROPOSED CONTOUR
1235.5
CONSTRUCTION LIMITS
WOODEN SLAT SNOW FENCE - 1.2 m HIGH
152.40 m
S 78° 05' 04" E
213.36 m
S 78° 05' 04" E
36.0 m
OR 30H
BOTTOM ELEV. = 1235.5
SHORELINE ELEV. = 1235.6
X=19229.5220
Y=11913.3254
X=19249.8510
Y=11915.3941
X=19261.9465
Y=11913.9595
X=19274.9706
Y=11906.5048
X=19284.9407
Y=11895.9953
X=19300.6740
Y=11896.8668
X=19314.3846
Y=11893.3691
X=19197.2172
Y=11880.6626
X=19228.6852
Y=11880.4716
X=19242.5865
Y=11881.3814
X=19257.9630
Y=11884.8446
X=19272.9638
Y=11878.0476
X=19278.0199
Y=11869.3995
X=19281.0191
Y=11866.4839
X=19286.3892
Y=11862.5309
X=19300.0165
Y=11853.7426
X=19304.8700
Y=11851.6296
X=19308.5026
Y=11837.495
X=19320.7061
Y=11813.7359
X=19336.3197
Y=11799.9865
X=19369.6506
Y=11810.4796
X=19143.9995
X=19 161.7478
Y=11 856.5974
X=19 122.3376
Y=11 828.1430
EXISTING WETLAND
PROPOSED SITE 1
FULL SERVICE LEVEL ELEV. = 1235.6
FINISHED BOTTOM ELEV. = 1235.5
100 mm TOPSOIL FROM WETLAND SALVAGE SOURCE
SEE SPECIAL PROVISIONS
1236.56
1236.00
1235.00
1234.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00
METERS



05' 46" E PROJ.
PI = 286+26.63
Δ = 16° 13'
R = 1,235 m
T = 175.96 m
L = 349.57 m
E = 12.47 m
S = 5 %
PROPOSED CONTOUR
1219.8
PROPOSED SITE 2
2.68 HECTARES
WOODEN SLAT SNOW FENCE - 1.2 m HIGH
CUT LINE
SHORELINE ELEV. = 1220.10
BOTTOM ELEV. = 1219.80
CONSTRUCTION LIMITS
LEGEND
METERS
EXISTING WETLAND
PROPOSED SITE 2
FULL SERVICE LEVEL ELEV. = 1220.10
FINISHED BOTTOM ELEV. = 1219.80
100 mm TOPSOIL FROM WETLAND SALVAGE SOURCE
SEE SPECIAL PROVISIONS
METERS
SITE 2
2.68 HECTARES
WETLAND CREAT
WET MEADOW T
NO SCALE