
MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2004

*Browns Gulch
Rocker, Montana*



Prepared for:

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

Prepared by:

LAND & WATER CONSULTING
~ A DIVISION OF **PBS&J**
P.O. Box 239
Helena, MT 59624

June 2005

Project No: B43054.00 - 0205

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1.0 INTRODUCTION

This report summarizes the third year of monitoring at the Browns Gulch wetland mitigation project site. The Browns Gulch wetland mitigation project was constructed in early 2000 in Watershed 2 (Upper Clark Fork). It is anticipated that this site will compensate for wetland impacts resulting from road widening and culvert lengthening where the Brown Gulch Road (State Highway 276) crosses Oro Fino Creek and at two other unnamed wetland crossings along this same road. Constructed within the MDT right-of-way (ROW) in the MDT Butte District, the mitigation site is located approximately 1.5 miles north of Rocker and 5 miles northwest of Butte in Silverbow County (**Figure 1**). The goal of the project is to adjust grade by excavation adjacent to Oro Fino Gulch Creek in order to create 0.24 acres of wetland credit. The approximate site boundary is illustrated on **Figure 2 (Appendix A)**, and the original engineering plan is provided in **Appendix D**. The project is located adjacent to Oro Fino Gulch Creek and the Brown Gulch Road. Wetland hydrology is supplied by stream flow and by shallow groundwater or “springs” associated with the stream. Precipitation and surface runoff may provide minor contributions to wetland hydrology at this site.

No pre-existing wetlands were delineated at this location. The Corps of Engineers (COE) has approved allocation of 1:1 credit for wetland creation at this site, which occurs entirely within the MDT right-of-way (ROW) and will not be developed (Urban pers. comm.). The entire site is fenced by the ROW.

The Browns Gulch site was monitored once per year over the 4-year contract period to document wetland and other biological attributes. This 2004 report represents the final year of monitoring. The monitoring area is illustrated in **Figure 2 (Appendix A)**.

2.0 METHODS

2.1 Monitoring Dates and Activities

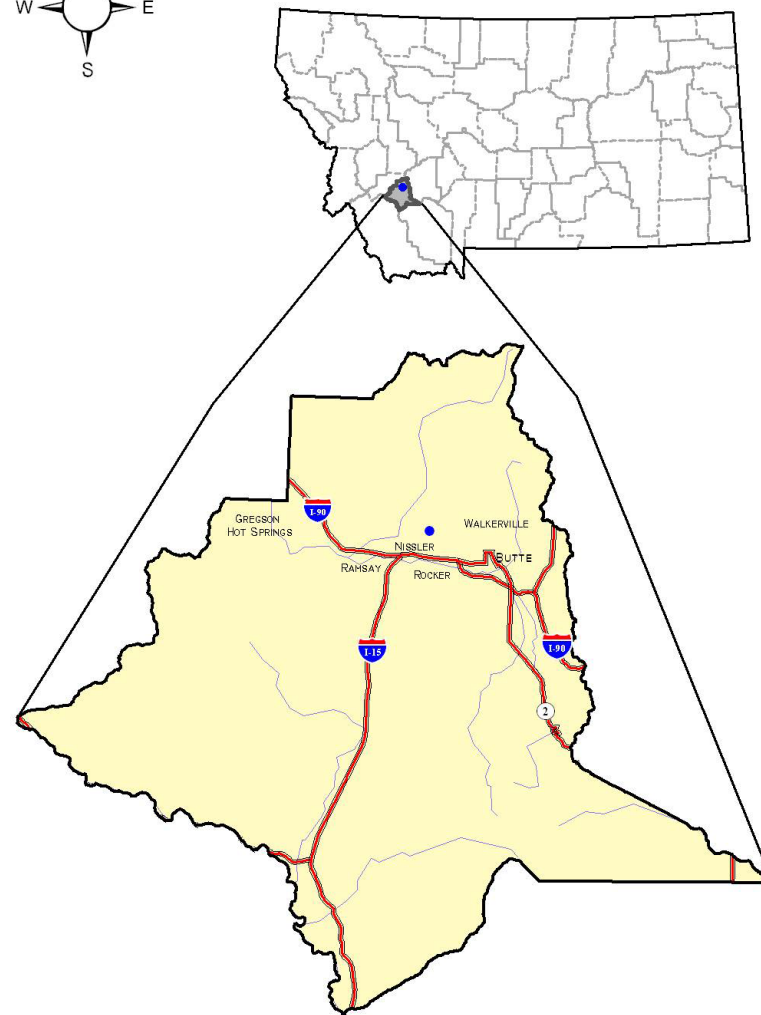
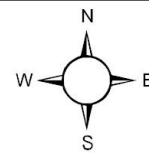
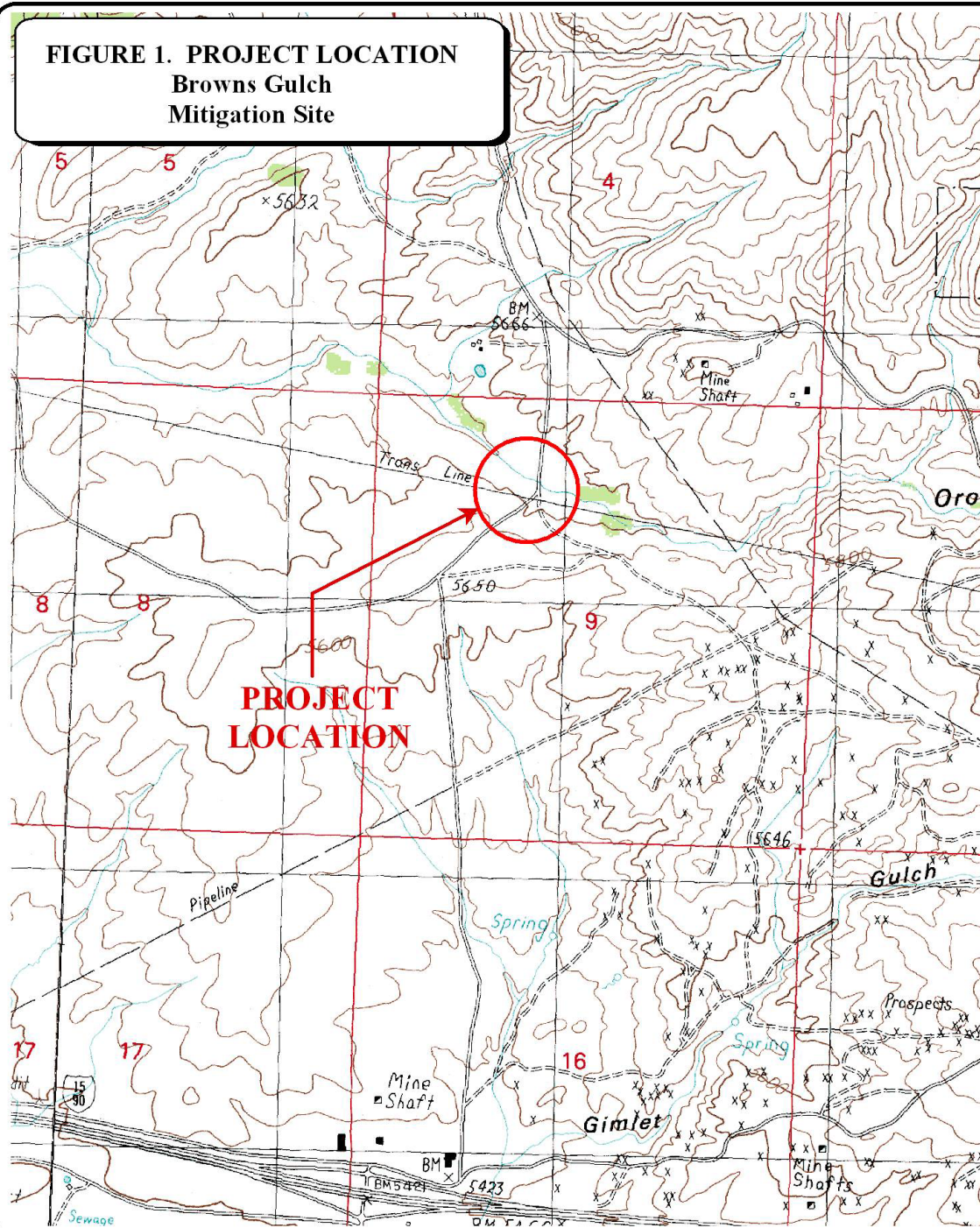
The site was visited on July 20, 2004 (mid-season). This annual visit was conducted to document vegetation, soil, and hydrologic conditions used to map jurisdictional wetlands. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected at this time. Activities and information conducted/collected included: wetland delineation; vegetation community mapping; vegetation transects; soils data; hydrology data; bird and general wildlife use; photograph points; functional assessment; and (non-engineering) examination of structures.

2.2 Hydrology

Wetland hydrology indicators were recorded using procedures outlined in the COE 1987 Wetland Delineation Manual (Environmental Laboratory 1987). Hydrology data were recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**).

FIGURE 1. PROJECT LOCATION

**Browns Gulch
Mitigation Site**



800 0 800 1600 FEET
1: 24,000

PROJECT #: 30091.012
DATE: MARCH 2001
LOCATION:
PROJECT MANAGER: B. DUTTON
DRAWN BY: B. NOECKER

LAND & WATER CONSULTING, INC.

1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

Additional hydrologic data were recorded on the mitigation site monitoring form (**Appendix B**).

No groundwater monitoring wells were installed at the site. If located within 18 inches of the ground surface (soil pit depth for purposes of delineation), groundwater depths were documented on the routine wetland delineation data form at each data point.

2.3 Vegetation

General dominant species-based vegetation community types (e.g., *Typha latifolia/Scirpus acutus*) were delineated on an aerial photograph during the mid-season visit. Standardized community mapping was not employed as many of these systems are geared towards climax vegetation and do not reflect yearly changes. Estimated percent cover of the dominant species in each community type was listed on the site monitoring form (**Appendix B**).

The 10-foot wide belt transect established in 2001 was sampled during the 2004 mid-season monitoring event to represent the range of current vegetation conditions. Percent cover was estimated for each vegetative species encountered. The transect location is illustrated on **Figure 2 (Appendix A)**. The transect will be used to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. All data were recorded on the mitigation site monitoring form. Transect endpoint locations were recorded with the GPS unit in 2001. A photo was taken from only one end of the transect due to its short length.

A comprehensive plant species list for the site was compiled and will be updated as new species are encountered. Ultimately, observations from past years will be compared with new data to document vegetation changes over time. Woody species were planted at this mitigation site and results were recorded on the site monitoring form.

2.4 Soils

Soils were evaluated according to hydric soils determination procedures outlined in the COE 1987 Wetland Delineation Manual. Soil data were recorded for each wetland determination point on the COE Routine Wetland Delineation Data Form (**Appendix B**). The most current terminology used by NRCS was used to describe hydric soils (USDA 1998).

2.5 Wetland Delineation

Wetland delineation was conducted within the monitoring area according the 1987 COE Wetland Delineation Manual. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). The information was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundary was originally delineated on the air photo and recorded with a resource grade GPS unit using the procedures outlined in **Appendix E**. Modifications to these boundaries in 2004 were accomplished by hand-mapping onto the 2002 aerial photograph. The wetland acreage was calculated from GPS data.

2.6 Mammals, Reptiles, and Amphibians

Mammal and herptile species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during the annual visit. Indirect use indicators, including tracks; scat; burrows; eggshells; skins; bones; etc., were also recorded. Observations were recorded as the observer traversed the site while conducting other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive list of observed species was compiled.

2.7 Birds

Bird observations were also recorded during the annual visit. No formal census plots, spot mapping, point counts, or strip transects were conducted. Observations were recorded incidental to other monitoring activities and were categorized by species, activity code, and general habitat association (see field and office data forms in **Appendix B**).

2.8 Macroinvertebrates

No macroinvertebrate samples were collected at this site.

2.9 Functional Assessment

A functional assessment form was completed for the site using the 1999 MDT Montana Wetland Assessment Method (**Appendix B**). Key field data were recorded at the site and the functional assessment completed in the office. No pre-project functional assessment was conducted at this site.

2.10 Photographs

Photographs were taken illustrating the current land use surrounding the site, the upland buffer, the monitored area and the vegetation transect. Each photograph point location was recorded with a resource grade GPS in 2001. The approximate location of photo points is shown on **Figure 2, Appendix A**. All current photographs were taken using a digital camera. A description and compass direction for each photograph was recorded on the wetland monitoring form.

2.11 GPS Data

During the 2001 monitoring season, point data were collected with a resource grade GPS unit at the vegetation transect beginning and ending locations and at all photograph locations. Wetland boundaries were also recorded with a resource grade GPS unit in 2001, but were modified via hand-mapping onto aerial photographs in 2004. The method used to collect these points is described in the GPS protocol in **Appendix E**.

2.12 Maintenance Needs

Observations were made of existing structures and of erosion/sediment problems to identify maintenance needs. This did not constitute an engineering-level structural inspection, but rather a cursory examination. Current or future potential problems were documented on the monitoring form.

3.0 RESULTS

3.1 Hydrology

No inundation was observed on the July 20, 2004 monitoring date either in Oro Fino Gulch Creek or in the adjacent constructed wetland area. Groundwater was observed on August 5 within 18 inches of the surface and saturated soil within 15 inches as documented on the Routine Wetland Determination forms (**Appendix B**). These observations are similar to those documented during past visits.

It is important to note that drought conditions have dominated this area for many years in recent time. According to the Western Regional Climate Center, Butte yearly precipitation totals for 2000 (8.63 inches), 2001 (10.39 inches), 2002 (10.70 inches), 2003 (9.67), and 2004 (11.14) were 67, 81, 83, 76, and 87 percent, respectively, of the total annual mean precipitation (12.78 inches) in this area (Western Regional Climate Center, 2004). Hydrologic conditions must be considered within this climatic context. No open water was present at this site.

3.2 Vegetation

Forty-one plant species were identified at the site and are presented in **Table 1**. No new species were observed during the 2004 monitoring. The same two wetland community types identified and mapped at the mitigation area in past years were present in 2004 (**Figure 3**, **Appendix A**). Upland areas were also mapped. The two wetland community types are Type 1: *Agrostis alba*/*Salix exigua*, and Type 2: *Salix boothii*. Dominant species within each of these communities are listed on the attached data form (**Appendix B**). The species, community types and boundaries were all similar to those observed in past years.

Type 1 is the most common wetland community type and occurs in the newly developing wetland area. This type is dominated by young sandbar willow (*Salix exigua*) and other disturbance species that are establishing under the newly created wetland conditions. This community type showed a significant increase in the coverage and vigor of sandbar willow following a period of establishment. Type 2 is limited to the immediate streambanks of Oro Fino Gulch Creek in the southeast corner of the assessment area. This type is dominated by mature Booths' willow (*Salix boothii*) that existed prior to this project.

The surrounding landscape is dominated by sagebrush/grassland rangeland. Common species include big sage (*Artemisia tridentata-vaseyana*), rubber rabbitbrush (*Chrysothamnus nauseosus*), Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Agropyron spicatum*) and

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Table 1: 2001-2004 Browns Gulch vegetation species list

Scientific Name	Common Name	Region 9 (Northwest) Wetland Indicator
<i>Achillea millefolium</i>	common yarrow	FACU
<i>Agropyron intermedium</i>	intermediate wheatgrass	--
<i>Agropyron repens</i>	quackgrass	FACU
<i>Agropyron smithii</i>	western wheatgrass	FACU
<i>Agropyron trachycaulum</i>	slender wheatgrass	FAC
<i>Agrostis alba</i>	redtop	FAC
<i>Alopecurus pratensis</i>	meadow foxtail	FACW
<i>Artemisia dracunculus</i>	wild tarragon	--
<i>Artemisia tridentate</i>	big sagebrush	--
<i>Carex nebrascensis</i>	Nebraska sedge	OBL
<i>Carex utriculata</i>	beaked sedge	OBL
<i>Centaurea maculosa</i>	spotted knapweed	--
<i>Chenopodium album</i>	white goosefoot	FAC
<i>Chrysothamnus nauseosus</i>	rabbitbrush	--
<i>Cirsium arvense</i>	Canada thistle	FACU+-
<i>Eleocharis palustris</i>	creeping spikerush	OBL
<i>Elymus spp.</i>	wildrye	--
<i>Festuca ovina</i>	sheep fescue	FACU
<i>Grindelia squarrosa</i>	curly-cup gumweed	FACU
<i>Hordeum jubatum</i>	fox tail barley	FAC-
<i>Juncus balticus</i>	Baltic rush	FACW+
<i>Juniperus scopulorum</i>	Rocky Mountain juniper	--
<i>Kochia scoparia</i>	summer cypress	FAC
<i>Lepidium perfoliatum</i>	clasping pepper grass	FACU+
<i>Linaria vulgaris</i>	butter and eggs	--
<i>Melilotus officinalis</i>	yellow sweetclover	FACU
<i>Mentha arvensis</i>	field mint	FACW-
<i>Montia perfoliata</i>	miner's lettuce	--
<i>Phalaris arundinacea</i>	reed canary grass	FACW
<i>Poa pratensis</i>	Kentucky bluegrass	FAC
<i>Polygonum spp.</i>	knotweed	--
<i>Potentilla anserine</i>	silverweed	OBL
<i>Rosa woodsii</i>	woods rose	FACU
<i>Rumex crispus</i>	curly dock	FAC+
<i>Salix boothii</i>	Booth willow	OBL
<i>Salix exigua</i>	sandbar willow	OBL
<i>Salsola iberica</i>	Russian thistle	--
<i>Sisymbrium altissimum</i>	tumble mustard	FACU-
<i>Solidago missouriensis</i>	Missouri goldenrod	--
<i>Typha latifolia</i>	broadleaf cattail	OBL
<i>Verbascum thapsus</i>	common mullein	--

others. Road widening or other construction activities have disturbed most of the area immediately surrounding the mitigation site. The vegetation on these disturbed areas is a mixture of planted grasses and weedy species including several noxious weeds. There is a significant amount of bare ground where plants have yet to establish. Common species include spotted knapweed (*Centaurea maculosa*), butter and eggs (*Linaria vulgaris*), common mullein (*Verbascum thapsus*), and slender wheatgrass (*Agropyron trachycaulum*).

Vegetation transect results are detailed in the attached data form (**Appendix B**), and are summarized in **Table 2** and **Charts 1** and **2**. It should be noted that half of the transect length occurs in an upland community type, which is not intended to develop into wetland (**Table 2**, **Charts 1** and **2**).

Table 2: Transect 1 data summary.

Monitoring Year	2001	2002	2003	2004
Transect Length (feet)	75	75	75	75
# Vegetation Community Transitions along Transect	2	2	2	2
# Vegetation Communities along Transect	2	2	2	2
# Hydrophytic Vegetation Communities along Transect	1	1	1	1
Total Vegetative Species	12	12	12	12
Total Hydrophytic Species	6	6	6	6
Total Upland Species	6	6	6	6
Estimated % Total Vegetative Cover	75%	75%	75%	80%
% Transect Length Comprised of Hydrophytic Vegetation Communities	33%	33%	33%	33%
% Transect Length Comprised of Upland Vegetation Communities	67%	67%	67%	67%
% Transect Length Comprised of Unvegetated Open Water	0%	0%	0%	0%
% Transect Length Comprised of Bare Substrate	0%	0%	0%	0%

Chart 1: Length of vegetation communities along Transect 1.

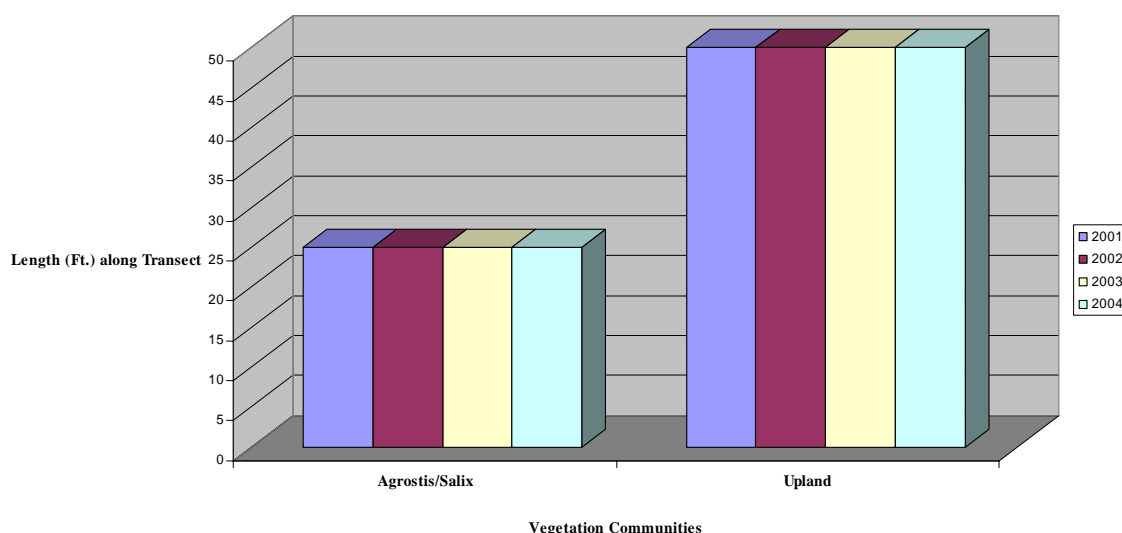
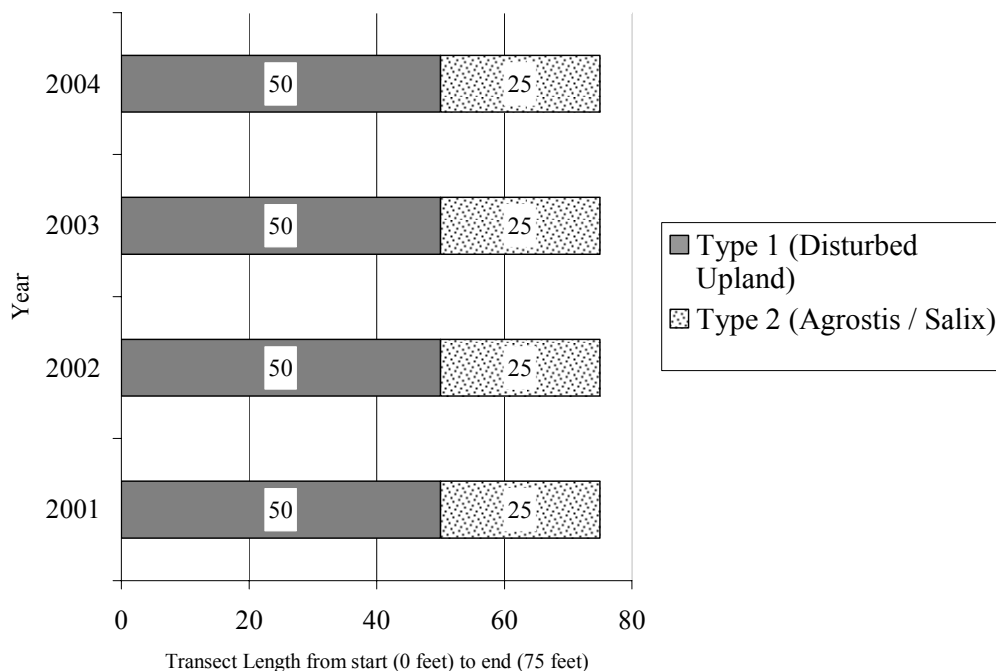


Chart 2: Transect maps showing vegetation types from the start of transect (0 feet) to the end of transect (75 feet) for each year monitored.



3.3 Soils

NRCS soil information is not available for this site. Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were loams or silty clay loams with mixed matrix colors of 10YR3/2 and 10YR 2/0. These mixed colors suggest a transition from upland to wetland conditions. Mottles were 10YR 5/8 in color, few and faint. Mottles are likely to develop more fully with time. Soils were saturated to within 15 inches of the surface in 2004 across most of the area delineated as wetland. It is likely soil saturation was shallower early in the season. Soil features were similar to those observed in past years.

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3 in Appendix A**. Completed wetland delineation forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. The wetland delineation and acreage of wetland was the same as in past years. Approximately 0.17 wetland acre has been created on the mitigation site to date. The created wetland was an upland area adjacent to old a roadbed excavated to groundwater level. Additional area may form with time and with more normal precipitation around the low gradient portions of the current wetland area. MDT delineated no pre-existing wetlands within the footprint of the mitigation project, although there was a riparian fringe along the immediate streambanks of Oro Fino Gulch Creek (Urban pers. comm.).

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during the 2001 - 2004 monitoring efforts are listed in **Table 3**. Specific evidence observed, as well as activity codes pertaining to birds, is provided on the monitoring form in **Appendix B**. Evidence of two mammal and two bird species were observed using the mitigation site during the site visit. It is likely that other wildlife species use the site but were not observed during the short monitoring visit.

Table 3: Wildlife species observed on the Browns Gulch mitigation site from 2001 to 2004.

BIRDS ¹ Brown-headed Cowbird (<i>Molothrus ater</i>) Western Meadowlark (<i>Sturnella neglecta</i>)
MAMMALS ¹ coyote (<i>Canis latrans</i>) white-tailed deer (<i>Odocoileus virginianus</i>)

¹ All species were observed during one or more monitoring years.

3.6 Macroinvertebrates

No macroinvertebrate samples were taken at this site.

3.7 Functional Assessment

A completed 2004 functional assessment form is included in **Appendix B**. The overall assessment area result for functional points was 26%, making this a Class IV wetland under current conditions. No comparison was made between functional assessments due to the lack of change between years.

3.8 Photographs

Representative photographs taken from photo points and the transect end are in **Appendix C**. A copy of the 2004 aerial photograph is also provided in **Appendix C**.

3.9 Maintenance Needs/Recommendations

Erosion is still carrying small amounts of sediment into the northeast corner of the site from an adjacent unpaved and unvegetated roadway (**Figure 3**). This sediment should be prevented from reaching the wetland area temporarily by using sediment fences and permanently by revegetation, regrading and/or other runoff controls.

3.10 Current Credit Summary

At this time approximately 0.17 of the 0.24 acres of wetland creation have been accomplished. Currently this site has 0.476 functional units. It is likely that additional acreage will form with additional time and more normal precipitation.

Table 4: Summary of 2001-2004 wetland function/value ratings and functional points.

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	2001/2002/2003/2004 Ratings and Scores
Listed/Proposed T&E Species Habitat	Low (0.0)
MNHP Species Habitat	Low (0.0)
General Wildlife Habitat	Low (0.1)
General Fish/Aquatic Habitat	Low (0.1)
Flood Attenuation	Low (0.1)
Short and Long Term Surface Water Storage	Low (0.3)
Sediment, Nutrient, Toxicant Removal	Mod (0.6)
Sediment/Shoreline Stabilization	NA
Production Export/Food Chain Support	Low (0.3)
Groundwater Discharge/Recharge	High (1.0)
Uniqueness	Low (0.2)
Recreation/Education Potential	Low (0.1)
Actual Points/ Possible Points	2.8 / 11
% of Possible Score Achieved	26%
Overall Category	IV
Total Acreage of Assessed Wetlands and Other Aquatic Habitats	0.17
Functional Units (acreage x actual points)	0.476
Net Acreage Gain	0.17
Net Functional Unit Gain	0.476

4.0 REFERENCES

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Appendix A

FIGURES 2 - 3

MDT Wetland Mitigation Monitoring
Browns Gulch
Rocker, Montana

Figure 2 Monitoring Activity Locations

Legend

Monitoring Area Limits

Vegetation Transect

Photograph Points

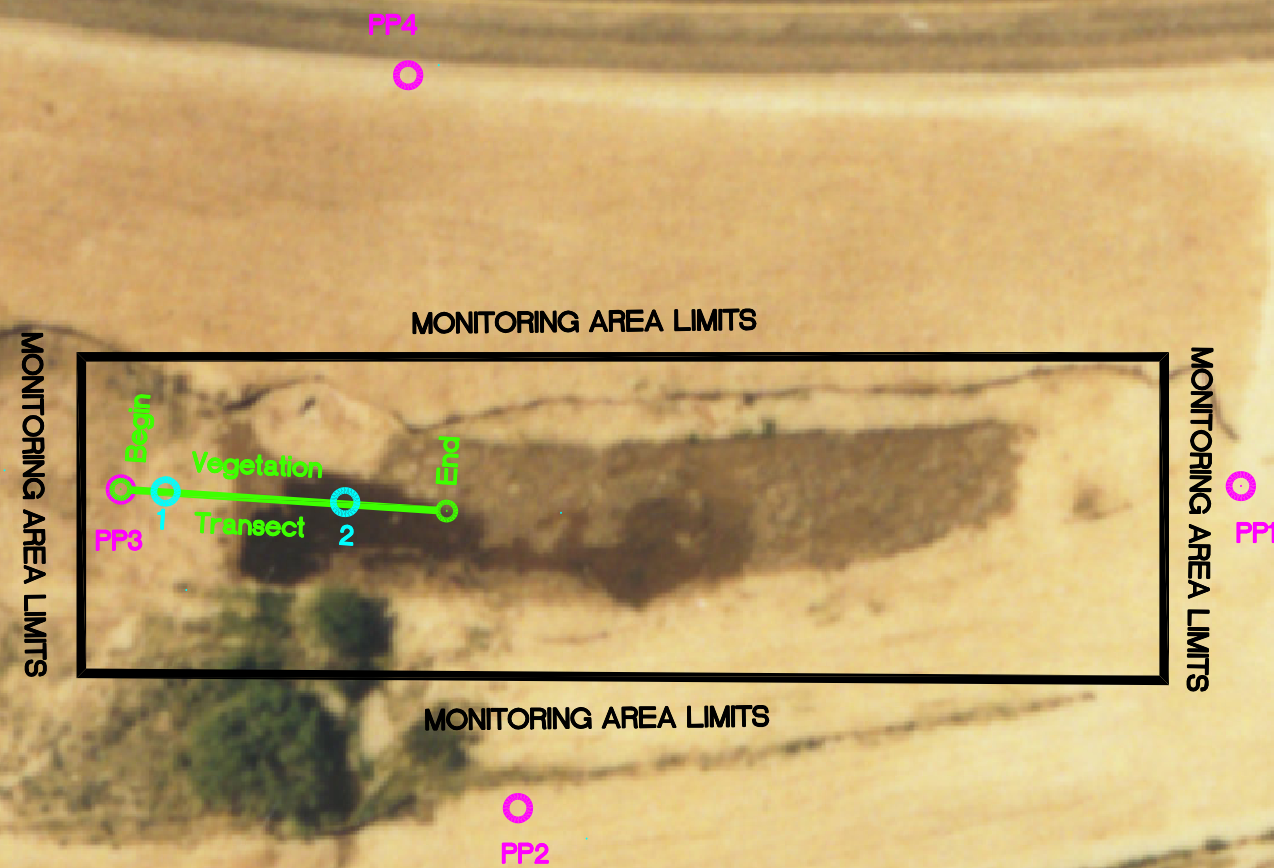
Aerial Reference Points

Observation Point

Base Photograph Date: July 11, 2000



SCALE 1"= 50 ft



PROJECT NAME

MDT Brown's Gulch Wetland Mitigation

DRAWING TITLE

Monitoring Activity Locations

DRAWN: RA

PROJ NO: 330054.206

CHECKED:

FILE NAME: TASK12BASE.dwg

SCALE: 1"= 50 ft

APPVD: BD

PROJ MGR: BD

LAND & WATER CONSULTING, INC.
P.O. BOX 8254
Missoula, MT 59807

SHEET NUMBER

2

REV -

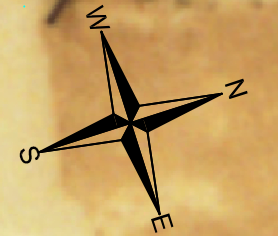
DATE: 6-25-05

Figure 3 Mapped Site Features 2004

- Vegetation Communities:**
- ① Agrostis/Salix
 - ② Salix
 - ③ Uplands

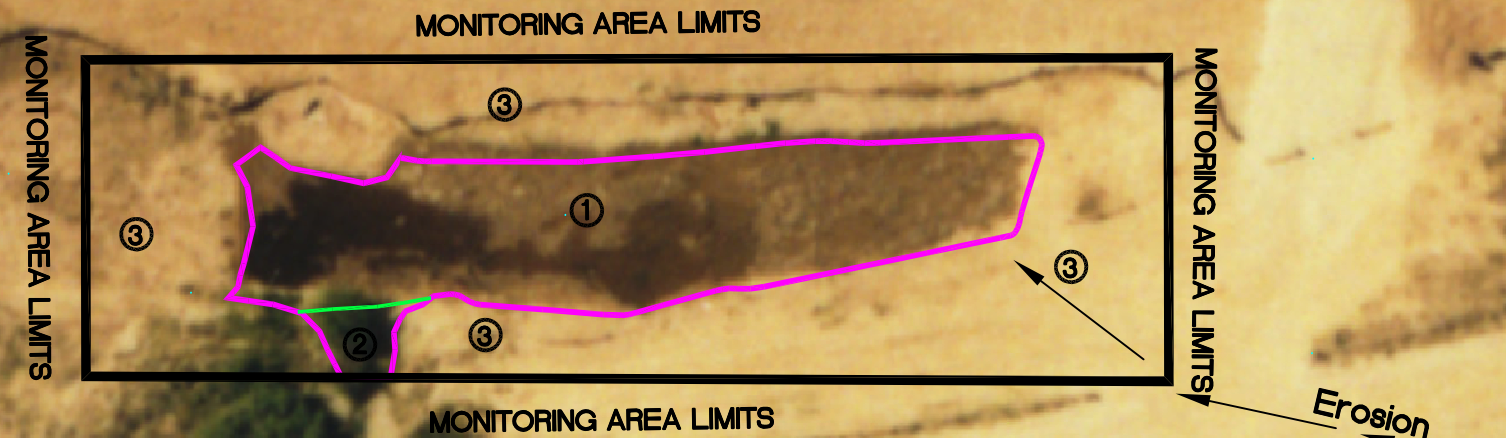
Legend

- Monitoring Area Limits
- Wetland - Upland Boundary
- Vegetation Community Boundary
- Base Photograph Date: July 11, 2000



SCALE 1"= 50 ft

Net Wetland Area 0.173 Acres



Appendix B

COMPLETED 2004 WETLAND MITIGATION SITE MONITORING FORM
COMPLETED 2004 BIRD SURVEY FORM
COMPLETED 2004 WETLAND DELINEATION FORMS
COMPLETED 2004 FUNCTIONAL ASSESSMENT FORM

MDT Wetland Mitigation Monitoring
Browns Gulch
Rocker, Montana

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Browns Gulch Project Number: 130091.12 Assessment Date: 7/20/04
Location: East of Rocker MDT District: Butte Milepost: _____
Legal description: T 3N R 8W Section 9 Time of Day: 7 am – 3 pm
Weather Conditions: Clear Person(s) conducting the assessment: Barry Dutton
Initial Evaluation Date: 7/21/01 Visit #: 4 Monitoring Year: 2004
Size of evaluation area: < 1 acres Land use surrounding wetland: Highway & rangeland

HYDROLOGY

Surface Water Source: Orofino Creek
Inundation: Present _____ Absent X Average depths: 0 ft Range of depths: 0 ft (no flow)
Assessment area under inundation: 0 %
Depth at emergent vegetation-open water boundary: NA ft
If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes X No _____
Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): Water marks, faint drift lines, stained vegetation.

Groundwater

Monitoring wells: Present _____ Absent X
Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:

NA Map emergent vegetation-open water boundary on air photo
X Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining etc.)
NA GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS: No water/inundation observed on this early August visit. A portion of the wetland areas had soils saturated within 15" of the surface.

VEGETATION COMMUNITIES

Community No.: 1 Community Title (main species): Agrostis/Salix

Dominant Species	% Cover	Dominant Species	% Cover
<i>Agrostis alba</i>	25		
<i>Poa pratensis</i>	25		
<i>Salix exigua</i>	25		
<i>Eleocharis palustris</i>	10		

COMMENTS/PROBLEMS: _____

Community No.: 2 Community Title (main species): Salix boothii

Dominant Species	% Cover	Dominant Species	% Cover
<i>Salix boothii</i>	90		
<i>Agrostis alba</i>	5		
<i>Poa pratensis</i>	5		

COMMENTS/PROBLEMS: _____

Community No.: 3 Community Title (main species): Uplands Agropyron / Kochia / Centaurea

Dominant Species	% Cover	Dominant Species	% Cover
<i>Agropyron trachycaulum</i>	30		
<i>Centaurea maculosa</i>	10		
<i>Kochia scoparia</i>	5		

COMMENTS/PROBLEMS: _____

Additional Activities Checklist:

X Record and map vegetative communities on air photo

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
<i>Achillea millefolium</i>	1	<i>Salix exigua</i>	1
<i>Agropyron intermedium</i>	UP	<i>Salsola iberica</i>	UP
<i>Agropyron repens</i>	1, UP	<i>Sisymbrium altissimum</i>	1, UP
<i>Agropyron smithii</i>	UP	<i>Solidago missouriensis</i>	UP
<i>Agropyron trachycaulum</i>	1, UP	<i>Typha latifolia</i>	1
<i>Agrostis alba</i>	1, UP	<i>Verbascum thapsus</i>	1
<i>Alopecurus pratensis</i>	1		
<i>Artemisia dracunculus</i>	1, UP		
<i>Artemisia tridentate</i>	UP		
<i>Carex nebrascensis</i>	1		
<i>Carex utriculata</i>	1		
<i>Centaurea maculosa</i>	1, UP		
<i>Chenopodium album</i>	1		
<i>Chrysothamnus nauseosus</i>	UP		
<i>Cirsium arvense</i>	1		
<i>Eleocharis palustris</i>	1, 2		
<i>Elymus spp.</i>	UP		
<i>Festuca ovina</i>	UP		
<i>Grindelia squarrosa</i>	1		
<i>Hordeum jubatum</i>	1, 2, UP		
<i>Juncus balticus</i>	1, UP		
<i>Juniperus scopulorum</i>	1		
<i>Kochia scoparia</i>	UP		
<i>Lepidium perfoliatum</i>	UP		
<i>Linaria vulgaris</i>	1, UP		
<i>Melilotus officinalis</i>	1		
<i>Mentha arvensis</i>	1,2		
<i>Montia perfoliata</i>	1		
<i>Phalaris arundinacea</i>	1		
<i>Poa pratensis</i>	1, 2, UP		
<i>Polygonum spp.</i>	1		
<i>Potentilla anserine</i>	1		
<i>Rosa woodsii</i>	1, UP		
<i>Rumex crispus</i>	1		
<i>Salix boothii</i>	2		

COMMENTS/PROBLEMS:

PLANTED WOODY VEGETATION SURVIVAL

[illegible]

COMMENTS/PROBLEMS: About 50% of the visible stems are dead.

BIRDS

Were man made nesting structures installed? Yes_____ No X Type:_____ How many?_____ Are the nesting structures being utilized? Yes_____ No_____ Do the nesting structures need repairs? Yes_____ No_____

[illegible]

___ Macroinvertebrate sampling (if required)

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

PHOTOGRAPHS

Using a camera with a 50 mm lenses and color film take photographs of the following permanent reference points listed in the checklist below. Record the direction of the photograph using a compass. (The first time at each site establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3' above ground, survey the location with a resource grade GPS and mark the location on the air photo.)

Checklist:

- ☒ One photo for each of the 4 cardinal directions surrounding wetland
- ☒ At least one photo showing upland use surrounding wetland – if more than one upland use exists, take additional photos
- ☒ At least one photo showing buffer surrounding wetland
- ☒ One photo from each end of vegetation transect showing transect

Location	Photo Frame #	Photograph Description	Compass Reading
1	--	Wetland overview looking south from N. of AA	200°
2	--	Panoramic from the S. to W. to N.	220° – 20°
3	--	Overview from S. end of Transect looking N.	20°
4	--	Panoramic from N. to E. to S.	30° - 160°

COMMENTS/PROBLEMS: _____

GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points with the GPS unit set at 5 second recording rate. Record file numbers for site in designated GPS field notebook

Checklist:

- ☒ Jurisdictional wetland boundary
- ☒ 4-6 landmarks recognizable on the air photo
- ☒ Start and end points of vegetation transect(s)
- ☒ Photo reference points
- ☐ Groundwater monitoring well locations

COMMENTS/PROBLEMS: Original delineation and mapping completed in 2001, no change in 2004 monitoring season.

WETLAND DELINEATION

(Attach Corps of Engineers delineation forms)

At each site conduct the items on the checklist below:

- ☒ Delineate wetlands according to the 1987 Army Corps manual.
- ☒ Delineate wetland-upland boundary on the air photo
- ☒ Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: Similar conditions present in 2004 as observed in past years.

FUNCTIONAL ASSESSMENT

(Complete and attach full MDT Montana Wetland Assessment Method field forms; also attach abbreviated field forms, if used)

COMMENTS/PROBLEMS: No changes between 2003 and 2004.

MAINTENANCE

Were man-made nesting structures installed at this site? YES___ NO X

If yes, do they need to be repaired? YES___ NO___

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

Were man-made structures build or installed to impound water or control water flow into or out of the wetland?
YES X NO___

If yes, are the structures working properly and in good working order? YES X NO___

If no, describe the problems below.

COMMENTS/PROBLEMS: Erosion is still transporting a small amount of sediment into the northeast corner of the wetland from adjacent roadway. Not a large amount.

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Browns Gulch Date: 7/20/04 Examiner: Barry Dutton Transect # 1

Approx. transect length: 75 Ft. Compass Direction from Start (Upland): 20°

Vegetation type A:	Upland – Disturbed	
Length of transect in this type:	50	feet
Species:		Cover:
Agropyron trachycaulum		20
Artemisia tridentate		10
Centaurea maculosa		10
Agrostis alba		P
Hordeum jubatum		P
Poa pratensis		T
Chrysothamnus nauseosus		T
Total Vegetative Cover:	50%	

Vegetation type B:	Agrostis / Salix	
Length of transect in this type:	25	feet
Species:	Cover:	
Agrostis alba	20	
Salix exigua	25	
Poa pratensis	10	
Hordeum jubatum	5	
Eleocharis palustris	10	
Typha latifolia	T	
Juncus balticus	15	
Potentilla anserina	P	
Total Vegetative Cover:		80%

Vegetation type C:		
Length of transect in this type:		feet
Species:		Cover:
Total Vegetative Cover:		

Vegetation type D:		
Length of transect in this type:		feet
Species:		Cover:
Total Vegetative Cover:		



MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate

+ = <1% 3 = 11-20%
 1 = 1-5% 4 = 21-50%
 2 = 6-10% 5 = >50%

Indicator Class:

+ = Obligate
 - = Facultative/Wet
 0 = Facultative

Source:

P = Planted
 V = Volunteer

Percent of perimeter 100% % developing wetland vegetation – excluding dam/berm structures.

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 foot depth (in open water), or at a point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 ft wide “belt” along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

Notes:

BIRD SURVEY – FIELD DATA SHEET

Page 1 of 1Date: 7/20/04

Survey Time: 8:30 am – 3:00 pm

SITE: Browns Gulch

[illegible]

Notes:

Behavior: BP – one of a breeding pair; BD – breeding display; F – foraging; FO – flyover; L – loafing; N – nesting

Habitat: AB – aquatic bed; FO – forested; I – island; MA – marsh; MF – mud flat; OW – open water; SS – scrub/shrub; UP – upland buffer; WM – wet meadow, US – unconsolidated shoreline

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Browns Gulch Mitigation Site</u> Applicant/Owner: <u>MDT</u> Investigator: <u>B. Dutton</u>	Date: <u>7/20/04</u> County: <u>Silverbow</u> State: <u>MT</u>
Do Normal Circumstances exist on the site: <u>X</u> Yes <u> </u> No Is the site significantly disturbed (Atypical Situation)? <u> </u> Yes <u>X</u> No Is the area a potential Problem Area?: <u> </u> Yes <u>X</u> No (If needed, explain on reverse.)	Community ID: <u>Upland</u> Transect ID: <u>1</u> Plot ID: <u>1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1 <i>Agropyron trachycaulum</i>	H	FAC		9		
2 <i>Artemisia tridentata</i>	S	--		10		
3 <i>Centaurea maculosa</i>	H	--		11		
4 <i>Agrostis alba</i>	H	FAC		12		
5 <i>Hordeum jubatum</i>	H	FAC-		13		
6 <i>Poa pratensis</i>	H	FAC		14		
7 <i>Chrysothamnus nauseosus</i>	S	--		15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 3/7 = 42%

Same as last year.

HYDROLOGY

_____ Recorded Data (Describe in Remarks): _____ Stream, Lake, or Tide Gauge _____ Aerial Photographs _____ Other <u> X </u> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: _____ Inundated _____ Saturated in Upper 12 Inches _____ Water Marks _____ Drift Lines _____ Sediment Deposits _____ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): _____ Oxidized Root Channels in Upper 12 Inches _____ Water-Stained Leaves _____ Local Soil Survey Data _____ FAC-Neutral Test _____ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u> - </u> (in.) Depth to Free Water in Pit: <u> >18 </u> (in.) Depth to Saturated Soil: <u> >18 </u> (in.)	
Remarks: Dry hillside above wetland. Same as last year.	

SOILS

Map Unit Name (Series and Phase):			Drainage Class: _____		
Taxonomy (Subgroup): <u>NA</u>			Field Observations		
			Confirm Mapped Type? _____ Yes _____ No		
Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 2	A	7.5 YR 3/3	--	--	
2 - 18	B	7.5 YR 4/3	--	--	
Hydric Soil Indicators:					
_____ Histosol		_____ Concretions			
_____ Histic Epipedon		_____ High Organic Content in surface Layer in Sandy Soils			
_____ Sulfidic Odor		_____ Organic Streaking in Sandy Soils			
_____ Aquic Moisture Regime		_____ Listed on Local Hydric Soils List			
_____ Reducing Conditions		_____ Listed on National Hydric Soils List			
_____ Gleyed or Low-Chroma Colors		_____ Other (Explain in Remarks)			
Not hydric, same as last year.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? ___ Yes <u>X</u> No Wetland Hydrology Present? ___ Yes <u>X</u> No Hydric Soils Present? ___ Yes <u>X</u> No	Is this Sampling Point Within a Wetland? ___ Yes <u>X</u> No
Remarks: Upland at south end of transect.	

Approved by HQUSACE 2/92

DATA FORM
ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Browns Gulch Mitigation Site</u> Applicant/Owner: <u>MDT</u> Investigator: <u>B. Dutton</u>	Date: <u>7/20/04</u> County: <u>Silverbow</u> State: <u>MT</u>
Do Normal Circumstances exist on the site: <u>X</u> Yes <u> </u> No Is the site significantly disturbed (Atypical Situation)? <u> </u> Yes <u>X</u> No Is the area a potential Problem Area?: <u> </u> Yes <u>X</u> No (If needed, explain on reverse.)	Community ID: <u>Emergent</u> Transect ID: <u>1</u> Plot ID: <u>2</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1 <i>Agrostis alba</i>	H	FAC		9		
2 <i>Poa pratensis</i>	H	FAC		10		
3 <i>Juncus balticus</i>	H	FACW+		11		
4 <i>Eleocharis palustris</i>	H	OBL		12		
5 <i>Salix exigua</i>	S	OBL		13		
6				14		
7				15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 5/5 = 100%

Same as last year.

HYDROLOGY

Recorded Data (Describe in Remarks): <u> </u> Stream, Lake, or Tide Gauge <u> </u> Aerial Photographs <u> </u> Other <u>X</u> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <u> </u> Inundated <u> </u> Saturated in Upper 12 Inches <u>X</u> Water Marks <u>X</u> Drift Lines <u>X</u> Sediment Deposits <u>X</u> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <u> </u> Oxidized Root Channels in Upper 12 Inches <u> </u> Water-Stained Leaves <u> </u> Local Soil Survey Data <u> </u> FAC-Neutral Test <u> </u> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u> - </u> (in.) Depth to Free Water in Pit: <u> 18 </u> (in.) Depth to Saturated Soil: <u> 15 </u> (in.)	
Remarks: Hydrologic conditions present. Same condition as last year.	

SOILS

Map Unit Name (Series and Phase): _____			Drainage Class: _____		
Taxonomy (Subgroup): <u>NA</u>			Field Observations		
			Confirm Mapped Type? <u> </u> Yes <u> </u> No		

Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 2	A	10 YR 3/2	--	--	
2 - 16	BC	10 YR 2/0 + 10 YR 3/2	10 YR 5/8	--	

Hydric Soil Indicators:	
<u> </u> Histosol	<u> </u> Concretions
<u> </u> Histic Epipedon	<u> </u> High Organic Content in surface Layer in Sandy Soils
<u> </u> Sulfidic Odor	<u> </u> Organic Streaking in Sandy Soils
<u> X </u> Aquic Moisture Regime	<u> </u> Listed on Local Hydric Soils List
<u> X </u> Reducing Conditions	<u> </u> Listed on National Hydric Soils List
<u> X </u> Gleyed or Low-Chroma Colors	<u> </u> Other (Explain in Remarks)

Hydric soils indicators present. Same indicators as last year.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <u> X </u> Yes <u> </u> No Wetland Hydrology Present? <u> X </u> Yes <u> </u> No Hydric Soils Present? <u> X </u> Yes <u> </u> No	Is this Sampling Point Within a Wetland? <u> X </u> Yes <u> </u> No
Remarks: Wetlands located along the north end of transect.	

Approved by HQUSACE 2/92

V MDT MONTANA WETLAND ASSESSMENT FORM (revised May 25, 1999)

1. Project Name: Browns Gulch

2. Project #: 130091.012

Control #: AA-1

3. Evaluation Date: 7/20/04

4. Evaluator(s): Barry Dutton

5. Wetland / Site #(s): Emergent wetland

6. Wetland Location(s) i. T: 3 N R: 8 W S: 9 T: N R: E S:

ii. Approx. Stationing / Mileposts:

iii. Watershed: 17010201 GPS Reference No. (if applies):

Other Location Information:

7. A. Evaluating Agency MDT

8. Wetland Size (total acres): (visually estimated)
0.17 (measured, e.g. GPS)

B. Purpose of Evaluation:

- ☐ Wetlands potentially affected by MDT project
☐ Mitigation wetlands; pre-construction
☒ Mitigation wetlands; post-construction
☐ Other

9. Assessment Area (total acres): (visually estimated)
0.17 (measured, e.g. GPS)

Comments:

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS ¹	SYSTEM ²	SUBSYSTEM ²	CLASS ²	WATER REGIME ²	MODIFIER ²	% OF AA
Riverine	Riverine	Upper Perennial	Unconsolidated Shore	Semipermanently Flooded	Excavated	95
Riverine	Riverine	Intermittent	Streambed	Intermittently Exposed	---	5
---	---	---	---	---	---	
---	---	---	---	---	---	
---	---	---	---	---	---	

¹ = Smith et al. 1995. ² = Cowardin et al. 1979.

Comments:

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin)

Common Comments:

12. GENERAL CONDITION OF AA

i. Regarding Disturbance: (Use matrix below to select appropriate response.)

Conditions Within AA	Predominant Conditions Adjacent (within 500 Feet) To AA		
	Land managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings.	Land not cultivated, but moderately grazed or hayed or selectively logged or has been subject to minor clearing; contains few roads or buildings.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.
AA occurs and is managed in predominantly a natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings.	---	---	---
AA not cultivated, but moderately grazed or hayed or selectively logged or has been subject to relatively minor clearing, or fill placement, or hydrological alteration; contains few roads or buildings.	---	---	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	---	---	high disturbance

Comments: (types of disturbance, intensity, season, etc.) Construction & roads

ii. Prominent weedy, alien, & introduced species: Spotted knapweed, butter & eggs, pepperweed, goosefoot, gumweed, & mullein.

iii. Briefly describe AA and surrounding land use / habitat: Constructed wetland between paved and unpaved roadways adjacent to stream crossing. Livestock grazing is major land use in surrounding area.

13. STRUCTURAL DIVERSITY (Based on 'Class' column of #10 above.)

Number of 'Cowardin' Vegetated Classes Present in AA	≥3 Vegetated Classes or ≥ 2 if one class is forested	2 Vegetated Classes or 1 if forested	≤ 1 Vegetated Class
Select Rating	---	Moderate	---

Comments:

14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS AND ANIMALS

- i. AA is Documented (D) or Suspected (S) to contain (check box):

Primary or Critical habitat (**list species**) ☐ D ☐ S _____
 Secondary habitat (**list species**) ☐ D ☐ S _____
 Incidental habitat (**list species**) ☐ D ☐ S _____
 No usable habitat ☐ D ☒ S none

- ii.
- Rating**
- (Based on the strongest habitat chosen in 14A(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	---	---	---	---	0 (L)

If documented, list the source (e.g., observations, records, etc.): _____

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.**Do not include species listed in 14A(i).**

- i. AA is Documented (D) or Suspected (S) to contain (check box):

Primary or Critical habitat (**list species**) ☐ D ☐ S _____
 Secondary habitat (**list species**) ☐ D ☐ S _____
 Incidental habitat (**list species**) ☐ D ☐ S _____
 No usable habitat ☐ D ☒ S none

- iii.
- Rating**
- (Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level:	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	---	---	---	---	0 (L)

If documented, list the source (e.g., observations, records, etc.): _____

14C. General Wildlife Habitat Rating

- i.
- Evidence of overall wildlife use in the AA:**
- (Check either substantial, moderate, or low)

☐ **Substantial** (based on any of the following)

- ☐ 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

☒ **Low** (based on any of the following)

- ☒ 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 AA

☐ **Moderate** (based on any of the following)

- ☐ 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, select appropriate AA attributes to determine the exceptional (E), high (H), moderate (M), or low (L) rating. Structural diversity is from #13. For class cover to be considered evenly distributed, vegetated classes must be within 20% of each other in terms of their percent composition in the AA (see #10). Duration of Surface Water: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; A= absent.

Structural Diversity (from #13)	<input type="checkbox"/> High								<input checked="" type="checkbox"/> Moderate								<input type="checkbox"/> Low			
Class Cover Distribution (all vegetated classes)	<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input checked="" type="checkbox"/> Uneven				<input type="checkbox"/> 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 #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	L	--	--	--	--

- iii. **Rating** (Using 14C(i) and 14C(ii) above and the matrix below to arrive at the functional point and rating of exceptional (E), high (H), moderate (M), or low (L) for this function.)

Evidence of Wildlife Use from 14C(i)	Wildlife Habitat Features Rating from 14C(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Low
Substantial	--	--	--	--
Moderate	--	--	--	--
Low	--	--	--	.1 (L)

Comments: _____

14D. GENERAL FISH/AQUATIC HABITAT RATING ☒ NA (proceed to 14E)

If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, then check the NA box above.

Assess if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [e.g. fish use is precluded by perched culvert or other barrier, etc.]. If fish use occurs in the AA but is not desired from a resource management perspective (e.g. fish use within an irrigation canal), then Habitat Quality [14D(i)] below should be marked as "Low", applied accordingly in 14D(ii) below, and noted in the comments.

i. **Habitat Quality** (Pick the appropriate AA attributes in matrix to pick the exceptional (E), high (H), moderate (M), or low (L) quality rating.)

Duration of Surface Water in AA	<input type="checkbox"/> Permanent/Perennial			<input type="checkbox"/> Seasonal / Intermittent			<input type="checkbox"/> Temporary / Ephemeral		
Cover - % of waterbody in AA containing cover objects (e.g. submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation)	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Shading - >75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities	--	--	--	--	--	--	--	--	--
Shading - 50 to 75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	--	--	--	--	--	--	--
Shading - < 50% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	--	--	--	--	--	--	--

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

☐ Y ☒ N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: ☐ E ☐ H ☐ M ☐ L

iii. **Rating** (Use the conclusions from 14D(i) and 14D(ii) above and the matrix below to pick the functional point and rating of exceptional (E), high (H), moderate (M), or low (L).)

Types of Fish Known or Suspected Within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: _____

14E. FLOOD ATTENUATION ☐ NA (proceed to 14G)

Applies only to wetlands subject to flooding via in-channel or overbank flow.

If wetlands in AA do not flooded from in-channel or overbank flow, check NA above.

i. **Rating** (Working from top to bottom, mark the appropriate attributes to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Estimated wetland area in AA subject to periodic flooding	<input type="checkbox"/> ≥ 10 acres			<input type="checkbox"/> <10, >2 acres			<input checked="" type="checkbox"/> ≤2 acres		
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains no outlet or restricted outlet	--	--	--	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	--	--	--	.1 (L)

ii. **Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA?** (check)

☐ Y ☒ N Comments: _____

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ NA (proceed to 14G)

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, check NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input type="checkbox"/> >5 acre feet			<input type="checkbox"/> <5, >1 acre feet			<input checked="" type="checkbox"/> ≤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	--	--	--	--	--	--	--	.3 (L)	--
Wetlands in AA flood or pond < 5 out of 10 years	--	--	--	--	--	--	--	--	--

Comments: _____

14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL ☐ NA (proceed to 14H)

Applies to wetlands with potential to receive excess 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, check NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds 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 has 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	<input type="checkbox"/> ≥ 70%		<input checked="" type="checkbox"/> < 70%		<input type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%	
Evidence of flooding or ponding in AA	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
AA contains no or restricted outlet	--	--	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	.6 (M)	--	--	--	--	--

Comments: _____

14H. SEDIMENT/ShORELINE STABILIZATION☒ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body that is subject to wave action. If this does not apply, check NA above.

- i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating exceptional (E), high (H), moderate (M), or low (L) for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input type="checkbox"/> Permanent / Perennial	<input type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

- i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.
A = acreage of vegetated component in the AA. **B** = structural diversity rating from #13. **C** = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; **P/P** = permanent/perennial; **S/I** = seasonal/intermittent; **T/E/A** = temporary/ephemeral/absent.

A	<input type="checkbox"/> Vegetated component >5 acres						<input type="checkbox"/> Vegetated component 1-5 acres						<input checked="" type="checkbox"/> Vegetated component <1 acre					
B	<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input checked="" type="checkbox"/> Moderate		<input type="checkbox"/> Low	
C	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.3L	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

14J. GROUNDWATER DISCHARGE/RECHARGE (D/R) (Check the indicators in i & ii below that apply to the AA)i. ☒ **Discharge Indicators**

- ☒ Springs 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.
☐ Other _____

ii. ☐ **Recharge Indicators**

- ☐ Permeable substrate presents without underlying impeding layer.
☐ Wetland contains inlet but not outlet.
☐ Other _____

- iii. **Rating:** Use the information from 14J(i) and 14J(ii) above and the table below to arrive at the functional point and rating of high (H) or low (L) for this function.

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	--
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

14K. UNIQUENESS

- i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

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 from #11	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input checked="" type="checkbox"/> common	<input type="checkbox"/> abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	.2L	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

- i. **Is the AA a known recreational or educational site?** ☐ **Yes** (Rate ☐ **High (1.0)**, then proceed to 14L(ii) only] ☒ **No** [Proceed to 14L(iii)]
ii. **Check categories that apply to the AA:** ☐ Educational / scientific study ☐ Consumptive rec. ☐ Non-consumptive rec. ☐ Other
iii. **Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?**
☐ **Yes** [Proceed to 14L (ii) and then 14L(iv).] ☒ **No** [Rate as low in 14L(iv)]

- iv. **Rating** (Use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

Ownership	Disturbance at AA from #12(i)		
	<input type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> High
Public ownership	--	--	--
Private ownership	--	--	.1(L)

Comments: _____

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	Low	0.00	1	
B. MT Natural Heritage Program Species Habitat	Low	0.00	1	
C. General Wildlife Habitat	Low	0.10	1	
D. General Fish/Aquatic Habitat	Low	0.10	1	
E. Flood Attenuation	Low	0.10	1	
F. Short and Long Term Surface Water Storage	Low	0.3	1	
G. Sediment/Nutrient/Toxicant Removal	Moderate	0.60	1	
H. Sediment/Shoreline Stabilization			--	
I. Production Export/Food Chain Support	Low	0.30	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Low	0.20	1	
L. Recreation/Education Potential	Low	0.10	1	
Totals:		<u>2.80</u>	<u>11.00</u>	
Percent of Total Possible Points:			<u>26%</u> (Actual / Possible) x 100 [rd to nearest whole #]	

<p>Category I Wetland: (Must satisfy one of the following criteria. If not proceed to Category II.)</p> <p><input type="checkbox"/> Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or</p> <p><input type="checkbox"/> Score of 1 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Score of 1 functional point for Flood Attenuation and answer to Question 14E(ii) is "yes"; or</p> <p><input type="checkbox"/> Percent of total Possible Points is > 80%.</p>
<p>Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following Category II criteria. If not satisfied, proceed to Category IV.)</p> <p><input type="checkbox"/> Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Wildlife Habitat; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Fish/Aquatic Habitat; or</p> <p><input type="checkbox"/> "High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish / Aquatic Habitat; or</p> <p><input type="checkbox"/> Score of .9 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Percent of total possible points is > 65%.</p>
<p><input type="checkbox"/> Category III Wetland: (Criteria for Categories I, II, or IV not satisfied.)</p>
<p>Category IV Wetland: (Criteria for Categories I or II are not satisfied and <u>all</u> of the following criteria are met; If not satisfied, proceed to Category III.)</p> <p><input checked="" type="checkbox"/> "Low" rating for Uniqueness; and</p> <p><input checked="" type="checkbox"/> "Low" rating for Production Export / Food Chain Support; and</p> <p><input checked="" type="checkbox"/> Percent of total possible points is < 30%.</p>

OVERALL ANALYSIS AREA (AA) RATING: (Check appropriate category based on the criteria outlined above.)

☐ **I**
☐ **II**
☐ **III**
☒ **IV**

Appendix C

REPRESENTATIVE PHOTOGRAPHS **2004 AERIAL PHOTOGRAPH**

MDT Wetland Mitigation Monitoring
Browns Gulch



Brown's Gulch Photo-point 1



Brown's Gulch Photo-point 3 and
Transect 1



Brown's Gulch Photo-point 4



Brown's Gulch Photo-point 2

Brown's Gulch 2004 Aerial Photograph



Appendix D

ENGINEERING DESIGN

*MDT Wetland Mitigation Monitoring
Browns Gulch
Rocker, Montana*

MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. STPS 276-1(3)1
GRADE, GRAVEL, PLANT MIX SURFACING

BROWN'S GULCH ROAD
SILVER BOW COUNTY

LENGTH 3.7 kilometers

SCALES

VERTICAL: 1:100
HORIZONTAL: 1:1000

CROSS SECTION - HORIZONTAL & VERTICAL: 1:100
REDUCED PRINTS APPROXIMATELY 1/2 ORIGINAL SCALE

DESIGN DATA

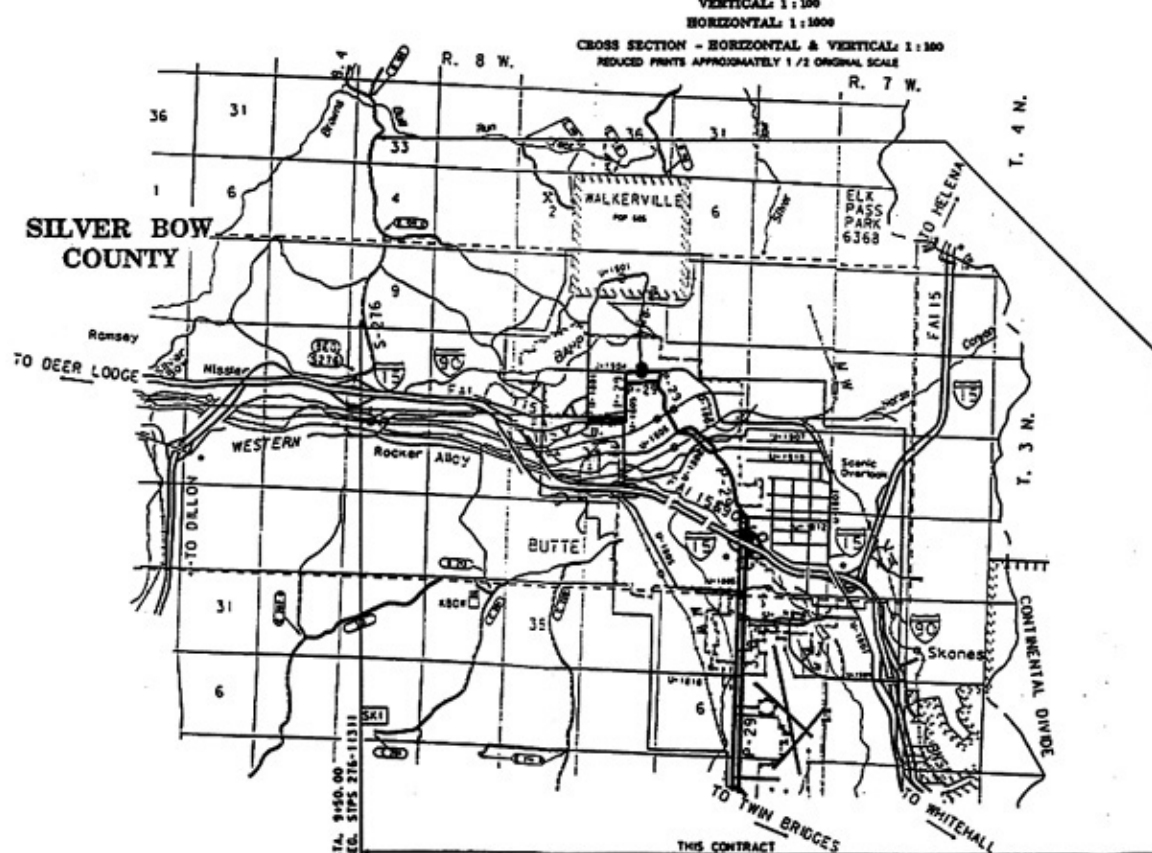
A.D.T. = 1900 - 400
A.D.T. = 2019 - 600
D.V.V. = 80
D. = 55-65%
T. = 12.5%
V. = 70 km/h
ALL TRUCKS = 62.5%
16 kg ESAL = 22.02 daily

LETTING DATE -

LAND & WATER D-1



THIS PROJECT



PLANS PREPARED BY

HCM ENGINEERING
200 NORTH ALASKA STREET
BUTTE, MONTANA 59701
(406) 223-4210

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS

HW	STPS 276-1(3)1
PA	STPS 276-1(3)1
CA	200
LC	

MONTANA DEPARTMENT OF TRANSPORTATION

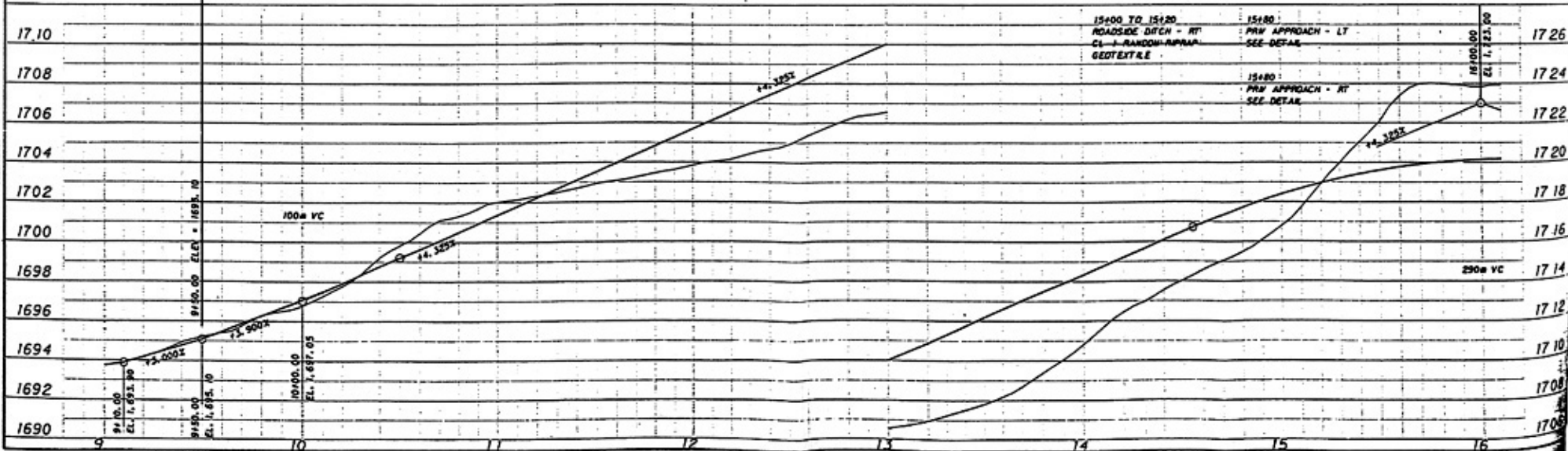
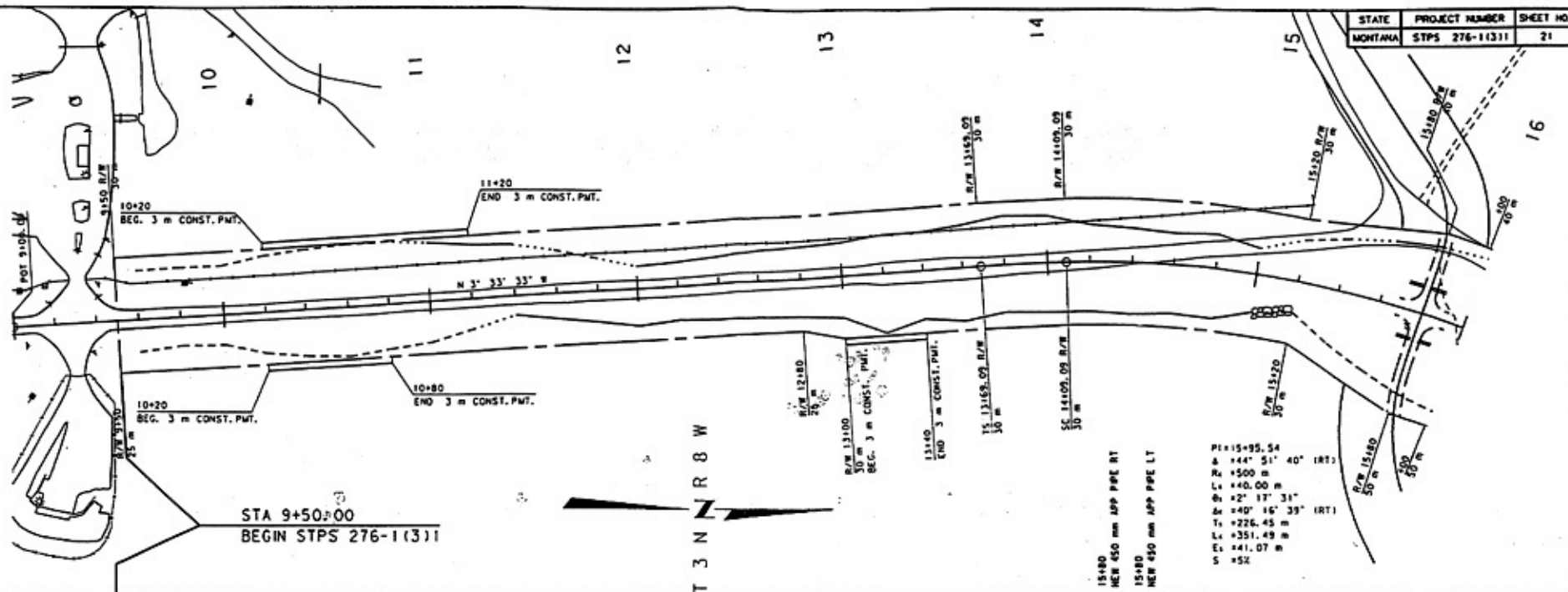
APPROVED: *July 20, 2022*
NATHAN DYE
DIRECTOR OF TRANSPORTATION
BY: *Carl S. Pal*
PRECONSTRUCTION ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED: _____
DIVISION ADMINISTRATOR DATE

THIS CONTRACT

STA. 48+20
END STPS 276-1(3)1

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPS 276-11311	21



15+00 TO 15+20
ROADSIDE DITCH - RT
CL - 3 RANDOM ASPHALT
GEOTEXTILE

15+80:
PRW APPROACH - LT
SEE DETAIL

15+80:
PRW APPROACH - RT
SEE DETAIL

17.10

17.08

17.06

17.04

17.02

17.00

16.98

16.96

16.94

16.92

16.90

17.26

17.24

17.22

17.20

17.18

17.16

17.14

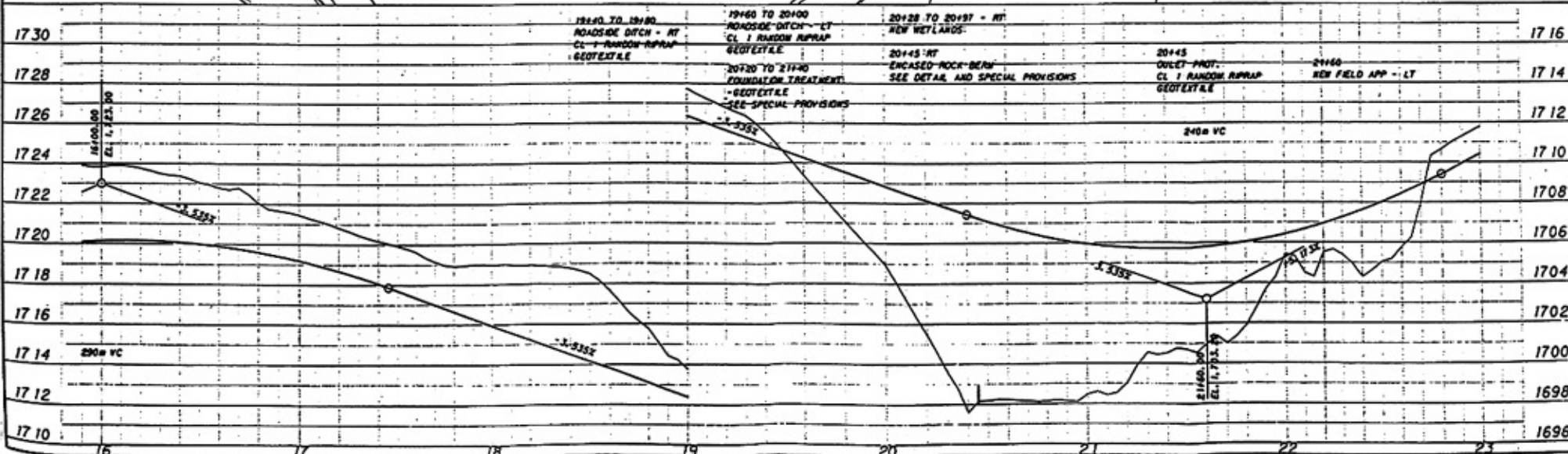
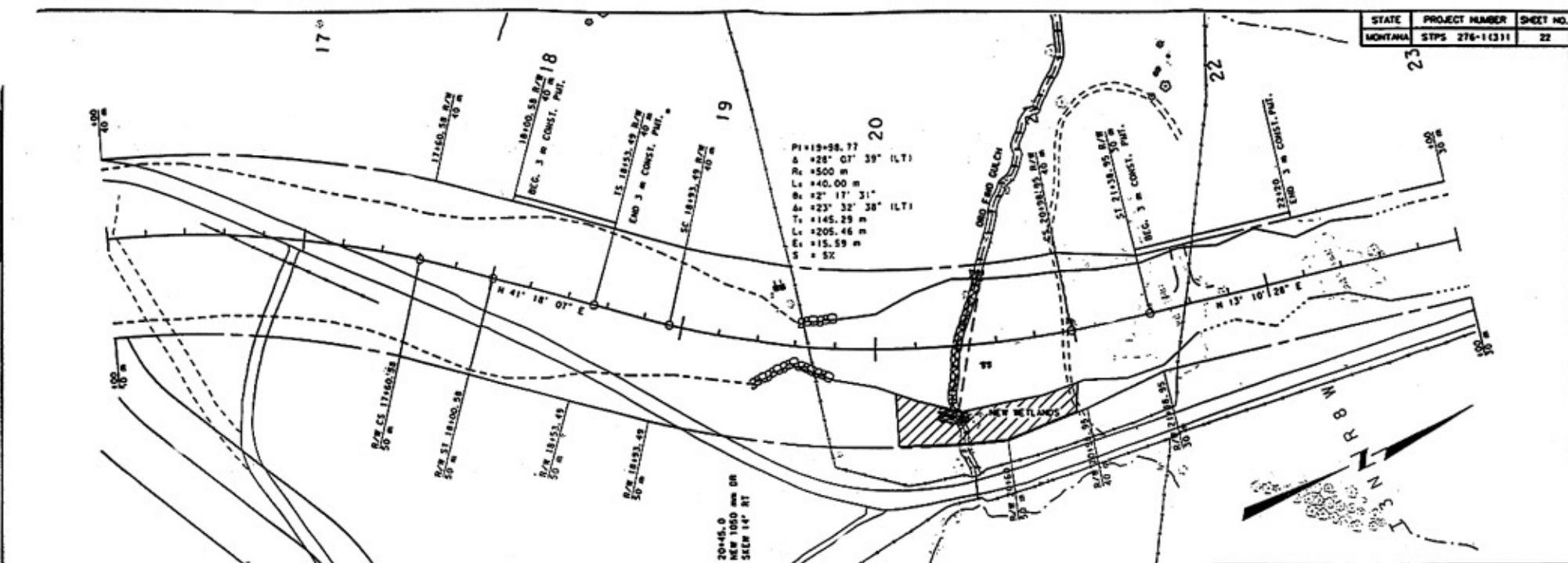
17.12

17.10

17.08

17.06

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPS 276-1(311)	22



Appendix E

BIRD SURVEY PROTOCOL GPS PROTOCOL

*MDT Wetland Mitigation Monitoring
Browns Gulch
Rocker, Montana*

BIRD SURVEY PROTOCOL

The following is an outline of the MDT Wetland Mitigation Site Monitoring Bird Survey Protocol. Though each site is vastly different, the bird survey data collection methods must be standardized to a certain degree to increase repeatability. An Area Search within a restricted time frame will be used to collect the following data: a bird species list, density, behavior, and habitat-type use. There will be some decisions that team members must make to fit the protocol to their particular site. Each of the following sections and the desired result describes the protocol established to reflect bird species use over time.

Species Use within the Mitigation Wetland: Survey Method

Result: To conduct a bird survey of the wetland mitigation site within a restricted period of time and the budget allotment.

Sites that can be circumambulated or walked throughout.

These types of sites will include ponds, enhanced historic river channels, wet meadows, and any area that can be surveyed from the entirety of its perimeter or walked throughout. If the wetland is not uncomfortably inundated, conduct several “meandering” transects through the site in an orderly fashion (record the number and approximate location/direction of the transects in the field notebook; they do not have to be formalized or staked). If a very small portion of the site cannot be crossed due to inundation, this method will also apply. Though the sizes of the site vary, each site will require surveying to the fullest extent possible within a set time limit. The optimum times to conduct the survey are in the morning hours. Conduct the survey from sunrise to no later than 11:00 AM. (Note: some sites may have to be surveyed in the late afternoon or evening due to time constraints or weather; if this is the case, record the time of day and include this information in your report discussion.) If the survey is completed before 11:00 AM and no additions are being made to the list, then the task is complete. The overall limiting factor regarding the number of hours that are spent conducting this survey is the number of budgeted hours; this determination must be made by site by each individual.

In many cases, binoculars will be the only instrument that is needed to identify and count the birds using the wetland. If the wetland includes deep water habitat that can not be assessed with binoculars, then a scope and tripod are necessary. If this is the case, establish as many lookout posts as necessary from key vantage points to collect the data. Depending on the size of the open water, more time may be spent viewing the mitigation area from these vantage points than is spent walking the peripheries of more shallow-water wetlands.

Sites that cannot be circumambulated.

These types of sites will include large-bodied waters, such as reservoirs, particularly those with deep water habitat (>6 ft) close to the shore and no wetland development in that area of the shoreline. If one area of the reservoir was graded in such a way to create or enhance the development of a wetland, then that will be the area in which the ambulatory bird survey is conducted. The team member must then determine the length of the shoreline that will be surveyed during each visit.

As stated above in the ambulatory site section, these large sites most likely will have to be surveyed from established vantage points.

Species Use within the Mitigation Wetland: Data Recording

Result: A complete list of bird species using the site, an estimate of bird densities and associated behaviors, and identification of habitat use.

1. Bird Species List

Record the bird species on the Bird Survey - Field Data Sheet using the appropriate 4-letter code of the common name. The coding uses the first two letters of the first two words of the birds' common name or if one name, the first four (4) letters. For example, mourning dove is coded MODO and mallard is MALL. If an unknown individual is observed, use the following protocol and define your abbreviation at the bottom of the field data sheet: unknown shorebird: UNSB; unknown brown bird (UNBR); unknown warbler (UNWA); unknown waterfowl (UNWF). For a flyover of a flock of unknown species, use a term that describes the birds' general characteristics and include the approximate flock size in parentheses; do not fill in the habitat column. For example, a flock of black, medium-sized birds could be coded: UNBB / FO (25). You may also note on the data sheet if that particular individual is using a constructed nest box.

2. Bird Density

In the office, sum the Bird Survey – Field Data Sheet data by species and by behavior. Record this data in the Bird Summary Table.

3. Bird Behavior

Bird behavior must be identified by what is known. When a species is simply observed, the behavior that it is immediately exhibiting is what is recorded. Only behaviors that have discreet descriptive terms should be used. The following terms are recommended: breeding pair individual (BP); foraging (F); flyover (FO); loafing (L; e.g. sleeping, roosting, floating with head tucked under wing are loafing behaviors); and, nesting (N). If more behaviors are observed that do have a specific descriptive word, use them and we will add it to the protocol; descriptive words or phrases such as “migrating” or “living on site” are unknown behaviors.

4. Bird Species Habitat Use

We are interested in what bird species are using which particular habitat within the mitigation wetlands. This data is easily collected by simply recording what habitat the species was initially observed. Use the following broad category habitat classifications: aquatic bed (AB - rooted floating, floating-leaved, or submergent vegetation); forested (FO); marsh (MA – cattail, bulrush, emergent vegetation, etc. with surface water); open water (OW – primarily unvegetated); scrub-shrub (SS); and upland buffer (UP); wet meadow (WM – sedges, rushes, grasses with little to no surface water). If other categories are observed onsite that are not suggested here, we will make a new category next year.

GPS Mapping and Aerial Photo Referencing Procedure

The wetland boundaries, photograph location points and sampling locations were field located with mapping grade Trimble Geo III GPS units. The data was collected with a minimum of three positions per feature using Course/Acquisition code. The collected data was then transferred to a PC and differentially corrected to the nearest operating Community Base Station. The corrected data was then exported to ACAD drawings in Montana State Plain Coordinates NAD 83 international feet.

The GPS positions collected and processed had a 68% accuracy of 7 feet except in isolated areas of Tasks .008 and .011, where it went to 12 feet. This is within the 1 to 5 meter range listed as the expected accuracy of the mapping grade Trimble GPS.

Aerial reference points were used to position the aerial photographs. This positioning did not remove the distortion inherent in all photos; this imagery is to be used as a visual aide only. The located wetland boundaries were given a final review by the wetland biologist and adjustments were made if necessary.

Any relationship of features located to easement or property lines are not to be construed from these figures. These relationships can only be determined with a survey by a licensed surveyor.