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2022 Stormwater BMPs Repair, Inspection Report, and Maintenance Work Plan BNSF Railway Company and Union Pacific Railroad Company Butte Priority Soils Operable Unit KJ 2299019.00

Doug Brannan P.E.

Kennedy Jenks

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16 February 2023

Transmitted Electronically via Email

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Subject: 2022 Stormwater BMPs Repair, Inspection Report, and Maintenance Work Plan
BNSF Railway Company and Union Pacific Railroad Company
Butte Priority Soils Operable Unit
KJ 2299019.00

Dear Mr. Greene:

This 2022 Stormwater Best Management Practices (BMPs) Repair, Inspection Report, and Maintenance Work Plan (report/work plan) presents 2022 repairs and findings from the September 2022 stormwater inspection activities. Kennedy/Jenks Consultants, Inc. (Kennedy Jenks) personnel performed the activities described in this report on behalf of BNSF Railway Company (BNSF) and Union Pacific Railroad Company (Union Pacific), collectively referred to as the Railroads. The inspections cover the stormwater features of the Railroads' portions of the Railroad Beds Time Critical Removal Action (RBTCRA) and certain portions of the Unilateral Administrative Order (UAO), U.S. Environmental Protection Agency (EPA) Docket No. CERCLA-08-2011-011 associated with the Butte Priority Soils Operable Unit (BPSOU) of the Silver Bow Creek/Butte Area National Priorities List Site. Kennedy Jenks has prepared this report on behalf of the Railroads.

The activities presented in this report were performed according to the procedures described in the following operation and maintenance and data management documents prepared for the Railroads by Kennedy Jenks: 1) *Revised 2023 Operation and Maintenance Plan, Railroad Stormwater Best Management Practices within the Butte Priority Soils Operable Unit* (Stormwater BMP O&M Plan; Kennedy Jenks 2016); 2) the *Draft Operations and Maintenance Plan, BNSF Railway Company and Union Pacific Railroad Company, Railroad Non-Track Areas* (Kennedy Jenks 2011a); 3) the *Draft Operations and Maintenance Plan, Active Railroad Lines* (Kennedy Jenks 2011b); and the *Revised 2023 Data Management Plan* (DMP; Kennedy Jenks 2017).

Per the Stormwater BMP O&M Plan, stormwater BMPs are inspected on an annual basis. The stormwater BMPs are grouped by the following railyard/railroad subareas (shown on Figure 1):

- Middle Yard
- Lower Yard
- Mainline East.

Stormwater BMPs were inspected by Kennedy Jenks personnel on 27 through 28 September 2022. Observations found stormwater BMPs to be performing as designed and identified recommended maintenance activities. Based on observations at the time of inspection, maintenance is recommended for seven (7) of the stormwater BMPs. Other stormwater BMPs were observed to be performing as designed and no additional maintenance is needed.

Stormwater BMPs and their O&M condition are shown on Figures 2 through 4. Additionally, the inspection results and maintenance needs for BMPs are summarized in Tables 1 through 3. Inspection forms and photographs for BMPs with 2022 maintenance scope are provided in Attachments 1 and 2, respectively. Maintenance items identified in 2021 and not yet addressed in 2022 are shown in a peach color in Tables 1 through 3 and 2022 items are shown in yellow.

2022 Maintenance Actions Performed

Middle Yard (Table 1)

MY-CVR-01 (Rock Cap). Displaced Type 3 rock was moved to cover area of exposed geotextile fabric.

MY-D-01 (Riprap). Trash in the ditch was removed and disposed of at the local landfill.

MY-D-02 (Riprap). Trash in the ditch was removed and disposed of at the local landfill.

MY-D-03 (Riprap). Trash in the ditches was removed and disposed of at the local landfill.

MY-D-04 (Partial topsoil with vegetation). Trash in the ditch was removed and disposed of at the local landfill.

MY-D-05 (Partial topsoil with vegetation). Vegetative growth was mechanically removed from ditch. Trash in the ditch was removed and disposed of at the local landfill.

MY-O-07. Vegetative growth was mechanically removed from outfall.

MY-O-08. Vegetative growth was mechanically removed from outfall.

MY-PND-01 (Unlined sediment basin). Trash in the sediment basin was removed and disposed of at the local landfill.

MY-PND-02 (Unlined sediment basin). Trash in the sediment basin was removed and disposed of at the local landfill.

MY-RCP-04. Trash in the sediment basin was removed and disposed of at the local landfill.

Lower Yard (Table 2)

LY-B-02 (Vegetative Berm). Trash was removed from the berm and disposed of at the local landfill.

LY-D-01 (Riprap ditch). Trash was removed from the riprap area and disposed of at the local landfill.

LY-D-04 (Riprap ditch). Trash was removed from the riprap area and disposed of at the local landfill.

LY-I-05. Wood debris was removed from inlet grate during inspection.

LY-O-01. Trash was removed from the outfall and disposed of at the local landfill.

LY-RA-02 (Riprap ditch). Trash was removed from the riprap area and disposed of at the local landfill.

Mainline East (Table 3)

MLE-B-01 (Barren Berm). Noxious weeds were observed, and spot herbicide was applied during 2022 inspection, noxious weeds were sprayed with a mixture of Weedmaster® herbicide (dimethylamine salts of 2,4-dichlorophenoxyacetic acid and dicamba) and Activator 90 (surfactant). These weeds will be monitored during the 2023 inspection.

MLE-B-02 (Barren Berm). Removed weeds from berm during inspection and disposed of at the local landfill.

MLE-PND-03 (Unlined sediment basin). Trash was removed and disposed of at the local landfill.

MLE-PND-04 (Unlined sediment basin). Trash and weeds removed and disposed of at the local landfill.

MLE-RA-01 (Riprap set in concrete). Trash and weeds removed from the riprap area and disposed of at the local landfill.

MLE-RA-02 (Riprap set in concrete). Trash was removed from the riprap area and disposed of at the local landfill.

2022 Inspections Requiring Maintenance

The maintenance needs per railroad area are as follows:

- Middle Yard (one location; see Figure 2 and Table 1)
- Lower Yard (six locations; see Figure 3 and Table 2)
- Mainline East (no locations; see Figure 4 and Table 3)

A presentation of observations and recommendations for the 2023 maintenance scope items are provided in the following sections by railroad area. Stormwater BMPs are identified using their assigned asset identification (e.g., MY-C-03) from the Stormwater BMP O&M Plan.

Middle Yard (Table 1)

MY-D-03 (Riprap). Accumulated sediment was observed in ditch at outlet of MY-HDPE-03 (see photographs MY-D-03 in Attachment 2). Sediment has accumulated over an area of approximately 60 sq ft with a thickness of 1 to 3 inches. Remove and dispose of sediment. Potential methods of sediment removal may include one or more of the following, but are not limited to, vacuum extraction, shoveling, and brushing. This work will be completed by a contractor with engineering oversight.

Lower Yard (Table 2)

LY-D-01 (Riprap ditch). Accumulated sediment and thin rock cover was observed in ditch at the inlet and outlet of LY-HDPE-02 (see photographs LY-D-01 in Attachment 2). In the ditch, on the Southwest side of LY-HDPE-02, limited erosion is occurring, approximately 1 inch of sediment has accumulated, and rock is missing in an area of approximately 30 SF. Remove sediment from riprap ditch and cover area of thin rock cover with Type 2 Rock. Potential methods of sediment removal may include one or more of the following, but are not limited to, vacuum extraction, shoveling, and brushing. This work will be completed by a contractor with engineering oversight.

LY-HDPE-02. Accumulated sediment was observed in pipe (see photograph LY-HDPE-02 in Attachment 2). Sediment is entering pipe from the downgradient accumulation and is reducing flow through the pipe. Remove and dispose of sediment. Potential methods of sediment removal may include one or more of the following, but are not limited to, vacuum extraction, shoveling, and brushing. This work will be completed by a contractor with engineering oversight.

LY-HDPE-03. Accumulated sediment was observed in pipe (see photograph LY-HDPE-03 in Attachment 2). Sediment is entering pipe from the upgradient accumulation and is reducing flow through the pipe. Remove and dispose of sediment. Potential methods of sediment removal may include one or more of the following, but are not limited to, vacuum extraction, shoveling, and brushing. This work will be completed by a contractor with engineering oversight.

LY-PND-01. At the time of the inspection, two 1-foot-long tears remain in similar condition to observed conditions during the 2021 inspection and one 2-foot-long tear, , one 0.5 foot-long tear, and two 0.25 foot-long tears were newly observed in the sediment basin high density polyethylene (HDPE) liner; however, the sediment basin is still performing per design. Liner repairs have been added to the 2021 inspection maintenance items scheduled for repair. Undesirable vegetation growth observed in basin area at approximately 60 percent density covering 20,000 square feet (see photographs for LY-PND-01 in Attachment 2). Repair the liner tears and spot spray with limited application of herbicide as needed. This work will be completed by a contractor with engineering oversight.

LY-RA-01a,b. Accumulated sediment was observed at inlet and outlet aprons (see photographs LY-RA-01a,b in Attachment 2). Sediment appears to be accumulating from the 1,650 sq ft barren area east of Lower Yard entrance driveway and the 2,300-square-foot barren area west of the driveway. Remove sediment from riprap aprons, regrade inlet apron to 2:1 slope, and cover barren areas in 6 inches of Type 3 Rock. Potential methods of sediment removal may include one or more of the following, but are not limited to, vacuum extraction, shoveling, and brushing. This work will be completed by a contractor with engineering oversight.

Mainline East

No new maintenance items observed during the 2022 inspections.

Solid Media Management Approach

Sediment removal is recommended at LY-HDPE-02, LY-HDPE-03, LY-D-01, and LY-RA-01. Sediment will be managed in accordance with the *Revised 2023 Quality Assurance Project Plan for the Long-Term Operation and Maintenance of Railroad Assets* (QAPP, Kennedy Jenks 2020), including the solid

media management standard operating procedure (BPSOU-SOP-01) for screening, removal, temporary management, analytical testing, and disposal/reuse.

Per the QAPP, the following will occur in the order shown:

1. Contractor will remove solid media.

2. Construction oversight engineer will provide a visual screening of the removed solid media.

3. Solid media will be hauled by the Contractor and managed at the Lower Yard.

4. At the Lower Yard solid media management area, solid media will be screened visually for potential mining-related materials. Samples will be collected and submitted to an analytical laboratory to be tested by EPA Method SW-846 Test Method 6010D for lead and arsenic[1] and other analyses as required by prospective disposal facilities. Solid media will be managed onsite in approved areas or disposed offsite at approved facilities.

5. Analytical data will be managed in accordance with the DMP (Kennedy Jenks 2017).

Anticipated Scope and Schedule

The scope of work presented here is intended to be implemented in spring 2023. EPA and Montana Department of Environmental Quality (DEQ) will be notified of the maintenance schedule prior to mobilization. Work recommended in this report/work plan will be completed by a contractor with engineering oversight.

References

Kennedy/Jenks Consultants, Inc. 2011a. *Draft Operations and Maintenance Plan, BNSF Railway Company and Union Pacific Railroad Company, Railroad Non-Track Areas, Butte Priority Soils Operable Unit.* Prepared for BNSF Railway Company and Union Pacific Railroad Company. 5 October 2011. Kennedy/Jenks Consultants, Federal Way, Washington.

Kennedy/Jenks Consultants, Inc. 2011b. *Draft Operations and Maintenance Plan, Active Railroad Lines, Butte Priority Soils Operable Unit.* Prepared for BNSF Railway Company and Union Pacific Railroad Company. 13 October 2011. Kennedy/Jenks Consultants, Federal Way, Washington.

Kennedy/Jenks Consultants, Inc. 2016a. *Final Interim Operation and Maintenance Plan, Railroad Stormwater Best Management Practices within the Butte Priority Soils Operable Unit.* Prepared for BNSF Railway Company and Union Pacific Railroad Company. March 2016. Kennedy/Jenks Consultants, Whitefish, Montana.

[1] Lead and arsenic are the applicable constituents of concern (COCs) from the BPSOU Record of Decision (ROD) to be tested.

Kennedy/Jenks Consultants, Inc. 2017. *Final Revised 2017 Data Management Plan.* Prepared for BNSF Railway Company and Union Pacific Railroad Company. July 2017. Kennedy/Jenks Consultants, Whitefish, Montana.

Kennedy/Jenks Consultants, Inc. 2020. *Quality Assurance Project Plan for the Long-Term Operation and Maintenance of Railroad Assets Revision.* August 2020. Kennedy/Jenks Consultants, Whitefish, Montana.

Please contact Doug Brannan of Kennedy Jenks' Whitefish, Montana, office at (406) 578-4503 with any questions.

Sincerely,

Doug Brannan, P.E.
Technical Representative for
BNSF Railway Company
Union Pacific Railroad Company

Attachments:

Table 1: Middle Yard 2022 Stormwater BMP Maintenance Inspections Checklist
Table 2: Lower Yard 2022 Stormwater BMP Maintenance Inspections Checklist
Table 3: Mainline East 2022 Stormwater BMP Maintenance Inspections Checklist
Figure 1: Project Location Overview
Figure 2: Middle Yard Stormwater BMPs – 2022 Inspections
Figure 3: Lower Yard Stormwater BMPs – 2022 Inspection
Figure 4: Mainline East Stormwater BMPs – 2022 Inspections

Attachment 1: Inspection Forms
Attachment 2: Maintenance Required Photographs

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Tables

TABLE 1

MIDDLE YARD
2022 STORMWATER BMP MAINTENANCE INSPECTIONS CHECKLIST
Butte Priority Soils Operable Unit
Butte, Montana

SW BMP ID(a)	SW Feature Type	BMP Inspected (Y or N)	General Condition (G, F, or P)[b]	Needs Maintenance (Y or N)[c]	Maintenance Completed at Time of Inspection (Y or N)[d]	Maintenance to be Completed After Inspection (Y or N)	Comments/Notes
MY-B-01	B = berm	Y	G	N	N	N	
MY-C-01	C=combination manhole/inlet	Y	G	N	Y	N	Removed trash during inspection.
MY-C-02	C=combination manhole/inlet	Y	G	N	N	N	
MY-C-03	C=combination manhole/inlet	Y	G	N	N	N	
MY-C-04	C=combination manhole/inlet	Y	G	N	N	N	
MY-CVR-01	CVR = Cover	Y	F	Y	Y	N	1 ft wide area of exposed geofabric along north side of cap along tracks. Several areas of displaced rock in cap, appears to be from vehicle traffic, rock was moved to cover displaced areas during inspection.
MY-CVR-02	CVR = Cover	Y	G	N	N	N	
MY-D-01	D = ditch	Y	G	Y	Y	N	Vegetation growth in ditch to be monitored. Trash was removed during inspection.
MY-D-02	D = ditch	Y	G	Y	Y	N	Minor sediment accumulated in western rip rap ditch to be monitored. Trash removed during inspection.
MY-D-03	D = ditch	Y	P	Y	Y	Y	Some vegetation (summer-cypress) present. Trash removed during inspection. On the south side of the northeast ditch at MY-HDPE-03 outlet, 1-3 inches of sediment is covering rock over an approximately 60 SF area.
MY-D-04	D = ditch	Y	G	Y	Y	N	Removed trash during inspection.
MY-D-05	D = ditch	Y	G	Y	Y	N	Barren area approximately 70 SF observed on northwest end of ditch to be monitored. Weeds and trash removed during inspection.
MY-HDPE-01	HDPE = pipe/culvert	Y	G	N	N	N	
MY-HDPE-02	HDPE = pipe/culvert	Y	G	N	N	N	
MY-HDPE-03	HDPE = pipe/culvert	Y	G	N	N	N	
MY-HDPE-04	HDPE = pipe/culvert	Y	G	N	N	N	
MY-HDPE-05	HDPE = pipe/culvert	Y	G	N	N	N	
MY-HDPE-06	HDPE = pipe/culvert	Y	G	N	N	N	
MY-M-01	M = manhole	Y	G	N	N	N	
MY-CLAY-01	CLAY = tile/clay	Y	G	N	N	N	
MY-O-01	O = outfall/spillway	Y	G	N	N	N	
MY-O-02	O = outfall/spillway	Y	G	N	N	N	Grass growth at outflow to be monitored.
MY-O-03	O = outfall/spillway	Y	G	N	N	N	
MY-O-04	O = outfall/spillway	Y	G	N	N	N	
MY-O-05	O = outfall/spillway	Y	G	N	N	N	
MY-O-06	O = outfall/spillway	Y	G	N	N	N	
MY-O-07	O = outfall/spillway	Y	G	Y	Y	N	Grass and weeds mechanically removed.
MY-O-08	O = outfall/spillway	Y	G	Y	Y	N	Grass mechanically removed.
MY-O-09	O = outfall/spillway	Y	G	N	N	N	
MY-PND-01	PND = retention pond/sediment basin	Y	G	Y	Y	N	Rills forming on north and east side of basin wall to be monitored. Noxious weeds in basin on north and south side sprayed. Removed trash during inspection.
MY-PND-02	PND=retention pond/sediment basin	Y	G	Y	Y	N	Vegetation (grass, toadflax) present. Small rills observed on northern slope, will continue to monitor. Trash was removed during inspection.
MY-RA-01	RA = riprap apron	Y	G	N	N	N	
MY-RCP-01	RCP = pipe/culvert	Y	G	N	N	N	
MY-RCP-02	RCP = pipe/culvert	Y	G	N	N	N	
MY-RCP-03	RCP = pipe/culvert	Y	G	N	N	N	
MY-RCP-04	RCP = pipe/culvert	Y	G	Y	Y	N	Removed trash during inspection.

= Performing as designed. = Maintenance needed from 2022 inspection. Y = Yes N = No

Notes:

(a) Stormwater best management practice (BMP) IDs presented in greater detail in Interim Final: Operation and Maintenance Plan Stormwater Best Management Practices within the Butte Priority Soils Operable Unit, dated March 2016.

(b) G = good; F = fair; P = poor.

(c) If maintenance is needed, take photograph and complete inspection portion of inspections/maintenance form specific to the stormwater BMP feature type.

(d) If maintenance is completed at time of inspection, complete "maintenance" portion of inspection/maintenance form.

SW = stormwater RCP = reinforced concrete pipe

HDPE = high-density polyethylene

TABLE 2

LOWER YARD
2022 STORMWATER BMP MAINTENANCE INSPECTIONS CHECKLIST
Butte Priority Soils Operable Unit
Butte, Montana

SW BMP ID[a]	SW Feature Type	BMP Inspected (Y or N)	General Condition (G, F, or P)[b]	Needs Maintenance (Y or N)[c]	Maintenance Completed at Time of Inspection (Y or N)[d]	Maintenance to be Completed After Inspection (Y or N)	Comments/Notes
LY-B-01	B = berm	Y	G	N	N	N	
LY-B-02	B = berm	Y	G	Y	Y	N	Removed trash during inspection.
LY-B-03	B = berm	Y	G	N	N	N	
LY-C-01	C = combination manhole/inlet	Y	G	N	N	N	
LY-CMP-01	CMP = pipe/culvert	Y	G	N	N	N	
LY-CMP-02, LY-CMP-03	CMP = pipe/culvert	Y	G	N	N	N	
LY-CPP-01	CPP = pipe/culvert	Y	G	N	N	N	
LY-CSP-01	CSP= pipe/culvert	Y	G	N	N	N	
LY-CSP-02	CSP= pipe/culvert	Y	G	N	N	N	
LY-D-01	D = ditch	Y	P	Y	Y	Y	Sediment is accumulating at both ends of LY-HDPE-02 and rock cover is thin. In the ditch, on the Southwest side of LY-HDPE-02, some erosion is occurring, approximately 1 inch of sediment has accumulated and rock is missing in an area of approximately 30 SF. Collected trash during inspection.
LY-D-02	D = ditch	Y	G	N	N	N	
LY-D-03	D = ditch	Y	G	N	N	N	Western ditch has sediment accumulation in approximately 25 ft along the northern portion of ditch to be monitored for additional sediment accumulation.
LY-D-04	D = ditch	Y	G	Y	Y	N	Removed trash during inspection.
LY-HDPE-01	HDPE = pipe/culvert	Y	G	N	N	N	
LY-HDPE-02	HDPE = pipe/culvert	Y	P	Y	N	Y	Sediment accumulated at pipe outlet, sediment is obstructing approximately 80% of pipe outlet. Sediment removal is part of the 2021 inspection maintenance items scheduled.
LY-HDPE-03	HDPE = pipe/culvert	Y	P	Y	N	Y	Sediment accumulated at pipe inlet and outlet, sediment is obstructing approximately 50% of pipe inlet and outlet. Sediment removal is part of the 2021 inspection maintenance items scheduled.
LY-HDPE-04	HDPE = pipe/culvert	Y	G	N	N	N	
LY-HDPE-05	HDPE = pipe/culvert	Y	G	N	N	N	
LY-HDPE-06	HDPE = pipe/culvert	Y	G	N	N	N	
LY-HDPE-07	HDPE = pipe/culvert	Y	G	N	N	N	
LY-HDPE-08	HDPE = pipe/culvert	Y	G	N	N	N	
LY-HDPE-09	HDPE = pipe/culvert	Y	G	N	N	N	
LY-I-01	I = inlet	Y	G	N	N	N	
LY-I-02	I = inlet	Y	G	N	N	N	Some rock falling into inlet through grate to be monitored.
LY-I-03	I = inlet	Y	G	N	N	N	Some rock falling into inlet through grate to be monitored.
LY-I-04	I = inlet	Y	G	N	N	N	Some rock falling into inlet through grate to be monitored.
LY-I-05	I = inlet	Y	G	Y	Y	N	Pieces of wood from broken railroad tie covering inlet. Wood pieces were moved off of inlet.
LY-I-06	I = inlet	Y	G	N	N	N	
LY-M-01	M = manhole (solid lid)	Y	G	N	N	N	
LY-M-02	M = manhole	Y	G	N	N	N	
LY-M-03	M = manhole	Y	G	N	N	N	
LY-M-04	M = manhole	Y	G	N	N	N	
LY-O-01	O = outfall/spillway	Y	G	Y	Y	N	Removed trash during inspection.
LY-O-04	O = outfall/spillway	Y	G	N	N	N	
LY-PND-01	PND = retention pond/sediment basin	Y	F	Y	Y	Y	Sediment accumulation observed at both the west and east side of pond. Minor rills present on the north side of pond near gate entrance. UWS and noxious weeds from 2021 inspection still present. Two liner tears from 2021 inspection observed, both tears are part of the 2021 inspection maintenance items scheduled for repair. Four new liner tears observed on north side slope of basin near gate. 1 - 24 inch, 1 - 6 inch, 2 - 3 inch.
LY-PND-02	PND = retention pond/sediment basin	Y	G	N	N	N	Minor rills above inlet pipe on north side of pond to be monitored.
LY-RA-01a,b	RA = riprap apron	Y	P	Y	N	Y	Sediment accumulated in apron. Sediment removal is part of the 2021 inspection maintenance items scheduled.
LY-RA-02	RA = riprap apron	Y	G	Y	Y	N	Removed trash during inspection.

= Performing as designed. = Maintenance needed from 2022 inspection. = Maintenance needed from 2021 inspection.

Notes:

(a) Stormwater best management practice (BMP) IDs presented in greater detail in Interim Final: Operation and Maintenance Plan Stormwater Best Management Practices within the Butte Priority Soils Operable Unit, dated March 2016.

(b) G = good; F = fair; P = poor.

(c) If maintenance is needed, take photograph and complete inspection portion of inspections/maintenance form specific to the stormwater BMP feature type.

(d) If maintenance is completed at time of inspection, complete "maintenance" portion of inspection/maintenance form.

SW = stormwater. CSP = corrugated steel pipe. HDPE = high-density polyethylene. Y = Yes. N = No. NA = Not Applicable.

TABLE 3

MAINLINE EAST
2022 STORMWATER BMP MAINTENANCE INSPECTIONS CHECKLIST
Butte Priority Soils Operable Unit
Butte, Montana

SW BMP ID[(a)]	SW Feature Type	BMP Inspected (Y or N)	General Condition (G, F, or P)[(b)]	Needs Maintenance (Y or N)[(c)]	Maintenance Completed at Time of Inspection (Y or N)[(d)]	Maintenance to be Completed After Inspection (Y or N)	Comments/Notes
MLE-B-01	B = berm	Y	F	Y	Y	N	Vegetation is present in several areas of the berm, spot herbicide was applied.
MLE-B-02	B = berm	Y	G	Y	Y	N	Removed weeds during inspection.
MLE-C-01	C = combination manhole/inlet	Y	G	N	N	N	
MLE-D-01	D = ditch	Y	F	N	Y	N	One point on north side along edge of cap where geo fabric is exposed. Fabric covered with rock.
MLE-D-02	D = ditch	Y	G	N	N	N	
MLE-O-01	O = outlet/spillway	Y	G	N	N	N	
MLE-PND-01	PND = retention pond/sediment basin	Y	G	N	N	N	
MLE-PND-02	PND = retention pond/sediment basin	Y	G	N	N	N	
MLE-PND-03	PND = retention pond/sediment basin	Y	G	Y	Y	N	Two large Timbers in pond. Noxious weeds present. Trash removed during inspection. Continue to monitor weeds for spraying.
MLE-PND-04	PND = retention pond/sediment basin	Y	G	Y	Y	N	Trash and weeds removed during inspection.
MLE-RA-01	RA = riprap apron	Y	F	Y	Y	N	Rock has fallen off area above culvert, small area of geofabric exposed directly above culvert to be monitored for additional settlement. Trash and weeds removed during inspection.
MLE-RA-02	RA = riprap apron	Y	G	Y	Y	N	Removed trash during inspection.

= Performing as designed. Y = Yes N = No

Notes:

(a) Stormwater best management practice (BMP) IDs presented in greater detail in Interim Final: Operation and Maintenance Plan Stormwater Best Management Practices within the Butte Priority Soils Operable Unit, dated March 2016.

(b) G = good; F = fair; P = poor.

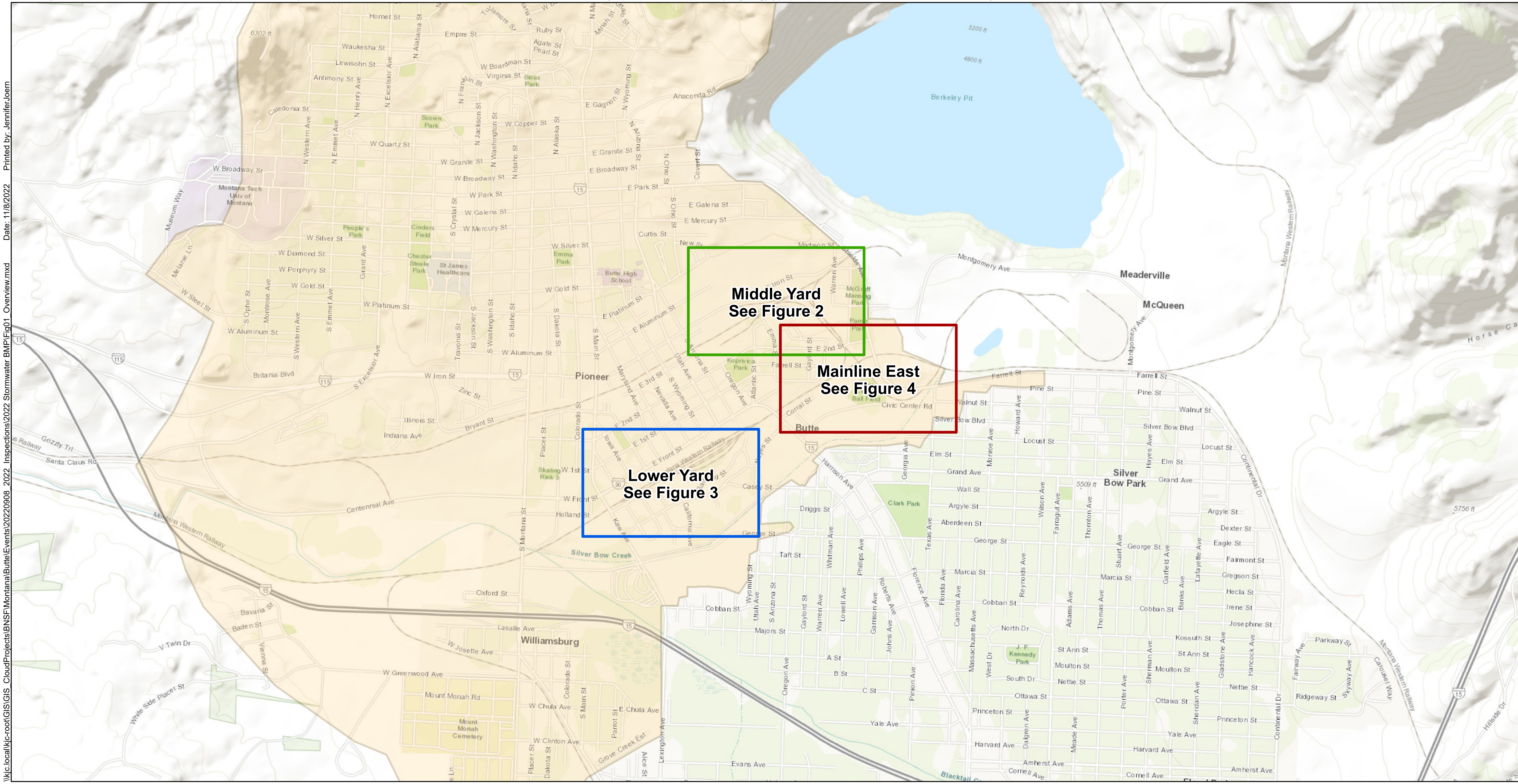
(c) If maintenance is needed, take photograph and complete inspection portion of inspections/maintenance form specific to the stormwater BMP feature type.

(d) If maintenance is completed at time of inspection, complete "maintenance" portion of inspection/maintenance form.

SW = stormwater

Figures

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



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Legend

- Figure 2: Middle Yard
- Figure 3: Lower Yard
- Figure 4: Mainline East
- BPSOU

N

0 0.25 0.5
Miles

Kennedy Jenks

Butte Priority Soils Operable Unit
Butte, MT

Project Location Overview

BNSF/Union Pacific
2299019*01

Figure 1

Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Printed by: Jennifer.Joern Date: 11/9/2022 \\kjc-local\kjc-root\GIS\GIS_CloudProjects\BNSFMontana\Butte\Events\20220908_2022_Inspections\2022 Stormwater BMP\Fig02_MiddleYard.mxd

MY-C-04
MY-HDPE-06
MY-D-05
MY-O-09
MY-D-04
MY-O-08
MY-O-07
MY-O-06
MY-O-05
MY-RCP-04
MY-D-05
MY-RCP-02
MY-O-03
MY-PND-01
MY-D-01
MY-O-02
MY-PND-01
MY-D-01
MY-HDPE-05
MY-C-03
MY-HDPE-04
MY-D-01
MY-D-04
MY-D-01
MY-RA-01
MY-D-01
MY-RCP-01
MY-C-01
MY-CLAY-01
MY-HDPE-02
MY-O-01
MY-O-04
MY-M-01
MY-RCP-03
MY-PND-02
MY-C-02
MY-HDPE-03
MY-D-03
MY-D-03
MY-D-02
MY-HDPE-01
MY-CVR-02
MY-CVR-02
MY-D-02
MY-CVR-01
MY-B-01
MLE-D-01

NEW ST
MAHONEY ST
S OHIO ST
E PLATINUM ST
E ALUMINUM ST
MADISON ST
E IRON ST
JEFFERSON ST
GALLATIN ST
WARREN AVE
CHICAGO ST
SHIELDS AVE
GARDEN AVE
ATLANTIC ST
EMMA ST
SHORT ST
ERGO ST
E SECOND ST
GAYLORD ST
S ARIZONA ST
UTAH AVE
THIRD ST

Legend

Stormwater Manhole/Inlet/Outfall

BMP Performing as Designed

Stormwater Pipe/Culvert

BMP Performing as Designed

Stormwater Barren Berm/Ditch/Retention Basin/Riprap

BMP Performing as Designed

BMP Needs Maintenance

Stormwater Flow Direction

MY-B-01 Assigned GIS Code

Code Key:

PND =	pond
D =	ditch
I =	inlet
M =	manhole
C =	combination manhole and inlet
O =	outfall/spillway
CMP,RCP, HDPE, CIP, CLAY, WOOD, ect. =	type of pipe/culvert material
B =	berm
CVR =	cover

Notes:
1. BMP = Best Management Practices
   BRES = Butte Reclamation Evaluation System
2. Inspections performed 27-28 September 2022.
3. All features shown are stormwater BMPs, BRES sites are not shown.

N

0 125 250
Scale: Feet

Kennedy Jenks

Butte Priority Soils Operable Unit
Butte, MT

Middle Yard Stormwater BMP 2022 Inspections

BNSF/Union Pacific
2299019*01

Figure 2

Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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W SECOND ST
E SECOND ST
S DAKOTA ST
COLORADO ST
E FIRST ST
MARYLAND AVE
CALIFORNIA AVE
NEVADA AVE
DELAWARE AVE
IOWA AVE
W FIRST ST
MISSOURI AVE
S MAIN ST
E FRONT ST
W FRONT ST
HOLLAND ST
KAW AVE
RAILROAD ST
NOYES ST
UTAH AVE
CASEY ST
IRVINE ST
GEORGE ST

LY-HDPE-06
LY-PND-02
LY-C-01
LY-M-02
LY-HDPE-07
LY-M-03
LY-HDPE-08
LY-M-04
LY-HDPE-09
LY-CSP-02
LY-I-06
LY-I-05
LY-I-04
LY-CSP-01
LY-B-03
LY-I-02
LY-I-03
LY-D-02
LY-HDPE-04
LY-M-01
LY-HDPE-05
LY-O-04
LY-CPP-01
LY-B-01
LY-PND-01
LY-D-01
LY-B-01
LY-D-03
LY-D-03
LY-I-01
LY-RA_02
LY-CMP-03
LY-CMP-02
LY-D-01
LY-HDPE-01
LY-B-02
LY-O-01
LY-CMP-01
LY-D-01
LY-HDPE-02
LY-D-01
LY-D-04
LY-HDPE-02
LY-HDPE-03
LY-RA-01

Legend

Stormwater Manhole/Inlet/Outfall

- BMP Performing as Designed
- BMP Needs Maintenance

Stormwater Pipe/Culvert

- BMP Performing as Designed
- BMP Needs Maintenance

Stormwater Barren Berm/Ditch/Retention Basin/Riprap

- BMP Performing as Designed
- BMP Needs Maintenance
- Stormwater Flow Direction

LY-B-01 Assigned GIS Code

Code Key:

PND =	pond
D =	ditch
I =	inlet
M =	manhole
C =	combination manhole and inlet
O =	outfall/spillway
CMP,RCP, HDPE, CIP, CLAY, WOOD, ect. =	type of pipe/culvert material
B =	berm
CVR =	cover

Notes:
1. BMP = Best Management Practices
   BRES = Butte Reclamation Evaluation System
2. Inspections performed 27-28 September 2022.
3. All features shown are stormwater BMPs, BRES sites are not shown.

N

0 125 250

Scale: Feet

Kennedy Jenks

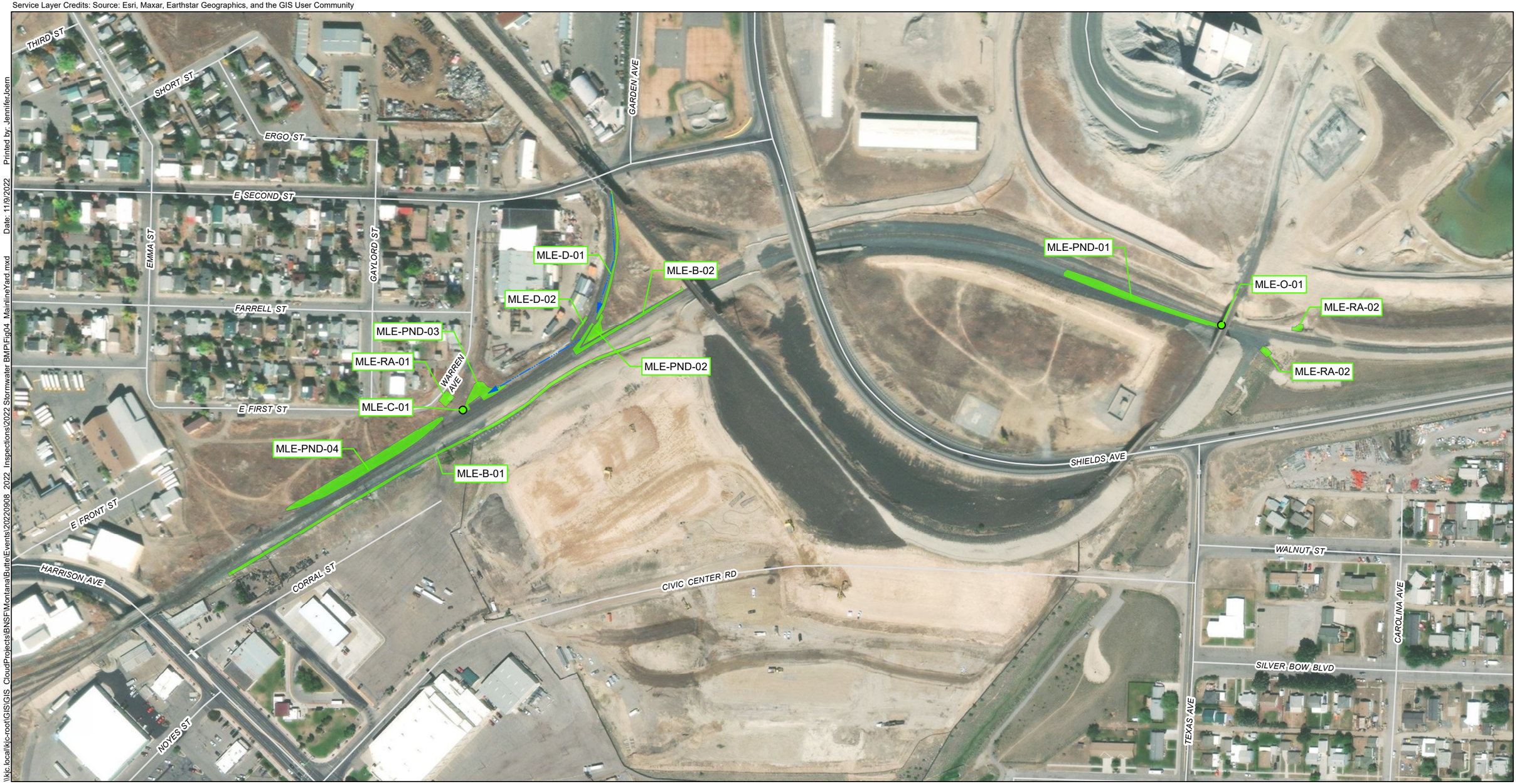
Butte Priority Soils Operable Unit
Butte, MT

Lower Yard Stormwater BMP 2022 Inspections

BNSF/Union Pacific
2299019*01

Figure 3

Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



\\kjc.local\kjc-root\GIS\GIS_CloudProjects\BNSFMontana\Butte\Events\20220908_2022_Inspections\2022 Stormwater BMP\Fig04_MainlineYard.mxd Date: 11/9/2022 Printed by: JenniferJoern

Legend

Stormwater Manhole/Inlet/Outfall

- BMP Performing as Designed

Stormwater Barren Berm/Ditch/Retention Basin/Riprap

- BMP Performing as Designed

Stormwater Flow Direction

MLE-B-01 Assigned GIS Code

Code Key:

PND =	pond
D =	ditch
I =	inlet
M =	manhole
C =	combination manhole and inlet
O =	outfall/spillway
CMP,RCP, HDPE, CIP, CLAY, WOOD, ect. =	type of pipe/culvert material
B =	berm
CVR =	cover

Notes:

1. BMP = Best Management Practices
   BRES = Butte Reclamation Evaluation System
2. Inspections performed 27-28 September 2022.
3. All features shown are stormwater BMPs, BRES sites are not shown.

N

0 125 250

Scale: Feet

Kennedy Jenks

Butte Priority Soils Operable Unit
Butte, MT

Mainline East Stormwater BMP 2022 Inspections

BNSF/Union Pacific
2299019*01

Figure 4

Attachment 1

Inspection Forms

SEDIMENT BASIN
INSPECTION AND MAINTENANCE FORM

Structure GIS Code: LY-PND-01
Type: Retention Basin

Annual Inspection Completed By: Phil Hooper **Date:** 9/27/22

Maintenance Inspection Completed By: _____ **Date:** _____

Property Classification: On-track (Off-track) Non-Railroad

Pond Liner: (HDPE) Unlined

Scoring Breakdown

N/A = Not Applicable	1 = Monitor (potential for future problem exists)	* Use open space in each section to further explain scoring as needed
N/I = Not Investigated	2 = Routine Maintenance Required	
0 = Not a Problem	3 = Immediate Repair Necessary	

Overflow Structure

Outfall/spillway channel functioning	N/A	N/I	(0)	1	2	3
Manholes, Frames and Covers	(N/A)	N/I	0	1	2	3
Released water undercutting outlet	N/A	N/I	(0)	1	2	3
Erosion	N/A	N/I	(0)	1	2	3
Displaced rip rap	N/A	N/I	(0)	1	2	3
Excessive sediment deposits	N/A	N/I	(0)	1	2	3
Other:	(N/A)	N/I	0	1	2	3

Emergency Spillway

Weeds	N/A	N/I	(0)	1	2	3
Erosion or back cutting	N/A	N/I	(0)	1	2	3
Obstructions / debris	N/A	N/I	(0)	1	2	3

SEDIMENT BASIN
INSPECTION AND MAINTENANCE FORM

Riser Built to Plans

Size: _____	CONC	CMP	or		MASONRY		(Circle One)
Minor spalling or parging (<1")	N/A	N/I	0	1	2	3	
Major spalling (exposed rebar)	N/A	N/I	0	1	2	3	
Joint failure	N/A	N/I	0	1	2	3	
Loss of joint material	N/A	N/I	0	1	2	3	
Leaking	N/A	N/I	0	1	2	3	
Manhole access and steps acceptable	N/A	N/I	0	1	2	3	
Corrosion	N/A	N/I	0	1	2	3	
Protective material deficient	N/A	N/I	0	1	2	3	
Misalignment or split seams / joints	N/A	N/I	0	1	2	3	
Anti-vortex device secure / acceptable	N/A	N/I	0	1	2	3	
Sediment Accumulation within riser	N/A	N/I	0	1	2	3	
Woody or vegetative growth within 25' of riser	N/A	N/I	0	1	2	3	
Safety Rebar/pipes in place	N/A	N/I	0	1	2	3	
Safety Rebar/pipes corroded	N/A	N/I	0	1	2	3	
Other:	N/A	N/I	0	1	2	3	

Weir Trash Rack

Structurally sound	N/A	N/I	0	1	2	3	
Debris removal necessary	N/A	N/I	0	1	2	3	
Corrosion	N/A	N/I	0	1	2	3	

Basin

Vegetation sparse	N/A	N/I	(0)	1	2	3	
Undesirable woody or vegetative growth	N/A	N/I	0	1	(2)	3	UWS & NOXIOUS Weeds Present
Low flow channels obstructed	N/A	N/I	(0)	1	2	3	
Standing water or spots	N/A	N/I	(0)	1	2	3	
Sediment or debris accumulation	N/A	N/I	0	(1)	2	3	Minor Sediment accumulation
Bathometric study recommended			(No)		Yes		
Other:	(N/A)	N/I	0	1	2	3	

Inflow Points

Number of inflow pipes: _____	Direction:		N		E		(S)	Ditches and Pipes
Endwalls, headwalls, end sections	N/A	N/I	0	(1)	2	3		Minor rills on North side Near Outle
Outfall pipes	N/A	N/I	0	1	2	3		
Discharge undercutting outlet or displacing rip-rap	N/A	N/I	(0)	1	2	3		
Discharge water is causing outfall to erode	N/A	N/I	(0)	1	2	3		
Sediment accumulation	N/A	N/I	(0)	1	2	3		

N/A = Not Applicable
N/I = Not Investigated
0 = Not a Problem

1 = Monitor for Future Repairs
2 = Routine Repairs Needed
3 = Immediate Repair Needed

SEDIMENT BASIN
INSPECTION AND MAINTENANCE FORM

Overall Condition

Total number of concerns receiving a:

2 (1) - Need Monitoring

2 (2) - Routine Repair

~~0~~ (3) - Immediate Repair Needed

Inspector's Notes

Liner repairs from August 2020 were inspected and look good. Removed trash. Recommend 1 liner repairs and cutting/removing and spraying UWS & noxious weeds inside basin & fence on side walls of basin. UWS - Ruby's breathe, knapweed, toadflax, yellow salsify. Minor rills on north side of basin near gate, continue to monitor.

Pictures (as needed)

	Clock/Degrees
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	

N/A = Not Applicable
N/I = Not Investigated
0 = Not a Problem

1 = Monitor for Future Repairs
2 = Routine Repairs Needed
3 = Immediate Repair Needed

SEDIMENT BASIN
INSPECTION AND MAINTENANCE FORM

Special Structures

Manhole access (steps, ladders)	N/A	N/I	0	1	2	3	
Vehicular access	N/A	N/I	0	1	2	3	
Concrete/masonry condition	N/A	N/I	0	1	2	3	
Trash racks	N/A	N/I	0	1	2	3	
Elbows	N/A	N/I	0	1	2	3	
Sediment / trash removal	N/A	N/I	0	1	2	3	
Manhole lockable nuts	N/A	N/I	0	1	2	3	

Liner

Punctures	N/A	N/I	0	1	2	3	
Tears	N/A	N/I	0	1	2	3	2 tears (from 2021 inspection) & 4 new tears
Seam Separation	N/A	N/I	0	1	2	3	

Miscellaneous

Fence condition	N/A	N/I	0	1	2	3	
Safety signs	N/A	N/I	0	1	2	3	
Public hazards	N/A	N/I	0	1	2	3	
Were any pad locks cut and replaced			No		Yes		How Many? _____
Other (describe)	N/A	N/I	0	1	2	3	

N/A = Not Applicable
N/I = Not Investigated
0 = Not a Problem

1 = Monitor for Future Repairs
2 = Routine Repairs Needed
3 = Immediate Repair Needed

SEDIMENT BASIN
INSPECTION AND MAINTENANCE FORM

Sketches or comments, if necessary:

N/A = Not Applicable
N/I = Not Investigated
0 = Not a Problem

1 = Monitor for Future Repairs
2 = Routine Repairs Needed
3 = Immediate Repair Needed

STORMWATER CONVEYANCE PIPE/CULVERT INSPECTION AND MAINTENANCE FORM

Structure GIS Code: LY-HDPE-02

Type: HDPE Pipe

Pipe from inlet: LY-D-04

To outlet: LY-RA-01

Annual Inspection Completed By: Phil Hooper **Date:** 9/27/22

Maintenance Inspection Completed By: _____ **Date:** _____

Inspection			Notes
Sediment/debris in pipe	(Y)	N	~6" in pipe, 12" (full) at outlet end
Length of pipe as measured with wheel above ground			_____ feet ~90 ft (total GIS)
Length of pipe CCTV inspected			_____ feet ~
Length of pipe unable to be inspected			~88 feet
CCTV log attached	Y	(N)	
Other (describe)	(Y)	N	Sediment entering from upgradient barren area, recommend cleaning out & covering barren area in rock.
Maintenance			
Sediment/debris removed from pipe	Y	N	
Entire length of pipe jetted	Y	N	
Hours required to jet and remove sediment			_____ hours
CCTV log attached	Y	N	
Other (describe)	Y	N	
Localized Rehabilitation			
Pipe replaced by excavation	Y	N	
CIPP Spot Repair	Y	N	
Other (describe)	Y	N	

STORMWATER CONVEYANCE PIPE/CULVERT
INSPECTION AND MAINTENANCE FORM

Sketches or comments, if necessary:

STORMWATER CONVEYANCE PIPE/CULVERT INSPECTION AND MAINTENANCE FORM

Structure GIS Code: LY-HDPE-03

Type: HDPE PIPE

Pipe from inlet: LY-RA-01 (east of Railroad St)

To outlet: LY-RA-01 (West of Railroad St)

Annual Inspection Completed By: PCH **Date:** 9/27/22

Maintenance Inspection Completed By: _____ **Date:** _____

Inspection			Notes
Sediment/debris in pipe	Y	N	~6" in Pipe
Length of pipe as measured with wheel above ground			_____ feet ~31ft total (GIS)
Length of pipe CCTV inspected			_____ feet
Length of pipe unable to be inspected			~29 feet
CCTV log attached	Y	N	
Other (describe)	Y	N	Sediment entering from upgradient riprap apron & burn area. Recommend cleaning out and covering burn area in rock.
Maintenance			
Sediment/debris removed from pipe	Y	N	
Entire length of pipe jetted	Y	N	
Hours required to jet and remove sediment			_____ hours
CCTV log attached	Y	N	
Other (describe)	Y	N	
Localized Rehabilitation			
Pipe replaced by excavation	Y	N	
CIPP Spot Repair	Y	N	
Other (describe)	Y	N	

STORMWATER CONVEYANCE PIPE/CULVERT
INSPECTION AND MAINTENANCE FORM

Sketches or comments, if necessary:

APRON – ENERGY DISSIPATER
INSPECTION AND MAINTENANCE FORM

Structure GIS Code: LY-RA-01 (same GIS code on both sides of Railroad St)

Type: Rip Rap Apron

Outlet to apron: LY-D-04

Apron discharges to: LY-RA-01 (west of Railroad St)

Annual Inspection Completed By: DCH **Date:** 9/27/22

Maintenance Inspection Completed By: _____ **Date:** _____

Property Classification: On-track (Off-track) Non-Railroad

Material: Concrete (Riprap) Concrete set riprap

Inspection			Notes:
Sediment/Trash present	(Y)	N	8-10 inch sediment present in both polygons
Oily Residue present	Y	(N)	
Rocks missing	Y	(N)	
Rock diameter possibly too small	Y	(N)	
Sediment from pipe present	(Y)	N	
Erosion or scouring present	(Y)	N	Minor rills present at top of Apron
Damaged (describe)	Y	(N)	
Other (describe)	Y	N	
Maintenance			
Remove trash, debris or sediment	(Y)	N	Removed trash
Determine cause of soil erosion	Y	N	
Replace rocks	Y	(N)	
Other (describe)	Y	N	

APRON – ENERGY DISSIPATER
INSPECTION AND MAINTENANCE FORM

Sketches or comments, if necessary:

Sediment accumulating at base of Apron and along walls/sides. Sediment is covering riprap rock and entering/obstructing drain outflow pipe. Sediment has accumulated inside pipe and is obstructing bottom 1/4 of pipe. Likely source of sediment is from barren area/berm on east side of apron that runs parallel to railroad street.

Upgradient RA taking sed from barren area east of rock-covered berm, this is clogging LY-HDPE-03.

Downgradient RA taking sed from LY-HDPE-02 & LY-HDPE-03 and ditch (not a SW BMP) on west side of Railroad St.

DITCH
INSPECTION AND MAINTENANCE FORM

Structure GIS Code: LY-D-01

Type: Riprap Ditch

Annual Inspection Completed By: Phil Hooper **Date:** 9/27/22

Maintenance Inspection Completed By: _____ **Date:** _____

Property Classification: On-track (Off-track) Non-Railroad

Surface Material Type: Barren Grass (Riprap) Rock

Inspection			Notes
Evidence of trash, or pollution (oil, gas or illicit discharge)	Y	(N)	
Evidence of noxious weeds or vegetative growth/obstruction in channel	Y	(N)	
Soil erosion / scour	(Y)	N	Minor Soil erosion
Sediment accumulation > 6-inches or preventing flow	Y	(N)	
Concrete deterioration or rip rap voids	Y	(N)	Riprap apron Y N
Other (describe)	Y	(N)	
Maintenance			
Remove trash, determine source of illicit discharge	(Y)	N	Removed trash
Remove nuisance, obstructive vegetation	Y	(N)	
Determine cause of soil erosion	Y	N	
Remove sediment accumulation	Y	(N)	
Regrade flowline	Y	(N)	
Replace/repair/clear out inlet or outlet	Y	(N)	
Replace/ repair concrete or rip rap	Y	(N)	
Other (describe)	Y	(N)	

DITCH
INSPECTION AND MAINTENANCE FORM

Sketches or comments, if necessary:

Soil erosion ~~in ditch~~ at top of ditch around the southwest end of Stormwater feature LY-HDPE-02. Sediment accumulating at base of ditch. Sediment is likely accumulating in ditch from run-off at soil erosion area. Sediment is not obstructing LY-HDPE-02. Rock cover is thin over area of approximately 30 SF around wall/side and base of ditch near LY-HDPE-02.

PCH 9/22/22

DITCH
INSPECTION AND MAINTENANCE FORM

Structure GIS Code: MY-D-03
Type: Riprap Ditch

Annual Inspection Completed By: Phil Hooper **Date:** 9/27/22

Maintenance Inspection Completed By: _____ **Date:** _____

Property Classification: On-track (Off-track) Non-Railroad

Surface Material Type: Barren Grass (Riprap) Rock

Inspection			Notes
Evidence of trash, or pollution (oil, gas or illicit discharge)	(Y)	N	Trash
Evidence of noxious weeds or vegetative growth/obstruction in channel	(Y)	N	Vegetative growth
Soil erosion / scour	Y	(N)	
Sediment accumulation > 6-inches or preventing flow	Y	(N)	
Concrete deterioration or rip rap voids	Y	(N)	Riprap apron Y N
Other (describe)	Y	(N)	
Maintenance			
Remove trash, determine source of illicit discharge	(Y)	N	Trash removed
Remove nuisance, obstructive vegetation	(Y)	N	Vegetation mechanically removed
Determine cause of soil erosion	Y	(N)	
Remove sediment accumulation	Y	(N)	
Regrade flowline	Y	(N)	
Replace/repair/clear out inlet or outlet	Y	(N)	
Replace/ repair concrete or rip rap	Y	(N)	
Other (describe)	Y	(N)	

DITCH
INSPECTION AND MAINTENANCE FORM

Sketches or comments, if necessary:

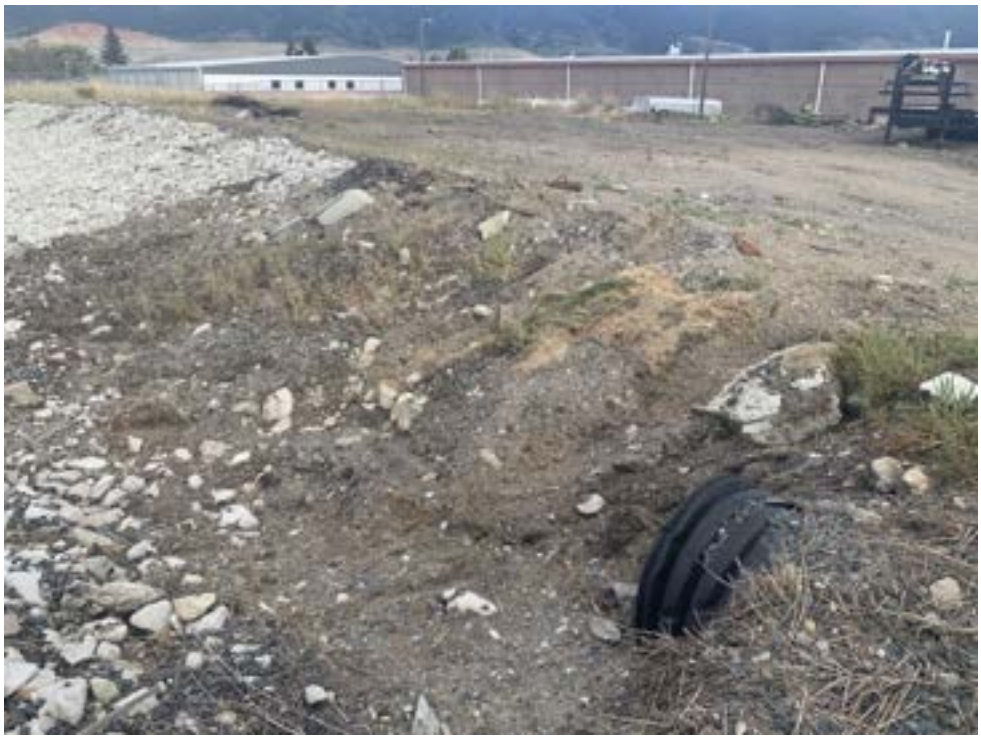
1-3 inches of sediment covering rock over area of approximately 60 SF, on ditch wall/side and bottom in the northeast ditch near stormwater feature MY-HDPE-03 outlet. Sediment likely moved from barren area above ditch by vehicle traffic or snow plow.

Attachment 2

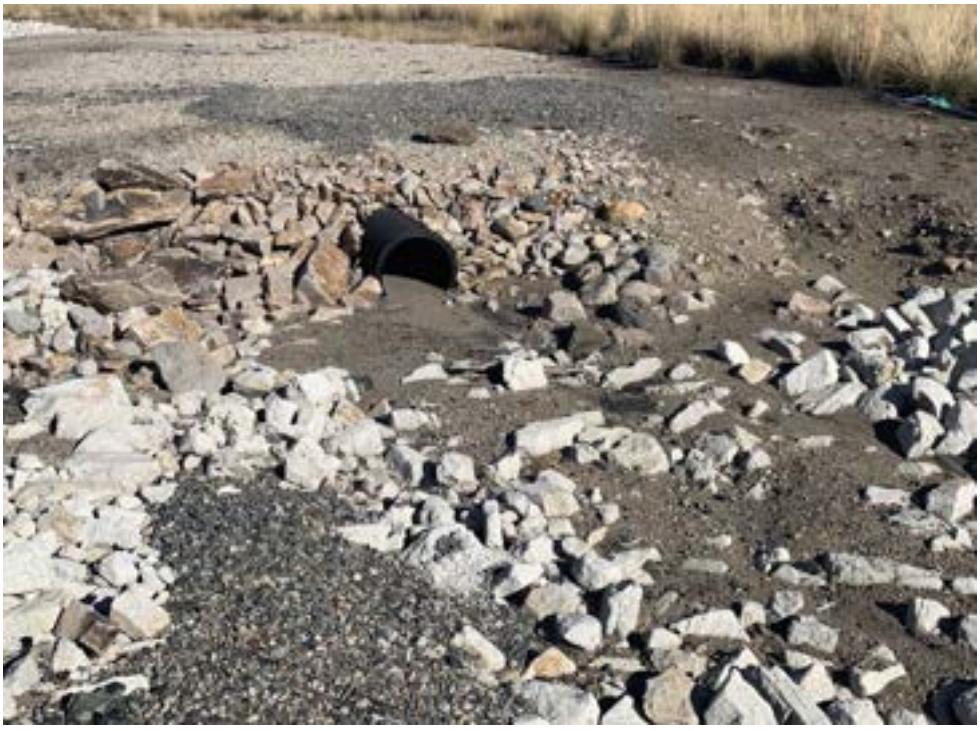
Maintenance Required Photographs

ATTACHMENT 2

PHOTOGRAPHS OF BMPs REQUIRING MAINTENANCE



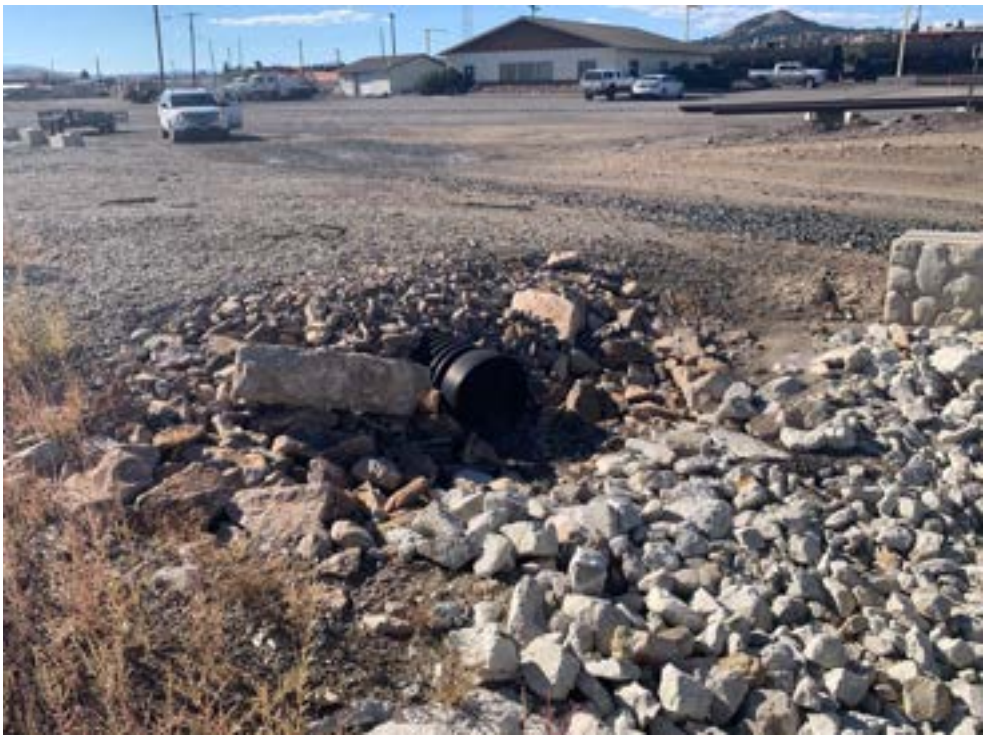
MY-D-03: On the south side of the northeast ditch at MY-HDPE-03 outlet, 1-3 inches of sediment is covering rock over an approximately 60 SF area.



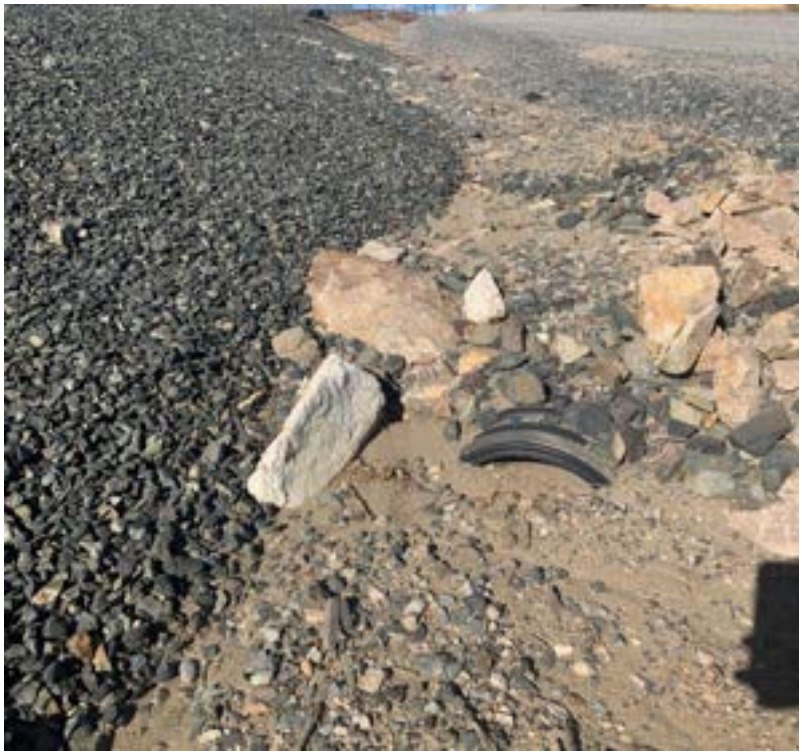
LY-D-01: Sediment accumulation and thin rock cover on the Southwest side.

ATTACHMENT 2

PHOTOGRAPHS OF BMPs REQUIRING MAINTENANCE



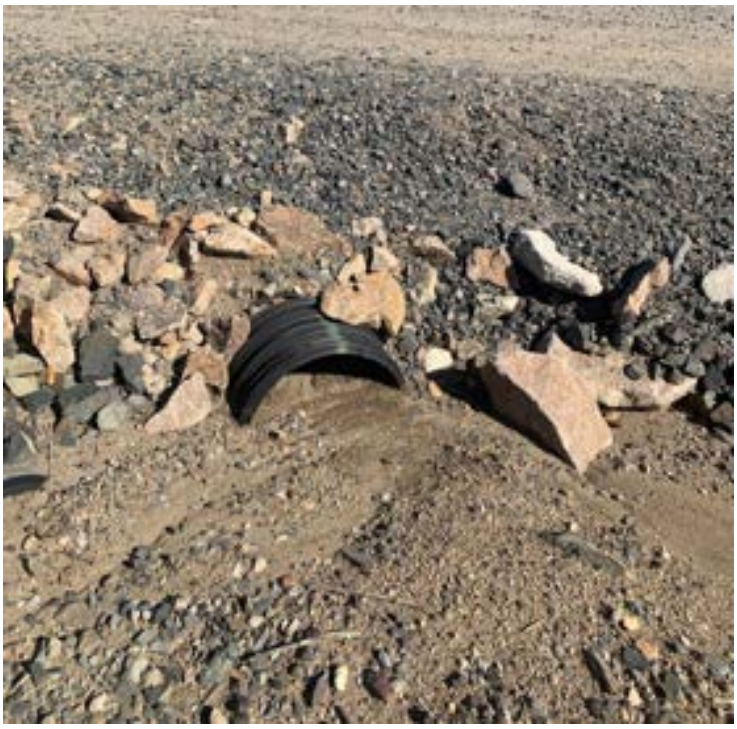
LY-D-01: Sediment accumulation.



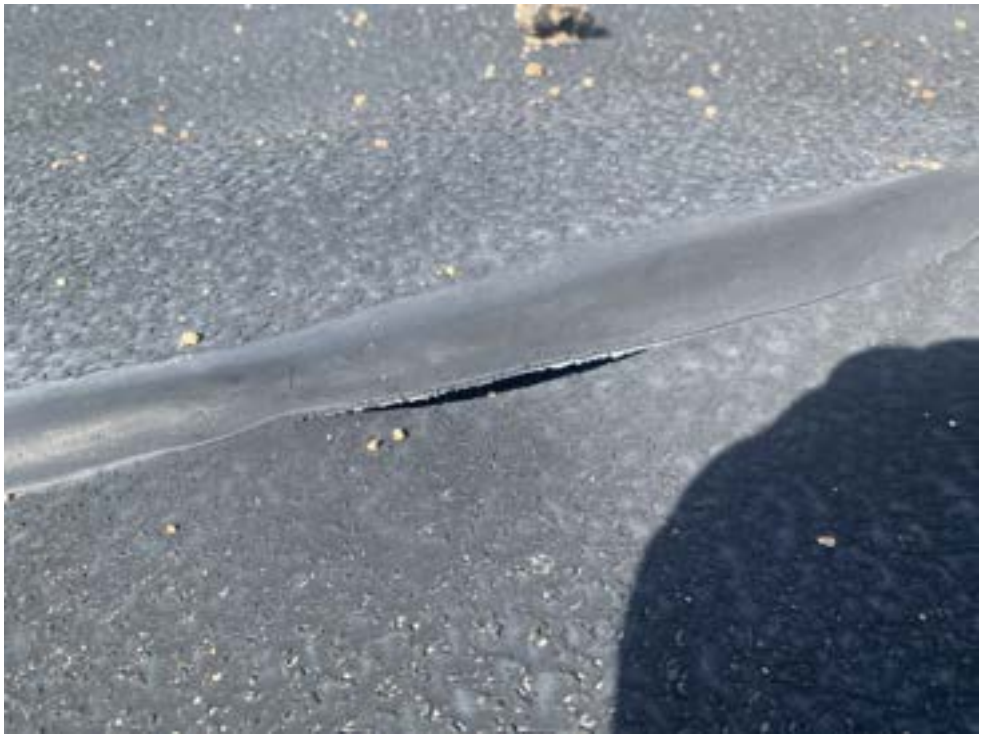
LY-HDPE-02: Sediment accumulated at pipe outlet. Sediment removal is part of the 2021 inspection maintenance items scheduled.

ATTACHMENT 2

PHOTOGRAPHS OF BMPs REQUIRING MAINTENANCE



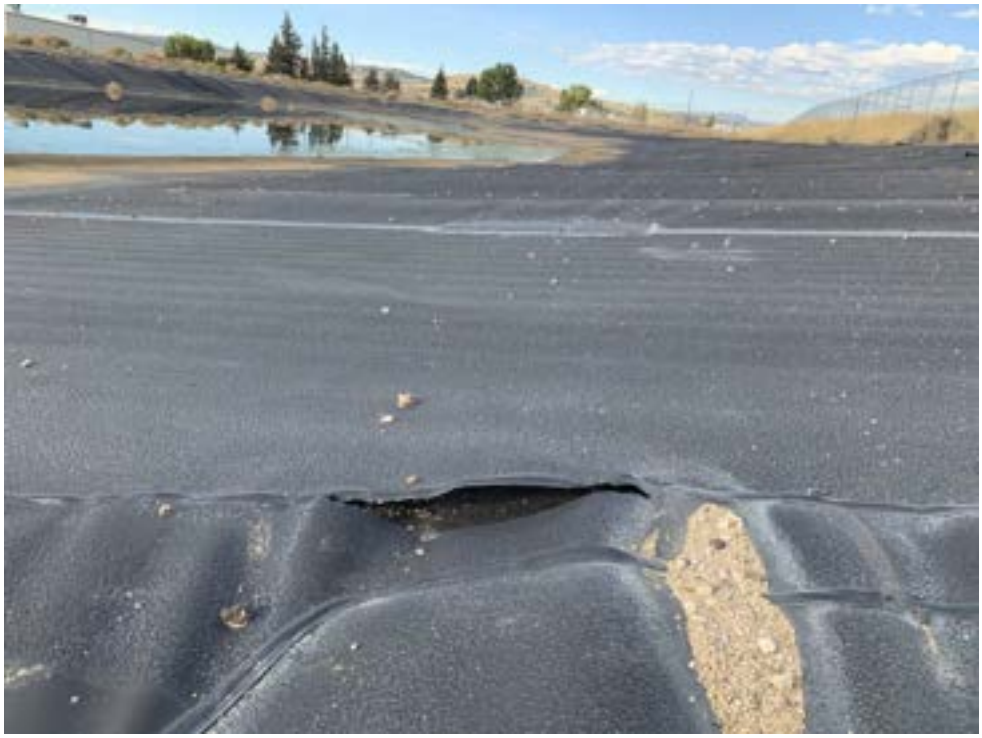
LY-HDPE-03: Sediment accumulation at inlet end of pipe. Sediment removal is part of the 2021 inspection maintenance items scheduled.



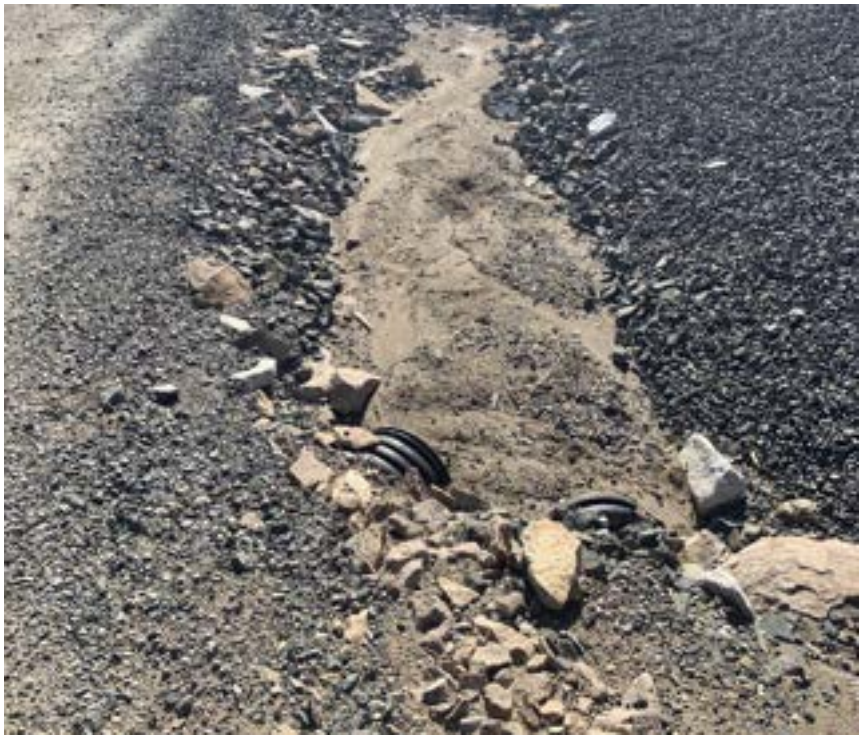
LY-PND-01: New tear in liner (Two liner tears from 2021 inspection still present).

ATTACHMENT 2

PHOTOGRAPHS OF BMPs REQUIRING MAINTENANCE



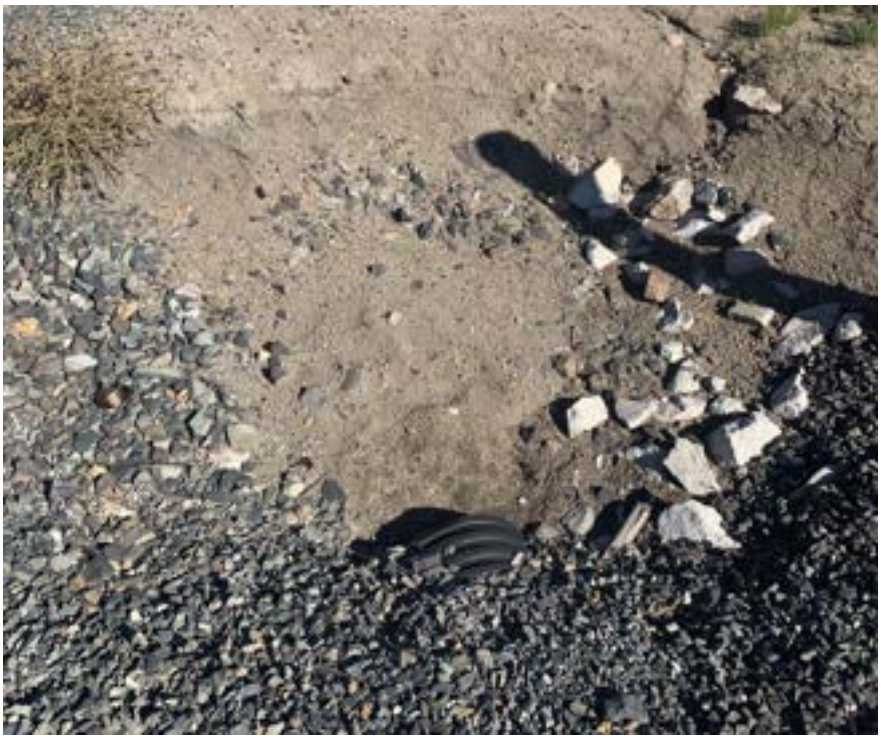
LY-PND-01: New tear in liner (Two liner tears from 2021 inspection still present).



LY-RA-01a: Sediment accumulated in apron. Sediment removal is part of the 2021 inspection maintenance items scheduled.

ATTACHMENT 2

PHOTOGRAPHS OF BMPs REQUIRING MAINTENANCE



LY-RA-01b: Sediment accumulated in apron. Sediment removal is part of the 2021 inspection maintenance items scheduled.