MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2016

AMERICAN COLLOID MITIGATION SITE
ALZADA, CARTER COUNTY, MONTANA



Prepared for:

MONTANA MDT DEPARTMENT OF TRANSPORTATION

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December 2016

MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2016

AMERICAN COLLOID MITIGATION SITE ALZADA, CARTER COUNTY, MONTANA

INITIAL CONSTRUCTION: 2001

MDT Project Number NH STPS BR 6(10)
Control Number 1396

Watershed 16 Repair: 2010
MDT Project Number STPX 6(15)
Control Number 6714

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TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 METHODS 4

2.1 HYDROLOGY 4
2.2 VEGETATION 4
2.3 SOIL 5
2.4 WETLAND DELINEATION 5
2.5 WILDLIFE 6
2.6 FUNCTIONAL ASSESSMENT 6
2.7 PHOTOGRAPHIC DOCUMENTATION 6
2.8 GLOBAL POSITIONING SYSTEM DATA 6
2.9 MAINTENANCE NEEDS 7

3.0 RESULTS 7

3.1 HYDROLOGY 7
3.2 VEGETATION 8
3.3 SOIL 14
3.4 WETLAND DELINEATION 14
3.5 WILDLIFE 14
3.6 FUNCTIONAL ASSESSMENT 15
3.7 PHOTOGRAPHIC DOCUMENTATION 16
3.8 MAINTENANCE NEEDS 16
3.9 CURRENT CREDIT SUMMARY 18

4.0 REFERENCES 21

LIST OF TABLES

TABLE PAGE

3-1 Vegetation Species Observed From 2011 Through 2016 at the American Colloid Site 9

3-2 Data Summary for T-1 From 2011 Through 2016 at the American Colloid Site 11

3-3 Total Wetland Acres Delineated From 2011 Through 2016 at the American Colloid Site 14

3-4 Wildlife Species Observed From 2011 Through 2016 Within the American Colloid Site 15

3-5 Functional Assessment Results From 2011 Through 2016 for the American Colloid Site 17

3-6 Credit Summary From 2012 Through 2016 for the American Colloid Site 19

3-7 Summary of Success Criteria and Site Performance 20

LIST OF FIGURES

FIGURE PAGE

1-1 Project Location of the American Colloid Site 2

LIST OF CHARTS

CHART PAGE

3-1. Transect Map Showing Community Types on T-1 From 2011 Through 2016 From Start (0 Foot) to End (300 Feet) at the American Colloid Site 12

3-2. Length of Habitat Types Within T-1 From 2011 Through 2016 at the American Colloid Site 13

LIST OF APPENDICES

APPENDIX A. PROJECT AREA MAPS A-1

APPENDIX B. MONITORING FORMS B-1

APPENDIX C. PROJECT AREA PHOTOGRAPHS C-1

APPENDIX D. PROJECT PLAN SHEETS D-1

Cover: View looking west at wetland sample point.

1.0 INTRODUCTION

The American Colloid 2016 Wetland Mitigation Monitoring Report presents the results of the sixth year of monitoring at the American Colloid wetland mitigation site since the berm and outlet structures were reconstructed in 2010. The 2010 construction repaired damages to the dike sustained from erosion along the outlet pipe that caused a subsequent failure in 2007. The American Colloid mitigation project is situated approximately 2 miles south and 7 miles west of Alzada, Montana, on Montana School Trust Land in Lot 7, Lot 10, and Lot 11 of Section 36, Township 9 South, Range 58 East. The project's location is shown on the map in Figure 1-1. Figures A-2 and A-3 in Appendix A show the monitoring activity locations and mapped site features, respectively. The Montana Department of Transportation (MDT) Wetland Mitigation Site Monitoring form, the US Army Corps of Engineers (USACE) Wetland Determination Data forms [USACE, 2010], and the 2008 MDT Montana Wetland Assessment Method (MWAM) form [Berglund and McEldowney, 2008] are included in Appendix B. Appendix C provides project area photographs, and Appendix D presents the project plan sheets.

The mitigation site is located in Watershed #16 – the Little Missouri River Basin, in the Glendive District on land owned by the Montana Department of Natural Resources and Conservation (DNRC). The site is approximately 3,518 feet above mean sea level (amsl) and was formerly leased to the American Colloid Mining Company. The site was mined for bentonite clay before the 1971 Open Cut Mining Act and is currently surrounded by topography typical of open-cut mining activities. A dike that is approximately 190 feet long was constructed along a topographic depression to impound precipitation runoff from a 167-acre ephemeral drainage. Soil borings at the site revealed highly erodible clay soils underlain by shale, which is suitable for impounding and storing surface water. The property is managed for perpetuity in a conservation easement between the DNRC and MDT. A fenced enclosure surrounds the 15-acre easement that includes the proposed 5-acre wetland and a 10-acre buffer zone of upland vegetation. The mitigation monitoring limits, per MDT guidance and for purposes of this report, encompass only the 6.44-acre monitoring boundary as depicted on Figure A-2 in Appendix A. However, the entire 15-acre site is included for purposes of calculating mitigation credits. Mitigation ratios of 1:1 (impact to credit) for the created wetland and open-water habitat and 5:1 for preserving and maintaining the upland buffer were used to calculate credit acres for the American Colloid site.

MDT designed and constructed the American Colloid wetland mitigation project. The site was initially constructed in October 2001 to mitigate for 4.4 acres of wetland impacts associated within the Alzada-West and Alzada-South projects in Watershed #16. The initial mitigation monitoring event was conducted in 2002. Monitoring ceased in 2007 after the dike failed and resumed in 2011 after the dike was repaired in 2010.

No specific goals or success criteria were defined for this project, which was originally constructed before the 2008 USACE mitigation rule was released that requires such components. Wetland success will be based on the following performance standards:

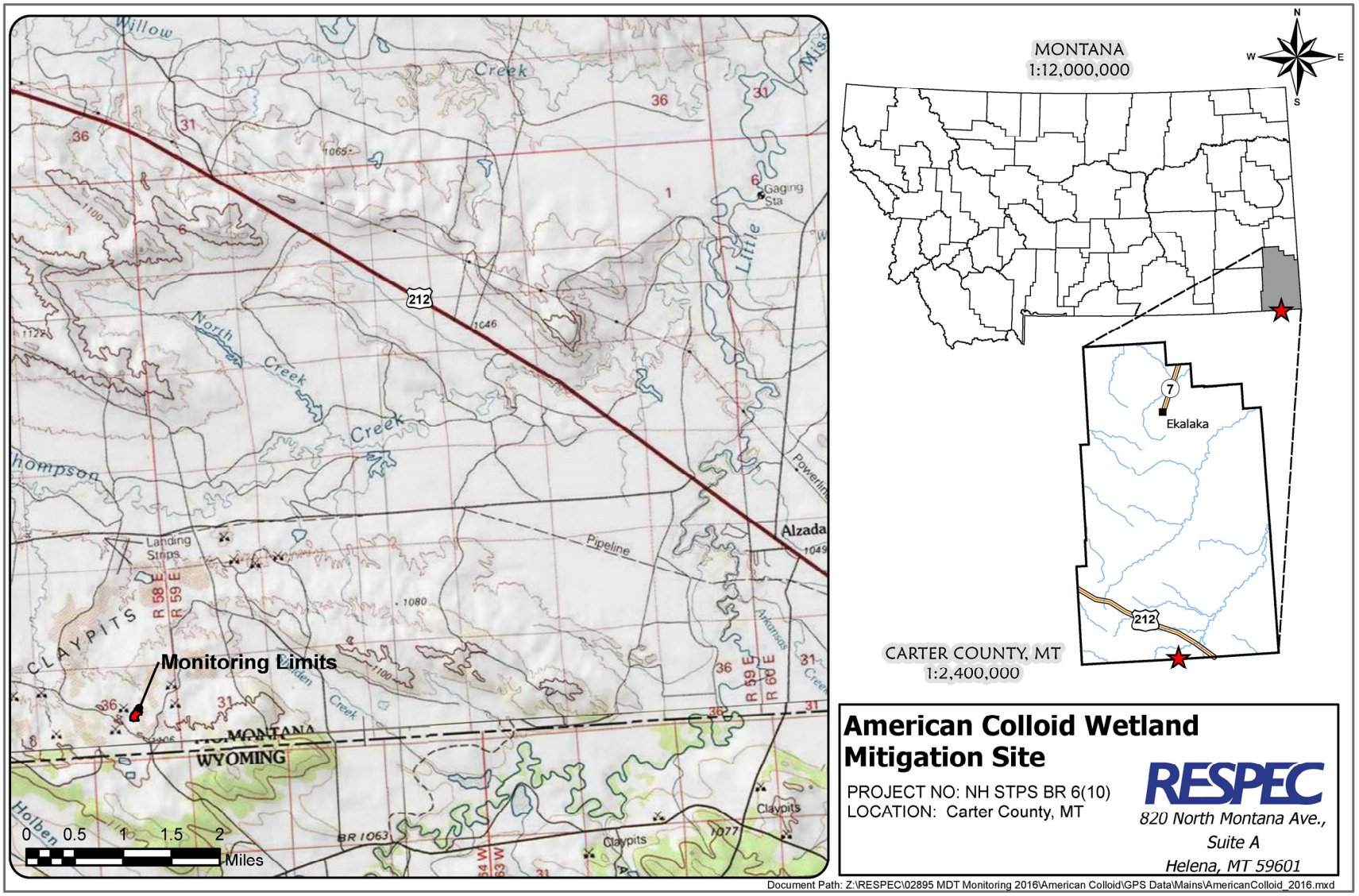


Figure 1-1. Project Location of the American Colloid Site.

1. **Wetland Characteristics** for all of the restored, created, enhanced, and preserved wetlands within the project limits will meet the three parameter criteria for hydrology, vegetation, and soils established for determining wetland areas as outlined in the 1987 *Corps of Engineers Wetland Delineation Manual* (1987 Wetland Manual) [Environmental Laboratory, 1987] and the 2010 *Regional Supplement to the Corps of Engineers Manual: Great Plains Region (Version 2.0)* (2010 Regional Supplement) [USACE, 2010].
    a. **Wetland Hydrology Success** will be achieved where wetland hydrology is present as per the technical guidelines in the 1987 Wetland Manual and the 2010 Regional Supplement, including soil saturation present for at least 12.5 percent of the growing season.
    b. **Hydric Soil Success** will be achieved where hydric soil conditions are present (per the most recent Natural Resource Conservation Service [NRCS] definitions for hydric soil) or appear to be forming and the soil is able to support plant cover. Soil characterization will be conducted during the course of the monitoring period to determine if wetland areas are exhibiting characteristics of hydric soils per the 1987 Wetland Manual and 2010 Regional Supplement. Because typical hydric soil indicators may require long periods to form, a lack of distinctive hydric soil features will not be considered a failure if hydrologic and vegetation success is achieved.
    c. **Hydrophytic Vegetation Success** will be achieved by delineating developing wetlands that use the technical guidelines established in the 1987 Wetland Manual and the 2010 Regional Supplement. The following concept of "dominance," as defined in the 1987 Wetland Manual, will be applied during future routine wetland determinations in created/restored wetlands: "*Subjectively determine the dominant species by estimating those having the largest relative basal area (woody overstory), greatest height (woody understory), greatest percentage of areal cover (herbaceous understory), and/or greatest number of stems (woody vines).*"
2. **Upland Buffer Success** will be achieved when noxious weeds do not exceed 10 percent of cover within the buffer areas on site. Any area within the creditable buffer zone that is disturbed by project construction must have at least 30 percent areal cover of nonweed species by the end of the monitoring period. *Note: The areal coverage for the upland buffer success criteria was decreased from 50 percent to 30 percent based on the high proportion of bare ground within the adjacent undisturbed upland areas and apparent climax vegetation cover for the region (climate/soils limit vegetation development).*
3. **Weed Control** will be based on annual site monitoring to determine weed species and the degree of infestation within the site. Control measures based on the monitoring results will be implemented by MDT to minimize and/or eliminate intruding state-listed noxious weed species within the site. MDT will manage the wetland conservation easement area to meet a goal of less than 10 percent absolute cover of state-listed noxious weed species across the site.
4. **Fencing** has been installed along the boundaries of the proposed mitigation site to protect the integrity of the wetland and upland buffer from disturbance that may be detrimental to the site. Fencing installed along the perimeter of the site has been designed to be wildlife-friendly to allow for wildlife movement into and out of the wetland complex.

5. **Monitoring** of this MDT mitigation site will be based on the MDT standard monitoring protocols that are used for all of the MDT sites for a minimum period of 5 years or longer as determined by the USACE Montana Regulatory Office's review of annual monitoring reports for the site and whether or not the site has met the wetland success criteria.

2.0 METHODS

The 2016 monitoring event was completed on June 14, 2016. Information for the Wetland Mitigation Site Monitoring form and Wetland Determination Data forms was recorded in the field during the site investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) and are illustrated in Figure A-2 (Appendix A). The collected information included a wetland delineation, vegetation community mapping, vegetation transect data, soil and hydrology data, bird- and wildlife-use documentation, photographic documentation, and a nonengineering examination of the infrastructure established within the mitigation project area.

2.1 HYDROLOGY

The presence of hydrological indicators as outlined on the Wetland Determination Data forms was documented at two data points established within the project area. The hydrologic indicators were evaluated according to features observed in situ during the site visit. The data were recorded on Wetland Determination Data forms (Appendix B). Hydrologic assessments allow evaluation of mitigation performance standards that address inundation and saturation requirements.

Technical criteria for wetland hydrology guidelines have been established as "permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season) during the growing season" [USACE, 2010]. Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered wetlands. The growing season is defined in the 1987 Wetland Manual [Environmental Laboratory, 1987] as the number of days where a 50 percent probability exists that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit. The growing season that was recorded for the predominant soil map unit, Neldore-rock outcrop complex (58D), averages 120 days [USDA, 2011]. Areas that are defined as wetlands would require 15 days of continuous inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within approximately 18 inches of the ground surface. The data were recorded on the Wetland Determination Data forms (Appendix B). No monitoring wells were installed at this site.

2.2 VEGETATION

The boundaries of dominant-species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2016 aerial photograph of the site, which was provided by MDT. Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure A-3, Appendix A). Percent cover of dominant

species within a community type was estimated and recorded using the following values: 0 (< 1 percent), 1 (1–5 percent), 2 (6–10 percent), 3 (11–20 percent), 4 (21–50 percent), and 5 (> 50 percent) (Appendix B). No woody species were planted at the American Colloid site.

Temporal changes in vegetation are evaluated through annual assessments of a single static belt transect, which was originally established in July 2002 and reestablished in 2011. Vegetation composition was assessed and recorded along a 10-foot-wide and 300-foot-long belt transect (T-1) (Figure A-2, Appendix A). The transect location was recorded with a resource-grade GPS unit. Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species within the belt transect was estimated using the same values and cover ranges used for the vegetation community polygon data (Appendix B). Photographs were taken at the transect endpoints during the monitoring event (Appendix C).

The *Montana Noxious Weed List* (July 2015) was prepared by the Montana Department of Agriculture [2015] and used to categorize weeds that were identified within the site. The location of noxious weeds was noted in the field during the investigation and mapped on the 2016 aerial photographs (Appendix A). The identified noxious weed species are color-coded, and their locations are denoted with the symbol "**x**", "▲", or "■," which represent 0.0–0.1 acre, 0.1–1.0 acre, or greater than 1.0 acre in extent, respectively. The letters T, L, M, and H represent the cover classes and stand for less than 1 percent, 1–5 percent, 6–25 percent, and 26–100 percent, respectively.

2.3 SOIL

Soil information was obtained from the *Web Soil Survey for Carter County Area* [USDA, 2011] and in situ soil descriptions. Soil cores were excavated using a sharpshooter shovel and evaluated according to procedures outlined in the 1987 Wetland Manual and the 2010 Regional Supplement. A description of the soil profile, including hydric soil indicators when present, was recorded on the Wetland Determination Data forms for each profile (Appendix B).

2.4 WETLAND DELINEATION

Waters of the US, including special aquatic sites and wetlands, were delineated throughout the project area according to criteria established in the 1987 Wetland Manual and the 2010 Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology that are described in the 2010 Regional Supplement must be satisfied to delineate a representative area as a wetland. The name and indicator status of plant species was derived from the 2016 national wetland plant list (NWPL) [Lichvar et al., 2016]. Following USACE guidance, the 2016 NWPL scientific and common plant names were used in this report. A routine level-2 on-site determination method [Environmental Laboratory, 1987] was used to delineate jurisdictional areas within the project boundaries. The information was recorded on the Wetland Determination Data forms (Appendix B).

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology, as well as on changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross-referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology

were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was classified as an atypical situation, potential problem area for vegetation, soil or hydrology, or special aquatic site (i.e., mudflat). The wetland boundaries were surveyed using resource-grade GPS and imported into GIS format. The reported wetland areas have been calculated using GIS spatial quantification methodology.

2.5 WILDLIFE

Direct observations and other positive indicators of use by mammal, reptile, amphibian, and bird species were recorded on the Wetland Mitigation Site Monitoring form during the site visit. Indirect-use indicators, including tracks, scat, burrows, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive wildlife species list of animals observed from 2011 through 2016 was compiled for this report.

2.6 FUNCTIONAL ASSESSMENT

The 2008 MDT MWAM was used to evaluate functions and values on the site from 2012 through 2016. This method provides an objective means of assigning an overall rating to wetlands and provides regulators a means of assessing mitigation success based on wetland functions. Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and relate to ecological significance without regard to subjective human values [Berglund and McEldowney, 2008]. Field data for this assessment were collected during the site visit. One MWAM was completed for the project area (Appendix B).

2.7 PHOTOGRAPHIC DOCUMENTATION

Monitoring at photo points provided supplemental information that documented wetland, upland, and transect conditions; site trends; and current land uses that surround the site. Photographs were taken at established photo points throughout the mitigation site during the site visit (Appendix C). Photo-point locations were recorded with a resource-grade GPS unit (Figure A-2, Appendix A).

2.8 GLOBAL POSITIONING SYSTEM DATA

Site features and survey points were collected using a resource-grade (± 1 meter) Trimble R1 GNSS GPS receiver and companion Android tablet during the 2016 monitoring season. The collected data were then transferred to a personal computer, imported into GIS, and projected in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with GPS included fence boundaries, photographic points, transect endpoints, and wetland data points.

2.9 MAINTENANCE NEEDS

Engineered structures, including the dike and outlet structure, fencing, and other features, were examined during the site visit for obvious signs of breaching, damage, or other problems. This examination was cursory and did not constitute an engineering-level structural inspection.

3.0 RESULTS

3.1 HYDROLOGY

Monthly precipitation totals that were collected at the Broadus meteorological station (241127) [Western Regional Climate Center, 2016], which is located approximately 50 miles northwest of the site, were used to provide regional climate data for the American Colloid site. The mean annual precipitation total for the period of record at Broadus (68 years) is 13.97 inches. The annual precipitation totals recorded at the Broadus station were 18.12 inches in 2011, 9.78 inches in 2012, 18.00 inches in 2013, 13.27 inches in 2014, and 15.87 inches in 2015. These totals indicate above-average precipitation in 2011, 2013, and 2015 and below-average precipitation for 2012 and 2014. The historic precipitation average from January to August was 10.9 inches, with the site receiving 10.05 inches in 2016 for this same time period. Precipitation data indicate that the region received above- or near-average precipitation during the 2011, 2013, 2014, and 2015 growing seasons and below-average precipitation in 2012 and 2016, as reflected in the lower water level observed within the constructed impoundment during the 2012 and 2016 field surveys compared to the 2011, 2013, 2014, and 2015 water levels.

The wetland basin was constructed in an ephemeral drainage within a 167-acre watershed. Wetland hydrology at the site is provided solely through direct precipitation and surface runoff. During the site inspection, the constructed dike was impounding surface water and functioning as designed. This site has approximately 3 acres of surface water at depths that range from 0.0 to 2.7 feet. The water surface was approximately 1.0 foot below the outlet elevation. Surface soil cracks, water-stained leaves, and water marks were noted at the water's edge. Inundation was also visible on the aerial imagery. Rills and other drainage patterns were observed throughout the uplands that surround the inundated basin. Surface water from the wetland depression discharges to the ephemeral drainage through a series of downgradient wetlands into an unnamed tributary of Thompson Creek and eventually into the Little Missouri River, which is located approximately 15 miles downstream of the site. Precipitation, surface-water runoff, and evaporation rates are the dominant factors that influence seasonal water elevations within the wetland. Groundwater input is limited based on the low hydraulic conductivity of the soil that forms the unconsolidated bottom of the basin.

No groundwater monitoring wells were installed within this site. Hydrological data were collected at two data points: DP-1U and DP-1W. DP-1W is located approximately 40 feet from the water's edge and exhibited saturation to the ground surface, drainage patterns, surface soil cracks, geomorphic position, and oxidized rhizopheres. No primary indicators of wetland hydrology were observed at DP-1U, which is located in upland community Type 6 and approximately 10 feet from DP-1W.

3.2 VEGETATION

Monitoring year 2016 marked the sixth year of monitoring at the American Colloid site. A total of 53 plant species have been observed site-wide since 2011; Table 3-1 provides a list of these species. The indicator status for all of the plants was derived from the 2016 Great Plains (GP) NWPL [Lichvar et al., 2016]. Vegetation plant communities were mapped and named by plant composition and dominance. The composition of each community is listed on the Wetland Mitigation Site Monitoring form (Appendix B). The community boundaries are shown on Figure A-3 (Appendix A). The impounded depression is defined by polygon 4 and encompassed 2.97 acres of open water in 2016, which is an increase of approximately 0.1 acre from 2014 (Figure A-3, Appendix A; Wetland Mitigation Site Monitoring form, Appendix B).

Three upland and one wetland community types were observed on the site in 2015 and remained static in 2016:

- Upland Type 2 – *Schizachyrium scoparium/Grindelia squarrosa*
- Upland Type 5 – *Calamovilfa longifolia/Spartina pectinata*
- Upland Type 6 – *Ericameria nauseosa/Endolepis dioica*
- Wetland Type 3 – *Spartina pectinata.*

These communities are discussed below.

Upland community Type 2 – *Schizachyrium scoparium/Grindelia squarrosa* characterized the 0.8-acre community that abuts the wetland fringe that surrounds the open water. The community acreage decreased by 0.3 acre from 2014 to 2016 as a result of the new upland community Type 5 – *Calamovilfa longifolia/Spartina pectinata* and an expansion of upland community Type 6 – *Ericameria nauseosa/Endolepis dioica*. The community was dominated by little false bluestem (*Schizachyrium scoparium*), curly-cup gumweed (*Grindelia squarrosa*), small-flowered buckwheat (*Eriogonum pauciflorum*), and prairie sandreed (*Calamovilfa longifolia*). Approximately 11–20 percent of the total cover was bare ground.

Upland community Type 5 – *Calamovilfa longifolia/Spartina pectinata* was identified in 2015 on 0.1 acre, adjacent to the wetland fringe in the southwestern portion of the project area. The vegetation was dominated by prairie sandreed, freshwater cord grass (*Spartina pectinata*), curly-cup gumweed, curly blue grass (*Poa secunda*), Nuttall's alkali grass (*Puccinellia nuttalliana*), and rough cocklebur (*Xanthium strumarium*). Approximately 21–50 percent of the total cover was bare ground.

Upland community Type 6 – *Ericameria nauseosa/Endolepis dioica* is located around the circumference of most of the site perimeter. Rubber rabbitbrush (*Ericameria nauseosa*), Suckley's saltbush (*Endolepis dioica*), fox-tail barley (*Hordeum jubatum*), curly-cup gumweed, small-flowered buckwheat, greasewood (*Sarcobatus vermiculatus*), big sagebrush (*Artemisia tridentata*), cheatgrass (*Bromus tectorum*), plains pricklypear (*Opuntia polyacantha*), curly blue grass, silverscale (*Atriplex*

Table 3-1. Vegetation Species Observed From 2011 Through 2016 at the American Colloid Site (Page 1 of 2)

Scientific Name	Common Name	GP Indicator Status[a]
Achillea millefolium	Common Yarrow	FACU
Agrostis scabra	Rough Bent	FAC
Agrostis stolonifera	Spreading Bent	FACW
Algae, green[b]	Algae, green	NL
Alopecurus aequalis	**Short-Awn Meadow-Foxtail**	**OBL**
Amaranthus retroflexus	Red-Root	FACU
Artemisia tridentata	Big Sagebrush	NL
Asclepias purpurascens	Arrow-Feather Three-Awn	NL
Aster sp.	Aster	NL
Atriplex argentea	Silverscale	FAC
Avena fatua	Wild Oats	NL
Beckmannia syzigachne	American Sloughgrass	OBL
Bouteloua gracilis	Blue Gramma	NL
Bromus arvensis	Field Brome	FACU
Bromus tectorum	Cheatgrass	NL
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium leptophyllum	Narrow-Leaf Goosefoot	FACU
Chenopodium sp.	Goosefoot	NL
Cirsium arvense	Canada Thistle	FACU
Echinochloa crus-galli	Large Barnyard Grass	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elymus elymoides	Western Bottle-Brush Grass	UPL
Elymus repens	Creeping Wild Rye	FACU
Endolepis dioica	Suckley's Saltbrush	NL
Ericameria nauseosa	Rubber Rabbitbrush	NL
Eriogonum pauciflorum	Small-flowered Buckwheat	NL
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Gutierrezia sarothrae	Broom Snakeweed	NL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Juncus tenuis	Lesser Poverty Rush	FAC
Juniperus communis	Common Juniper	UPL
Juniperus scopulorum	Rocky Mountain Juniper	NL
Lactuca serriola	Prickly Lettuce	FAC
Opuntia polyacantha	Plains Pricklypear	NL

Table 3-1. Vegetation Species Observed From 2011 Through 2016 at the American Colloid Site (Page 2 of 2)

Scientific Name	Common Name	GP Indicator Status[(a)]
Panicum capillare	Common Panic Grass	FAC
Pascopyrum smithii	Western-Wheat Grass	FACU
Poa secunda	Curly Blue Grass	FACU
Poa sp.	Blue Grass	NL
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Rumex acetosella	Common Sheep Sorrel	FAC
Rumex crispus	Curly Dock	FAC
Rumex triangulivalvis	Triangular-Valved Dock	FAC
Sarcobatus vermiculatus	Greasewood	FAC
Schizachyrium scoparium	Little False Bluestem	FACU
Schedonorus pratensis	Meadow False Rye Grass	FACU
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Spartina pectinata	Freshwater Cord Grass	FACW
Spergula arvensis	Cornspurry	NL
Sporobolus airoides	Alkali-Sacaton	FAC
Stenotus acaulis	Stemless Mock Goldenweed	NL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Xanthium strumarium	Rough Cockleburr	FAC

(a) 2016 NWPL [Lichvar et al., 2016].
(b) These plants were not noted in 2016.
New species that were identified in 2016 are **bolded.**

argentea), blue gramma (*Bouteloua gracilis*), and arrow-feather three-awn (*Asclepias purpurascens*) dominated the vegetation cover. Rocky mountain juniper (*Juniperus scopulorum*) occurs occasionally within the site perimeter. Approximately 60–70 percent of the area characterized by the community was bare ground.

Wetland community Type 3 – *Spartina pectinata* dominated the 0.61-acre wetland community that characterized the wetland fringe adjacent to the open water. Freshwater cord grass continued to dominate the community with less cover contributed by narrow-leaf goosefoot (*Chenopodium leptophyllum*), common spike-rush (*Eleocharis palustris*), American sloughgrass (*Beckmannia syzigachne*), lesser poverty rush (*Juncus tenuis*), fox-tail barley, saltmarsh club-rush (*Schoenoplectus maritimus*), broad-leaf cat-tail (*Typha latifolia*), broom snakeweed (*Gutierrezia sarothrae*), and little false bluestem. The cover class for bare ground was estimated at 21–50 percent.

Approximately 3 acres of open water represents approximately 83 percent of the aquatic resources habitat. The open water contained less than 5 percent cover of freshwater cord grass, broad-leaf cat-tail, saltmarsh club-rush, common spike-rush, triangular-valved dock (*Rumex triangulivalvis*), and Canada thistle (*Cirsium arvense*). The wetland cell was flooded following construction in 2001 through

sometime in 2007 before the dike failed. The area has supported open water since the dike repair in 2010.

Hydrophytic plant colonization of the ponded area may be inhibited by excessive water depth and exacerbated by high water turbidity that restricts photosynthesis through the water column. Several other chemical, hydrologic, and substrate factors could also restrict expansion of the vegetation community, such as high salinity, drastic changes in water level caused by oscillating drought or high precipitation years, and condition of the substrate within the open-water area. Soils within the open-water area likely have a high concentration of clay and thus lower oxygen levels, which would likely decrease the ability for vegetation to colonize even in shallow zones. Depth of water may also be greater than vegetation tolerance parameters, especially if salinity, substrate clay levels, and turbidity are negatively affecting the development of the hydrophytic community. An area downslope of the outlet pipes contains a large cat-tail area (100 percent vegetated) that has been there since the early phases of the American Colloid project. A comparison of the ecological parameters of the downslope wetland with those of the American Colloid site may offer insight into why the site has not developed a hydrophytic community beyond the sparse wetland fringe.

Data collected on T-1 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphic formats (Table 3-2, Charts 3-1 and 3-2, respectively). Photographs of the start and finish of T-1 are shown in Appendix C. T-1 traversed Type 3 – *Spartina pectinata* wetland and open water. Hydrophytic vegetation was identified on 3 percent of the belt transect, and open water encompassed 97 percent of the transect area. The upland community was identified at the end of T-1 in 2011 and 2012, converted to wetland in 2013, and persisted as wetland in 2016.

Table 3-2. Data Summary for T-1 From 2011 Through 2016 at the American Colloid Site

Monitoring Year	2011	2012	2013	2014	2015	2016
Transect Length (feet)	**300**	**300**	**300**	**300**	**300**	**300**
Vegetation Community Transitions Along Transect	3	3	2	1	1	1
Vegetation Communities Along Transect	2	2	1	1	1	1
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	1	1
Total Vegetative Species	7	12	11	8	12	9
Total Hydrophytic Species	4	5	4	5	6	7
Total Upland Species	3	7	7	3	6	2
Estimated % Total Vegetative Cover	12	15	15	15	15	15
Estimated % Unvegetated	88	85	85	85	85	85
% Transect Length Comprising Hydrophytic Vegetation Communities	7.3	8.3	6.3	1.7	1.0	3.0
% Transect Length Comprising Upland Vegetation Communities	4.3	6.7	0.0	0.0	0.0	0.0
% Transect Length Comprising Unvegetated Open Water	88.3	85.0	93.7	98.3	99.0	97.0
% Transect Length Comprising Mudflat	0.0	0.0	0.0	0.0	0.0	0.0

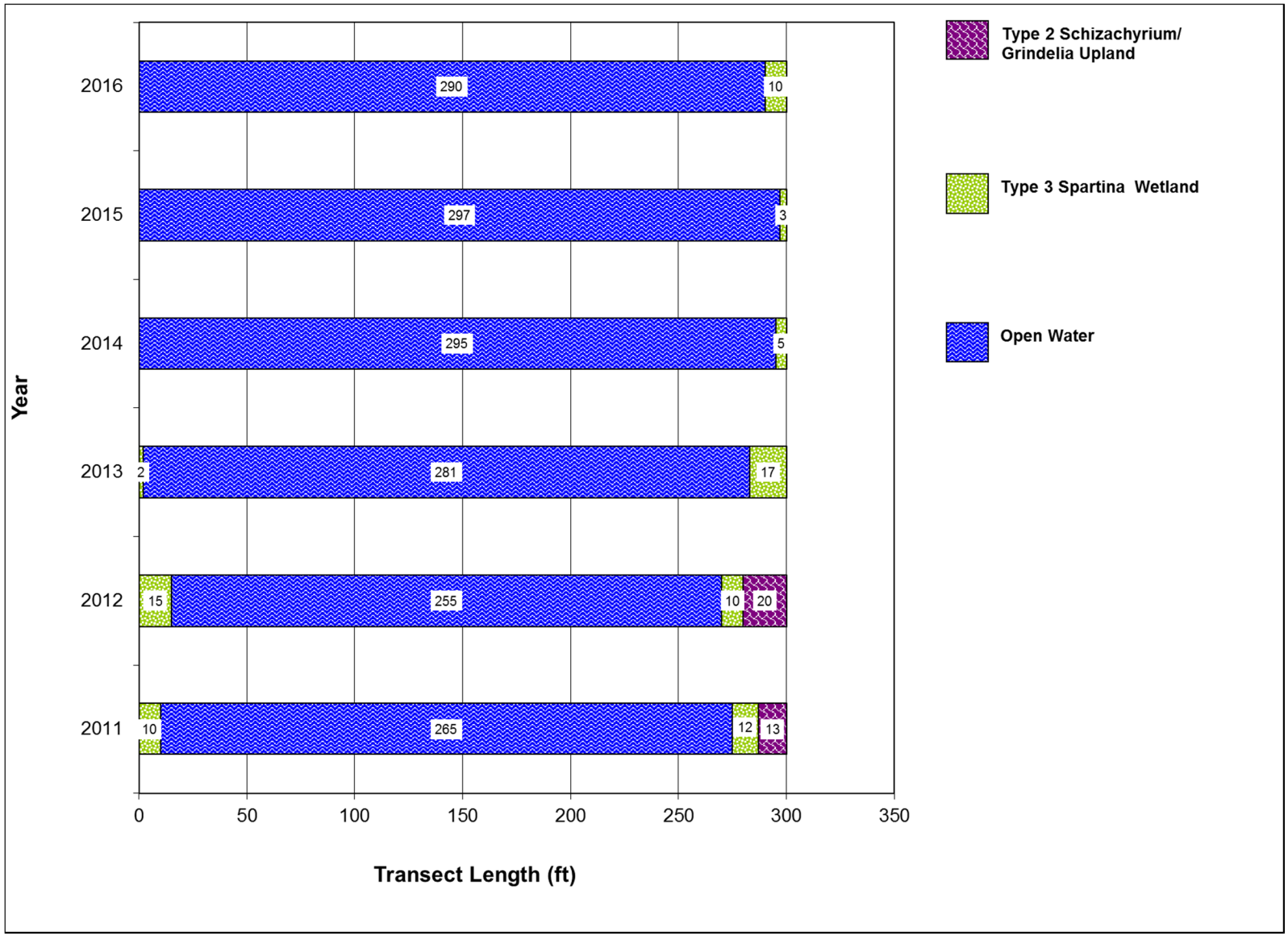


Chart 3-1. Transect Map Showing Community Types on T-1 From 2011 Through 2016 From Start (0 Foot) to End (300 Feet) at the American Colloid Site.

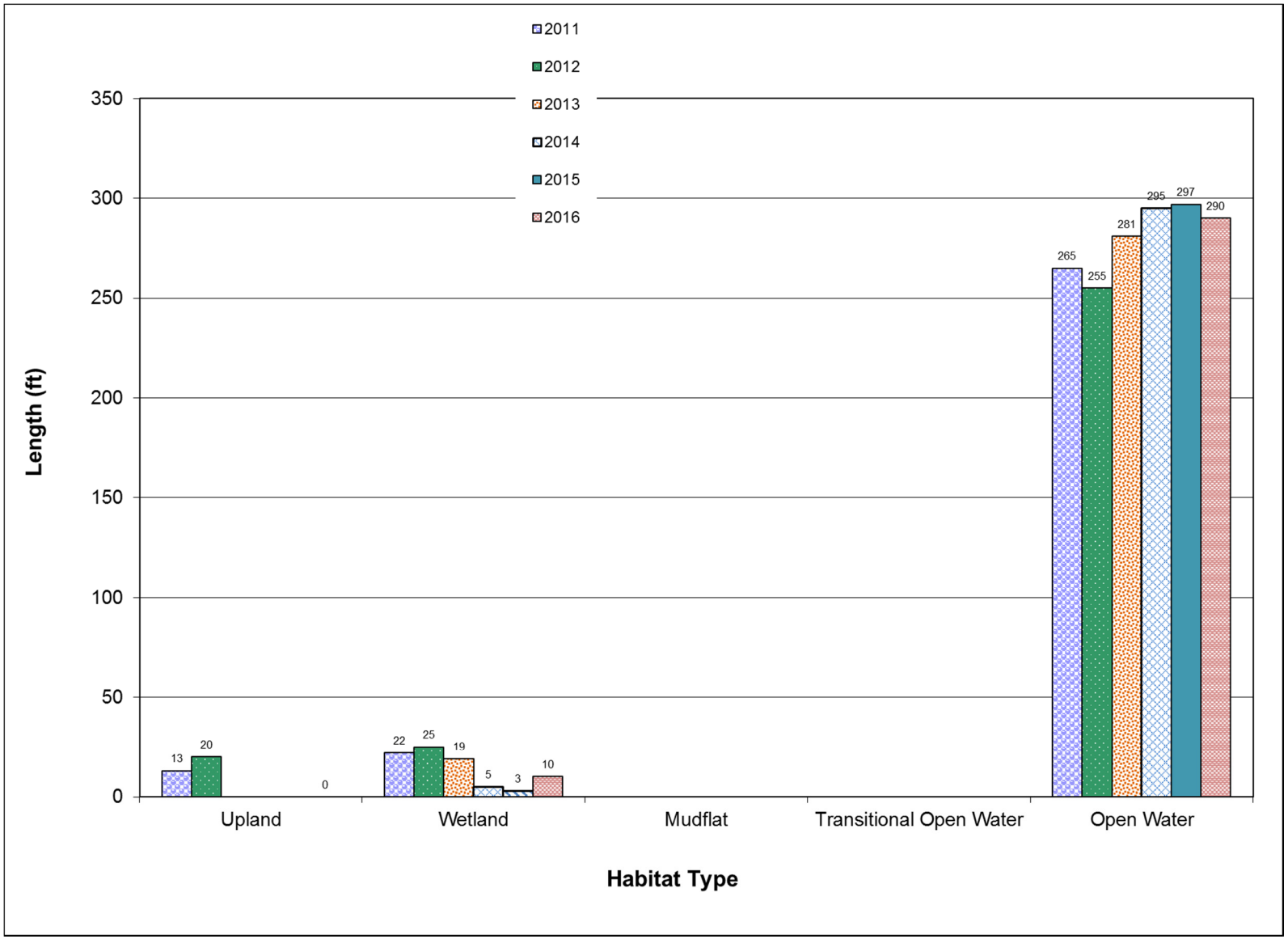


Chart 3-2. Length of Habitat Types Within T-1 From 2011 Through 2016 at the American Colloid Site.

Canada thistle, which is a Priority 2B noxious weed, was noted at the start of T-1 at the edge of wetland and open water. This infestation covers less than 0.1 acre at 5 percent cover. MDT has an ongoing weed-control program that annually manages state-listed noxious weed infestations on each mitigation site. According to MDT records, the American Colloid site was not treated for weeds in 2016.

3.3 SOIL

The project site was mapped in the *Web Soil Survey for Carter County, Montana* [US Department of Agriculture (USDA), 2011] within the Neldor-Rock outcrop complex at 4–15 percent slopes on hill slopes. The parent material of this complex is clay residuum over semiconsolidated shale. These soils are well drained, low-permeable, and nonhydric with clay loam inclusions. The test pit results generally confirmed the presence of soils consistent with the Neldor-Rock outcrop complex.

Soil test pits were excavated at two locations, both within what was originally mapped as the Neldor-Rock outcrop soil series (DP-1W and DP-1U; Figure A-2, Appendix A). DP-1W is located in wetland community Type 3 in a potential area of wetland expansion in a minor drainage feature near the east side of the damn. The soil profile revealed a very dark, grayish-brown (10YR 3/2) silty clay with 5 percent dark yellowish-brown (10YR 4/6) redoximorphic features. This soil met the criteria for redox dark surface (F6). The soil profile at DP-1U, which is located slightly upslope within the minor drainage feature, was also a very dark, grayish-brown (10YR 3/2) silty clay with no redoximorphic or other hydric soil indicators.

3.4 WETLAND DELINEATION

Two data points (DP-1W and DP-1U) were evaluated to confirm the wetland boundary determination. Between 2012 and 2013, the wetland acreage decreased by 0.85 acre, and the open-water aquatic habitat increased by 1.16 acres. This change was predominantly the result of increased inundation levels in the impoundment observed during the 2013 survey. A slight increase in open water (0.1 acre) with a corresponding decrease in wetland acreage was noted between 2014 and 2015. The extent of overall wetland and aquatic habitat remained the same in 2015. Wetland acreage was static in 2016. A total of 3.58 acres of vegetated wetland and unvegetated open-water aquatic habitat was delineated in 2016, as shown as Table 3-3.

Table 3-3. Total Wetland Acres Delineated From 2011 Through 2016 at the American Colloid Site

Wetland and Aquatic Habitat Acreages	2011	2012	2013	2014	2015	2016
Wetlands	0.26	1.23	0.38	0.71	0.61	0.61
Open Water	3.01	2.04	3.20	2.87	2.97	2.97
Total	**3.27**	**3.27**	**3.58**	**3.58**	**3.58**	**3.58**

3.5 WILDLIFE

A comprehensive list of bird and other wildlife species that were observed directly or indirectly from 2011 through 2016 is presented in Table 3-4. Seven wildlife species or signs of their presence were observed in 2016, including four avian species, one amphibian, and two mammalian species.

Table 3-4. Wildlife Species Observed From 2011 Through 2016 Within the American Colloid Site

Common Name	Scientific Name
Amphibian	
Northern Leopard Frog	***Rana pipiens***
Birds	
American Goldfinch	*Spinus tristus*
Canada Goose	*Branta canadensis*
Grasshopper Sparrow	*Ammodramus savannarum*
Killdeer	***Charadrius vociferus***
Gull sp.	
Mallard	*Anas platyrhynchos*
Mourning Dove	*Zenaida macroura*
Northern Harrier	*Circus cyaneus*
Red-Tailed Hawk	*Buteo jamaicensis*
Red-Winged Blackbird	***Agelaius phoeniceus***
Vesper Sparrow	***Pooecetes gramineus***
Sparrow sp.	
Song Sparrow	*Melospiza melodia*
Swallow sp.	
Turkey Vulture	*Cathartes aura*
Vesper Sparrow	***Pooecetes gramineus***
Mammal	
Beaver	*Castor canadensis*
Deer sp.	***Odocoileus* sp.**
Eastern Cottontail	***Sylvilagus floridanus***
Mule Deer	*Odocoileus hemionus*
Muskrat	*Ondatra zibethicus*
Reptile	
Turtle sp.	

Species identified in 2016 are **bolded**.

3.6 FUNCTIONAL ASSESSMENT

The 2011 monitoring data provided a baseline for subsequent functional assessments. The 2008 MWAM has been used from 2011 through 2016 to evaluate the assessment area (AA) that included the open-water depression and adjacent herbaceous-dominated wetland fringe (Appendix B). The site is situated within the semiarid Pierre Shale Plains with a surrounding habitat of undulating, rolling plains and vegetation cover that consists of short-statured sagebrush steppe, shortgrass prairie, and scattered stands of Ponderosa pine. The AA is located on DNRC property under an MDT conservation

easement. No active mining or roads exist within 500 feet of the AA, and a few isolated ponds and wetland areas are located near the AA.

The functional points and ratings increased from 2014 to 2015 and slightly increased in 2016 as a result of a slight increase for sediment/nutrient/toxicant removal. Table 3-5 provides these points and ratings. The size of the AA increased from 3.27 acres in 2012 to 3.58 acres in 2013 as a result of the increase in the extent of inundation in the depression. The AA was rated as a Category II wetland with 49 percent of the total points possible and 15.75 functional units in 2016. The short- and long-term surface-water storage was rated as high from 2011 through 2016 as a result of the large depression that contains perennial surface water. The AA received high ratings for general wildlife habitat and production export/food chain support.

The percent cover of wetland species is unlikely to expand at the edge of open water because of excessively arid conditions at this site. Hydrophytic vegetation may increase if the overall depth of open water is decreased by leveling and increasing the elevation of the pond bottom, thereby maintaining saturation at its current edge and enabling hydrophytes to colonize a more shallow (< 1 foot) open-water feature. The subsequent increase in vegetation cover would result in an increase in functional units.

3.7 PHOTOGRAPHIC DOCUMENTATION

Photographs taken from five photo points (PP1 to PP5) as well as photographs of the transect end points and of the two data points are provided in Appendix C. In general, these photographs show that vegetation cover in both the wetland and upland communities has been slow to develop.

3.8 MAINTENANCE NEEDS

No nesting structures were installed at the site. The outlet control structure was repaired in 2010. The water-control standpipes and armored earthen berm were in good condition and working as designed during the 2016 investigation. A wildlife-friendly fence that surrounds the 15-acre site was in good condition and did not require maintenance. Small areas of Canada thistle, which is a Priority 2B noxious weed, were noted near the west end of the vegetation transect. MDT administers an ongoing weed-control program that annually assesses the location and size of state-listed noxious weed infestations on each mitigation site.

The vegetation cover in the upland communities at the site is estimated at 40 percent, which meets the success criteria for the upland buffer by more than 10 percent. Reseeding the bare areas with appropriate species may facilitate an overall increase in vegetation cover and soil stability, although a sizeable increase in vegetation cover is likely unachievable. The sparsely vegetated substrate consists of extremely dry and easily erodible clayey soils. Harsh soil properties and high rates of erosion and deposition are driving environmental variables that support very low vegetation cover. The upland buffer within the fenced mitigation area blends well with the surrounding upland habitat outside the fence.

Table 3-5. Functional Assessment Results From 2011 Through 2016 for the American Colloid Site

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2011	2012	2013	2014	2015	2016
Listed/Proposed Threatened and Endangered (T&E) Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
Montana Natural Heritage Program (MTNHP) Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)
General Wildlife Habitat	Mod (0.4)	Mod (0.6)	Mod (0.6)	Mod (0.6)	High (0.9)	High (0.9)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	N/A	N/A	N/A	N/A	N/A	N/A
Short- and Long-Term Surface-Water Storage	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.7)
Sediment/Shoreline Stabilization	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
Production Export/Food Chain Support	Mod (0.7)	High (0.8)	Mod (0.7)	Mod (0.7)	High (0.9)	High (0.9)
Groundwater Discharge/Recharge	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)
Uniqueness	Low (0.3)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential (bonus points)	N/A	N/A	N/A	N/A	N/A	N/A
Actual Points/Possible Points	**3.5/9**	**3.9/9**	**3.8/9**	**3.8/9**	**4.3/9**	**4.4/9**
% of Possible Score Achieved	**39%**	**43%**	**42%**	**42%**	**48%**	**49%**
Overall Category	**III**	**III**	**III**	**III**	**II**	**II**
Total Acreage of Assessed Wetlands Within Site Boundaries	**3.27**	**3.27**	**3.58**	**3.58**	**3.58**	**3.58**
Functional Units (acreage × actual points)	**11.45**	**12.75**	**13.60**	**13.60**	**15.39**	**15.75**

The open-water area accounted for 83 percent of the wetland area. As noted above, the depth of open water may be too excessive for hydrophytic vegetation to grow and is likely exacerbated by high turbidity that restricts photosynthesis through the water column. Several other chemical, hydrologic, and substrate factors could also restrict expansion of the vegetation community, such as high salinity, drastic changes in water level caused by oscillating drought and high precipitation years, and the condition of the substrate within the open-water area. A comparison of the ecological parameters of the wetland area downslope of the American Colloid outlet pipes with the parameters of the MDT site (e.g., water depth, salinity, turbidity, substrate) may offer insight into why the site has not developed a hydrophytic community beyond the sparse wetland fringe.

3.9 CURRENT CREDIT SUMMARY

Credit acre calculation is shown in Table 3-6 and assumed a mitigation ratio of 1:1 (impact to credit) for the created wetland and open-water aquatic habitat within the wetland depression and a 5:1 credit ratio for preserving and maintaining the upland buffer. The wetland and aquatic habitat acreage totaled 3.58 acres in 2016. The full acreage (11.42 acres) of the fenced upland buffer was used to calculate the upland preservation credit of 2.28 acres. The proposed credit acreage for this site was 7 acres based on the design plan that outlined creating 5 acres of wetlands and preserving 10 acres of upland buffer. The 5.86 estimated credit acres in 2016 is 1.14 acres less than the proposed credits for the American Colloid site.

The status of key performance standards evaluated in 2016 is summarized below and shown in Table 3-7.

- Community Type 3 surrounds the open-water area and meets the three parameter criteria for wetland characteristics.
- Very little aquatic vegetation (< 5 percent) has established within the impounded open water. The percent cover of aquatic macrophytes may increase in the open-water area in the long term and eventually create an aquatic bed vegetation class. Several factors that may be negatively affecting the development of the hydrophytic community beyond the wetland fringe include chemical characteristics (e.g., salinity), a high concentration of suspended particles in the water column, high hydrologic variations (i.e., oscillating drought and high precipitation years), and substrate (e.g., high clay content and/or impenetrable substrate content such as crushed rock). This 2.97-acre area is creditable as open-water aquatic habitat as outlined in the mitigation monitoring plan.
- The wetland depression was inundated throughout the growing season.
- Hydric soil indicators were evident at the wetland data point along the wetland fringe.
- The 0.61-acre wetland area supported a dominance of hydrophytic vegetation.

Table 3-6. Credit Summary From 2012 Through 2016 for the American Colloid Site

Compensatory Mitigation Type	USACE Mitigation Ratio	Proposed Acres	2012 Delineated Acres	2012 Credit Acres	2013 Delineated Acres	2013 Credit Acres	2014 Delineated Acres	2014 Credit Acres	2015 Delineated Acres	2015 Credit Acres	2016 Delineated Acres	2016 Credit Acres
Creation: Establishment (wetland)	1:1	5	1.23	1.23	0.38	0.38	0.71	0.71	0.61	0.61	0.61	0.61
Creation: Establishment (open water)	1:1		2.04	2.04	3.2	3.20	2.87	2.87	2.97	2.97	2.97	2.97
Preservation and Maintenance (upland buffer)	5:1	10 (2 credit acres)	11.73	2.35	11.42	2.28	11.42	2.28	11.42	2.28	11.42	2.28
Total		7	15.00	5.62	15.00	5.86	15.00	5.86	15.00	5.86	15.00	5.86

Table 3-7. Summary of Success Criteria and Site Performance

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Wetland Characteristics	The three parameter criteria for hydrology, vegetation, and soils are met as outlined in the 1987 Wetland Manual and 2010 Regional Supplement.	Y	Approximately 0.61 acre of delineated wetlands on the site (*Spartina* community) met the three parameter criteria for wetland habitat.
Upland Buffer	Noxious weeds do not exceed 10 percent cover within upland buffer area.	Y	Noxious weed cover is less than 10 percent within the upland buffer.
	Any disturbed area within the creditable buffer zone must have at least 30 percent aerial cover of nonweed species by the end of the monitoring period.	Y	Disturbed areas have established approximately 40 percent vegetation cover by nonweed species.
Weed Control	Less than 10 percent absolute cover of state-listed noxious weed species is allowed across the site.	Y	State-listed noxious weed species across the site have less than 5 percent absolute cover.
Fencing	Wildlife-friendly fencing is installed along the easement boundaries.	Y	Wildlife-friendly fencing has been installed around the easement boundaries and is in good condition.
Monitoring	The site is monitored for a minimum of 5 years or longer as determined by the USACE.	Y	Comprehensive site monitoring has been ongoing for 5 years after the repair activities were completed in 2010.

4.0 REFERENCES

Berglund, J. and R. McEldowney, 2008. *MDT Montana Wetland Assessment Method,* PBS&J Project B43075.00, prepared by Post, Buckley, Schuh, & Jernigan, Helena, MT, for the Montana Department of Transportation, Helena, MT.

Environmental Laboratory, 1987. *Corps of Engineers Wetlands Delineation Manual,* Program Technical Report Y-87-1, prepared by Environmental Laboratory, Department of the Army, Waterways Experiment Station, Corps of Engineers, Vicksburg, MS, for the Department of the Army, US Army Corps of Engineers, Washington, DC.

Lichvar, R. W., D. L. Banks, W. N. Kirchner, and N. C. Melvin, 2016. "The National Wetland Plant List: 2016 Wetland Ratings," *Phytoneuron*, Vol. 2016-30, No. 1–17.

Montana Department of Agriculture, 2015. "Montana Noxious Weed List," *mt.gov,* retrieved October 2015 from *http://agr.mt.gov/agr/Programs/Weeds/PDF/2015WeedList.pdf*

US Army Corps of Engineers, 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual, Great Plains Region (Version 2.0),* ERDC/El TR-10-3, J. S. Wakely, R. W. Lichvar, and C. V. Noble (eds.), prepared by the US Army Corps of Engineers, US Army Engineer Research and Development Center, Environmental Laboratory, Vicksburg, MS.

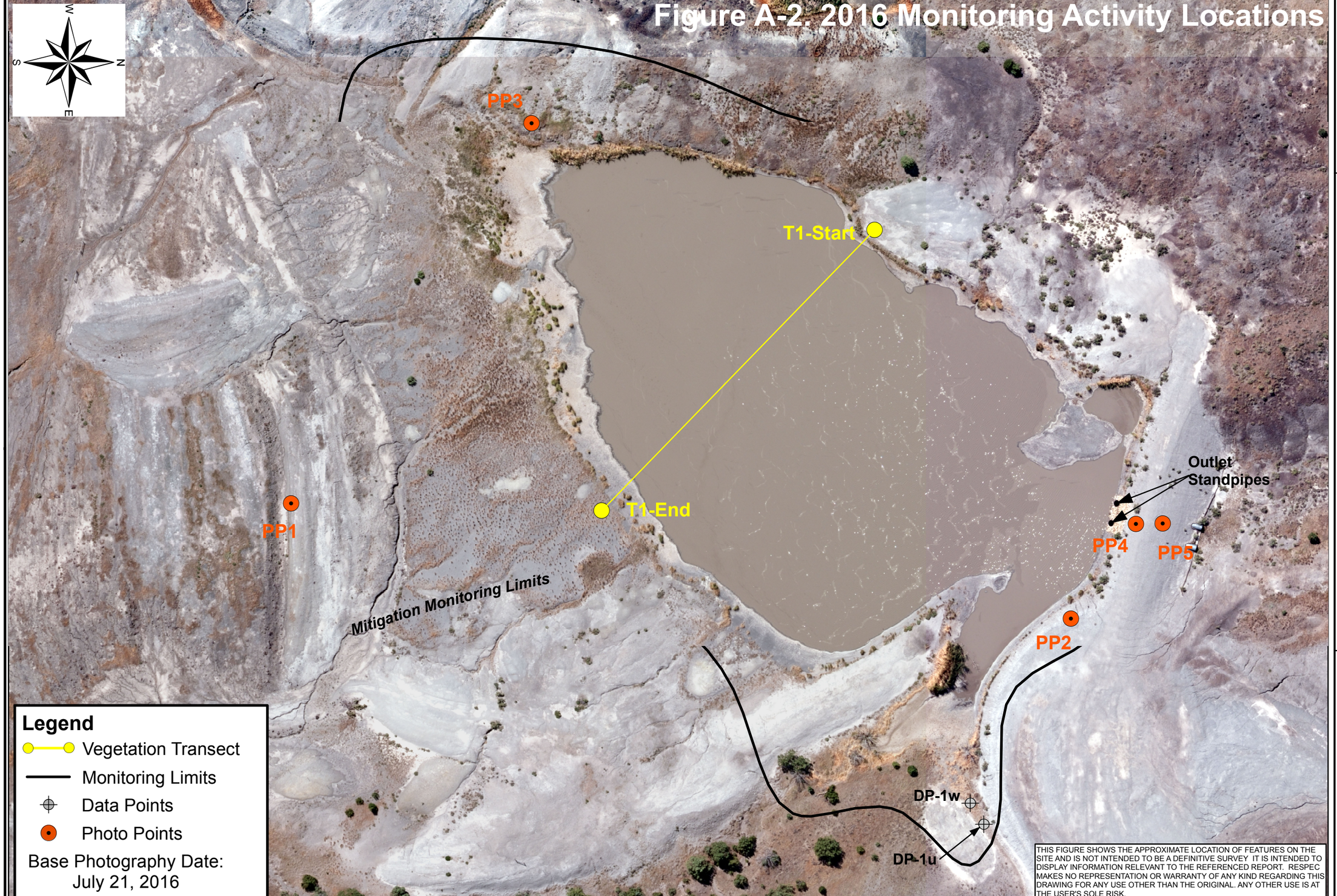
US Department of Agriculture, 2011. "Web Soil Survey for Carter County, Montana," *usda.gov* retrieved July 21, 2011, from *http://websoilsurvey.nrcs.usda.gov/app/*

Western Regional Climate Center, 2016. "Monthly Sum of Precipitation at the Broadus Meteorological Station (241127)," *dri.edu*, retrieved September 14, 2016, from *http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?mt1127*

APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
American Colloid
Alzada, Carter County, Montana

Figure A-2. 2016 Monitoring Activity Locations



RESPEC
820 North Montana Ave.,
Suite A
Helena, MT 59601

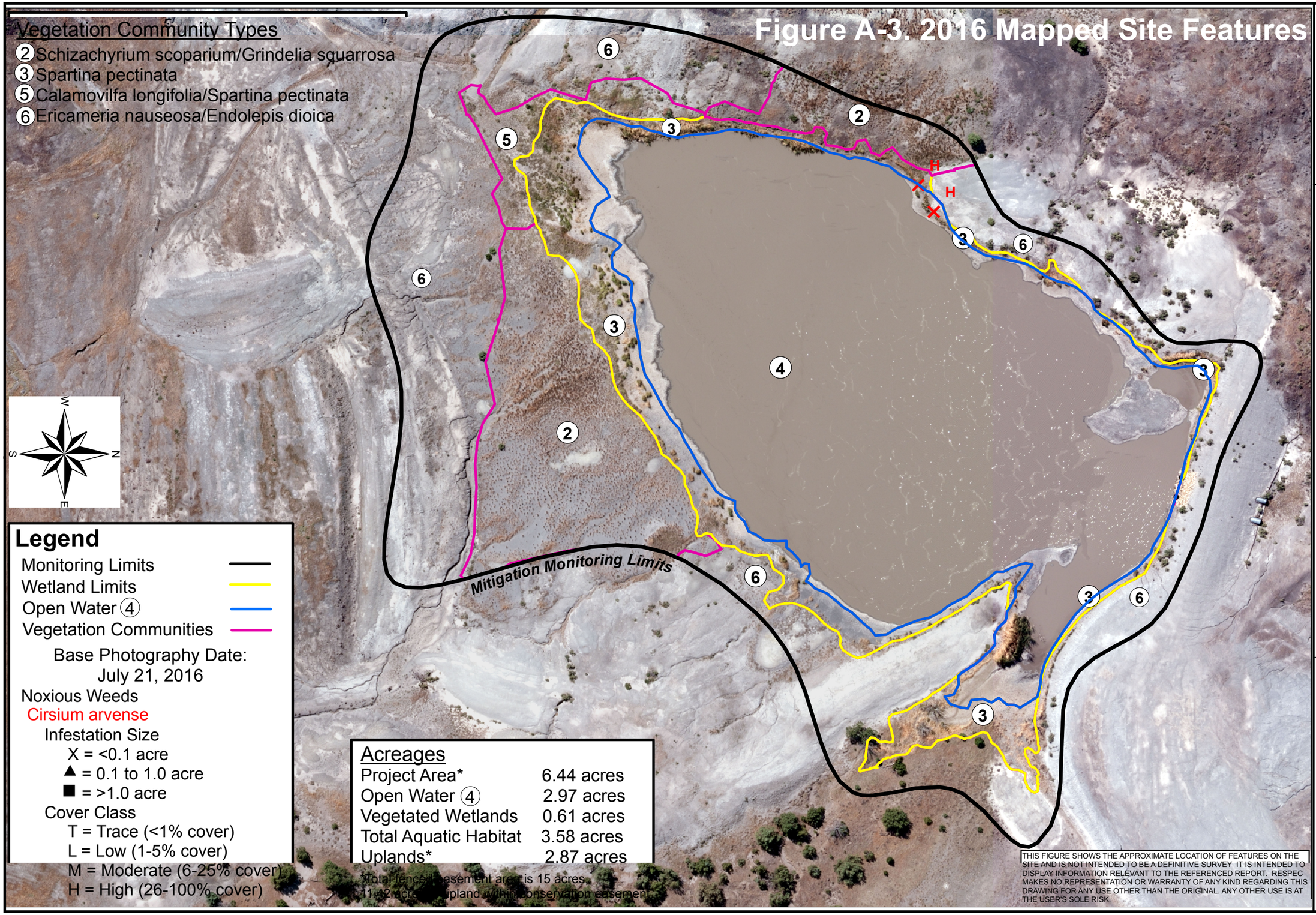
American Colloid Mitigation Site
2016 Monitoring Activity Locations

0 30 60 120 180 240 300 Feet

Project: NH STPS BR 6(10)
Location: Carter Co., Montana
Date: September 2016
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016\American Colloid\GPS Data\Mains\Monitor2016.mxd

Figure A-3. 2016 Mapped Site Features



Legend

- Monitoring Limits
- Wetland Limits
- Open Water (4)
- Vegetation Communities

Base Photography Date:
July 21, 2016

Noxious Weeds

Cirsium arvense

Infestation Size

- X = <0.1 acre
- ▲ = 0.1 to 1.0 acre
- ■ = >1.0 acre

Cover Class

- T = Trace (<1% cover)
- L = Low (1-5% cover)
- M = Moderate (6-25% cover)
- H = High (26-100% cover)

Acreages

Project Area*	6.44 acres
Open Water (4)	2.97 acres
Vegetated Wetlands	0.61 acres
Total Aquatic Habitat	3.58 acres
Uplands*	2.87 acres

*Total fenced easement area is 15 acres.
11.42 acres of upland within conservation easement.

THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY. IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

RESPEC
820 North Montana Ave.,
Suite A
Helena, MT 59601

American Colloid Mitigation Site
2016 Mapped Site Features

0 30 60 120 180 240 300 Feet

Project:	NH STPS BR 6(10)
Location:	Carter Co., Montana
Date:	September 2016
Project Manager:	M. Traxler
Drawn By:	J. Rosenbaum

M:\Projects\Powering 2020\American Colloid\GIS\Mapfiles\Figure A-3 2016 Mapped Site Features.mxd

APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
American Colloid
Alzada, Carter County, Montana

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **American Colloid** Project Number: _____
Assessment Date: **June 14, 2016** Person(s) conducting the assessment: **Lynn Bacon**
Location: **Alzada, MT** MDT District: **Billings** Milepost: **N/A**
Legal Description: T **9N** R **58E** Section **36**
Weather Conditions: **75F, partly cloudy** Time of Day: **1400**
Initial Evaluation Date: **August 9, 2011** Monitoring Year: **6** # Visits in Year: **1**
Size of evaluation area: **6.44 acres** Land use surrounding wetland: **Bentonite mine, open range**

HYDROLOGY

Surface Water Source: **Precipitation, runoff**
Inundation: **Present** Average Depth: **1.5 feet** Range of Depths: **0-3 ft**
Percent of assessment area under inundation: **50%**
Depth at emergent vegetation-open water boundary: **0.5 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **Yes**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
Surface soil cracks, water-stained leaves, geomorphic position, water marks, FAC-neutral test, drain pattern, and salt crust, algal crust.

Groundwater Monitoring Wells: **Absent**
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:
☒ Map emergent vegetation-open water boundary on aerial photograph.
☒ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☐ Use GPS to survey groundwater monitoring well locations, if present.

COMMENTS / PROBLEMS:

_____

VEGETATION COMMUNITIES

Community Number: **2** Community Title (main spp): **Schizachyrium scoparium / Grindelia squarrosa**

Dominant Species	% Cover	Dominant Species	% Cover
Schizachyrium scoparium	4 = 21-50%	Hordeum jubatum	1 = 1-5%
Bare Ground	3 = 11-20%	Sarcobatus vermiculatus	1 = 1-5%
Eriogonum pauciflorum	3 = 11-20%	Spartina pectinata	1 = 1-5%
Grindelia squarrosa	3 = 11-20%	Xanthium strumarium	1 = 1-5%
Calamovilfa longifolia	2 = 6-10%	Agrostis scabra	1 = 1-5%
Aristida purpurascens	1 = 1-5%	Artemisia tridentata	1 = 1-5%

Comments / Problems: _____

Community Number: **3** Community Title (main spp): **Spartina pectinata /Grindelia squarrosa**

Dominant Species	% Cover	Dominant Species	% Cover
Bare Ground	4 = 21-50%	Gutierrezia sarothrae	1 = 1-5%
Spartina pectinata	2 = 6-10%	Juncus tenuis	1 = 1-5%
Hesperostipa sp.	2 = 6-10%	Schizachyrium scoparium	1 = 1-5%
Alopecurus aequalis	1 = 1-5%	Chenopodium leptophyllum	1 = 1-5%
Beckmannia syzigachne	1 = 1-5%	Grindelia squarrosa	1 = 1-5%
Eleocharis palustris	1 = 1-5%	Hordeum jubatum	1 = 1-5%

Comments / Problems: _____

Community Number: **4** Community Title (main spp): **Open Water /**

Dominant Species	% Cover	Dominant Species	% Cover
Open Water	5 = > 50%		
Algae, green	1 = 1-5%		
Schoenoplectus maritimus	1 = 1-5%		
Typha latifolia	1 = 1-5%		
Spartina pectinata	1 = 1-5%		

Comments / Problems: _____

Community Number: **5** Community Title (main spp): **Calamovilfa longifolia / Spartina pectinata**

Dominant Species	% Cover	Dominant Species	% Cover
Bare Ground	4 = 21-50%	Poa secunda	1 = 1-5%
Calamovilfa longifolia	3 = 11-20%	Opuntia polyacantha	+ = < 1%
Spartina pectinata	2 = 6-10%		
Grindelia squarrosa	1 = 1-5%		
Puccinellia nuttalliana	1 = 1-5%		
Xanthium strumarium	1 = 1-5%		

Comments / Problems: _____

VEGETATION COMMUNITIES (continued)

Community Number: **6** Community Title (main spp): **Ericameria nauseosa / Endolepis dioica**

Dominant Species	% Cover	Dominant Species	% Cover
Bare Ground	5 = > 50%	Grindelia squarrosa	2 = 6-10%
Ericameria nauseosa	3 = 11-20%	Achillea milefolium	1 = 1-5%
Endolepis dioica	2 = 6-10%	Artemisia tridentata	+ = < 1%
Eriogonum pauciflorum	2 = 6-10%	Bouteloua gracilis	+ = < 1%
Hordeum jubatum	2 = 6-10%	Aristida purpurascens	+ = < 1%
Sarcobatus vermiculatus	2 = 6-10%	Atriplex argentea	+ = < 1%

Comments / Problems: _____

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes

Comments / Problems: **No woody vegetation planted at this site.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **American Colloid** Date: **June 14, 2016** Examiner: **Lynn Bacon**
Transect Number: **1** Approximate Transect Length: **300 feet** Compass Direction from Start: **130˚** Note: _____

Transect Interval Length: **290 feet (station 0-290)**	
Vegetation Community Type: Open Water /	
Plant Species	**Cover**
Open Water	5 = > 50%
Algae, green	+ = < 1%
Eleocharis palustris	+ = < 1%
Juncus tenuis	+ = < 1%
Rumex salicifolius	+ = < 1%
Cirsium arvense	+ = < 1%
Hordeum jubatum	+ = < 1%
Spartina pectinata	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length: **10 feet (station 290-300)**	
Vegetation Community Type: Spartina pectinata /	
Plant Species	**Cover**
Bare Ground	5 = > 50%
Spartina pectinata	4 = 21-50%
Agrostis scabra	1 = 1-5%
Juncus tenuis	1 = 1-5%
Rumex salicifolius	+ = < 1%
Schizachyrium scoparium	+ = < 1%
Xanthium strumarium	+ = < 1%
Total Vegetative Cover:	90%

Transect Interval Length:	
Vegetation Community Type:	
Plant Species	**Cover**
Total Vegetative Cover:	%

Transect Interval Length:	
Vegetation Community Type:	
Plant Species	**Cover**
Total Vegetative Cover:	%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		Indicator Class	Source
+ = < 1%	3 = 11-10%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = > 50%	0 = Facultative	

Percent of perimeter developing wetland vegetation (excluding dam/berm structures): **95%**

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

Estimate cover within a 10 foot 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.

Comments: **Wetland vegetation has developed around approximately 90% of the open water circumference, however width of community ranges from 1 to 10 feet. The potential for expansion of the wetland communtiy width is very limited given the lack of any substantial change in severall years. Water depth, sediment concentration of the water column, hardpan clay, salinity, and perhaps other factors likely prevent expansion of the wetland community into the open water area.**

PHOTOGRAPHS

Take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph Checklist:

- ☒ One photograph for each of the four cardinal directions surrounding the wetland.
- ☒ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.
- ☒ At least one photograph showing the buffer surrounding the wetland.
- ☒ One photograph from each end of the vegetation transect, showing the transect.

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1: 45.003201 / -104.547737	130
PP-2		Photo Point 2: 45.004951 / -104.547249	230
PP-3		Photo Point 3: 45.003777 / -104.549034	80
PP-4		Photo Point 4: 45.00523 / -104.547684	185
PP-5		Photo Point 5: 45.00523 / -104.547684	10
T-1 start		Transect 1 start: 45.004608 / -104.548531	130
T-1 end		Transect 1 end: 45.004108 / -104.547676	310
DP-1W		Wetland soil pit: 45.003768 / -104.54858	
DP-1U		Upland soil pit: 45.003681 / -104.548457	

Comments / Problems: _____

GPS SURVEYING

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

GPS Checklist:

- ☒ Upland/wetland boundary.
- ☒ 4-6 landmarks that are recognizable on the aerial photograph.
- ☒ Start and End points of vegetation transect(s).
- ☒ Photograph reference points.
- ☐ Groundwater monitoring well locations.
- ☐ Bird nest boxes.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual and regional supplement.
- ☒ Delineate wetland – upland boundary onto aerial photograph.

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

- ☒ Complete and attach full MDT Montana Wetland Assessment Method field forms.

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **NA**
If yes, do they need to be repaired? **NA**
If yes, describe the problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: **Water-control standpipes and armoured earthen berm in good condition.**

WILDLIFE

Birds

Were man-made nesting structures installed? **No**
If yes, type of structure: _____ How many? **0**
Are the nesting structures being used? **NA**
Do the nesting structures need repairs? **NA**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
Deer sp.		☒	☒	☐	
Eastern Cottontail	1	☐	☐	☐	
Northern Leopard Frog	1	☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: _____

BIRD SURVEY – FIELD DATA SHEET

Site: **American Colloid** Date: **6/14/16**
Survey Time: **1400** to **1430**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Killdeer	1		MA UP				
Red-winged Blackbird	3		MA				
Swallow sp.	5		UP				
Vesper Sparrow.	1		UP				

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

HABITAT CODES
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 shore

Weather: **80 degrees, partly cloudy, breezy (<10 mph)**

Notes: _____

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: American Colloid **City/County:** Carter Co. **Sampling Date:** 14-Jun-16

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-1U**

Investigator(s): Lynn Bacon **Section, Township, Range:** S 36 T 9S R 58E

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** flat **Slope:** 2.0% 1.1 °

Subregion (LRR): LRR G **Lat.:** 45.003768 **Long.:** -104.54858 **Datum:** WGS84

Soil Map Unit Name: Neldore-Rock outcrop **NWI classification:** Not Mapped

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ○ No ◉

Hydric Soil Present? Yes ○ No ◉

Wetland Hydrology Present? Yes ○ No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:
SP located on uphill edge of wetland boundary up small drainage. Formerly SP02-u.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Pascopyrum smithii	10	☑ 20.0%	FACU
2. Hordeum jubatum	25	☑ 50.0%	FACW
3. Calamovilfa longifolia	15	☑ 30.0%	UPL
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
	50	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐	
2.	0	☐	
	0	= Total Cover	

% Bare Ground in Herb Stratum 55

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	15	x 5 =	75
Column Totals:	50 (A)		165 (B)

Prevalence Index = B/A = 3.3

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0[1]**
- ☐ **4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation[1] (Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
Hydrophytic vegetation community not present.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-1U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/2	100					Silty Clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

Did not observe any indicators of hydric soils during field survey.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

Did not observe any indicators of wetland hydrology during field survey.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: American Colloid **City/County:** Carter Co. **Sampling Date:** 14-Jun-16

Applicant/Owner: MDT **State:** MT **Sampling Point:** DP-1W

Investigator(s): Lynn Bacon **Section, Township, Range:** S 36 T 9S R 58E

Landform (hillslope, terrace, etc.): Shoreline **Local relief (concave, convex, none):** flat **Slope:** 0.0% 0.0 °

Subregion (LRR): LRR G **Lat.:** 45.003768 **Long.:** -104.54858 **Datum:** WGS84

Soil Map Unit Name: Neldore-Rock outcrop **NWI classification:** Not Mapped

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☑ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○

Hydric Soil Present? Yes ◉ No ○

Wetland Hydrology Present? Yes ◉ No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks:
Sample point located in area of potential wetland expansion. Formerly SP01-w.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Spartina pectinata	15	☑	21.1%	FACW
2. Rumex salicifolius	1	☐	1.4%	OBL
3. Hordeum jubatum	35	☑	49.3%	FACW
4. Pascopyrum smithii	20	☑	28.2%	FACU
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	71	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species	50	x 2 =	100
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	71 (A)		181 (B)

Prevalence Index = B/A = 2.549

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0[1]**
- ☐ **4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation[1] (Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Edge of wetland is diversifying.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-1W

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					Silty Clay	
2-16	10YR 3/2	95	10YR 4/6	5			Silty Clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Hydric soils present in this wetland thumb near dam.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Tested this area to check for wetland expansion; hydric soils are apparently forming in some areas because of adequate hydrology.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: American Colloid **2. MDT Project #:** STPX 6(15) **3. Control #:** 6714

3. Evaluation Date: 6/15/16 **4. Evaluator(s):** LBacon **5. Wetland/Site #(s):** American Colloid

6. Wetland Location(s): Township 9 S, Range 58 E, Section 36; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: N/A

Watershed: 16 - Little Missouri **County:** Carter _ _ _____

7. Evaluating Agency: Confluence for MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
3.58 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 3.58 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Depressional	Unconsolidated Bottom	Impounded	Permanent / Perennial	90
Depressional	Emergent Wetland	Impounded	Seasonal / Intermittent	10

Comments: _____

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

12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

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

Comments (types of disturbance, intensity, season, etc.)**:** No disturbance to site or AA since dam breach was repaired in 2011. Hydrology from precipitation and surface runoff. AA is fenced to include a 10-acre upland buffer. Area surrounding site mined for bentonite although there is no active mining within 500 ft. of AA.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA located on DNRC property under an MDT conservation easement. No active mining or roads within 500 ft of AA. A few isolated ponds and wetland areas near AA. Site is situated within the semiarid Pierre Shale Plains with surrounding habitat of undulating rolling plains and vegetation of short-statured sagebrush steppe, shortgrass prairie and some scattered stands of Ponderosa pine.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	---
1 class, monoculture (1 species comprises 90% of total cover)	---	NA	NA	NA

Comments: Emergent vegetation class.

Wetland/Site #(s): American Colloid

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

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	---	0L

Sources for documented use (e.g. observations, records): USFWS T&E list.

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☒ S Greater Sage-Grouse (S2)
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	---	---	.1L	---

Sources for documented use (e.g. observations, records): MTNHP SOC list for Carter County.

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check 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
- ☐ interview with local biologist with knowledge of the AA

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☒ ***Moderate:*** Based on any of the following [check].
- ☒ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☒ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual 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	---	---	---	---	---	---	---	---	---	---	---
☐ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	**Wildlife Habitat Features Rating (ii)**			
	☒ **Exceptional**	☐ **High**	☐ **Moderate**	☐ **Low**
☐ **Substantial**	---	---	---	---
☒ **Moderate**	.9H	---	---	---
☐ **Minimal**	---	---	---	---

Comments: Observed a few species during afternoon visit, when avian species are particularly quiet.

Wetland/Site #(s): American Colloid

14D. GENERAL FISH HABITAT ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

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].

Type of Fishery: ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface Water in AA	☐ **Permanent / Perennial**						☐ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

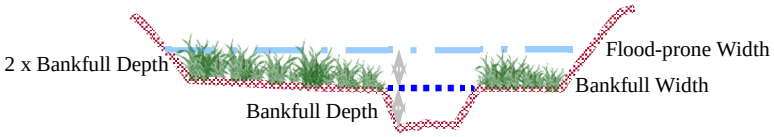
iii. Final Score and Rating: _ **Comments:** _____

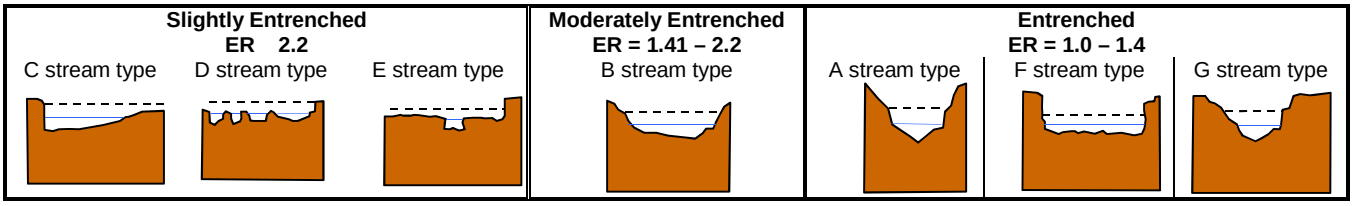
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	☐ Slightly Entrenched C, D, E stream types			☐ Moderately Entrenched B stream type			☐ Entrenched A, F, G stream types		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---	---

ii. Are 10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** _____

Wetland/Site #(s): American Colloid

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

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

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

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☒ **>5 acre feet**			☐ **1.1 to 5 acre feet**			☐ **≤1 acre foot**		
Duration of Surface Water at Wetlands within the AA	☒ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	1H	---	---	---	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: Hydrology source for AA from precip and upland surface runoff. Approx 3-acres of surface water present during the majority of the year with an average depth of 2-3 feet.

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

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☐ **≥ 70%**		☒ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☐ **Yes**	☐ **No**	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	---	---	.7M	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: The depression contains a surface water outlet, water level approx 12 inches below max design elevation at time of 2016 visit.

14H. SEDIMENT / SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of 6 (see Appendix F).	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☒ **Permanent / Perennial**	☐ **Seasonal / Intermittent**	☐ **Temporary / Ephemeral**
☐ **≥ 65%**	---	---	---
☐ **35-64%**	---	---	---
☒ **< 35%**	.3L	---	---

Comments: Three acres of open water subject to wave action. The vegetation cover of species w/ high stability ratings (Spartina, bulrush, spikerush) is <35%.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)** ☒ **E/H**	☐ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☒ **NA**	H	---	---

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual 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	---	---	---	---	---	---	---	---	---	---	---	---	.8H	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): American Colloid

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: Area with 30% plant cover, 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average 50-foot wide vegetated upland buffer around 75% of the AA's perimeter? ☒ **YES**, add 0.1 to score in **ii** = .9H ☐ **NO**

iv. Final Score and Rating: .9H **Comments:** Vegetated component of AA is <1-ac.

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and ii below.

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

ii. Recharge Indicators
- ☐ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

iii. Rating: Use the information from i and ii above and the table below to select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☐ P/P	☐ S/I	☐ T	☒ None
☒ **Groundwater Discharge or Recharge**	---	---	---	.1L
☐ **Insufficient Data/Information**	---			

Comments: The AA contains an unconsolidated bottom composed of bentonite with minimal permeability.

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant
☒ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	.4M	---
☐ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL ☒ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☐ **YES**, go to ii. ☒ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☐ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational
☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: _____

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): American Colloid

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	low 0.10	1.00	0.36	
C. General Wildlife Habitat	high 0.90	1.00	3.22	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	NA	NA	0	
F. Short and Long Term Surface Water Storage	high 1.00	1.00	3.58	*
G. Sediment / Nutrient / Toxicant Removal	mod 0.70	1.00	2.51	*
H. Sediment / Shoreline Stabilization	low 0.30	1.00	1.07	
I. Production Export / Food Chain Support	high 0.90	1.00	3.22	*
J. Groundwater Discharge / Recharge	low 0.10	1.00	0.36	
K. Uniqueness	mod 0.40	1.00	1.43	
L. Recreation / Education Potential (bonus point)	NA		0	
Total Points	**4.4**	**9**	**15.75 Total Functional Units**	
Percent of Possible Score 49% (round to nearest whole number)				

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

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

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

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

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

☐ **I** ☒ **II** ☐ **III** ☐ **IV**

APPENDIX C
PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
American Colloid
Alzada, Carter County, Montana



Photo Point 1 – Panorama; Location: South Boundary; Bearing 300 degrees; Year 2013



Photo Point 1 – Panorama; Location: South Boundary; Bearing 300 degrees; Year 2014



Photo Point 1 – Panorama; Location: South Boundary; Bearing 300 degrees; Year 2015



Photo Point 1 – Panorama; Location: South Boundary; Bearing 300 degrees; Year 2016



Photo Point 2; Location: NE edge of wetland cell; Bearing 230 degrees; Year 2013



Photo Point 2; Location: NE edge of wetland cell; Bearing 230 degrees; Year 2014



Photo Point 2; Location: NE edge of wetland cell; Bearing 230 degrees; Year 2015



Photo Point 2; Location: NE edge of wetland cell; Bearing 230 degrees; Year 2016



Photo Point 3; Location: SW edge of wetland cell; Bearing 60 degrees; Year 2013



Photo Point 3; Location: SW edge of wetland cell; Bearing 60 degrees; Year 2014



Photo Point 3; Location: SW edge of wetland cell; Bearing 60 degrees; Year 2015



Photo Point 3; Location: SW edge of wetland cell; Bearing 60 degrees; Year 2016



Photo Point 4 Location: North edge of cell
Bearing: 185 degrees Year 2012



Photo Point 4 Location: North edge of cell
Bearing: 185 degrees Year 2013



Photo Point 4 Location: North edge of cell
Bearing: 185 degrees Year 2014



Photo Point 4 Location: North edge of cell
Bearing: 185 degrees Year 2015



Photo Point 4 Location: North edge of cell
Bearing: 185 degrees Year 2016



Photo Point 5 Location: Outside North Border
Bearing: 10 degrees Year 2012



Photo Point 5 Location: Outside North Border
Bearing: 10 degrees Year 2013



Photo Point 5 Location: Outside North Border
Bearing: 10 degrees Year 2014



Photo Point 5 Location: Outside North Border
Bearing: 10 degrees Year 2015



Photo Point 5 Location: Outside North Border
Bearing: 10 degrees Year 2016



Transect 1: Start Location: NW Wetland Boundary
Bearing: 130 degrees Year 2012



Transect 1: Start Location: NW Wetland Boundary
Bearing: 130 degrees Year 2013



Transect 1: Start Location: NW Wetland Boundary
Bearing: 130 degrees Year 2014



Transect 1: Start Location: NW Wetland Boundary
Bearing: 130 degrees Year 2015



Transect 1: Start Location: NW Wetland Boundary
Bearing: 130 degrees Year 2016



Transect 1: End Location: SE Wetland Boundary
Bearing: 310 degrees Year 2012



Transect 1: End Location: SE Wetland Boundary
Bearing: 310 degrees Year 2013



Transect 1: End Location: SE Wetland Boundary
Bearing: 310 degrees Year 2014



Transect 1: End Location: SE Wetland Boundary
Bearing: 310 degrees Year 2015

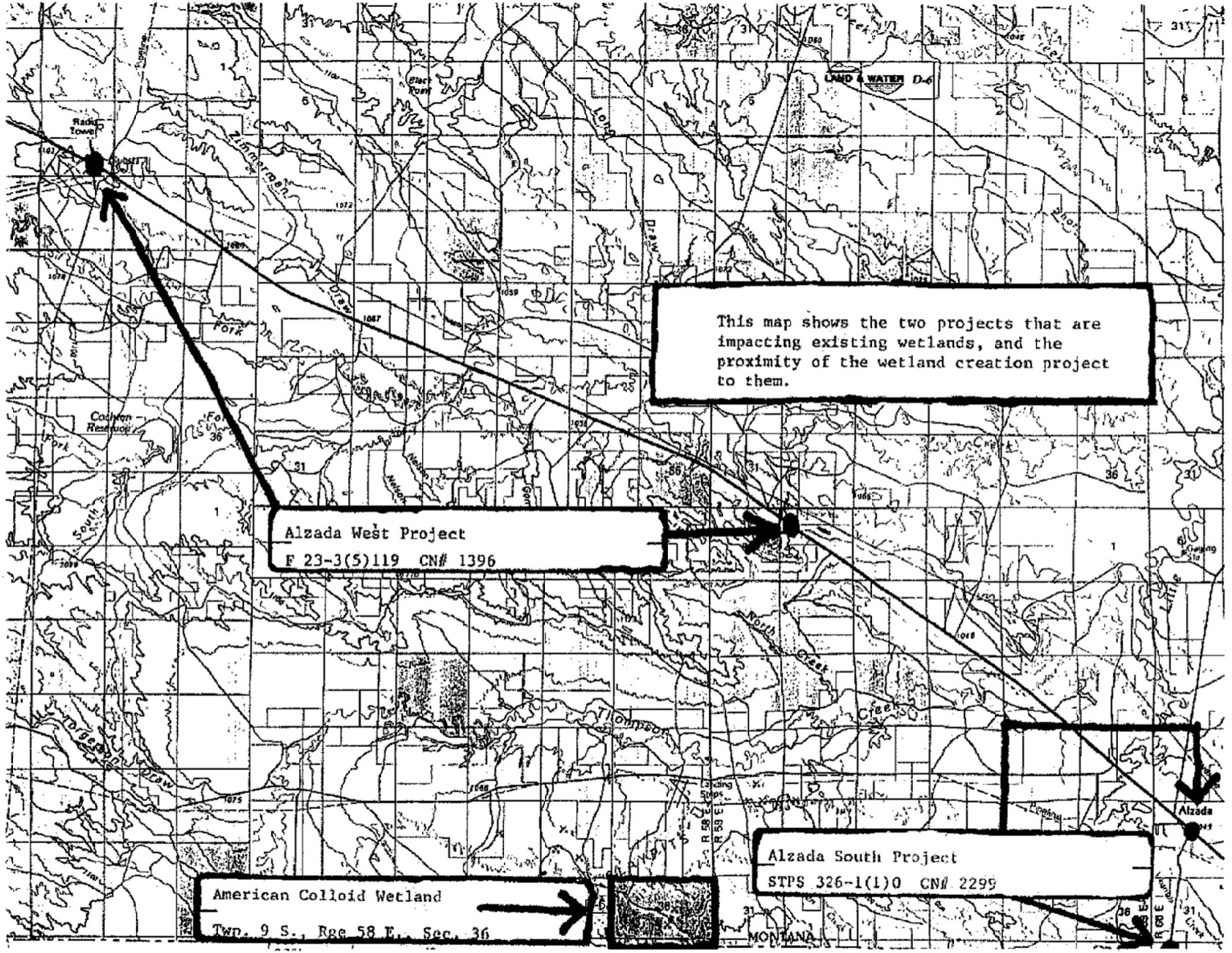


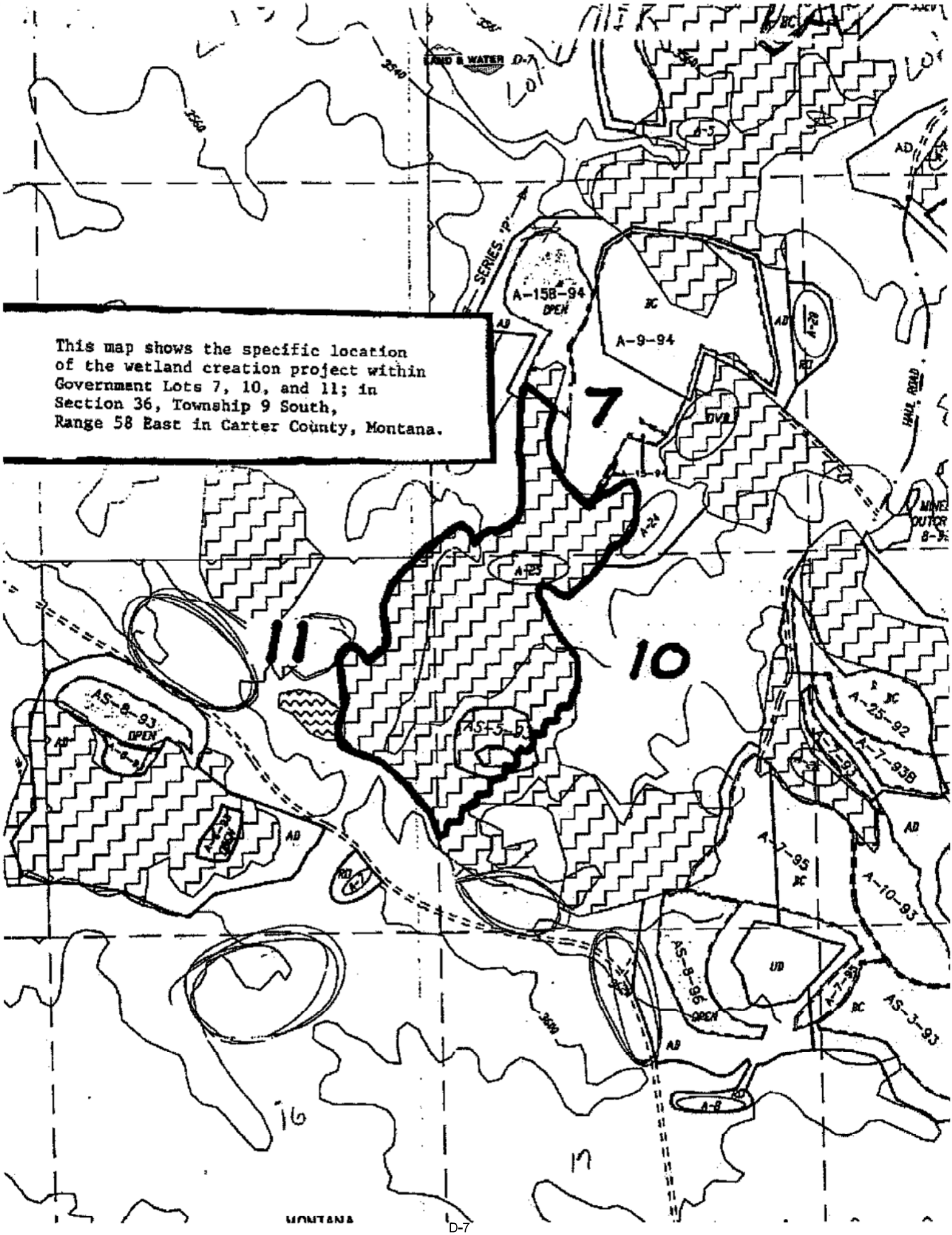
Transect 1: End Location: SE Wetland Boundary
Bearing: 310 degrees Year 2016

	
Data Point: DP-1U Location: NE part of site Year 2016	Data Point: DP-1W Location: NE part of site Year 2016

APPENDIX D
PROJECT PLAN SHEETS

MDT Wetland Mitigation Monitoring
American Colloid
Alzada, Carter County, Montana


This map shows the two projects that are impacting existing wetlands, and the proximity of the wetland creation project to them.
Alzada West Project
F 23-3(5)119 CN# 1396
Alzada South Project
STPS 326-1(1)0 CN# 2299
American Colloid Wetland
Twp. 9 S., Rge 58 E., Sec. 36
LAND & WATER D-6
MONTANA
Alzada


This map shows the specific location of the wetland creation project within Government Lots 7, 10, and 11; in Section 36, Township 9 South, Range 58 East in Carter County, Montana.
7
10
11
A-158-94
OPEN
A-9-94
A-25-92
A-7-93B
A-7-95
A-10-93
AS-8-96
OPEN
AS-3-93
AS-8-93
OPEN
AS-5-D
A-8
A-24
A-12S
HALL ROAD
SERIES 'P'
MONTANA

STATE	PROJECT NO.	SHEET NO.
MONTANA	STPS-BR-SF(10)	1

CPS - U6564 01:14:08 05/30/01

EXCAVATION
cubic meters

EMBANKMENT
cubic meters

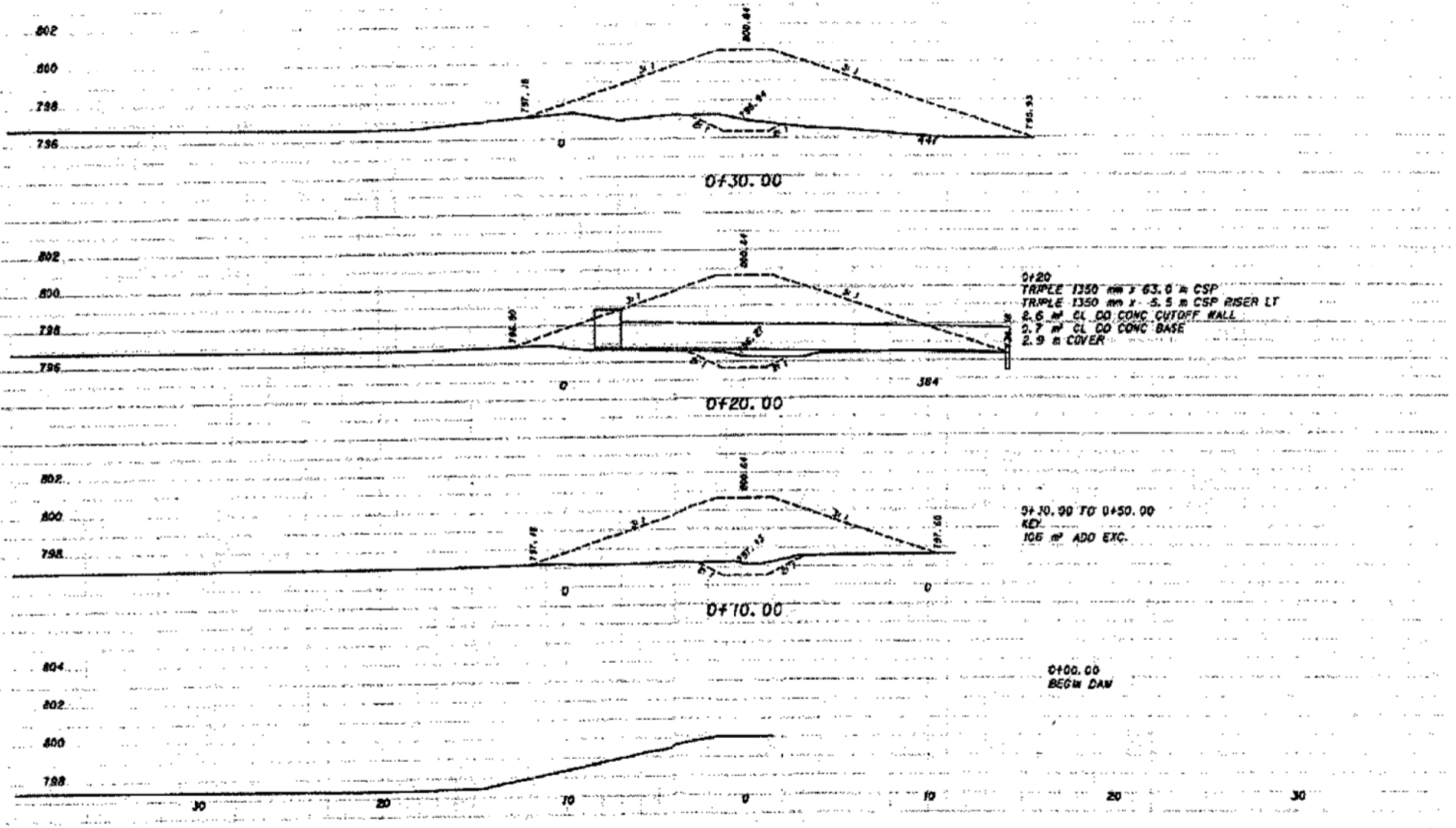


TABLE OF CONTENTS

ROAD PLANS	SHEET NO.
TITLE SHEET	1
TABLE OF CONTENTS	2
NOTES	2
SUMMARIES	3
GRADING	3
FENCING	3
TOPSOIL & SEEDING	3
CULVERTS	3
DETAILS	4
DAM SIDE VIEW	4
DAM END VIEW	4
CONCRETE BASE	4
PLAN & PROFILE	5
CROSS SECTIONS	1-2

NOTES

PROPERTY CORNER

THE PROPERTY CORNER LOCATED WITHIN THE EASEMENT WILL BE REMOVED AND RESET BY STATE FORCES.

BACKSLOPE

GRADE AND SHAPE BACKSLOPES OF THE WETLAND SITE TO 4:1 AS DIRECTED BY THE ENGINEER. THE COST OF THE BACKSLOPE WORK IS INCLUDED IN THE OTHER GRADING ON THE PROJECT.

CLEARING AND GRUBBING

CLEAR AND GRUB TO CONSTRUCTION LIMITS. INCLUDE THE COST OF CLEARING AND GRUBBING IN OTHER ITEMS.

SUMMARY

ADDENDUM NO. 1
ATTACHMENT NO. 3

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH-STPS-BR 6110( )	3

LANDS & WATER D-11

GRADING

STATION	cubic meters EXCAVATION		EMB. IN PLACE	REMARKS
0+10.00				
	106			KEY
0+50.00				
0+85.00				
0+97.30			2006	DAM
			109	TOPSOIL REPLACEMENT
TOTAL	4 106		2115	

* FOR INFORMATION ONLY

FENCING

STATION* FROM	TO	meters TYPE FSW			EACH SINGLE PANEL	DOUBLE PANEL		meters GATES GI		REMARKS
		1 043			4	4		5.6		
TOTAL		1 043			4	4		5.6		

* REFERENCE TO SURVEYED EASEMENT

TOPSOIL & SEEDING*

STATION FROM	TO	cubic meters TOPSOIL SALVAGED & PLACING	hectares SEED NO. 1	NO. 2	NO. 3	FERTILIZER NO. 1	NO. 2	NO. 3	CONIFERS SEEDED		REMARKS
0+00.00	0+97.50	109	1			1			1		DAM
TOTAL		109	1			1			1		

* SEEDING WILL BE HAND BROADCAST

CULVERTS

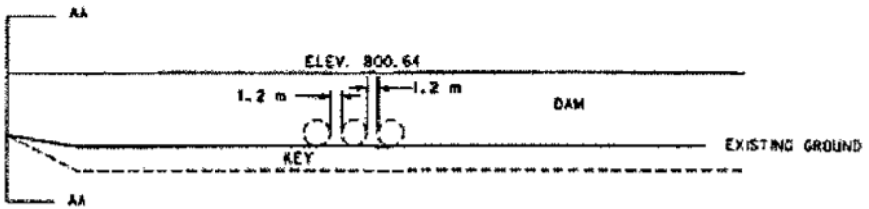
STATION	meters CSP 1350 mm	END SECTIONS LEFT	RIGHT	cubic meters CULVERT EXCAVATION	BEDDING MATERIAL	CLASS "20" CONCRETE	CULVERT RIPRAP CLASS	meters REMOVE	RELAY	HEIGHT OF COVER IN meters	EACH CLEAN CULVERT	IN PLACE mm X m	REMARKS
0+20	68.5		56	100		3.3				0.9			TRIPLE 1350 mm x 5.5 m CSP ASSEMBLY
TOTAL	68.5	~	~	100		3.3		~		~			

D-6

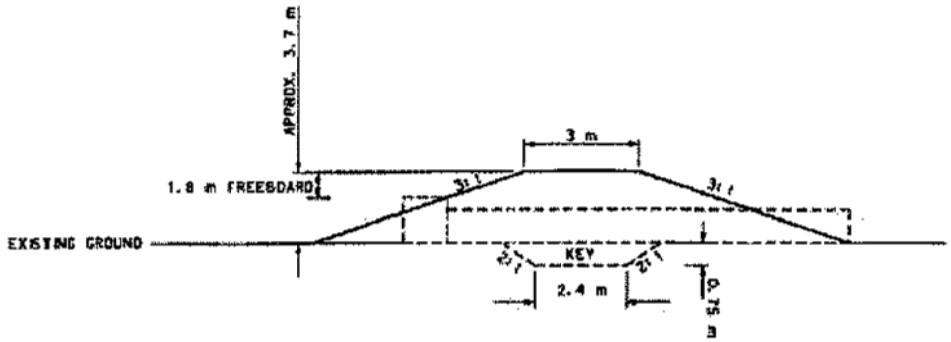
MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADD
1360\MISC\vertsum1.dgn
DESIGNED BY L. ELLEN
DRAWN BY K. ELLEN
APPROVED BY P. FLYNN
DATE 5-08-2001

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	[redacted]	4

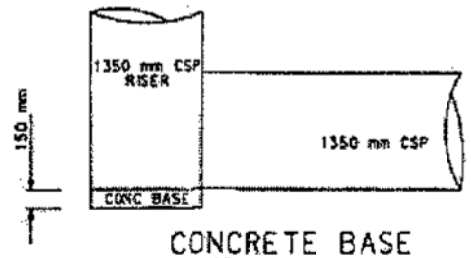
DETAILS



SIDE VIEW DAM
NOT TO SCALE

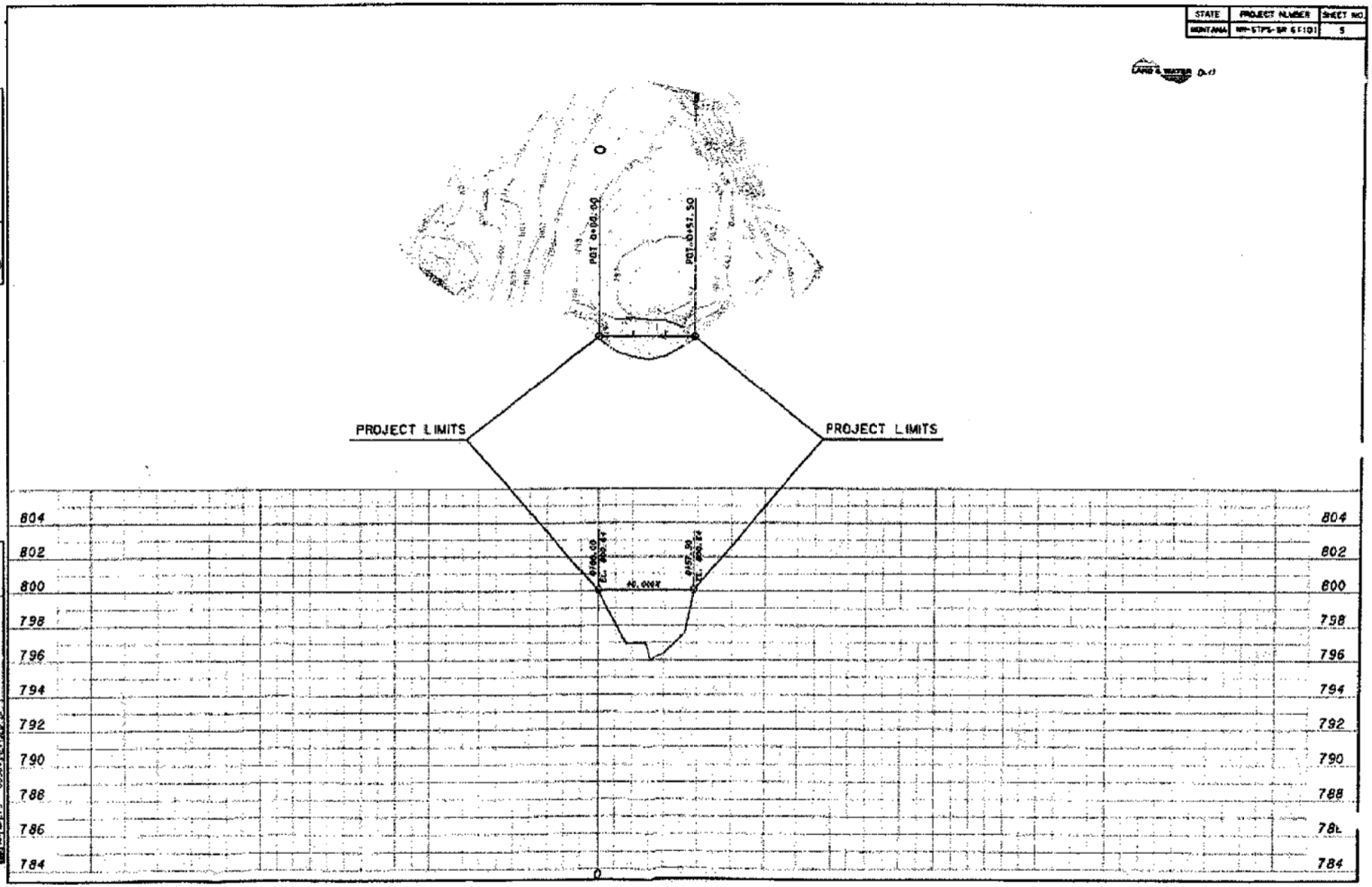


END VIEW DAM
NOT TO SCALE
SECTION AA



CONCRETE BASE
NOT TO SCALE

D-7


STATE
MONTANA
PROJECT NUMBER
SHEET NO
5
PROJECT LIMITS
PROJECT LIMITS
804
802
800
798
796
794
792
790
788
786
784