MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2001

Browns Gulch
Rocker, Montana

Prepared for:

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

Prepared by:

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

July 2002

Project No: 130091.012

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1.0 INTRODUCTION

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 on private land 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 to be 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 prior wetland delineation was conducted at this location where previously, a wetland occurred as a very narrow strip along Oro Fino Gulch Creek. The Corps of Engineers (COE) has approved allocation of 1:1 credit for wetland creation at this location. The site occurs entirely within the MDT right-of-way (ROW) and will not be developed (Urban pers. comm.). The entire site is fenced.

Prior to this report, no formal monitoring has been conducted by MDT. The Browns Gulch site will be monitored once per year over the 3-year contract period to document wetland and other biological attributes. The monitoring area is illustrated in **Figure 2** (**Appendix A**).

2.0 METHODS

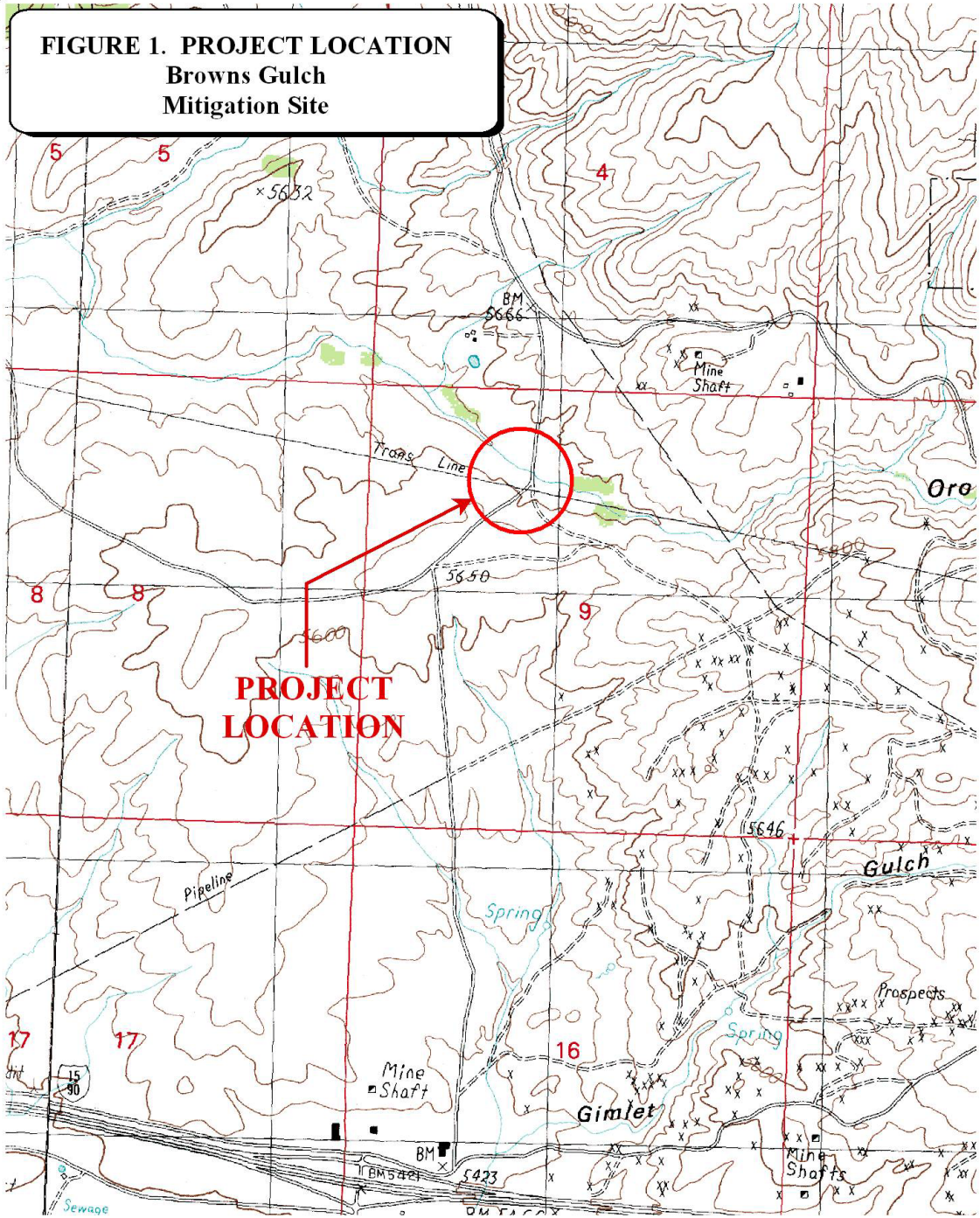
2.1 Monitoring Dates and Activities

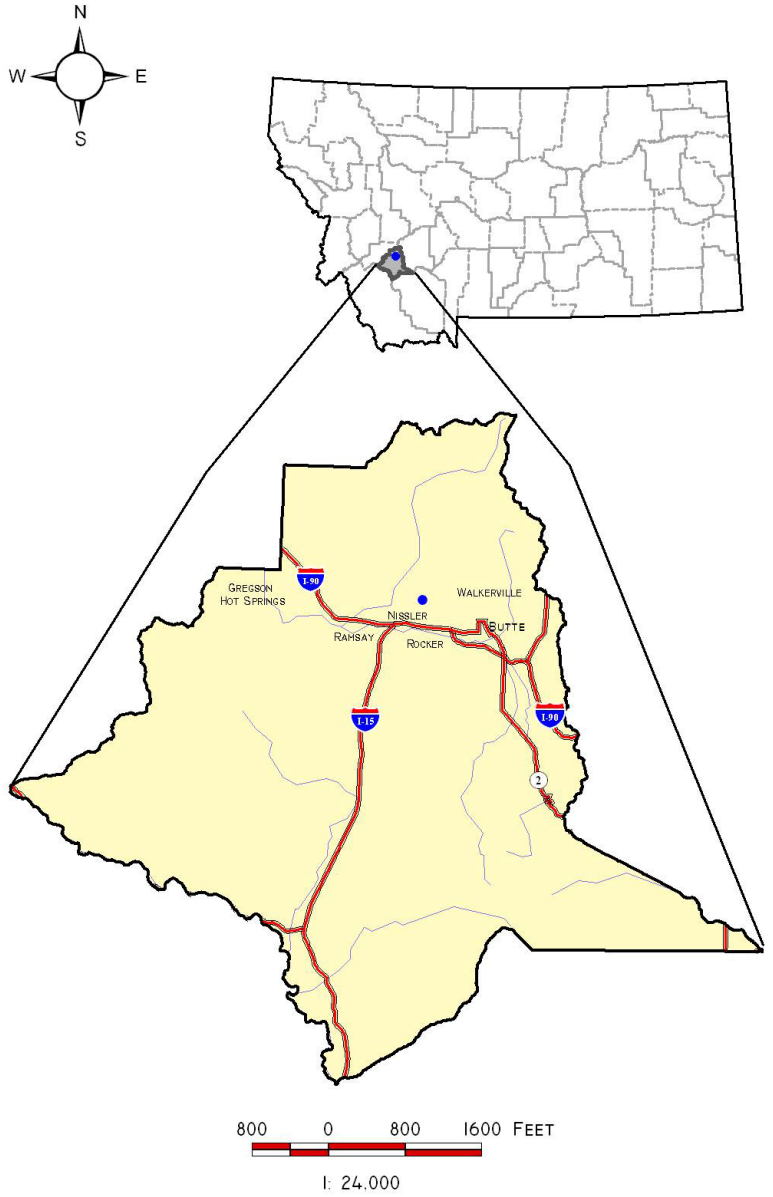
The site was visited on August 21, 2001(mid-season). This annual visit was conducted to document vegetation, soil, and hydrologic conditions used to map jurisdictional wetlands. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected at this time. Activities and information conducted/collected included: wetland delineation; vegetation community mapping; vegetation transects; soils data; hydrology data; bird and general wildlife use; photograph points; macroinvertebrate sampling; GPS data; 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





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

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. Observations from past years will ultimately be compared with new data.

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**). Observations from past years will be compared with new data.

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 was recorded at the site and the functional assessment completed in the office. No pre-project functional assessment was made 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. The approximate location of photo points is shown on **Figure 2**, **Appendix A**. All photographs were taken using a 50 mm lens. 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. 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 August 2001 monitoring date either in Oro Fino Gulch Creek or in the adjacent constructed wetland area. Inundation was observed throughout the constructed wetland area during an informal drive-by in early June and Oro Fino Gulch Creek was flowing. Groundwater was observed on August 21 within 14 inches of the surface and saturated soil within 12 inches as documented on the Routine Wetland Determination form (**Appendix B**).

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) and 2001 (10.39 inches) were 67 and 81 percent, respectively, of the total annual mean precipitation (12.84 inches) in this area. Hydrologic conditions must be considered within this climatic context. No open water was present at this site.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the attached data forms. Two wetland community types were identified and mapped at the mitigation area (**Figure 3**, **Appendix A**). Upland areas were also mapped. The two wetland community types include 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**).

Type 1 is the most common wetland community type and occurs in the newly developing wetland area. This type is dominated by young *Salix exigua* and other disturbance species that are establishing under the newly created wetland conditions. 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 *Salix boothii* that existed prior to this project.

The surrounding landscape is dominated by sagebrush/grassland rangeland. Common species include *Artemesia tridentate-vaseyana*, *Chrysothamnus nauseosus*, *Festuca idahoensis*, *Agropyron spicatum* and others. Most of the area immediately surrounding the mitigation site has been disturbed by road widening or other construction activities. The vegetation on these disturbed areas is a mixture of planted grasses and weedy species including noxious weeds. There is a significant amount of bare ground where plants have yet to establish. Common species include *Centaurea maculosa*, *Linaria vulgaris*, *Verbascum thapsus*, *Agropyron trachycaulum* and others.

Vegetation transect results are detailed in the attached data form, and are summarized graphically below.

Start	*Type 1 - Disturbed Upland (50')*	*Type 2 - Agrostis/Salix (25')*	Total: 75'	End

Table 1: ***2001 Browns Gulch Vegetation Species List***

Scientific Name	Common Name	Region 9 (Northwest) Wetland Indicator
Achillea millefolium	Common Yarrow	FACU
Agropyron intermedium	Intermediate Wheatgrass	--
Agropyron repens	Quackgrass	FACU
Agropyron smithii	Western Wheatgrass	FACU
Agropyron trachycaulum	Slender Wheatgrass	FAC
Agrostis alba	Redtop	FAC
Artemisia dracunculus	Wild Tarragon	--
Artemisia tridentata	Big Sagebrush	--
Carex nebrascensis	Nebraska Sedge	OBL
Centaurea maculosa	Spotted Knapweed	--
Chenopodium album	White Goosefoot	FAC
Chrysothamnus nauseosus	Rabbitbrush	--
Cirsium arvense	Canadian Thistle	FACU+-
Eleocharis palustris	Creeping Spikerush	OBL
Elymus spp.	Wildrye	--
Festuca ovina	Sheep Fescue	FACU
Grindelia squarrosa	Curly-cup Gumweed	FACU
Juncus balticus	Baltic rush	FACW+
Juniperus scopulorum	Rocky Mountain Juniper	--
Kochia scoparia	Summer Cypress	FAC
Lepidium perfoliatum	Clasping Pepper Grass	FACU+
Linaria vulgaris	Butter and Eggs	--
Melilotus officinalis	Yellow Sweetclover	FACU
Mentha arvensis	Field Mint	FACW-
Montia perfoliata	Miner's Lettuce	--
Phalaris arundinacea	Reed Canary Grass	FACW
Poa pratensis	Kentucky Bluegrass	FAC
Polygonum spp.	Knotweed	--
Potentilla anserina	Silverweed	OBL
Rosa woodsii	Woods Rose	FACU
Rumex crispus	Curly Dock	FAC+
Salix boothii	Booth's Willow	OBL
Salix exigua	Sandbar Willow	OBL
Salsola iberica	Russian Thistle	--
Sisymbrium altissimum	Tumble Mustard	FACU-
Solidago missouriensis	Missouri Goldenrod	--
Typha latifolia	Broadleaf Cattail	OBL
Verbascum thapsus	Common Mullein	--

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 12 inches of the surface across most of the area delineated as wetland.

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3**. Completed wetland delineation forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. Approximately 0.17 wetland acres have been created on the mitigation site to date. Additional area may form with time and more normal precipitation around the low gradient portions of the current wetland area. No pre-existing wetlands were delineated by MDT 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 2001 monitoring efforts are listed in **Table 2**. Specific evidence observed, as well as activity codes pertaining to birds, are provided on the completed monitoring form in **Appendix B**. Evidence of two mammal and three 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 2: ***Wildlife Species Observed on the Browns Gulch Mitigation Site***

BIRDS
Brown-headed Cowbird (*Molothrus ater*) Canada Goose (*Branta Canadensis*) Western Meadowlark (*Sturnella neglecta*)
MAMMALS
Coyote (*Canis latrans*) White-tailed Deer (*Odocoileus virginianus*)

3.6 Macroinvertebrates

No macroinvertebrate samples were taken at this site.

3.7 Functional Assessment

A completed functional assessment form is included in **Appendix B**. The overall assessment area result for functional points was 25% making this a Class IV wetland under current conditions.

3.8 Photographs

Representative photographs taken from photo-points and transect ends are in **Appendix C**.

3.9 Maintenance Needs/Recommendations

Erosion is carrying 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. It is likely that additional acreage will form with additional time and more normal precipitation.

4.0 REFERENCES

Carlson, J. Program Zoologist, Montana Natural Heritage Program. Helena, MT. April 2001 conversation.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual.* US Army Corps of Engineers. Washington, DC.

Ralph, C.J., Geupel, G.R., Pyle, P., Martin, T.E., and D.F. DeSante. 1993. *Handbook of field methods for monitoring landbirds*. Gen. Tech. Rep. PSW-GTR-144. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Dept. of Agriculture. 41 p.

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, D.C.

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U.S. Army Corps of Engineers. 2001. December 6, 2001 letter from Allan Steinle to Jeff Stutzman (Musgrave Lake Ranch LLC) regarding Milk River Wetland Mitigation Project – Corps File # 2000-90-331. Helena, MT.

USDA Natural Resources Conservation Service. 1998. *Field Indicators of Hydric Soils in the United States*, Version 4. G. Hurt, P. Whited and R. Pringle (eds.). USDA, NRCS Fort Worth, TX.

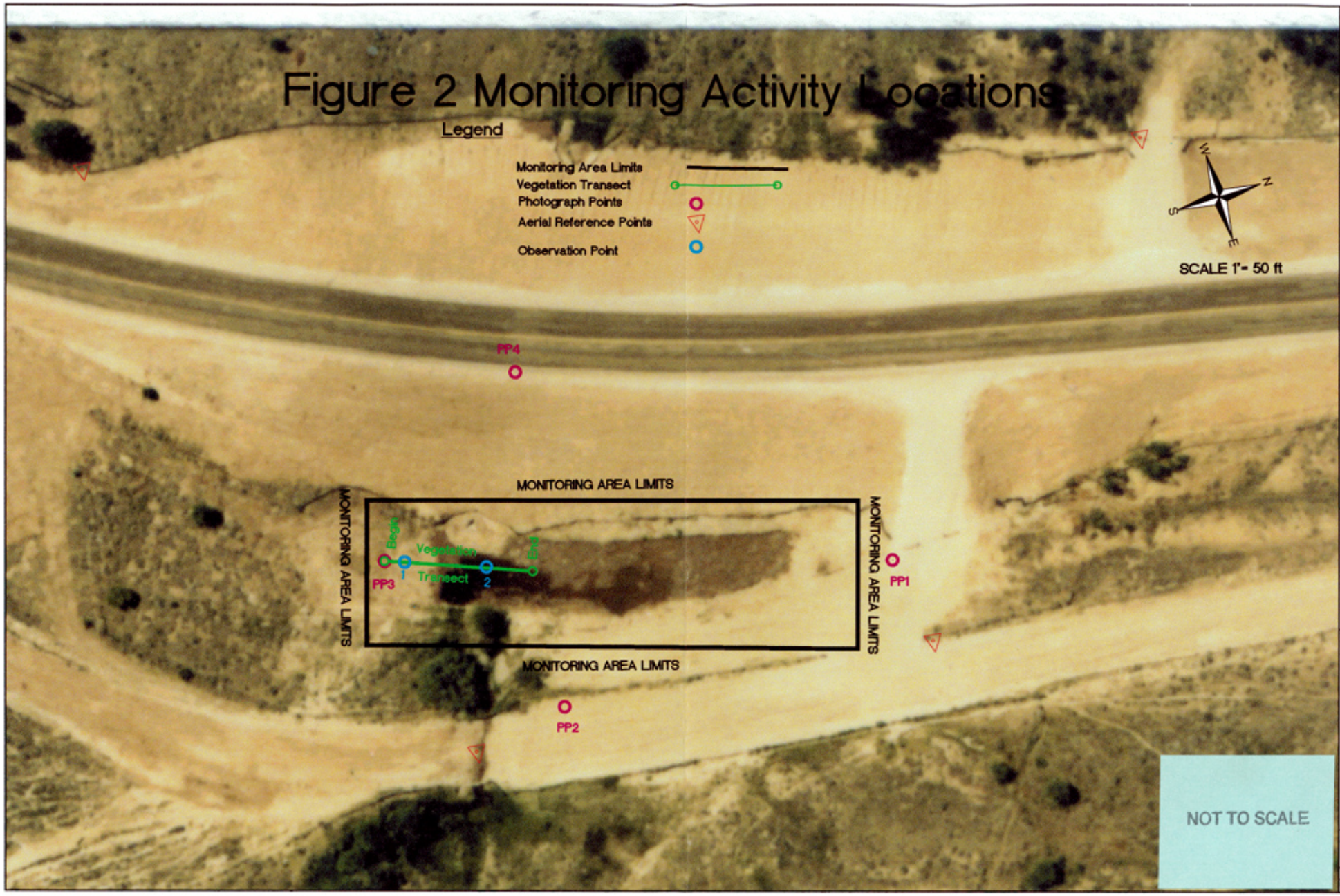
Appendix A

FIGURES 2 - 3

MDT Wetland Mitigation Monitoring
Browns Gulch
Rocker, Montana

LAND & WATER

Figure 2 Monitoring Activity Locations



PROJECT NAME: MDT Brown's Gulch Wetland Mitigation
DRAWING TITLE: Monitoring Activity Locations

PROJ. NO: 130091.012
FILE NAME: TASK12BASE.dwg
SCALE: 1"= 50 ft.
LOCATION: BROWN'S GULCH

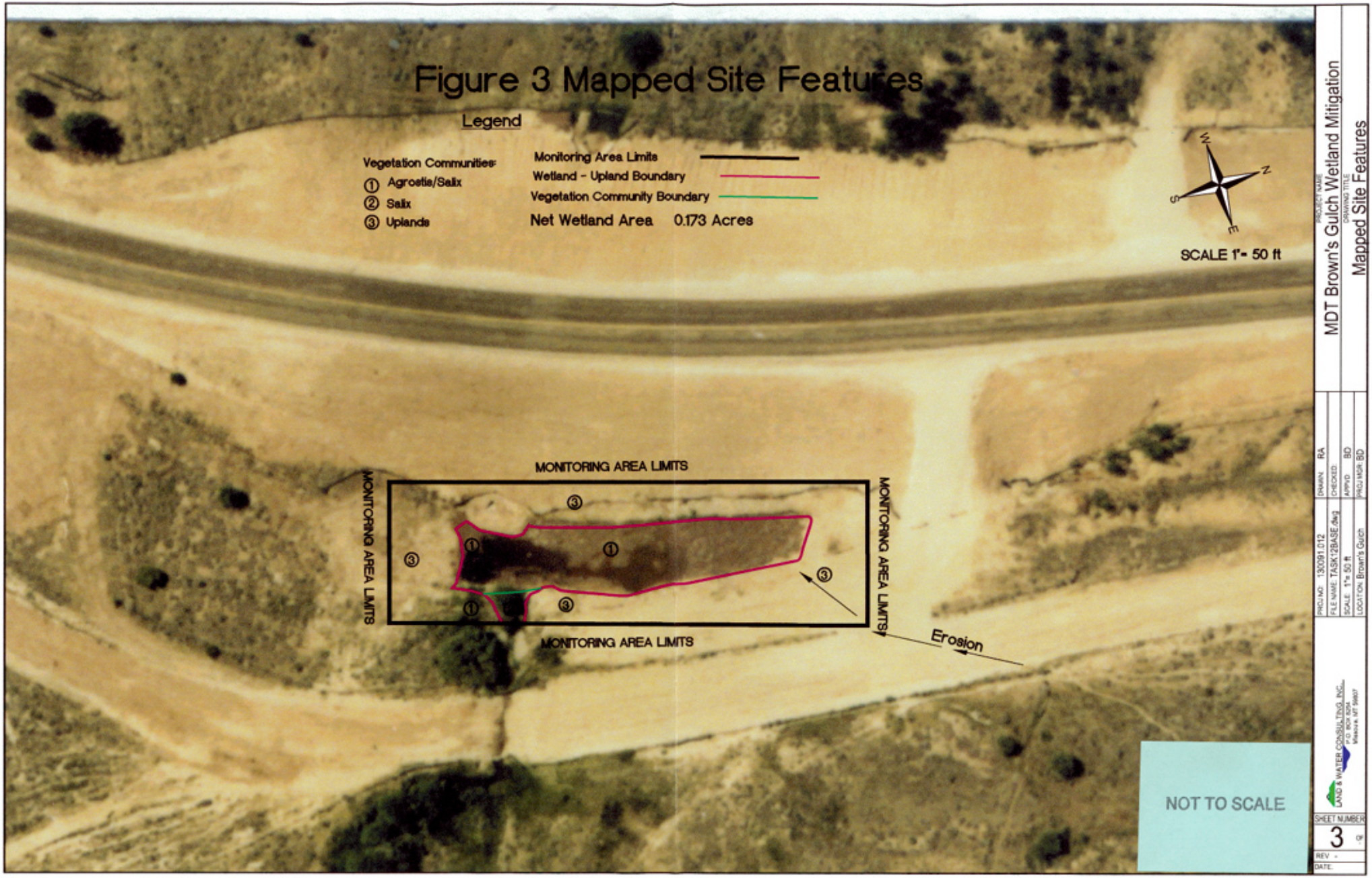
DRAWN: RA
CHECKED:
APPVD: BD
PROJ MGR: BD

LAND & WATER CONSULTING, INC.
P.O. BOX 4254
Missoula, MT 59807

SHEET NUMBER
2

REV: -
DATE: 12-11-01

Figure 3 Mapped Site Features



PROJECT NAME: MDT Brown's Gulch Wetland Mitigation
DRAWING TITLE: Mapped Site Features

PROJ.NO: 130091.012 | DRAWN: RA
FILE NAME: TASK12BASE.dwg | CHECKED:
SCALE: 1"= 50 ft | APPV'D: BD
LOCATION: Brown's Gulch | PROJ MGR: BD

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Missoula, MT 59807

SHEET NUMBER: 3
REV: -
DATE:

Appendix B

COMPLETED 2001 WETLAND MITIGATION SITE MONITORING FORM
COMPLETED 2001 BIRD SURVEY FORM
COMPLETED 2001 WETLAND DELINEATION FORMS
COMPLETED 2001 FUNCTIONAL ASSESSMENT FORM

MDT Wetland Mitigation Monitoring
Browns Gulch
Rocker, Montana

LAND & WATER

DRAFT - MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Browns Gulch Project Number: Task 12 Assessment Date: 8/21/01
Location: East of Rocker MDT District: Butte Milepost: ____
Legal description: T 3N R 8W Section 9 Time of Day: 7AM-3PM
Weather Conditions: clear Person(s) conducting the assessment: BD
Initial Evaluation Date: 7/21/01 Visit #: 1 Monitoring Year: 2001
Size of evaluation area: <1 acres Land use surrounding wetland: Highway, rangelands

HYDROLOGY

Surface Water

Inundation: Present X Absent ____ Average depths: .5 ft Range of depths: .1 - 1 ft (just stream channel)
Assessment area under inundation: 1 %
Depth at emergent vegetation-open water boundary: ____ ft NA - no open water
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 in mid-August except in stream channel (< 2 feet wide). Surface water/inundation was observed during drive-by visit in early June.

COMPREHENSIVE VEG ETATION LIST

LAND & WATER B-2

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
POA PRA	1, 2, UP	AGRSMI	UP
HORJUB	1, 2, UP	SALIBE russian thistle	UP
SAL EXI	1	AGRREP	1, UP
SAL BOO	2		
ELE PAL	1, 2		
SIS ALT	1, UP		
VERTHA	1		
MELOFF	1		
PHAARU	1		
MENARV	1, 2		
ARTDRA Tarragon	1, UP		
GRISQU curlycup gumweed	1		
AGR ALB	1, UP		
CARNEB	1		
POYGON	1		
TYP LAT	1		
RUM CRI	1		
POT ANS	1		
CIR ARV	1		
JUN SCO	1		
JUN BAL	1, UP		
CHEBER lambsquarters	1		
MONTPER miners lettuce	1		
CENMAC	1, UP		
AGRTRA	1, UP		
FESOVI sheep fescue	UP		
ELYMUS introduced ryegrass	UP		
LEPPER yellow pepperweed	UP		
ARTTRI	UP		
SOLMIS	UP		
AGRINT	UP		
CHRNAU	UP		
LIN VUL	UP, 1		
ROSWOO	1, UP		
ACH MIL	1		

COMMENTS/PROBLEMS: Few heads on grasses, especially upland planted.

VEGETATION COMMUNITIES

LAND & WATER B-3

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

Dominant Species	% Cover	Dominant Species	% Cover
AGRALB	20		
POA PRA	20		
SALEXI	10		
ELEPAL	5		

COMMENTS/P ROBLEMS: _____

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

Dominant Species	% Cover	Dominant Species	% Cover
SALBOO	90		
AGRALB	T		
POA PRA	T		

COMMENTS/P ROBLEMS: _____

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

Dominant Species	% Cover	Dominant Species	% Cover
AGRTRA	20		
CENMAC	10		
KOCSCO	5		

COMMENTS/P ROBLEMS: _____

Additional Activities Checklist:

_x_ Record and map v egetative communities on air photo

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Browns Gulch Date: _____ Examiner: _____ Transect # 1

Approx. transect length: _____ Compass Direction from Start (Upland): _____

Vegetation type 1:	Upland - Disturbed	
Length of transect in this type:	50	feet
Species:		Cover: %
AGRTRA		20
ARTTRI		10
CENMAC		10
AGRALB		1-5
HORJUB		1-5
POA PRA		T
CHRNAU		T
Total Vegetative Cover:		70%

Vegetation type 2:	Agrostis/Salix	
Length of transect in this type:	25	feet
Species:		Cover:
AGRALB		20
SALEXI		10
POA PRA		10
HORJUB		5
ELE PAL		10
TYP LAT		T
JUN BAL		10
POTANS		1-5
Total Vegetative Cover:		80%

Vegetation type 3:		
Length of transect in this type:		feet
Species:		Cover: %
Total Vegetative Cover:		

Vegetation type 4:		
Length of transect in this type:		feet
Species:		Cover:
Total Vegetative Cover:		

PLANTED WOODY V EGETATION SURVIVAL

LAND & WATER B-5

Species	Number Originally Planted	Number Observed	Mortality Causes
SALIXX (SALEXI?)	120	50	planting shock, drought ?

COMMENTS/P ROBLEMS:

About 50% of the visible stems are dead.

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate

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

3/01 rev

WILDLIFE

LAND & WATER B-7

BIRDS

Species	Number Observed	Nesting or Breeding Activity	Likely Breeding Resident	Likely Migrating	Species	Number Observed	Nesting or Breeding Activity	Likely Breeding Resident	Likely Migrating

Were man made nesting structures installed? Yes____ No____Type:_____ How many?_____ Are the nesting structures being utilized? Yes____ No____ Do the nesting structures need repairs? Yes____ No____

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
Deer	0	X	X		
Coyote	0	X			

Additional Activities Checklist:

_____Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: _____

\\mslx02\Resource Analysis\Current Projects\130091 MDT Wetlands\General Technical\MDT Monitoring Form.doc

WETLAND DELINEA TION

At each site conduc t the items on the checklist bel ow:

__X__ Delineate wetlands according to the 1987 Army Corps manual.
__X__ Delineate w etland-upland boundar y on the air photo
__X__ Survey wetland-upland boundar y with a resource grade GPS survey

COMMENTS/P ROBLEMS: Forms attached

FUNCTIONAL ASSES SMENT

Complete J eff's abbreviated MDT F unction and Values Assessment field fo rm. X

MAINTENANCE

Were man-mad e 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-mad e structures build or installed to im pound water or control water flow into or out of th e wetland?
YES__X__ NO____
If yes, are the structures working properly and in good working order? YES__X__ NO___
If no, describe the proble ms below.

COMMENTS/P ROBLEMS: Erosion is transporting sediment into the northeast corner of the wetland from adjacent roadway. Not a large amount so far but could be significant over time and should be remedied. (See Figure 2)

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 Photopoints	Photo Frame #	Photograph Description	Compass Reading
# 1		Wetland overview looking south from north of AA	200°
# 2		Panorama from south to west to north	220 - 20
# 3		Overview from south end of transect looking north	20°
# 4		Panorama from north to east to south	30 - 160°
E			
F			
G			
H			

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: _____

BIRD SURVEY – Field Data Sheet
SITE: Browns Gulch

Page 1 of 1
Date: 8/21/01
Survey Time: 7:15AM – 3:30PM

Bird Species	Behavior	Habitat Type
Canada geese – 2	FO	
Cowbirds – 3	F	SS
Meadowlark – 1	L	UP

Bird Species	Behavior	Habitat Type

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

2/02 sma

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

Project/Site: Browns Gulch Mitigation Site Applicant/Owner: MDT Investigator: B. Dutton	Date: 8-21-01 County: Silverbow State: MT
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Upland Transect ID: 1 Plot ID: 1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. AGRTRA	H	NI	9.		
2. ARTTRI	S	NI	10.		
3. CENMAC	H	NI	11.		
4. AGRALB	H	FACW	12.		
5. HORJUB	H	FAC+	13.		
6. POAPRA	H	FAC	14.		
7. CHRNAU	S	NI	15.		
8.			16.		

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

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	0 (in.)
Depth to Free Water in Pit:	>18 (in.)
Depth to Saturated Soil:	>18 (in.)

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)

Remarks: Dry hillside above wetland.

SOILS

Map Unit Name (Series and Phase): NA

Drainage Class: _____

Taxonomy (Subgroup): _____

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	7.5YR 3/3	none	—	
2-18	B	7.5YR 4/3	none	—	

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic 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 Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Not hydric.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (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: Browns Gulch Mitigation Site
Applicant/Owner: MDT
Investigator: B. Dutton

Date: 8-21-01
County: Silver Bow
State: MT

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on reverse.)

Community ID: Emergent
Transect ID: 1
Plot ID: 2

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. AGRALB	H	FACW
2. POAPRA	H	FAC
3. JUNBAL	H	FACW+
4. ELEPAL	H	OBL
5.		
6.		
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

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

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:
Depth of Surface Water: — (in.)
Depth to Free Water in Pit: 14 (in.)
Depth to Saturated Soil: 12 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
X Saturated in Upper 12 Inches
X Water Marks
X Drift Lines
X Sediment Deposits
X 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)

Remarks:

SOILS

Map Unit Name (Series and Phase): NA

Drainage Class: _____

Taxonomy (Subgroup): _____

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	10YR 3/2			
2-16	BC	10YR 2/0 + 10YR 3/2	10YR 5/8	Few/faint	

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- X Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks: Wetland area at north end of transect.

Approved by HQUSACE 2/92

MDT Montana Wetland Assessment Form (revised 5/25/1999)

1. Project Name: Browns Gulch Mitigation Site 2. Project #: _____ Control #: _____

3. Evaluation Date: Mo. 8 Day 21 Yr. 01 4. Evaluator(s): B. Outton 5. Wetlands/Site #(s) 1

6. Wetland Location(s): i. Legal: T 3 (N) or S; R 8 E or (W); S 9 ; T ___ N or S; R ___ E or W; S ___ ;
ii. Approx. Stationing or Mileposts: _____

iii. Watershed: 17010201 GPS Reference No. (if applies): _____
Other Location Information:

7. a. Evaluating Agency: MDT ;
b. Purpose of Evaluation:
1. ____ Wetlands potentially affected by MDT project
2. ____ Mitigation wetlands; pre-construction
3. X Mitigation wetlands; post-construction
4. ____ Other

8. Wetland size: (total acres) _____ (visually estimated)
0.17 (measured, e.g. by GPS [if applies])

9. Assessment area: (AA, tot., ac., see instructions on determining AA) _____ (visually estimated)
0.17 (measured, e.g. by GPS [if applies])

10. Classification of Wetland and Aquatic Habitats in AA (HGM according to Brinson, first col.; USFWS according to Cowardin [1979], remaining cols.)

HGM Class	System	Subsystem	Class	Water Regime	Modifier	% of AA
Riverine	Riverine	Upper Perennial	US	F	E	95
Riverine	Riverine	Intermittent	SB	G		5

(Abbreviations: **System:** Palustrine(P)/ **Subsyst.:** none/ **Classes:** Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO)/ **System:** Lacustrine (L)/ **Subsyst.:** Limnetic (2)/ **Classes:** RB, UB, AB/ **Subsystem:** Littoral (4)/ **Classes:** RB, UB, AB, US, EM/ **System:** Riverine (R)/ **Subsyst.:** Lower Perennial (2)/ **Classes:** RB, UB, AB, US, EM/ **Subsystem:** Upper Perennial (3)/ **Classes:** RB, UB, AB, US/ **Water Regimes:** Permanently Flooded (H), Intermittently Exposed (G), Semipermanently Flooded (F), Seasonally Flooded (C), Saturated (B), Temporarily Flooded (A), Intermittently Flooded (J) **Modifiers:** Excavated (E), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A) **HGM Classes:** Riverine, Depressional, Slope, Mineral Soil Flats, Organic Soil Flats, Lacustrine Fringe

11. Estimated relative abundance: (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
(Circle one) Unknown Rare (Common) Abundant
Comments:

12. General condition of AA:
i. Regarding disturbance: (use matrix below to determine [circle] appropriate response)

Conditions within AA	*Predominant conditions adjacent to (within 500 feet of) 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 natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings.	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but 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.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	high disturbance	high disturbance	(high disturbance)

Comments: (types of disturbance, intensity, season, etc.): Construction, roads
ii. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) CENMAC, LINVUL, MELOFF, LEPPER (pepperweed), CHEBER (lambsquarter), GRISQU (gumweed), VERTHA (mullein)
iii. Provide brief descriptive summary of 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 number of "Cowardin" *vegetated* classes present [do not include unvegetated classes], see #10 above)

# of "Cowardin" vegetated classes present in AA (see #10)	≥ 3 vegetated classes (or ≥ 2 if one is forested)	2 vegetated classes (or 1 if forested)	≤ 1 vegetated class
Rating (circle)	High	(Moderate)	Low

Comments:

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 (circle 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	D (S)	_____

II. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus/primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.9 (H)	.8 (M)	.7 (M)	.5 (L)	.3 (L)	0 (L)

Sources for documented use (e.g. observations, records, etc):

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 (circle 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	D (S)	_____

II. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus/primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.8 (H)	.7 (M)	.6 (M)	.2 (L)	.1 (L)	0 (L)

Sources for documented use (e.g. observations, records, etc.):

14C. General Wildlife Habitat Rating:

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

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

Low (based on any of the following [check]):
- X few or no wildlife observations during peak use periods
- X little to no wildlife sign
- X 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, circle appropriate AA attributes in matrix to arrive at 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 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 [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	High	Moderate	Low
Substantial	1 (E)	.9 (H)	.8 (H)	.7 (M)
Moderate	.9 (H)	.7 (M)	.5 (M)	.3 (L)
Minimal	.6 (M)	.4 (M)	.2 (L)	(.1 (L))

Comments:

14D. General Fish/Aquatic 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 or was not historically used by fish due to lack of habitat, excessive gradient, etc., circle **NA** here and proceed to the next function. If fish use occurs in the AA but is not desired from a resource management perspective [such as fish use within an irrigation canal], then Habitat Quality [i below] should be marked as "Low", applied accordingly in ii below, and noted ih the comments.)

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

Duration of surface water in AA	Permanent / Perennial			Seasonal / Intermittent			Temporary / Ephemeral		
Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.	>25%	10–25%	<10%	>25%	10–25%	<10%	>25%	10–25%	<10%
Shading - **>75%** of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities	E	E	H	H	H	M	M	M	M
Shading – **50 to 75%** of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	H	M	M	M	M	M	L	L
Shading - **< 50%** of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	M	M	M	L	L	L	L	L

ii. **Modified Habitat Quality** (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E = H, H = M, M = L, L = L]). *Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity* **or** *is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support?* Y (N) Modified habitat quality rating = (circle) **E** **H** **M** (L)

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Types of fish known or suspected within AA	*Modified Habitat Quality (ii)*			
	Exceptional	High	Moderate	Low
Native game fish	1 (E)	.9 (H)	.7 (M)	.5 (M)
Introduced game fish	.9 (H)	.8 (H)	.6 (M)	.4 (M)
Non-game fish	.7 (M)	.6 (M)	.5 (M)	.3 (L)
No fish	.5 (M)	.3 (L)	.2 (L)	.1 (L)

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, circle **NA** here and proceed to next function.)

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

Estimated wetland area in AA subject to periodic flooding	≥ 10 acres			<10, >2 acres			≤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**	1(H)	.9(H)	.6(M)	.8(H)	.7(H)	.5(M)	.4(M)	.3(L)	.2(L)
AA contains **unrestricted outlet**	.9(H)	.8(H)	.5(M)	.7(H)	.6(M)	.4(M)	.3(L)	.2(L)	.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 (circle)? Y (N)
Comments:

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

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. 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			<5, >1 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**	1(H)	.9(H)	.8(H)	.8(H)	.6(M)	.5(M)	.4(M)	.3(L)	.2(L)
Wetlands in AA flood or pond **< 5 out of 10 years**	.9(H)	.8(H)	.7(M)	.7(M)	.5(M)	.4(M)	.3(L)	.2(L)	.1(L)

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (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, circle **NA** here and proceed with the evaluation.)

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with 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 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 or ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1 (H)	.8 (H)	.7 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)	.2 (L)
AA contains **unrestricted outlet**	.9 (H)	.7 (M)	.6 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)	.1 (L)

Comments:

14H Sediment/Shoreline Stabilization: (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 which is subject to wave action. If does not apply, circle **NA** here and proceed to next function)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses	*Duration of surface water adjacent to rooted vegetation*		
	permanent / perennial	seasonal / intermittent	Temporary / ephemeral
≥ 65%	1 (H)	.9 (H)	.7 (M)
35-64%	.7 (M)	.6 (M)	.5 (M)
< 35%	.3 (L)	.2 (L)	.1 (L)

Comments:

14I. Production Export/Food Chain Support:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = structural diversity rating from #13; 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 = permanent/perennial; S/I = seasonal/intermittent; T/E /A= temporary/ephemeral or 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	1H	.9H	.9H	.8H	.8H	.7M	.9H	.8H	.8H	.7M	.7M	.6M	.7M	.6M	.6M	.4M	.4M	.3L
S/I	.9H	.8H	.8H	.7M	.7M	.6M	.8H	.7M	.7M	.6M	.6M	.5M	.6M	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.7M	.7M	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L

Comments:

14J. Groundwater Discharge/Recharge: (Check the indicators in i & ii below that apply to the AA)

i. Discharge Indicators

- X Springs are known or observed
- X 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 present without underlying impeding layer
- ___Wetland contains inlet but no outlet
- ___Other

iii. Rating: Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H = high, L = low] for this function.

Criteria	*Functional Points and Rating*
AA is known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	.1 (L)
Available Discharge/Recharge information inadequate to rate AA D/R potential	N/A (Unknown)

Comments:

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] 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 MNHP			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MNHP			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)	1 (H)	.9 (H)	.8 (H)	.8 (H)	.6 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)
Moderate disturbance at AA (#12i)	.9 (H)	.8 (H)	.7 (M)	.7 (M)	.5 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)
High disturbance at AA (#12i)	.8 (H)	.7 (M)	.6 (M)	.6 (M)	.4 (M)	.3 (L)	.3 (L)	.2 (L)	.1 (L)

Comments:

14L. Recreation/Education Potential: i. Is the AA a known rec./ed. site: (circle) Y N (If yes, rate as [circle] High [1] and go to ii; if no go to 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 strong potential for rec./ed. use? Y N

(If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

iv. Rating (use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Ownership	*Disturbance at AA (#12i)*		
	low	moderate	high
public ownership	1 (H)	.5 (M)	.2 (L)
private ownership	.7 (M)	.3 (L)	.1 (L)

Comments:

FUNCTION & VALUE SUMMARY & OVERALL RATING

Function & 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	1	
B. MT Natural Heritage Program Species Habitat	Low	0	1	
C. General Wildlife Habitat	Low	.1	1	
D. General Fish/Aquatic Habitat	Low	.1	1	
E. Flood Attenuation	Low	.1	1	
F. Short and Long Term Surface Water Storage	Low	.3	1	
G. Sediment/Nutrient/Toxicant Removal	Moderate	.6	1	
H. Sediment/Shoreline Stabilization	NA			
I. Production Export/Food Chain Support	Low	.3	1	
J. Groundwater Discharge/Recharge	High	1	1	
K. Uniqueness	Low	.2	1	
L. Recreation/Education Potential	Low	.1	1	
Totals:		2.8	11	
		(.26)		

OVERALL ANALYSIS AREA (AA) RATING: (Circle appropriate category based on the criteria outlined below) I II III (IV)

Category I Wetland: (Must satisfy one of the following criteria; if does not meet criteria, 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**
- ___ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go to Category IV)
- ___ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
- ___ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ___ Score of .9 or 1 functional point for General Fish/Aquatic 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**
- ___ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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; if does not satisfy criteria go to Category III)
- X "Low" rating for Uniqueness; **and**
- X "Low" rating for Production Export/Food Chain Support; **and**
- X Total actual functional points < 30% (round to nearest whole #) of total possible functional points

Appendix C

REPRESENTATIVE PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Browns Gulch
Rocker, Montana

LAND & WATER

Brown's Gulch Photo-point 1

Brown's Gulch Photo-point 3 and Transect 1

Brown's Gulch Photo-point 2

Brown's Gulch Photo-point 4

Appendix D

ENGINEERING DESIGN

MDT Wetland Mitigation Monitoring
Browns Gulch
Rocker, Montana

LAND & WATER

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

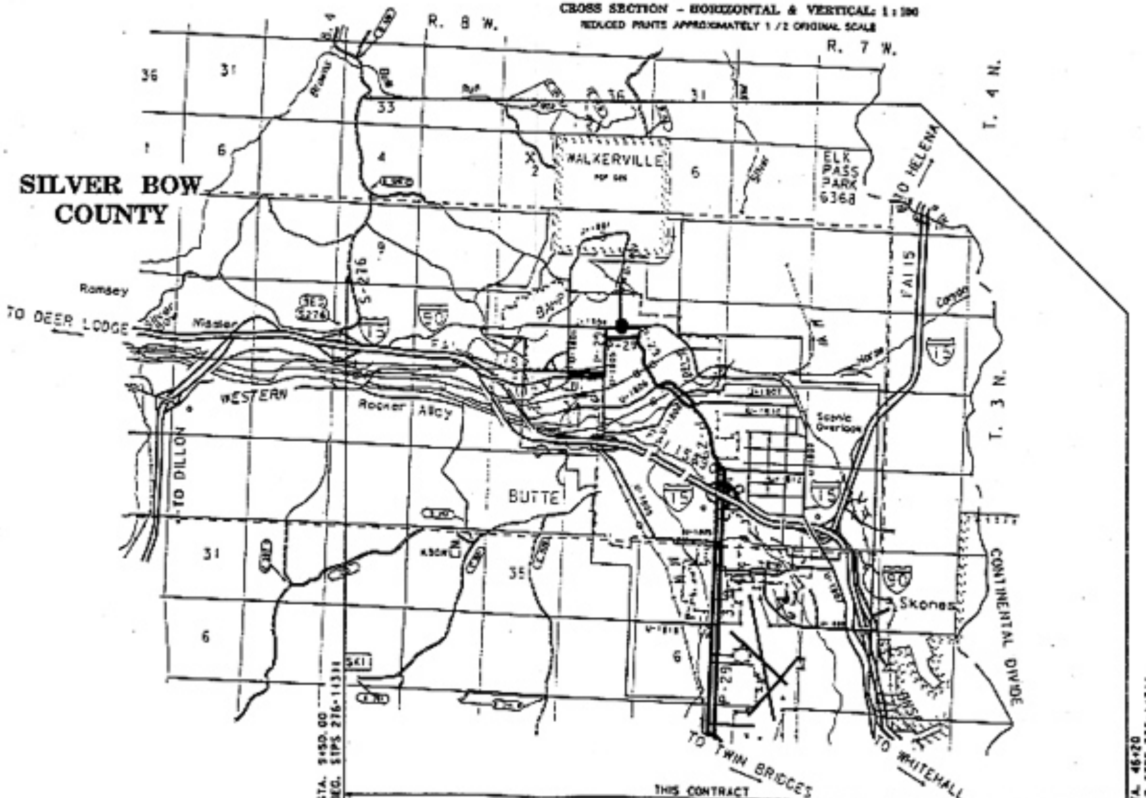
SCALES
VERTICAL: 1 : 100
HORIZONTAL: 1 : 1000
CROSS SECTION - HORIZONTAL & VERTICAL: 1 : 100
REDUCED PRINTS APPROXIMATELY 1 / 2 ORIGINAL SCALE

DESIGN DATA
A.D.T. = 1999 = 430
A.D.T. = 2019 = [illegible]
D.H.V. = 90
D. = 55-45%
T. = 12.8%
V. = 70 km/h
ALL TRUCKS = [illegible]
18 Kip ESAL = 32.05 daily

LETTING DATE - ____________

LAND & WATER

SILVER BOW COUNTY



PLANS PREPARED BY
HKM ENGINEERING
222 NORTH ALASKA STREET
BUTTE, MONTANA 59701
[illegible]

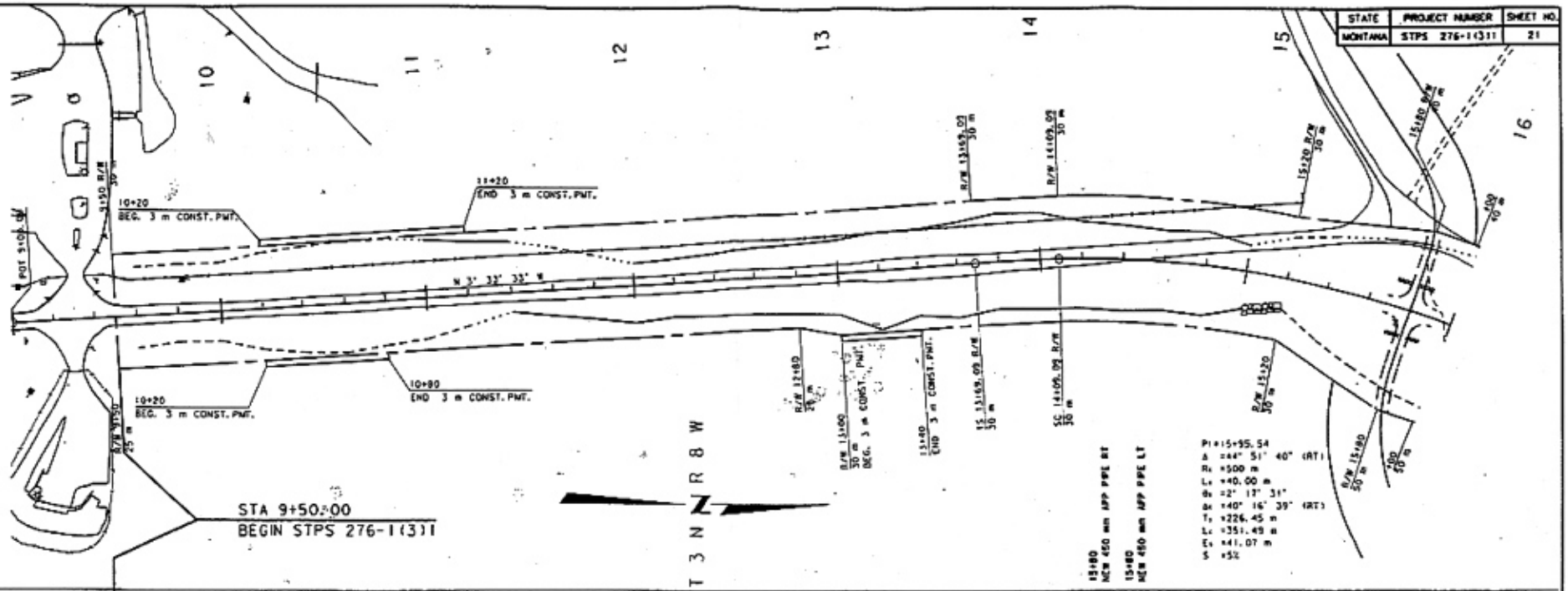
RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R/W	[illegible]
P.E.	[illegible]
C.N.	[illegible]
I.C.	

MONTANA DEPARTMENT OF TRANSPORTATION	
APPROVED July 20, 99 MARVIN DYE DIRECTOR OF TRANSPORTATION BY Carl S. Peil PRECONSTRUCTION ENGINEER	MONTANA CARL S. PEIL [illegible] PROFESSIONAL ENGINEER
U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION	
APPROVED : DIVISION ADMINISTRATOR DATE	

2020

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPS 276-1(31)1	21



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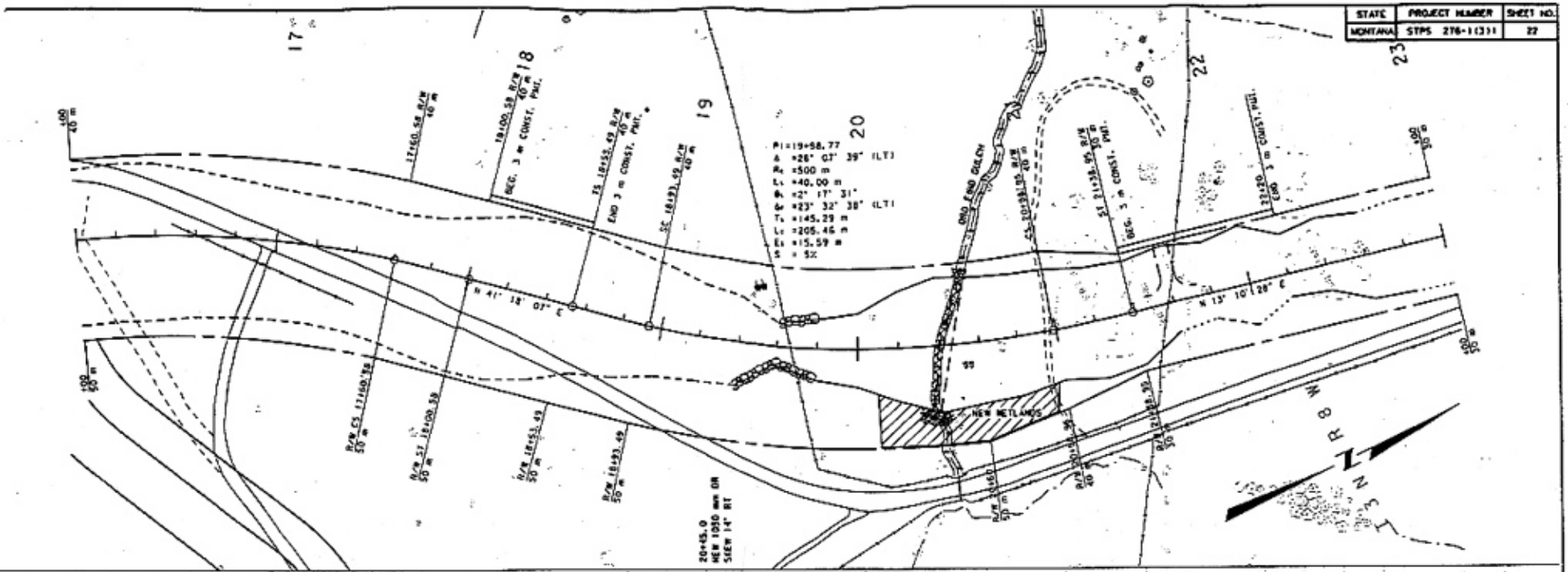
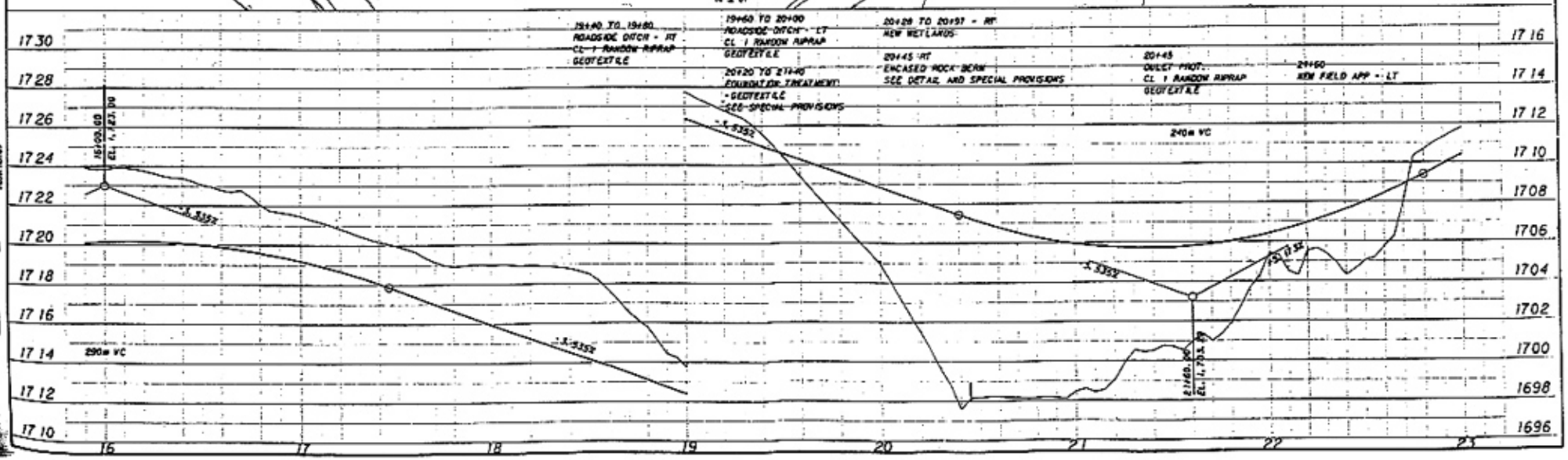
MONTANA	STPS 276-1(3)1	22





Appendix E

BIRD SURVEY PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Browns Gulch
Rocker, Montana

LAND & WATER

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.