SILICON MOUNTAIN MITIGATION SITE

Project Overview

Watershed: Watershed #2 – Upper Clark Fork of the Columbia River

Monitoring Year: 2019

Years Monitored: 5th year of monitoring

Corps Permit Number: NWO-2012-01822-MTH

Stream Protection Act (SPA) Number: MDT-R2-74-201

Monitoring Conducted By: RESPEC/TREC/HDR for MDT

Dates Monitoring Was Conducted: July 25, 2019

Purpose of the Approved Project:

The site was constructed to provide 11.45 acres of compensatory wetland mitigation credits and 12,369 stream mitigation credits for wetland and stream impacts associated with Butte Silver Bow County's Silicon Tech Park and Port project and impacts associated with future Montana Department of Transportation (MDT) project-related wetland and stream impacts in Watershed #2 – Upper Clark Fork River. The project is intended to: (a) establish 6.77 acres of emergent and scrub/shrub wetland by excavating and creating six wetland cells; (b) protect 10.06 acres of existing emergent and scrub/shrub wetland; (c) restore upland, wetland, and riparian areas that were impacted by the new roadway alignment via seeding and planting of mostly native graminoids, shrubs, and trees; (d) restore and reconstruct approximately 3,250 linear feet of the Sand Creek channel to its historic natural condition; and (e) relocate and restore approximately 650 linear feet of the Sand Creek channel on privately owned property south of the realignment project.

Site Location:

Latitude: 45.99848945 **Longitude:** –112.6629488

County: Butte Silver Bow **Nearest Town:** Rocker, MT

Map Included: Yes

Mitigation Site Construction Started: 2013 **Construction Ended:** 2015

Dates of Any Recent Corrective or Maintenance Activities (since previous report):

Activity: Weed Spraying **Date:** July 7and 8, 2019 **Specific recommendations for any additional corrective actions:** Weed treatment will continue in 2020.

Anticipated Wetland Credit Acres: 11.45

Wetland Credit Acres Generated to Date: 12.16

Anticipated Stream Credits: 12,369.5

Stream Credits Generated to Date: 12,369.5

Previous Monitoring Reports:
https://www.mdt.mt.gov/publications/brochures/wetland_mitigation.shtml

Requirements (from approved mitigation plan, banking instrument, or Department of Army (DA) permit conditions)

Monitoring Period: 5 years from construction completion or until concurrence by the US Army Corps of Engineers (USACE).

Performance Standards: A summary of performance standards established for the Silicon Mountain site and whether or not they are being achieved is provided in Table 1.

Table 1. Summary of Performance Standards

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	Areas that are identified as wetland habitat within the mitigation site meet the three parameter criteria.
Wetland Hydrology	Soil saturation is present for at least 12.5 percent of the growing season.	Y	Areas that are identified as wetland habitat within the mitigation site exhibit soil saturation for a minimum 12.5 percent of the growing season.
Hydric Soil	Hydric soil conditions are present or appear to be forming.	Y	Hydric soil characteristics are developing throughout a majority of the constructed wetlands.
	Soil is sufficiently stable to prevent erosion.	Y	Overall, disturbed soil is stable and generally does not exhibit signs of erosion. In 2017, a few rills and gullies were noted on the southern slope of wetland Cell 5; north of the newly constructed bike path; and west of DP-2U, which resulted in sediment deposition. In 2019, perennial vegetation was established within and adjacent to the erosion and, with time, the rills and gullies will likely become inactive.
	Soil is able to support plant cover.	Y	Plant cover is establishing within developed wetlands.
Hydrophytic Vegetation	Success is achieved where combined absolute cover of facultative or wetter species is ≥ 70 percent.	Y	Created wetland cells support 70 percent or greater cover of hydrophytic vegetation (OBL, FACW, and FAC).
	State-listed noxious weeds do not exceed 10 percent absolute cover.	Y	Montana state-listed noxious weeds are estimated at 2 percent absolute cover within wetland areas.
Channel-Restoration Success	Revegetation along the new Sand Creek channel corridor will be considered successful when banks are vegetated with a majority of deep-rooting riparian and wetland herbaceous and woody plant species.	Y	The majority of stream bank vegetation along the constructed Sand Creek channel corridor is dominated by vegetation communities with stability ratings equal to or greater than 6.
	The intent of the stream restoration is to allow for the stream to naturally migrate within the floodplain and to allow it to freely move and stabilize itself within the site.	Y	The stream has plenty of space within the floodplain for natural migration. The stream currently appears to be stable with no lateral adjustment observed after construction.
Stream Bank Vegetation	Banks are vegetated with a majority of deep-rooting riparian plant species that have root-stability indexes ≥ 6.	Y	The majority of stream bank vegetation along the constructed Sand Creek channel corridor is dominated by vegetation communities with stability ratings that are greater than or equal to 6.
Open Water	The project is intended to provide seasonal open water during the spring and early summer within excavated depressions. As the growing season progresses and the groundwater levels recede, vegetation is expected to germinate within the majority of the depressions. Open water with submerged and/or floating vegetation will, therefore, be considered successful and creditable.	Y	Wetland Cells 2, 3, and with portions of Cells 4 and 6 experience seasonal drawdown; rooted hydrophytic vegetation development has been observed; and wetland Cells 1, 5, and the northern quarter of Cell 4 appear to support perennial inundation and a developing aquatic macrophyte community.

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Upland Buffer	Noxious weeds do not exceed 10 percent cover within upland buffer area.	Y	Noxious weed cover is approximately 4 percent within the upland buffer.
	Any area that was disturbed within the creditable buffer zone must have at least 50 percent aerial cover of non-weed species by the end of the monitoring period.	Y	Disturbed areas have established greater than 50 percent cover by non-weed species.
Weed Control	Control measures will be based on annual monitoring of the site 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 the intrusion of state-listed noxious weed species within the site.	Y	State-listed noxious weed species across the site have been monitored and mapped during each post-construction monitoring event. MDT administers an ongoing weed-control program. Noxious weeds were sprayed in July 2019 by MDT's contractor and will continue ongoing weed-control efforts to reduce the existing noxious weed infestations. Montana state-listed noxious weeds are estimated at 6 percent absolute cover across the entire site.

Summary Data

Wetland Delineation –The total jurisdictional wetland and aquatic habitat acreage that was delineated at the Silicon Mountain mitigation site in 2019 was 18.3 acres, as shown in Table 2 and the figures in Appendix A. The delineation confirmed 7.5 acres of created wetland in the excavated cells and 10.8 acres in the preserved wetland areas. Uplands accounted for approximately 30.1 acres of the mitigation site; the remaining 1.7 acres are represented by the restored Sand Creek channel.

Table 2. Delineated Wetland Acres From 2015 Through 2019 at the Silicon Mountain Site

Wetland Habitat Type	2015 Acreage	2016 Acreage	2017 Acreage	2018 Acreage	2019 Acreage
Project Area	50.1	50.1	50.1	50.1	50.1
Establishment (Creation)	6.3	6.3	6.3	7.1	7.5
Preservation	10.3	10.3	10.8	10.8	10.8
Total Wetland Habitat	**16.6**	**16.6**	**17.1**	**17.9**	**18.3**

Functional Assessment – The 2008 Montana Wetland Assessment Method (MWAM) form [Berglund and McEldowney, 2008] was used to evaluate the site in 2019 (Appendix B). Four distinct Assessment Areas (AA) were evaluated at the site in 2019 and include AA1 – Created Wetland Cells 2, 3, and 4; AA2 – Created Wetland Cells 1 and 5; AA3 – Preservation Wetlands; and AA4 – Created Wetland Cell 6. Created Wetland Cells 1 and 5 rate as Category II wetlands and receive high ratings for General Wildlife Habitat, Production Export/Food Chain Support, Short- and Long-Term Surface-Water Storage, and Groundwater/Discharge/Recharge. All other wetlands within the site rate as Category III wetlands. MWAM ratings remained unchanged in 2019 from the previous year.

Vegetation – A total of 172 plant species have been identified at the site from 2015 through 2019, including 16 new species in 2019. Eight wetland and seven upland community types were identified and mapped at the mitigation site in 2019 (Figure A-3, Appendix A). Dominant plant species that were observed within each community are listed on the Wetland Mitigation Site Monitoring form (Appendix B). The vegetation community types identified on the site in 2019 include the following:

- Upland Type 2 – *Descurainia sophia*/*Thlaspi arvense*
- Upland Type 3 – *Bromus inermis*/*Poa pratensis*
- Upland Type 5 – *Elymus repens*/*Bromus inermis*
- Upland Type 10 – *Artemisia tridentata*/*Poa spp.*
- Upland Type 12 – *Elymus trachycaulus*/*Poa ampla*
- Upland Type 13 – *Leymus cinereus*/*Elymus trachycaulus*
- Upland Type 15 – *Poa pratensis*/*Elymus repens*
- Wetland Type 4 – *Carex spp*./*Juncus balticus*
- Wetland Type 7 – Open Water/Aquatic Macrophytes
- Wetland Type 8 – *Salix exigua*/*Juncus balticus*
- Wetland Type 9 – *Juncus balticus*/*Elymus repens*
- Wetland Type 11 – *Typha latifolia*
- Wetland Type 14 – *Eleocharis palustris*/*Deschampsia caespitosa*
- Wetland Type 16 – *Juncus balticus*/*Eleocharis palustris*
- Wetland Type 17 – *Salix spp*.

Vegetation cover was measured along two belt transects (T-1 and T-2) in 2019 (Figure A-2, Appendix A). Photographs of the transect end points are provided in Appendix C. Table 3 summarizes the data for T-1 from 2015 through 2019. T-1 is 564 feet long and intersects vegetation community Types 3, 11, 13, and 16. Hydrophytic vegetation accounted for 86 percent of the transect in 2019. The percent of this transect that crosses hydrophytic vegetation communities has not changed over the last 3 years of monitoring but the total number of upland species has declined and hydrophytic species has increased.

Table 3. Data Summary for T-1 From 2015 Through 2019 at the Silicon Mountain Site

Monitoring Year	2015	2016	2017	2018	2019
Transect Length (feet)	**564**	**564**	**564**	**564**	**564**
Vegetation Community Transitions Along Transect	4	6	6	6	6
Vegetation Communities Along Transect	3	4	4	5	5
Hydrophytic Vegetation Communities Along Transect	1	2	2	2	2
Total Vegetative Species	51	48	54	42	43
Total Hydrophytic Species	30	26	33	28	31
Total Upland Species	21	22	21	14	12
Estimated % Total Vegetative Cover	90	90	90	90	93
Estimated % Unvegetated	10	10	10	10	7
% Transect Length Comprising Hydrophytic Vegetation Communities	80.5	81.3	86	86	86
% Transect Length Comprising Upland Vegetation Communities	19.5	18.7	14	14	14
% Transect Length Comprising Open Water	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0

Table 4 summarizes the data for T-2 from 2015 through 2019. T-2 is 219 feet long and intersects vegetation community Types 11, 14, and 15. Hydrophytic vegetation accounted for 90 percent of the transect in 2019.

Table 4. Data Summary for T-2 From 2015 Through 2019 at the Silicon Mountain Site

Monitoring Year	2015	2016	2017	2018	2019
Transect Length (feet)	**219**	**219**	**219**	**219**	**219**
Vegetation Community Transitions Along Transect	2	2	2	2	3
Vegetation Communities Along Transect	2	3	3	3	4
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	2
Total Vegetative Species	9	21	47	27	35
Total Hydrophytic Species	5	10	24	17	19
Total Upland Species	4	11	23	10	16
Estimated % Total Vegetative Cover	30	45	55	72	87.5
Estimated % Unvegetated	70	55	45	28	12.5
% Transect Length Comprising Hydrophytic Vegetation Communities	88.1	88.1	88.1	90.9	90.4
% Transect Length Comprising Upland Vegetation Communities	11.9	11.9	11.9	9.1	9.6
% Transect Length Comprising Open Water	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0

Priority 2B noxious weeds that were identified within the Silicon Mountain mitigation site included spotted knapweed (*Centaurea stoebe*), Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), common tansy (*Tanacetum vulgare*), and butter-and-eggs (*Linaria vulgaris*). Infestation areas were mapped in 2019 and are shown on Figure A-3 in Appendix A. MDT has an ongoing weed-control program for their mitigation sites that includes conducting an annual assessment of weeds that are identified at each location and containing and controlling the identified populations. MDT completed noxious weed spraying at the Silicon Mountain site on July 7–8, 2019. Performance standards for noxious weeds across the site are currently being met.

MDT planted an estimated 30,000 willow cuttings and 350 containerized shrubs and trees along the stream banks of the Sand Creek channel, in riparian areas, and in small clusters around the perimeter of the excavated wetland cells. An estimated 17 percent of the containerized woody plantings continue to survive through the 2019 survey. An estimated 85 percent of the willow cuttings that were installed survived; young twigs off the cuttings ranged from 12 to 42 inches in length. The willow cuttings were healthy and robust, and no signs of insect damage or disease were observed.

Hydrology – During the 2019 investigation, the average depth of surface water across the site was estimated at 1.0 feet with a range of depth from 0.5 to 3 feet. Open water was present in more than 90 percent of constructed wetland Cells 1 and 5. Shallow ponded water was present across approximately 70 percent of Cell 4. Soils were saturated to the surface within Cells 2 and 3. Cell 6 was dry during the July monitoring trip. Flowing water was present in the entire length of the Sand Creek channel, and significant debris and sand deposits were noted along the upper (southern portion) of the creek. Groundwater monitoring by the US Geological Survey (USGS) over the last 4 years indicates that groundwater levels are rising across the site, and May 2019 water levels are the highest recorded to date (0.63 foot below land surface).

Photographs – Seven wetland photo points and ten stream photo points were initially established in the project area in 2015 (PP-1 to PP-17; Figure A-2, Appendix A). Photographs of all of the surveyed channel cross sections, wetland determination data points, and vegetation transect endpoints (T-1 and

T-2) are provided in Appendix C. The locations of these photographs are illustrated on Figure A-2 in Appendix A. The 2019 photographs with a comparison to the first year of monitoring are provided in Appendix C. Please refer to previous years' monitoring reports for all previous annual photographs (https://www.mdt.mt.gov/publications/brochures/wetland_mitigation.shtml).

Soils – Six soil pits were evaluated to determine the extent of hydric soil development across the site in 2019 (Appendix B). The soil profile at DP-1W, which is located in wetland Type 16 – *Juncus balticus/Eleocharis palustris*, revealed a very dark gray (10YR 3/1) silt loam in the upper 7 inches and a light brownish-gray (2.5 Y 6/2) silty clay loam below 7 inches. Hydric soil indicators included a depleted matrix (F3) at 7 inches. The soil profile at DP-2W, which is located in wetland Type 7 – Open Water/Aquatic Macrophytes, exhibited a dark gray (10YR 4/2) to very dark gray (10YR 3/1) silty clay in upper 16 inches. Hydric soil indicators were not observed for DP-2W, which is likely because of the location in a recently constructed wetland cell where soils may be too young to have formed hydric indicators. DP-3W is located on the edge of an existing wetland, Type 4 – *Carex spp./Juncus balticus.* The soils included dark organics in the upper 4 inches with a very dark grayish-brown clay soil below. Hydric soil indicators included redox concentrations at 5 inches. This soil meets the hydric soil indicator criteria for A11 – Depleted Below Dark Surface. No positive indicators of hydric soil were observed at any of the three upland data points.

Wildlife – Forty bird species were identified in 2019 at the Silicon Mountain site, including several wetland-dependent species. In addition to the bird observations, six mammals, one reptilian, and one amphibian species were also observed (Appendix B).

Stream Monitoring – The annual cross section survey of the Sand Creek reconstructed channel continues to reveal subtle horizontal and vertical changes year over year. Some sections exhibit slight scouring and/or lateral shifting of the thalweg and some sections show aggradation and/or point bar growth. For 2019, these changes can be observed in Cross Sections 1 and 2, and Cross Sections 3 and 4, respectively. As in previous years, Cross Section 6 shows the most pronounced changes in 2019. The section has aggraded since 2018 after it scoured the previous 2 years. Cross Section 7 (just downstream) has not changed substantially since construction and appears to serve as the hydraulic control for the reach immediately upstream because it has a similar bed elevation to the aggradation witnessed in Cross Section 6. These annual fluctuations are likely the result of varied relative magnitude in annual spring runoff. Anecdotal evidence suggests that 2017 and 2018 were large runoff years; whereas, 2019 is suspected to be of lesser magnitude. Large runoff years generally appear to induce more substantial scouring of pools, and low runoff years generally appear to promote relatively more aggradation. In 2019, all 16 belt transects that were monitored along Sand Creek exhibit vegetation communities with stability ratings of 6 or higher, which meets the performance standard. Willows represent 87.5 percent of the dominant community within the stream bank transects. The willows are increasing in height and width along the banks with slight shifts in species dominance.

Credit Summary – The goal of the stream mitigation component of the Silicon Mountain project includes restoring approximately 4,300 linear feet of Sand Creek of which 3,900 feet is considered creditable based on location and design. The project is expected to generate a total of 12,369.50 stream mitigation credits, as shown in Table 5. To date, the project is meeting the two success criteria established for stream mitigation components of the project. Stream cross sections for 2019 are provided in Appendix D and are compared to previous years' monitoring. The Sand Creek channel continues to develop as expected and is meeting success criteria.

Data collected during the 2019 monitoring revealed continued development of vegetation cover along the Sand Creek stream reaches. In 2019, all 16 belt transects that were monitored exhibit vegetation communities with stability ratings of 6 or higher, which meets the performance standard. Willows represent 87.5 percent of the dominant community within the stream bank transects. The willows are increasing in height and width along the banks with slight shifts in species dominance.

Table 5. 2019 Stream Mitigation Credits for the Silicon Mountain Site

Mitigation Reach	Linear Feet	Sum of Mitigation Factors[(a)]	Mitigation Credits
Reach 1	3,250	3.20	10,400
Reach 2	650	3.03	1,969.5
Total	**3,900**		**12,369.5**

(a) From Table 7 of *Silicon Mountain Aquatic Resource Mitigation Plan, Watershed #2 – Upper Clark Fork of the Columbia River, Silverbow County, MT* [Confluence Consulting, Inc., 2013].

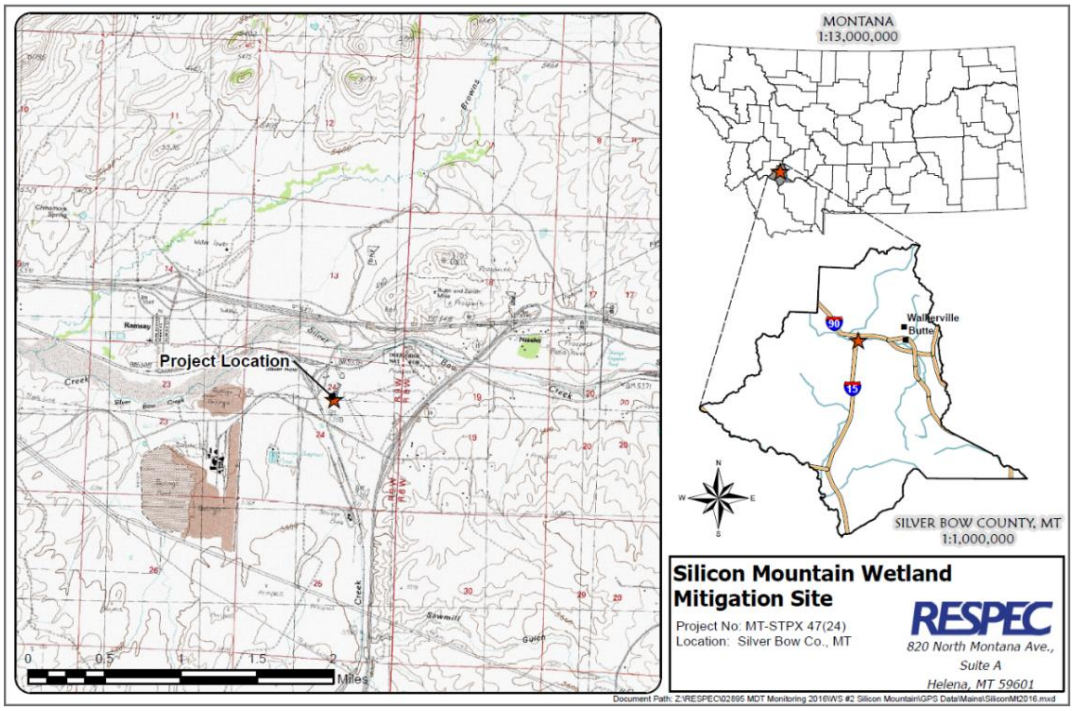
A total of 29.1 acres were delineated at the Silicon Mountain site in 2019, including 7.50 acres of creation, 10.8 acres of preservation, and 10.8 acres of upland buffer. Applying the USACE-approved ratios to these values, a total of 12.16 acres of mitigation credit have been estimated in 2019 (Table 6), which exceeds the targeted 11.45 acres anticipated at this site.

Table 6. Summary of Wetland Mitigation Credits at the Silicon Mountain Site From 2015 Through 2019

Compensatory Mitigation Type	Mitigation Area Description	Wetland Type	Anticipated Mitigation Surface Area (acres)	USACE-Approved Mitigation Ratios	Anticipated Mitigation Credit (acres)	2015 Delineated Acres	2015 Mitigation Credit (acres)	2016 Delineated Acres	2016 Mitigation Credit (acres)	2017 Delineated Acres	2017 Mitigation Credit (acres)	2018 Delineated Acres	2018 Mitigation Credit (acres)	2019 Delineated Acres	2019 Mitigation Credit (acres)
Creation (Establishment)	Wetland Cells 1, 2, 3, 4, & 5	Palustrine Emergent, Aquatic Bed	6.77	1:1	6.77	6.19	6.19	6.30	6.30	6.30	6.30	7.10	7.10	7.5	7.5
Preservation	Existing Wetland Areas	Palustrine Emergent, Scrub-Shrub	10.06	4:1	2.52	10.24	2.56	10.30	2.57	10.8	2.7	10.8	2.7	10.8	2.5
Upland Buffer	50-Foot-Wide Upland Perimeter	N/A	10.80	5:1	2.16	10.8	2.16	10.80	2.16	10.80	2.16	10.80	2.16	10.8	2.16
Totals			**27.6**		**11.45**	**16.43**	**10.91**	**27.40**	**11.03**	**27.90**	**11.16**	**28.7**	**11.96**	**29.10**	**12.16**

Maps, Plans, Photos

Site Location Map



Project Area Maps/Figures: See Appendix A

Data Forms: See Appendix B (Site Monitoring form, plant list, wildlife species list, USACE data forms, and MWAM forms)

Photos: See Appendix C

Plans: See Appendix D of 2015 Monitoring Report
https://www.mdt.mt.gov/other/webdata/external/planning/wetlands/2015_REPORTS/2015_Silicon_Mountain_FINAL.PDF

Conclusions

Based on the results of the fifth year of monitoring, the mitigation site continues to develop into a diverse stream and wetland ecosystem. The site is meeting all established performance standard as documented in Table 1. Wetland cells are developing as intended and wetland acreage continues to increase with each successive monitoring event. The Sand Creek channel is dynamic and continues to develop. Willow cuttings installed along the banks of Sand Creek are doing well and streambanks are mostly stable with developing woody vegetation communities. At this time, no remedial actions are necessary because the site continues to develop as designed.

References

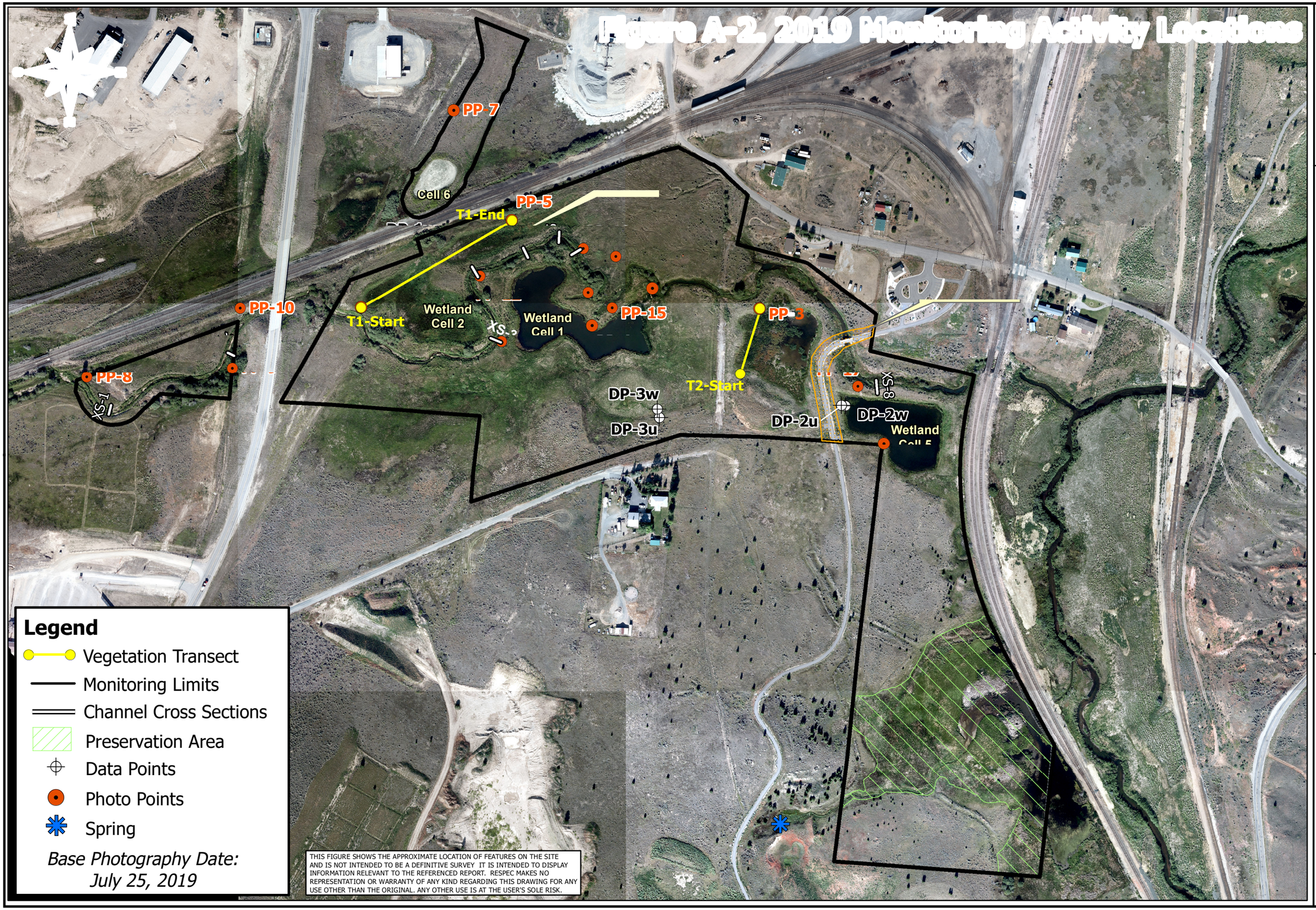
Berglund, J. and R. McEldowney, 2008. *MDT Montana Wetland Assessment Method,* PBS&J Project B43075.00, prepared by Post, Buckley, Schuh, & Jernigan, Helena, MT, for the Montana Department of Transportation, Helena, MT.

Confluence Consulting, Inc., 2013. *Silicon Mountain Aquatic Resource Mitigation Plan, Watershed #2 – Upper Clark Fork of the Columbia River, Silverbow County, MT,* CCI Project No. MDT.006, prepared by Confluence Consulting, Inc., Bozeman, MT, for the Montana Department of Transportation, Helena, MT.

APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Silicon Mountain
Butte Silver Bow County, Montana

Figure A-2. 2019 Monitoring Activity Locations



Legend

- Vegetation Transect
- Monitoring Limits
- Channel Cross Sections
- Preservation Area
- Data Points
- Photo Points
- Spring

Base Photography Date: July 25, 2019

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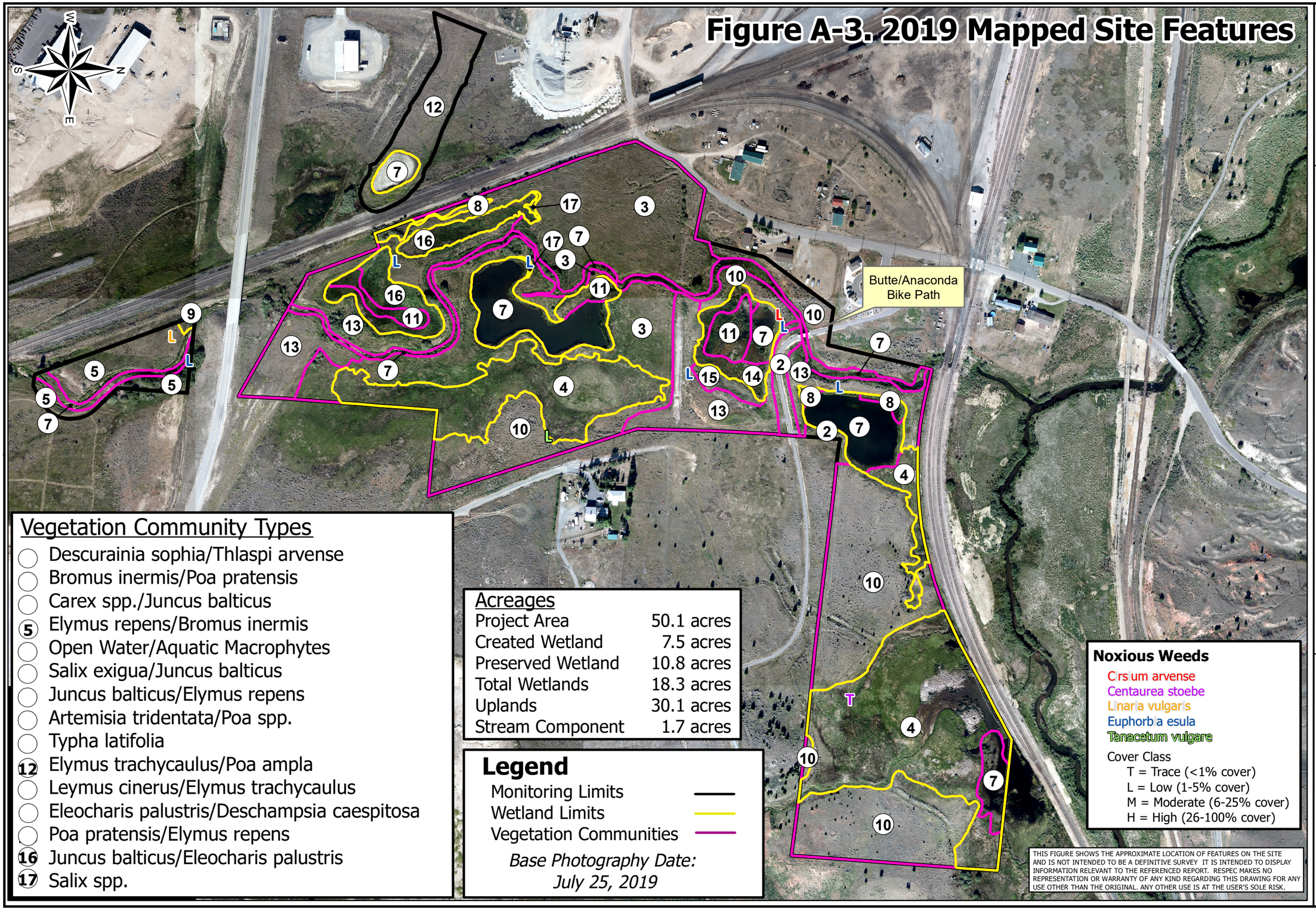
Silicon Mountain Mitigation Site
2019 Monitoring Activity Locations

0 125 250 500 750 1,000 1,250 Feet

Project: MT-STPX 47(24)
Location: Silver Bow Co., Montana
Date: November 2019
Project Manager: M. Traxler
Drawn By: JR/MP

File: C:\Projects\02895 MDT Monitoring 2016-2019\WS #2 Silicon Mountain\GPS Data\Mains\Monitor2019.mxd

Figure A-3. 2019 Mapped Site Features



Vegetation Community Types

- Descurainia sophia/Thlaspi arvense
- Bromus inermis/Poa pratensis
- Carex spp./Juncus balticus
- 5 Elymus repens/Bromus inermis
- Open Water/Aquatic Macrophytes
- Salix exigua/Juncus balticus
- Juncus balticus/Elymus repens
- Artemisia tridentata/Poa spp.
- Typha latifolia
- 12 Elymus trachycaulus/Poa ampla
- Leymus cinerus/Elymus trachycaulus
- Eleocharis palustris/Deschampsia caespitosa
- Poa pratensis/Elymus repens
- 16 Juncus balticus/Eleocharis palustris
- 17 Salix spp.

Acreages

Project Area	50.1 acres
Created Wetland	7.5 acres
Preserved Wetland	10.8 acres
Total Wetlands	18.3 acres
Uplands	30.1 acres
Stream Component	1.7 acres

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: July 25, 2019

Noxious Weeds

- Cirsium arvense
- Centaurea stoebe
- Linaria vulgaris
- Euphorbia esula
- Tanacetum vulgare

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

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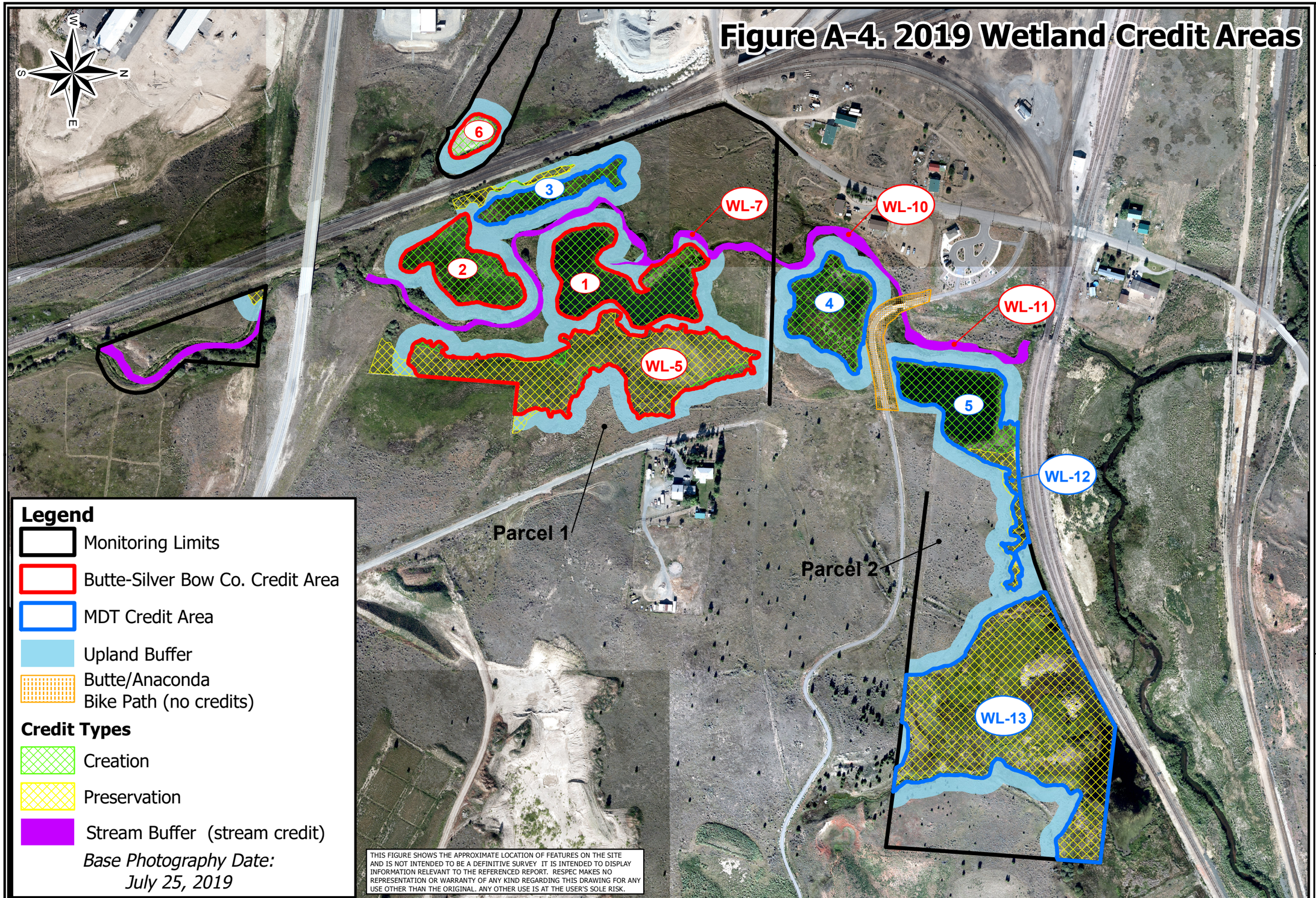
Silicon Mountain Mitigation Site
2019 Mapped Site Features

0 125 250 500 750 1,000 1,250 Feet

Project: MT-STPX 47(24)
Location: Silver Bow Co., Montana
Date: November 2019
Project Manager: M. Traxler
Drawn By: JR/MP

File: C:\Projects\02895 MDT Monitoring 2016-2019\WS #2 Silicon Mountain\GPS Data\Mains\Veg2019.mxd

Figure A-4. 2019 Wetland Credit Areas



Legend

- Monitoring Limits
- Butte-Silver Bow Co. Credit Area
- MDT Credit Area
- Upland Buffer
- Butte/Anaconda Bike Path (no credits)

Credit Types

- Creation
- Preservation
- Stream Buffer (stream credit)

Base Photography Date: July 25, 2019

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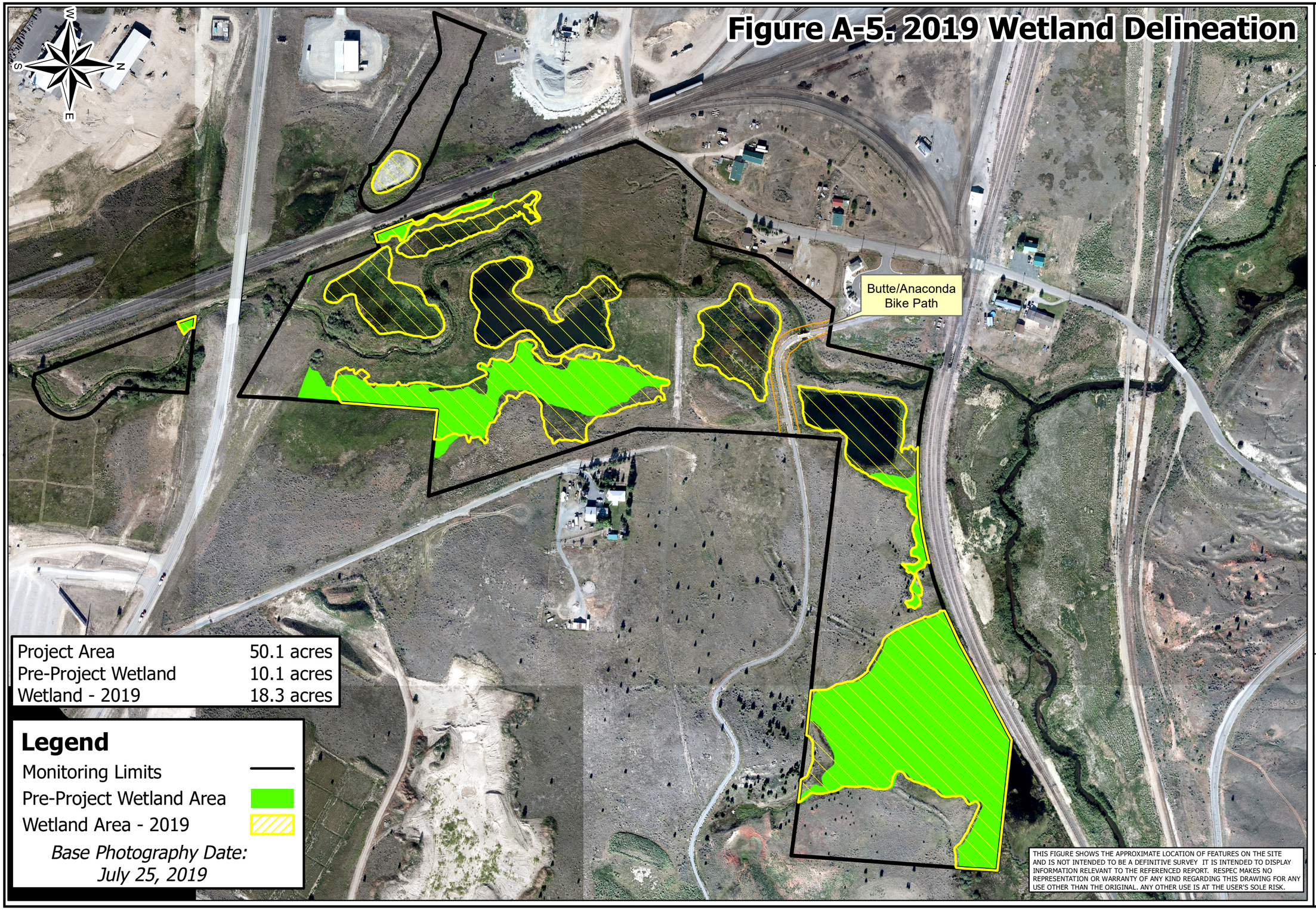
Silicon Mountain Mitigation Site
2019 Wetland Credit Areas

0 125 250 500 750 1,000 1,250 Feet

Project:	MT-STPX 47(24)
Location:	Silver Bow Co., Montana
Date:	December 2019
Project Manager:	M. Traxler
Drawn By:	JR/MP

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Figure A-5. 2019 Wetland Delineation



Project Area	50.1 acres
Pre-Project Wetland	10.1 acres
Wetland - 2019	18.3 acres

Legend

- Monitoring Limits
- Pre-Project Wetland Area
- Wetland Area - 2019

Base Photography Date: July 25, 2019

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RESPEC
815 E. Front Street
Suite 3
Missoula, MT 59802

Silicon Mountain Mitigation Site
2019 Wetland Delineation

0 125 250 500 750 1,000 1,250 Feet

Project: MT-STPX 47(24)
Location: Silver Bow Co., Montana
Date: November 2019
Project Manager: M. Traxler
Drawn By: JR/MP

File: C:\Projects\02895 MDT Monitoring 2016-2019\WS #2 Silicon Mountain\GPS Data\Mains\Delin2019.mxd

APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
Silicon Mountain
Butte Silver Bow County, Montana

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Silicon Mountain** Project Number: _____
Assessment Date: **July 25, 2019** Person(s) conducting the assessment: **T. Traxler, C. Hoschouer, C. Seibert**
Location: **5 miles west of Butte** MDT District: **Butte** Milepost: **MP 119 on I-15**
Legal Description: T **3N** R **9E** Section **24**
Weather Conditions: **Sunny and warm** Time of Day: **7:30 am**
Initial Evaluation Date: **June 23, 2015** Monitoring Year: **5** # Visits in Year: **1**
Size of evaluation area: **50.1 acres** Land use surrounding wetland: **Rail yard and private property**

HYDROLOGY

Surface Water Source: **Sand Creek and a well defined spring**
Inundation: **Present** Average Depth: **1 feet** Range of Depths: **0.5 -3ft**
Percent of assessment area under inundation: **25%**
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.):
Open water was present in more than 90 percent of constructed wetland Cells 1 and 5. Shallow ponded water was present across approximately 70 percent of Cell 4. Soils were saturated to the surface within Cells 2 and 3. Cell 6 was dry during the July monitoring trip however, signs of ponded water included surface soil cracks, sparsely vegetated concave surface and water marks. Flowing water was present in the entire length of the Sand Creek channel; with significant debris and sand deposits noted along the upper (southern portion) of the creek. Wetland soils were saturated within the upper 12 inches, FAC-neutral test, geomorphic position and saturation visible on aerial imagery.

Groundwater Monitoring Wells: **Present**
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:
Two wells onsite that remained after construction are monitored by USGS.

VEGETATION COMMUNITIES

Community Number: **2** Community Title (main spp): **Descurainia sophia/Thlaspi arvens**

Dominant Species	% Cover	Dominant Species	% Cover
Descurainia sophia	2 = 6-10%	Pascopyrum smithii	1 = 1-5%
Thlaspi arvense	2 = 6-10%	Elymus trachycaulus	1 = 1-5%
Camelina microcarpa	2 = 6-10%	Bromus tectorum	1 = 1-5%
Lepidium perfoliatum	2 = 6-10%	Leymus cinereus	1 = 1-5%
Bassia scoparia	2 = 6-10%	Artemisia tridentata	1 = 1-5%
Bromus tectorum	1 = 1-5%	Agropyrum cristatum	1 = 1-5%

Comments / Problems: **Upland community composed of mostly early successional, non-native species commonly found on disturbed landscapes. In 2018 this community type was mapped in one small upland corner, east of wetland cell 5. In 2019, there is less Descurainia sophia but Thaspi arvens is still present.**

Community Number: **3** Community Title (main spp): **Bromus inermis/Poa pratensis**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	4 = 21-50%	Poa palustris	1 = 1-5%
Poa pratensis	3 = 11-20%	Schedonorus pratensis	1 = 1-5%
Elymus repens	2 = 6-10%	Koeleria macrantha	1 = 1-5%
Leymus cinereus	2 = 6-10%	Achilla millefolium	1 = 1-5%
Elymus trachycaulus	2 = 6-10%	Trifolium hybridum	1 = 1-5%
Melilotus officinalis	2 = 6-10%	Astragalus cicer	1 = 1-5%

Comments / Problems: **Upland community**

Community Number: **4** Community Title (main spp): **Carex spp./Juncus balticus**

Dominant Species	% Cover	Dominant Species	% Cover
Carex nebrascensis	3 = 11-20%	Poa palustris	2 = 6-10%
Carex utriculata	2 = 6-10%	Potentilla anserina	2 = 6-10%
Carex aquatilis	2 = 6-10%	Calamagrostis canadensis	1 = 1-5%
Carex praticola	1 = 1-5%	Deschampsia caespitosa	1 = 1-5%
Juncus balticus	3 = 11-20%	Mentha arvensis	1 = 1-5%
Poa pratensis	2 = 6-10%	Cirsium arvense	+ = < 1%

Comments / Problems: **Existing wetland community. In 2019 a small area between Sand Creek and wetland cell 1 was mapped as CT4.**

Community Number: **5** Community Title (main spp): **Elymus repens/Bromus inermis**

Dominant Species	% Cover	Dominant Species	% Cover
Elymus repens	4 = 21-50%	Potentilla anserina	1 = 1-5%
Bromus inermis	3 = 11-20%	Descurainia sophia	1 = 1-5%
Pascopyrum smithii	2 = 6-10%	Astragalus cicer	1 = 1-5%
Juncus balticus	2 = 6-10%	Bromus tectorum	1 = 1-5%
Poa pratensis	1 = 1-5%	Elymus trachycaulus	1 = 1-5%
Leymus cinereus	1 = 1-5%	Cirsium arvense	+ = < 1%

Comments / Problems: **Upland community south of the road alignment and overpass.**

VEGETATION COMMUNITIES (continued)

Community Number: **6** Community Title (main spp): **Puccinella nutalliana/Deschampsia caespitosa**

Dominant Species	% Cover	Dominant Species	% Cover
Puccinella nuttalliana	3 = 11-20%	Eleocharis palustris	1 = 1-5%
Deschampsia caespitosa	3 = 11-20%	Typha latifolia	1 = 1-5%
Beckmannia syzigachne	2 = 6-10%	Potentilla anserina	1 = 1-5%
Agrostis stolonifera	2 = 6-10%	Cyrtorhyncha cymbalaria	1 = 1-5%
Poa palustris	2 = 6-10%	Trifolium hybridum	1 = 1-5%
Juncus balticus	1 = 1-5%	Trifolium repens	1 = 1-5%

Comments / Problems: **Originally a diverse wetland community type with dense cover. In 2018 areas previously mapped community type 6 have transitioned to wetter community types such as CT 7, CT 11 or CT 16 .**

Community Number: **7** Community Title (main spp): **Open water/Aquatic macrophytes**

Dominant Species	% Cover	Dominant Species	% Cover
Open water	5 = > 50%		
Algae, green	3 = 11-20%		
Lemma minor	2 = 6-10%		
Beckmannia syzigachne	2 = 6-10%		
Typha latifolia	2 = 6-10%		

Comments / Problems: **Created wetland cells 1, 4, 5 and 6.**

Community Number: **8** Community Title (main spp): **Salix exigua/Juncus balticus**

Dominant Species	% Cover	Dominant Species	% Cover
Salix exigua	4 = 21-50%	Calamagrostis canadensis	1 = 1-5%
Juncus balticus	3 = 11-20%	Hordeum jubatum	1 = 1-5%
Eleocharis palustris	2 = 6-10%	Glyceria striata	1 = 1-5%
Carex nebrascensis	2 = 6-10%	Cicuta douglasii	1 = 1-5%
Alopecurus arundinaceus	2 = 6-10%	Agrostis stolonifera	1 = 1-5%
Scirpus microcarpus	1 = 1-5%		

Comments / Problems: **Existing wetland west of wetland cell 2. A new (2018) area on the northwestern side of wetland cell 5 and along the southwest portion of wetland cell 5 in 2019.**

Community Number: **9** Community Title (main spp): **Juncus balticus/Elymus repens**

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	4 = 21-50%	Cirsium arvense	+ = < 1%
Elymus repens	4 = 21-50%	Epilobium ciliatum	+ = < 1%
Poa palustris	2 = 6-10%	Hordeum jubatum	+ = < 1%
Symphyotrichum lanceolatum	1 = 1-5%	Rumex crispus	+ = < 1%
Potentilla anserina	1 = 1-5%	Geum macrophyllum	+ = < 1%
Solidago gigantea	1 = 1-5%		

Comments / Problems: **Small wetland in the corner of the parcel south of the bridge**

VEGETATION COMMUNITIES (continued)

Community Number: **10** Community Title (main spp): **Artemisia tridentata/Poa spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Artemisia tridentata	3 = 11-20%	Juniperus scopulorum	2 = 6-10%
Poa ampla =juncifolia, secunda	3 = 11-20%	Koeleria macrantha	1 = 1-5%
Poa pratensis	2 = 6-10%	Bromus inermus	1 = 1-5%
Symphoricarpos falcatum	2 = 6-10%	Hesperostipa comata	1 = 1-5%
Pascopyrum smithii	3 = 11-20%	Ericamria nauseosa	1 = 1-5%
Pseudoroegneria spicata	2 = 6-10%	Astragalus agrestis	1 = 1-5%

Comments / Problems: **Upland shrubland**

Community Number: **11** Community Title (main spp): **Typha latifolia**

Dominant Species	% Cover	Dominant Species	% Cover
Typha latifolia	5 = > 50%	Alysma plantago-aquatica	1 = 1-5%
Eleocharis palustris	2 = 6-10%	Schoenoplectus tabernaernaemontani	3 = 11-20%
Juncus balticus	1 = 1-5%	Mentha arvensis	+ = < 1%
Deschampsia caespitosa	1 = 1-5%	Ranunculus sceleratus	+ = < 1%
Cyrtorhyncha cymbalaria	1 = 1-5%	Scripus microcarpus	1 = 1-5%
Beckmannia syzigachne	1 = 1-5%	Water	3 = 11-20%

Comments / Problems: **In 2018, a portion of wetland cell 4 transitioned from CT 6 to a dominance of Typha latifolia. In 2019 CT 11 increased in size across wetland cell 4, replacing portions of CT14.**

Community Number: **12** Community Title (main spp): **Elymus trachycaulus/Poa ampla**

Dominant Species	% Cover	Dominant Species	% Cover
Elymus trachycaulus	3 = 11-20%	Astragalus cicer	1 = 1-5%
Elymus lanceolatus	2 = 6-10%	Elymus repens	1 = 1-5%
Leymus cinereus	2 = 6-10%	Lepidum perifolium	1 = 1-5%
Poa ampla = juncifolia, secunda	3 = 11-20%	Hordeum jubatum	1 = 1-5%
Melilotus officinalis	2 = 6-10%	Cirsium arvense	+ = < 1%
Agropyron cristatum	1 = 1-5%	Centaurea stoebe	+ = < 1%

Comments / Problems: **Seeded upland areas transitioning from annual weedy species to more perennial grasses. Also a shift in 2018 near the overpass from CT 12 to CT 13 with the expansion of Leymus cinereus.**

Community Number: **13** Community Title (main spp): **Leymus cinereus/Elymus trachycaulus**

Dominant Species	% Cover	Dominant Species	% Cover
Leymus cinerus	4 = 21-50%	Festuca ovina	1 = 1-5%
Elymus trachycaulus	3 = 11-20%	Poa pratensis	1 = 1-5%
Elymus repens	1 = 1-5%	Melilotus officinalis	1 = 1-5%
Bromus inermis	1 = 1-5%	Hordeum jubatum	1 = 1-5%
Astragalus cicer	1 = 1-5%	Silene latifolia	+ = < 1%
Poa ampla = juncifolia, secunda	1 = 1-5%	Juncus balticus	1 = 1-5%

Comments / Problems: **Newly seeded upland areas along the Butte/Anaconda bike path shifting from annual weedy species (CT 2) to more perennial grasses and forbs.**

VEGETATION COMMUNITIES (continued)

Community Number: **14** Community Title (main spp): **Eleocharis palustris/Deschampsia caespitosa**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	3 = 11-20%	Potentilla anserina	1 = 1-5%
Deschampsia caespitosa	3 = 11-20%	Epilobium ciliatum	1 = 1-5%
Juncus balticus	2 = 6-10%	Bechmannia syzigachne	1 = 1-5%
Poa palustris	1 = 1-5%	Typha latifolia	1 = 1-5%
Alopecurus aequalis	1 = 1-5%	Hordeum jubatum	1 = 1-5%
Mentha arvensis	1 = 1-5%	Agrostis stolonifera	1 = 1-5%

Comments / Problems: **CT 11 has expanded along the southwestern side of wetland cell 4 replacing a portion of CT 14.**

Community Number: **15** Community Title (main spp): **Poa pratensis/Elymus repens**

Dominant Species	% Cover	Dominant Species	% Cover
Poa pratensis	3 = 11-20%	Astragulus cicer	1 = 1-5%
Elymus repens	3 = 11-20%	Puccinellia nuttalliana	1 = 1-5%
Bromus inermis	2 = 6-10%	Bare ground	2 = 6-10%
Elymus trachycaulus	2 = 6-10%		
Leymus cinereus	2 = 6-10%		
Trifolium hybridum	1 = 1-5%		

Comments / Problems: **CT 15 replaced a portion of CT 12 on the upland slope above wetland cell 4.**

Community Number: **16** Community Title (main spp): **Juncus balticus/Eleocharis palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	3 = 11-20%	Epilobium ciliatum	1 = 1-5%
Eleocharis palustris	3 = 11-20%	Alopecurus pratensis	1 = 1-5%
Deschampsia caespitosa	2 = 6-10%	Glyceria grandis	1 = 1-5%
Beckmannia syziganchne	2 = 6-10%	Poa palustris	1 = 1-5%
Potentilla anserina	1 = 1-5%	Typha latifolia	1 = 1-5%
Cyrtorhyncha cymbalaria	1 = 1-5%	Bare soil, mud flats	2 = 6-10%

Comments / Problems: **A new community type in 2018 replacing CT 6.**

Community Number: **17** Community Title (main spp): **Salix spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Salix exigua	4 = 21-50%		
Salix lutea (eriocephala)	2 = 6-10%		
Salix bebbiana	2 = 6-10%		
Salix geyeriana	2 = 6-10%		
Salix boothii	2 = 6-10%		
Alnus incana	1 = 1-5%		

Comments / Problems: **This is a new community type added in 2019, starting to see the development of planted willows and alder as well as volunteer willows on the edges of wetland cells.**

Additional Activities Checklist:

☐ Record and map vegetative communities on aerial photograph.

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
Alnus incana		5	
Salix eriocephala		14	
Salix exigua		16	
Salix geyeriana		13	
Shepherdia argentea		10	

Comments / Problems: **An estimated 350 containerized trees and shrubs were part of the original planting. During the 2015 monitoring a total of 47 live shrubs were noted; in 2016, 2017 and 2018 a total of 44 live shrubs were identified. During the July 2019 monitoring an additional 14 trees and shrubs were counted increasing the total to 58 live containerized plants.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Silicon Mountain** Date: **July 25, 2019** Examiner: **C. Seibert, T. Traxler, C.Hoschouer**
Transect Number: **1** Approximate Transect Length: **564 feet** Compass Direction from Start: **332**˚ Note: _____

Transect Interval Length: **15 feet (station 0 to 15)**	
Vegetation Community Type: Leymus cinereus/Elymus trachycaulus	
Plant Species	**Cover**
Leymus cinereus	4 = 21-50%
Elymus trachycaulus	3 = 11-20%
Elymus repens	2 = 6-10%
Poa pratensis, Poa ampla, Poa palustris	2 = 6-10%
Festuca ovina	1 = 1-5%
Epilobium ciliatum	1 = 1-5%
Juncus balticus	1 = 1-5%
Silene latifolia	+ = < 1%
Astragalus cicer	+ = < 1%
Euphorbia esula	+ = < 1%
Bare soil and litter	2 = 6-10%
Total Vegetative Cover:	90%

Transect Interval Length: **16 feet (station 15 to 31)**	
Vegetation Community Type: Juncus balticus/Eleocharis palustris	
Plant Species	**Cover**
Juncus balticus, Juncus effusus	3 = 11-20%
Deschampsia caespitosa	3 = 11-20%
Eleocharis palustris	3 = 11-20%
Alopecurus pratensis	1 = 1-5%
Poa palustris, Beckmannia syziganchne	2 = 6-10%
Cyrtorhyncha cymbalaria, Plantago major	1 = 1-5%
Epilobium ciliatum, Hordeum jubatum	1 = 1-5%
Juncus bufonius	1 = 1-5%
Potentilla anserina	1 = 1-5%
Typha latifolia	1 = 1-5%
Bare soil and litter (including moss)	2 = 6-10%
Total Vegetative Cover:	95%

Transect Interval Length: **33 feet (station 31 to 64)**	
Vegetation Community Type: Typha latifolia	
Plant Species	**Cover**
Typha latifolia	3 = 11-20%
Eleocharis palustris	3 = 11-20%
Juncus balticus, Juncus effusus	2 = 6-10%
Glyceria grandis	1 = 1-5%
Beckmannia syziganchne	2 = 6-10%
Cyrtorhyncha cymbalaria	2 = 6-10%
Deschampsia caespitosa	1 = 1-5%
Poa palustris, Scirpus microcarpus	1 = 1-5%
Alysma plantago-aquatica	1 = 1-5%
Juncus bufonius	1 = 1-5%
Bare soil (mud) and litter	2 = 6-10%
Total Vegetative Cover:	95%

Transect Interval Length: **200 feet (station 64 to 264)**	
Vegetation Community Type: Juncus balticus/Eleocharis palustris	
Plant Species	**Cover**
Juncus balticus, Juncus effusus	3 = 11-20%
Eleocharis palustris	4 = 21-50%
Beckmannia syziganchne	2 = 6-10%
Deschampsia caespitosa, Phalaris arundinacea	2 = 6-10%
Potentilla anserina, Cicuta douglasii	2 = 6-10%
Alopecurus pratensis, Hordeum jubatum	1 = 1-5%
Trifolium longipes	1 = 1-5%
Carex nebrascensis, Plantago major	1 = 1-5%
Poa palustris, Typha latifolia	1 = 1-5%
Glyceria grandis	1 = 1-5%
Alopecurus aequalis	1 = 1-5%
Bare soil (mud) and litter	2 = 6-10%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Silicon Mountain** Date: **July 25, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **1** Approximate Transect Length: **564 feet** Compass Direction from Start: **332**° Note: _____

Transect Interval Length: **34 feet (station 264 to 298)**	
Vegetation Community Type: Leymus cinereus/Elymus trachycaulus	
Plant Species	**Cover**
Leymus cinereus	4 = 21-50%
Elymus trachycaulus	3 = 11-20%
Bromus inermis	3 = 11-20%
Poa pratensis	2 = 6-10%
Elymus repens	3 = 11-20%
Astragalus cicer	1 = 1-5%
Euphorbia esula, Thlaspi arvense	+ = < 1%
Potentilla ansernia	1 = 1-5%
Trifolium longipes	1 = 1-5%
Rumex salicifolius	1 = 1-5%
Bare soil and litter	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **237 feet (station 298 to 535)**	
Vegetation Community Type: Juncus balticus/Eleocharis palustris	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Eleocharis palustris	2 = 6-10%
Deschampsia caespitosa, Phalaris arundinaceus	2 = 6-10%
Potentilla anserina, Symphyotrichum ciliatum	2 = 6-10%
Poa palustris, Poa pratensis	1 = 1-5%
Carex nebrascensis. Carex aquatilis	2 = 6-10%
Typha latifolia	1 = 1-5%
Epilobium ciliatus, Mentha arvensis	1 = 1-5%
Cyrtorhyncha cymbalaria, Alopecurus arundinaceus	1 = 1-5%
Glyceria striata, Hordeum jubatum	1 = 1-5%
Bare soil and litter	2 = 6-10%
Total Vegetative Cover:	90%

Transect Interval Length: **29 ft (station 535 to 564)**	
Vegetation Community Type: Bromus inermis/Poa pratensis	
Plant Species	**Cover**
Bromus inermis	4 = 21-50%
Poa pratensis, Poa palustris	3 = 11-20%
Elymus repens	1 = 1-5%
Trifolium hybridum	2 = 6-10%
Potentilla anserina	1 = 1-5%
Elymus trachycaulus	1 = 1-5%
Astragalus cicer	2 = 6-10%
Rumex salicifolius	1 = 1-5%
Mentha arvensis, Epilobium ciliatum	2 = 6-10%
Bare soil and litter	1 = 1-5%
Total Vegetative Cover:	95%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Silicon Mountain** Date: **July 25, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **2** Approximate Transect Length: **219 feet** Compass Direction from Start: **288°** Note: **Traverses wetland cell 4**

Transect Interval Length: **8 feet (station 0 to 8)**	
Vegetation Community Type: Poa pratensis/Elymus repens	
Plant Species	**Cover**
Poa pratensis	3 = 11-20%
Elymus repens, Elymus trachycaulus	3 = 11-20%
Trifolium hybridium	3 = 11-20%
Bromus inermis	2 = 6-10%
Leymus cinereus	2 = 6-10%
Festuca ovina	1 = 1-5%
Descurainia sophia	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Puccinellia nuttalliana	1 = 1-5%
Bare soil	2 = 6-10%
Linium lewisi, Poa palustris	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **34 feet (station 8 to 42)**	
Vegetation Community Type: Eleocharis palustris/Deschampsia caespitosa	
Plant Species	**Cover**
Eleocharis palustris	4 = 21-50%
Deschampsia caespitosa	3 = 11-20%
Agrostis stolonifera	3 = 11-20%
Poa palustris, Polygonum amphibium	2 = 6-10%
Alopecurus aequalis	1 = 1-5%
Juncus balticus	2 = 6-10%
Potentilla anserina, Mentha arvensis	2 = 6-10%
Epilobium ciliatum	1 = 1-5%
Beckmannia syzigachne	1 = 1-5%
Typha latifolia, Hordeum jubatum	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **164 feet (station 42 to 206)**	
Vegetation Community Type: Typha latifolia	
Plant Species	**Cover**
Typha latifolia	4 = 21-50%
Eleocharis palustris	4 = 21-50%
Calamagrostis canadensis	2 = 6-10%
Juncus balticus	1 = 1-5%
Schoenoplectus tabernaemontani	1 = 1-5%
Carex nebrascensis	1 = 1-5%
Salix lutea	1 = 1-5%
Mentha arvensis	1 = 1-5%
Beckmannia syzigachne, Deschampsia caespitosa	1 = 1-5%
Potentilla anserina, Ranunculus sceleratus	1 = 1-5%
Bare soil (mud flats)	3 = 11-20%
Water	2 = 6-10%
Total Vegetative Cover:	80%

Transect Interval Length: **13 feet (station 206 to 219)**	
Vegetation Community Type: Bromus inermis/Poa pratensis	
Plant Species	**Cover**
Bromus inermis	3 = 11-20%
Poa pratensis	2 = 6-10%
Agrostis stolonifera	2 = 6-10%
Beckmannia syzigachne	2 = 6-10%
Deschampsia cespitosa	2 = 6-10%
Poa ampla	1 = 1-5%
Elymus repens	1 = 1-5%
Cirsium arvense	1 = 1-5%
Artemisia tridentata	1 = 1-5%
Potentilla anserina, Sonchus arvensis	1 = 1-5%
Solidago gigantea	1 = 1-5%
Bare soil and litter	3 = 11-20%
Total Vegetative Cover:	85%

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): **___%**

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: **A comprehensive species list was compiled for each community type during the July 2019 monitoring.**

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	1-5	West side of wetland cell 1	
PP2	1-3	Outside wetland cell 1	
PP3	1-4	West side of wetland cell 4	
PP4	1-5	East side of constructed wetland cell 5	
PP5	1-2	North end of T-1, constructed wetland cell 3	
PP6	1-2	South end of T-1, constructed wetland cell 3	
PP7	1	Cell 6, west side of tracks, south of overpass	
PP8	1-2	Southern edge of cell 6 - upstream end	SW, NW
PP9	1-2	Northern edge of cell 6 - downstream end	SW, NW
PP10	1-2	West side of wetland cell 3	
PP11	1-3	Sand Creek	
PP12	1-4	Sand Creek	
PP13	1-2	Sand Creek	
PP14	1	Headcut	S
PP15	1	Headcut	
PP16	1	Headcut	
PP17	1-2	Northern end of Sand Creek	W, N
T-1-S T-1-E	1 1	South end of wetland cell 2 West side of cell 2	N S
T-2-S T-2-E	1 1	East side of wetland cell 4 West side of cell 4	W E
DP-1w DP-1u	1 1	Data point within wetland cell 3 Upland point	
DP-2w DP-2u	1 1	Data point within wetland cell 5 Upland point	
DP-3w DP-3u	1 1	Data point along the eastern edge of CT4 Upland	

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: _____

WILDLIFE

Birds

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

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
Muskrat	1	☐	☐	☐	
Meadow voles		☐	☐	☐	several
White-tailed deer	2	☐	☐	☐	
Mountain Cottontail	1	☐	☐	☐	
Columbia Spotted Frog	1	☐	☐	☐	
Mule Deer	1	☐	☐	☐	
Common Gartersnake	1	☐	☐	☐	
Coyote		☒	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: _____

BIRD SURVEY – FIELD DATA SHEET

Site: **Silicon Mountain** Date: **7/25/19**
Survey Time: **7:30 am** to **5:30 pm**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Coot	5	FO	SS	Hungarian Partridge	6	L	UP
American Robin	7	F	MF	American Crow	1	FO	UP
American Wigeon	2	FO L	MA UP				
Bank Swallow	2	FO	MA				
Barn Swallow	2	F	SS				
Black-billed Magpie	3	L	UP				
Blue-winged Teal	6	F	OW				
Brewer's Blackbirds	6	L	SS				
Brown-headed Cowbird	12	FO	UP				
Canada Geese	7	FO F L	MA OW				
Cinnamon Teal	15	F	OW				
Cliff Swallow	8	FO	MA OW				
Common Snipe	1	FO	MA				
Common Yellowthroat	1	FO	OW				
Eastern Kingbird	1	F	MA				
European Starlings	6	F	UP				
Gadwall	12	F L	OW				
Great Blue Heron	1	FO	MA OW				
Green-winged Teal	4	F	OW				
Horned Grebe	1	FO	MA				
Killdeer	8	BD	UP				
Mallard	10	L	OW				
Marsh Wren	2	F	MA				
Northern Harrier	2	FO	SS UP				
Northern Shoveler	1	L	MA				
Red-winged Blackbird	2	FO F	MA WM				
Ruddy Duck	2	F L	OW				
Savannah Sparrow	2	FO F	UP				
Sora	1	F	MA				
Spotted Sandpiper	2	L	MA				
Tree Swallow	6	FO	MF OW				
Vesper Sparrow	1	L	UP				
Western Meadowlark	1	L	UP				
Willow Flycatcher	1	FO	MA				
Wilson's Phalarope	1	F	MA				
Wilson's Snipe	3	F	MA				
Yellow Warbler	1	F	SS				
Yellow-headed Blackbird	2	F	MA				

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: **Warm with increasing clouds toward late afternoon.**

Notes: _____

Silicon Mountain Plant List (2015-2019)

Scientific Name	Common Name	WMVC Indicator Status[a,b]
Achillea millefolium	Common Yarrow	FACU
Agoseria glauca	Pale Goat Chicory	FAC
Agropyron cristatum	Crested Wheatgrass	UPL
Agrostis stolonifera	Spreading Bent	FAC
Algae, green	Algae, green	UPL
Alisma plantago-aquatica	Eurpean Water-Plantain	OBL
Alllium cernuum	**Nodding Onion**	**FACU**
Alopecurus aequalis	Short-Awn Meadow-Foxtail	OBL
Alopecurus arundinaceus	Creeping Meadow-Foxtail	FAC
Alopecurus pratensis	Field Meadow Foxtail	FAC
Alyssum alyssoides	Pale or Yellow Alyssum	UPL
Alyssum desestorum	Dwarf Alyssum	UPL
Antennaria neglecta	Field Pussytoes	FACU
Artemisia campestris	Pacific Wormwood	FACU
Artemisia frigida	Fringed Sage	UPL
Artemisia ludovicinana	White Sagebrush	FACU
Artemisia tridentata	Big Sagebrush	UPL
Astragalus agrestis	Cock's-Head/Purple Milkvetch	FACW
Astragalus bisulcatus	Two-Grooved Milkvetch	UPL
Astragalus cicer	Chickpea Milkvetch	UPL
Astragalus miser	Milkvetch	UPL
Beckmannia syzigachne	American Slough Grass	OBL
Bidens cernua	Nodding Burr-Marigold	OBL
Bromus inermis	Smooth Brome	UPL
Bromus japonicus	Japanese Brome	UPL
Bromus tectorum	Cheatgrass	UPL
Calamagrostis canadensis	Bluejoint	FACW
Camelina microcarpa	Little-Pod False Flax	FACU
Cardaria draba	Whitetop	UPL
Carex aquatilis	Leafy Tussock Sedge	OBL
Carex nebrascensis	Nebraska Sedge	OBL
Carex pellita	Woolly Sedge	OBL
Carex praegracilis	Clustered Field Sedge	FACW
Carex simulata	Analogue Sedge	OBL
Carex utriculata	Northwest Territory Sedge	OBL
Catabrosa aquatica	Water Whorl Grass	OBL
Centaurea stoebe	Spotted Knapweed	UPL

Scientific Name	Common Name	WMVC Indicator Status[a,b]
Chaenactis douglasii	**Douglas's Dustymaiden**	**UPL**
Chenopodium album	Lamb's-Quarters	FACU
Cicuta douglasii	Western Water-Hemlock	OBL
Cirsium arvense	Canadian Thistle	FAC
Cirsium foliosum	Elk Thistle	FAC
Cirsium scariosum	**Meadow Thistle**	**FAC**
Collomia linearis	Narrow-Leaf Mountain-Trumpet	FACU
Crepis runcinata	**Fiddleleaf Hawk's Beard**	**FACU**
Crepis tectorum	Narrowleaf Hawksbeard	UPL
Cyrtorhyncha cymbalaria	Alkali Buttercup	OBL
Dasiphora fruticosa	Golden-Hardhack	FAC
Deschampsia caespitosa	Tufted Hair Grass	FACW
Descurainia richardsonii	**Western Tansy Mustard**	**UPL**
Descurainia sophia	Herb Sophia	UPL
Distichlis spicata (stricta)	Coastal/Inland Saltgrass	FACW
Eleocharis palustris	Common Spike-Rush	OBL
Elymus canadensis	Nodding Wild Rye	FAC
Elymus lanceolatus	Streamside Wild Rye	FACU
Elymus repens	Creeping Wild Rye	FAC
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium ciliatum	Fringed Willowherb	FACW
Equisetum arvense	Field Horsetail	FAC
Equisetum laevigatum	Smooth Scouring-Rush	FACW
Ericameria nauseosa	Rubber Rabbitbrush	UPL
Erigeron sp.	Fleabane	UPL
Erysimum inconspicuum	Small-flowered Wallflower	UPL
Euphorbia esula	Leafy Spurge	UPL
Festuca ovina	Sheep Fescue	UPL
Filago arvenvis	**Field Cudweed**	**UPL**
Geum macrophyllum	Large-Leaf Avens	FAC
Glyceria grandis	American Manna Grass	OBL
Glyceria striata	Fowl Manna Grass	OBL
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Gutierrezia sarothrae	Matchbrush	UPL
Hesperostipa comata	Needle-and-Thread	UPL
Heterotheca villosa	**Hairy Golden Aster**	**UPL**
Hordeum brachyantherum	Meadow Barley	FACW
Hordeum jubatum	Fox-Tail Barley	FAC
Hyoscyamus niger	Black Henbane	UPL

Scientific Name	Common Name	WMVC Indicator Status[a,b]
Ionactis alpina	Crag Aster	UPL
Iris missouriensis	Rocky Mountain Iris	FACW
Juncus balticus	Baltic Rush	FACW
Juncus bufonius	Toad Rush	FACW
Juncus effusus	**Lamp Rush**	**FACW**
Juncus longistylis	**Long-Style Rush**	**FACW**
Juncus mertensianus	Mertens' Rush	OBL
Juniperus scopulorum	Rocky Mountain Juniper	UPL
Kochia scoparia	Mexican-Fireweed	FAC
Koeleria macrantha	Prairie Junegrass	UPL
Lemna minor	Common Duckweed	OBL
Lepidium campestre	Field Pepper-grass	UPL
Lepidium perfoliatum	Clasping Pepperwort	FACU
Leymus cinereus	Great Basin Wild Rye	FAC
Linaria vulgaris	Butter-and-Eggs	UPL
Linum lewisii	Prairie Flax	UPL
Lupinus sericeus	Silky Lupine	UPL
Madia glomerata	**Mountain Tarplant**	**FACU**
Medicago lupulina	Black Medic	FACU
Melilotus officinalis	Yellow Sweet-Clover	FACU
Mentha arvensis	American Wild Mint	FACW
Mimulus guttatus	Seep Monkey-Flower	OBL
Myosotis laxa	**Bay Forget-Me-Not**	**OBL**
Nasturtium officinale	Watercress	OBL
Orthocarpus tenuifolius	Thin-leaved Owl's-clover	UPL
Oxytropis deflexa	Pendant-pod Locoweed	FACU
Pascopyrum smithii	Western-Wheat Grass	FACU
Penstemon eriantherus	Fuzzy-Tongue Penstemon	UPL
Penstemon nitidus	Wax-leaf Beardtongue	UPL
Penstemon procerus	Pincushion Beardtongue	FAC
Penstemon strictus	**Rocky Mountain Penstemon**	**UPL**
Peritoma serrulata	Rocky Mountain Beeplant	FACU
Persicaria amphibia	Water Smartweed	OBL
Phacelia hastata	Silverleaf Scorpion-weed	UPL
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FAC
Phlox muscoides	Moss Phlox	UPL
Plantago eriopoda	Red-Wooly or Redwool Plantain	FACW
Plantago major	Great Plantain	FAC

Scientific Name	Common Name	WMVC Indicator Status[a,b]
Poa ampla (= P. secunda, P. junicifolia)	Big Bluegrass	FACU
Poa compressa	Flat-stem Bluegrass	FACU
Poa palustris	Fowl Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FAC
Polemonium pulcherrimum	Showy Jacob's-ladder	UPL
Polygonum aviculare	Yard Knotweed	FAC
Polypogon monspeliensis	Annual Rabbit's Foot Grass	FACW
Potentilla anserina	Silverweed	OBL
Potentilla gracilis	Graceful Cinquefoil	FAC
Pseudoroegneria spicata	Bluebunch Wheatgrass	UPL
Puccinellia distans	**Spreading Alkali Grass**	**FACW**
Puccinellia nuttalliana	Nuttall's Alkali Grass	FACW
Pyrrocoma integrifolia	Goldenweed	UPL
Ranunculus sceleratus	Cursed Buttercup	OBL
Ranunculus sp.	Buttercup	(OBL)
Ribes aureum	Golden Currant	FAC
Ribes irriguum	**Idaho Gooseberry**	**UPL**
Rorippa palustris	Bog Yellow Cress	OBL
Rumex crispus	Curly Dock	FAC
Rumex salicifolius	Willow Dock	FACW
Salix bebbiana	Gray Willow	FACW
Salix boothii	Booth's Willow	FACW
Salix exigua	Narrow-Leaf Willow	FACW
Salix geyerianna	Geyer Willow	FACW
Salix lutea (=S. eriocephala)	Yellow Willow	OBL
Schedonorus pratensis	Meadow False Rye Grass	FACU
Schoenocrambe linifolia	Plains Mustard	UPL
Schoenoplectus tabernaernaemontani	**Soft-Stem Club-Rush**	**OBL**
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Shephardia argentea	Silver Buffalo-Berry	FACU
Silene latifolia	White Cockle/Campion	UPL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Sisymbrium loeselii	Smallpod Tumble Mustard	UPL
Sisyrinchium montanum	Strict Blue-eyed Grass	FAC
Solidago canadensis	Canadian Goldenrod	FACU
Solidago gigantea	Late Goldenrod	FACW
Sonchus arvensis	Field Sow-Thistle	FACU
Sphaeralcea coccinea	Scarlet Globemallow	UPL

Scientific Name	Common Name	WMVC Indicator Status[a,b]
Stachys pilosa	**Hairy Hedge-Nettle**	**FACW**
Stellaria longipes	Long-Stalk Starwort	FACW
Symphyotrichum ascendens	Western American-Aster	FACU
Symphyotrichum falcatum	Rough White Prairie American-Aster	FACU
Symphyotrichum lanceolatum	White Panicled American-Aster	OBL
Tanacetum vulgare	Common Tansy	FACU
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	UPL
Tragopogon dubius	Meadow Goat's-beard	UPL
Trifolium hybridum	Alsike Clover	FAC
Trifolium longipes	Long-Stalk Clover	FAC
Trifolium pratense	Red Clover	FACU
Trifolium repens	White Clover	FAC
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Valeriana edulis	Tobacco-Root	FAC
Verbascum thapsus	Great Mullein	FACU
Veronica americana	American Brooklime or Speedwell	OBL
Veronica anagallis-aquatica	Blue Water Speedwell	OBL
Veronica arvensis	Corm Speedwell	FACU

(a) 2016 NWPL (Lichvar *et al.*, 2016)

(b) Bolded species were documented for the first time in 2019

Silicon Mountain Wildlife Species List (2015-2019)

Common Name	Scientific Name
Bird	
American Crow	***Corvus brachyrhynchos***
American Coot	***Fulica americana***
American Robin	***Turdus migratorius***
American Wigeon	***Anas americana***
Bank Swallow	***Riparia riparia***
Barn Swallow	***Hirundo rustica***
Black-billed Magpie	***Pica hudsonia***
Blue-winged Teal	***Spatula discors***
Brewer's Blackbird	***Euphagus cyanocephalus***
Brown-headed Cowbird	***Molothrus ater***
Canada Geese	***Branta canadensis***
Cinnamon Teal	***Anas cyanoptera***
Cliff Swallow	***Hirundo pyrrhonota***
Common Grackle	*Quiscalus quiscula*
Common Menganser	*Mergus merganser*
Common Snipe	***Gallinago gallinago***
Common Yellowthroat	***Geothlypis trichas***
Eastern Kingbird	***Tyrannus tyrannus***
Europeon Starling	***Styrnus vulgaris***
Gadwall	***Anas strepera***
Great Blue Heron	***Ardea herodias***
Green-winged Teal	***Anas crecca***
Horned Grebe	***Podiceps auritus***
House Sparrow	*Passer domesticus*
Hungarian Partridge	***Perdix perdix***
Killdeer	***Charadrius vociferus***
Lesser Scaup	*Aythya affinis*
Magpie	*Pica pica*
Mallard	***Anas platyrhynchos***
Marsh Wren	***Cistothorus palustris***
Mourning Dove	*Zenaida macroura*
Northern Harrier	***Circus cyaneus***
Northern Shoveler	***Anas clypeata***
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	***Agelaius phoeniceus***
Ring-billed Gull	*Larus delawarensid*
Ruddy Duck	***Oxyura jamaicensis***

Sandhill Crane	*Grus canadensis*
Savannah Sparrow	***Passerculus sandwichensis***
Sora Rail	***Porzana carolina***
Spotted Sandpiper	***Actitis macularius***
Tree Swallow	***Tachycineta bicolor***
Unknown duckling	
Vesper Sparrow	***Pooecetes gramineus***
Western Bluebird	*Sialia mexicana*
Western Meadowlark	***Sturnella neglecta***
Willow Flycatcher	***Empidonax traillii***
Wilson's Plalarope	***Phalaropus tricolor***
Wilson's Snipe	***Gallinago delicata***
Yellow Warbler	***Dendroica petechia***
Yellow-headed Blackbird	***Xanthocephalus xanthocephalus***
Mammal	
Coyote	***Canis latrans***
Columbian Ground Squirrel	*Urocitellus columbianus*
Cottontail Rabbit	***Sylvilagus sp.***
Elk	*Cervus canadensis (droppings)*
Ground squirrel sp.	*Urocitellus columbionos (burrow)*
Meadow Vole	***Microtus pennsylvanicus***
Mule Deer	***Odocoileus hemionus***
Muskrat	***Ondatra ziebethicus***
Raccoon sp.	*Procyon lotor*
White-tailed Deer	***Odocoileus virginianus***
Red Fox	*Vulpes vulpes*
Amphibian and Reptile	
Columbia Spotted Frog	***Rana luteiventris***

Bolded Species Observed in 2019

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Silicon Mountain **2. MDT Project #:** MT-STPX 47(24) **3. Control #:** 6044000

3. Evaluation Date: 7/25/2019 **4. Evaluator(s):** C. Hoschouer, T. Traxler, C. Seibert **5. Wetland/Site #(s):** Created Cells 1and 5

6. Wetland Location(s): Township 3 N, Range 9 W, Section 24; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: N/A

Watershed: 2 - Upper Clark Fork **County:** _ _ Silver Bow _____

7. Evaluating Agency: RESPEC 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)
3.56 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 3.56 (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	Aquatic Bed	Excavated	Permanent / Perennial	95
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	5

Comments: Two constructed wetlands with permanent/perennial water regime.

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.)**:** This is year 5 (2019) following construction, wetland cell 1 has a good perennial grass and forb establishment, with some minor annual and perennial weeds still persisting. Most of wetland cell 5 has established perennial vegetation with the exception of the southeast corner where annual weedy species are still common. The area surrounding this cell was disturbed with the construction of the new trail and bridge but in 2019 established perennial grasses were observed in these disturbed areas. The level of disturbance has decreased, the site has become stabilize with improved cover by perennial species. Rills and gullies noted in 2019 between the bike path and wetland cell 5 are still present but perennial grasses are established in and around the erosion.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Centaurea stoebe, Euphorbia esula, Cirsium arvense

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The site is a mitigation site comprised of two separate wetland cells (1 & 5) that are designed to intercept groundwater, and appear to have a more perennial water source. They have no surface connection to one another. Cell 1 does drain into Sand Creek, but is outside of Sand Creek's active floodplain area, and so is not subject to overbank flooding.

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	mod	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Palustrine Aquatic Bed, Palustrine emergent

Wetland/Site #(s): Created Cells 1 and 5

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, MTNHP

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 Hoary bat (S3), Preble's shrew (S3)
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
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	.5M	---	---	---

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

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: Moderate wildlife use but exceptional wildlife habitat features.

Wetland/Site #(s): Created Cells 1 and 5

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:**

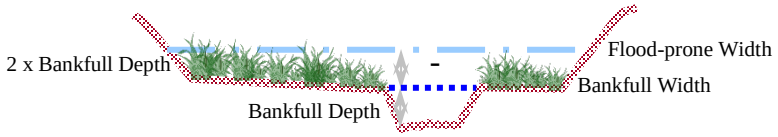
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

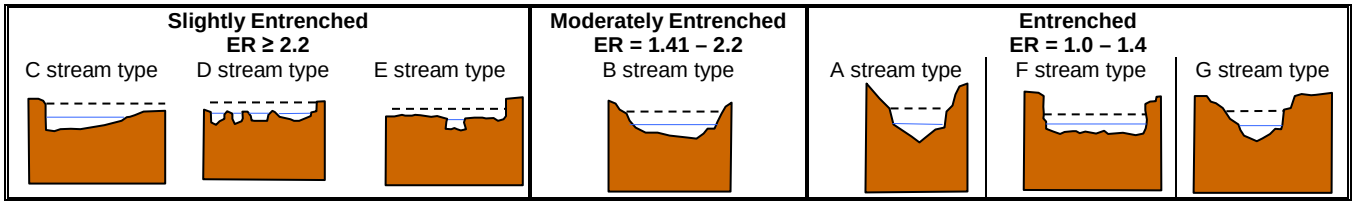
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

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.

75 / 32 = 2.34375

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**	---	---	.6M	---	---	---	---	---	---
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:** AA is <10 acres. Wetland cell impounds water restricting return to Sand Creek. Floodprone width is greater than 75 and entrenchment ratio greater than 2.2.

Wetland/Site #(s): Created Cells 1 and 5

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**	---	---	---	.8H	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: _____

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

Applies to 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 surrounding land use has the potential to deliver sediments and nutrients through influx of surface or groundwater.

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%**	.7M	---	---
☐ **< 35%**	---	---	---

Comments: Vegetation with a rating of 6 or greater include Typha latifolia, Juncus balticus, Eleocharis palustris and Carex nebrascensis

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	---	---	---	---	---	---	.9H	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Created Cells 1 and 5

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** = 0.9 ☐ **NO**

iv. Final Score and Rating: 1H **Comments:** Vegetated component may increase as the site develops.

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**	1H	---	---	---
☐ **Insufficient Data/Information**	---			

Comments: Wetland mitigation cells with perennial water that intercept groundwater.

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: AA does not contain rare types and structural diversity is moderate.

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	.1M	---

Comments: Site is a mitigation site that could be used for education purposes, but does not have general public access.Site is being used for educational studies by students at Montana State University and Montana Tech.

15. GENERAL SITE NOTES: The open water attracts a variety of waterfowl and birds which makes the site enjoyable to visit.

Wetland/Site #(s): Created Cells 1 and 5

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	mod 0.50	1.00	1.78	
C. General Wildlife Habitat	high 0.90	1.00	3.20	
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.60	1.00	2.14	
F. Short and Long Term Surface Water Storage	high 0.80	1.00	2.85	*
G. Sediment / Nutrient / Toxicant Removal	mod 0.70	1.00	2.50	*
H. Sediment / Shoreline Stabilization	mod 0.70	1.00	2.50	
I. Production Export / Food Chain Support	high 1.00	1.00	3.56	*
J. Groundwater Discharge / Recharge	high 1.00	1.00	3.56	*
K. Uniqueness	mod 0.40	1.00	1.42	
L. Recreation / Education Potential (bonus point)	mod 0.10		0.36	
Total Points	**6.70**	**10**	**23.86 Total Functional Units**	
Percent of Possible Score 67% (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**

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Silicon Mountain **2. MDT Project #:** MT-STPX 47(24) **3. Control #:** 6044000

3. Evaluation Date: 7/25/2019 **4. Evaluator(s):** C. Hoschouer, T. Traxler, C. Seibert **5. Wetland/Site #(s):** Created Cells 2, 3, 4

6. Wetland Location(s): Township 3 N, Range 9 W, Section 24; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: N/A

Watershed: 2 - Upper Clark Fork **County:** _ _ Silver Bow _____

7. Evaluating Agency: RESPEC 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)
3.36 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 3.36 (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	Emergent Wetland	Excavated	Seasonal / Intermittent	100

Comments: Excavated emergent wetlands with seasonal/intermittent water regime.

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

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.)**:** There has been a fairly high level of disturbance due to site construction, trail and bridge construction in the past. This internal disturbance level has reduced to reflect the recovery and stabilization of the site. The area surrounding the site is primarily rural, but there are roads, a residence, and some commercial activity.

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA consists of wetland cells constructed to intercept groundwater. This AA is comprised of the wetland cells (2,3,4) that have a more seasonal /intermittent water regime. Sand Creek is not included in this AA because it's berms surrounding the cells do not allow for the creek to access these areas. The surrounding area is comprised of low rolling hills dominated by sagebrush and grasses.

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: Cells 2, 3 and 4 are palustrine emergent wetlands with a variety of different herbaceous vegetation including Juncus balticus, Deschampsia caespitosa, Typha latifolia, Eleocharis palustris and Cytorhycha cymbalaria.

Wetland/Site #(s): Created Cells 2, 3 and 4

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, MTNHP

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 Hoary bat (S3), Preble's shrew (S3)
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
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	.5M	---	---	---

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

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)	---	---	---	---	---	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---
☐ **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**	---	.7M	---	---
☐ **Minimal**	---	---	---	---

Comments: Moderate wildlife use and high wildlife habitat features.

Wetland/Site #(s): Created Cells 2, 3 and 4

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**

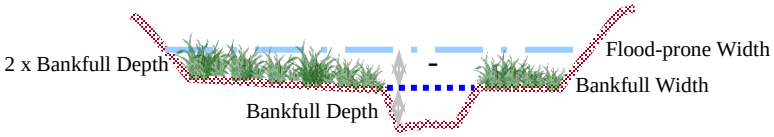
iii. Final Score and Rating: _ **Comments:**

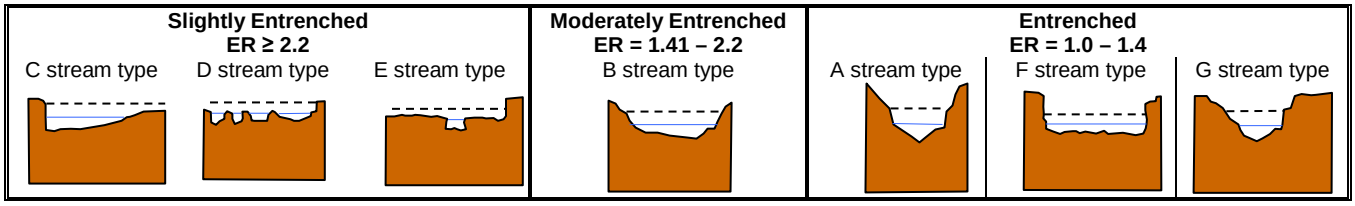
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

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:** AA is less than 10 acres.

Wetland/Site #(s): Created Cells 2, 3 and 4

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**	---	---	---	---	.6M	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: Wetland cells intercept groundwater.

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**	---	.8H	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: Cells have the potential to receive compounds through groundwater inputs.

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%**	---	.6M	---
☐ **< 35%**	---	---	---

Comments: Wave action is likely across a portion of these wetland cells at times. Vegetation includes Juncus balticus, Typha latifolia and Eleocharis palustris with rating of 6 or greater.

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**	---	M	---

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	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	.6M	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Created Cells 2, 3 and 4

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** = 0.70 ☐ **NO**

iv. Final Score and Rating: .7M **Comments:** Cells contain a subsurface outlet; have vegetated buffers.

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**	---	.7M	---	---
☐ **Insufficient Data/Information**	---			

Comments: Mitigation cells designed to intercept shallow groundwater aquifer.

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)	---	---	---	---	---	---	---	---	.3L
☐ **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	.1M	---

Comments: Site is a mitigation site that could be used for education purposes, but does not have general public access. Site is being used for educational studies by students at Montana State University and Montana Tech.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Created Cells 2, 3 and 4

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	mod 0.50	1.00	1.68	
C. General Wildlife Habitat	mod 0.70	1.00	2.35	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	NA	NA	0	
F. Short and Long Term Surface Water Storage	mod 0.60	1.00	2.02	
G. Sediment / Nutrient / Toxicant Removal	high 0.80	1.00	2.69	*
H. Sediment / Shoreline Stabilization	mod 0.60	1.00	2.02	
I. Production Export / Food Chain Support	mod 0.70	1.00	2.35	*
J. Groundwater Discharge / Recharge	mod 0.70	1.00	2.35	*
K. Uniqueness	low 0.30	1.00	1.01	
L. Recreation / Education Potential (bonus point)	mod 0.10		0.336	
Total Points	**5.00**	**9**	**16.80 Total Functional Units**	
Percent of Possible Score 56% (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**

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Silicon Mountain **2. MDT Project #:** MT-STPX 47(24) **3. Control #:** 6044000

3. Evaluation Date: 7/25/2019 **4. Evaluator(s):** C. Hoschouer, T. Traxler, C. Seibert **5. Wetland/Site #(s):** Preservation

6. Wetland Location(s): Township 3 N, Range 9 W, Section 24; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: N/A

Watershed: 2 - Upper Clark Fork **County:** _ _ Silver Bow _____

7. Evaluating Agency: RESPEC 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)
10.8 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 10.8 (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	Aquatic Bed		Permanent / Perennial	5
Depressional	Emergent Wetland		Seasonal / Intermittent	94
Depressional	Scrub-Shrub Wetland		Temporary / Ephemeral	1

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.)**:** The wetland mitigation site was constructed in 2014 which consisted of substantial excavation to create new wetlands and channel re-alignment/restoration. In 2016 the area surrounding the existing wetlands was disturbed as a result of the new trail and bridge. In 2019, previously disturbed areas are stable and well vegetated with seeded perennial grasses and forbs or the expansion of native, existing desirable species. .

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Centaurea stoebe, Cirsium arvense, Euphorbia esula, Linaria vulgaris.

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA consists of pre-existing depressional wetlands located adjacent to Sand Creek and south of Silver Bow Creek. Land use surrounding the AA includes commercial developments, agriculture (grazing/pasture), transportation (railroad and highway) and private residences.

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	high	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Palustrine Emergent, Palustrine Scrub/Shrub, Palustrine Aquatic Bed

Wetland/Site #(s): Preservation Wetlands

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, MTNHP

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 Hoary bat (S3), Preble's shrew (S3)
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
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	.5M	---	---	---

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

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: Moderate wildlife use but high wildlife habitat features.

Wetland/Site #(s): Preservation Wetlands

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**

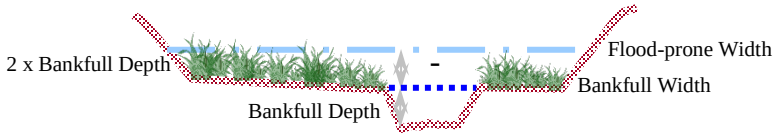
iii. Final Score and Rating: _ **Comments:**

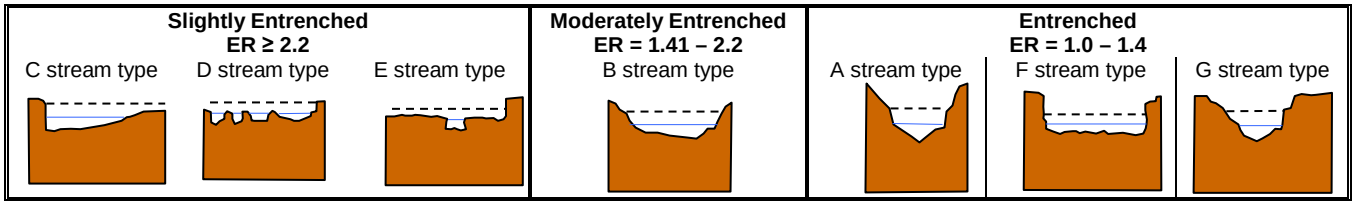
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

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): Preservation Wetlands

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**	---	---	---	.8H	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: Preservation wetlands receive water from precipitation, runoff, groundwater and a spring.

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: Evidence of flooding or ponding in the preservation wetlands.

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%**	.7M	---	---
☐ **< 35%**	---	---	---

Comments: Preservation wetlands in the far eastern portion of the site include a shoreline with standing water. Vegetation includes a mix of Typha latifolia, Carex utriculata and Juncus balticus.

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**	---	M	---

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	---	---	---	.5M	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Preservation Wetlands

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** = 0.50 ☐ **NO**

iv. Final Score and Rating: .6M **Comments:** well-vegetated upland buffer around greater than 75 percent of the AA's perimeter.

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**	1H	---	---	---
☐ **Insufficient Data/Information**	---			

Comments: Some preserved wetlands are groundwater fed, the large wetland in the NE corner is fed by a spring.

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: Wetlands of this type are common in the area but have low disturbance in comparison to others impacted by land management.

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	.1M	---

Comments: Site is a mitigation site that could be used for education purposes, but does not have general public access.Site is being used for educational studies by students at Montana State University and Montana Tech.

15. GENERAL SITE NOTES: Overall improved hydrology across the preservation wetlands in 2019 due to higher groundwater, precipitation and runoff.

Wetland/Site #(s): Preservation Wetlands

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	mod 0.50	1.00	5.40	
C. General Wildlife Habitat	high 0.90	1.00	9.72	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	NA	NA	0	
F. Short and Long Term Surface Water Storage	high 0.80	1.00	8.64	*
G. Sediment / Nutrient / Toxicant Removal	mod 0.70	1.00	7.56	*
H. Sediment / Shoreline Stabilization	mod 0.70	1.00	7.56	
I. Production Export / Food Chain Support	mod 0.50	1.00	5.40	
J. Groundwater Discharge / Recharge	high 1.00	1.00	10.8	*
K. Uniqueness	mod 0.40	1.00	4.32	
L. Recreation / Education Potential (bonus point)	mod 0.10		1.08	
Total Points	**5.60**	**9**	**60.48 Total Functional Units**	
Percent of Possible Score 62% (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**

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Silicon Mountain **2. MDT Project #:** MT-STPX 47(24) **3. Control #:** 6044000

3. Evaluation Date: 7/25/2019 **4. Evaluator(s):** C. Hoschouer, T. Traxler, C. Seibert **5. Wetland/Site #(s):** Created Cell 6

6. Wetland Location(s): Township 3 N, Range 9 W, Section 24; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: N/A

Watershed: 2 - Upper Clark Fork **County:** _ _ Silver Bow _____

7. Evaluating Agency: RESPEC 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)
0.31 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 0.31 (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	Aquatic Bed	Excavated	Seasonal / Intermittent	98
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	2

Comments: 2018 was the first year that water was observed within the excavated portion of wetland cell 6. This cell was dry during 2019 monitoring, but monitoring was conducted one month later than usual in 2019 and the cell likely had standing water earlier in the summer.

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

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.)**:** Wetland Cell 6 is within the old road alignment, the construction in the cell included excavation, regrading and revegetation. The reseeded uplands are stable and well vegetated with seeded perennial grasses and forbs as well as the expansion of native, existing desirable species. No ponded water was observed in the excavated depression during 2019 monitoring but the cell was likely inundated earlier in the summer.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Centaurea stoebe

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA consists of a depressional wetland and upland buffer at the bottom of a gentle hillslope. Land use surrounding the AA includes commercial developments and transportation (railroad tracks and highway).

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	mod	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Palustrine emergent, Palustrine Aquatic Bed

Wetland/Site #(s): Created Cell 6

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, MTNHP

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 Hoary bat (S3), Preble's shrew (S3)
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
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	.5M	---	---	---

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

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)	---	---	---	---	---	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---
☐ **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**	---	---	---	---
☒ **Minimal**	---	.4M	---	---

Comments: Small wetland with limited value to wildlife.

Wetland/Site #(s): Created Cell 6

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: NA

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**

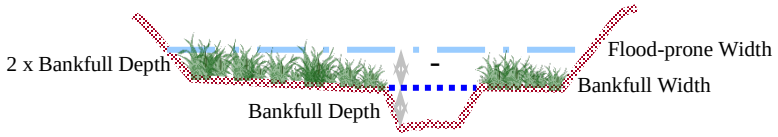
iii. Final Score and Rating: _ **Comments:**

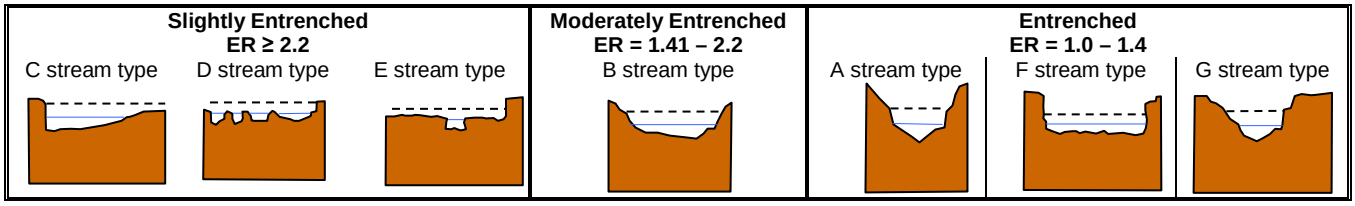
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

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:** AA subject to flooding is less than 10 acres. Depressional wetland restricts discharge or drainage to the east toward the railroad tracks.

Wetland/Site #(s): Created Cell 6

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**	---	---	---	---	---	---	---	.3L	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: This wetland is subject to ponding from precipitation, upland surface flow but primarily from seasonal high groundwater.

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: Very minor sedimentation was noted in the bottom of the wetland.

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%**	---	.2L	---

Comments: This small wetland is likely subject to wave action as long as surface or ponded water is present.

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**	---	M	---

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	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.3L	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Created Cell 6

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** = 0.40 ☐ **NO**

iv. Final Score and Rating: .4M **Comments:** There is a 50-foot buffer around the wetland

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: Seasonally high groundwater

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**	---	.7M	---	---
☐ **Insufficient Data/Information**	---			

Comments: Wetland with likely seasonal surface water supported by seasonally high groundwater, runoff and precipitaion.

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)	---	---	---	---	---	---	---	---	.3L
☐ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: Wetlands of this type are abundant in the area but have low disturbance in comparison to others impacted by land management.

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: Currently this AA does not meet the 3 categories above.

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	.1M	---

Comments: Site is very close to active railroad tracks and currently a little difficult access unless you walk in from the west side. Site is being used for educational studies by students at Montana State University and Montana Tech.

15. GENERAL SITE NOTES: It will be interesting to see the continued development of created cell 6 with time and the continued improvement of wildlife habitat and wetland habitat.

Wetland/Site #(s): Created Cell 6

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	mod 0.50	1.00	0.155	*
C. General Wildlife Habitat	mod 0.40	1.00	0.124	
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	NA	NA	0	
F. Short and Long Term Surface Water Storage	low 0.30	1.00	0.093	
G. Sediment / Nutrient / Toxicant Removal	mod 0.70	1.00	0.217	*
H. Sediment / Shoreline Stabilization	low 0.20	1.00	0.062	
I. Production Export / Food Chain Support	mod 0.40	1.00	0.124	*
J. Groundwater Discharge / Recharge	mod 0.70	1.00	0.217	*
K. Uniqueness	low 0.30	1.00	0.093	
L. Recreation / Education Potential (bonus point)	mod 0.10		0.0028	
Total Points	**3.60**	**9**	**1.1019 Total Functional Units**	
Percent of Possible Score 40% (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**

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain **City/County:** Silver Bow **Sampling Date:** 25-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** **S** 24 **T** 3N **R** 9W

Landform (hillslope, terrace, etc.): Valley bottom **Local relief (concave, convex, none):** convex **Slope:** 5.0 **% /** 2.9 **°**

Subregion (LRR): LRR E **Lat.:** 45.99848945 **Long.:** -112.6629488 **Datum:** WGS84

Soil Map Unit Name: Riverrun, occasionally flooded-Mannixlee, frequently flooded complex **NWI classification:** PEM

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 ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:

Mapped as PEM on the USFWS National Wetland Inventory Wetland Mapper, updated May 5, 2019. However, site is highly disturbed and hydrology has been altered due to a constructed wetland. Field data indicates a non-wetland at this data point.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Astragalus cicer	60	☑ 65.2%	UPL
2. Leymus cinereus	15	☐ 16.3%	FAC
3. Bromus inermis	10	☐ 10.9%	UPL
4. Poa pratensis	5	☐ 5.4%	FAC
5. Linaria vulgaris	2	☐ 2.2%	UPL
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	92	**= Total Cover**	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	**x 1 =**	0
FACW species	0	**x 2 =**	0
FAC species	20	**x 3 =**	60
FACU species	0	**x 4 =**	0
UPL species	72	**x 5 =**	360
Column Totals:	92 **(A)**		420 **(B)**

Prevalence Index = B/A = 4.565

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

Sample point dominated by Astragulus cicer.

*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
0-11	10YR	3/1	100						Silt Loam	
11-14	10YR	4/4	100						Sandy Silt Loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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:

No hydric soil indicators observed. Side slope of the wetland.

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

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:

No hydrology indicators observed. Soils were moist in the upper 12 inches, dry below.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain **City/County:** Silver Bow **Sampling Date:** 25-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** **S** 24 **T** 3N **R** 9W

Landform (hillslope, terrace, etc.): Valley bottom **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45.99848606 **Long.:** -112.6629828 **Datum:** WGS84

Soil Map Unit Name: Riverrun, occasionally flooded-Mannixlee, frequently flooded complex **NWI classification:** PEM

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 ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
PEM wetland located in Cell 3.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Juncus balticus	60	☑ 75.0%	FACW
2. Typha latifolia	5	☐ 6.3%	OBL
3. Epilobium ciliatum	5	☐ 6.3%	FACW
4. Carex nebrascensis	3	☐ 3.8%	OBL
5. Poa palustris	2	☐ 2.5%	FAC
6. Alopecurus arundinaceus	2	☐ 2.5%	FAC
7. Deschampsia cespitosa	1	☐ 1.3%	FACW
8. Beckmannia syzigachne	1	☐ 1.3%	OBL
9. Glyceria striata	1	☐ 1.3%	OBL
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 20

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	66	x 2 =	132
FAC species	4	x 3 =	12
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		154 (B)

Prevalence Index = B/A = 1.925

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Plot dominated by Juncus balticus.

*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
0-7	10YR	3/1	100						Silt Loam	organics and small gravel
7-12	2.5Y	6/2	100						Silty Clay Loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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 soil indicators include a depleted matrix starting at 7".

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):	
Water Table Present?	Yes ◉	No ○	Depth (inches):	3
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:

Soils were saturated to the surface. Water in pit at 3".

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain **City/County:** Silver Bow **Sampling Date:** 25-Jul-19

Applicant/Owner: MDT **State:** MT **Sampling Point:** DP-2U

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 24 T 3N R 9W

Landform (hillslope, terrace, etc.): Valley bottom **Local relief (concave, convex, none):** convex **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR E **Lat.:** 46.0017268 **Long.:** -112.6612105 **Datum:** WGS84

Soil Map Unit Name: Riverrun, occasionally flooded-Mannixlee, frequently flooded complex **NWI classification:** Upland

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 ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
Paired upland sample point on the slope above wetland cell 5.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Elymus lanceolatus	30	☑ 40.0%	FACU
2. Leymus cinereus	20	☑ 26.7%	FAC
3. Elymus trachycaulus	10	☐ 13.3%	FAC
4. Elymus repens	10	☐ 13.3%	FAC
5. Bromus inermis	3	☐ 4.0%	UPL
6. Alopecurus pratensis	2	☐ 2.7%	FAC
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	75	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 25

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	42	x 3 =	126
FACU species	30	x 4 =	120
UPL species	3	x 5 =	15
Column Totals:	75 (A)		261 (B)

Prevalence Index = B/A = 3.480

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
Starting to see more seeded species and fewer annual weeds/mustards compared to previous years. Of the 25% bare ground, 15% is covered in standing and downed litter.

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

Soil

Sampling Point: DP-2U

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
0-6	10YR	3/2	100						Silt Loam	
6-14	10YR	3/2	100						Silty Clay Loam	
14-16	10YR	2/2	100						Silty Clay	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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:

No hydric soil indicators observed.

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

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:

Soils were moist from the surface to 16 inches. Sample point located on a side slope of this excavated wetland cell.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain **City/County:** Silver Bow **Sampling Date:** 25-Jul-19

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-2W**

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** **S** 24 **T** 3N **R** 9W

Landform (hillslope, terrace, etc.): Valley bottom **Local relief (concave, convex, none):** convex **Slope:** 5.0 **%** / 2.9 **°**

Subregion (LRR): LRR E **Lat.:** 46.00176209 **Long.:** -112.6612077 **Datum:** WGS84

Soil Map Unit Name: Riverrun, occasionally flooded-Mannixlee, frequently flooded complex **NWI classification:** Upland

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 ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

NWI indicates upland, however this is a fairly new constructed wetland site within Cell 5. Data point taken 5 feet from the edge of the water. Surface water level slightly lower than 2018.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Juncus balticus	60	☑ 63.2%	FACW
2. Poa reflexa	10	☐ 10.5%	OBL
3. Hordeum jubatum	5	☐ 5.3%	FAC
4. Potentilla gracilis	5	☐ 5.3%	FAC
5. Eleocharis palustris	5	☐ 5.3%	OBL
6. Geum macrophyllum	2	☐ 2.1%	FAC
7. Elymus trachycaulus	2	☐ 2.1%	FAC
8. Epilobium ciliatum	2	☐ 2.1%	FACW
9. Agrostis gigantea	2	☐ 2.1%	FAC
10. Thlaspi arvense	1	☐ 1.1%	UPL
11. Salix exigua	1	☐ 1.1%	FACW
	95	**= Total Cover**	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 5

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	63	x 2 =	126
FAC species	16	x 3 =	48
FACU species	0	x 4 =	0
UPL species	1	x 5 =	5
Column Totals:	95 (A)		194 (B)

Prevalence Index = B/A = 2.042

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

Cover very uniform across plot. Salix exigua seedlings noted in the herbaceous stratum.

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

Soil

Sampling Point: DP-2W

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	4/1	100						Silty Clay	
14-16	10YR	3/1	100						Silty Clay	10% sand
16+	10YR	4/2	100						Sandy Silt	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☑ 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:

Recently constructed wetland. Soils may be too young to have formed hydric soil indicators (Problematic Hydric Soils: Recently Developed Wetlands, USACE 2010).

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☑ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):	
Water Table Present?	Yes ◉	No ○	Depth (inches):	16
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:

Soils were saturated to the surface. Water in pit at 16".

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain **City/County:** Silver Bow **Sampling Date:** 25-Jul-19

Applicant/Owner: MDT **State:** MT **Sampling Point:** DP-3U

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 24 T 3N R 9W

Landform (hillslope, terrace, etc.): Valley bottom **Local relief (concave, convex, none):** convex **Slope:** 1.0 % / 0.6 °

Subregion (LRR): LRR E **Lat.:** 46.00011962 **Long.:** -112.6609638 **Datum:** WGS84

Soil Map Unit Name: Riverrun, occasionally flooded-Mannixlee, frequently flooded complex **NWI classification:** Upland

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 ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
This sample point is located within 3 feet of the wetland line at the base of an upland slope.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Poa secunda	40	☑ 57.1%	FACU
2. Antennaria neglecta	10	☐ 14.3%	FACU
3. Juncus balticus	10	☐ 14.3%	FACW
4. Potentilla gracilis	5	☐ 7.1%	FAC
5. Symphyotrichum ascendens	5	☐ 7.1%	FACU
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 15

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	5	x 3 =	15
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	70 (A)		255 (B)

Prevalence Index = B/A = 3.643

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
Litter represents approximately 15% of the ground cover.

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

Soil

Sampling Point: DP-3U

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
0-5	10YR	4/2	100						Loam	
5-18	10YR	3/2	100						Loam	
18-20	7.5YR	3/2	100						Sandy Silt Loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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:

No hydric soil indicators observed. Very sandy soils below 18 inches.

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

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:

Soils were dry throughout.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain **City/County:** Silver Bow **Sampling Date:** 25-Jul-19

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-3W**

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** **S** 24 **T** 3N **R** 9W

Landform (hillslope, terrace, etc.): Valley bottom **Local relief (concave, convex, none):** concave **Slope:** 1.0 **%** / 0.6 **°**

Subregion (LRR): LRR E **Lat.:** 46.00009981 **Long.:** -112.6610697 **Datum:** WGS84

Soil Map Unit Name: Riverrun, occasionally flooded-Mannixlee, frequently flooded complex **NWI classification:** PEM

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 ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
This sample point is located on the east side of the project area within community type 4.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Carex nebrascensis	50	☑ 62.5%	OBL
2. Carex aquatilis	20	☑ 25.0%	OBL
3. Deschampsia cespitosa	10	☐ 12.5%	FACW
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%	
11.	0	☐ 0.0%	
	80	**= Total Cover**	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 20

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		90 (B)

Prevalence Index = B/A = 1.125

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
A dominance of hydrophytic vegetation.

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

Soil

Sampling Point: DP-3W

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
0-4	10YR	2/1	100						organics	
4-11	2.5Y	4/2	95	7.5YR	5/8	5	C	M	Silty Clay	
11-16	7.5YR	2.5/2	100						Silt Loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☑ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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:

Redox concentrations present in the 4-11" layer.

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

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:

Soils were saturated to the surface.

APPENDIX C
PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Silicon Mountain
Butte Silver Bow County, Montana

Silicon Mountain: Photo Point Photographs

	
Photo Point: 1. Photo 1: View of western edge of cell 1 looking NW. Bearing: 333 degrees Year: 2015	Photo Point: 1. Photo 1: View of western edge of cell 1 looking NW. Bearing: 333 degrees Year: 2019
	
Photo Point: 1. Photo 2: View of central portion of cell 1 looking NE. Bearing: 26 degrees Year: 2015	Photo Point: 1. Photo 2: View of central portion of cell 1 looking NE. Bearing: 26 degrees Year: 2019
	
Photo Point: 1. Photo 3: View of central portion of cell 1 looking E. Bearing: 86 degrees Year: 2015	Photo Point: 1. Photo 3: View of central portion of cell 1 looking E. Bearing: 86 degrees Year: 2019

Silicon Mountain: Photo Point Photographs

	
Photo Point: 1. Photo 4: View of southern end of cell 1 looking SE. Bearing: 166 degrees Year: 2015	Photo Point: 1. Photo 4: View of southern end of cell 1 looking SE. Bearing: 166 degrees Year: 2019
	
Photo Point: 1. Photo 5: View of western side of cell 1 looking SW. Bearing: 202 degrees Year: 2015	Photo Point: 1. Photo 5: View of western side of cell 1 looking SW. Bearing: 202 degrees Year: 2019
	
Photo Point: 2. Photo 1: View of Sand Creek channel looking NE. Bearing: 40 degrees Year: 2015	Photo Point: 2. Photo 1: View of Sand Creek channel looking NE. Bearing: 40 degrees Year: 2019

Silicon Mountain: Photo Point Photographs

	
Photo Point: 2. Photo 2: View outside cell 1 looking east. Bearing: 86 degrees Year: 2015	Photo Point: 2. Photo 2: View outside cell 1 looking east. Bearing: 86 degrees Year: 2019
	
Photo Point: 2. Photo 3: View of eastern portion of cell 1 looking SE. Bearing: 113 degrees Year: 2015	Photo Point: 2. Photo 3: View of eastern portion of cell 1 looking SE. Bearing: 113 degrees Year: 2019
	
Photo Point: 3. Photo 1: View of western edge of cell 4 looking NW. Bearing: 314 degrees Year: 2015	Photo Point: 3. Photo 1: View of western edge of cell 4 looking NW. Bearing: 314 degrees Year: 2019

Silicon Mountain: Photo Point Photographs

	
Photo Point: 3. Photo 2: View of western side of cell 4 looking N. Bearing: 343 degrees Year: 2015	Photo Point: 3. Photo 2: View of western side of cell 4 looking N. Bearing: 343 degrees Year: 2019
	
Photo Point: 3. Photo 3: View across center of cell 4 looking NW. Bearing: 66 degrees Year: 2015	Photo Point: 3. Photo 3: View across center of cell 4 looking NW. Bearing: 66 degrees Year: 2019
	
Photo Point: 3. Photo 4: View of southern side of cell 4 looking SE. Bearing: 114 degrees Year: 2015	Photo Point: 3. Photo 4: View of southern side of cell 4 looking SE. Bearing: 114 degrees Year: 2019

Silicon Mountain: Photo Point Photographs

	
Photo Point: 4. Photo 1: View of southern side of cell 5 looking SW. Bearing: 220 degrees Year: 2015	Photo Point: 4. Photo 1: View of southern side of cell 5 looking SW. Bearing: 220 degrees Year: 2019
	
Photo Point: 4. Photo 2: View across SE portion of cell 5 looking W. Bearing: 268 degrees Year: 2015	Photo Point: 4. Photo 2: View across SE portion of cell 5 looking W. Bearing: 268 degrees Year: 2019
	
Photo Point: 4. Photo 3: View across center of cell 5 looking NW. Bearing: 321 degrees Year: 2015	Photo Point: 4. Photo 3: View across center of cell 5 looking NW. Bearing: 321 degrees Year: 2019

Silicon Mountain: Photo Point Photographs



Photo Point: 4. Photo 4: View of eastern side of cell 5 looking N. Bearing: 24 degrees Year: 2015



Photo Point: 4. Photo 4: View of eastern side of cell 5 looking N. Bearing: 24 degrees Year: 2019



Photo Point: 4. Photo 5: View of eastern side of cell 5 looking NE. Bearing: 56 degrees Year: 2015



Photo Point: 4. Photo 5: View of eastern side of cell 5 looking NE. Bearing: 56 degrees Year: 2019



Photo Point: 5. Photo 1: View of north end of cell 3 looking SE. Bearing: 145 degrees Year: 2015



Photo Point: 5. Photo 1: View of north end of cell 3 looking SE. Bearing: 145 degrees Year: 2019

Silicon Mountain: Photo Point Photographs

	
Photo Point: 5. Photo 2: View of north end of cell 3 looking NW. Bearing: 345 degrees Year: 2015	Photo Point: 5. Photo 2: View of north end of cell 3 looking NW. Bearing: 345 degrees Year: 2019
	
Photo Point: 6. Photo 1: View of south end of cell 2 looking NW. Bearing: 326 degrees Year: 2015	Photo Point: 6. Photo 1: View of south end of cell 2 looking NW. Bearing: 326 degrees Year: 2019
	
Photo Point: 6. Photo 2: View of southeast side of cell 2 looking N. Bearing: 352 degrees Year: 2015	Photo Point: 6. Photo 2: View of southeast side of cell 2 looking N. Bearing: 352 degrees Year: 2019

Silicon Mountain: Photo Point and Stream Photographs

	
Photo Point: 7. Photo 1: View of cell 6 looking east. Bearing: 95 degrees Year: 2015	Photo Point: 7. Photo 1: View of cell 6 looking east. Bearing: 95 degrees Year: 2019
	
Photo Point: 8. Photo 1: View of the south end of Sand Creek looking SW. Bearing: 213 degrees Year: 2015	Photo Point: 8. Photo 1: View of the south end of Sand Creek looking SW. Bearing: 213 degrees Year: 2019
	
Photo Point: 8. Photo 2: View across southern portion of Sand Creek looking SE. Bearing: 28 degrees Year: 2015	Photo Point: 8. Photo 2: View across southern portion of Sand Creek looking SE. Bearing: 28 degrees Year: 2019

Silicon Mountain: Stream Point Photographs

	
Photo Point: 9. Photo 1: View of Sand Creek downstream of PP-8 looking SE. Bearing: 148 degrees Year: 2015	Photo Point: 9. Photo 1: View of Sand Creek downstream of PP-8 looking SE. Bearing: 148 degrees Year: 2019
	
Photo Point: 9. Photo 2: View of Sand Creek downstream of PP-9 looking N. Bearing: 356 degrees Year: 2015	Photo Point: 9. Photo 2: View of Sand Creek downstream of PP-9 looking N. Bearing: 356 degrees Year: 2019
	
Photo Point: 10. Photo 1: View of the channel/slopes under overpass looking NW. Bearing: 312 degrees Year: 2015	Photo Point: 10. Photo 1: View of the channel/slopes under overpass looking NW. Bearing: 312 degrees Year: 2019

Silicon Mountain: Stream Point Photographs

	
Photo Point: 10. Photo 2: View of Sand Creek looking NE Bearing: 66 degrees Year: 2015	Photo Point: 10. Photo 2: View of Sand Creek looking NE Bearing: 66 degrees Year: 2019
	
Photo Point: 11. Photo 1: View of Sand Creek looking SE. Bearing: 144 degrees Year: 2015	Photo Point: 11. Photo 1: View of Sand Creek looking SE. Bearing: 144 degrees Year: 2019
	
Photo Point: 11. Photo 2: View of stream x-section 3 looking S. Bearing: 178 degrees Year: 2015	Photo Point: 11. Photo 2: View of stream x-section 3 looking S. Bearing: 178 degrees Year: 2019

Silicon Mountain: Stream Point Photographs

	
Photo Point: 11. Photo 3: View downstream of stream x-section 3 looking NW. Bearing: 300 degrees Year: 2015	Photo Point: 11. Photo 3: View downstream of stream x-section 3 looking NW. Bearing: 300 degrees Year: 2019
	
Photo Point: 12. Photo 1: View SW across stream x-section 4. Bearing: 216 degrees Year: 2015	Photo Point: 12. Photo 1: View SW across stream x-section 4. Bearing: 216 degrees Year: 2019
	
Photo Point: 12. Photo 2: View SW across stream x-section 4. Bearing: 284 degrees Year: 2015	Photo Point: 12. Photo 2: View SW across stream x-section 4. Bearing: 284 degrees Year: 2019

Silicon Mountain: Stream Point Photographs

	
Photo Point: 12. Photo 3: View west across Sand Creek channel. Bearing: 270 degrees Year: 2015	Photo Point: 12. Photo 3: View west across Sand Creek channel. Bearing: 270 degrees Year: 2019
	
Photo Point: 12. Photo 4: View NW of stream x-section 4. Bearing: 348 degrees Year: 2015	Photo Point: 12. Photo 4: View NW of stream x-section 4. Bearing: 348 degrees Year: 2019
	
Photo Point: 13. Photo 1: View SE of stream x-section 7. Bearing: 153 degrees Year: 2015	Photo Point: 13. Photo 1: View SE of stream x-section 7. Bearing: 153 degrees Year: 2019

Silicon Mountain: Stream Point Photographs

	
Photo Point: 13. Photo 2: View NE of stream x-section 7. Bearing: 341 degrees Year: 2015	Photo Point: 13. Photo 2: View NE of stream x-section 7. Bearing: 341 degrees Year: 2019
	
Photo Point: 14. Photo 1: View of middle headcut looking south. Bearing: 178 degrees Year: 2015	Photo Point: 14. Photo 1: View of middle headcut looking south. Bearing: 178 degrees Year: 2019
	
Photo Point: 15. Photo 1: View of the eastern headcut looking S. Bearing: 189 degrees Year: 2015	Photo Point: 15. Photo 1: View of the eastern headcut looking S. Bearing: 189 degrees Year: 2019

Silicon Mountain: Stream Point Photographs

	
Photo Point: 16. Photo 1: View of western headcut looking west. Bearing: 270 degrees Year: 2015	Photo Point: 16. Photo 1: View of western headcut looking west. Bearing: 270 degrees Year: 2019
	
Photo Point: 17. Photo 1: View of Sand Creek channel looking W. Bearing: 157 degrees Year: 2015	Photo Point: 17. Photo 1: View of Sand Creek channel looking W. Bearing: 157 degrees Year: 2019
	
Photo Point: 17. Photo 2: View of Sand Creek channel looking N. Bearing: 356 degrees Year: 2015	Photo Point: 17. Photo 2: View of Sand Creek channel looking N. Bearing: 356 degrees Year: 2019

Silicon Mountain: Transect Photographs



Transect 1: Start
Bearing: 305 degrees
Location: South end cell 2
Year: 2015



Transect 1: Start
Bearing: 305 degrees
Location: South end cell 2
Year: 2019



Transect 1: End
Bearing: 177 degrees
Location: West end of cell 2
Year: 2015



Transect 1: End
Bearing: 177 degrees
Location: West end of cell 2
Year: 2019

Silicon Mountain: Transect Photographs



Transect 2: Start
Bearing: 106 degrees
Location: West side of cell 4
Year: 2015



Transect 2: Start
Bearing: 106 degrees
Location: West side of cell 4
Year: 2019



Transect 2: End
Bearing: 285 degrees
Location: East side of cell 4
Year: 2015



Transect 2: End
Bearing: 285 degrees
Location: East side of cell 4
Year: 2019

Silicon Mountain: Data Points



Data Point: DP-1W Location: East side of cell 3
Year: 2019



Data Point: DP-1U Location: Near cell 3
Year 2019



Data Point: DP-2W Location: South end of cell 5
Year: 2019



Data Point: DP-2U Location: South end of cell 5
Year: 2019



Data Point: DP-3W Location: East side CT4
Year: 2019



Data Point: DP-3U Location: South end of cell 5
Year: 2019

Silicon Mountain: Cross-Section Photographs

	
Cross-section 1: At center looking upstream. Year: 2017	Cross-section 1: At center looking upstream. Year: 2019
	
Cross-section 1: At center looking downstream. Year: 2017	Cross-section 1: At center looking downstream. Year: 2019
	
Cross-section 2: At center looking upstream. Year: 2017	Cross-section 2: At center looking upstream. Year: 2019

Silicon Mountain: Cross-Section Photographs

	
Cross-section 2: At center looking downstream. Year: 2017	Cross-section 2: At center looking downstream. Year: 2019
	
Cross-section 3: At center looking upstream. Year: 2017	Cross-section 3: At center looking upstream. Year: 2019
	
Cross-section 3: At center looking downstream. Year: 2017	Cross-section 3: At center looking downstream. Year: 2019

Silicon Mountain: Cross-Section Photographs

	
Cross-section 4: At center looking upstream. Year: 2017	Cross-section 4: At center looking upstream. Year: 2019
	
Cross-section 4: At center looking downstream. Year: 2017	Cross-section 4: At center looking downstream. Year: 2019
	
Cross-section 5: At center looking upstream. Year: 2017	Cross-section 5: At center looking upstream. Year: 2019

Silicon Mountain: Cross-Section Photographs

	
Cross-section 5: At center looking downstream. Year: 2017	Cross-section 5: At center looking downstream. Year: 2019
	
Cross-section 6: At center looking upstream. Year: 2017	Cross-section 6: At center looking upstream. Year: 2019
	
Cross-section 6: At center looking downstream. Year: 2017	Cross-section 6: At center looking downstream. Year: 2019

Silicon Mountain: Cross-Section Photographs

	
Cross-section 7: At center looking upstream. Year: 2017	Cross-section 7: At center looking upstream. Year: 2019
	
Cross-section 7: At center looking downstream. Year: 2017	Cross-section 7: At center looking downstream. Year: 2019
	
Cross-section 8: At center looking upstream. Year: 2017	Cross-section 8: At center looking upstream. Year: 2019

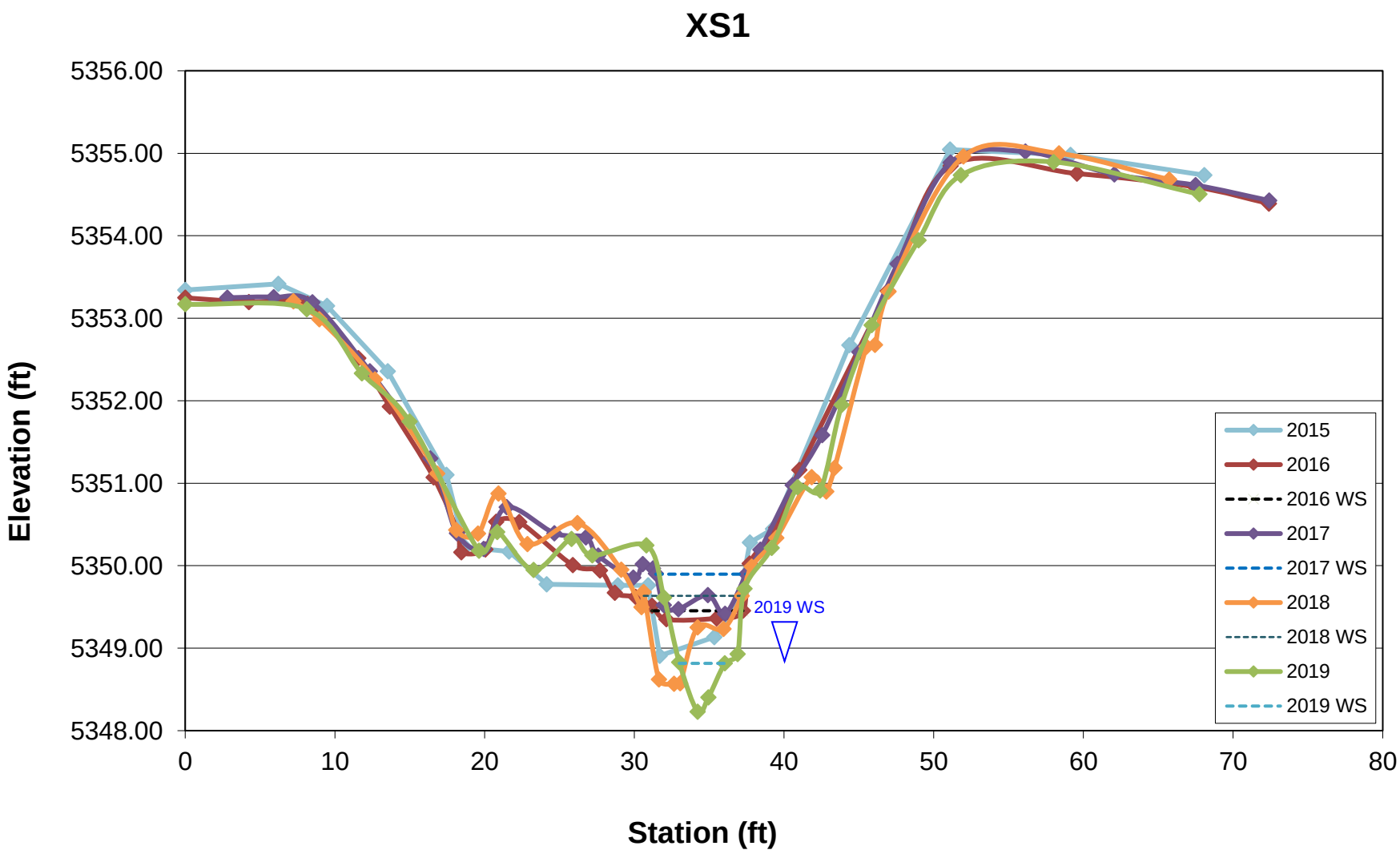
Silicon Mountain: Cross-Section Photographs

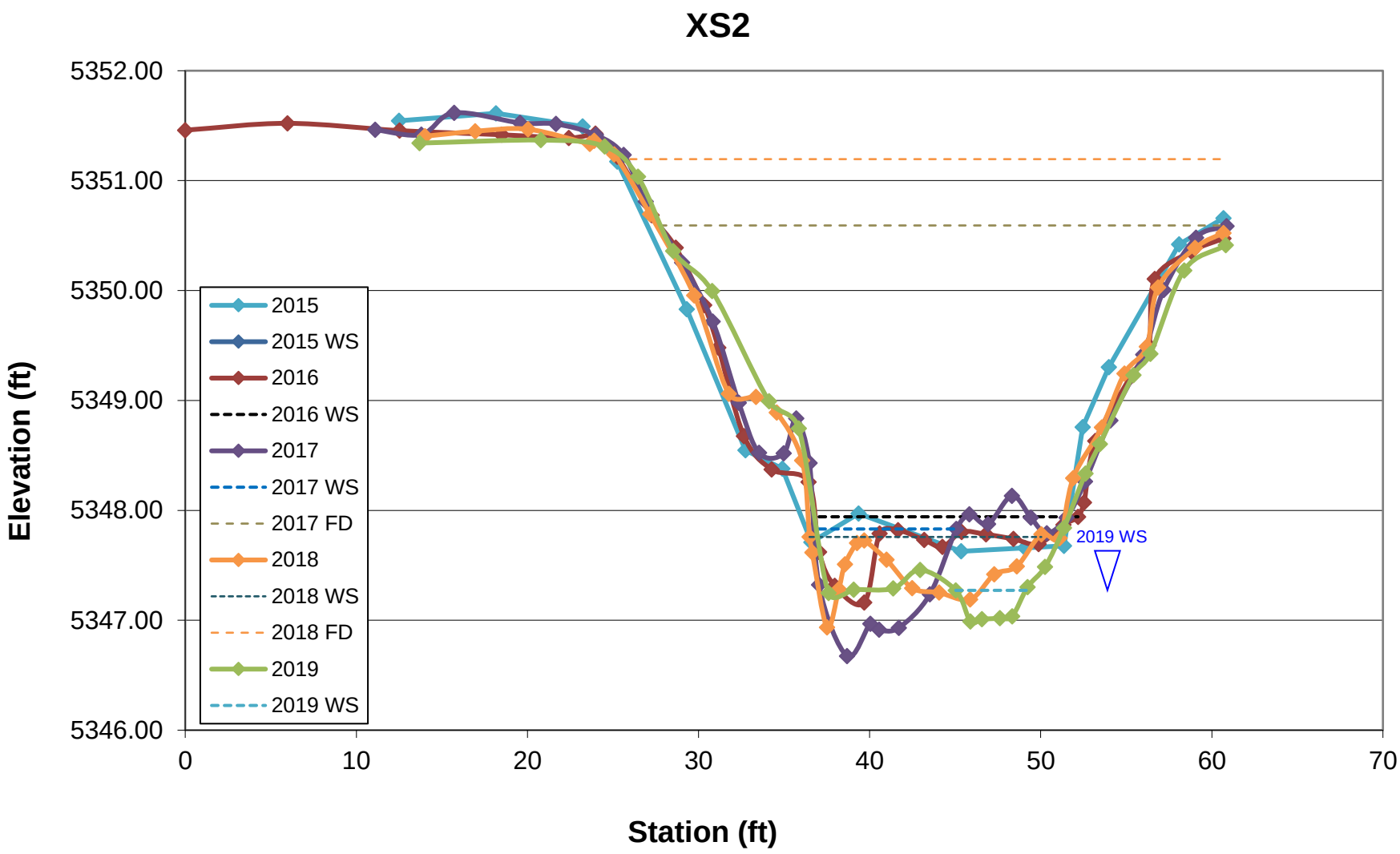
	
Cross-section 8: At center looking downstream. Year: 2017	Cross-section 8: At center looking downstream. Year: 2019

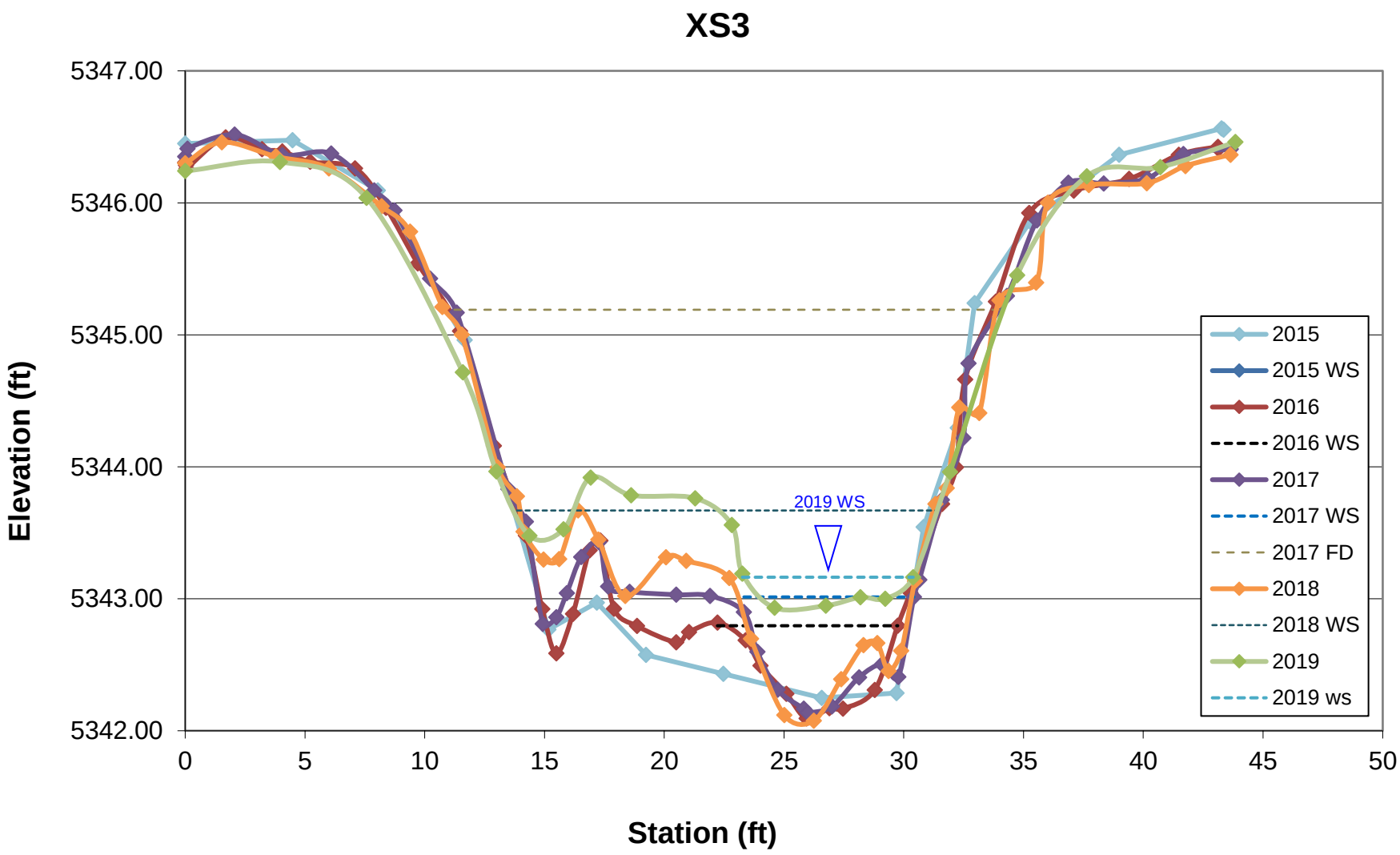
APPENDIX D

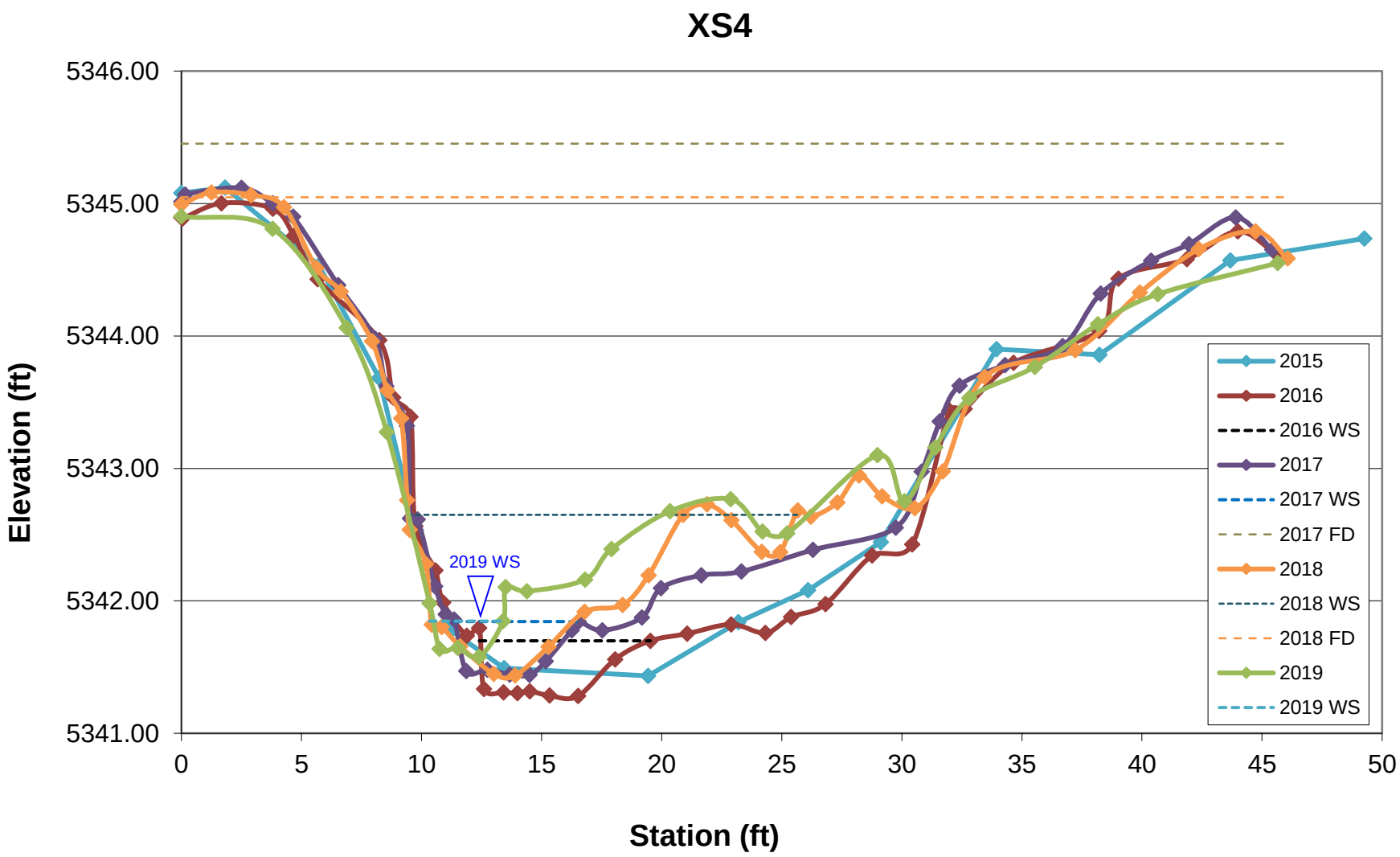
Surveyed Stream Cross Sections

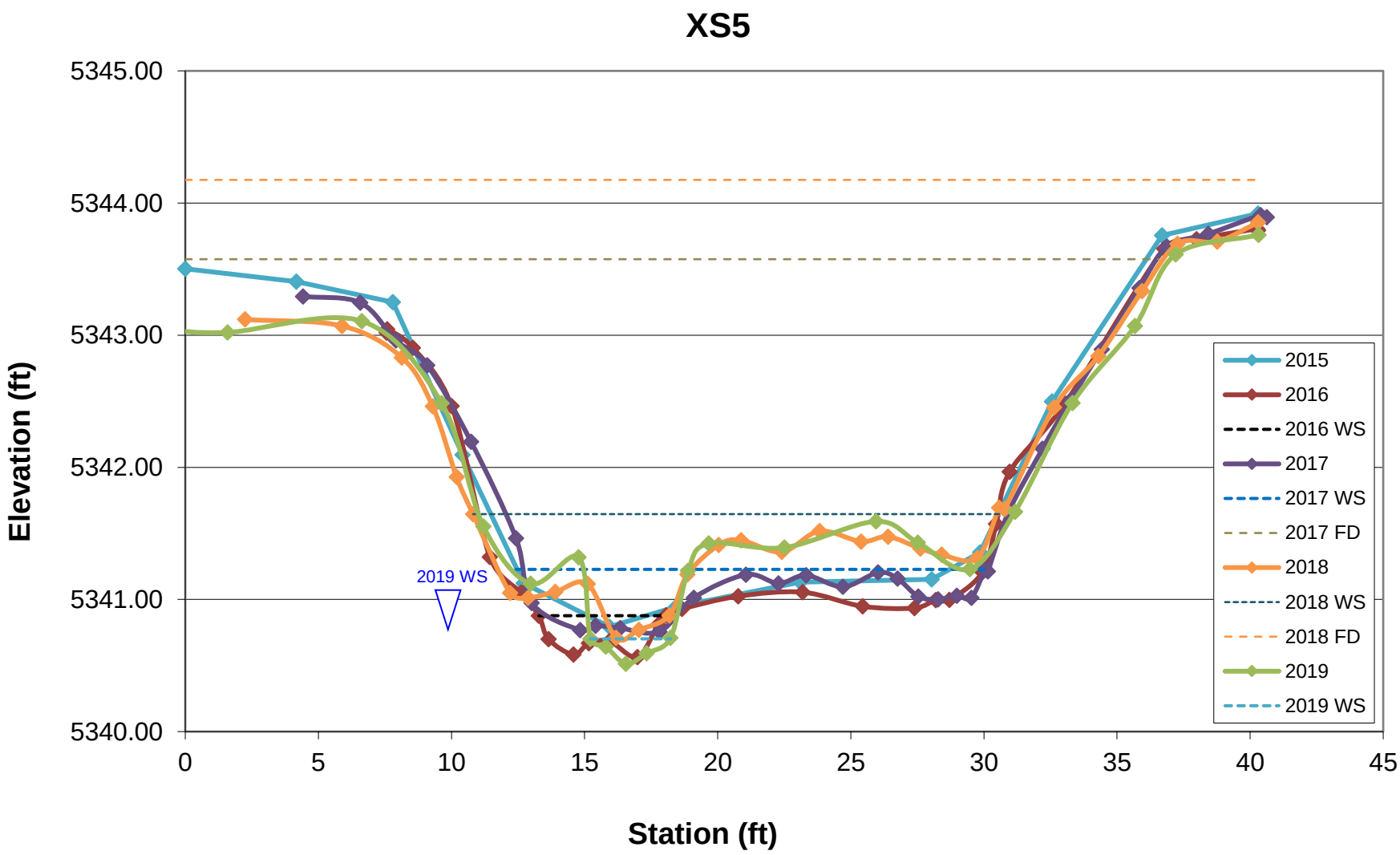
MDT Wetland Mitigation Monitoring
Silicon Mountain
Butte Silver Bow County, Montana

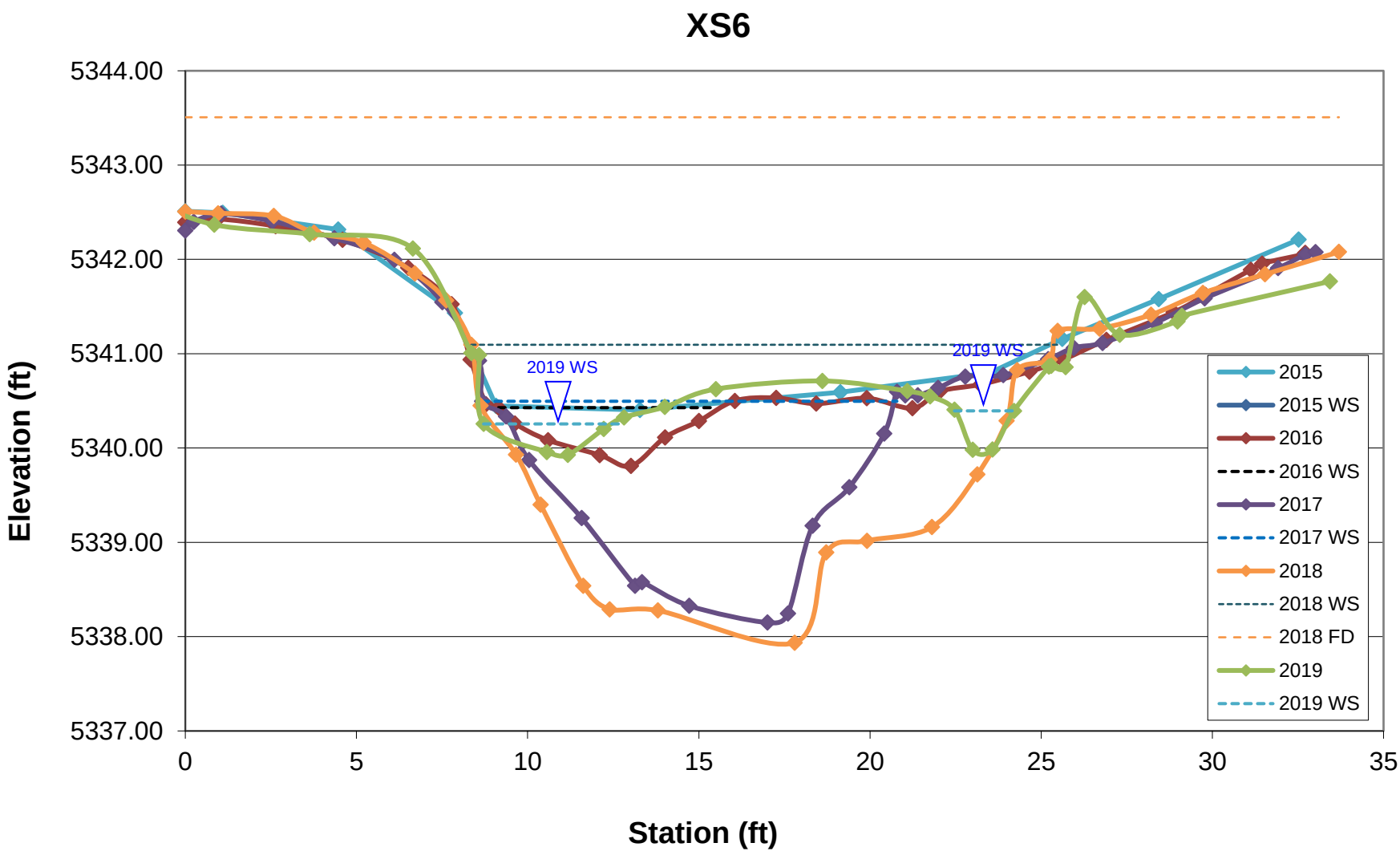

XS1
Elevation (ft)
5356.00
5355.00
5354.00
5353.00
5352.00
5351.00
5350.00
5349.00
5348.00
0
10
20
30
40
50
60
70
80
Station (ft)
2019 WS
2015
2016
2016 WS
2017
2017 WS
2018
2018 WS
2019
2019 WS

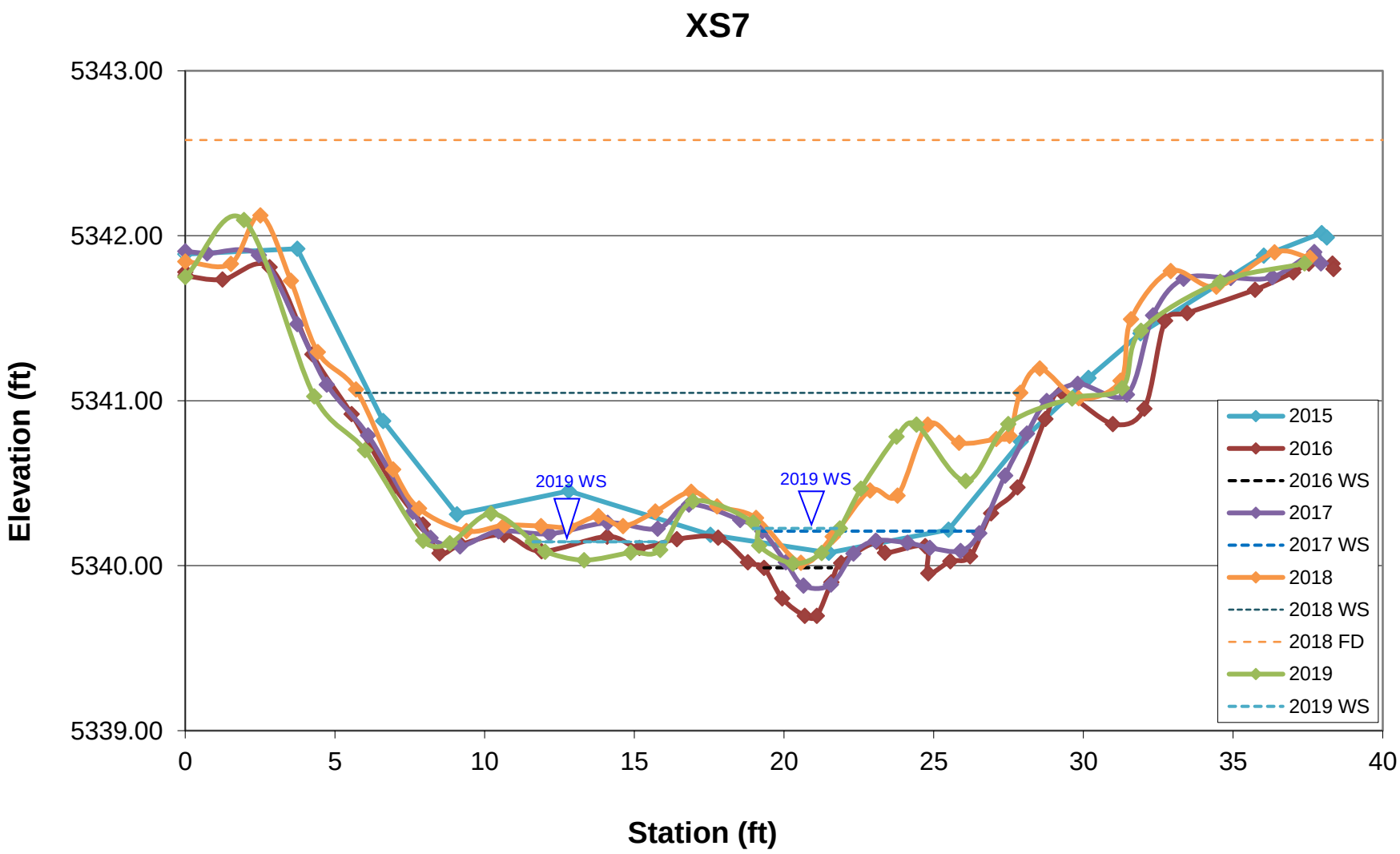

XS2
5352.00
5351.00
5350.00
5349.00
5348.00
5347.00
5346.00
Elevation (ft)
0
10
20
30
40
50
60
70
Station (ft)
2015
2015 WS
2016
2016 WS
2017
2017 WS
2017 FD
2018
2018 WS
2018 FD
2019
2019 WS
2019 WS

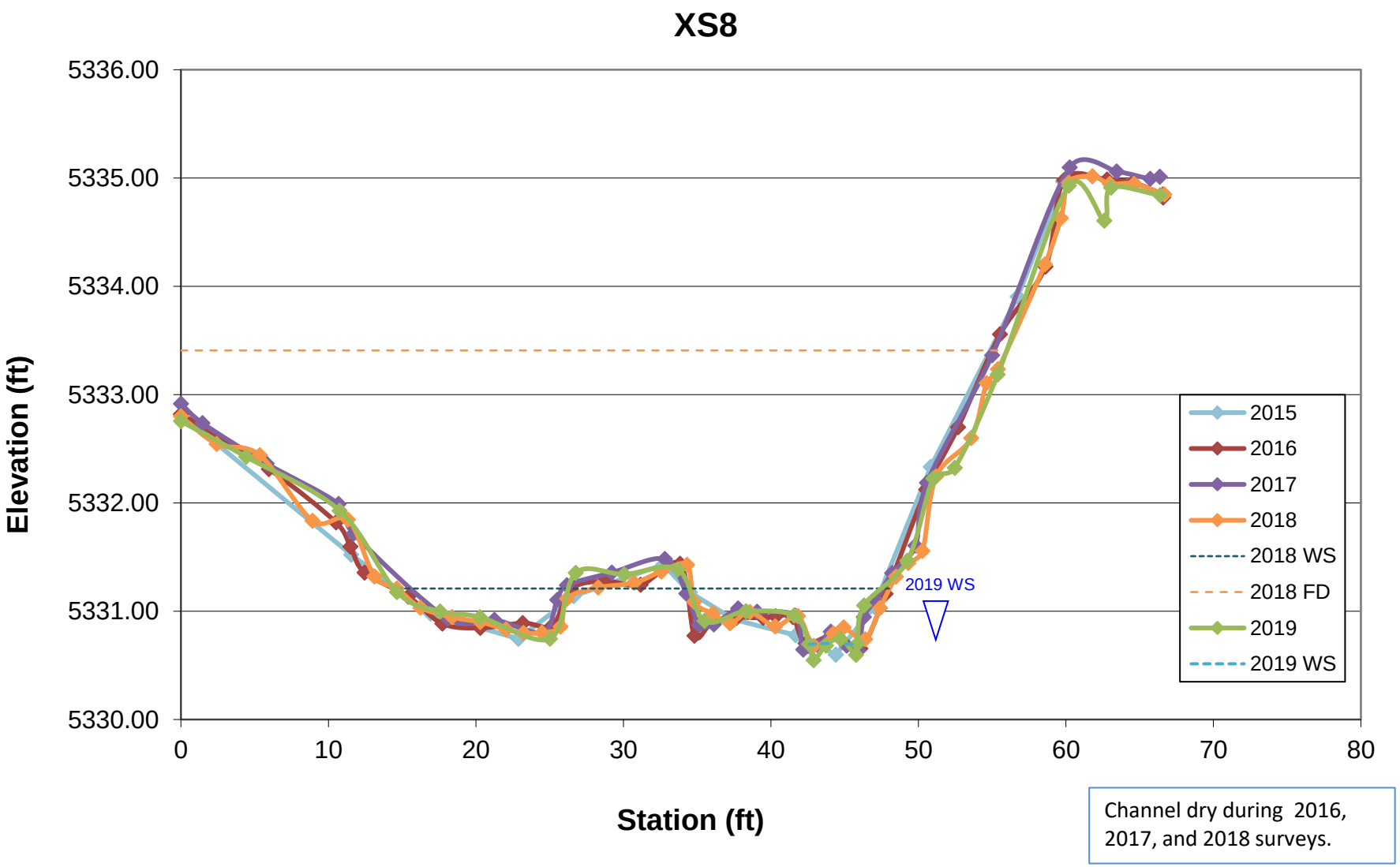

XS3
5347.00
5346.00
5345.00
5344.00
5343.00
5342.00
Elevation (ft)
0
5
10
15
20
25
30
35
40
45
50
Station (ft)
2019 WS
2015
2015 WS
2016
2016 WS
2017
2017 WS
2017 FD
2018
2018 WS
2019
2019 ws


XS4
Elevation (ft)
Station (ft)
5346.00
5345.00
5344.00
5343.00
5342.00
5341.00
0
5
10
15
20
25
30
35
40
45
50
2019 WS
2015
2016
2016 WS
2017
2017 WS
2017 FD
2018
2018 WS
2018 FD
2019
2019 WS


XS5
5345.00
5344.00
5343.00
5342.00
5341.00
5340.00
Elevation (ft)
0
5
10
15
20
25
30
35
40
45
Station (ft)
2019 WS
2015
2016
2016 WS
2017
2017 WS
2017 FD
2018
2018 WS
2018 FD
2019
2019 WS


XS6
5344.00
5343.00
5342.00
5341.00
5340.00
5339.00
5338.00
5337.00
Elevation (ft)
0
5
10
15
20
25
30
35
Station (ft)
2019 WS
2019 WS
2015
2015 WS
2016
2016 WS
2017
2017 WS
2018
2018 WS
2018 FD
2019
2019 WS


XS7
5343.00
5342.00
5341.00
5340.00
5339.00
Elevation (ft)
0
5
10
15
20
25
30
35
40
Station (ft)
2019 WS
2019 WS
2015
2016
2016 WS
2017
2017 WS
2018
2018 WS
2018 FD
2019
2019 WS


XS8
Elevation (ft)
5336.00
5335.00
5334.00
5333.00
5332.00
5331.00
5330.00
0
10
20
30
40
50
60
70
80
Station (ft)
2019 WS
2015
2016
2017
2018
2018 WS
2018 FD
2019
2019 WS
Channel dry during 2016, 2017, and 2018 surveys.