MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2002

Ridgeway Wetland Complex: Mitigation Pond #9
Ekalaka, Montana

Prepared for:

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

Prepared by:

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

February 2003

Project No: 130091.025

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1.0 INTRODUCTION

This annual report summarizes methods and results of the second year of monitoring at the Montana Department of Transportation's Ridgeway Complex mitigation site. The Ridgeway wetland complex was created to provide wetland mitigation credits for MDT impacts in Watershed #16 located in District 5. The complex, comprised of sixteen constructed impoundments, is located in Carter County, Montana, in Section 36, Township 4 South, Range 57 East and Sections 31-35, Township 4 South, Range 58 East **(Figure 1)**. Elevations in the complex range from approximately 3,300 to 3,400 feet.

Eight wetlands were created during the summer of 2000 and an additional eight were completed in January of 2001 (**Figure 1**). Hydrophytic vegetation had not developed at the majority of these sites as of 2002 because of the drought and grazing. The objective for the Ridgeway Complex was to maximize the surface acres of each individual project to create 50 acres of shallow waterfowl habitat (USDA BLM 1999, **Appendix D**). Several construction designs were employed to create the impoundments (USDA BLM 1990); 15 of the 16 impoundments were originally intended to have a surface area of 3.5 acres and one impoundment (#3) 22 surface acres (Rau 1999).

For this monitoring report, Wetland #9 (W-9) was sampled for the second season according to the full sampling protocol on August 9, 2002. Wetland 9 was chosen out of the sixteen constructed open-water impoundments because of its representative wetland qualities. All data sheets for W-9 are included in **Appendix B**.

The remainder of the fifteen sites, impoundments 1-8, and 10-16, are shown on **Figure 1.** Aerial photos, locations of the photo points, and an associated photo log are included in **Appendix F**.

2.0 METHODS

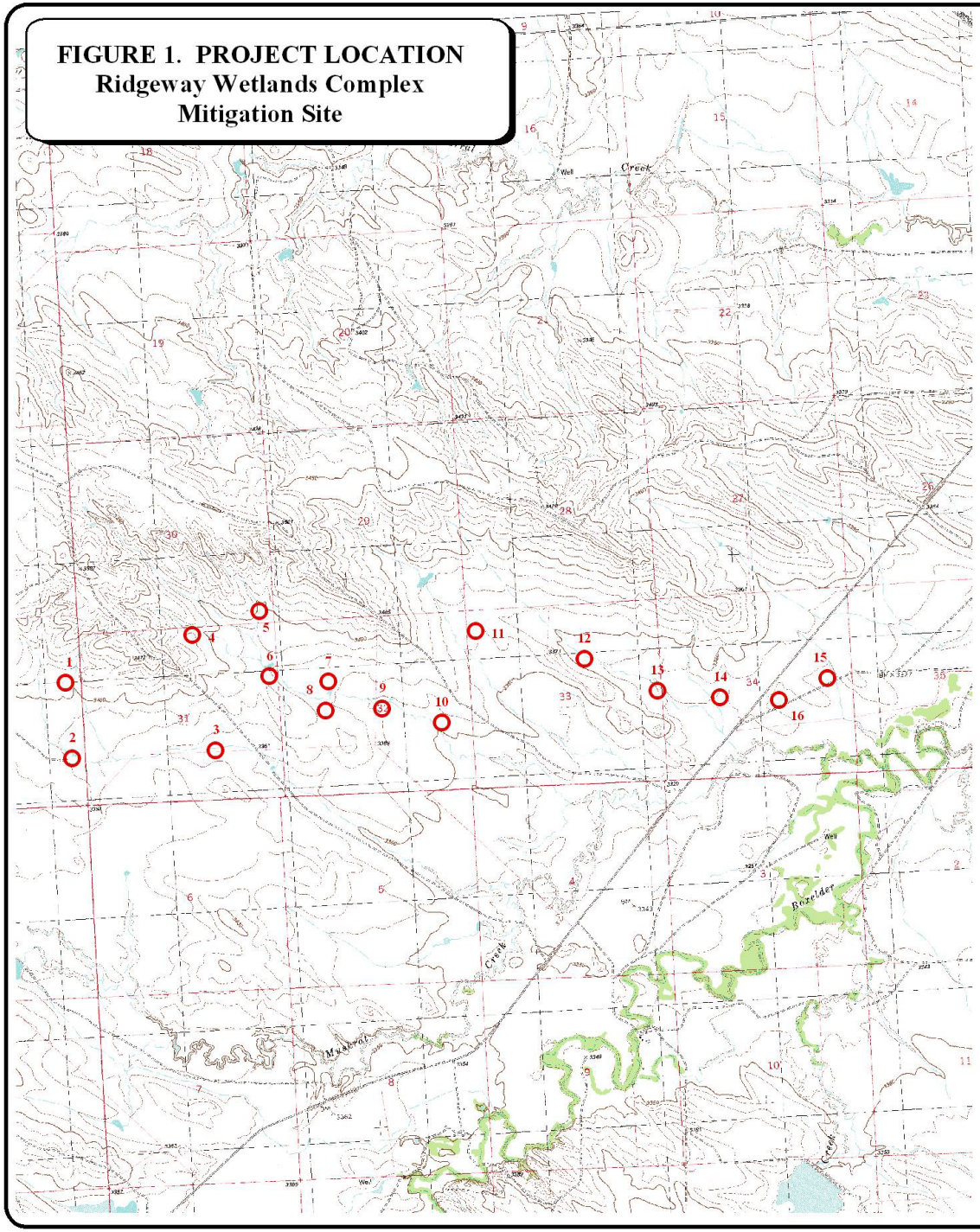
2.1 Monitoring Dates and Activities

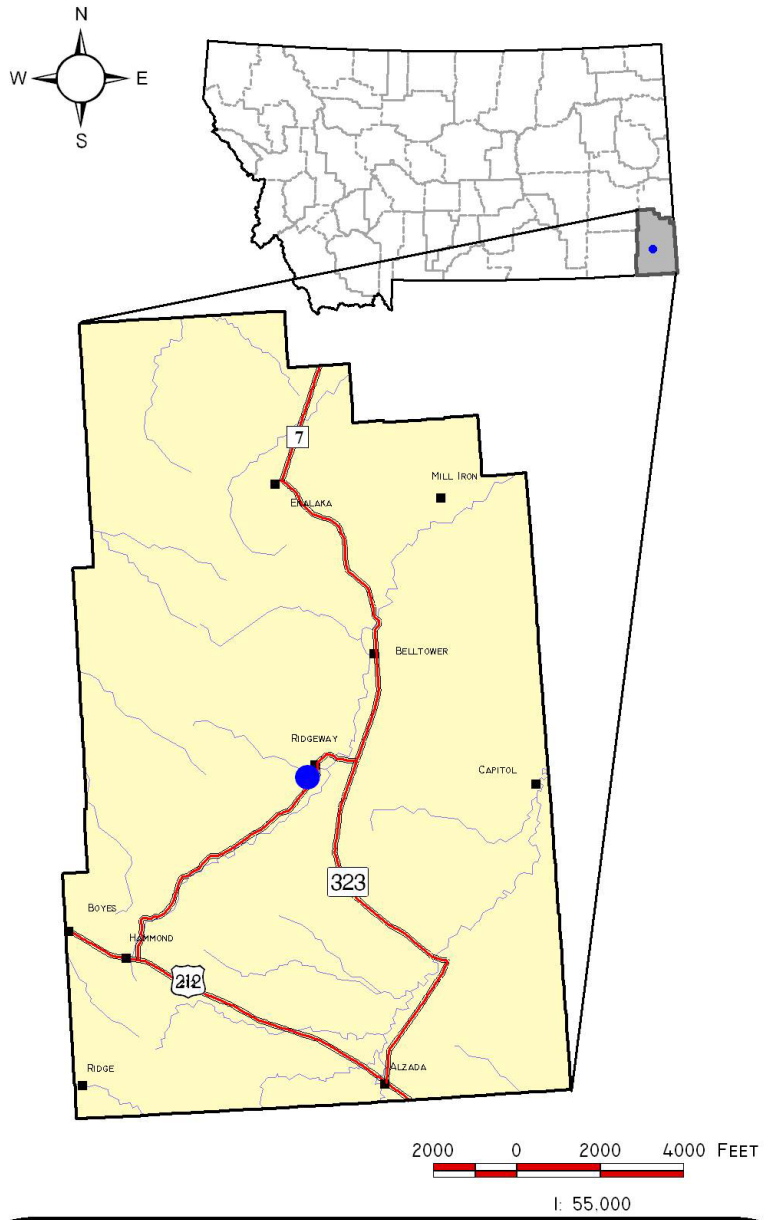
All sixteen pond sites were investigated for wetland development on August 9, 2002. The Wetland Mitigation Site Monitoring Form data **(Appendix B)** were collected for W-9 at this time. Activities and information collected included: wetland delineation; wetland/open water boundary mapping; vegetation community mapping; vegetation transect data; soils data; hydrology data; bird and general wildlife use; photograph points; GPS data points; functional assessment; and, maintenance needs of inflow and outflow structures.

2.2 Hydrology

Wetland hydrology indicators for W-9 were recorded using procedures outlined in the US Army Corps' (COE) 1987 Wetland Delineation Manual. Hydrology data were recorded on the Routine Wetland Delineation Data Form **(Appendix B)**. Any additional hydrologic data were recorded on the mitigation site monitoring form **(Appendix B)**.

FIGURE 1. PROJECT LOCATION
Ridgeway Wetlands Complex
Mitigation Site





PROJECT #: 130091.025
DATE: APRIL 2001
LOCATION:
PROJECT MANAGER: B. DUTTON
DRAWN BY: B. NOECKER

LAND & WATER CONSULTING, INC.
1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

The boundary between emergent vegetation and open water for W-9 was mapped on the aerial photograph **(Figure 3, Appendix A)**. There are no groundwater monitoring wells at the site. Precipitation data for the year 2002 were compared to the 1952-2001 average (WRCC 2002).

2.3 Vegetation

General vegetation types were delineated on an aerial photograph during the site visit (**Figure 3, Appendix A)**. Coverage of the dominant species in each community type is listed on the monitoring form **(Appendix B)**. A comprehensive plant species list for the entire site was compiled and will be updated as new species are encountered. Woody species were not planted on this site.

One transect was established at W-9 during the 2001 monitoring event to represent the range of current vegetation conditions at this wetland. The transect was lengthened in 2002 because of the dewatering that had occurred in the wetland which resulted in both ends of the transect being outside of actively growing wetland vegetation. The location of the transect is shown on **Figure 2, Appendix A**. Percent cover for each species was recorded on the vegetation transect data form **(Appendix B)**. The transect will be used to evaluate changes in species composition over time, especially the establishment and increase of hydrophytic vegetation.

Transect ends were marked with metal fence posts at W-9 and their locations were recorded with the GPS unit. Photos were taken from both ends of the transect during the site visit **(Appendix C)**. Photos with representative vegetation were taken of wetlands sites W-1-8, 10-16; these photos, aerial photographs, and photograph log are included as **Appendix F**.

2.4 Soils

Soils were evaluated during the site visit at W-9 according to the procedure outlined in the 1987 Wetland Delineation Manual. Soil data were recorded for each wetland determination point on the Routine Wetland Delineation Data Form **(Appendix B)**.

2.5 Wetland Delineation

A wetland delineation for W-9 was conducted within the assessment area according to the 1987 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: North Plains Region 4 (Reed 1988). The information was recorded on the Routine Wetland Delineation Forms **(Appendix B)**. The wetland/upland boundary was used to calculate the wetland area.

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations were recorded on the wetland monitoring form for W-9 during the site visit **(Appendix B)**; observations of wildlife at all other wetland sites were recorded in the field notebook. Indirect use indicators were also recorded including

tracks, scat and burrows. A comprehensive wildlife species list for the entire site was compiled and will be updated as new species are encountered. Observations from past years will be compared with new data to determine if wildlife use is changing over time.

2.7 Birds

Bird observations for W-9 were recorded during the site visit according to the established bird survey protocol **(Appendix E)**. A general, qualitative bird list has been compiled using these observations. Observations will be compared between years in future studies.

2.8 Macroinvertebrates

One macroinvertebrate sample was collected at W-9 during the site visit following the 2002 protocol **(Appendix E)**. Samples were preserved as outlined in the sampling procedure and sent to a laboratory for analysis. The approximate location is indicated on **Figure 2, Appendix A.**

2.9 Functional Assessment

A functional assessment form was completed for W-9 using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were collected on a condensed data sheet included in the mitigation site monitoring form **(Appendix B)**. The remainder of the assessment was completed in the office.

2.10 Photographs

Wetland-9 photos were taken showing the current land use surrounding the site, the wetland buffer, the monitored area, and the vegetation transect. A description and compass direction for each photograph were recorded on the wetland monitoring form. Photographs of W-9 are included in **Appendix C** and photo points are shown on **Figure 2, Appendix A**.

The remaining wetland sites (W-1-8, 10-16) were photographed from two (2) locations during the 2002 season. In some cases the location stakes were missing, likely as a result of sheep or horse grazing, and/or it was unclear where the original shots were taken from in this vast landscape. In this situation, the stakes were replaced with their original letter identification, and if the location could not be deciphered, the photo was taken from a new location and given a new identification letter. A picture of the berm in relation to the pond shape, photo location and direction were drawn in the field notebook to assist the investigator in finding the photo points in the future. Stakes at all of the impoundments were also labeled with the wetland number. In the event these stakes disappear, a continuous aerial photo of the area (with all pond locations and access roads) is on file. The wetland photos, photo logs, and aerial photographs of each pond are included as **Appendix F**. All photographs were taken using a 50 mm lens.

2.11 GPS Data

During the 2002 monitoring season, survey points were collected using a resource grade Trimble, Geoexplorer III hand-held GPS unit **(Appendix E)**. Points collected included: the

vegetation transect beginning and ending locations, survey points at three landmarks recognizable on the air photo for purposes of line fitting to the topography; and the wetland boundary **(Appendix A, Figures 2 and 3)**. GPS landmark data were not collected at all other wetland sites (W-1-8, 10-16).

2.12 Maintenance Needs

The conditions of the inlet and dike were examined during the monitoring visit for maintenance needs.

3.0 RESULTS

3.1 Hydrology

The source of hydrology at W-9 is an intermittent stream. During the August 2002 visit, 17% of the assessment area was inundated with approximately 0-2 feet of standing water. No emergent vegetation was within standing water at the time of the investigation. The only control structure was the constructed dike; no outflow pipe was installed in the dam.

According to the Western Regional Climate Center (WRCC 2002), the Ridgeway 1S station annual mean (1952 – 2001) precipitation was 13.39 inches; the average precipitation through the month of July was 9.29 inches. For the year 2002, precipitation through July was 5.44 inches or 59% of the mean.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and in the monitoring form **(Appendix B)**. Four dominant vegetation communities were mapped for the mitigation area (**Figure 3, Appendix A**). The communities include: Type 1, *Atriplex argentea*; Type 2, *Typha latifolia;* Type 3, *Scirpus heterochaetus*/*Alisma plantago-aquatica*; and, Type 4, *Hordeum jubatum.* Dominant species within each community are listed on the monitoring form **(Appendix B)**. The dominant vegetation communities throughout the wetland site are represented by Type 2 and 4 and the site is essentially surrounded by the Type 1 community. Greater than 75% of the site has developed wetland vegetation.

The vegetation transect results are detailed in the monitoring form **(Appendix B)** and are summarized below.

2001 Transect Data

Transect 1 Start	Upland Type 1 (40’)	Wetland Type 2 (20’)	Total 60’	End Transect 1

2002 Transect Data

Transect 1 Start	Upland Type 1 (27’)	Wetland Type 4 (30’)	Wetland Type 2 (33’)	Wetland Type 3 (45’)	Wetland Type 2 (15’)	Total 150’	End Transect 1

Table 1: ***2001 and 2002 Ridgeway Wetland Vegetation Species List***

Scientific Name	Common Name	Indicator status
*Agropyron dasystachyum***	Thick-spike wheatgrass	FAC
*Alisma plantago-aquatica***	broad-leaf water-plantain	OBL
*Artemesia tridentate***	sage	-
*Atriplex argentea***	silver-scale saltbush	FACU
*Beckmannia syzigachne***	American sloughgrass	OBL
*Bouteloua gracilis**	blue gramma grass	-
*Eleocharis palustris***	creeping spikerush	OBL
*Festuca idahoensis**	Idaho fescue	-
Glyceria spp.	manna grass	- (OBL)
*Grindelia gracifolia**	gumweed	-
*Hordeum jubatum***	fox-tail barley	FACW
Juncus spp.	rush	*(FACW-OBL)
*Rumex crispus***	curly dock	FACW
*Scirpus heterochaetus***	slender bulrush	OBL
*Spartina gracilis***	alkali cordgrass	FACW
*Typha latifolia**	broad-leaf cattail	OBL

- : Not included in indicator status list.
(X)-In general, these species are given the status range within the parenthesis.
*denotes observed in 2002 in addition to previous years.
**denotes observed in 2002 for the first time.
No star indicates a species was observed in 2001, but not in 2002.

3.3 Soils

The site was mapped as part of the Carter County Soil Survey. The dominant soils at Wetland 9 are the Bickerdyke clays. This soil type is typical of sedimentary plains. Bickerdyke is a non-hydric soil.

Soils were sampled at one wetland (SP-1) and one upland location (SP-2). Soil at SP-1 from 0-6 inches was a matrix of dark gray (10YR 4/1) and brown (10YR 4/3) clay loam with 50% red (10R 4/6) mottles. From 6-18 inches the soil was dark gray (10YR 4/1) with yellowish red (10YR 5/6) mottles (50%). The soil at SP-1 was saturated at a depth of 4 inches. Soil at SP-2 was a weak red (2.5YR 4/2) clay loam with no mottling and was slightly damp at a depth of 8 inches (recent rains may have caused this slight moisture).

3.4 Wetland Delineation

The delineated wetland boundary is depicted on **Figure 3, Appendix A**. The 2002 wetland boundary encompassed 3.45 acres of gross wetland area and 0.59 acres of open-water habitat; the net wetland area was 2.86 acres. During 2002, it was unclear where the monitoring limits were because a fenceline had apparently been moved, thus the delineation extended up to the fence. The delineation boundary was also refined during 2002, excluding some of the area that had been included during 2001; the vegetation species in these excluded areas did not warrant being included within the wetland boundary. It is possible that a die-back occurred as a result of the drought. The COE data forms are included in **Appendix B**.

3.5 Wildlife

Wildlife species are listed in **Table 2.** Activities and densities associated with these observations area are included on the monitoring form in **Appendix B**. Very few wildlife species were noted at Wetland #9 and no frogs were seen in 2002. Frogs, turtles and snakes were observed at other wetland impoundments throughout the Ridgeway complex.

Table 2. ***Wildlife Species Observed at the Ridgeway Wetland Mitigation Site***

AMPHIBIANS	
Leopard frogs (*Rana pipiens*)	
BIRDS	Killdeer (*Charadrius vociferous)**
American wigeon (*Anas americana)*	Mallards *(Anas platyrhynchos)*
Blue winged teal (*Anas discors)*	Spotted sandpiper (*Actitis macularia)*
Cinnamon teal (*Anas cyanoptera)*	unidentified hen duck**
Greater Yellow Legs *(Tringa melanoleuca)***	Willet (*Catoptrophorus semipalmatus)*
MAMMALS	
Cattle*	
White-tailed deer (*Odocoileus virginianus)*	

*denotes observed in 2002 in addition to previous years.
**denotes observed in 2002 for the first time.
No star indicates a species was observed in 2001, but not in 2002.

3.6 Macroinvertebrates

The macroinvertebrate sampling results are included in **Appendix B**. Rhithron, Inc. summarized the results. Sub-optimal conditions persisted at this site in 2002. Taxa richness increased between the two years, which suggested increasing habitat complexity. Although the biotic index value increased by the second year, the site continued to support the mayflies *Callibaetis* sp. and *Caenis* sp., suggesting that water quality did not substantially diminish. There was a loss of midge diversity, which may have been due to different sampling methods between the two years, or it could reflect deterioration of substrate habitats.

3.7 Functional Assessment

Completed functional assessment forms are included in **Appendix B** and summarized below in **Table 3**. Wetland #9 rated as a Category II wetland because of its high function and value in the MTNHP species category. Other high values occurred in the following categories: short and long-term surface water storage, groundwater discharge/recharge, sediment/nutrient/toxicant removal, and sediment/shoreline stabilization. No sign of fish were observed during the 2002 season. Some of the decreases in ratings occurred because water in the wetland does not appear perennially, but rather seasonally/intermittently, and the size of the wetland is less than 2001 because of boundary refinement. An improvement in the rating may be accomplished over time by increasing the vegetation's structural diversity, which would in effect increase its wildlife habitat, uniqueness and flood attenuation potential. However, planting shrubs is not a reasonable alternative given the grazing conditions.

Table 3: ***Summary of 2001 and 2002 Wetland Function/Value Ratings and Functional Points at the Ridgeway W-9 Wetland Mitigation Project***

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	2001	2002
Listed/Proposed T&E Species Habitat	Low (0)	Low (0)
MNHP Species Habitat	High (1.0)	High (1.0)
General Wildlife Habitat	High (0.9)	Mod (0.5)
General Fish/Aquatic Habitat	Mod (0.6)	NA
Flood Attenuation	Mod (0.5)	Mod (0.5)
Short and Long Term Surface Water Storage	High (1.0)	High (.9)
Sediment, Nutrient, Toxicant Removal	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Mod (0.7)	High (.9)
Production Export/Food Chain Support	Mod (0.7)	Mod (0.7)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)
Uniqueness	Mod (0.4)	Low (0.3)
Recreation/Education Potential	Low (0.1)	Low (0.1)
Actual Points/Possible Points	7.9/12	6.9/11
% of Possible Score Achieved	66%	62%
Overall Category	II	II
Total Acreage of Assessed Wetlands within Easement	4.345 ac	3.45 ac
Functional Units (acreage x actual points)	34.33 fu	23.8 fu
Net Acreage Gain	4.345 ac	3.45 ac
Net Functional Unit Gain	34.33 fu	23.81 fu
Total Functional Unit "Gain"	34.33 fu	23.81 fu

3.8 Photographs

Representative photographs of W-9 taken from photo points and transect ends are included in **Appendix C.** All photos for the remaining wetlands (1-8, 10-16) are included as **Appendix F.**

3.9 Maintenance Needs/Recommendations

The dike and inlet area appeared to be functioning satisfactorily. However, the constructed pond is several feet below the normal elevation of the land surrounding the pond and that of the wetland area between the depression and the berm. This cattail wetland between the depression and berm (Community Type 2) is shrinking and may be the result of the drought and/or the drought conditions are being exacerbated by the depression acting as a drain on the wetland hydrology. The water-holding ability of the newly constructed wetland may be enhanced by reshaping the depression to match the topography, particularly that of the inlet drainages, and regrading the steep walls of the depression into the cattail wetland.

Most of the other constructed impoundments at the time of investigation did not contain water, which in part is a result of the drought, but also may be the result of the construction methods. All of the depressions are nearly square and do not blend into the drainage landscape. Blending the constructed wetlands into the landscape may enable the depression to capture more water in a controlled manner, provided the construction does not perforate the underlying clays, and provide more substrate for greater wetland vegetation diversity.

3.10 Current Credit Summary

The gross wetland area of 3.45 acres includes 0.59 acres of open water. The open water habitat has an average depth of only one foot and should qualify as wetland acreage. Reshaping the constructed depression (see above, **Section 3.9** Maintenance Needs/Recommendations) may alleviate potential dewatering issues of the adjacent cattail wetland and may increase water-holding capacity. This assessment, in general, may be applied to all of the other 15 wetland sites.

Very little wetland development has occurred at the Wetlands 1-8 and 10-16 and most of the impoundments had little to no water. The average size of the wetlands at each site is likely less than 0.5 acres per constructed wetland site for an estimated grand total of 10.95 acres (including W-9) or 22% of the original 50-acre goal (USDA BLM 1999). It would be beneficial to ocularly estimate the wetland boundaries at all of the sites during the 2003 season to assess the status of the 50-acre wetland creation goal.

4.0 REFERENCES

Berglund, J. 1999. *MDT Montana Wetland Assessment Method*. Prepared for Montana Department of Transportation. May 1999.

Reed, P.B. 1988. National list of plant species that occur in wetlands: North Plains (Region 4). Biological Report 88(26.4), May 1988. U.S. Fish and Wildlife Service. Washington, D.C.

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

UDSA Bureau of Land Management. 1990. Typical Water Retention Pit. BLM, Miles City Field Office. Miles City, MT.

UDSA Bureau of Land Management. 1999. Ridgeway Wetland Complex Environmental Assessment. BLM, Miles City Field Office. Miles City, MT.

USDA Natural Resource Conservation Service. Soil Survey of Carter County, Montana.

Western Regional Climate Center, 1952-2002. Ridgeway 1S Station: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?mtridg.

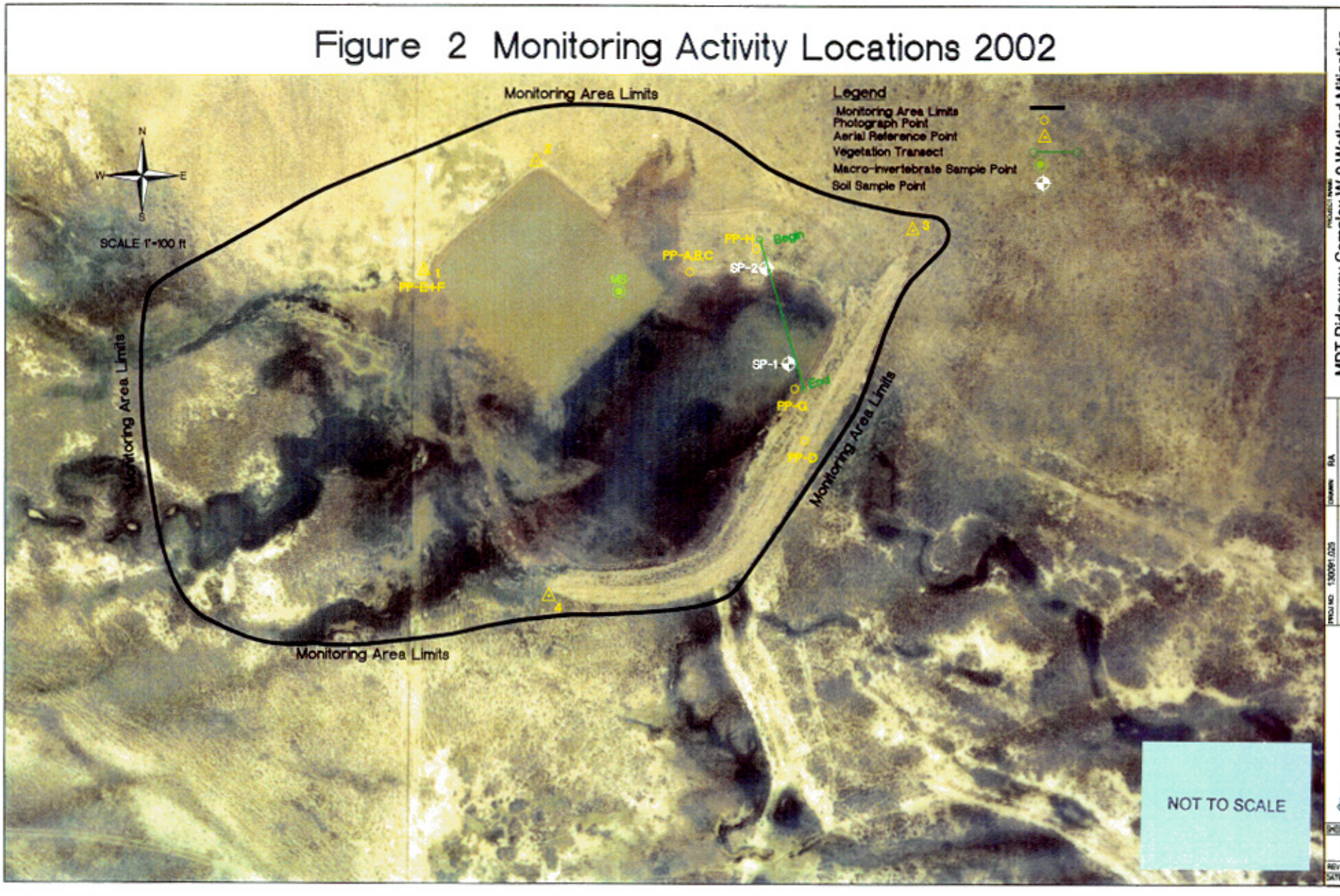
Appendix A

FIGURES 2 - 3

MDT Wetland Mitigation Monitoring
Ridgeway Wetland 9 (W-9)
Ekalaka, Montana

LAND & WATER

Figure 2 Monitoring Activity Locations 2002

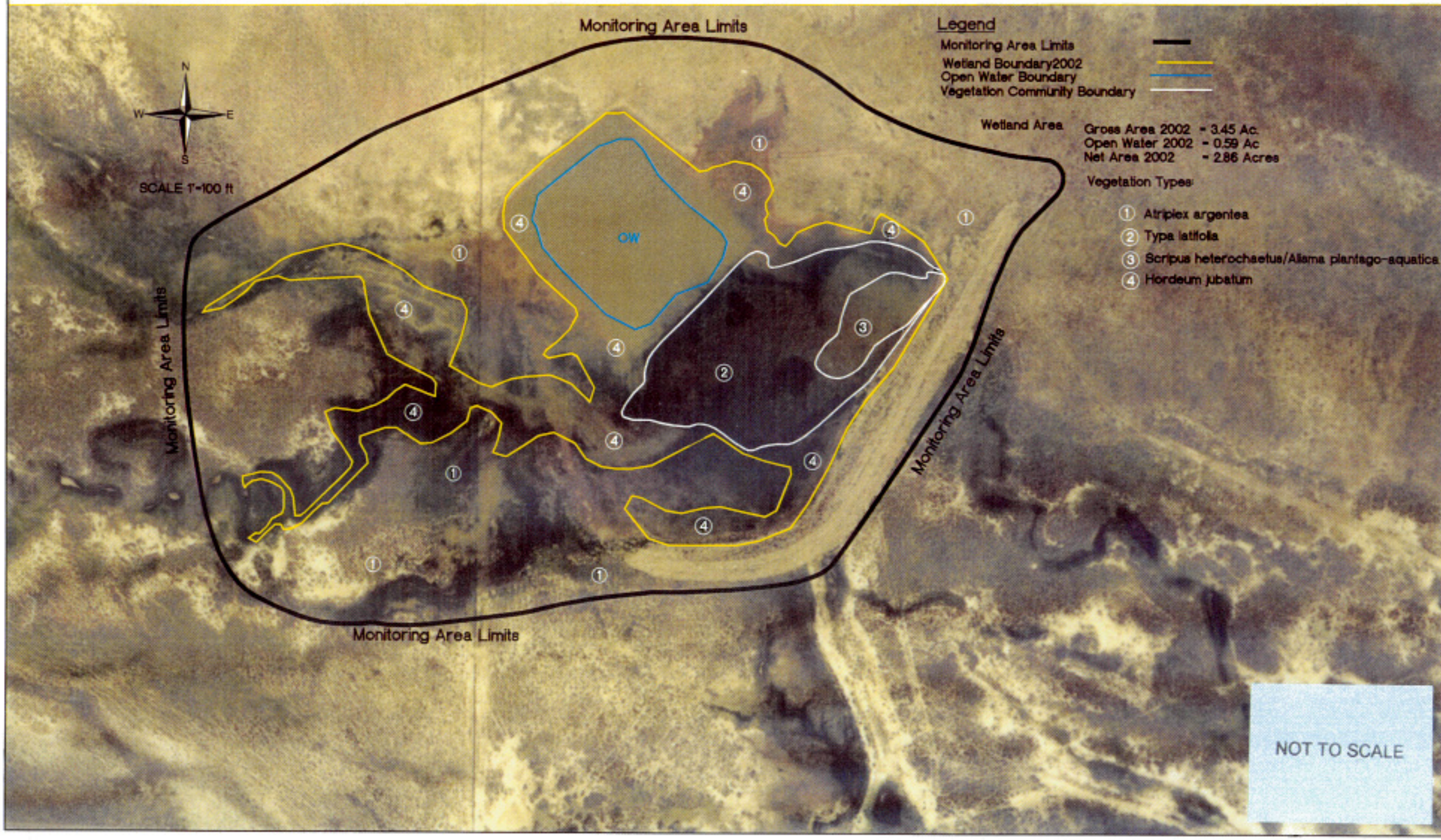


MDT Ridgeway Complex W-9 Wetland Mitigation

Monitoring Activity Locations 2002

SHEET NUMBER 2

Figure 3 Mapped Site Features 2002



PROJECT NAME: MDT Ridgeway Complex W-9 Wetland Mitigation
DRAWING TITLE: Mapped Site Features 2002

PROJ NO: 130091.025 | DRAWN: RA
FILE NAME: TASK25W9BASE.dwg | CHECKED:
SCALE: 1"= 100ft | APPVD: BD
LOCATION: Ridgeway Complex | PROJ MGR: BD

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

SHEET NUMBER 3 OF -
REV -
DATE: 12-04-02

Appendix B

COMPLETED 2002 WETLAND MITIGATION SITE MONITORING FORM (W-9)
COMPLETED 2002 BIRD SURVEY FORMS (W-9)
COMPLETED 2002 WETLAND DELINEATION FORMS (W-9)
COMPLETED 2002 FIELD AND FULL FUNCTIONAL ASSESSMENT FORMS (W-9)
COMPLETED 2002 MACROINVERTEBRATE SAMPLING RESULTS

MDT Wetland Mitigation Monitoring
Ridgeway Wetland (W-9)
Ekalaka, Montana

LAND & WATER

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name:___Ridgeway #9___ Project Number:__1300091-025_ Assessment Date:__8_/_9__/_02_
Location:____Ridgeway, MT_____ MDT District:_____#5___ Milepost:___NA_____
Legal description: T_4S/4S_ R_58E/57E___ Section_31-35/36__ Time of Day: 6AM-8PM___
Weather Conditions:__overcast, windy_____ Person(s) conducting the assessment:__LB/LWC____
Initial Evaluation Date:_8/_23_/_01_ Visit #:___2__ Monitoring Year:___2002_____
Size of evaluation area:__3.45_acres Land use surrounding wetland : grazing rangeland_____

HYDROLOGY

Surface Water Source:____intermittent drainage_____
Inundation**:** Present_X___ Absent____ Average depths:__2__ft Range of depths:__0_-_4_ft
Assessment area under inundation:__17%
Depth at emergent vegetation-open water boundary:_*emergent veg. not inundated*___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 lines, drainage pattern_____
_____

Groundwater
Monitoring wells: Present_____ Absent _____X_____
Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:
__X___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: _____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

VEGETATION COMMUNITIES

Community No.:__1__ Community Title (main species):__ *Atriplex argentea* _____

Dominant Species	% Cover	Dominant Species	% Cover
Atriplex argentea	20	*Agropyron daststachyum*	20
Festuca idahoensis	15		
Bouteloua gracilis	5		
Grindelia	10		
Artemesia tridentata.	30		

COMMENTS/PROBLEMS: _____

_____

_____

_____

Community No.:__2__ Community Title (main species):___ *Typha latifolia*_____

Dominant Species	% Cover	Dominant Species	% Cover
Rumex crispus	<10	*Scirpus heterochaetus*	5
Typha latifolia	75		
Eleocharis palustris	5		
Spartina gracilis	<5		
Horduem jubatum	5		

COMMENTS/PROBLEMS: _____

_____

_____

_____

Community No.:__3 __ Community Title (main species): *Scirpus heterochaetus* / *Alisma plantago-aquatica*

Dominant Species	% Cover	Dominant Species	% Cover
Scirpus heterochaetus	35		
Alisma plantago-aquatica	50		
Sagittaria cuneata	<5		

COMMENTS/PROBLEMS: _____

_____

_____

_____

Additional Activities Checklist:

__X__Record and map vegetative communities on air photo

VEGETATION COMMUNITIES (continued)

Community No.:__4__ Community Title (main species*):___ Horduem jubatum*

Dominant Species	% Cover	Dominant Species	% Cover
Rumex crispus	15		
Eleocharis palustris	<5		
Spartina gracilis	<5		
Horduem jubatum	75		

COMMENTS/PROBLEMS: ____The community around the circumference of the BLM pond most closely fits into this type, however, vegetation is very sparse and was mostly exposed soil during the time of the investigation.

Community No.:____ Community Title (main species):_____

Dominant Species	% Cover	Dominant Species	% Cover

COMMENTS/PROBLEMS: _____

Community No.:____ Community Title (main species):_____

Dominant Species	% Cover	Dominant Species	% Cover

COMMENTS/PROBLEMS: _____

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Agropyron dasystachyum**	1		
Alisma plantago-aquatica**	3		
Artemesia tridentate.**	1		
Atriplex argentea**	1		
Beckmannia syzigachne**	2		
*Boutelua gracilis**	1		
Eleocharis palustris**	2, 4		
*Festuca idahoensis**	1		
Glyceria spp.	2		
*Grindelia gracifolia**	1		
Horduem jubatum**	4		
Juncus spp.	2		
Rumex crispus**	2, 4		
Sagittaria cuneata**	3		
Scirpus heterochaetus**	2, 3		
Spartina gracilis**	2, 4		
*Typha latifolia**	2, 4		

*denotes observed in 2002 in addition to previous years
**denotes observed in 2002 for the first time
No star indicates a species was observed in 2001, but not in 2002

COMMENTS/PROBLEMS: _____

PLANTED WOODY VEGETATION SURVIVAL

Species	Number Originally Planted	Number Observed	Mortality Causes
NONE			

COMMENTS/PROBLEMS: ___None_____

WILDLIFE

BIRDS

(Attach Bird Survey Field Forms)

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____

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
none					
(other ponds-Prairie garter snake, unid. frogs, unid turtle)					

Additional Activities Checklist:
___X__Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: _____

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:

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

Location	Photo Frame #	Photograph Description	Compass Reading
A	*2/20	wetland view, buffer in foreground	288
B	2/21	wetland view, buffer in foreground	268
C	2/22	wetland view, buffer in foreground	238
D	2/23	wetland view	170
E	2/19	wetland view	80
F	2/18	wetland view	116
G	2/23	wetland view from WL end of transect (same photo as D)	170
H	2/24	UPL veg transect end	358

* 2 indicates Ridgeway film roll #.

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 fore site in designated GPS field notebook

Checklist:

__X__ Jurisdictional wetland boundary
__(2)_ 4-6 landmarks recognizable on the air photo
__X___ Start and end points of vegetation transect(s)
__X___ Photo reference points
__NA___ Groundwater monitoring well locations

COMMENTS/PROBLEMS: _GPSed the boundary again this year to clarify.

WETLAND DELINEATION

(Attach Corps of Engineers delineation forms)

At each site conduct the items on the checklist below:
__X___Delineate wetlands according to the 1987 Army Corps manual.
__X__ Delineate wetland-upland boundary on the air photo
__X___ Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: _____

FUNCTIONAL ASSESSMENT

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

COMMENTS/PROBLEMS: _____

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____ NO_X___
If yes, are the structures working properly and in good working order? YES____ NO___
If no, describe the problems below.

COMMENTS/PROBLEMS: __The natural part of this WL (not the square portion) has WL vegetation, however it is dry, which could be a function of the drought or because the square hole in the ground has effectively dewatered the WL.

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Ridgeway Complex (#9) Date: 8-9-02 Examiner: LB/LWC Transect # 1

Approx. transect length: 150 ft Compass Direction from Start (Upland): 170

Vegetation type A:	CT-1	
Length of transect in this type:	27’	feet
Species:		Cover:
ATRARG		10%
(bare dirt)		(90%)
	Total Vegetative Cover:	10%

Vegetation type B:	CT-4	
Length of transect in this type:	30’	feet
Species:		Cover:
TYPLAT		10%
RUMCRI		5%
(one BECSZY plant)		
*ATRARAG		<1%
*GRIGRA		<1%
bare, dry dirt		85%
*see comments for valuable observations regarding this area on the transect		
	Total Vegetative Cover:	~15%

Vegetation type C:	CT-2	
Length of transect in this type:	33’	feet
Species:		Cover:
TYPLAT		100
	Total Vegetative Cover:	100%

Vegetation type D:	CT-3	
Length of transect in this type:	45’	feet
Species:		Cover:
ALIPLA		20%
RUMCRI		<5
UNK Aquatic		50%
ELEPAL		20%
(exposed mud)		
	Total Vegetative Cover:	95%

LAND & WATER

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Ridgeway Complex (#9) Date: 8-9-02 Examiner: LB/LWC Transect # 1

Approx. transect length: 150 ft Compass Direction from Start (Upland): 170

Vegetation type A:	CT-2	
Length of transect in this type:	15’	feet
Species:		Cover:
TYPLAT		95%
SCIHET		5%
Total Vegetative Cover:		100%

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

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:		

LAND & WATER

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 [1]<20% (3) % 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:

[1] The "new" square pond has scant vegetation around the perimeter, however, the original WL portion is nearly 100% vegetated.

* (from page above) The *Atriplex* and *Grindelia* are apparently invading the original WL; cattail stubs were found way up into the exposed dirt and the rim of the wetland in the transect location is severely grazed and dry on the surface.

3/01 rev

LAND & WATER

BIRD SURVEY – FIELD DATA SHEET

Page__1_of__1_
Date: 8/9/02
Survey Time: 4PM

SITE: Ridgeway #9

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
unident hen duck	1	FO	MA				
Killdeer	1	BD	MA				
Greater Yellow Legs	1	FO	MA				

Notes: Poor avian sitings this year, could be time of day (afternoon).

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: Ridgeway Complex (#9)	Date: 8-9-02
Applicant/Owner: MDT	County: Carter
Investigator: Lynn Bacon, Land & Water Consulting	State: MT
Do Normal Circumstances exist on the site: x Yes ___ No	Community ID: Emergent
Is the site significantly disturbed (Atypical Situation)? ___ Yes x No	Transect ID:
Is the area a potential Problem Area?: ___ Yes x No	Plot ID: SP-1
(If needed, explain on reverse.)	

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Eleocharis palustis*	H	OBL	9			
2	*Rumex crispus*	H	FACW	10			
3	*Alisma plantago-aquatica*	H	OBL	11			
4	unknown aquatic veg; desiccated	H	(OBL)	12			
5				13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 4/4 = 100%

SP not within the wetland boundary.

HYDROLOGY

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

Field Observations:

Depth of Surface Water: NA (in.)

Depth to Free Water in Pit: NA (in.)

Depth to Saturated Soil: 4" (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
X Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

The transect is located within what appears to be an original wetland; concerned about this portion being dry and dewatering potential new "pond" may be creating.

LAND & WATER

SOILS

Map Unit Name (Series and Phase): Bickerdyke Clay

Drainage Class: well

Field Observations

Taxonomy (Subgroup): Udorthentic Chromusterts

Confirm Mapped Type? X Yes ___ No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 6	A	10YR 4/1 10YR 4/3	10YR 4/6	50%	clay loam
6-18	B	5YR 4/1	5YR 5/6	50%	clay loam

Hydric Soil Indicators:

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

Clayey soils, hydric soils with evidence of ponding within theis community type (CT-2) but water has evaporated +/or sunk into substrate.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	X	Yes		No	
Wetland Hydrology Present?	X	Yes		No	
Hydric Soils Present?	X	Yes		No	
Is this Sampling Point Within a Wetland?	x	Yes		No	

Remarks:

No water in this portion of the wetland, may be dewatering because of the square hole that was dug to increase WL size.

Approved by HQUSACE 2/92

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

Project/Site: Ridgeway Complex(#9)	Date: 8-9-02
Applicant/Owner: MDT	County: Carter
Investigator: Lynn Bacon, Land & Water Consulting	State: MT
Do Normal Circumstances exist on the site: x Yes ___ No	Community ID: UPL
Is the site significantly disturbed (Atypical Situation)? ___ Yes x No	Transect ID:
Is the area a potential Problem Area?: ___ Yes x No	Plot ID: SP-2
(If needed, explain on reverse.)	

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	Unknown desiccated grass	H	(UPL)	9			
2	GRIGRA	H	(UPL)	10			
3	ATRARG	H	FACU	11			
4				12			
5				13			
6				14			
7	*(bare dirt-80%)*			15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 0/3 = 0%

SP not within the wetland boundary.

HYDROLOGY

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

Field Observations:

Depth of Surface Water: NA (in.)

Depth to Free Water in Pit: NA (in.)

Depth to Saturated Soil: NA (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:

No hydrology indicators present.

SOILS

Map Unit Name (Series and Phase): Bickerdyke Clay

Drainage Class: well

Taxonomy (Subgroup): Udorthentic Chromusterts

Field Observations

Confirm Mapped Type? X Yes ___ No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 18	A	2.5YR 4/2			clay loam

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)

Clayey soils; at 8" soil is "damp".

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	___	Yes	X	No
Wetland Hydrology Present?	___	Yes	X	No
Hydric Soils Present?	___	Yes	X	No

Is this Sampling Point Within a Wetland? ___ Yes X No

Remarks:

Very scant UPL vegetation surrounding the WL; drought and grazing pressures may be decreasing plant density.

Approved by HQUSACE 2/92

LAND & WATER B-17

Field Data Sheet for 1999 MDT Wetland Assessment Form **Site:** Ridgeway **Date:** 8/9/02 **By:** LB/LWC

Estimated AA Size (Circle Ac.): <1 1-5 >5 **Brief Description:** constructed WL pond w/ likely hx portion btw pond and reservoir

HGM Class (CIRCLE)	Cowardin Class	Est. % of AA	Predominant Water Regime (CIRCLE)
Mineral Soil Flats Organic Soil Flats	Emergent	55	Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Riverine (nonperennial)	Aquatic Bed dried up 2002?	15	Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Riverine (upper perennial) Riverine (lower perennial)	Moss-Lichen Ø seen 2002 - today		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Lacustrine Fringe	Scrub-Shrub		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Depression (closed)	Forested		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Depression (open, groundwater) — possibly Depression (open, surface water)	Unconsolidated Bottom pond bottom	30	Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Slope	Other:		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Organic Soil Flats	Total Estimated % Vegetated	70 ±	pond not vegetated

RELATIVE ABUNDANCE: rare com abun. **DISTURBANCE** is: High Moderate Low grazing animal

HYDROLOGY: Max. acre-ft surf. water at wetlands in AA subject to inundation: <1 1-5 >5 (if no flooding/ponding, go to groundwater* section)

Does AA contain surface or subsurface outlet? Y N If outlet present, is it restricted (subsurface will always be "yes")? Y N

Longest duration of surface water: 2001 said perm - 2002	Surface Water Duration and other attributes (circle)		
at any wetlands within AA — water in WL does not appear perm.	Perm / Peren	Seas / Intermit	Temp / Ephem
in at least 10% of AA (both wetlands and nonwetlands [deepwater, streambed...]	Perm / Peren	Seas / Intermit	Temp / Ephem
~~Where fish are or historically were present (circle NA if not applicable)~~ unlikely	Perm / Peren	Seas / Intermit	Temp / Ephem
% of waterbody containing cover objects	>25%	10-25%	<10%
% bank or shore with riparian or wetland shrub or forested communities	>75%	50-74%	<50%
adjacent to rooted wetland vegetation along a defined watercourse or shoreline subject to wave action (circle NA if not applicable) None @ time of investigation	Perm / Peren	Seas / Intermit	Temp / Ephem
% cover of wetland bank or shore by sp. with binding rootmasses	>65%	35-64%	<35%

Flood Attenuation: Do any wetlands on site flood as a result of in-channel or overbank flow? Y N (if no, go to groundwater* section below) interm in let streams

Estimated wetland area subject to periodic flooding (acres): ≥10 2-10 <2

Estimated % of flooded wetland classified SS, FO or both: ≥75 25-74 <25

*Evidence of groundwater discharge or recharge? Y N unk List: — there is a permanent WL in front (upslope) of dam - may be grd water supported

HABITAT

Habitat for Listed or Proposed Threatened, Endangered, or Montana Natural Heritage Program S1, S2, or S3 Plants or Animals:

AA is Documented (D) or Suspected (S) to contain (circle based on definitions contained in instructions):

Primary or critical habitat (**list species**) D S T/E: D S MNHP: N leopard frog - none seen 2002 - but in 2001 likely sp. obs.

Secondary habitat (**list species**) D S T/E: D S MNHP:

Incidental habitat (**list species**) D S T/E: D S MNHP:

No usable habitat D S T/E: D S MNHP:

Wildlife observations? Ø (deer 2001)

Fish observations? Ø

OTHERS

Do wetlands have potential to receive excess sediments, nutrients, or toxicants? Y N From: Int. stream

Potential to receive: low to moderate levels high levels On TMDL List? Y N

Does site contain bog, fen, warm springs, >80 year-old forested wetland, or MNHP "S1" or "S2" plant association? Y N

List:

Is AA a known recreation / education site? Y N Type:

Does AA offer strong potential for use as recreation / education site? Y N Type:

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

1. Project Name: Ridgeway 2. Project #: 130091 - 025 Control #:

3. Evaluation Date: Mo. 8 Day 10 Yr. 02 4. Evaluator(s): UB/LWC 5. Wetlands/Site #(s) W-9

6. Wetland Location(s): i. Legal: T 4 N or S; R 5 E or W; S 32 ; T ___ N or S; R ___ E or W; S ___ ;
ii. Approx. Stationing or Mileposts: —
iii. Watershed: 10 1L 0202 GPS Reference No. (if applies): ___
Other Location Information:

7. a. Evaluating Agency: LWC ;
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)
3.45 (measured, e.g. by GPS [if applies])

9. Assessment area: (AA, tot., ac., see instructions on determining AA) ___ (visually estimated)
3.45 (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 (Ems)	Water Regime	Modifier	% of AA
Depression	Palustrine	(excavated pond)	UB	J, G, C	E, I	30
Riverine	Riverine	lower perennial	Em	J	E, I	20
Depression	Palustrine	(hx cattail wl)	Em	J	I	50

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.): grazing - heavy pressure
II. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) ± observed

III. Provide brief descriptive summary of AA and surrounding land use/habitat: grazed range land

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:

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	2001 N Leopard Frog
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]):
- __ few or no wildlife observations during peak use periods
- __ little to no wildlife sign
- __ sparse adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):
- __ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- __ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- X adequate adjacent upland food sources
- X interviews with local biologists with knowledge of the AA – 2001 obs.

likely deer hab (2001)

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 or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 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: barely > 65%

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

- ___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
- X Wetland contains inlet but no outlet
- ___Other

i. 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) 3.45
A. Listed/Proposed T&E Species Habitat	L	0	1	
B. MT Natural Heritage Program Species Habitat	H	1	1	
C. General Wildlife Habitat	m	.5	1	
D. General Fish/Aquatic Habitat	NA	–		
E. Flood Attenuation	m	.5	1	
F. Short and Long Term Surface Water Storage	H	.9	1	
G. Sediment/Nutrient/Toxicant Removal	H	1	1	
H. Sediment/Shoreline Stabilization	H	.9	1	
I. Production Export/Food Chain Support	m	.7	1	
J. Groundwater Discharge/Recharge	H	1	1	
K. Uniqueness	L	.3	1	
L. Recreation/Education Potential	L	.1	1	
Totals:		6.9	11	23.81

6.9/11 = 62%

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)
- ___ "Low" rating for Uniqueness; **and**
- ___ "Low" rating for Production Export/Food Chain Support; **and**
- ___ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

Montana Department of Transportation Wetland Mitigation Monitoring Project Rhithron Associates, Inc. for Land and Water Consulting 2001 and 2002		Project Name	Ridgeway	Ridgeway
		Date	8/23/2001	8/9/2002
Coelenterata		*Hydra*		
Turbellaria		*Dugesia*		
Oligochaeta	Enchytraeidae	Enchytraeidae		
	Lumbriculidae	Lumbriculidae		
	Naididae	*Chaetogaster*		
		Nais elinguis		
		Nais variabilis		
		Ophidonais serpentina		
	Tubificidae	Tubificidae - immature		
		Limnodrilus hoffmeisteri		
Hirudinea		*Mooreobdella microstoma*		
		Nephelopsis		
		Helobdella stagnalis		
		Helobdella		
		Glossiphonia		
		Theromyzon		1
Bivalvia	Sphaeriidae	*Sphaerium*		
Gastropoda	Lymnaeidae	*Fossaria*	3	18
	Physidae	*Physa*		1
	Planorbidae	*Gyraulus*		6
		Helisoma		
		Planorbella		17
Crustacea	Cladocera	Cladocera		
	Copepoda	Calanoida		
		Cyclopoida		
	Ostracoda	Ostracoda		19
	Amphipoda	*Gammarus*		
		Hyalella azteca		50
	Isopoda	*Caecidotea*		
	Decapoda	*Orconectes*		
Acarina		Acari		2
Odonata	Aeshnidae	*Anax junius*		
	Libellulidae	Libellulidae-early instar		
		Sympetrum	4	
	Coenagrionidae	Coenagrionidae-early instar		
		Enallagma	3	1
	Lestidae	*Lestes*		
Ephemeroptera	Baetidae	*Baetis tricaudatus*		
		Callibaetis	24	4
		Centroptilum		
	Caenidae	*Caenis*	11	10
	Ephemerellidae	*Ephemerella*		
	Heptageniidae	*Cinygma*		
		Nixe		
	Leptophlebiidae	*Paraleptophlebia*		
	Ameletidae	*Ameletus*		
Homoptera	Corixidae	Corixidae - immature	1	28
		Corisella tarsalis		4
		Hesperocorixa		
		Palmacorixa buenoi		
		Sigara		15
		Trichocorixa		
	Nepidae	*Ranatra*		
	Notonectidae	*Notonecta*	16	53
Plecoptera	Chloroperlidae	*Sweltsa*		
	Perlodidae	*Skwala*		
Trichoptera	Brachycentridae	*Brachycentrus* - early instar		
	Hydroptilidae	Hydroptilidae - pupa		

		Hydroptila		
	Lepidostomatidae	*Lepidostoma*		
	Leptoceridae	Leptoceridae - early instar		2
		Ceraclea		
		Mystacides		
		Nectopsyche		
		Ylodes		
	Limnephilidae	*Psychoglypha subborealis*		
Coleoptera	Chysomelidae	Chrysomelidae		
	Curculionidae	*Bagous*		
	Dytiscidae	*Acilius*		
		Dytiscidae - early instar larvae		
		Hydroporinae - early instar larvae		
		Hygrotus		9
		Liodessus		
		Laccophilus		
		Neoporus		
		Oreodytes		
		Rhantus		
		Stichtotarsus		
	Elmidae	*Dubiraphia*		1
		Heterlimnius		
		Lara avara		
		Optioservus		
		Zaitzevia		
	Haliplidae	*Haliplus*		1
		Peltodytes		
	Hydrophilidae	Hydrophilidae - early instar larvae		
		Berosus		6
		Helophorus		
		Hydrobius		
		Hydrochara		
		Laccobius	1	
		Tropisternus	1	
Diptera	Athericidae	*Atherix*		
	Ceratopogonidae	*Bezzia/Palpomyia*		6
		Dasyhelea		
	Chaoboridae	*Chaoborus*		
	Culicidae	*Anopheles*		
		Culex		
	Dixidae	*Dixella*		
	Dolichopodidae	Dolichopodidae		
	Empididae	*Clinocera*		
	Ephydridae	Ephydridae		
	Muscidae	Muscidae		
	Pelecorhynchidae	*Glutops*		
	Psychodidae	*Pericoma*		
	Simuliidae	*Simulium*		
	Sciomyzidae	Sciomyzidae		
	Stratiomyidae	*Odontomyia*		
	Tabanidae	Tabanidae		
	Tipulidae	*Hexatoma*		
		Tipula		
	Chironomidae	*Ablabesmyia*		
		Acricotopus		
		Camptocladius		
		Chironomus		
		Cladotanytarsus	4	
		Corynoneura		
		Cricotopus Bicinctus Gr.		
		Cricotopus (Cricotopus) Gr.		
		Cricotopus nostococladius		
		Cryptotendipes		
		Diamesa		

		Dicrotendipes		
		Einfeldia		
		Endochironomus	2	
		Labrundinia		
		Micropsectra		
		Microtendipes	84	1
		Odontomesa		
		Orthocladius annectens	39	
		Pagastia		
		Parachironomus		
		Paracladopelma		
		Paramerina	8	
		Parametriocnemus		
		Paratanytarsus	3	
		Paratendipes		
		Phaenopsectra		
		Polypedilum		
		Procladius		1
		Psectrocladius elatus		
		Psectrocladius vernalis		
		Psectrotanypus		
		Pseudochironomus		
		Stichtochironomus		
		Tanypus		
		Tanytarsus	1	
		Theinemanniella		
		Tvetenia		
		Total	205	256
		Total taxa	16	23
		POET	4	4
		Chironomidae taxa	7	2
		Crustacea taxa + Mollusca taxa	1	6
		% Chironomidae	68.78%	0.78%
		Orthocladiinae/Chironomidae	0.28	0.00
		%Amphipoda	0.00%	19.53%
		%Crustacea + %Mollusca	1.46%	43.36%
		HBI	6.45	7.88
		%Dominant taxon	40.98%	20.70%
		%Collector-Gatherers	80.49%	40.63%
		%Filterers	1.95%	0.00%
		Scores (2002 criteria)		
		Total taxa	3	5
		POET	5	5
		Chironomidae taxa	5	1
		Crustacea taxa + Mollusca taxa	1	5
		% Chironomidae	1	5
		Orthocladiinae/Chironomidae	3	1
		%Amphipoda	5	3
		%Crustacea + %Mollusca	5	3
		HBI	5	1
		%Dominant taxon	3	5
		%Collector-Gatherers	3	1
		%Filterers	1	1
		Total score	40	36

Appendix C

REPRESENTATIVE PHOTOGRAPHS OF W-9

MDT Wetland Mitigation Monitoring
Ridgeway Wetland
Ekalaka, Montana

LAND & WATER

WL#: 9 **Location:** B **Roll/Photo:** 2/21 **Description:** Wetland view, buffer in foreground **Compass Reading:** 268°

WL#: 9 **Location:** C **Roll/Photo:** 2/22 **Description:** Wetland view, buffer in foreground **Compass Reading:** 238°

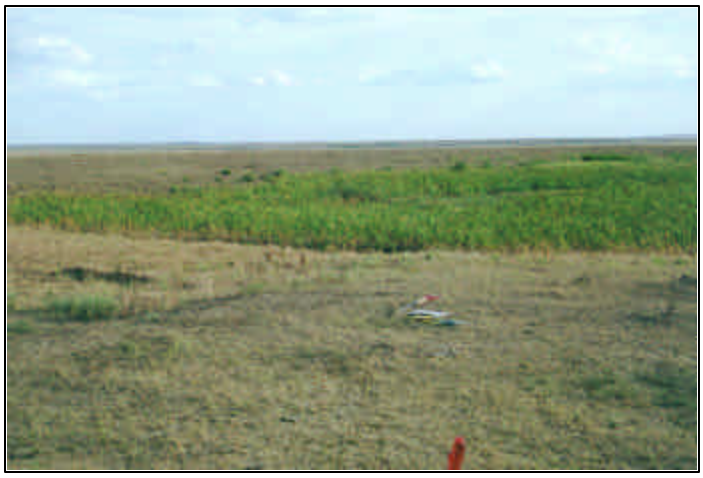
WL#: 9 **Location:** D **Roll/Photo:** 2/23 **Description:** Wetland view **Compass Reading:** 170°

WL#: 9 **Location:** E **Roll/Photo:** 2/19 **Description:** Wetland view **Compass Reading:** 80°

WL#: 9 **Location:** F **Roll/Photo:** 2/18 **Description:** Wetland view **Compass Reading:** 116°

WL#: 9 **Location:** G **Roll/Photo:** 2/23 **Description:** Wetland view from WL end of transect (same as D) **Compass Reading:** 170°

WL#: 9 **Location:** A **Roll/Photo:** 2/20 **Description:** Wetland view, buffer in foreground **Compass Reading:** 288°



WL#: 9 **Location**: H **Roll/Photo:** 2/24 **Description:** UPL veg transect end **Compass Reading:** 358°

Appendix D

1999 Ridgeway Complex Environmental Assessment
1990 BLM Typical Water Retention Pit Plans
Impoundment Sizes: L. Rau, BLM (1999)

MDT Wetland Mitigation Monitoring
Ridgeway Wetland
Ekalaka, Montana

LAND & WATER

RIDGEWAY WETLAND COMPLEX
ENVIRONMENTAL ASSESSMENT

EA NUMBER MT-020-9-87 **RIPS #** 9777 **GR#**

PROPOSED ACTION/TITLE TYPE: Ridgeway Wetland Complex/Wildlife Project

LOCATION OF PROPOSED ACTION: T.4S., R.58E., Section 28-35

PREPARING OFFICE: Miles City Field Office, Miles City, MT

APPLICANT: L. Tauk, Richards, Steig

DATE OF PREPARATION: 2/24/99

CONFORMANCE WITH APPLICABLE LAND USE PLAN:

This proposed action is subject to the Powder River Resource Area R approved in 1985. The proposed action has been reviewed for conformance with this plan and its terms and conditions as required 43 CFR 1610.6.

PURPOSE AND NEED: A complex of small to medium-sized water impoundments will be constructed to enhance waterfowl habitat. This approach is to create many shallow wetlands in a relatively small a (5 sections) to maximize that habitats' potential to produce waterf and other wetland species.

PROPOSED ACTION: BLM proposes construction of a complex of wetlands (20-25 ponds) on a 5 section parcel of public lands. Objective will be to maximize the surface acres of each individual project to create shallow water waterfowl habitat. There will be about 5 different construction designs based on individual site characteristics. Existing dams will be repaired and modified, spreader dikes will be modified with pits dug in front of structure, and 2-3 different pit and fill structures will be designed to meet site characteristics.

ALTERNATIVE CONSIDERED BUT NOT ANALYZED IN DETAIL: No Action - the project would not be completed as planned. This is not within present BLM management consideration for the area and will not be considered further.

AFFECTED ENVIRONMENT:

Vegetation: Vegetation consists of Wyoming sagebrush, western wheatgrass and low sagebrush.

Soils: Soils in this area have developed in residuum and alluvium derived from the Cretaceous Pierre Shale. As a result, surface and

subsurface textures are commonly clay, silty clay loam, and clay loam. Slopes range up to 25 percent, but commonly average around 8 percent. Near drainages, slopes may be less than two percent. Upland soils are commonly shallow on summits and soil depths increase down slope to deep and very deep on the alluvial fans and flats.

The characteristics of the marine shale parent material dominates physical and chemical characteristics of the soils. Soluble salts, predominately sodium, are present in most soils of the area. Slope wash concentrates these salts in the lowest parts of the landscape, usually in or near drainages. Concentration of salts may result in a claypan area. Salts will effect vegetation population and composition.

Hydrology: Water in this area is affected by the physical and chemical characteristics of the Pierre Shale. This is commonly expressed in salt context and suspended solids. The shale is often unstable and subject to mass movement, exposing unprotected material, ultimately affecting water quality.

Recreation Opportunities: Most recreation opportunity is during hunting season and focuses on antelope and some deer hunting.

Wildlife Habitat: The most common big game species in the area is antelope. Mule deer and sage grouse use the area infrequently. Non-game species that frequent the Wyoming sagebrush, western wheatgrass, and low sagebrush habitats are well represented resulting from good rangeland conditions.

Riparian: There are no riparian values on the project area at this time.

ENVIRONMENTAL IMPACTS:

There would be no impacts to the following elements of the human environment: air quality; ACECs; cultural resources; farmlands, prime/unique; floodplains; Native American concerns; environmental justice; T&E species; wastes, hazardous/solid; water quality; wetlands/riparian; wild & scenic rivers; wilderness.

DESCRIPTION OF IMPACTS FROM PROPOSED ACTION:

Vegetation: Some native vegetation will be destroyed in the excavation process. All native vegetation impacted by flooding will be killed. Dryland habitats will transition into wetland, sub-irrigated type vegetation as the reservoirs reach equilibrium.

Cultural Resources: Survey is required.

Soils: Heavier textured soils in this area are highly susceptible to water erosion. Water flowing over the surface may form rills and gullies. When vegetation is removed, water erosion may result.

Hydrology: Until vegetation is re-established, water quality may be damaged. Suspended solids may increase as well as dissolved solids and salts of many forms. Ultimately as vegetation re-establishes, water quality will return to a natural state.

Recreational Opportunities/VRM: Hunting season recreational opportunities will be enhanced as waterfowl begin using the area. Wildlife viewing opportunity will be improved with the addition of many wetland obligate species and endemic species that will come to water.

Wildlife Species: Non-game wildlife that have very small home ranges and limited movement potential will be impacted by habitat flooding. With the creation of wetland habitats, the associated wetland wildlife species will benefit from the project. Avian and terrestrial predators will benefit from enhanced prey base.

Riparian Values: Riparian/wetland values will be greatly enhanced. Shorelines will rapidly develop into stands of sedge, rush, cattail/bubrush and wet-meadow grasses and forbs.

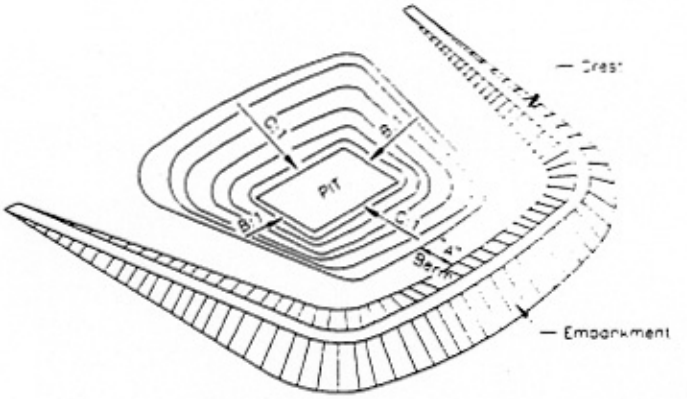
Land Uses: There are several Rights-of-Way in Section 34, some which are buried. If any digging takes place in this section, must coordinate with rights-of-way holders.

STIPULATIONS:

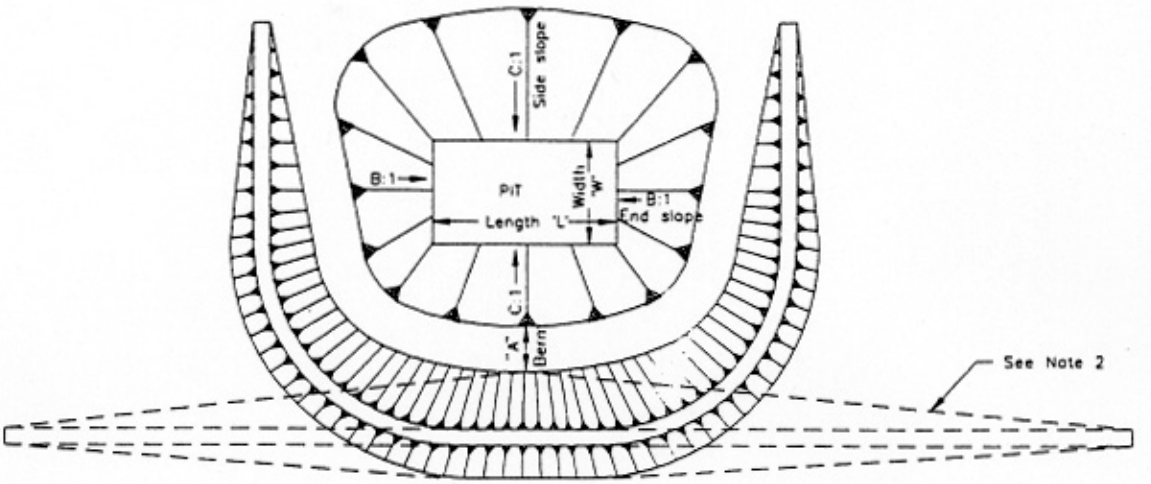
The contractor shall immediately bring to the attention of the BLM Field Manager any and all antiquities or other items of cultural or scientific interest, including but not limited to historic or prehistoric ruins, fossils, artifacts or burials discovered as a result of his operations, and shall leave such discoveries intact until told to proceed by the BLM Field Manager.

LIST OF PREPARERS:

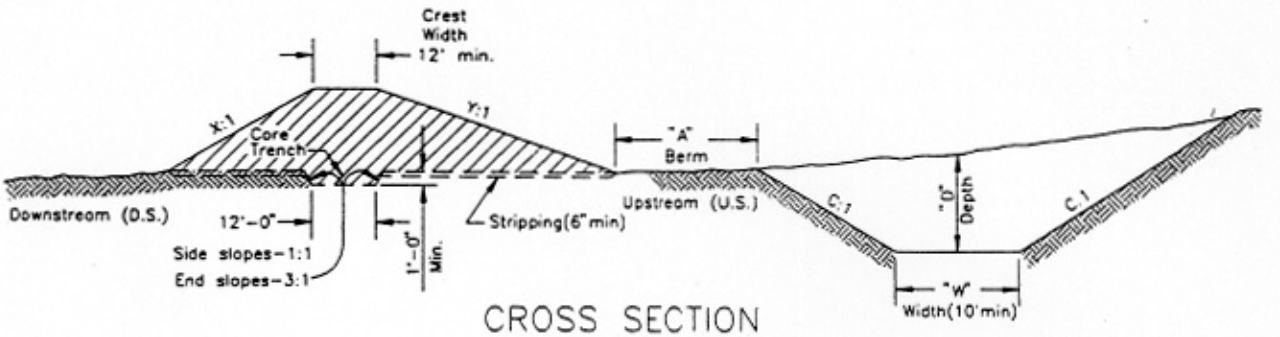
Miles City Field Office Personnel: Jeff Gustad, Rangeland Mgmt Spec; Ted Birnie, Archaeologist; Pam Wall, Realty Specialist; Robert Mitchell, Soil Scientist; Dan Bricco, Outdoor Recreation Planner; Larry Rau, Wildlife Biologist.



PERSPECTIVE VIEW



PLAN



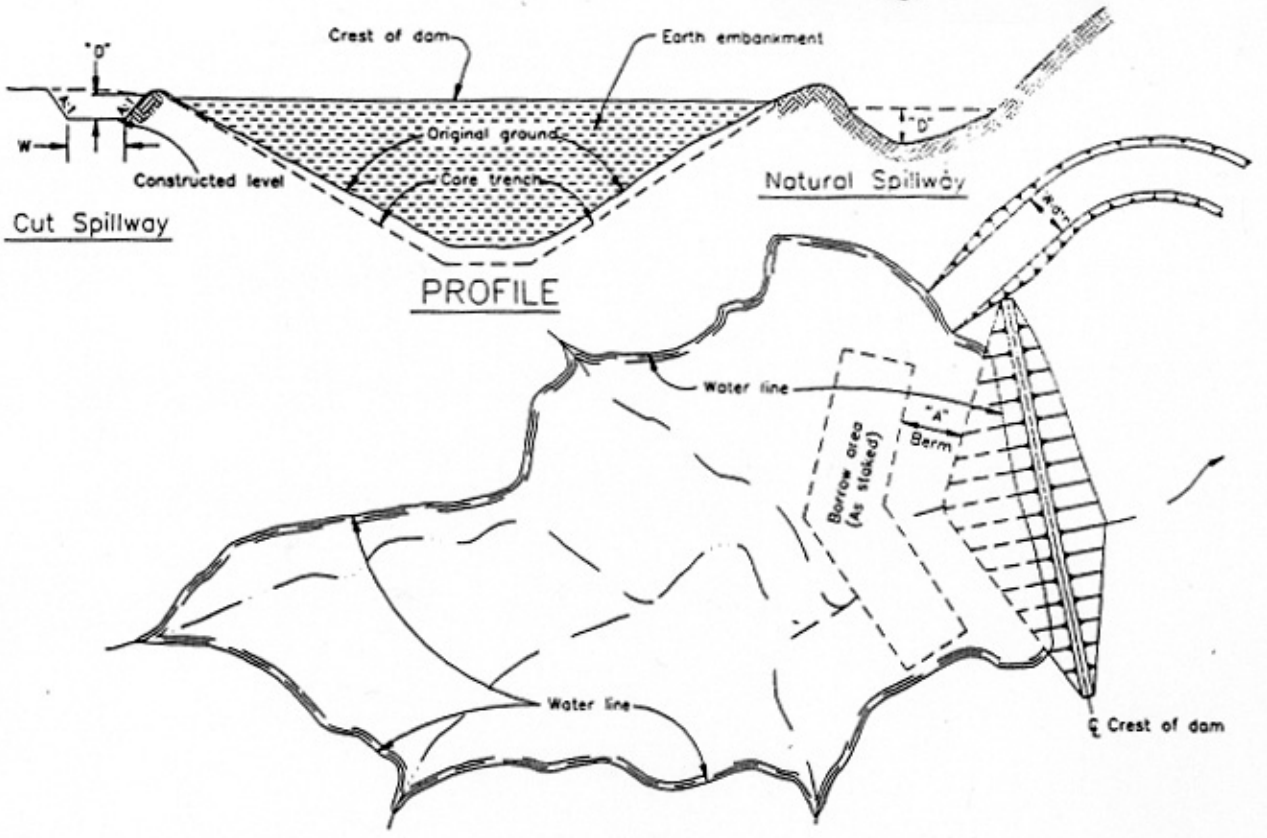
CROSS SECTION

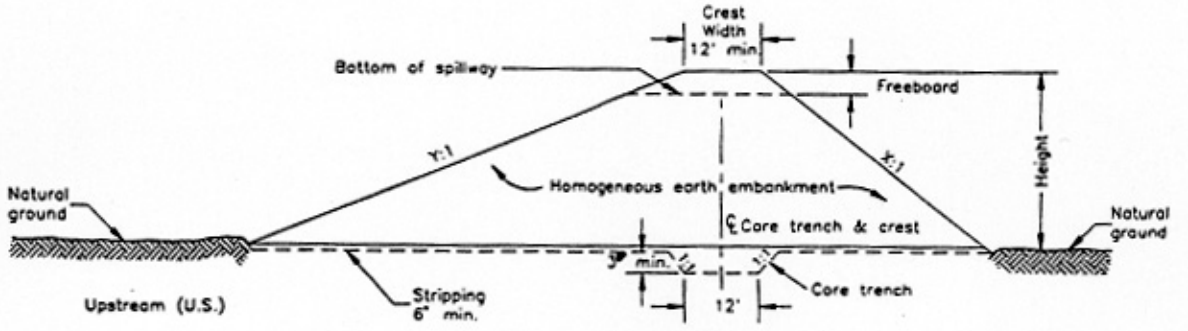
NOTES:

1. Pit and embankment slopes and dimensions shall be as shown on the Work Data Sheet or as staked.
2. Embankment may be "U", "L", "I", or straight line shape. Construct as indicated in specifications or as staked.

ALWAYS THINK SAFETY

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT DIVISION OF TECHNICAL SERVICES SERVICE CENTER	
TYPICAL WATER RETENTION PIT	
DESIGNED by others REVIEWED APPROVED	
DRAWN	SCALE NONE
DATE AUGUST 5, 1990	SHEET OF
DRAWING NO. 02291-1	





CROSS-SECTION
(BOTTOM OF DRAINAGE)

NOTES:

1. Embankment slopes and dimensions shall be as shown in specifications.
2. Berm with "A" minimum of 25' or as shown on the Work Data Sheet or as staked.
3. Freeboard as shown on the Work Data Sheet.

ALWAYS THINK SAFETY

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DIVISION OF TECHNICAL SERVICES SERVICE CENTER

TYPICAL MINOR RETENTION DAM

DESIGNED by others
REVIEWED
APPROVED

DRAWN
DATE
SCALE NONE
SHEET OF
DRAWING NO. 02291-2

LAND & WATER D-6

Larry 6/28

Enclosed are some examples of typical pit/fill projects that will be applied on the Ridgway waterfowl project.

At this time, we have 15-17 separate projects that will incorporate one or a combination of these examples.

The basic idea, as explained in previous correspondance, is to create as much shallow water/wetlands using the topography to the best of our advantage. The fill material will come from the pit which will designed for large surface, i.e. 200 x 200', and shallow depth, 6-8'.

The large dam will have more extensive & specific design. However, our engineering staff is waiting until we secure the water right before proceeding. We are expecting this documentation this summer.

Also included is the Environmental Analysis for this project.

Thanks for your help. Hopefully this info will help move things along.

Stay in touch -

Larry Lan

RECEIVED
JUN 29 1999
ENVIRONMENTAL

Ridgeway Wetlands Complex

LAND & WATER D-7

Project No	Yardage	Storage	Surface Area	Drainage Area	25 year storm yield
1.	5479 c.y.	4.0 AC Ft	3.5 AC	80 AC.	6.67 AC. Ft.
2.	2633 c.y.	3.0 Ac Ft	2.0 AC.	80 AC	6.67 AC. Ft.
3.	35,000 c.y.	80.0 AC. Ft	22.0 AC	900 AC.	75.0 AC. Ft.
4.	5420 c.y.	4.0 AC. Ft.	3.5 AC.	140 AC	11.7 AC. Ft.
5.	5420 c.y.	4.0 AC. Ft.	3.5 AC.	200 AC	16.7 AC. Ft.
6.	5479 c.y.	4.0 AC. Ft.	3.5 AC	500 AC	41.7 AC. Ft
7.	4152 c.y.	4.0 AC Ft	3.5 AC.	1200 AC.	100.0 AC. Ft.
8.	4152 c.y.	4.0 AC. Ft.	3.5 AC.	400 AC.	33.3 AC. Ft
9.	5243 c.y.	4.0 AC. Ft.	3.5 AC.	1500 AC.	125.0 AC. Ft
10.	5420 c.y.	4.0 AC Ft	3.5 AC.	230 AC.	19.2 AC. Ft.
11.	5420 c.y.	4.0 AC. Ft.	3.5 AC.	340 ±	28.3 AC. Ft.
12.	5420 c.y.	4.0 AC Ft.	3.5 AC.	580 AC.	48.3 AC. Ft.
13.	5420 c.y.	4.0 AC. Ft.	3.5 AC	45 AC	3.75 AC. Ft.
14.	5479 c.y.	4.0 AC. Ft	3.5 AC	370 AC	30.8 AC. Ft
15.	5243 c.y.	4.0 AC. Ft.	3.5 AC	725 AC.	60.0 AC. Ft
16.	5243 c.y.	4.0 AC. Ft	3.5 AC.	725 AC.	60.0 AC. Ft

Appendix E

BIRD SURVEY PROTOCOL
MACROINVERTEBRATE SAMPLING PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Ridgeway Wetland
Ekalaka, 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.

AQUATIC INVERTEBRATE SAMPLING PROTOCOL

Equipment List

- D-frame sampling net with 1 mm mesh. Wildco is a good source of these.
- Spare net.
- 1-liter plastic sample jars, wide-mouth. VWR has these: catalog #36319-707.
- 95% ethanol: Northwest Scientific in Billings carries this.

All these other things are generally available at hardware or sporting goods stores. Make the labels on an ink jet printer preferably.

- hip waders.
- pre-printed sample labels (printed on Rite-in-the-Rain or other coated paper, two labels per sample).
- pencil.
- plastic pail (3 or 5 gallon).
- large tea strainer or framed screen.
- towel.
- tape for affixing label to jar.
- cooler with ice for sample storage.

Site Selection

Select the sampling site with these considerations in mind:

- Select a site accessible with hip waders. If substrates are too soft, lay a wide board down to walk on.
- Determine a location that is representative of the overall condition of the wetland.

Sampling

Wetland invertebrates inhabit the substrate, the water column, the stems and leaves of aquatic vegetation, and the water surface. Your goal is to sweep the collecting net through each of these habitat types, and then to combine the resulting samples into the 1-liter sample jar.

Dip out about a gallon of water into the pail. Pour about a cup of ethanol into the sample jar. Fill out the top half of the sample labels, using pencil, since ink will dissolve in the ethanol.

Ideally, you can sample a swath of water column from near-shore outward to a depth of approximately 3 feet with a long sweep of the net, keeping the net at about half the depth of the water throughout the sweep. Sweep the water surface as well. Pull the net through a vegetated area, beneath the water surface, for at least a meter of distance.

Sample the substrate by pulling the net along the bottom, bumping it against the substrate several times as you pull.

This step is optional, but it gives you a chance to see that you've collected some invertebrates. Rinse the net out into the bucket, and look for insects, crustaceans, etc. If necessary, repeat the sampling process in a nearby location, and add the net contents to the bucket. Remember to sample all four environments.

Sieve the contents of the bucket through the straining device and pour or carefully scrape the contents of the strainer into the sample jar.

If you skip the bucket-and-sieve steps, simply lift handfuls of material out of the sampling net into the jars. In either case, please include some muck or mud and some vegetation in the jar. Often, you will have collected a large amount of vegetable material. If this is the case, lift out handfuls of material from the sieve into the jar, until the jar is about half full. Please limit material you include in the sample, so that there is only a single jar for each sample.

Top off the sample jar with enough ethanol to cover all the material in the jar. Leave as little headroom as possible.

It is not necessary to sample habitats in any specified order. Keep in mind that disturbing the habitats prior to sampling will chase off the animals you are trying to capture.

Complete the sample labels. Place one label inside the sample jar and tape the other label securely to the outside of the jar. Dry the jar before attaching the outer label if necessary. In some situations, it may be necessary to collect more than one sample at a site. If you take multiple samples from the same site, clearly indicate this by using individual sample numbers, along with the total number of samples collected at the site (e.g. Sample #3 of 5 total samples).

Photograph the sampled site.

Sample Handling/Shipping

- In the field, keep collected samples cool by storing them in a cooler. Only a small amount of ice is necessary.
- Inventory all samples, preparing a list of all sites and enumerating all samples, before shipping or delivering to the laboratory.
- Deliver samples to Rhithron.

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.

Appendix F

WETLANDS 1-8 AND 10-16 2002 PHOTOGRAPH LOG
WETLANDS 1-8 AND 10-16 2002 REPRESENTATIVE PHOTOGRAPHS
WETLANDS 1-16 2002 AERIAL PHOTOGRAPHS
WETLANDS 1-8 AND 10-16 FIGURE 2

MDT Wetland Mitigation Monitoring
Ridgeway Wetland
Ekalaka, Montana

LAND & WATER

W-1-8, 10-16
2002 PHOTOGRAPH LOG

Wetland #	Photo Location	Roll/ Frame #	Photograph Description	Compass Reading
1	D	*3/4	wetland view	234
1	A	3/5	wetland view	162
2	A	3/6	panoramic wetland view	48
2	B	3/8	panoramic wetland view	20
2	C	3/7	panoramic wetland view	342
3	A	3/9	wetland view	320
3	B	3/10	wetland view	58
4	B	2/9	wetland view	230
4	A	2/8	wetland view	16
5	A	2/7	wetland view	244
5	B	2/6	wetland view	50
6	A	2/12	wetland view	288
6	B	2/13	wetland view	258
7	F	2/14	wetland view	168
7	E	2/15	wetland view	54
8	A	2/16	wetland view	116
8	B	2/17	wetland view	160
10	F	2/25	wetland view	126
10	A	2/26	wetland view	0
11	E	2/4	wetland view	288
11	D	2/5	wetland view	100
12	A	1/24	wetland view	38
12	D	1/26	wetland view	270
12		1/25	Plains Garter Snake swimming	
13	D	2/2	wetland view	102
13	A	2/3	wetland view	0
14	E	3/2	wetland view	180
14	A	3/3	wetland view	326
15	E	1/22	wetland view	216
15	A	1/23	wetland view	38
16	C	1/20	wetland view	270
16	E	1/21	wetland view	90

* 2 indicates Ridgeway film roll #.

COMMENTS/PROBLEMS: Some of the stakes could not be located; these stakes were reset and in some cases if location could not be deciphered the photo point identification stake and ID # were reassigned; see aerial photographs for point locations. Only 2 photos were taken of each wetland (except W-9).

WL#: 1 **Location:** D **Roll/Photo:** 3/4 **Description:** Wetland view **Compass Reading:** 234°

WL#: 1 **Location:** A **Roll/Photo:** 3/5 **Description:** Wetland view **Compass Reading:** 162°

WL#: 2 **Location:** A **Roll/Photo:** 3/6 **Description:** Panoramic wetland view **Compass Reading:** 48°

WL#: 2 **Location:** B **Roll/Photo:** 3/8 **Description:** Panoramic wetland view **Compass Reading:** 20°

WL#: 2 **Location:** C **Roll/Photo:** 3/7 **Description:** Panoramic wetland view **Compass Reading:** 342°

WL#: 3 **Location:** A **Roll/Photo:** 3/9 **Description:** Wetland view **Compass Reading:** 320°

WL#: 3 **Location:** B **Roll/Photo:** 3/10 **Description:** Wetland view **Compass Reading:** 58°

WL#: 4 **Location:** B **Roll/Photo:** 2/9 **Description:** Wetland view **Compass Reading:** 230°

WL#: 4 **Location:** A **Roll/Photo:** 2/8 **Description:** Wetland view **Compass Reading:** 16°

WL#: 5 **Location:** A **Roll/Photo:** 2/7 **Description:** Wetland view **Compass Reading:** 244°

WL#: 5 **Location:** B **Roll/Photo:** 2/6 **Description:** Wetland view **Compass Reading:** 50°

WL#: 6 **Location:** A **Roll/Photo:** 2/12 **Description:** Wetland view **Compass Reading:** 288°

WL#: 6 **Location:** A **Roll/Photo:** 2/13 **Description:** Wetland view, buffer in foreground **Compass Reading:** 258°

WL#: 7 **Location:** F **Roll/Photo:** 2/14 **Description:** Wetland view **Compass Reading:** 168°

WL#: 7 **Location:** E **Roll/Photo:** 2/15 **Description:** Wetland view **Compass Reading:** 54°

WL#: 8 **Location:** A **Roll/Photo:** 2/16 **Description:** Wetland view **Compass Reading:** 116°

WL#: 8 **Location:** B **Roll/Photo:** 2/17 **Description:** Wetland view, buffer in foreground **Compass Reading:** 160°

WL#: 10 **Location**: A **Roll/Photo:** 2/26 **Description:** Wetland view **Compass Reading:** 0°

WL#: 10 **Location**: F **Roll/Photo:** 2/25 **Description:** Wetland view **Compass Reading:** 126°

WL#: 11 **Location**: E **Roll/Photo:** 2/4 **Description:** Wetland view **Compass Reading:** 288°

WL#: 11 **Location**: D **Roll/Photo:** 2/5 **Description:** Wetland view **Compass Reading:** 100°

WL#: 12 **Location**: A **Roll/Photo:** 1/24 **Description:** Wetland view **Compass Reading:** 38°

WL#: 12 **Location**: **Roll/Photo:** 1/26 **Description:** Plains Garter Snake Swimming **Compass Reading:**

WL#: 12 **Location**: D **Roll/Photo:** 1/26 **Description:** Wetland view **Compass Reading:** 270°

WL#: 13 **Location**: D **Roll/Photo:** 2/2 **Description:** Wetland view **Compass Reading:** 102°

WL#: 13 **Location**: A **Roll/Photo:** 2/3 **Description:** Wetland view **Compass Reading:** 0°

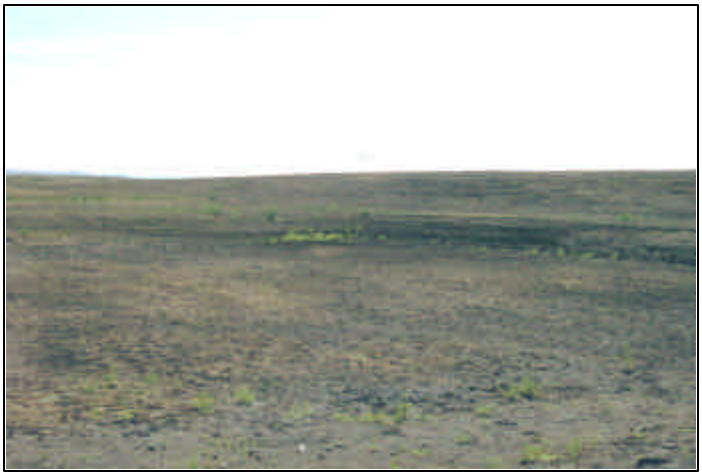
WL#: 14 **Location**: E **Roll/Photo:** 3/2 **Description:** Wetland view **Compass Reading:** 180°

WL#: 14 **Location**: A **Roll/Photo:** 3/3 **Description:** Wetland view **Compass Reading:** 326°

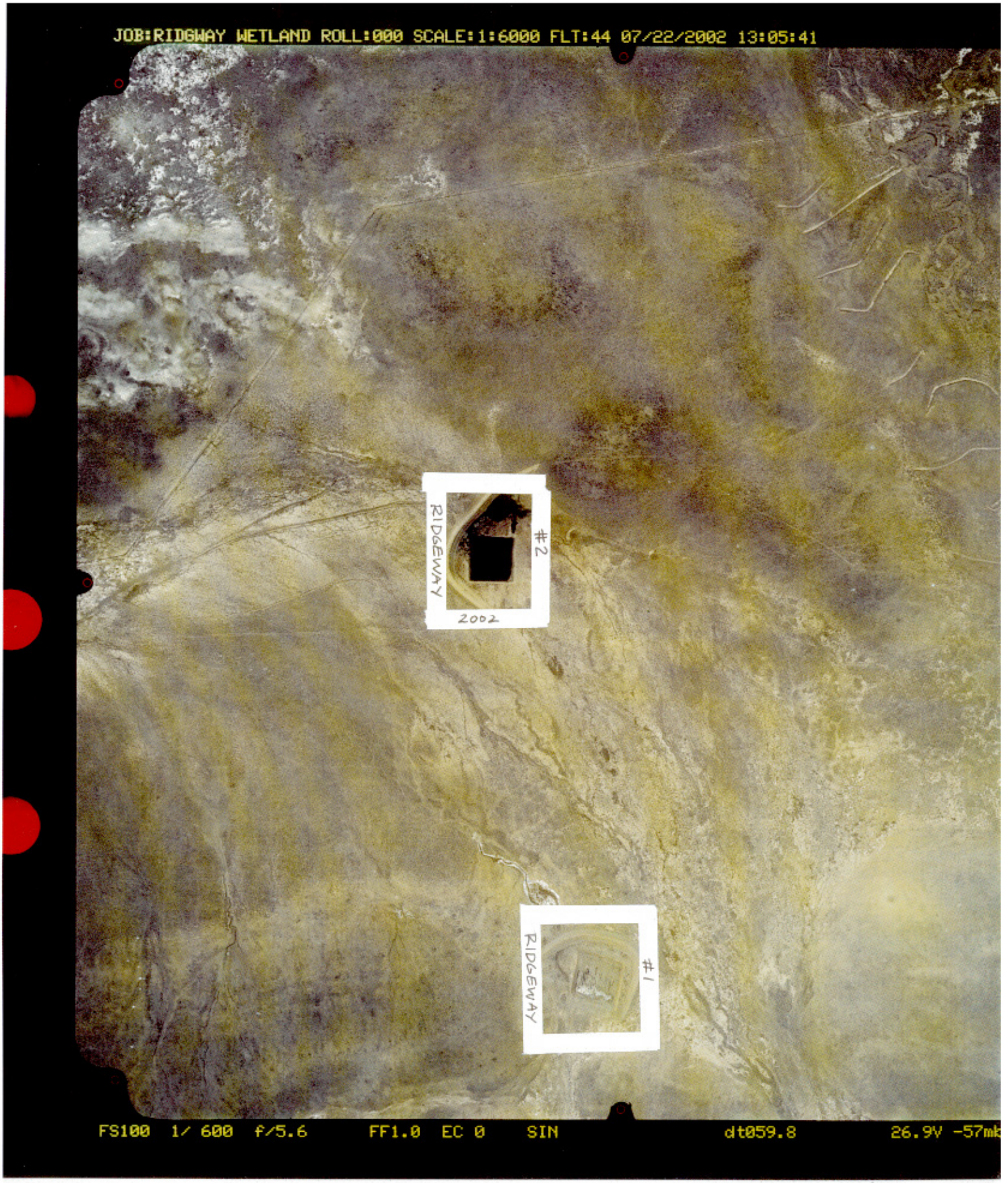
WL#: 15 **Location**: E **Roll/Photo:** 1/22 **Description:** Wetland view **Compass Reading:** 216°

WL#: 15 **Location**: A **Roll/Photo:** 1/23 **Description:** Wetland view **Compass Reading:** 38°

WL#: 16 **Location**: C **Roll/Photo:** 1/20 **Description:** Wetland view **Compass Reading:** 270°



WL#: 16 **Location**: E **Roll/Photo:** 1/21 **Description:** Wetland view **Compass Reading:** 90°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RIDGEWAY #1
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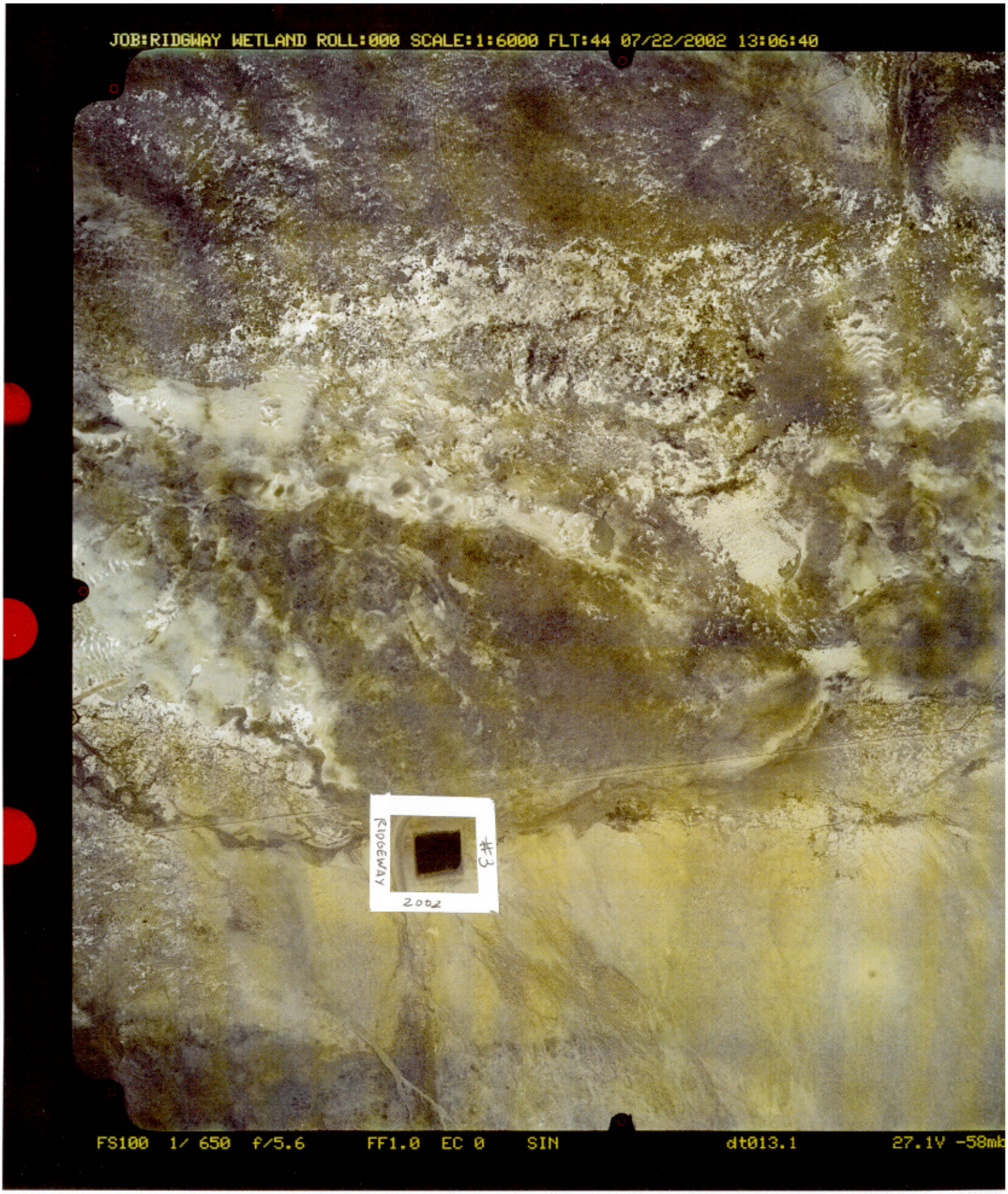
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2002
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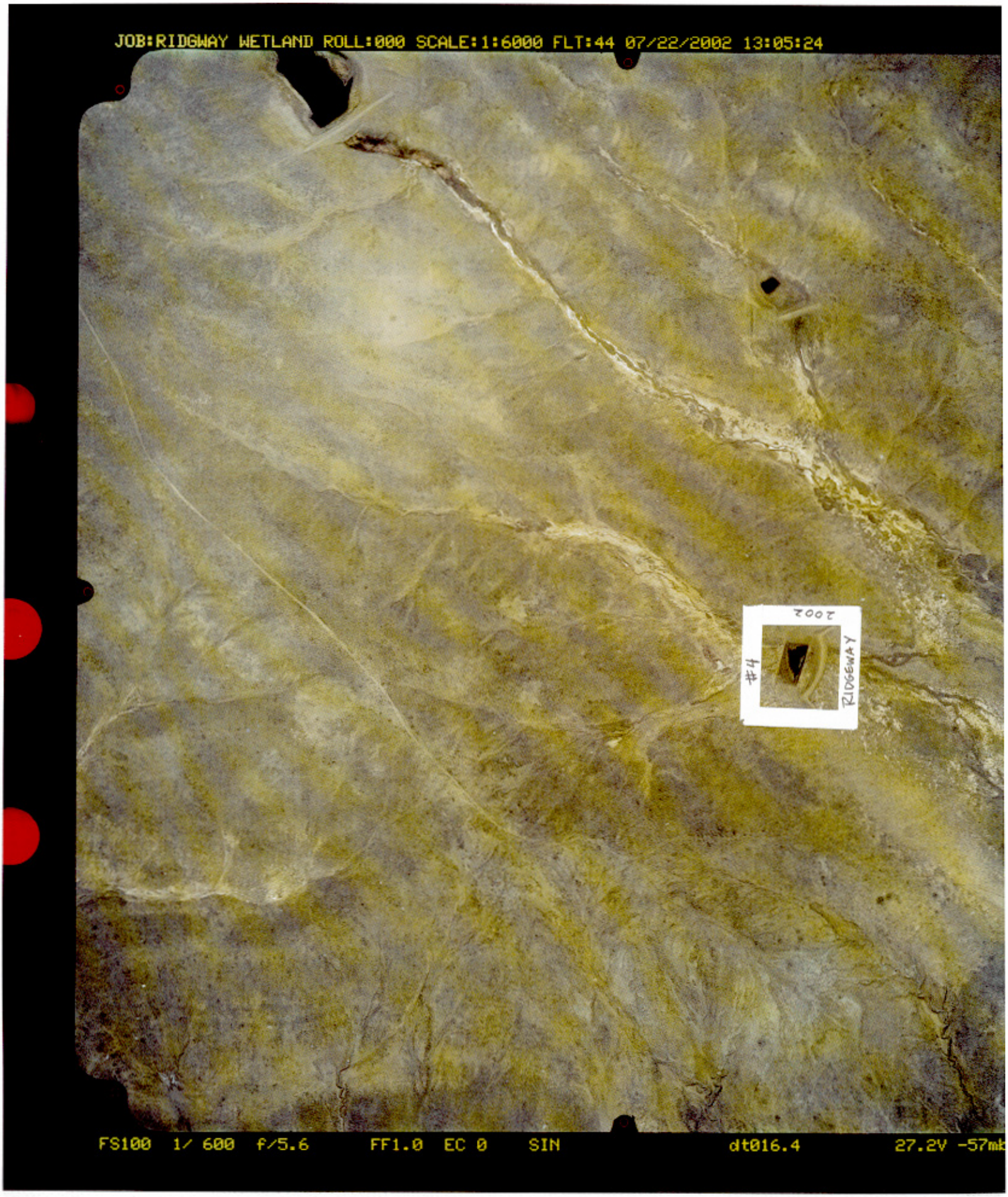
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RIDGEWAY
2002
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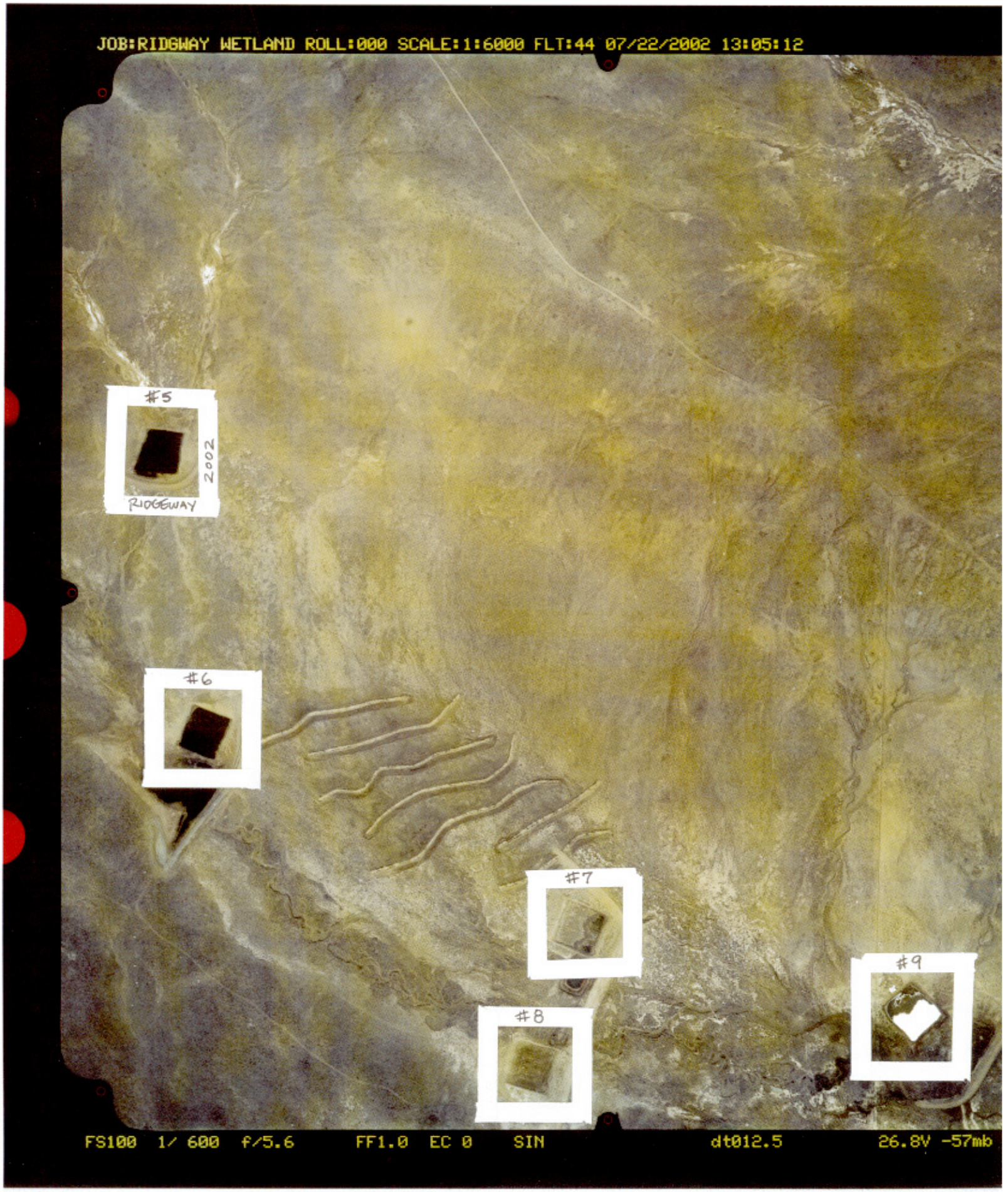
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2002
RIDGEWAY
#6
#7
#8
#9
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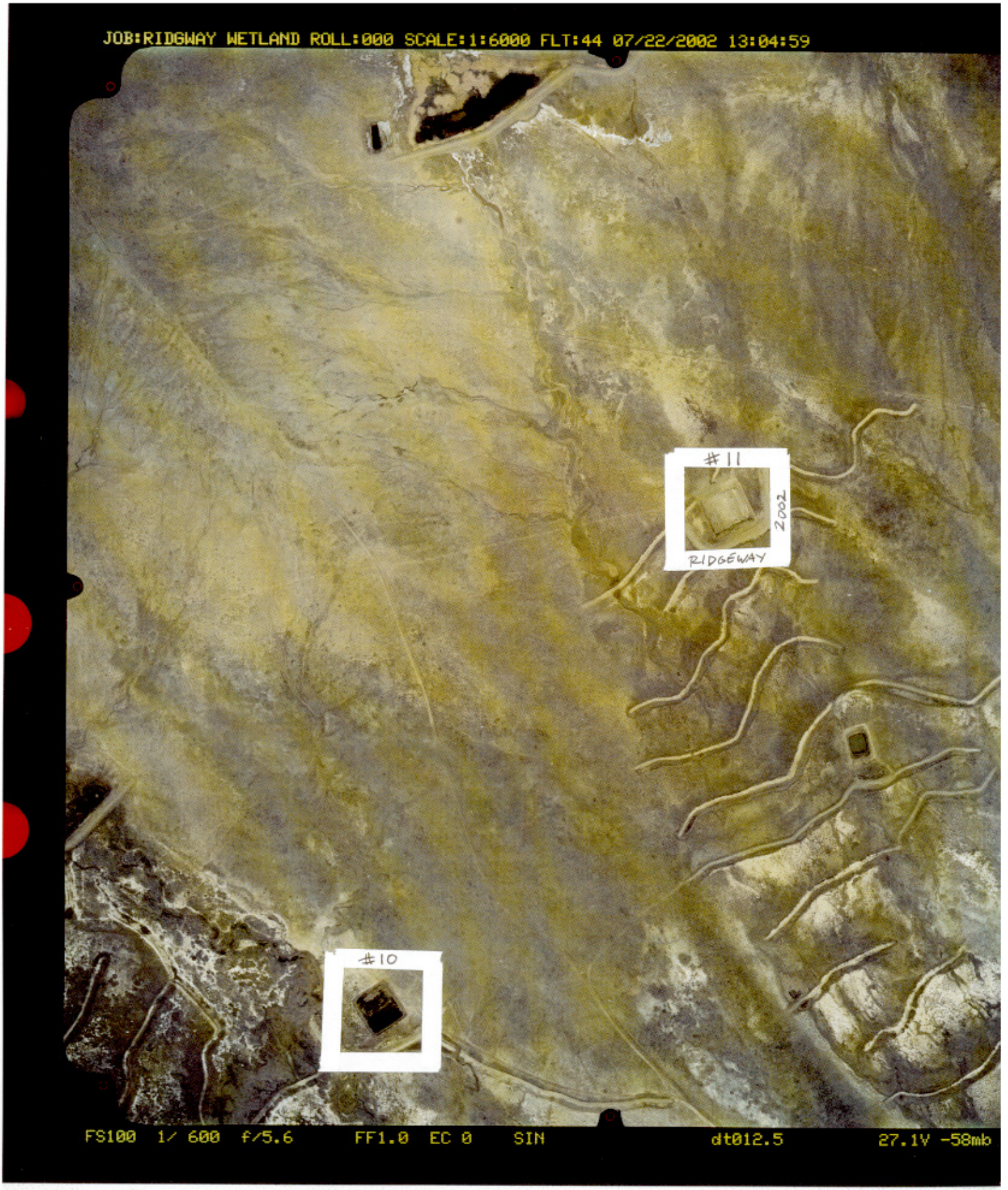
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2002
RIDGEWAY
#10
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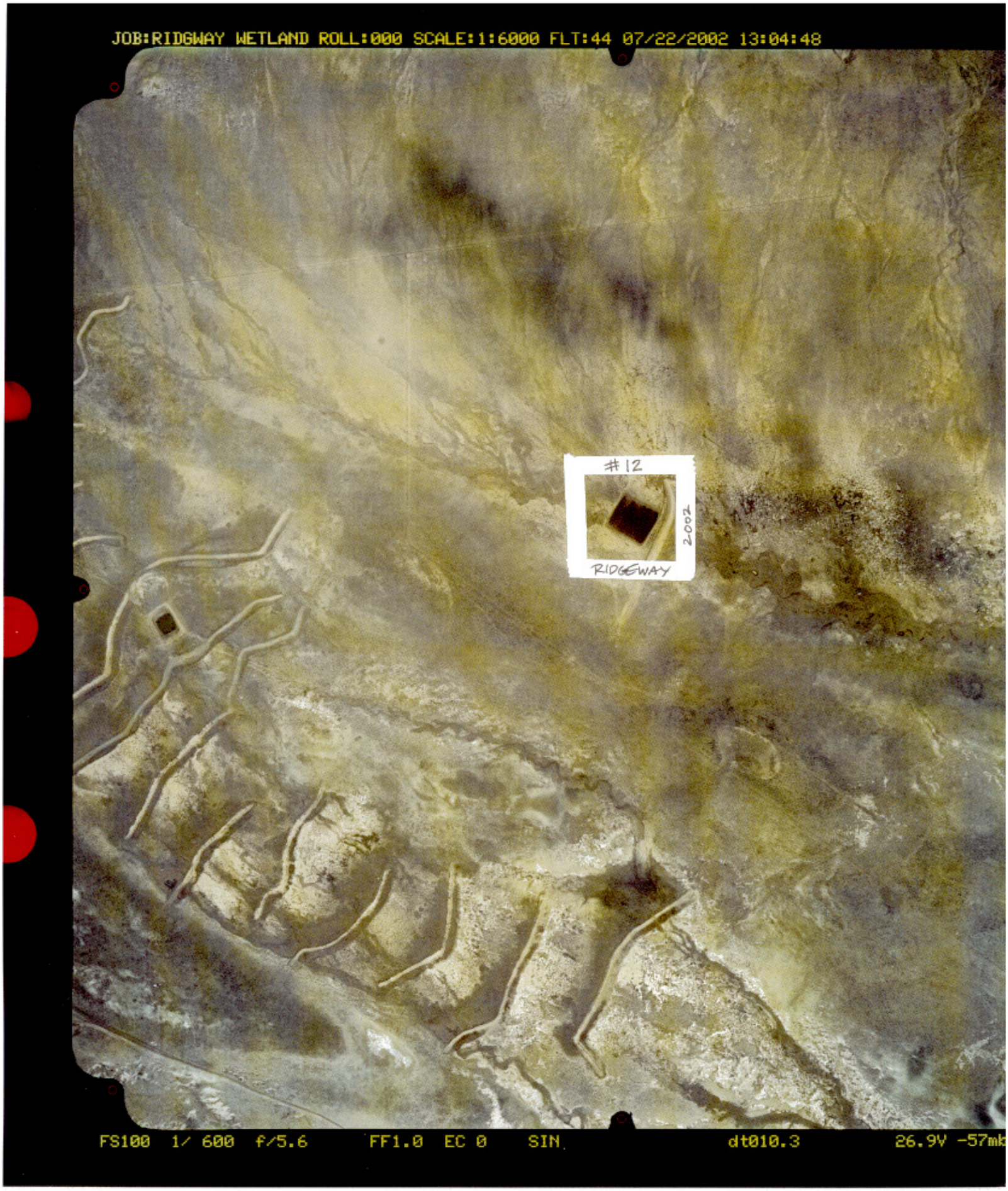
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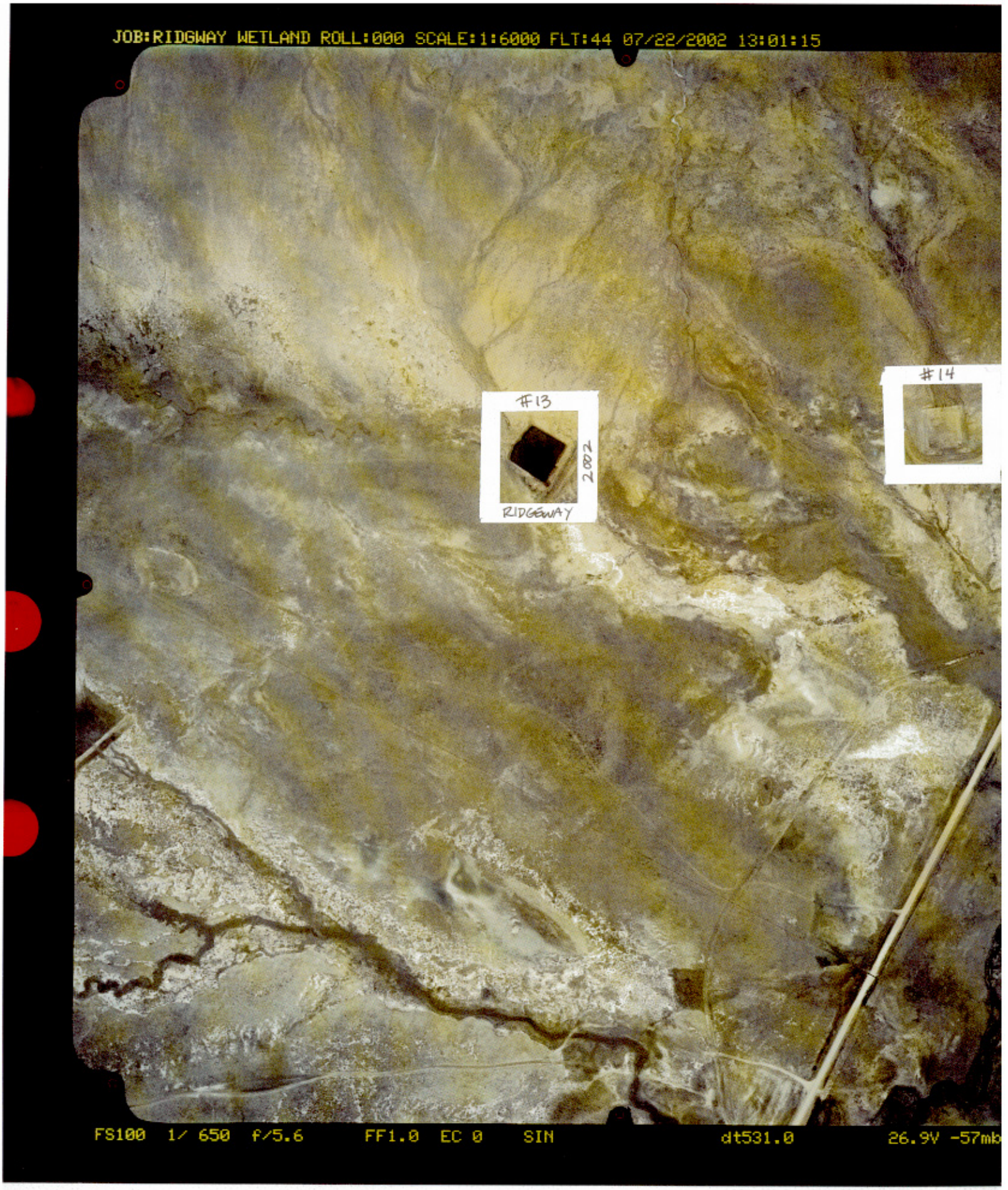
JOB:RIDGWAY WETLAND ROLL:000 SCALE:1:6000 FLT:44 07/22/2002 13:01:15
#13
2002
RIDGEWAY
#14
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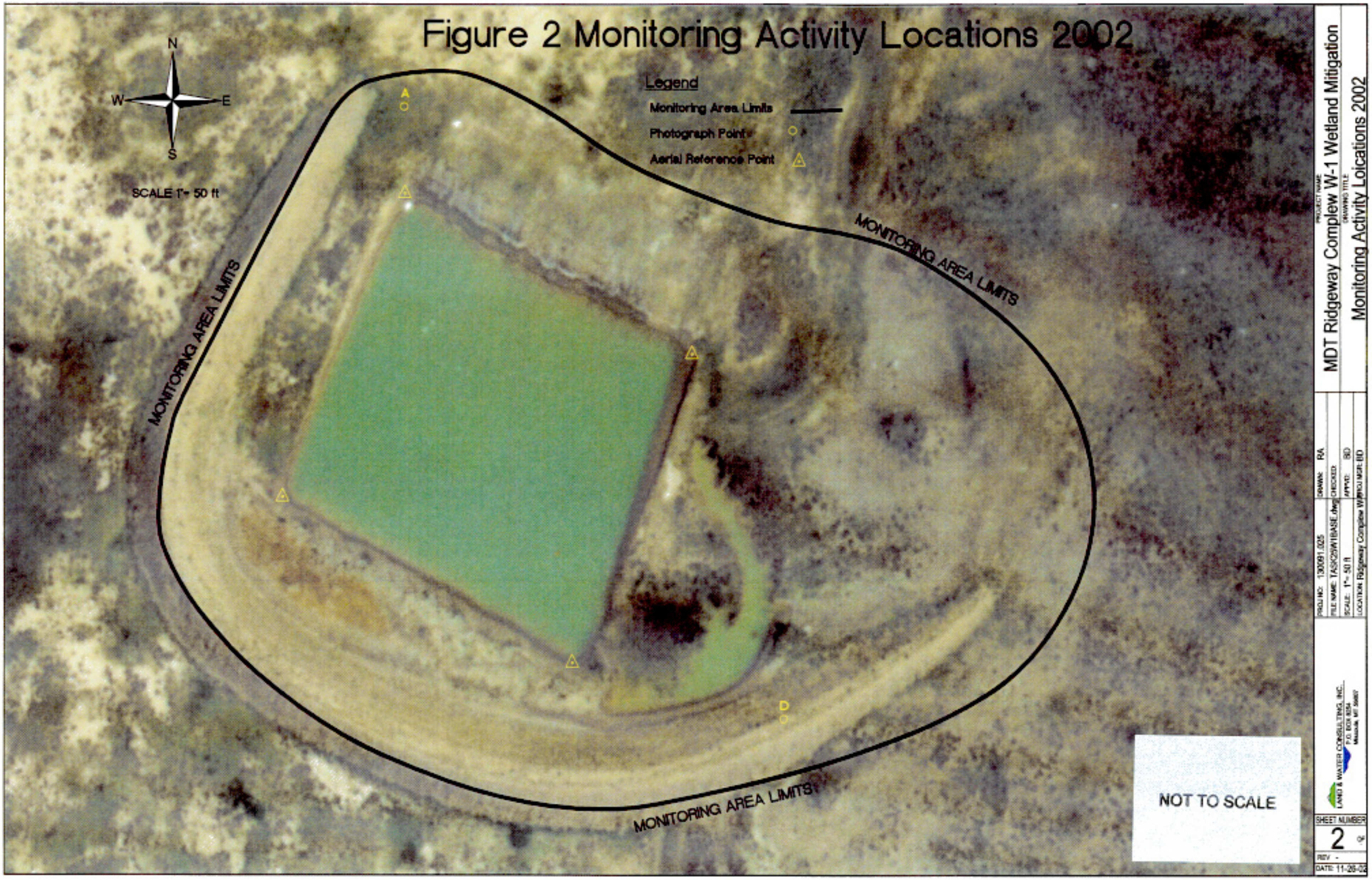
Figure 2 Monitoring Activity Locations 2002
N
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SCALE 1" = 50 ft
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
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MONITORING AREA LIMITS
MONITORING AREA LIMITS
MONITORING AREA LIMITS
NOT TO SCALE
PROJECT NAME
MDT Ridgeway Complew W-1 Wetland Mitigation
DRAWING TITLE
Monitoring Activity Loications 2002
PROJ NO: 130091.025
DRAWN: RA
FILE NAME: TASK25W1BASE.dwg
CHECKED:
SCALE: 1" = 50 ft
APPVD: BD
LOCATION: Ridgeway Complew W-1
PROJ MGR: BD
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2
REV -
DATE: 11-26-02

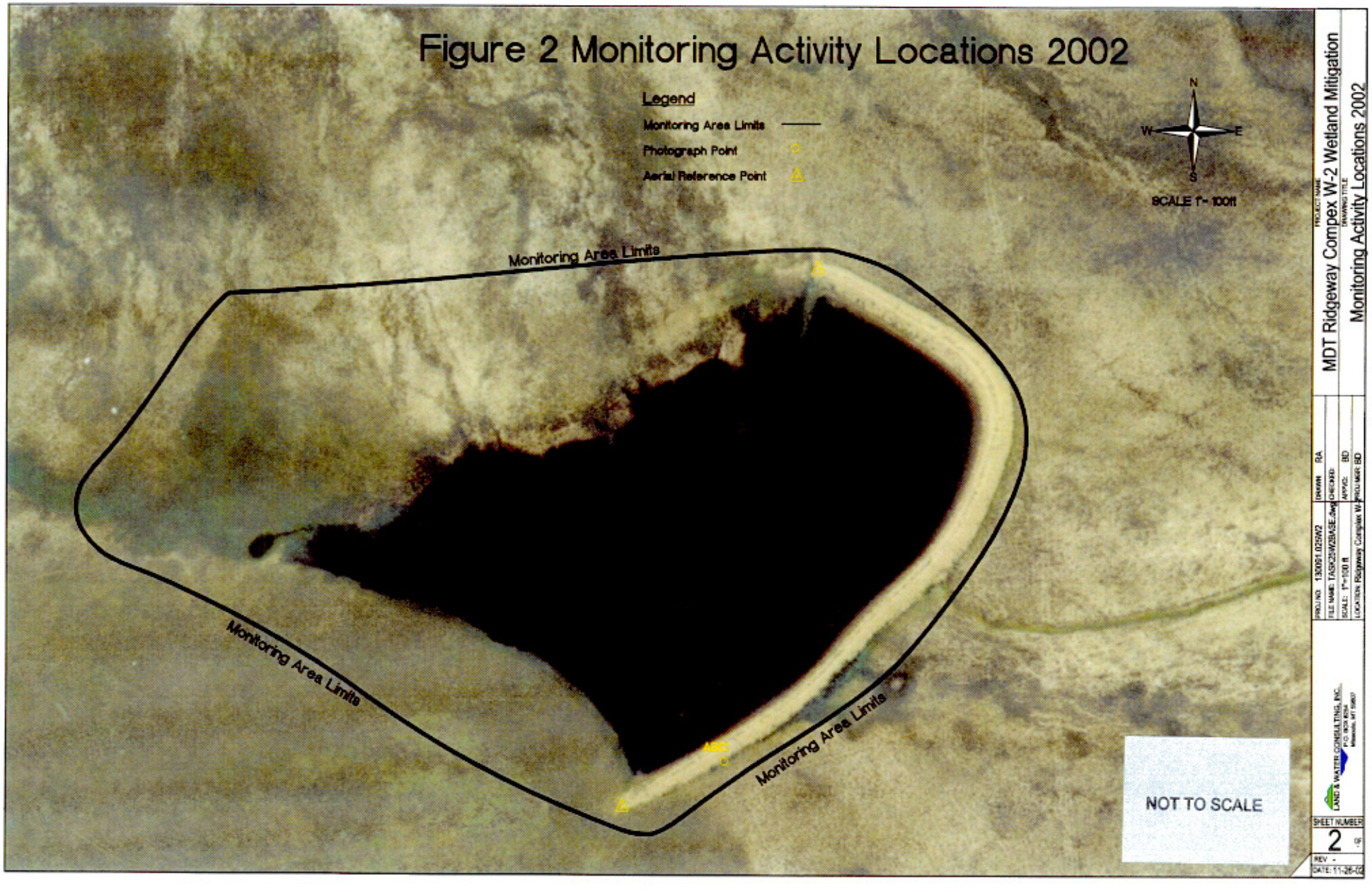
Figure 2 Monitoring Activity Locations 2002
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
N
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SCALE 1"= 100ft
Monitoring Area Limits
Monitoring Area Limits
Monitoring Area Limits
ABC
NOT TO SCALE
PROJECT NAME
MDT Ridgeway Compex W-2 Wetland Mitigation
DRAWING TITLE
Monitoring Activity Locations 2002
PROJ NO. 13061.029W2
DRAWN RA
FILE NAME: TASK2\W2BASE.dwg
CHECKED:
SCALE: 1"=100 ft.
APPVD. BD
LOCATION: Ridgeway Complex W-2
PROJ MGR BD
LAND & WATER CONSULTING, INC.
P.O. BOX 8254
Missoula, MT 59807
SHEET NUMBER
2
REV -
DATE: 11-26-02

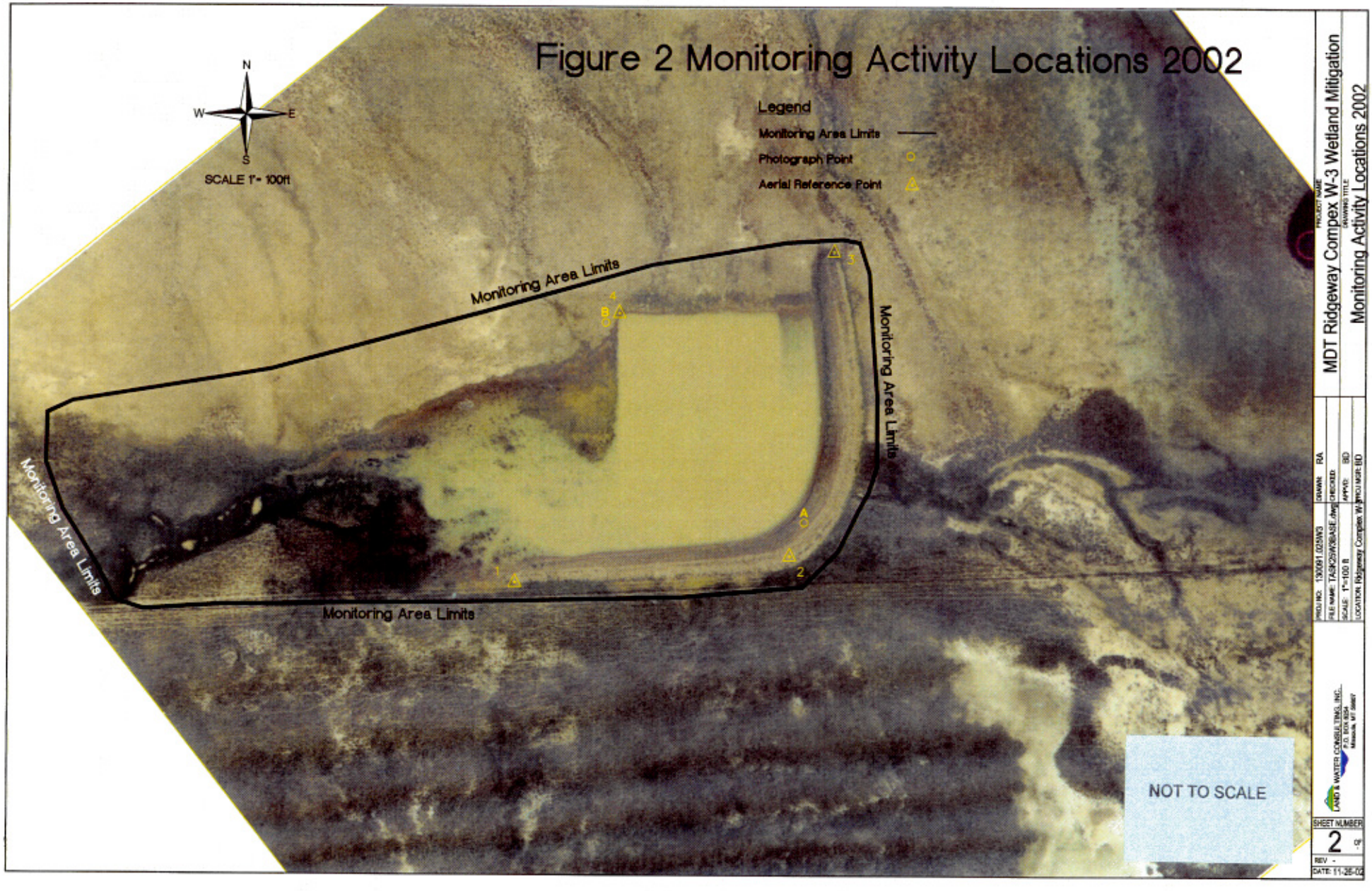
Figure 2 Monitoring Activity Locations 2002
N
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SCALE 1" = 100ft
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
Monitoring Area Limits
Monitoring Area Limits
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Monitoring Area Limits
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NOT TO SCALE
MDT Ridgeway Compex W-3 Wetland Mitigation
Monitoring Activity Locations 2002
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2
REV -
DATE: 11-26-02

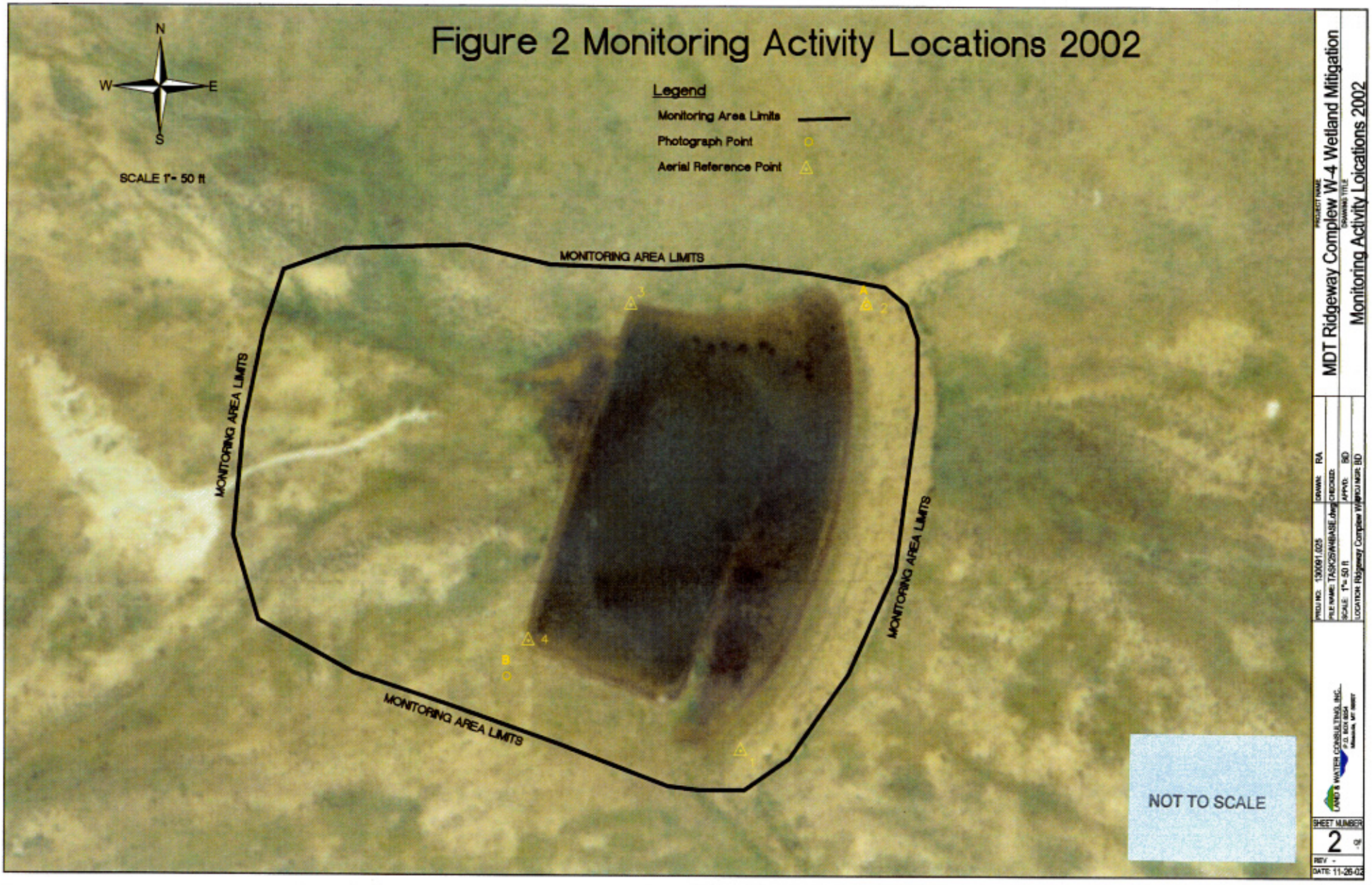
Figure 2 Monitoring Activity Locations 2002
N
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SCALE 1"= 50 ft
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
MONITORING AREA LIMITS
MONITORING AREA LIMITS
MONITORING AREA LIMITS
MONITORING AREA LIMITS
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NOT TO SCALE
MDT Ridgeway Complew W-4 Wetland Mitigation
Monitoring Activity Loications 2002
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2
DATE: 11-26-02

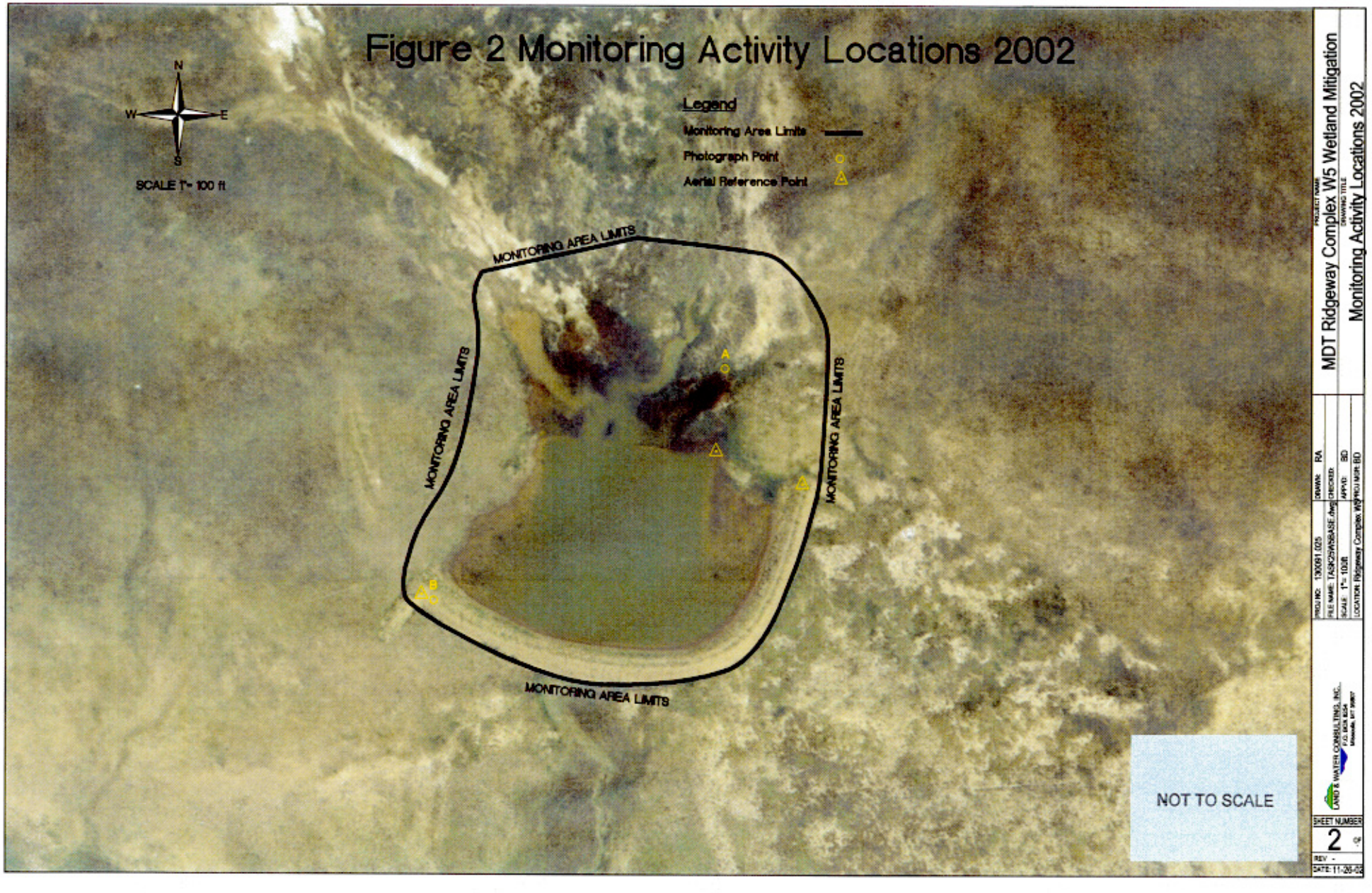
Figure 2 Monitoring Activity Locations 2002
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SCALE 1"= 100 ft
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
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MONITORING AREA LIMITS
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MDT Ridgeway Complex W5 Wetland Mitigation
Monitoring Activity Locations 2002
SHEET NUMBER
2

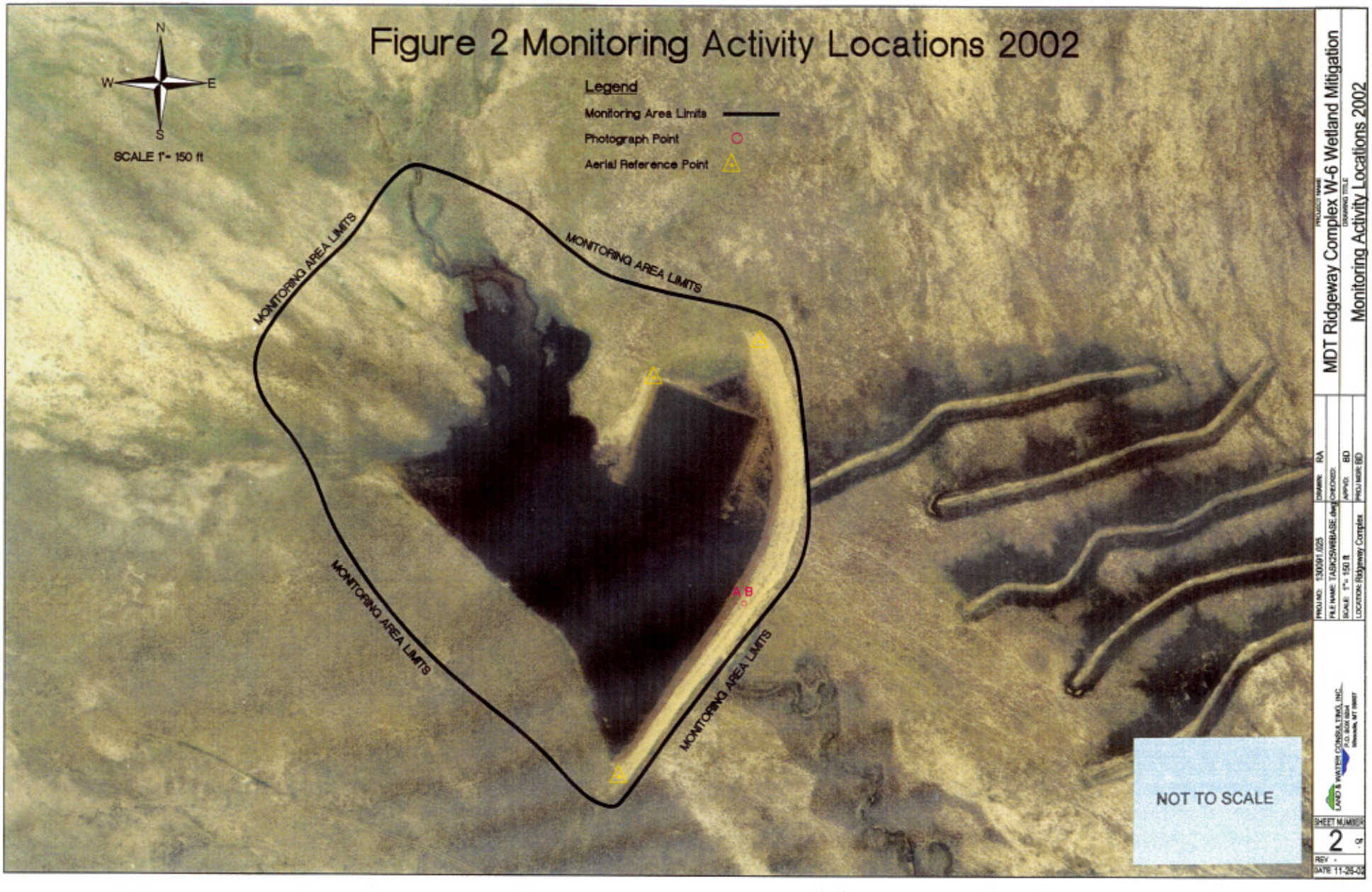
Figure 2 Monitoring Activity Locations 2002
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SCALE 1"= 150 ft
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
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NOT TO SCALE
MDT Ridgeway Complex W-6 Wetland Mitigation
Monitoring Activity Locations 2002
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2
REV -
DATE 11-26-02


Figure 2 Monitoring Activity Locations 2002
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
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SCALE 1"= 100ft
MONITORING AREA LIMITS
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GPS2
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GPS1
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NOT TO SCALE
MDT Ridgeway Complex W7-8 Wetland Mitigation
Monitoring Activity Locations 2002
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2

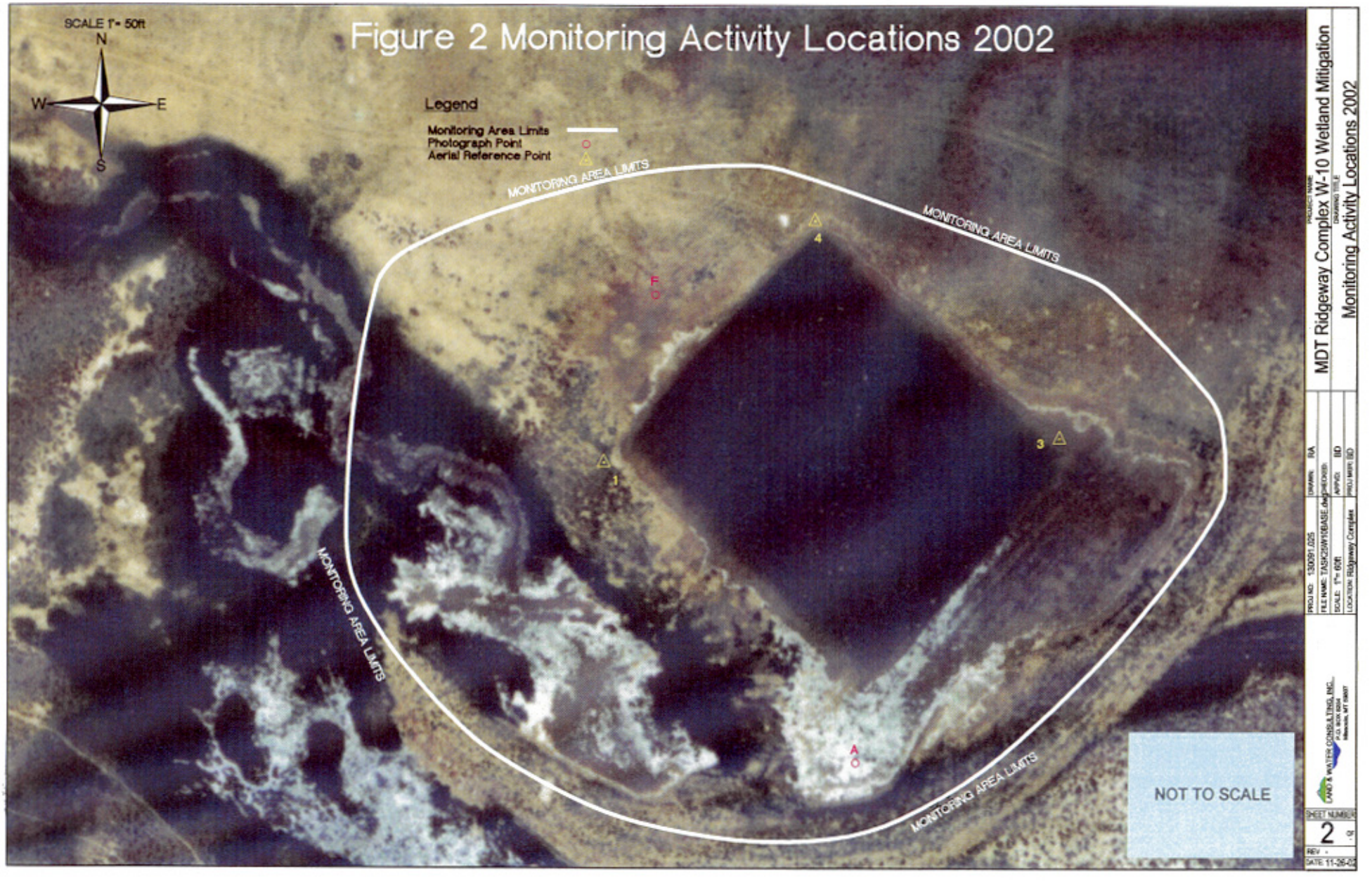
Figure 2 Monitoring Activity Locations 2002
SCALE 1"= 50ft
N
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Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
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MDT Ridgeway Complex W-10 Wetland Mitigation
Monitoring Activity Locations 2002
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2
REV -
DATE 11-26-02

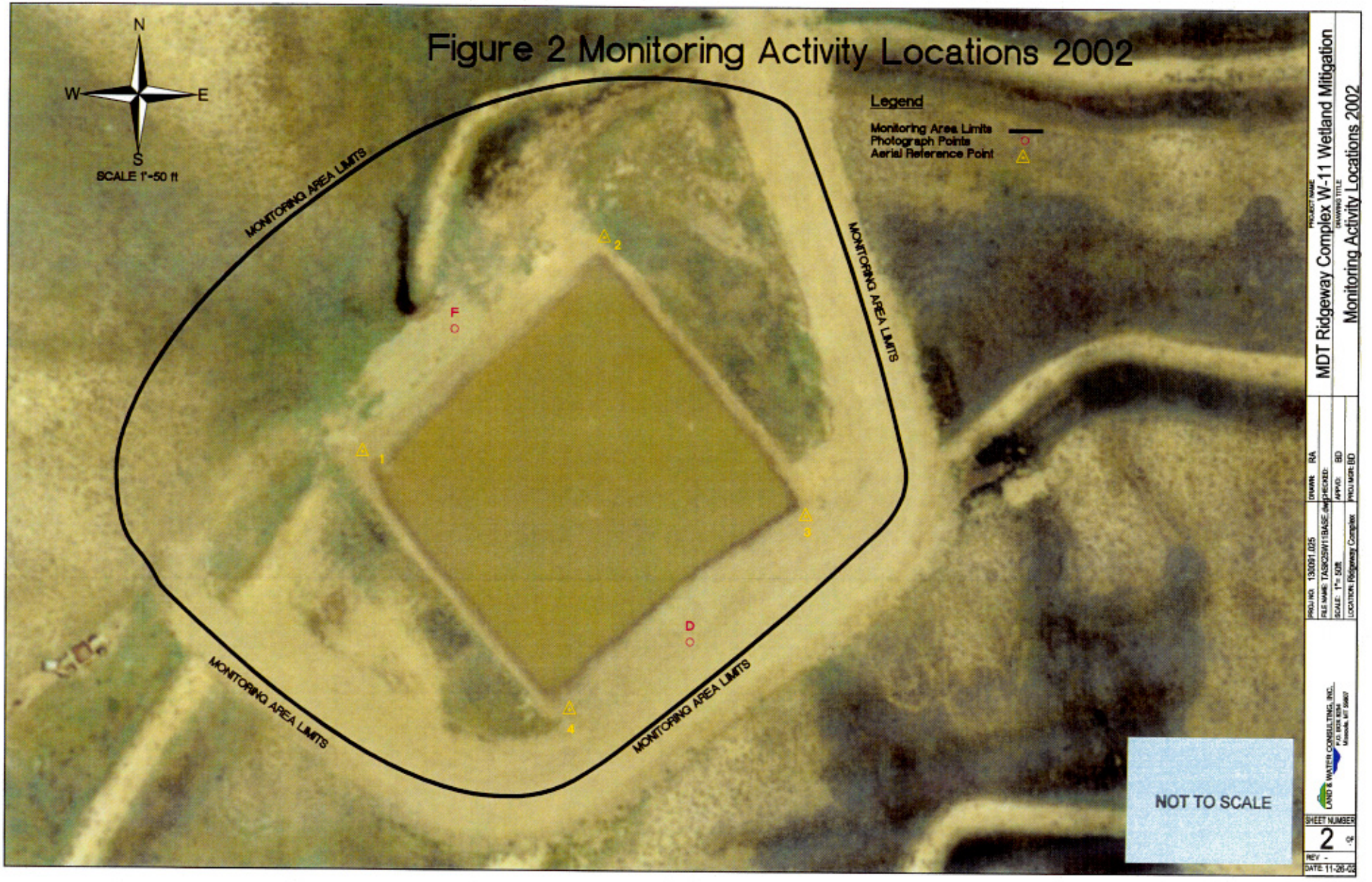
Figure 2 Monitoring Activity Locations 2002
N
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SCALE 1"=50 ft
Legend
Monitoring Area Limits
Photograph Points
Aerial Reference Point
MONITORING AREA LIMITS
MONITORING AREA LIMITS
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MONITORING AREA LIMITS
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NOT TO SCALE
PROJECT NAME
MDT Ridgeway Complex W-11 Wetland Mitigation
DRAWING TITLE
Monitoring Activity Locations 2002
PROJ NO: 1302061.025
FILE NAME: TASK25W11BASE.dwg
SCALE: 1"= 50ft
LOCATION: Ridgeway Complex
DRAWN: RA
CHECKED:
APPVD: BD
PHOTO MGR: BD
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2
REV -
DATE 11-26-02

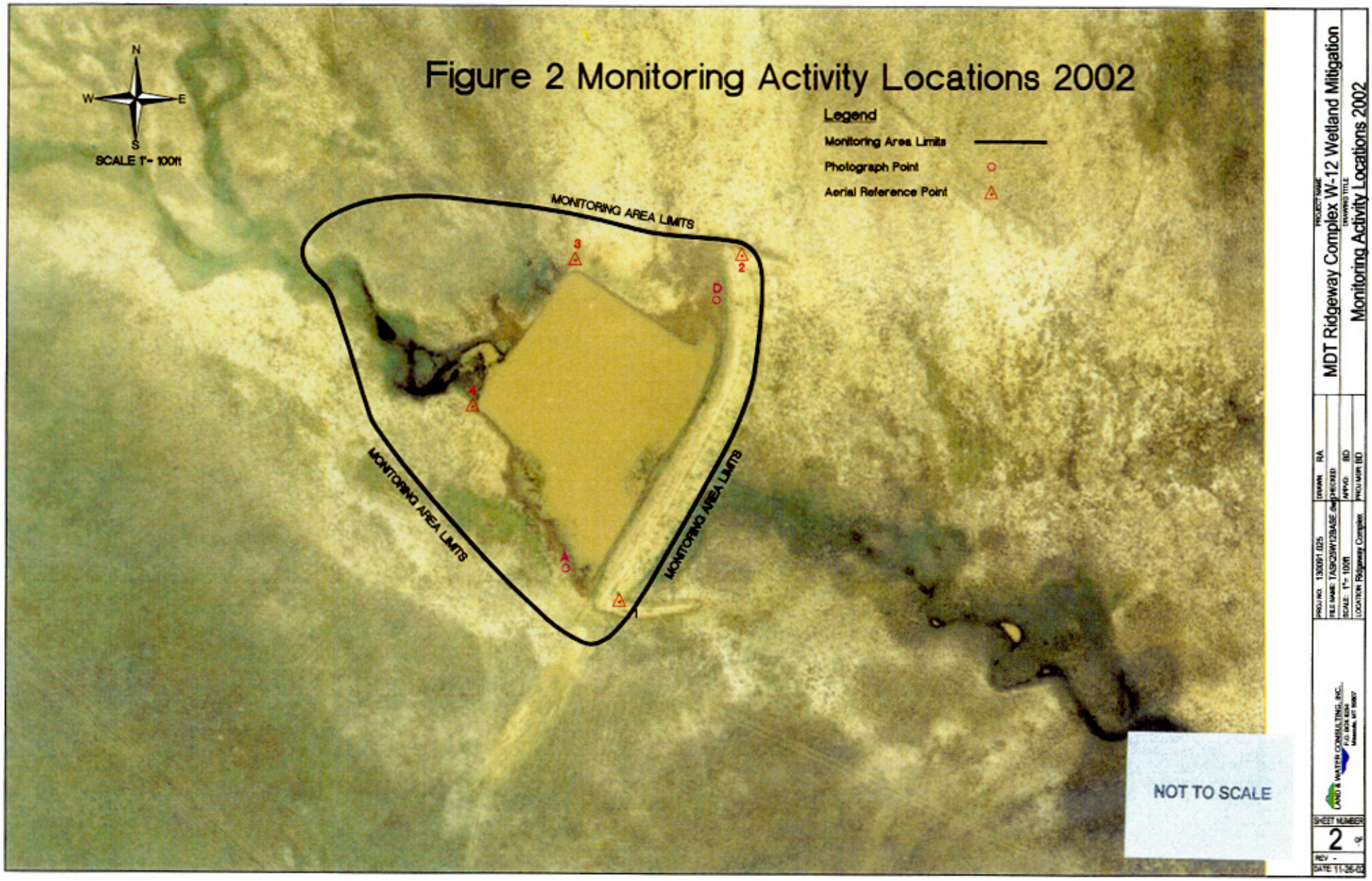
Figure 2 Monitoring Activity Locations 2002
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SCALE 1"= 100ft
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
MONITORING AREA LIMITS
MONITORING AREA LIMITS
MONITORING AREA LIMITS
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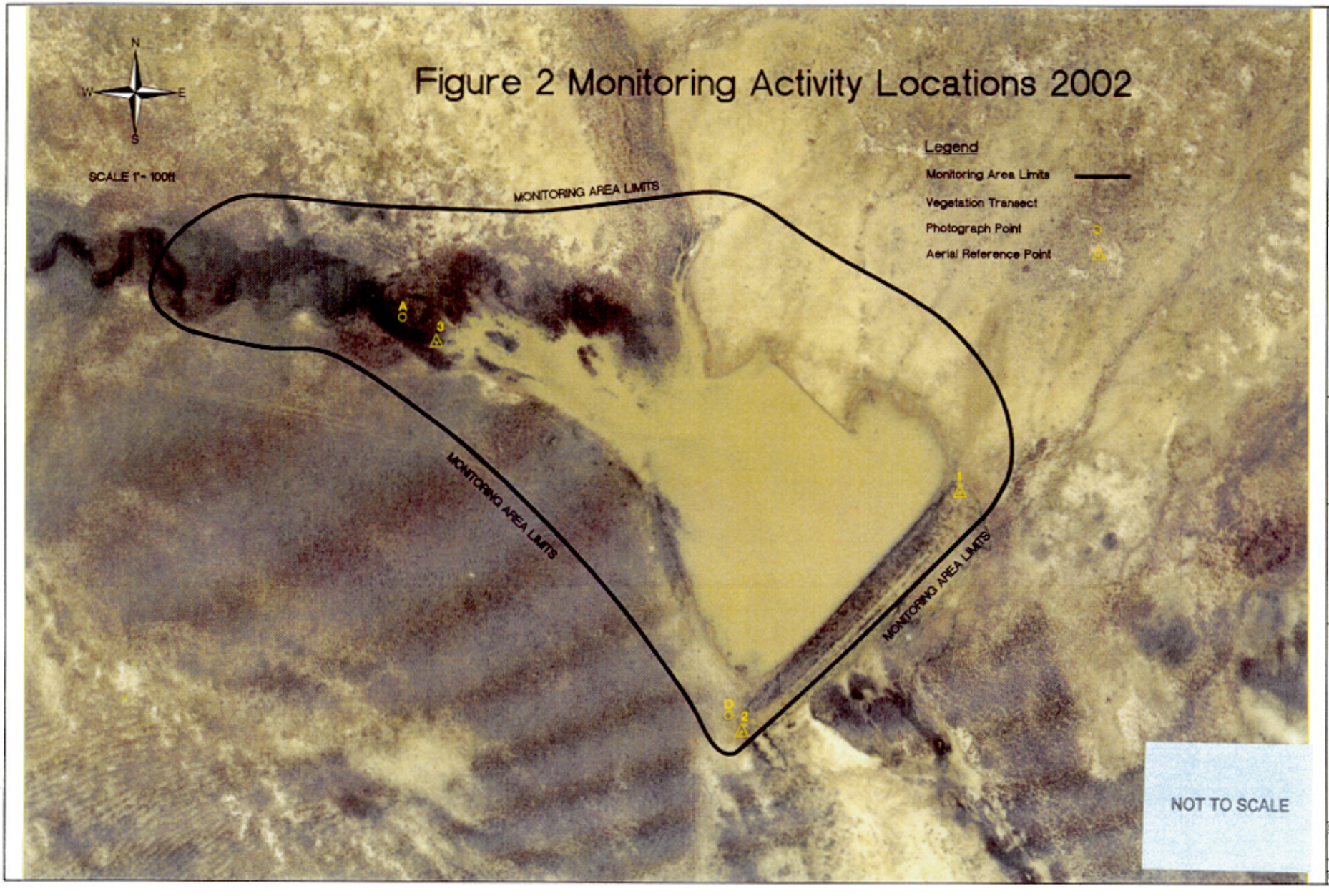
NOT TO SCALE
PROJECT NAME
MDT Ridgeway Complex W-12 Wetland Mitigation
DRAWING TITLE
Monitoring Activity Locations 2002
PROJ NO: 13009.025
DRAWN: RA
FILE NAME: TASK25W12BASE.dwg
CHECKED:
SCALE: 1"= 100ft
APPVD: BD
LOCATION: Ridgeway Complex
PROJ MGR: BD
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2
REV -
DATE: 11-26-02



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DRAWING TITLE: Monitoring Activity Locations 2002
PROJ NO: 130991.025
DRAWN: RA
FILE NAME: TASK2\W13BASE.dwg
CHECKED:
SCALE: 1"= 100ft
APPVD: BD
LOCATION:
PROJ MGR: Ridgeway Complex
LAND & WATER CONSULTING, INC.
P.O. BOX 8004
Missoula, MT 59807
SHEET NUMBER: 2
REV: -
DATE: 11-26-02

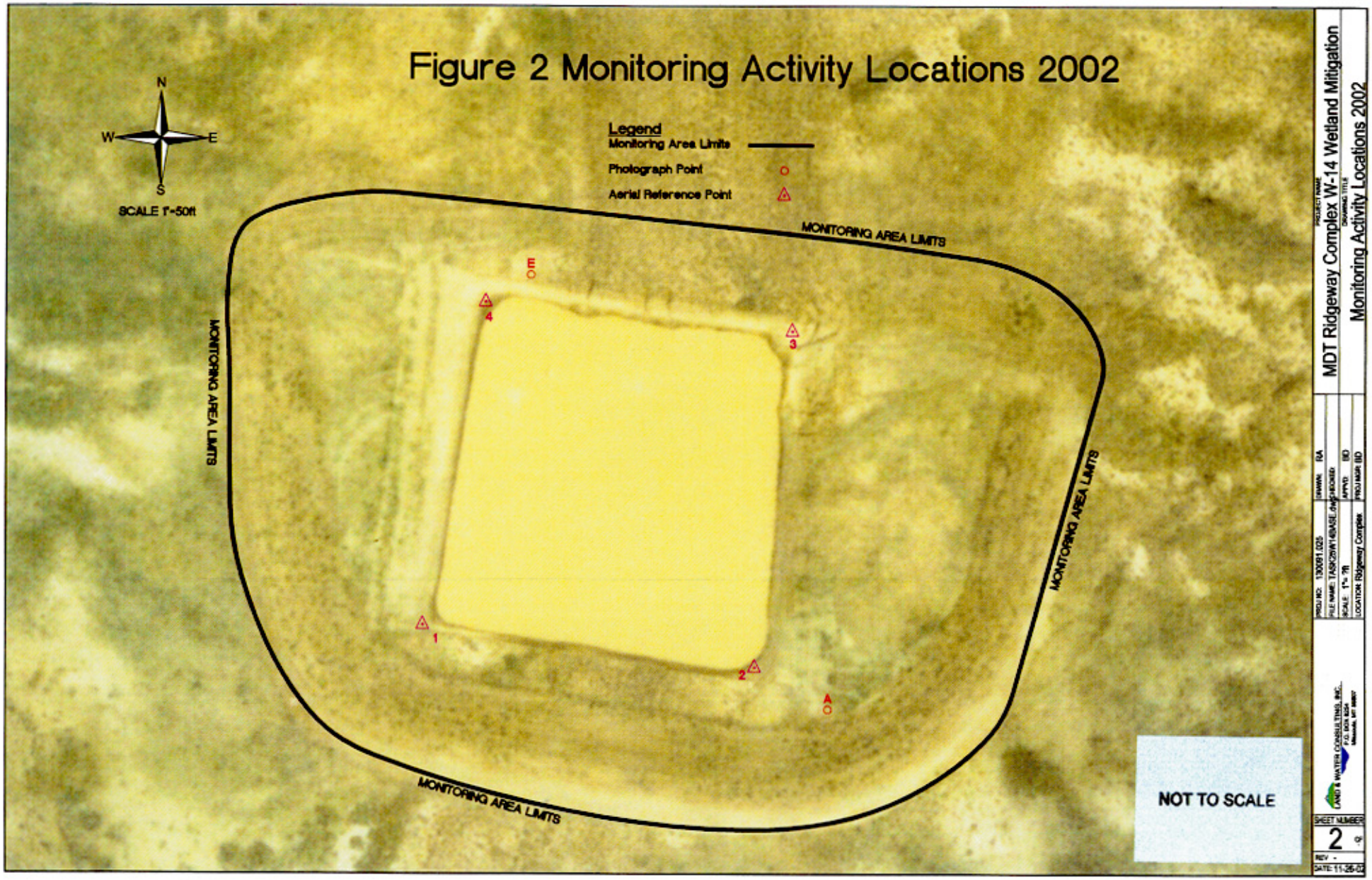
Figure 2 Monitoring Activity Locations 2002
N
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SCALE 1"=50ft
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
MONITORING AREA LIMITS
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PROJECT NAME
MDT Ridgeway Complex W-14 Wetland Mitigation
DRAWING TITLE
Monitoring Activity Locations 2002
PROJ NO: 1300/01.025
DRAWN: RA
FILE NAME: TASK25\W14BASE.DWG
CHECKED:
SCALE: 1"= 7ft
APPVD: BD
LOCATION: Ridgeway Complex
PROJ MGR: BD
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2
REV -
DATE: 11-26-02

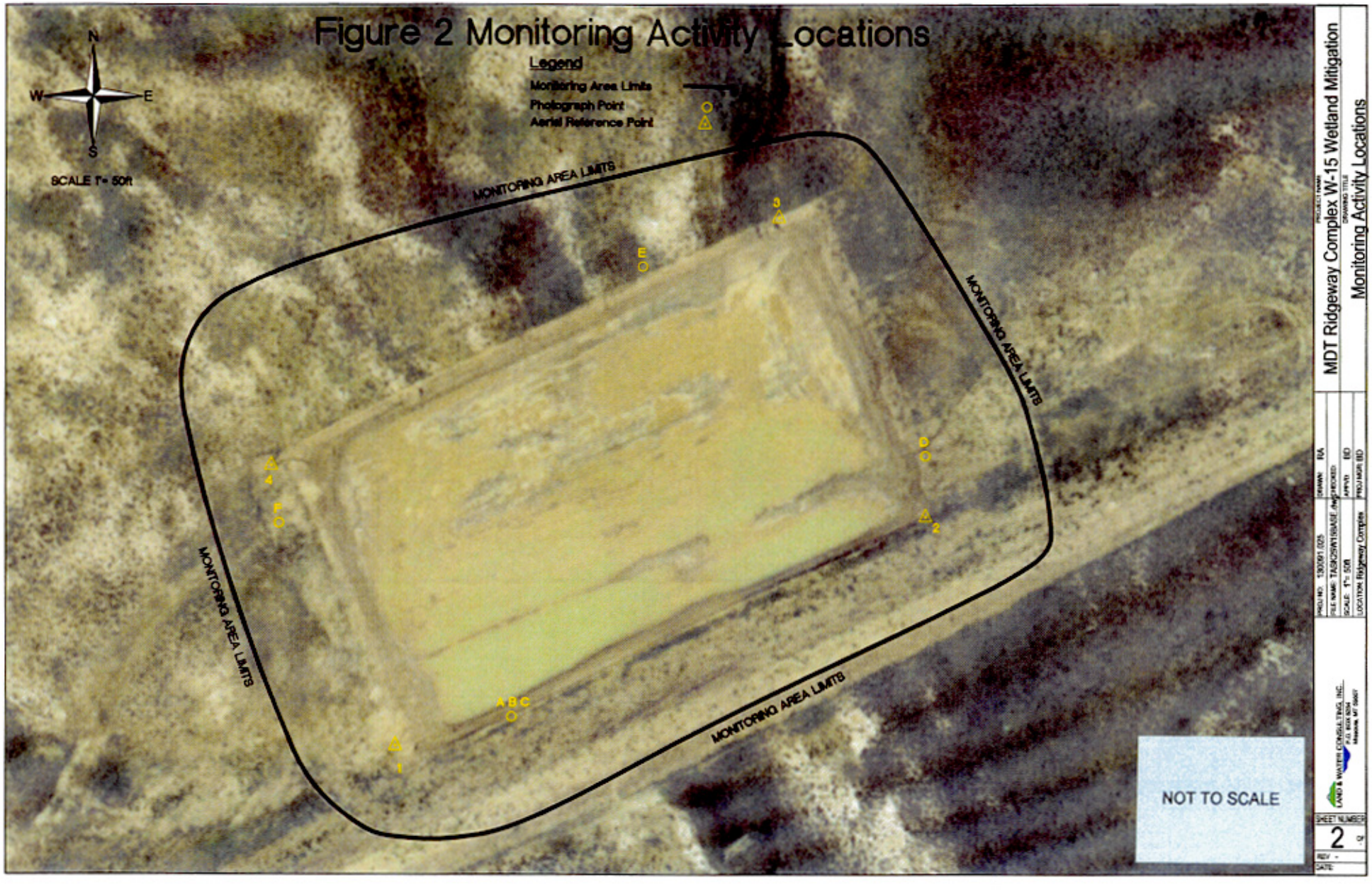
Figure 2 Monitoring Activity Locations
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
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SCALE 1"= 50ft
MONITORING AREA LIMITS
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NOT TO SCALE
MDT Ridgeway Complex W-15 Wetland Mitigation
Monitoring Activity Locations
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2

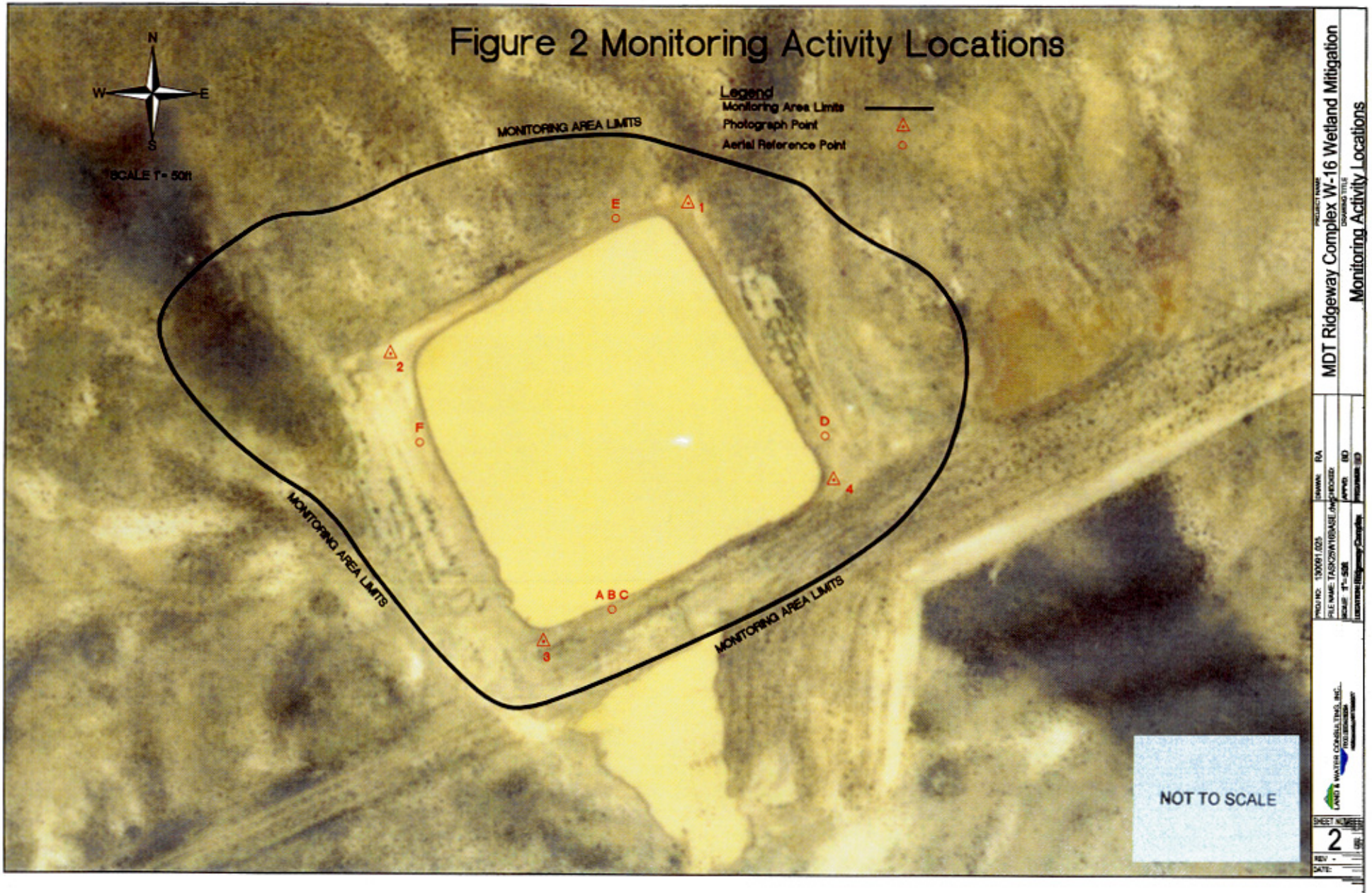
Figure 2 Monitoring Activity Locations
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SCALE 1" = 50ft
Legend
Monitoring Area Limits
Photograph Point
Aerial Reference Point
MONITORING AREA LIMITS
MONITORING AREA LIMITS
MONITORING AREA LIMITS
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NOT TO SCALE
MDT Ridgeway Complex W-16 Wetland Mitigation
Monitoring Activity Locations
LAND & WATER CONSULTING, INC.
SHEET NO. 2