DEQ Montana Department of Environmental Quality

Water Quality Division
Montana Pollutant Discharge Elimination System (MPDES) ▪ Fact Sheet

Permittee:	Westmoreland Rosebud Mining LLC
County:	Rosebud
Permit No.:	MT0023965
Receiving Waters:	East Fork Armells Creek, Stocker Creek, Lee Coulee, West Fork Armells Creek, Black Hank Creek, Donley Creek, Cow Creek, Spring Creek, Pony Creek
Facility Information:	
Name:	Rosebud Mine
Location:	45° 52’ 13.00” N latitude, 106° 38’ 14.00” W longitude Castle Rock Road Colstrip, MT 59323
Contact:	John Standa, General Manager PO Box 99 Colstrip, MT 59323
Fee Information:	
Type:	Privately Owned Treatment Works – Major (SIC 1221)
Number of Outfalls:	10 (For Fee Determination Only) Group A: 026, 048, 056, 061, 127, 128, 128A, 128B, 128C, 128D, 129, 133, 136, 137, 139, 042, 043, 044, 046, 049, 051, 052, 054, 058, 059, 059A, 060, 063, 064 Group B: 008D, 009, 009A, 013, 013A, 014, 016, 016A, 023, 024, 075, 011, 012, 015, 018, 019, 020, 021, 022, 025, 007, 077, 079, 141, 142, 143, 144, 194, 195, 010, 010A Group C: 028-1A, 028-2A, 028A, 028B, 030, 032, 033, 034, 035, 036, 037, 038, 039, 040, 041, 069, 070, 071, 071C, 072, 073, 073A, 074, 113D, 116A, 119, 120A, 121, 121A Group D: 095, 095A, 100, 101, 103, 104, 104A, 105, 106, 107, 108, 109, 112, 112A, 112B, 113 Group E: 130, 130A, 130B, 131, 131A, 132, 134 Group F: 096 Group G: 098 Group H: 006, 090, 091, 092, 093, 151, 152, 153, 154, 155, 173, 175, 176, 177, 178, 179

Group I: 080, 082, 083, 084, 085, 086, 160A, 160B, 161, 161A, 162, 163, 164
Group J: 165, 166,167, 168, 169, 169A, 170, 171, 172

Fact Sheet Date: March 2021

Table of Contents

List of Tables

I. Summary

Department of Environmental Quality (DEQ) proposes to renew the Montana Pollutant Discharge Elimination System (MPDES) permit for Rosebud Mine (hereinafter Facility), MT0023965. This fact sheet documents the legal requirements and technical rationale that serve as the basis for MPDES permit renewal and describe the decision-making process involved with developing effluent limits, monitoring and reporting requirements, and special conditions which are specific to Westmoreland Rosebud Mining LLC (hereinafter Permittee). For the purposes of this Permit, references to the "discharger" or "permittee" in applicable Federal and State laws, regulations, policy, plans, or implementation procedures are held to be equivalent to references to the Permittee.

A. Permit Status

This facility is currently regulated by Permit No. MT0023965, which became effective on November 01, 2012 and was scheduled to expire on October 31, 2017. The terms and conditions of the current permit have been administratively continued and remain in effect until a updated permit is issued.

B. Proposed Changes to Effluent Limits and Permit Conditions

For this permit renewal, DEQ proposes the following:

- Inclusion of narrative standards for the management of discharges to East Fork Armells Creek – Ephemeral to mitigate the potential for effluent to reach the downstream intermittent segment of East Fork Armells Creek.
- Inclusion of WQBELs for aluminum, iron, mercury, total nitrogen, ammonia as N, selenium, and silver to East Fork Armells Creek – Intermittent.

C. Proposed Changes to Outfalls

For this permit renewal, DEQ proposes the following:

- Removal of four Western Alkaline outfalls 003, 004, 005, and 027 associated with phase 4 final bond release for Area E.

II. Background

A. Description of Facility, Wastewater Treatment, Receiving Waters, and Discharge Point(s)

1. Description and Location of Facility

Table 1 summarizes general information related to the facility.

Table 1. Facility Information

Permittee	Westmoreland Rosebud Mining LLC
Name of Facility	Rosebud Mine
Facility Address	Castle Rock Road
	Colstrip, MT 59323
	Rosebud County
Facility Contact, Title and Phone	John Standa, General Manager
Authorized Person to Sign and Submit Reports	SAME
Mailing Address	P.O. Box 99, Colstrip MT 59323
Billing Address	SAME
Type of Facility	Industrial (SIC 1221)
Major or Minor Facility	Major
Pretreatment Program	NA
Number of Outfalls	151
Receiving Waters	East Fork Armells Creek – Ephemeral, East Fork Armells Creek – Intermittent, West Fork Armells Creek, Blank Hank Creek, Donley Creek, Stocker Creek, Lee Coulee, Cow Creek, Spring Creek

The Facility is a surface sub-bituminous coal mine located adjacent to the town of Colstrip, Montana and encompasses over 24,000 permitted acres with 17,692 acres of surface disturbance and 13,921 acres in various phases of reclamation. The Facility is segregated into mine areas that operate under the following Montana surface mining permits (SMP):

- Area A: C1986003A, 4,303 permitted acres, 3,166 acres of surface disturbance.
- Area B: C1984003B, 6,045 permitted acres, 4,502 acres of surface disturbance.
- Area C: C1985003C, 9,382 permitted acres, 6,987 acres of surface disturbance.
- Area D: C1986003D, 4,475 permitted acres, 3,037 acres of surface disturbance.
- Area E: C1981003, achieved Final Phase 4 bond release in May 2019.

In recent years, active mining has occurred in Areas B, C, and D with Areas A and E inactive. Area E achieved final Phase 4 bond release in May 2019. Area A will be reopened for future mining.

The Permittee mines the Rosebud Coal Seam, of the Fort Union Formation, in four pits. The seam is approximately 100 feet below the surface, with an average thickness of 24 feet. Coal sourced from the Facility is primarily used for electrical power generation and heating utilities. The typical average heat value of the coal is 8,500 British thermal units (Btu) per pound.

The Permittee submitted SMP applications to DEQ for expansion of the Facility into Area F and to extend Area B. The Area F expansion is authorized under SMP C2011003F and surface wastewater discharge is regulated under a separate MPDES permit, MT0031828. The Area B extension has not yet been approved by DEQ and those outfalls will be permitted at a later date under a separate MPDES permit, MT0032042.

The mining process at the Facility consists of the following six steps from initial surface disturbance through reclamation: 1) topsoil removal; 2) overburden blasting and removal; 3) coal mining; 4) overburden is used to fill the pit; 5) grading; and 6) topsoil replacement. During the first step topsoil and subsoil are stripped and stockpiled for use in site reclamation. Next, overburden, the material between soil and the coal seam, is blasted and removed to expose the coal seam for extraction. The overburden is stockpiled onsite and then used to fill the pit, base-graded, ripped to relieve compaction, and prepared for soil cover. Finally, the subsoil and topsoil are regraded to reflect the permitted post-mine topography and revegetated to meet reclamation requirements in bond release phasing.

2. Wastewater Treatment or Controls

Wastewater sources at the Facility include precipitation and groundwater infiltration in the form of mine drainage. Mine drainage is defined in the *Effluent Limitations Guidelines for the Coal Mining Point Source Category* codified at 40 CFR 434.11(h) as "any drainage, or any water pumped or siphoned, from an active mining area, which includes groundwater infiltration into the pit, storm water which collects in the pit or post-mining area." Wastewater at the facility is routed through sediment traps and ponds allowing sediment to settle, reducing sediment and other pollutants before discharge to receiving waters. Each point where discharge leaves the sediment pond is an identified outfall associated with the MPDES permit.

Mine drainage, as well as drainage from the coal preparation plant, is typically withdrawn out of sediment traps and ponds for use in dust suppression on mine roads and, if needed, fire control. **Appendix A** contains line drawings of water handling at the Facility.

Each outfall is associated with a sediment pond designed to contain no less than the runoff from a 10-year, 24-hour storm event (2.4 inches) and provide additional volume for a calculated 3-year sedimentation yield. Planned discharge may occur for maintenance purposes (i.e. accumulated sediment removal) or to maintain capacity within the sediment pond.

As the drainages contributing to outfalls are reclaimed, sediment ponds or basins are commonly reduced to small depressions or eliminated completely. During the time period between regrading and vegetation establishment, additional sediment control measures may

be implemented to reduce sediment loss from the drainage. Sediment controls for Western Alkaline outfalls are drainage specific and are described in the DEQ approved Sediment Control Plan.

3. Receiving Waters and Discharge Points

a. Receiving Waters

The Facility discharges wastewater to the following State waters, which are classified as C-3 (Administrative Rule of Montana (ARM) 17.30.629): East Fork Armells Creek, West Fork Armells Creek, Black Hank Creek, Donley Creek, Stocker Creek, Lee Coulee, Pony Creek, Cow Creek, and Spring Creek. West Fork Armells, Black Hank Creek, Donley Creek, and Stocker Creek are tributary to East Fork Armells Creek, which is tributary to the Yellowstone River. Lee Coulee, Cow Creek, Pony Creek, and Spring Creek are tributaries to Rosebud Creek, which is also tributary to the Yellowstone River.

All of the above-named receiving waters meet the definition of hydrologically ephemeral streams, except the lower segment of East Fork Armells Creek which meets the definition of intermittent stream. Ephemeral stream is defined as "a stream or part of a stream which flows only in direct response to precipitation in the immediate watershed or in response to melting of a cover of snow and ice and whose channel bottom is always above the local water table." See ARM 17.30.602(10). Intermittent stream is defined as "a stream or reach of a stream that is below the local water table for at least some part of the year, and obtains its flow from both surface run-off and ground water discharge." See ARM 17.30.602(13).

i. East Fork Armells Creek – Intermittent Reach

A 2015 study conducted by Nicklin Earth and Water (NEW), submitted by the permittee to DEQ in support of the surface mining permit application for the Rosebud Mine Area B expansion, provided an investigation of the hydrology of East Fork Armells Creek through the Facility. NEW evaluated decades of alluvial well monitoring data in the vicinity of the East Fork Armells Creek intermittent reach against mining and climate history data. Surface mining in the early 1980s initially resulted in a drawdown of alluvial aquifers below the stream channel base. Aquifer levels gradually recovered to pre-mine levels during the 1990s and 2000s. However, starting in 2011, aquifer levels rose well above pre-mine levels, likely due to several years with substantial precipitation and a corresponding increase in discharges from MPDES outfalls near the studied reach. Based on aerial photo interpretation coupled with well and climate data, the NEW study places the point of East Fork Armells Creek transition from an ephemeral to intermittent up-gradient from observation well WA-101, which is between outfalls 020 and 021. (NEW 2015, Attachment 2, p. 10)

This transition point, from an ephemeral to intermittent stream, is also supported by the Cumulative Hydrological Impact Analysis (CHIA) for Rosebud Mine Area B, Amendment 4 (AM4). A CHIA includes an analysis of probable cumulative impacts to the hydrologic balance, including both surface and groundwater systems, from the proposed operations and all previous, existing, and anticipated mining within the

cumulative impact area. The CHIA for AM4 covers the ephemeral and intermittent segments of East Fork Armells Creek and documents that the reach from the Area A Tipple to SW-55 may have routinely flowing or ponder water for months out of the year. Also, the reach between the Area A facilities and Area A Tipple has had intermittent to perennial water since at least 2011. (MDEQ CHIA, p.9-7) This agrees with the NEW 2015 study, which places the transition downstream of outfall 020.

The final 2018 DEQ Water Quality Standards Attainment Records (AR) for East Fork Armells Creek place the transition from an ephemeral to intermittent stream at latitude 45.85887° N and longitude -106.6621° W, approximately 15 to 20 yards downstream of outfall 020. (MDEQ 2018(1), p. 30; MDEQ 2018(2), p. 14) The ephemeral reach extends from the headwaters to approximately outfall 020 and the intermittent reach extends from approximately outfall 020 to the mouth. The 2018 Montana Water Quality Report and List of Impaired Waters (Integrated Report (IR)) also places the East Fork Armells Creek transition from an ephemeral to intermittent stream downstream of outfall 020. The AR and IR identify East Fork Armells Creek – Ephemeral as the segment from extending from the headwaters to approximately 45.85887° N, -106.6621° W and East Fork Armells Creek – Intermittent as the segment extending from approximately 45.85887° N, -106.6621° W to the mouth. See **Figure 1** for a map showing the location of the East Fork Armells Creek transition from an ephemeral to intermittent stream.

Figure 1. East Fork Armells Creek Transition Map

b. Discharge Points

Table 2 describes the receiving water and location for each of the 82 outfalls associated with active mining areas. **Table 3** describes the discharge points for each of the 71 outfalls associated with Western Alkaline mine areas. **Table 4** describes four outfalls that were authorized by the previous permit that have since been removed and are not authorized by this Permit. These outfalls were located in Mine Area E, which achieved Phase 4 final bond release, and is fully reclaimed. See map, **Appendix B**, for outfall locations.

i. Identification of Outfalls Associated with East Fork Armells Creek – Intermittent Reach

Based on the available information, East Fork Armells Creek transitions from an ephemeral to an intermittent stream between outfalls 021 and 020. Outfalls 021 and 022 discharge to the upstream East Fork Armells Creek – Ephemeral, but effluent discharged from these outfalls is likely to reach the downstream intermittent segment of East Fork Armells Creek. Effluent discharged from outfalls upstream of outfalls 021 and 022 is unlikely to reach East Fork Armells Creek – Intermittent due to the presence of an in-channel dam between outfalls 022 and 023. Therefore, the outfalls associated with the East Fork Armells Creek – Intermittent include outfall 022 and those outfalls downstream of outfall 022. See **Figure 1** for the location of the in-channel dam relative to the transition from ephemeral to intermittent steam.

Table 2. Description of Active Outfalls

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water
023	45°51'39"N	106°40'22"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
024	45°51'36"N	106°40'50"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
025	45°51'16"N	106°41'11"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
026	45°51'7"N	106°41'37"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
043	45°51'24"N	106°41'25"W	Precipitation event runoff, mine pit dewatering, and coal preparation area	East Fork Armells Creek – Ephemeral
044	45°51'16"N	106°41'39"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
046	45°51'27"N	106°42'12"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
048	45°51'1"N	106°42'21"W	Precipitation event	East Fork Armells Creek

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water
			runoff and mine pit dewatering	– Ephemeral
049	45°51'11"N	106°42'55"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
051	45°51'6"N	106°43'17"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
052	45°50'57"N	106°43'42"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
054	45°50'52"N	106°43'47"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
056	45°50'42"N	106°44'5"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
058	45°50'51"N	106°44'24"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
059	45°50'49"N	106°44'48"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
060	45°50'40"N	106°45'45"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
061	45°50'35"N	106°45'11"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
063	45°50'46"N	106°46'5"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
064	45°50'59"N	106°46'33"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
127	45°50'39"N	106°46'49"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
128	45°50'32"N	106°45'32"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
129	45°50'38"N	106°44'26"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
133	45°50'37"N	106°43'50"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water
136	45°50'38"N	106°43'32"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
137	45°50'52"N	106°42'53"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
139	45°50'60"N	106°42'7"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
128A	45°50'34"N	106°45'38"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
128B	45°50'35"N	106°45'46"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
128C	45°50'39"N	106°45'54"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
128D	45°50'48"N	106°46'23"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
059A	45°50'41"N	106°45'16"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Ephemeral
009	45°52'32"N	106°37'43"W	Precipitation event runoff, mine pit dewatering, and coal preparation area	East Fork Armells Creek – Intermittent
010	45°52'12"N	106°37'6"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
011	45°52'6"N	106°37'42"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
012	45°52'1"N	106°38'3"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
013	45°52'13"N	106°38'11"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
014	45°51'57"N	106°38'46"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
015	45°51'51"N	106°38'35"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
016	45°51'52"N	106°38'58"W	Precipitation event	East Fork Armells Creek

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water
			runoff and mine pit dewatering	– Intermittent
018	45°51'36"N	106°39'12"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
019	45°51'42"N	106°39'7"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
020	45°51'30"N	106°39'44"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
021	45°51'30"N	106°39'54"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
022	45°51'31"N	106°39'56"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
075	45°53'33"N	106°39'5"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
194	45°53'5"N	106°36'28"W	Precipitation event runoff, mine pit dewatering, and coal preparation area	East Fork Armells Creek – Intermittent
010A	45°52'30"N	106°36'42"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
013A	45°52'8"N	106°38'19"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
016A	45°51'42"N	106°39'26"W	Precipitation event runoff, mine pit dewatering, and coal preparation area	East Fork Armells Creek – Intermittent
008D	45°55'8"N	106°35'26"W	Precipitation event runoff and mine pit dewatering	East Fork Armells Creek – Intermittent
009A	45°52'20"N	106°37'55"W	Precipitation event runoff, mine pit dewatering, and coal preparation area	East Fork Armells Creek – Intermittent
095	45°53'14"N	106°51'31"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
100	45°53'4"N	106°51'15"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water
101	45°52'56"N	106°50'57"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
103	45°52'49"N	106°50'41"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
104	45°52'46"N	106°50'30"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
105	45°52'31"N	106°49'56"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
106	45°52'33"N	106°49'42"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
107	45°52'30"N	106°49'35"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
108	45°52'33"N	106°49'27"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
109	45°52'28"N	106°48'52"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
104A	45°52'41"N	106°47'40"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
95A	45°53'20"N	106°51'35"W	Precipitation event runoff and mine pit dewatering	West Fork Armells Creek
096	45°53'17"N	106°52'31"W	Precipitation event runoff and mine pit dewatering	Black Hank Creek
098	45°53'30"N	106°51'56"W	Precipitation event runoff and mine pit dewatering	Donley Creek
030	45°52'37"N	106°46'6"W	Precipitation event runoff and mine pit dewatering	Stocker Creek
032	45°52'19"N	106°45'47"W	Precipitation event runoff and mine pit dewatering	Stocker Creek
033	45°52'32"N	106°45'15"W	Precipitation event runoff and mine pit dewatering	Stocker Creek
034	45°52'32"N	106°45'8"W	Precipitation event runoff and mine pit	Stocker Creek

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water
			dewatering	
035	45°52'21"N	106°44'6"W	Precipitation event runoff and mine pit dewatering	Stocker Creek
069	45°52'52"N	106°42'9"W	Precipitation event runoff and mine pit dewatering	Stocker Creek
070	45°53'6"N	106°41'58"W	Precipitation event runoff and mine pit dewatering	Stocker Creek
071	45°53'22"N	106°41'15"W	Precipitation event runoff and mine pit dewatering	Stocker Creek
072	45°53'45"N	106°40'5"W	Precipitation event runoff and mine pit dewatering	Stocker Creek
071C	45°53'31"N	106°40'51"W	Precipitation event runoff and mine pit dewatering	Stocker Creek
130	45°49'56"N	106°45'6"W	Precipitation event runoff and mine pit dewatering	Lee Coulee
131	45°49'56"N	106°44'2"W	Precipitation event runoff and mine pit dewatering	Lee Coulee
132	45°49'56"N	106°43'42"W	Precipitation event runoff and mine pit dewatering	Lee Coulee
134	45°49'56"N	106°43'6"W	Precipitation event runoff and mine pit dewatering	Lee Coulee
130A	45°49'56"N	106°44'32"W	Precipitation event runoff and mine pit dewatering	Lee Coulee
130B	45°49'56"N	106°44'26"W	Precipitation event runoff and mine pit dewatering	Lee Coulee
131A	45°49'56"N	106°43'54"W	Precipitation event runoff and mine pit dewatering	Lee Coulee

Table 3. Description of Western Alkaline Outfalls

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water
042	45°51'54"N	106°41'31"W	Precipitation event runoff	East Fork Armells Creek – Ephemeral
007	45°54'15"N	106°36'48"W	Precipitation event runoff	East Fork Armells Creek – Intermittent
077	45°55'7"N	106°36'36"W	Precipitation event runoff	East Fork Armells Creek – Intermittent
079	45°55'13"N	106°36'8"W	Precipitation event runoff	East Fork Armells Creek – Intermittent
141	45°54'53"N	106°36'51"W	Precipitation event runoff	East Fork Armells Creek – Intermittent
142	45°54'41"N	106°36'43"W	Precipitation event runoff	East Fork Armells Creek – Intermittent
143	45°54'33"N	106°36'46"W	Precipitation event runoff	East Fork Armells Creek – Intermittent
144	45°54'3"N	106°36'46"W	Precipitation event runoff	East Fork Armells Creek – Intermittent
195	45°53'5"N	106°36'14"W	Precipitation event runoff	East Fork Armells Creek – Intermittent
112	45°53'24"N	106°48'15"W	Precipitation event runoff	West Fork Armells Creek
113	45°53'26"N	106°47'31"W	Precipitation event runoff	West Fork Armells Creek
112A	45°53'24"N	106°47'24"W	Precipitation event runoff	West Fork Armells Creek
112B	45°53'31"N	106°47'8"W	Precipitation event runoff	West Fork Armells Creek
036	45°52'31"N	106°43'26"W	Precipitation event runoff	Stocker Creek
037	45°52'32"N	106°43'9"W	Precipitation event runoff	Stocker Creek
038	45°52'31"N	106°42'52"W	Precipitation event runoff	Stocker Creek
039	45°52'29"N	106°42'21"W	Precipitation event runoff	Stocker Creek
040	45°52'25"N	106°42'12"W	Precipitation event runoff	Stocker Creek
041	45°52'21"N	106°42'7"W	Precipitation event runoff	Stocker Creek
073	45°53'43"N	106°39'48"W	Precipitation event runoff	Stocker Creek
074	45°53'41"N	106°39'28"W	Precipitation event runoff	Stocker Creek
116	45°53'36"N	106°46'34"W	Precipitation event runoff	Stocker Creek
119	45°53'8"N	106°45'49"W	Precipitation event	Stocker Creek

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water
			runoff	
121	45°52'44"N	106°46'9"W	Precipitation event runoff	Stocker Creek
113D	45°52'37"N	106°46'53"W	Precipitation event runoff	Stocker Creek
116A	45°53'32"N	106°46'19"W	Precipitation event runoff	Stocker Creek
120A	45°52'47"N	106°46'36"W	Precipitation event runoff	Stocker Creek
121A	45°52'53"N	106°46'2"W	Precipitation event runoff	Stocker Creek
028-1A	45°52'35"N	106°47'47"W	Precipitation event runoff	Stocker Creek
028-2A	45°52'33"N	106°48'2"W	Precipitation event runoff	Stocker Creek
028A	45°52'40"N	106°47'30"W	Precipitation event runoff	Stocker Creek
028B	45°52'37"N	106°47'35"W	Precipitation event runoff	Stocker Creek
073A	45°53'41"N	106°39'45"W	Precipitation event runoff	Stocker Creek
006	45°53'48"N	106°35'10"W	Precipitation event runoff	Cow Creek
090	45°53'52"N	106°34'0"W	Precipitation event runoff	Cow Creek
091	45°53'51"N	106°34'26"W	Precipitation event runoff	Cow Creek
092	45°53'50"N	106°34'38"W	Precipitation event runoff	Cow Creek
093	45°53'29"N	106°35'6"W	Precipitation event runoff	Cow Creek
151	45°52'56"N	106°35'32"W	Precipitation event runoff	Cow Creek
152	45°52'52"N	106°35'21"W	Precipitation event runoff	Cow Creek
153	45°53'7"N	106°35'22"W	Precipitation event runoff	Cow Creek
154	45°53'14"N	106°35'14"W	Precipitation event runoff	Cow Creek
155	45°53'23"N	106°35'11"W	Precipitation event runoff	Cow Creek
173	45°53'58"N	106°32'0"W	Precipitation event runoff	Cow Creek
175	45°53'50"N	106°32'36"W	Precipitation event runoff	Cow Creek
176	45°53'54"N	106°33'4"W	Precipitation event	Cow Creek

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water
			runoff	
177	45°53'52"N	106°35'18"W	Precipitation event runoff	Cow Creek
178	45°53'50"N	106°33'30"W	Precipitation event runoff	Cow Creek
179	45°53'51"N	106°33'53"W	Precipitation event runoff	Cow Creek
165	45°54'45"N	106°32'59"W	Precipitation event runoff	Pony Creek
166	45°54'45"N	106°33'4"W	Precipitation event runoff	Pony Creek
167	45°54'45"N	106°33'9"W	Precipitation event runoff	Pony Creek
168	45°54'45"N	106°33'20"W	Precipitation event runoff	Pony Creek
169	45°54'37"N	106°33'25"W	Precipitation event runoff	Pony Creek
170	45°54'19"N	106°33'6"W	Precipitation event runoff	Pony Creek
171	45°54'14"N	106°32'58"W	Precipitation event runoff	Pony Creek
172	45°54'15"N	106°32'39"W	Precipitation event runoff	Pony Creek
169A	45°54'30"N	106°33'25"W	Precipitation event runoff	Pony Creek
080	45°55'19"N	106°35'37"W	Precipitation event runoff	Spring Creek
082	45°55'22"N	106°35'8"W	Precipitation event runoff	Spring Creek
083	45°55'18"N	106°34'52"W	Precipitation event runoff	Spring Creek
084	45°55'6"N	106°34'21"W	Precipitation event runoff	Spring Creek
085	45°55'2"N	106°34'12"W	Precipitation event runoff	Spring Creek
086	45°55'7"N	106°34'0"W	Precipitation event runoff	Spring Creek
161	45°55'7"N	106°33'29"W	Precipitation event runoff	Spring Creek
162	45°55'8"N	106°33'25"W	Precipitation event runoff	Spring Creek
163	45°55'7"N	106°33'1"W	Precipitation event runoff	Spring Creek
164	45°55'3"N	106°32'56"W	Precipitation event runoff	Spring Creek
160A	45°55'8"N	106°33'42"W	Precipitation event	Spring Creek

Outfall	Latitude	Longitude	Outfall/Effluent Description	Receiving Water
			runoff	
160B	45°55'8"N	106°33'48"W	Precipitation event runoff	Spring Creek
161A	45°55'8"N	106°33'34"W	Precipitation event runoff	Spring Creek

Table 4. Description of Removed Outfalls

Outfall	Latitude	Longitude	Removal Justification	Receiving Water
003	45°51'21"N	106°34'0"W	Area E Phase 4 Bond Release	Cow Creek
004	45°52'10"N	106°34'55"W	Area E Phase 4 Bond Release	Cow Creek
005	45°52'35"N	106°35'25"W	Area E Phase 4 Bond Release	Cow Creek
027	45°51'56"N	106°34'28"W	Area E Phase 4 Bond Release	Cow Creek

B. Permit Application Information

The Facility is currently regulated by Montana Pollutant Discharge Elimination System (MPDES) permit No. MT0023965, which became effective on November 1, 2012, was modified on September 8, 2014 (Modification 1) and January 27, 2016 (Modification 2), and expired on October 31, 2017. The permittee submitted an application for renewal of its MPDES permit, which was received by DEQ on March 2, 2017. On December 3, 2019, the permittee submitted an updated application to reflect current mine conditions. The Montana Department of Environmental Quality (DEQ) responded with a Notice of Deficiency dated December 31, 2019. On June 10, 2020, DEQ received additional information addressing the application deficiencies. DEQ determined the application was complete on July 14, 2020.

1. Permit History

Discharges from the Rosebud Mine have been authorized under MPDES Permit No. MT0023965 since at least 1989. The version of the Permit renewed in 2012 has been the subject of ongoing litigation. On March 4, 2015, the First Judicial District Court granted summary judgment invalidating the 2012 renewal of the Permit. DEQ and Westmoreland appealed the decision, and, in September 2019, the Montana Supreme Court reversed the District Court's decisions of law and determined that DEQ properly interpreted rules implementing the Montana Water Quality Act (specifically ARM 17.30.637(4)). In particular, the Montana Supreme Court determined DEQ has the flexibility to exempt ephemeral waters from the water quality standards applicable to Class C-3 waters without reclassifying the waters. The Montana Supreme Court remanded the case back to the District Court for further proceedings to determine issues of material fact. The litigation on remand is currently proceeding before the First Judicial District Court. Upon issuance of the 2021 renewal of the Permit, the 2012 Permit, which is the subject of the litigation will be terminated.

2. Fee Determination

Permit fees are based on the type of waste (sewage, process wastewater, storm water, noncontact cooling water, etc.) and receiving waters. Based on ARM 17.30.201(6)(a), there are ten categories of outfalls for fee purposes. **Table 5** identifies, individually or by group, the type of wastewater and receiving water by outfall for which effluent limits will be required.

Table 5. Summary of Outfall Categories for Fee Purposes

Group	Effluent Description	Drainage	Outfalls
A	Comingled treated storm water and/or pit dewatering water and coal preparation area	Mine Area A, B-East, B-West, C; East Fork Armells Creek (Ephemeral)	023, 024, 025, 026, 048, 056, 061, 127, 128, 128A, 128B, 128C, 128D, 129, 133, 136, 137, 139, 042, 043, 044, 046, 049, 051, 052, 054, 058, 059, 059A, 060, 063, 064
B	Comingled treated storm water and/or pit dewatering water, coal preparation area, and Western Alkaline drainage	Mine Area A, B-East, and D; East Fork Armells Creek (Intermittent)	008D, 009, 009A, 013, 013A, 014, 016, 016A, 021, 022, 075, 011, 012, 015, 018, 019, 020, 007, 077, 079, 141, 142, 143, 144, 194, 195, 010, 010A
C	Comingled treated storm water and/or pit dewatering and Western Alkaline drainage	Mine Area A, C-East, and C-North; Stocker Creek	028-1A, 028-2A, 028A, 028B, 030, 032, 033, 034, 035, 036, 037, 038, 039, 040, 041, 069, 070, 071, 071C, 072, 073, 073A, 074, 113D, 116A, 119, 120A, 121, 121A
D	Comingled treated storm water and/or pit dewatering water and Western Alkaline drainage	Mine Area C-North and C-West; West Fork Armells Creek	095, 095A, 100, 101, 103, 104, 104A, 105, 106, 107, 108, 109, 112, 112A, 112B, 113
E	Comingled treated storm water and/or pit dewatering water	Mine Area B-West; Lee Coulee	130, 130A, 130B, 131, 131A, 132, 134
F	Comingled treated storm water and/or pit dewatering water	Mine Area C-West; Black Hank Creek	096
G	Comingled treated storm water and/or pit dewatering water	Mine Area C-West; Donley Creek	098
H	Western Alkaline drainage	Mine Area D, Cow Creek	006, 090, 091, 092, 093, 151, 152, 153, 154, 155, 173, 175, 176, 177, 178, 179
I	Western Alkaline drainage	Mine Area D; Spring Creek	080, 082, 083, 084, 085, 086, 160A, 160B, 161, 161A, 162, 163, 164
J	Western Alkaline drainage	Mine Area D-East; Pony Creek	165, 166,167, 168, 169, 169A, 170, 171, 172

3. Summary of Existing Permit Requirements and Effluent Quality Data

Table 6 summarizes effluent quality data submitted by the permittee in Discharge Monitoring Reports (DMRs) for the period of January 2105 through December 2020 and additional samples taken from 10 sites at the facility in March and April 2020. DMRs are submitted in during the term of the permit according to the terms of the permit. The additional samples were provided in support of the permit renewal application and

demonstrating effluent quality across the mine.

Flow data submitted in DMRs for the POR indicate discharge events occurred at 15 outfalls, with the highest frequency of discharge from outfalls 030, 129, and 060. Discharges were to Spring Creek, West Fork Armells Creek, Stocker Creek, and East Fork Armells Creek – Ephemeral, and East Fork Armells Creek – Intermittent. The maximum reported daily flow rate was 10.0 millions of gallons per day (mgd) at outfall 061 and the maximum monthly average flow rate was 5.05 mgd at outfall 129. See **Appendix C** for a summary of discharge flow data.

Table 6. Effluent Characteristics – All Outfalls

Parameter	Units	2012 Permit Limits[1]	Maximum Value	Minimum Value	Average[2]	Number of Samples
Aluminum, dissolved	µg/L	Footnote 10	550	< = 30	112.5789	19
Arsenic, total recoverable	µg/L	Footnote 9	3	< = 1	1.0625	16
Boron, total	mg/L	Footnote 3	0.98	< = 0.05	0.22	98
Cadmium, total recoverable	µg/L	Monitor only	1	< = 0.03	0.69	16
Chloride (as Cl)	mg/L	Monitor only	182.636	9	34626.22	9
Chromium, total recoverable	µg/L	Monitor only	10	< = 5	4.69	16
Copper, total recoverable	µg/L	Monitor only	5	< = 5	4.25	16
Electrical conductivity (EC)	µS/cm	Monitor only	5930	839	2927.66	18
Iron, total	mg/L	3.5/7.0[4]	249	< = 0.02	6.03	98
Lead, total recoverable	µg/L	Monitor only	1	< = 1	0.78	16
Manganese, total	mg/L	Monitor only	0.603	0.009	0.12	10
Mercury, total recoverable	µg/L	Monitor only	0.3	< = 0.1	0.1	16
Nitrogen, total	µg/L	Footnote 9	2.82	0.51	1.18	10
Nitrate + nitrite as nitrogen	mg/L	Monitor only	3.47	< = 0.01	0.65	19
Oil and grease	mg/L	---/10	2	< = 1	0.8	54
pH[8]	S.U.	6.0-9.0[4,5]	8.44	6.6	7.81	97

Parameter	Units	2012 Permit Limits[1]	Maximum Value	Minimum Value	Average[2]	Number of Samples
Phosphorus, total	mg/L	Footnote 9	0.05	< = 0.005	0.02	10
Selenium, total	µg/L	Monitor only	5	< = 1	1.61	23
Settleable solids	ml/L	---/0.5[5]	98	< = 0.5	14.29	7
Silver, total recoverable	µg/L	Footnote 9	1.0	< = 1	0.73	16
Sodium adsorption ratio (SAR)	Ratio	Monitor only	1.88	0.84	1.13	9
Sulfate	mg/L	Footenote 6	3840	86	1098.87	98
Total dissolved solids (TDS)	mg/L	Footnote 7	3580	236	1741.86	88
Total suspended solids (TSS)	mg/L	35/70[4]	294	< = 10	48.02	86
Zinc, total recoverable	µg/L	Monitor only	10	< = 10	7.88	16

Footnotes:
< = Non-detect value

1. Permit limits: 30-day average/instantaneous maximum
2. Detection limits were substituted in the calculation of the average for data that were below detection limits.
3. Boron limitations applicable to all discharges:
   East Fork Armells – Ephemeral reach: 0.7/1.1 mg/L
   West Fork Armells – Intermittent reach: 0.7/1.1 mg/L
   West Fork Armells, Lee Coulee, Black Hank, Donley Creek: 0.4/0.6 mg/L
   Stocker Creek: 1.0/1.5 mg/L
   Pony Creek: 1.2/1.8 mg/L
   Cow Creek: 1.6/2.4 mg/L
   Spring Creek: 1.1/1.7 mg/L
4. Permit limit is not applicable to discharges caused by precipitations events greater than the 10-year, 24-hour event size
5. Permit limit applicable to discharges caused by precipitation events greater than the 10-year, 24-hour event size.
6. Sulfate limitations applicable to all discharges:
   East Fork Armells Ephemeral and Intermittent reaches: 2050/3075 mg/L
   West Fork Armells, Lee Coulee, Black Hank Creek, Donley Creek: 1500/2250 mg/L
   Stocker Creek: 2400/3600 mg/L
   Pony Creek: 1550/2325 mg/L
   Cow Creek: 2300/3450 mg/L
   Spring Creek: 1300/1950 mg/L
7. TDS limitations applicable to all discharges:
   East Fork Armells Ephemeral and Intermittent: 3000/4500 mg/L
   West Fork Armells, Black Hank Creek, Donley Creek: 2600/3900 mg/L
   Stocker Creek: 3950/5925 mg/L
   Lee Coulee: NA
   Pony Creek: NA
   Cow Creek: NA
   Spring Creek: NA
8. pH data were converted to hydrogen ion concentration for the purpose of average calculation.

Parameter	Units	2012 Permit Limits[1]	Maximum Value	Minimum Value	Average[2]	Number of Samples
9. Monitoring requirement is only applicable to East Fork Armells Creek – Intermittent reach. 10. Dissolved Aluminum limitation is only applicable to East Fork Armells Creek – Intermittent: 87/780.						

4. Compliance History

Four compliance inspections were conducted during the term of the previous permit on March 19-20, 2013, March 12, 2015, January 26, 2017, and January 30, 2019. No permit violations were observed during these inspections.

For the reporting period ending June 30, 2014, the Permittee reported an effluent exceedance in the total suspended solids (TSS) daily maximum limit for outfall 032.

For the reporting period ending April 30, 2015, the Permittee reported an effluent exceedance in the TSS daily maximum limit for outfall 019. This exceedance was attributed to a high wind event and TSS returned to normal after the wind event.

On August 3, 2016, the Permittee reported that they were unable to collect discharge samples on June 13, 2016 at outfalls 080 and 169A due to a large storm event. The facility was found to not be in violation due to severe weather conditions that limited access to these outfalls.

For the reporting period ending September 30, 2017, the Permittee reported effluent exceedances in the total iron daily maximum and monthly average limits and settleable solids daily maximum limit for outfall 060. Discharge was the result of a storm event which caused run-off to overtop a berm and ditch. The berm and ditch were cleaned out and repaired to divert wastewater to the pit.

On April 17, 2018, the Permittee reported that they were unable to collect discharge samples from February 5, 2018 to April 17, 2018 at outfall 080. The mine area was inaccessible due to snow and blowing snow during this period. Water samples were obtained from pond PO-80A on April 18, 2018 and results were submitted to the DEQ.

In January and February 2020, the Permittee reported effluent exceedances for TSS at outfall 129. Samples collected on January 29, January 30, February 1, and February 5, 2020 exceeded the daily maximum permit limit for TSS. Samples collected on January 22 and January 31, 2020 exceeded the average monthly permit limit for TSS. Discharge from outfall 129 was ceased until the exceedance was resolved.

The discharge monitoring reports (DMRs) were submitted late for the reporting period ending March 31, 2012 and April 30, 2018. The DMRs were received on July 2, 2012 and August 14, 2018, respectively.

III. Rationale for Permit Conditions

A. Rationale for Effluent Limitations

The control of pollutants discharged is established through effluent limitations and other requirements in MPDES permits. There are two principal bases for effluent limitations: technology-based effluent limitations (TBELs) that attain industry specific technology-based standards and limitations specified in the federal regulations and water quality-based effluent limitations (WQBELs) that attain and maintain applicable state numeric and narrative water quality standards. TBELs are based on implementing available technologies to reduce or treat pollutants while WQBELs are designed to protect the beneficial uses of the receiving water. MPDES permits include conditions that meet all applicable technology-based standards and limitations, at a minimum, and any more stringent WQBELS necessary to meet applicable state water quality standards.

1. Technology-based Effluent Limitations (TBELs)

TBELs are based on Federal or State technology-based standards and reflect a minimum level of treatment or control for point source discharges. These standards are developed based on the performance of currently available treatment and control technologies for the industry, here surface coal mining.

a. Scope and Authority

MPDES permits for industrial and commercial facilities [i.e., facilities other than publicly-owned treatment works (POTWs), or other facilities treating sewage] must include TBELs that implement any applicable Effluent Limitations Guidelines and Standards (ELGs) promulgated by EPA.

b. Effluent Guidelines

TBELs for non-POTWs (industrial and commercial facilities) are based on several levels of control:

1. Best practicable treatment control technology (BPT) represents the average of the best performance by plants within an industrial category or subcategory. BPT standards apply to toxic, conventional, and non-conventional pollutants.

2. Best available technology economically achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an industrial point source category. BAT standards apply to toxic and non-conventional pollutants.

3. Best conventional pollutant control technology (BCT) represents the control from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease. The BCT standard is established after considering the “cost reasonableness” of the relationship between the cost of attaining a reduction in effluent discharge and the benefits that would result, and also the cost effectiveness of additional industrial treatment beyond BPT.

4. New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources.

EPA has established effluent limitation guidelines (ELGs) for the coal mining industry at 40 CFR Part 434, *Effluent Limitations Guidelines for the Coal Mining Point Source Category.* Subparts B – Coal Preparation Plants and Coal Preparation Plant Associated Areas; D – Alkaline Mine Drainage; and F – Miscellaneous Provisions are applicable ELGs to the Rosebud Mine and are the basis of TBELs in this permit. In accordance with 40 CFR 434.61, for commingled waste streams, the most stringent TBELs for a pollutant apply.

c. Applicable TBELs

Discharge limitations for non-POTWs (industrial facilities) must be stated as average monthly discharge limitations and maximum daily discharge limitations unless impracticable. Effluent guidelines with numeric limitations generally include both average monthly and maximum daily limitations. DEQ has not identified any additional pollutants of concern for TBELs beyond the ones described below.

i. Coal Preparation Plants and Coal Preparation Plant Associated Areas

The provisions described in 40 CFR Part 434, Subpart B are applicable to discharges from coal preparation plants and associated areas. These include discharges that are pumped, siphoned, or drained from preparation plant water circuits, coal storage, refuse storage, and ancillary areas related to the cleaning or beneficiation of any rank of coal, including, but not limited to, lignite, bituminous, and anthracite. When discharges from these areas normally exhibit a pH equal to or greater than 6.0 prior to treatment, the TBELs in **Table 7** apply. Outfalls belonging to this subcategory are identified in **Appendix D**.

Table 7. TBELs – Coal Preparation Plant Area and Associated Areas

Parameter	Units	Daily Maximum Limitation	30-day Average Limitation	Category
Iron, Total	mg/L	7.0	3.5	BPT, BAT
TSS	mg/L	70	35	BPT
pH	s.u.	6.0 – 9.0		BPT

ii. Alkaline Mine Drainage: All Active Outfalls

The provisions described in 40 CFR Part 434, Subpart D are applicable to alkaline mine drainage. Alkaline mine drainage is mine drainage which, before any treatment, has a pH equal to or greater than 6.0 and total iron concentration of less than 10 mg/L. See 40 CFR 434.11(c). Mine drainage is any drainage, and any water pumped or siphoned, from an active mining area or a post-mining area. See 40 CFR 434.11(h). Pursuant to 40 CFR 434.40, TBELs for alkaline mine drainage are applicable to alkaline mine drainage from an active mining area of coal of any rank. TBELs presented in **Table 8** are applicable to discharges of alkaline mine drainage from active mine areas. Outfalls belonging to this subcategory are identified in **Table 2**.

Table 8. TBELs – Alkaline Mine Drainage

Parameter	Units	Daily Maximum Limitation	30-day Average Limitation	Category

Iron, Total	mg/L	7.0	3.5	BPT, BAT
TSS	mg/L	70	35	BPT
pH	s.u.	Between 6.0 and 9.0		BPT

iii. Precipitation Events: All Active Outfalls

For discharges driven by precipitation events, alternative effluent limitations are established in the permit, based on 40 CFR 434.63, instead of otherwise applicable effluent limitations. Outfalls belonging to this subcategory are identified in **Table 2**.

1) Storm Events Less than or Equal to the 10-year, 24-hour Event.
Precipitation-driven discharges are subject to the ELGs at 40 CFR 434.63 (a)(2), for any discharge or increase in the volume of discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume). The National Oceanographic and Atmospheric Administration (NOAA) Atlas 2, Volume 1 (1973) defines the 10-year, 24-hour precipitation for the Rosebud Mine location as 2.4 inches. TBELs presented in **Table 9** are applicable to precipitation-driven discharges from less than the 10-year, 24-hour event.

Table 9. TBELs – Precipitation Events Less Than or Equal to the 10-yr, 24-hr Event: All Active Outfalls

Parameter	Units	Daily Maximum Limitation	30-day Average Limitation
Settleable solids	mg/L	0.5	---
pH	Standard units	Between 6.0 and 9.0 at all times	

2) Storm Events Greater than the 10-yr, 24-hr Precipitation Event.
Precipitation driven discharges or increases in the volume of discharges caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) of 2.4 inches (NOAA Atlas 2, Vol. 1, 1973), are subject to the following effluent limitations, pursuant to 40 CFR 434.63(d)(2). TBELs presented in **Table 10** are applicable to precipitation-driven discharges from greater than the 10-year, 24-hour event.

Table 10. TBELs – Precipitation Events Greater Than the 10-yr, 24-hr Event: All Active Outfalls

Parameter	Units	Daily Maximum Limitation	30-day Average Limitation
pH	Standard units	Between 6.0 and 9.0 at all times	

iv. Western Alkaline Coal Mining

The Rosebud mine facility meets the definition of a western coal mining operation as defined in 40 CFR 434, Subpart H by operational, location, and climatic criteria:

a. The facility is a surface coal mine.
b. The facility is located within the interior western United States (southeastern Montana), west of the 100th meridian (106° W).
c. The region containing the Facility is classified as a cold semi-arid climate (BSk, Köppen climate classification), with an average annual precipitation of 26.0 inches or less.

The provisions described in 40 CFR 434, Subpart H are applicable to reclamation areas, brushing and grubbing areas, topsoil stockpiling areas, and regraded areas meeting definition and applicability criteria outlined in §434.80 and §434.81. These provisions are not applicable to active mining areas, coal preparation associated areas, and coal preparation plant areas as defined by 40 CFR §434.11.

ELGs for the Western Alkaline Coal Mining subcategory require the following narrative effluent limitations in applicable areas:

a. The operator must submit a site-specific Sediment Control Plan (SCP) to the permitting authority that is designed to prevent an increase in the average annual sediment yield from pre-mined, undisturbed conditions. The SCP must be approved by the permitting authority and be incorporated into the permit as an effluent limitation. The SCP must identify best management practices (BMPs) and must also describe design specifications, construction specifications, maintenance schedules, criteria for inspection, and expected performance and longevity of the BMPs.
b. Using watershed models, the operator must demonstrate that implementation of the SCP will result in average annual sediment yields that will not be greater than the sediment yields from pre-mined, undisturbed conditions. The operator must use the same watershed model that was, or will be, used to acquire the SMCRA permit.
c. The operator must design, implement, and maintain BMPs in the manner specified in the SCP.

Following recovery of coal, distribution of spoil, and initial contouring consistent with post-mine contouring requirements of the mine's coal permits (SMP numbers C1986003A, C1984003B, C1985003C, and C1986003D) active mine areas transition to reclamation areas upon associated bond release requirements described at ARM 17.24.1116(6). Drainage areas wholly within phase II or greater bond release status

for the above-mentioned permits are subject to the effluent limitations for Western Alkaline Coal Mining (40 CFR 434, subpart H). Western Alkaline Coal Mining ELGs represent the degree of effluent reduction attainable through application of best practicable control technology (BPT), the best available technology economically achievable (BAT), and new source performance standards (NSPS). Outfalls belonging to this subcategory are identified in **Table 3**. All outfalls currently associated with Cow Creek, Pony Creek, and Spring Creek are regulated by the Western Alkaline Standards.

Once the Permittee receives written approval/notification from DEQ for phase II bond release and approval of the SCP for the contributing drainage area, Western Alkaline Standards become the applicable effluent limitations for the associated outfalls. Changes to the permit as a result of outfall transition to Western Alkaline Standards are processed as a minor modification. Only effluent limitations enforceable under 40 CFR 434 Subpart H are applicable to outfalls designated under Western Alkaline Standards and effluent limitations associated with active mining are no longer applicable following permit modification.

Permit modification for outfall transition to Western Alkaline Standards shall include specific Best Management Practice inspection, maintenance, and reporting conditions drawn from the DEQ approved SCP, or as determined by the DEQ. SCPs for mine areas A, C, and D watersheds are on file with DEQ.

2. Water Quality-based Effluent Limitations (WQBELs)

Permits are required to include WQBELs when TBELs are not adequate to prevent excursions of state water quality standards (WQS).

a. Scope and Authority

Montana WQS include beneficial use classifications, numeric and/or narrative water quality standards, and a nondegradation policy, and implementing regulations. The WQS applicable to receiving waters for the discharges regulated by this permit establish a basis for WQBELs in the permit.

b. Applicable Beneficial Uses

The beneficial uses applicable to the receiving waters for discharges from the Rosebud Mine are summarized in **Table 11**. All receiving waters are located within the Middle Yellowstone watershed. Lee Coulee, Cow Creek, Pony Creek, and Spring Creek belong to the Rosebud hydrologic unit (HUC 10100003). They are tributary to Rosebud Creek, which is tributary to the Yellowstone River. West Fork Armells Creek, Black Hank Creek, Donley Creek, and Stocker Creek belong to the Lower Yellowstone-Sunday hydrologic unit (HUC 10100001). They are tributary to East Fork Armells Creek, which is tributary to the Yellowstone River.

The receiving waters fall under the Water-Use Classifications for the Yellowstone River drainage from the Billings water supply intake to the North Dakota state line. At the point of discharge for all permitted outfalls, the hydrologic condition of the receiving water is ephemeral as that term is defined at ARM 17.30.602(10), excluding those outfalls discharging to the intermittent segment of East Fork Armells Creek as discussed in **Part II Section A.3** of this Fact Sheet.

Table 11. Beneficial Uses

Classification	Beneficial Uses
C-3	• Bathing, swimming, and recreation • Growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl, and furbearers • Natural water quality is marginally suitable for drinking, culinary and food processing purposes, agriculture, and industrial water supply.

c. Impaired Waters

The State of Montana draft 2020 and final 2018 Integrated 303(d) List and 305(b) Water Quality Report lists East Fork Armells Creek and West Fork Armells Creek as impaired waters. If a TMDL is adopted and approved for any of the pollutants provided below, the Permit may be reopened to include effluent limitations based on appropriate wasteload allocations (WLAs) from the TMDL for that parameter.

East Fork Armells Creek – Ephemeral reach, segment MT42K002_170, from the headwaters to the mine shops area near outfall 020 (latitude 45.866, longitude -106.368) is listed as a category 4C water body, indicating the water body is impaired or threatened by causes that cannot be resolved with a TMDL. This segment of East Fork Armells Creek is listed as not fully supporting aquatic life and has not been assessed for primary contact recreation. The probable cause of impairment is alteration in stream-side or littoral vegetative covers. The probable source of the impairment is grazing in riparian or shoreline zones.

East Fork Armells Creek – Intermittent reach, segment MT42K002_110, from the mine shops area near outfall 020 (latitude 45.866, longitude -106.638) to mouth is listed as a category 5 water body, indicating that one or more beneficial uses have been assessed as being impaired or threatened. This segment of East Fork Armells Creek is listed as not

fully supporting aquatic life and fully supporting primary contact recreation. The probable causes of impairment are aluminum, iron, nitrate plus nitrite, total nitrogen, total phosphorus, electrical conductivity, TDS, habitat alterations, and alteration in stream-side or littoral vegetative covers. The probable sources of impairments are agricultural, coal mining, transfer of water from an outside watershed, natural and unknown sources, and grazing in riparian or shoreline zones.

West Fork Armells Creek, segment MT42K002_120, from headwaters to mouth is listed as a category 5 water body, indicating that one or more beneficial uses have been assessed as being impaired or threatened. This segment is listed as not fully supporting aquatic life and fully supporting primary contact recreation. The probable causes of impairment are aluminum and iron. The probable sources of aluminum and iron are thought to be natural and unknown. West Fork Armells Creek is a hydrologically ephemeral stream and is not subject to the numeric water quality standards in Circular DEQ-7 pursuant to ARM 17.30.637(4). This permit contains monitoring requirements for aluminum and iron.

The State of Montana draft 2020 and final 2018 Integrated 303(d) List and 305(b) Water Quality Report do not list Stocker, Donley, Black Hank, Spring, Cow, and Pony Creeks and Lee Coulee as impaired.

d. Numeric Standards

Montana Water Quality Standards include both specific water quality standards and general provisions that protect the beneficial uses set forth in the water use classifications. General treatment standards in ARM 17.30.635 and ARM 17.30.637 apply to all discharges from the permittee's facility.

Discharges to C-3 waters must comply with the specific water quality standards in ARM 17.30.629, as well as numeric water quality criteria in Circular DEQ-7. Tributaries of the Rosebud Creek sub-basin must comply with numeric standards for electrical conductivity (EC) and sodium adsorption ration (SAR) in ARM 17.30.670(4).

ARM 17.30.637(4) is specific to ephemeral streams of all classes and prescribes the standards applicable to protect the uses of hydrologically ephemeral streams. Pursuant to ARM 17.30.637(4), the applicable water quality standards for hydrologically ephemeral streams include the minimum treatment requirements in ARM 17.30.1203; and the operation standards, sampling and analytical methods, and general prohibitions in ARM 17.30.635 through 17.30.637, 17.30.640, 17.30.641, 17.30.645, and 17.30.646. The specific water quality standards for C-3 waters found in ARM 17.30.629(2) do not apply to ephemeral streams pursuant to ARM 17.30.637(4).

i. EC and SAR

ARM 17.30.670 sets forth numeric standards for electrical conductivity (EC) and sodium adsorption ratio (SAR), applicable to discharges to tributaries of Rosebud Creek. Tributaries in the Rosebud Creek watershed must meet the following standards:

1. The monthly average numeric water quality standard for EC is 500 µS/cm and no sample may exceed an EC value of 500 µS/cm; and
2. From March 2 through October 31, the monthly average numeric water quality standard for SAR is 3.0 and no sample may exceed an SAR value of 4.5. From November 1 through March 1, the monthly average numeric water quality standard for SAR is 5.0 and no sample may exceed an SAR value of 7.5.

Effluent limitations set forth by the permit for all outfalls discharging into tributaries of Rosebud Creek must address the standards of ARM 17.30.670(4). This includes discharges to Lee Coulee. Other tributaries of Rosebud Creek include Cow Creek, Pony Creek, and Spring Creek which are subject to the Western Alkaline Standards.

As outlined in DEQs white paper titled A Review of the Rationale for EC and SAR Standards water quality standards for EC and SAR may be developed and based on the natural condition of the receiving water. The natural condition is determined through monitoring, interpretation of historic data and modeling. Since EC and SAR water quality standards based on the natural condition applicable to Rosebud Creek have not been developed, the standards in ARM 17.30.670(4) are applicable.

ii. Nutrients

In 2014, DEQ adopted Circular DEQ 12-A, containing numeric nutrient (nitrogen and phosphorus) criteria applicable to wadeable streams. For the purposes of Circular DEQ 12-A, a "wadeable stream" means a perennial or intermittent stream in which most of the wetted channel is safely wadeable by a person during base flow conditions. East Fork Armells Creek – Intermittent reach is considered a wadeable stream and is subject to the numeric criteria of Circular DEQ 12-A for the Northwester Great Plans (43) ecoregion. The hydrologically ephemeral receiving waters at the facility are not considered wadeable streams and are not subject to the numeric criteria of Circular DEQ 12-A.

e. Narrative Standards

i. "Free From" Standards

The general provisions of ARM 17.30.637(1) apply to all categories of state waters, including mixing zones, and typically are referred to as "free from" standards. These general prohibitions represent the minimum level of protection that applies to all state waters, including within mixing zone, ephemeral water, and drainage ways. These provisions require that state waters must be free from substances which will:

a) Settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines;
b) Create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter) or globules of grease or other floating materials;
c) Produce odors, colors or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible;

d) Create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; and
e) Create conditions which produce undesirable aquatic life.

ii. East Fork Armells Creek – Ephemeral

All planned discharges to East Fork Armells Creek – Ephemeral will be managed in such a way that effluent infiltrates prior to reaching East Fork Armells Creek – Intermittent. This includes all outfalls on East Fork Armells which are upstream of the in-channel dam located between outfalls 022 and 023. Planned discharges to East Fork Armells – Ephemeral shall adhere to the following requirements:

a) Discharges must be designed in such a way as to prevent erosion of the channel at the point of discharge and immediately downstream;
b) Any discharges that result in the overtopping of the in-channel dam located between outfalls 022 and 023 must be reported to DEQ within 24 hours;
c) The in-channel dam between outfalls 022 and 023 must be maintained in good working order;
d) The site conditions for all planned discharges to East Fork Armells Creek – Ephemeral must be recorded and retained onsite. These records are to include the reason for the planned discharge, weather conditions, observations of the channel, and date of last inspection of the in-channel dam between outfalls 022 and 023; and
e) The permittee must submit a report to DEQ within one month following each planned discharge to East Fork Armells Creek – Ephemeral which contains a summary of the event as described in item "d" above.

f. Nondegradation

The Montana Water Quality Act includes a nondegradation policy in 75-5-303 MCA and Administrative Rules found in 17.30 Subchapter 7. Discharges from outfalls listed in **Tables 2 and 3** are considered existing discharges, not new or increased sources as defined at ARM 17.30.702(17).

The three aspects of the State nondegradation policy parallel the three "tiers" of a Federal antidegradation policy as required by USEPA in 40 CFR 131.12. These three tiers are as follows:

Tier 1: Existing uses of State waters and the level of water quality necessary to protect those uses must be maintained and protected [75-5-303(1) MCA]. ARM 17.30.705(2)(a) requires that, for all State waters, existing and anticipated uses and the water quality necessary to protect those uses must be maintained.

Tier 2: Unless authorized by DEQ through a nondegradation analysis or exempted from review under 75-5-317 MCA, the quality of high-quality waters must be maintained [75-5-303(2)].

Tier 3: The Board may not authorize degradation of State waters classified as "outstanding resource waters" [75-5-303(7)].

Outfalls discharging to East Fork Armells Creek – Ephemeral, Stocker Creek, Lee Coulee, West Fork Armells Creek, Black Hank Creek, Donley Creek, Cow Creek, Spring Creek, and Pony Creek are existing sources and discharge to hydrologically ephemeral drainages, which have zero flow or surface expression for more than 270 days in most years. Therefore, these waters are not high-quality waters as defined at 75-5-103(13) and are afforded Tier 1 protection meaning existing and anticipated uses and water quality necessary to protection those uses must be maintained, see 75-5-303(1), MCA and ARM 17.30.705(2)(a).

Outfalls discharging to East Fork Armells Creek – Intermittent are existing sources and discharge to a hydrologically intermittent drainage, which is below the local water table for at least some part of the year and obtains its flow from both surface run-off and ground water discharge. However, East Fork Armells Creek – Intermittent is not a high-quality water as defined at 75-5-103(13) because it has been listed as a category 5 water body, which is not capable of supporting aquatic life. This water is afforded Tier 1 protection meaning existing and anticipated uses and water quality necessary to protection those uses must be maintained, see 75-5-303(1), MCA and ARM 17.30.705(2)(a).

g. Mixing Zones

Mixing zones are granted by DEQ only when a permittee has applied for a mixing zone, where they are needed (where a discharger cannot meet the applicable numeric WQS at the point of discharge), and where they are appropriate (based on the criteria specified in the regulations).

East Fork Armells Creek – Ephemeral, Stocker Creek, Lee Coulee, West Fork Armells Creek, Black Hank Creek, Donley Creek, Cow Creek, Spring Creek, and Pony Creek are ephemeral streams having critical low flows of 0 cubic feet per second (cfs), which provides no dilution for a mixing zone. Therefore, a mixing zone is not authorized by the permit.

East Fork Armells Creek – Intermittent is an intermittent stream and has a critical low flow of 0 cfs, providing no dilution water for a mixing zone. Therefore, a mixing zone is not authorized by the permit.

h. Determining the Need for WQBELs

Limitations must be established in permits to control all pollutants or pollutant parameters that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard. Often, this requirement is referred to as the "reasonable potential" regulation and the process that DEQ uses to determine whether a WQBEL is required is called a "reasonable potential analysis." Thus, a reasonable potential analysis may be used to determine whether a discharge, alone or in combination with other sources of pollutants to a water body and under some set of conditions arrived at by making a series of reasonable assumptions, could lead to an excursion above an applicable water quality standard.

Pollutants of concern for discharges from the Facility include total iron, total suspended solids (TSS), settleable solids (SS), and pH. These pollutants and parameters are identified as pollutants of concern as they are regulated under the applicable ELGs for coal mines found at 40 CFR Part 434, Subpart D, effluent limit guidelines for coal mines, alkaline mine drainage. Thus, the MPDES permit for the facility must include TBELs for these pollutants and parameters and they should be evaluated to determine the need for WQBELs.

Additional pollutants of concern for include dissolved aluminum, arsenic, cadmium, chromium, copper, EC, lead, mercury, nickel, nitrate plus nitrite, SAR, selenium, silver, and zinc. These parameters were identified as pollutants of concern because they were included in earlier permits and effluent data indicate they are, or potentially may be, present in discharges. In addition to the pollutants and parameters listed above, pollutants of concern for East Fork Armells Creek – Intermittent reach include total nitrogen, total phosphorus, and ammonia as N.

DEQ will maintain effluent limits from the previous permit for boron, TDS, and sulfate. DEQ will also retain effluent monitoring requirements for chloride.

ARM 17.30.637(4) applies to ephemeral streams of all classes and prescribes the standards applicable to protect the uses of hydrologically ephemeral streams. The specific water quality standards for C-3 waters found in ARM 17.30.629 do not apply to ephemeral streams pursuant to ARM 17.30.637(4). Evaluation of reasonable potential to exceed numeric standards in Circulars DEQ-7 and DEQ-12A, as adopted by ARM 17.30.629, is unnecessary for the ephemeral stretch of East Fork Armells Creek, Stocker Creek, Lee Coulee, West Fork Armells Creek, Black Hank Creek, Donley Creek, Cow Creek, Spring Creek, and Pony Creek because these receiving waters of permitted discharges are ephemeral. However, a reasonable potential analysis to exceed the numeric standards for EC and SAR set by ARM 17.30.670(4) is necessary for discharges to Lee Coulee as this stream is a tributary of Rosebud Creek.

i. Reasonable Potential Analysis (RPA)

In general, there are two scenarios when a discharge occurs: 1) a planned discharge and 2) a precipitation-driven discharge. During a planned discharge the effluent travels from the sediment trap or pond to the receiving water. During a precipitation-driven discharge, large volumes of rainfall and/or snowmelt are present to dilute the effluent. DEQ evaluated the reasonable potential for the discharge to cause or contribute to an excursion of applicable water quality standards.

Machinery used inside the mine has the potential to leak hydraulic oil, engine oil and other fluids and enter mine dewatering water. For this reason, the general prohibition at ARM 17.30.637(1)(b) limiting oil and grease to less than 10 mg/L will be retained from the previous permit in addition to narrative limitations prohibiting sludge or emulsion, floating solids or visible oil film.

Whole Effluent Toxicity (WET) testing is required for any outfall receiving effluent impacted by activities meeting the definition in 40 CFR 434.11 of "coal preparation plant," "coal preparation plant associated areas," and "coal plant water circuit." The Facility does include activities related to coal preparation and WET testing of effluent for those outfalls will be required. ARM 17.30.637(1)(d) is implemented through application of numeric standards and whole effluent toxicity (WET) requirements. WET tests conducted during the previous permit cycle do not indicate reasonable potential to violate the general prohibitions of ARM 17.30.637(1)(d), therefore a narrative effluent limit is not required. WET monitoring requirements are continued from the previous permit.

ARM 17.30.670(4) includes water quality standards for EC and SAR. These standards apply to tributaries of Rosebud Creek, which include Lee Coulee, Cow Creek, Pony Creek, and Spring Creek. Cow Creek, Pony Creek, and Spring Creek are subject to Western Alkaline Standards. DEQ finds discharges from outfalls to Lee Coulee having RPA to exceed ARM 17.30.670(4) will be subject to EC effluent limits. DEQ has no effluent data for SAR from the Lee Coulee outfalls since the Permittee did not report any discharges during the POR. In addition, the Permittee was not required to submit SAR data for renewal application purposes. Therefore, DEQ has not data to find a WQBEL is justified at this time. DEQ require SAR monitoring for all discharges at the Lee Coulee outfalls during the permit term.

TBELs for total suspended solids, settleable solids, and pH were found to be protective of water quality and no further reasonable potential analysis is necessary.

Effluent quality data collected from discharges during the period of January 2015 through December 2020, and summarized in the facility's DMRs, and results from representative sampling of the facility's sedimentation ponds were used to evaluate reasonable potential for discharges to cause or contribute to an excursion above water quality standards. The permittee provided a correlation between all outfalls and the representative sampling sites. Effluent quality data from discharges and data from the representative sampling sites were consolidated according to receiving water based on the assumption that both datasets are representative of effluent quality for all outfalls. RPA methods are detailed in

Appendix G. RPA was performed for East Fork Armells Creek – Intermittent and Lee Coulee (EC only).

RPA was not performed for East Fork Armells Creek – Ephemeral, West Fork Armells Creek, Black Hank Creek, Donley Creek, Lee Coulee, Stocker Creek, and Spring Creek as the specific water quality standards for C-3 waters found in ARM 17.30.629 do not apply to ephemeral streams pursuant to ARM 17.30.637(4). RPA was not performed for Cow Creek, Pony Creek, and Spring Creek as these discharges are regulated under the Western Alkaline Coal Mining standards, 40 CFR 434, Subpart H.

Table 12 presents a summary of the RPA for East Fork Armells Creek – Intermittent. Reasonable potential was found to exist for dissolved aluminum, ammonia as N, iron, mercury, total nitrogen, selenium, and silver for discharges to East Fork Armells Creek – Intermittent. **Table 13** presents a summary of the RPA for Lee Coulee. Reasonable potential was found to exist for EC for discharges to Lee Coulee. Therefore, WQBELs will be calculated and compared to previous permits (where applicable), with the most stringent limitations retained.

Freshwater aquatic life standards for cadmium, chromium, copper, lead, nickel, silver, and zinc are expressed as a function of total hardness (mg/L, as calcium carbonate or CaCO3). As total hardness of the receiving water increases, criteria concentrations also increase. Circular DEQ-7 specifies upper and lower threshold values for total hardness used in calculating hardness-based metals criteria, in addition to the equations used for acute and chronic standards.

Table 12. RPA Summary – Discharges to East Fork Armells Creek – Intermittent

Parameter	Units	Lowest Applicable Numeric Standard (C) (1)	Projected Maximum Effluent Concentration (C_d) (2)	Projected Receiving Water Concentration (C_r) (3)	RPA Result – Need Limit?
Aluminum, dissolved	µg/L	87	540	540	Yes
Arsenic, total recoverable	µg/L	10	2	2	No
Cadmium, total recoverable	µg/L	5	2	2	No
Chromium, total recoverable	µg/L	100	10	10	No
Copper, total recoverable	µg/L	446.17	10	10	No
Iron, total		1	10.67	10.67	Yes
Lead, total recoverable	µg/L	4.18	2	2	No
Mercury, total	µg/L	0.05	0.2	0.2	Yes

Parameter	Units	Lowest Applicable Numeric Standard (C) (1)	Projected Maximum Effluent Concentration (C_d) (2)	Projected Receiving Water Concentration (C_r) (3)	RPA Result – Need Limit?
recoverable					
Nickel, total recoverable	µg/L	100	84	84	No
Nitrogen, total	µg/L	150	4862	4862	Yes
Nitrogen, Ammonia as N	mg/L	1.91(4)	3.9	3.9	Yes
Nitrate + nitrite as N	mg/L	10	1.26	1.26	No
Phosphorus, total	mg/L	1.3	0.099	0.099	No
Selenium, total	µg/L	5	5.4	5.4	Yes
Silver, total recoverable	µg/L	0.27	2	2	Yes
Zinc, total recoverable	µg/L	7400	20	20	No

Footnotes:
(1) For metals with WQS (C) that are calculated using the receiving water hardness, a hardness of 400 mg/L as $CaCO_3$ was used.
(2) See Appendix G for a summary of C_d calculations.
(3) Because the critical low flow is 0 cfs, dilution (D) = 0 and C_d=C_r
(4) WQS (C) for Nitrogen, Ammonia as N was calculated per DEQ-7 footnotes 7 and 8 using the 75th percentile values for pH and temperature: pH = 8.1 and temperature = 18.6° C.

Table 13. RPA Summary – Discharges to Lee Coulee

Parameter	Units	Lowest Applicable Numeric Standard (C)	Projected Maximum Effluent Concentration (C_d) (1)	Projected Receiving Water Concentration (C_r) (2)	RPA Result – Need Limit?
Electrical Conductivity (EC)	µS.cm	500	8531.2	8531.2	Yes

Footnotes:
(1) See Appendix G for a summary of C_d calculations.
(2) Because the critical low flow is 0 cfs, dilution (D) = 0 and C_d=C_r

3. Final Effluent Limitations

Section 402(o) of the CWA and 40 CFR 122.44(l) require that effluent limitations or conditions in reissued permits be at least as stringent as those in the existing permit, with certain exceptions.

a. Satisfaction of Anti-backsliding Analysis

All numeric effluent limitations in this permit are at least as stringent as the effluent limitations in the previous permit. Narrative effluent limitations addressing sludge,

emulsions, floating debris, scum, oil film, odors and color are retained from the previous permit. Narrative effluent limitations addressing toxic or harmful concentrations and undesirable aquatic life have been retained from the previous permit.

b. Stringency of Requirements for Individual Pollutants

This permit consists of effluent limits for individual pollutants. The TBELs, which are retained from the previous permit, consist of restrictions on total suspended solids, settleable solids, total iron, and pH, and are discussed in **Section III Part A.1** of this Fact Sheet. TBELs are the applicable Federal minimum technology-based pollutant restriction requirements. Effluent limits for sodium adsorption ratio and electrical conductivity, based on ARM 17.30.670(4), and oil and grease, based on 17.30.637(1)(b), have been retained from the previous permit. Effluent limits for boron, sulfate, and total dissolved solids were retained from the previous permit. WQBELs were applied for aluminum, ammonia as N, iron, mercury, total nitrogen, selenium, and silver for East Fork Armells Creek – Intermittent and EC for Lee Coulee.

c. Narrative Effluent Limitations

i. "Free From" Standards

a) There shall be no discharge from any outfall listed in **Table 2** that reacts or settles to form an objectionable sludge deposit or emulsion beneath the surface of the receiving water or upon adjoining shorelines.
b) There shall be no discharge from any outfall listed in **Table 2** of floating debris, scum, a visible oil film or globules of grease or other floating materials.
c) There shall be no discharge from any outfall listed in **Table 2** that produce odors, colors, or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible.
d) There shall be no discharge from any outfall listed in **Table 2** that creates conditions that produce undesirable aquatic life; or
e) There shall be no discharge from any outfall listed in **Table 2** that creates concentrations or combinations of materials which are toxic or harmful to human, animal, plant, or aquatic life.

ii. East Fork Armells Creek – Ephemeral

All planned discharges to East Fork Armells Creek – Ephemeral will be managed in such a way that effluent infiltrates prior to reaching East Fork Armells Creek – Intermittent. This includes all outfalls on East Fork Armells which are upstream of the in-channel dam located between outfalls 022 and 023. Planned discharges to East Fork Armells – Ephemeral shall adhere to the following requirements:

a) Discharges must be designed in such a way as to prevent erosion of the channel at the point of discharge and immediately downstream;
b) Any discharges that result in the overtopping of the in-channel dam located between outfalls 022 and 023 must be reported to DEQ within 24 hours;
c) The in-channel dam between outfalls 022 and 023 must be maintained in good working order;

d) The site conditions for all planned discharges to East Fork Armells Creek – Ephemeral must be recorded and retained onsite. These records are to include the reason for the planned discharge, weather conditions, observations of the channel, and date of last inspection of the in-channel dam between outfalls 022 and 023; and
e) The permittee must submit a report to DEQ within one month following each planned discharge to East Fork Armells Creek – Ephemeral which contains a summary of the event as described in item "d" above.

d. Numeric Effluent Limitations

Numeric effluent limitations for all outfalls are summarized in **Tables 14 through 18**. These limitations apply to planned discharges from the outfalls.

Table 14. Summary of Final Numeric Effluent Limitations – East Fork Armells Creek – Ephemeral(1)

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Boron, total as B	mg/L	0.7	1.1
Iron, total as Fe	mg/L	3.5	7
Oil and grease	mg/L	--	10
pH	S.U.	Between 6.0 and 9.0 at all times	
Sulfate	mg/L	2050	3075
Total dissolved solids (TDS)	mg/L	3000	4500
Total suspended solids	mg/L	35	70

Footnotes:
(1) Outfalls included in the East Fork Armells Creek – Ephemeral drainage are: 023, 024, 025, 026, 043, 044, 046, 048, 049, 051, 052, 054, 056, 058, 059, 060, 061, 063, 064, 127, 128, 133, 136, 137, 139, 128A, 128B, 128C, 128D, 059A.

Table 15. Summary of Final Numeric Effluent Limitations – East Fork Armells Creek – Intermittent(1)

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Aluminum, dissolved as Al(2)	µg/L	71	143
Boron, total as B	mg/L	0.7	1.1
Iron, total as Fe(2)	mg/L	0.7	1.8

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Mercury, total(2)	µg/L	0.05	0.05
Nitrogen, total as N(2) (3)	µg/L	150	150
Nitrogen, Ammonia as N(2)	mg/L	1.56	3.14
Oil and grease	mg/L	--	10
pH	S.U.	Between 6.0 and 9.0 at all times	
Selenium, total as Se(2)	µg/L	4.1	8.2
Silver, total recoverable(2)	µg/L	0.14	.27
Sulfate	mg/L	2050	3075
Total dissolved solids (TDS)	mg/L	3000	4500
Total suspended solids	mg/L	35	70

Footnotes:
(1) Outfalls included in the East Fork Armells Creek – Intermittent drainage are: 009, 010, 011, 012, 013, 014, 015, 016, 018, 019, 020, 021, 022, 075, 194, 010A, 013A, 016A, 008D, 009A.
(2) Limits for these parameters will become effective four (4) years from the effective date of the permit.
(3) Average monthly limit and daily maximum limit for total nitrogen are applicable July 1 to September 30 annually.

Table 16. Summary of Final Numeric Effluent Limitations – West Fork Armells Creek, Black Hank Creek, and Donley Creek(1)

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Boron, total as B	mg/L	0.4	0.6
Iron, total as Fe	mg/L	3.5	7
Oil and grease	mg/L	--	10
pH	S.U.	Between 6.0 and 9.0 at all times	
Sulfate	mg/L	1500	2250
Total dissolved solids (TDS)	mg/L	2600	3900
Total suspended solids	mg/L	35	70

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Footnotes: (1) Outfalls included in the West Fork Armells drainage are: 095, 100, 101, 103, 104, 105, 106, 107, 108, 109, 104A, 95A. The outfall in the Black Hank Creek drainage is 096. The outfalls in Donley Creek is 098.			

Table 17. Summary of Final Numeric Effluent Limitations – Stocker Creek(1)

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Boron, total as B	mg/L	1	1.5
Iron, total as Fe	mg/L	3.5	7.0
Oil and grease	mg/L	--	10
pH	S.U.	Between 6.0 and 9.0 at all times	
Sulfate	mg/L	2400	3600
Total dissolved solids (TDS)	mg/L	3950	5925
Total suspended solids	mg/L	35	70
Footnotes: (1) Outfalls included in the Stocker Creek drainage are: 030, 032, 033, 034, 035, 069, 070, 071, 072, 071C.			

Table 18. Summary of Final Numeric Effluent Limitations – Lee Coulee(1)

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Boron, total as B	mg/L	0.4	0.6
Electrical Conductivity (EC)	µS/cm	249	500
Iron, total as Fe	mg/L	3.5	7
Oil and grease	mg/L	--	10
pH	S.U.	Between 6.0 and 9.0 at all times	
Sulfate	mg/L	1500	2250
Total suspended solids	mg/L	35	70

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Footnotes: (1) Outfalls included in the Lee Coulee drainage are: 130, 131, 132, 134, 130A, 130B, 131A.			

e. Alternate Numeric Effluent Limitations:

The effluent limitations applicable to precipitation-driven discharge events are summarized in **Tables 19 through 23**. These apply to defined precipitation-driven discharge conditions. The permittee bears the burden of proof that the discharge or increase in discharge was caused by an applicable precipitation event. Notification of a precipitation-driven discharge event will be provided to the Department by the permittee within 30 days of the discharge event or increase in discharge; monitoring results demonstrating precipitation volume (or snowmelt equivalent) are required with notification of a precipitation-driven event.

Table 19. Summary of Alternate Numeric Effluent Limitations for Precipitation Events – East Fork Armells Creek – Ephemeral

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Boron, total as B[(1) (2)]	mg/L	--	1.1
Oil and grease[(1)(2)]	mg/L	--	10
pH[(1)(2)]	S.U.	Between 6.0 and 9.0 at all times	
Settleable solids[(1)]	ml/L	--	0.5
Sulfate[(1) (2)]	mg/L	--	3075
Total dissolved solids (TDS) [(1) (2)]	mg/L	--	4500
Footnotes: (1) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-yr, 24-hr precipitation event (or snowmelt of equivalent volume) of 2.4 inches. (2) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period greater than the 10-yr, 24-hr precipitation event (or snowmelt of equivalent volume) of 2.4 inches.			

Table 20. Summary of Alternate Numeric Effluent Limitations for Precipitation Events – East Fork Armells Creek – Intermittent

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Aluminum, dissolved as Al[(1) (2) (3)]	µg/L	--	143
Boron, total as B[(1) (2)]	mg/L	--	1.1
Iron, total as Fe[(1) (2) (3)]	mg/L	--	1.8
Mercury, total recoverable[(1) (2) (3)]	µg/L	--	0.05
Nitrogen, total as N[(1) (2) (3)]	µg/L	--	150
Nitrogen, Ammonia as N[(1) (2) (3)(4)]	mg/L	--	3.14
Oil and grease[(1)(2)]	mg/L	--	10
pH[(1)(2)]	S.U.	Between 6.0 and 9.0 at all times	
Selenium, total as Se[(1) (2) (3)]	µg/L	--	8.2
Settleable solids[(1)]	ml/L	--	0.5
Silver, total recoverable[(1) (2) (3)]	µg/L	--	0.27
Sulfate[(1) (2)]	mg/L	--	3075
Total dissolved solids (TDS) [(1) (2)]	mg/L	--	4500

Footnotes:
(1) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-yr, 24-hr precipitation event (or snowmelt of equivalent volume) of 2.4 inches.
(2) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period greater than the 10-yr, 24-hr precipitation event (or snowmelt of equivalent volume) of 2.4 inches.
(3) Limits for these parameters will become effective four (4) years from the effective date of the permit.
(4) Average monthly limit and daily maximum limit for total nitrogen are applicable July 1 to September 30 annually.

Table 21. Summary of Alternate Numeric Effluent Limitations for Precipitation Events – West Fork Armells Creek, Black Hank Creek, and Donley Creek

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Boron, total as B[(1) (2)]	mg/L	--	0.6

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Oil and grease(1)(2)	mg/L	--	10
pH(1)(2)	S.U.	Between 6.0 and 9.0 at all times	
Settleable solids(1)	ml/L	--	0.5
Sulfate(1) (2)	mg/L	--	2250
Total dissolved solids (TDS) (1) (2)	mg/L	--	3900

Footnotes:
(1) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-yr, 24-hr precipitation event (or snowmelt of equivalent volume) of 2.4 inches.
(2) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period greater than the 10-yr, 24-hr precipitation event (or snowmelt of equivalent volume) of 2.4 inches.

Table 22. Summary of Alternate Numeric Effluent Limitations for Precipitation Events – Stocker Creek

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Boron, total as B(1) (2)	mg/L	--	1.5
Oil and grease(1)(2)	mg/L	--	10
pH(1)(2)	S.U.	Between 6.0 and 9.0 at all times	
Settleable solids(1)	ml/L	--	0.5
Sulfate(1) (2)	mg/L	--	3600
Total dissolved solids (TDS) (1) (2)	mg/L	--	5925

Footnotes:
(1) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-yr, 24-hr precipitation event (or snowmelt of equivalent volume) of 2.4 inches.
(2) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period greater than the 10-yr, 24-hr precipitation event (or snowmelt of equivalent volume) of 2.4 inches.

Table 23. Summary of Alternate Numeric Effluent Limitations for Precipitation Events – Lee Coulee

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Boron, total as B[(1) (2)]	mg/L	--	0.6
Electrical Conductivity[(1)(2)]	µS/cm	--	500
Oil and grease[(1)(2)]	mg/L	--	10
pH[(1)(2)]	S.U.	Between 6.0 and 9.0 at all times	
Settleable solids[(1)]	ml/L	--	0.5
Sulfate[(1) (2)]	mg/L	--	2250

Footnotes:
(1) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-yr, 24-hr precipitation event (or snowmelt of equivalent volume) of 2.4 inches.
(2) Applicable to discharges or increases in the volume of discharges caused by precipitation within any 24-hour period greater than the 10-yr, 24-hr precipitation event (or snowmelt of equivalent volume) of 2.4 inches.

B. Rationale for Monitoring and Reporting Requirements

Section I.C of the permit establishes monitoring and reporting requirements to implement Federal and State requirements. The following provides the rationale for the monitoring and reporting requirements for this facility.

All analytical procedures must comply with the specification of 40 CFR 136 and the analyses must meet any Required Reporting Values (RRVs) listed in Circular DEQ-7 unless otherwise specified. Samples shall be collected, preserved, and analyzed in accordance with approved procedures listed in 40 CFR 136.

1. Monitoring Requirements

All monitoring shall be conducted at the overflow structure where effluent discharges as overflow from the sediment control structure, or at the end of the discharge pipe when pumped or drained, and prior to contact with the receiving water. **Tables 24 through 27** summarize the monitoring requirements for all outfalls described in **Table 2.** Monitoring parameters are retained from the previous permit, with the addition of more frequent monitoring requirements for those parameters with WQBELs identified in **Tables 15 and 17** for East Fork Armells Creek – Intermittent and Lee Coulee.

Table 24. Summary of Monitoring Requirements – East Fork Armells Creek – Ephemeral

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (1)
Flow	gpd	(2)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Total suspended solids	mg/L	Grab	Daily	Daily Max. & Mo. Avg.	NA
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total dissolved solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Aluminum, dissolved as Al	µg/L	Grab	Monthly	Daily Max. & Mo. Avg.	9
Boron, total as B	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Nitrate + nitrite, total as N	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	0.02
Selenium, total as Se	µg/L	Grab	Monthly	Daily Max. & Mo. Avg.	1
Sodium adsorption ratio	Ratio	Calculated(3)	Monthly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(4)
WET – Acute Two Species(5)	% Effluent	Grab	Annually	Pass/Fail	NA

Footnotes:

(1) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition.

(2) Requires recording device or totalizer.

(3) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$

(4) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable.

(5) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.

Table 25. Summary of Monitoring Requirements – East Fork Armells Creek – Intermittent

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (1)
Flow	gpd	(2)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Total suspended solids	mg/L	Grab	Daily	Daily Max. & Mo. Avg.	NA
Aluminum, dissolved as Al	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Mercury, total recoverable	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.005
Nitrogen, total as N	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	245
Nitrogen, Ammonia as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.07
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Selenium, total as Se	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1
Silver, total recoverable	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.2
Total dissolved solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Boron, total as B	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Nitrate + nitrite, total as N	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	0.02
Phosphorus, total as P	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	3
Sodium adsorption ratio	Ratio	Calculated(3)	Monthly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(4)
WET – Acute Two Species(5)	% Effluent	Grab	Annually	Pass/Fail	NA

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (1)
Footnotes: (1) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition. (2) Requires recording device or totalizer. (3) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5*([Ca^{2+}]+[Mg^{2+}])}$ (4) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable. (5) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.					

Table 26. Summary of Monitoring Requirements – West Fork Armells Creek, Black Hank Creek, Donley Creek, and Stocker Creek

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (1)
Flow	gpd	(2)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Total suspended solids	mg/L	Grab	Daily	Daily Max. & Mo. Avg.	NA
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total dissolved solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Aluminum, dissolved as Al	µg/L	Grab	Monthly	Daily Max. & Mo. Avg.	9
Boron, total as B	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Nitrate + nitrite, total as N	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	0.02
Selenium, total as Se	µg/L	Grab	Monthly	Daily Max. & Mo. Avg.	1
Sodium adsorption ratio	Ratio	Calculated(3)	Monthly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(4)
WET – Acute Two Species(5)	% Effluent	Grab	Annually	Pass/Fail	NA

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (1)
Footnotes: (1) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition. (2) Requires recording device or totalizer. (3) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$ (4) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable. (5) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.					

Table 27. Summary of Monitoring Requirements – Lee Coulee

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (1)
Flow	gpd	(2)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Total suspended solids	mg/L	Grab	Daily	Daily Max. & Mo. Avg.	NA
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Aluminum, dissolved as Al	µg/L	Grab	Monthly	Daily Max. & Mo. Avg.	9
Boron, total as B	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Nitrate + nitrite, total as N	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	0.02
Selenium, total as Se	µg/L	Grab	Monthly	Daily Max. & Mo. Avg.	1
Sodium adsorption ratio	Ratio	Calculated(3)	Monthly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Monthly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(4)
WET – Acute Two Species(5)	% Effluent	Grab	Annually	Pass/Fail	NA

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (1)
Footnotes: (1) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition. (2) Requires recording device or totalizer. (3) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$ (4) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable. (5) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.					

2. Alternate Monitoring Requirements

Alternate monitoring requirements for discharges caused by precipitation events are summarized in **Tables 28 through 35.** The permittee shall have the burden of proof that any discharge was a result of a precipitation events, and that these alternate monitoring requirements are applicable.

The permittee shall collect a grab sample within the first thirty minutes of discharge from any permitted outfall for any discharge which results from a precipitation related event. As an alternative to a single grab sample, the permittee may take a flow-weighted composite of either the entire discharge or for the first three hours of the discharge. For a flow-weighted composite, only one analysis of the composited aliquots is required. Flow weighted composite samples are not allowed for pH and oil and grease.

Table 28. Summary of Monitoring Requirements for Precipitation-Driven Small Events(1) – East Fork Armells – Ephemeral

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Flow	gpd	(3)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Settleable Solids	mL/L	Grab	Daily	Daily Max. & Mo. Avg.	NA
Aluminum, dissolved as Al	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9
Boron, total as B	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Nitrate + nitrite, total as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Selenium, total as Se	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1
Sodium adsorption ratio	Ratio	Calculated(4)	Weekly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total dissolved solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total suspended solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(5)
WET – Acute Two Species(6)	% Effluent	Grab	Annually	Pass/Fail	NA

Footnotes:
(1) These monitoring requirements apply to any discharges or increases in volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equal volume) of 2.4 inches.
(2) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition.
(3) Requires recording device or totalizer.
(4) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$
(5) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable.
(6) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.

Table 29. Summary of Monitoring Requirements for Precipitation-Driven Large Events(1) – East Fork Armells – Ephemeral

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Flow	gpd	(3)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Aluminum, dissolved as Al	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9
Boron, total as B	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Weekly	Daily Max. & Mo. Avg.	NA

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Nitrate + nitrite, total as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Selenium, total as Se	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1
Sodium adsorption ratio	Ratio	Calculated(4)	Weekly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total dissolved solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total suspended solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(5)
WET – Acute Two Species(6)	% Effluent	Grab	Annually	Pass/Fail	NA

Footnotes:
(1) These monitoring requirements apply to any discharges or increases in volume of discharges caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equal volume) of 2.4 inches.
(2) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition.
(3) Requires recording device or totalizer.
(4) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$
(5) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable.
(6) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.

Table 30. Summary of Monitoring Requirements for Precipitation-Driven Small Events(1) – East Fork Armells – Intermittent

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Flow	gpd	(3)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Settleable solids	mL/L	Grab	Daily	Daily Max. & Mo. Avg.	NA
Aluminum, dissolved as Al	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Boron, total as B	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Mercury, total recoverable	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.005
Nitrate + nitrite, total as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Nitrogen, total as N	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	245
Nitrogen, Ammonia as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.07
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Phosphorus, total as P	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	3
Selenium, total as Se	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1
Silver, total recoverable	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.2
Sodium adsorption ratio	Ratio	Calculated(4)	Weekly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total dissolved solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total suspended solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(5)
WET – Acute Two Species(6)	% Effluent	Grab	Annually	Pass/Fail	NA

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Footnotes: (1) These monitoring requirements apply to any discharges or increases in volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equal volume) of 2.4 inches. (2) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition. (3) Requires recording device or totalizer. (4) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$ (5) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable. (6) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.					

Table 31. Summary of Monitoring Requirements for Precipitation-Driven Large Events(1) – East Fork Armells – Intermittent

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Flow	gpd	(3)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Aluminum, dissolved as Al	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9
Boron, total as B	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Mercury, total recoverable	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.005
Nitrate + nitrite, total as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Nitrogen, total as N	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	245
Nitrogen, Ammonia as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.07
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Phosphorus, total as P	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	3
Selenium, total as Se	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Silver, total recoverable	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.2
Sodium adsorption ratio	Ratio	Calculated(4)	Weekly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total dissolved solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total suspended solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(5)
WET – Acute Two Species(6)	% Effluent	Grab	Annually	Pass/Fail	NA

Footnotes:
(1) These monitoring requirements apply to any discharges or increases in volume of discharges caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equal volume) of 2.4 inches.
(2) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition.
(3) Requires recording device or totalizer.
(4) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$
(5) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable.
(6) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.

Table 32. Summary of Monitoring Requirements for Precipitation-Driven Small Events(1) – West Fork Armells Creek, Black Hank Creek, Donley Creek, and Stocker Creek

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Flow	gpd	(3)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Settleable solids	mL/L	Grab	Daily	Daily Max. & Mo. Avg.	NA
Aluminum, dissolved as Al	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9
Boron, total as B	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Weekly	Daily Max. & Mo. Avg.	NA

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Nitrate + nitrite, total as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Selenium, total as Se	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1
Sodium adsorption ratio	Ratio	Calculated(4)	Weekly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total dissolved solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total suspended solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(5)
WET – Acute Two Species(6)	% Effluent	Grab	Annually	Pass/Fail	NA

Footnotes:
(1) These monitoring requirements apply to any discharges or increases in volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equal volume) of 2.4 inches.
(2) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition.
(3) Requires recording device or totalizer.
(4) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$
(5) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable.
(6) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.

Table 33. Summary of Monitoring Requirements for Precipitation-Driven Large Events(1) – West Fork Armells Creek, Black Hank Creek, Donley Creek, and Stocker Creek

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Flow	gpd	(3)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Aluminum, dissolved as Al	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9
Boron, total as B	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Chloride (as Cl)	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Nitrate + nitrite, total as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Selenium, total as Se	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1
Sodium adsorption ratio	Ratio	Calculated(4)	Weekly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total dissolved solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total suspended solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(5)
WET – Acute Two Species(6)	% Effluent	Grab	Annually	Pass/Fail	NA

Footnotes:
(1) These monitoring requirements apply to any discharges or increases in volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equal volume) of 2.4 inches.
(2) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition.
(3) Requires recording device or totalizer.
(4) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$
(5) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable.
(6) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.

Table 34. Summary of Monitoring Requirements for Precipitation-Driven Small Events(1) – Lee Coulee

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Flow	gpd	(3)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Settleable Solids	mL/L	Grab	Daily	Daily Max. & Mo. Avg.	NA

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Aluminum, dissolved as Al	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9
Boron, total as B	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Nitrate + nitrite, total as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Selenium, total as Se	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1
Sodium adsorption ratio	Ratio	Calculated(4)	Weekly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total suspended solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(5)
WET – Acute Two Species(6)	% Effluent	Grab	Annually	Pass/Fail	NA

Footnotes:

(1) These monitoring requirements apply to any discharges or increases in volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equal volume) of 2.4 inches.

(2) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition.

(3) Requires recording device or totalizer.

(4) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$

(5) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable.

(6) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.

Table 35. Summary of Monitoring Requirements for Precipitation-Driven Large Events(1) – Lee Coulee

Parameter	Units	Sample Type	Monitoring Frequency	Reporting Requirement	RRV (2)
Flow	gpd	(3)	Continuous	Daily Max. & Mo. Avg.	NA
pH	S.U.	Instantaneous or Grab	Daily	Daily Max./Min.	NA
Aluminum, dissolved as Al	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	9
Boron, total as B	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Chloride (as Cl)	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Electrical conductivity	µS/cm	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Iron, total as Fe	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Nitrate + nitrite, total as N	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	0.02
Oil and grease	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Selenium, total as Se	µg/L	Grab	Weekly	Daily Max. & Mo. Avg.	1
Sodium adsorption ratio	Ratio	Calculated(4)	Weekly	Daily Max. & Mo. Avg.	NA
Sulfate	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Total suspended solids	mg/L	Grab	Weekly	Daily Max. & Mo. Avg.	NA
Metals, total recoverable	µg/L	Grab	Annually	Daily Max. & Mo. Avg.	(5)
WET – Acute Two Species(6)	% Effluent	Grab	Annually	Pass/Fail	NA

Footnotes:

(1) These monitoring requirements apply to any discharges or increases in volume of discharges caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equal volume) of 2.4 inches.

(2) Required reporting values (RRV) for parameters listed in *Circular DEQ-7 Montana Numeric Water Quality Standard* are current as of the June 2019 edition.

(3) Requires recording device or totalizer.

(4) Monitoring for SAR shall consist of monitoring for dissolved sodium, calcium and magnesium with a ML of 1.0 mg/L; calculated as $SAR = [Na+]/\sqrt{(0.5 * ([Ca^{2+}] + [Mg^{2+}])}$

(5) Metals includes those metals with aquatic life numeric standards contained in the Montana Circular DEQ-7: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc as total recoverable.

(6) Whole effluent toxicity testing is required for outfalls associated with Coal Preparation Plants and Coal Preparation Plant Associated Areas.

3. Whole Effluent Toxicity Testing

Whole effluent acute toxicity testing as specified in the permit is required to assess any negative effects caused by aggregate toxic effects of pollutants in the discharge. Whole effluent toxicity testing is required for any outfall where activities that meet the definition of "coal preparation plant," "coal preparation plant associated areas," and "coal plant water circuit," as defined in 40 CFR 434.11 are conducted or are located. At the facility, Outfalls 009, 016A, 009A, 043, and 194 meet these criteria.

Starting the first calendar quarter following the effective date of the permit, the permittee shall conduct acute static renewal toxicity tests on a grab sample of the effluent according to the above monitoring schedules. Testing will employ two species and will consist of five (5) effluent concentrations (100, 50, 25, 12.5, 6.25 percent effluent) and a control. Dilution water and the control shall consist of moderately hard water, in accordance with WET methods.

The static renewal toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Methods for Measuring the Acute Toxicity of Effluent to Freshwater and Marine Organisms*, EPA-600/4-90/027 and the *Region VIII EPA NPDES Acute Test Conditions-Static Renewal Whole Effluent Toxicity*. The permittee shall conduct acute 48-hour static renewal tests using *Ceriodaphnia dubia* and a 96-hour static renewal acute toxicity test using *Pimephales promelas* (fathead minnow).

Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration. If more than 10 percent control mortality occurs, the test is considered invalid and shall be repeated until satisfactory control survival is achieved, unless a specific individual exception is granted by the Department. This exception may be granted if less than 10 percent mortality was observed at the dilutions containing high effluent concentrations.

If acute toxicity occurs in a routine test, an additional test (resample) shall be conducted within 14 days of the date of notification of the test failure. Should acute toxicity occur in the resample test or if a second sample cannot be collected, testing shall occur at each discharge event for the duration of this permit term. In all cases, the results of all toxicity tests must be submitted to the Department in accordance with the permit.

Monitoring for chronic toxicity is not required due to the intermittent, not continuous, nature of discharges at the facility. As discharges are intermittent, chronic effects from discharge are not anticipated. If discharges become continuous in the future, the permit may be reopened to include chronic toxicity monitoring requirements.

4. Other Monitoring Requirements

a. Precipitation Monitoring

The permittee is required to monitor and report precipitation in each drainage basin (i.e., East Fork Armells Creek, West Fork Armells Creek, Stocker Creek, Donley Creek, Black Hank Creek, Pony Creek, Cow Creek, Spring Creek, and Lee Coulee), using a precipitation gauge that meets the standards provided in National Weather Services (NWS) Instructional Bulletin 10-1302 (November 14, 2014), *Requirements and*

Standards for NWS Climate Observations, which are provided in **Table 36**. Precipitation monitoring is required to provide evidence that a precipitation event resulted in a discharge, and that alternate limitations and monitoring requirements apply.

Table 36. Precipitation Gauge Performance Standards

Manual Daily Precipitation – Gauge Standard					
Parameter	**Requires**	**Seasonal**	**Range**	**Resolution**	**Measurement Accuracy**
Precipitation, Rain	Eight-Inch Diameter Collection Vessel with Tube and Measuring Stick	Funnel (All year except for snow or frozen precip. events)	0 to 20 inches	0.01 inches	±0.02 inches
	Four-Inch Diameter Collection Vessel with Tube	Funnel (All year except for snow or frozen precip. events)	0 to 10 inches	0.01 inches	±0.02 inches
Precipitation, Frozen (Liquid Equivalent)	Eight-Inch Diameter Collection Vessel	Open Aperture (snow or frozen precip. events)	0 to 24 inches of snow	0.01 inches melted	±0.04 inches melted
	Four-Inch Diameter Collection Vessel	Open Aperture (snow or frozen precip. events)	0 to 12 inches of snow	0.01 inches melted	±0.04 inches melted
Snowfall / Snow Depth - Equipment Standard					
Snowfall / Snow Depth: 0.1 inch to 20 inches	Snow stick (marked) and Snow board	Not applicable	0 to 20 inches	0.1 inch	±0.1 inch
Snowfall / Snow Depth: 20 to 40 inches	Snow stick (marked) and Snow board		0 to 40 inches	0.1 inch	±0.1 inch
Snow Depth: 40 to 60 inches	Snow stake (marked)		0 to 60 inches	1 inch	± 1 inch

b. Flow Monitoring and Sampling Units.
The permit requires the permittee to install and use flow monitoring and sampling equipment at each outfall. This requirement is necessary because precipitation events are often localized, high intensity, short duration thunderstorms, and watersheds often cover vast and isolated areas. Ponds may retain water from previous events. Likewise, weather conditions may prevent access to outfalls for monitoring whether an overflow discharge occurred or for discharge sampling. A crest gauge or equivalent equipment can measure flow at the crest, with the establishment of a ratings curve that shows the relationship between peak flow and gauge height. A remote sampling unit can sample a representative sample of the discharged effluent when discharge occurs. The discharge point and monitoring location shall be permanently marked and identified at the overflow structure.

5. Reporting Requirements
The permittee must comply with reporting requirements as specified in ARM 17.30.1342. The reporting period for discharges is monthly. If multiple discharge events occur during the monthly reporting period, the permittee must report the highest calculated or measured values that conform to the numeric effluent in the permit. For parameters specified as minimum on the DMR, the permittee must report the lowest calculated or measured value.

C. Rationale for Special Conditions

1. Additional Monitoring and Special Studies
Whole Effluent Toxicity (WET) and Toxicity Identification Evaluation/Toxicity Reduction Evaluation (TIE/TRE) standard language will be included in the permit.

2. Reopener Provisions
These provisions are based on 40 CFR Part 122 and the previous permit. DEQ may reopen the permit to modify permit conditions and requirements. Causes for modifications include the promulgation of new Federal regulations, modification in toxicity requirements, adoption of a TMDL, or adoption of new regulations by DEQ.

3. Compliance Schedules
The permit imposes new WQBELs for several pollutants at outfalls discharging to East Fork Armells Creek – Intermittent. The Permittee has demonstrated RP to exceed the applicable WQBELs for ammonia, dissolved aluminum, total iron, mercury, total nitrogen, selenium, and silver. A compliance schedule to allow the Permittee to assess the need for and develop any additional treatment that may be necessary is included in the permit. The final WQBELs shall be effective four years from the effective date of the permit.

MPDES regulations authorize the use of compliance schedules to give permittees additional time to achieve compliance with the Montana Water Quality Act and rules adopted thereunder. Schedules developed under this provision must require compliance by the permittee “as soon as possible” and may not extend the date for final compliance beyond the compliance dates established by the federal CWA. Compliance schedules that exceed on year from the date of the permit issuance must set forth interim requirements and the dates for their achievement.

The permit requires the Permittee to submit an annual report of progress towards compliance with the final WQBELs.

D. Rationale for Standard Conditions

Standard Conditions, which apply to all MPDES permits in accordance with ARM 17.30.1342 and additional conditions applicable to specified categories of permits in accordance with ARM 17.30.1343, are included in **Section III** of the permit. The permittee must comply with all standard conditions under ARM 17.30.1342 and the additional conditions that are applicable to the permittee under ARM 17.30.1343.

40 CFR 123.25(a) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with 40 CFR 123.25, this permit omits Federal conditions that address enforcement authority specified in 40 CFR 122.41(j)(5) and (k)(2) because the enforcement authority under the WQA is more stringent. In lieu of these conditions, this permit incorporates by reference 75-5-Part 6, MCA.

References

CWAIC 2020(1): Clean Water Act Information Center (CWAIC) Montana Department of Environmental Quality, 2020 (1). *Water Quality Standards Attainment Record MT42K002_110.* http://deq.mt.gov/Water/Resources/cwaic

CWAIC 2020(2): Clean Water Act Information Center (CWAIC) Montana Department of Environmental Quality, 2020 (2). *Water Quality Standards Attainment Record MT42K002_170.* http://deq.mt.gov/Water/Resources/cwaic

CWAIC 2020(3): Clean Water Act Information Center (CWAIC) Montana Department of Environmental Quality, 2020 (3). *Water Quality Standards Attainment Record MT42K002_120.* http://deq.mt.gov/Water/Resources/cwaic

MDEQ 2018: Montana Department of Environmental Quality (MDEQ), 2018. *2018 Final Water Quality Integrated Report* (November 2018). http://deq.mt.gov/Water/Resources/report#2020Report

MDEQ 2019: Montana Department of Environmental Quality (MDEQ), Air, Energy, & Mining Division; Coal & Opencut Mining Bureau – Coal Section, 2019. *2019 Annual Report.* http://deq.mt.gov/Mining/coal

MDEQ 2020: Montana Department of Environmental Quality (MDEQ), 2020. *2020 Draft Water Quality Integrated Report.* http://deq.mt.gov/Water/Resources/report#2020Report

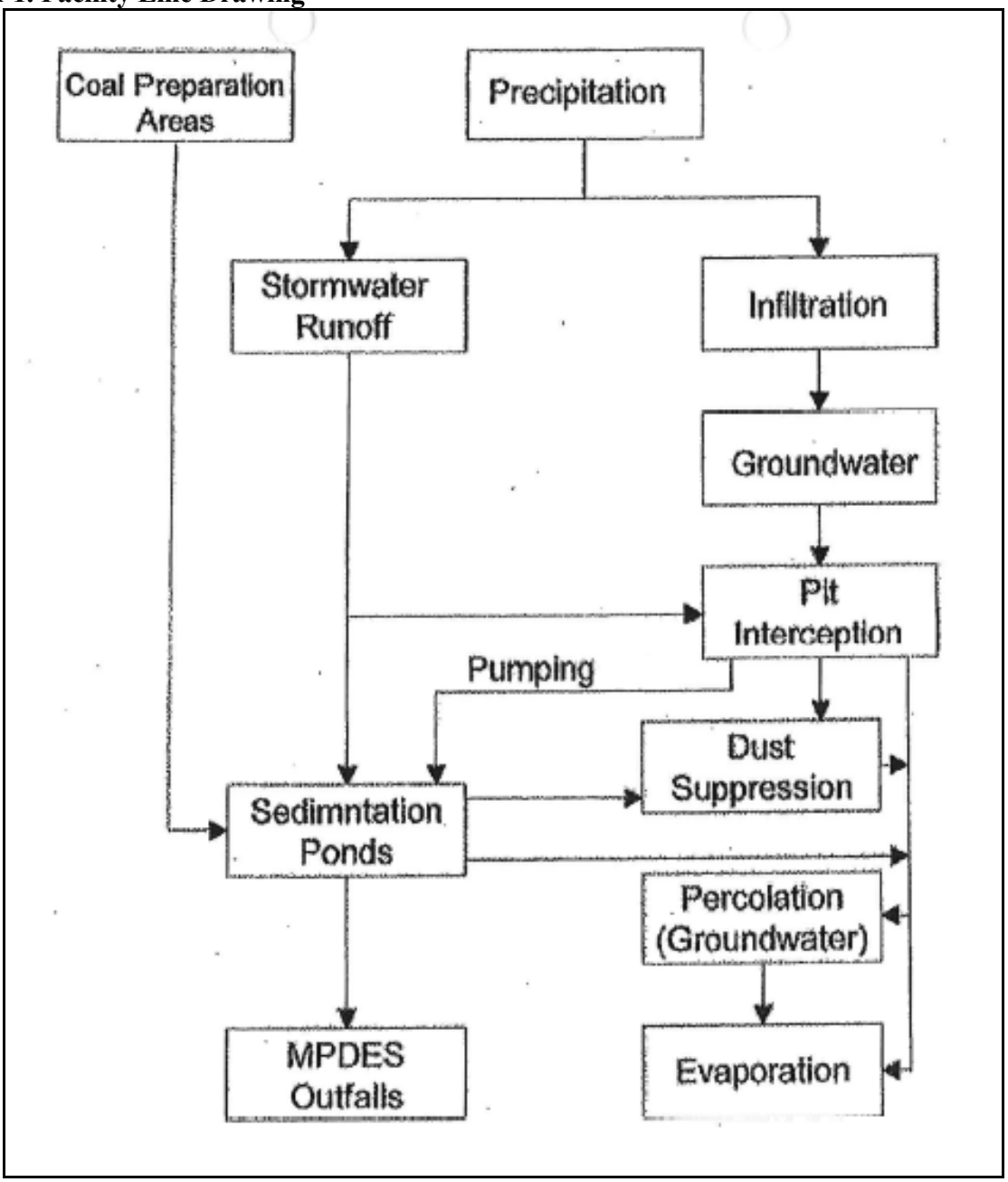
MDEQ CHIA: Montana Department of Environmental Quality (MDEQ), Air, Energy, & Mining Division; Coal & Opencut Mining Bureau – Coal Section. *Appendix I Western Energy Company Rosebud Mine Cumulative Hydrologic Impact Assessment – Amendment AM4.*

NOAA 1973: National Oceanic and Atmospheric Administration (NOAA), 1973. NOAA Atlas 2, Volume 1, Montana. http://nws.noaa.gov/oh/hdsc/PF_documents/Atlas2_Volume1.pdf

NEW 2015: Nicklin Earth and Water (NEW), 2015. *Addendum to the Comprehensive Evaluation of Probably Hydrologic Consequences Areas A, B, and C Western Energy Rosebud Mine.*

Appendix A. Facility Line Drawing

Figure A-1. Facility Line Drawing



Notes:

1. The Rosebud Mine does not intercept any perennial streamflows and as such inflows are a result of precipitation.
2. Water balance cannot be determined due to the variability in precipitation events (intensitites, duration, etc.).
3. A listing of individual outfalls can be found in Tables 2 and 3.
4. The water process is representative of all outfalls under MPDES Permit No. MT-0023965.

Appendix B. Outfall Location Maps

Figure B-1. Rosebud Mine Overview Map

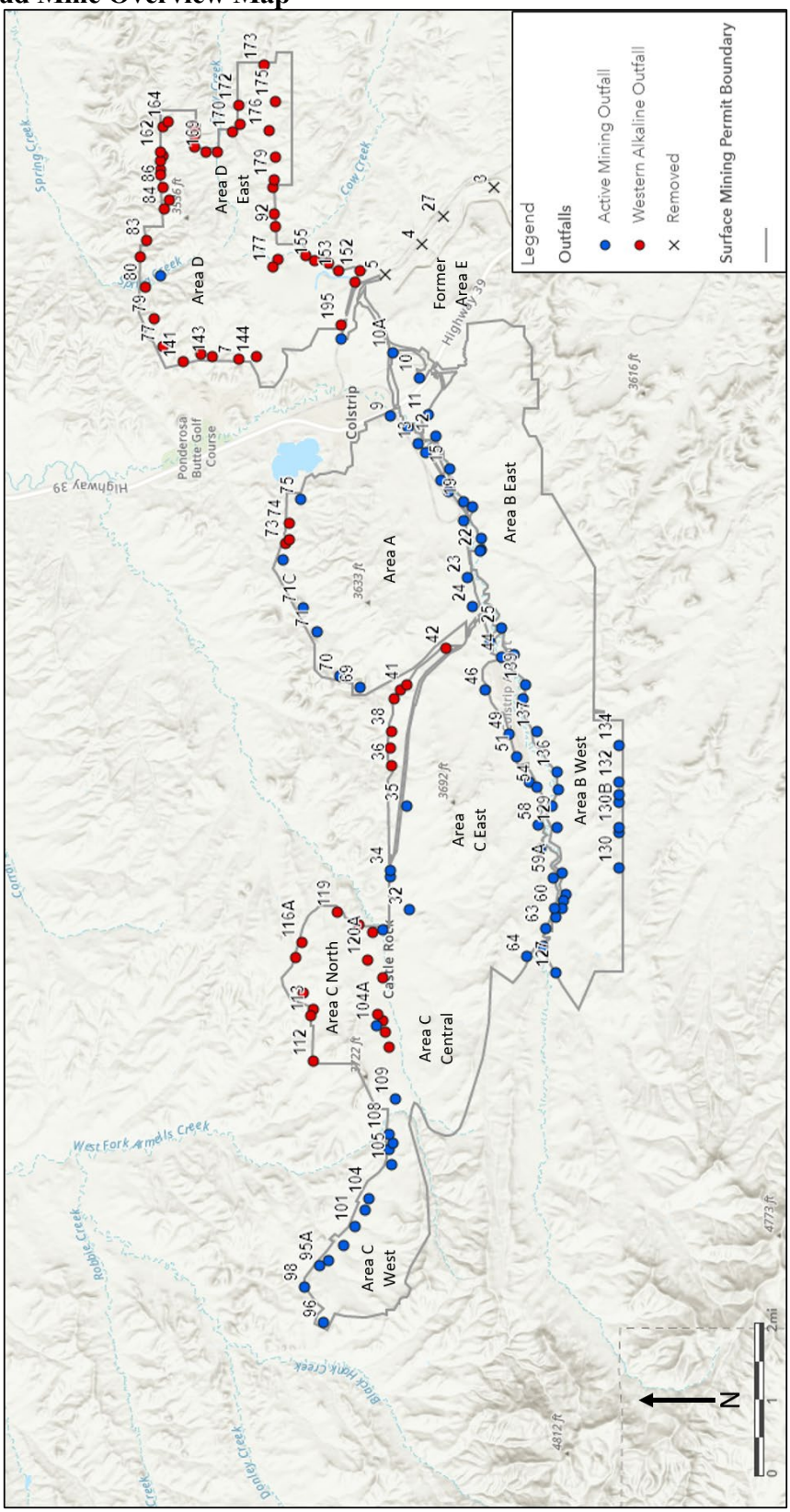


Figure B-2. Rosebud Mine Area A

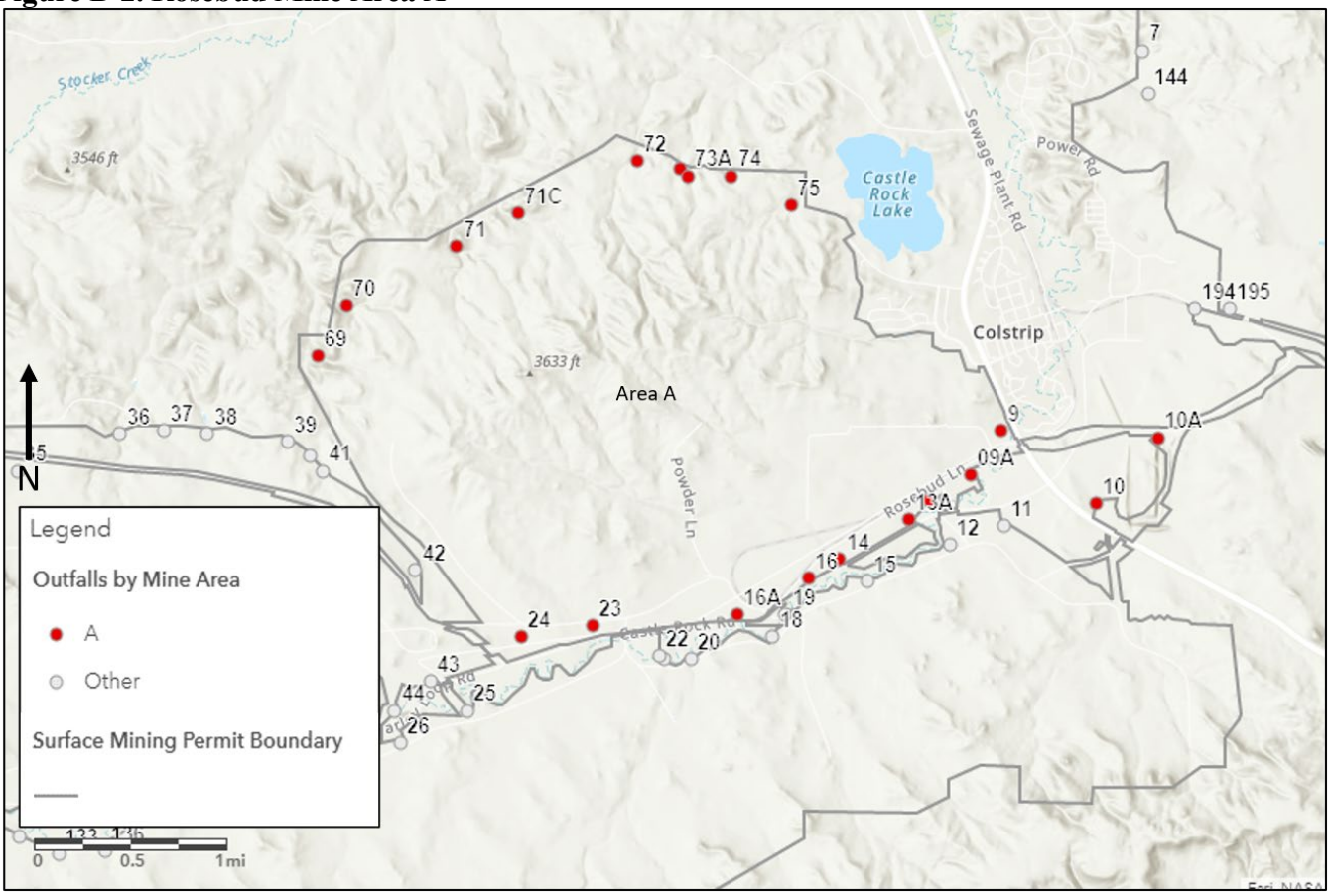


Figure B-3. Rosebud Mine Area B

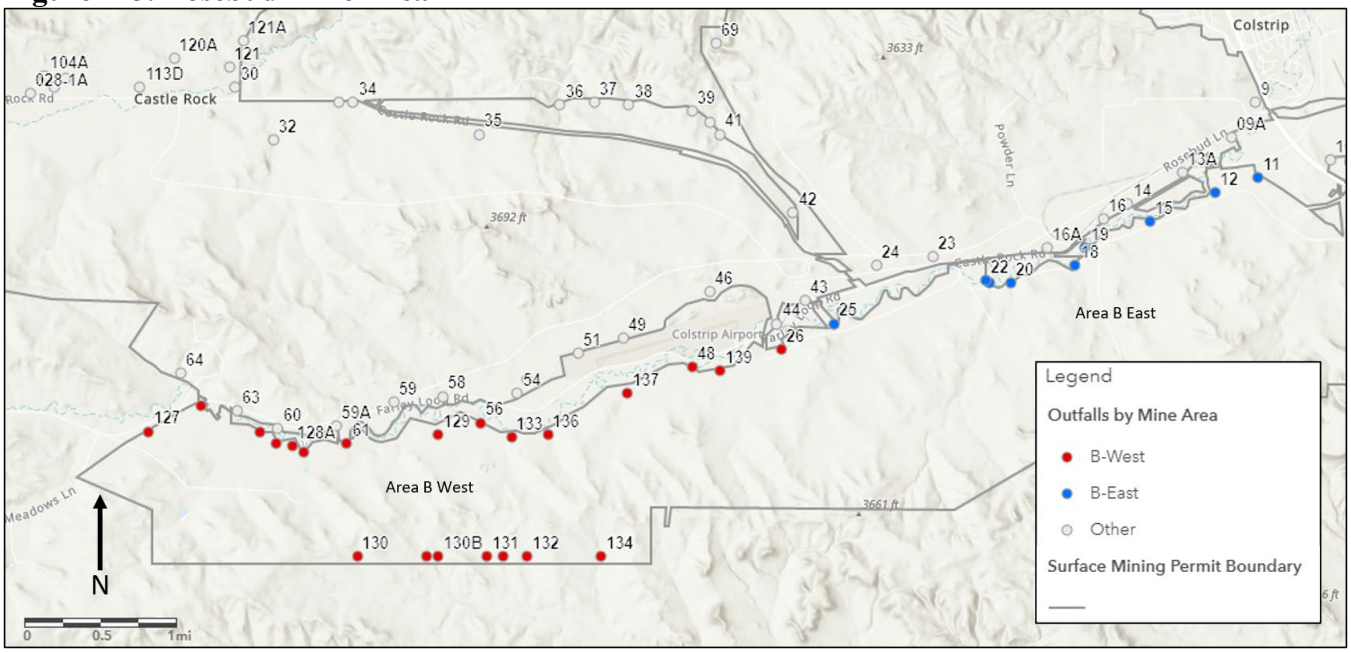


Figure B-4. Rosebud Mine Area C

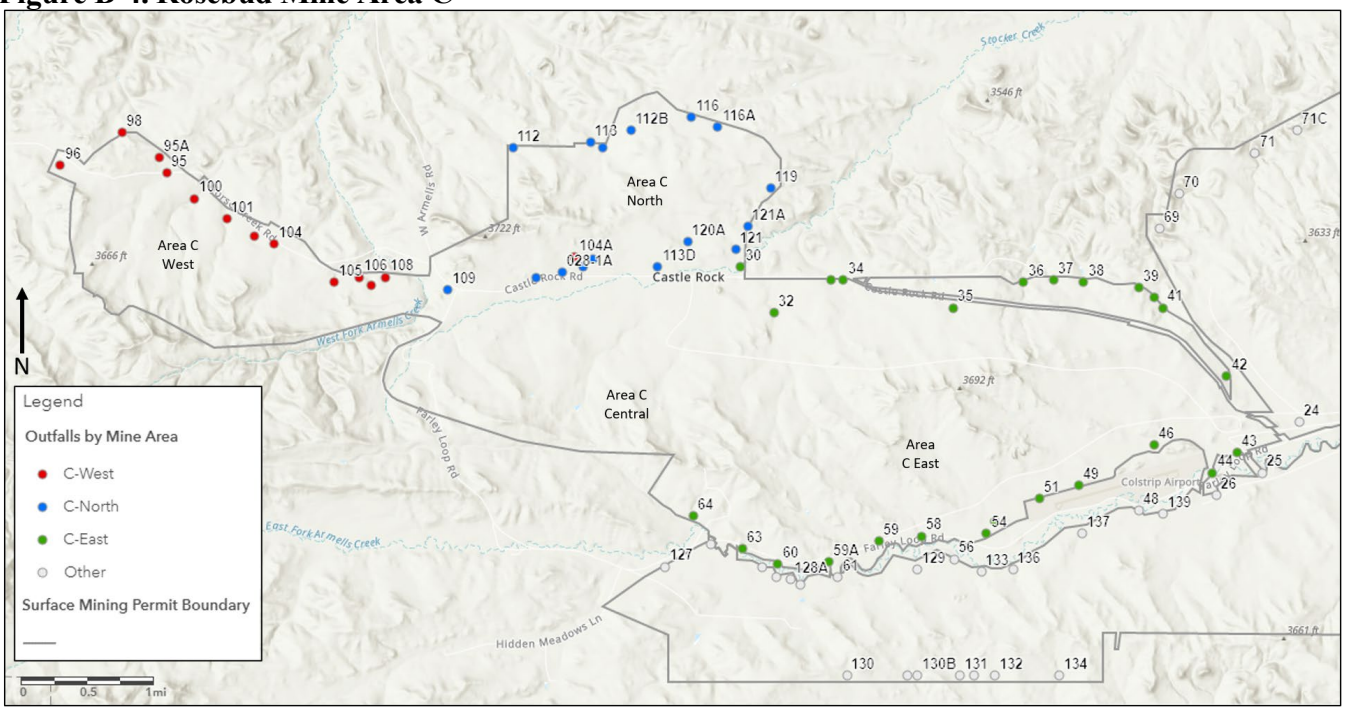
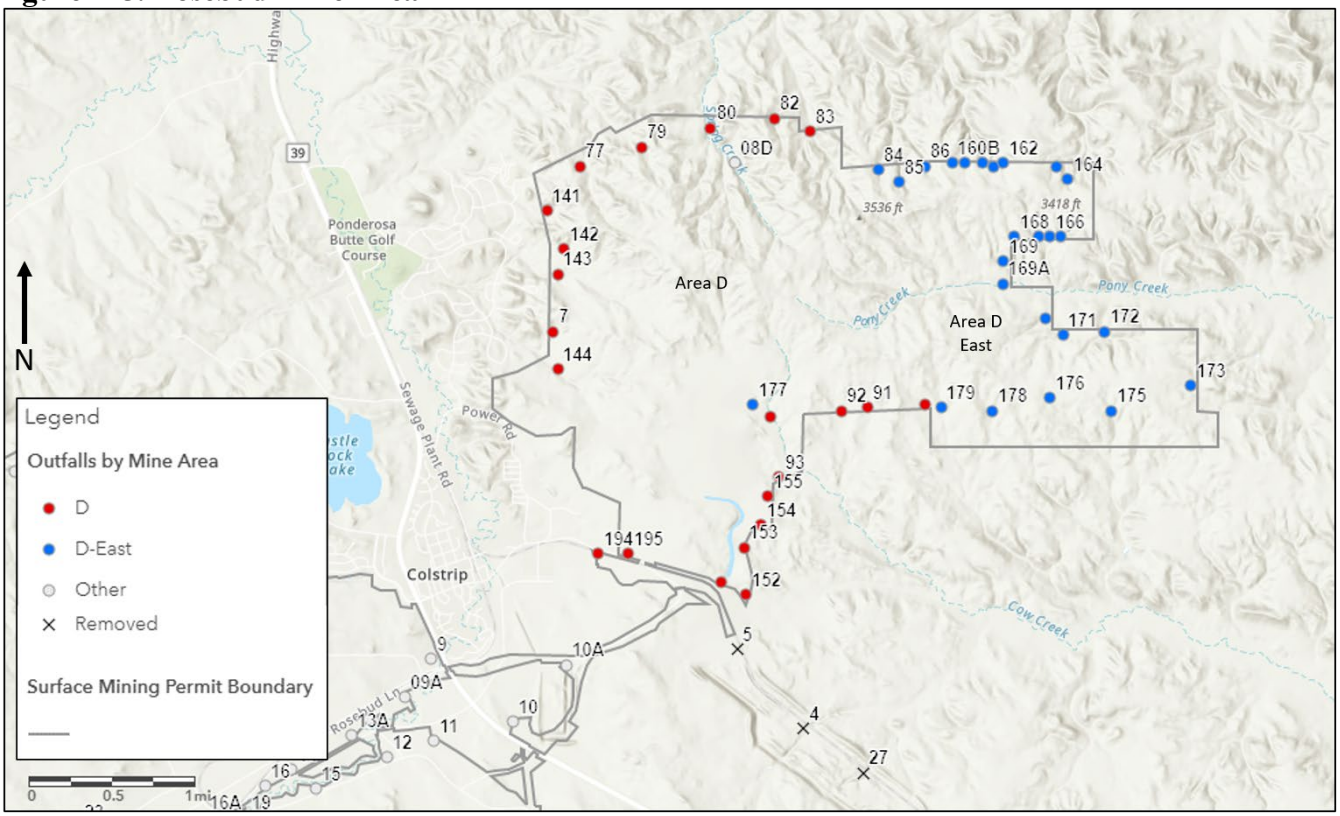


Figure B-5. Rosebud Mine Area D



Appendix C. Summary of Flow Data for January 2015 through December 2020

Table C-1. Outfall 9

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
9	EFAC - Intermittent	No	3/31/2019	439,488	gal/d
Monthly Average Flow Rate					
9	EFAC - Intermittent	No	3/31/2019	14,595	gal/d

Table C-2. Outfall 15

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
15	EFAC - Intermittent	No	3/31/2015	1,458,720	gal/d
15	EFAC - Intermittent	No	4/30/2015	1,535,040	gal/d
Monthly Average Flow Rate					
15	EFAC - Intermittent	No	3/31/2015	219,763	gal/d
15	EFAC - Intermittent	No	4/30/2015	293,136	gal/d

Table C-3. Outfall 19

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
19	EFAC - Intermittent	No	4/30/2015	1,167,840	gal/d
19	EFAC - Intermittent	No	3/31/2015	1,624,320	gal/d
Monthly Average Flow Rate					
19	EFAC - Intermittent	No	4/30/2015	233,232	gal/d
19	EFAC - Intermittent	No	3/31/2015	884,016	gal/d

Table C-4. Outfall 21

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
21	EFAC - Ephemeral	No	9/30/2019	37,440	gal/d
21	EFAC - Ephemeral	No	9/30/2019	57,600	gal/d
Monthly Average Flow Rate					
21	EFAC - Ephemeral	No	9/30/2019	37,440	gal/d
21	EFAC - Ephemeral	No	9/30/2019	57,600	gal/d

Footnote:
Outfall 21 discharges to East Fork Armells Creek – Ephemeral, however it is included with discharges to East Fork Armells Creek – Intermittent due to its proximity to the transition from ephemeral to intermittent

Table C-5. Outfall 22

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
22	EFAC - Ephemeral	No	1/31/2015	2,664,000	gal/d
Monthly Average Flow Rate					
22	EFAC - Ephemeral	No	1/31/2015	716,191	gal/d

Footnote:
1. Outfall 22 discharges to East Fork Armells Creek – Ephemeral, however it is included with discharges to East Fork Armells Creek – Intermittent due to its proximity to the transition from ephemeral to intermittent

Table C-6. Outfall 26

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
26	EFAC - Ephemeral	No	1/31/2020	1,061,718	gal/d
Monthly Average Flow Rate					
26	EFAC - Ephemeral	No	1/31/2020	428,764	gal/d

Table C-7. Outfall 30

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
30	Stocker Creek	No	10/31/2018	1,827,360	gal/d
30	Stocker Creek	No	11/30/2018	1,789,920	gal/d
30	Stocker Creek	No	12/31/2018	1,814,400	gal/d
30	Stocker Creek	No	1/31/2019	6,014,880	gal/d
30	Stocker Creek	No	2/28/2019	2,652,480	gal/d
30	Stocker Creek	No	3/31/2019	2,944,800	gal/d
30	Stocker Creek	No	4/30/2019	1,560,960	gal/d
30	Stocker Creek	No	5/31/2019	6,395,040	gal/d
30	Stocker Creek	No	6/30/2019	6,815,045	gal/d
30	Stocker Creek	No	7/31/2019	2,422,850	gal/d
Monthly Average Flow Rate					
30	Stocker Creek	No	10/31/2018	1,415,474	gal/d
30	Stocker Creek	No	11/30/2018	1,541,171	gal/d
30	Stocker Creek	No	12/31/2018	1,335,252	gal/d
30	Stocker Creek	No	1/31/2019	3,524,971	gal/d
30	Stocker Creek	No	2/28/2019	1,717,046	gal/d
30	Stocker Creek	No	3/31/2019	1,189,208	gal/d
30	Stocker Creek	No	4/30/2019	690,735	gal/d
30	Stocker Creek	No	5/31/2019	2,344,870	gal/d
30	Stocker Creek	No	6/30/2019	1,411,590	gal/d
30	Stocker Creek	No	7/31/2019	1,311,944	gal/d

Table C-8. Outfall 32

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
32	Stocker Creek	No	4/30/2019	1,357,920	gal/d
32	Stocker Creek	No	12/31/2019	3,569,728	gal/d
Monthly Average Flow Rate					
32	Stocker Creek	No	4/30/2019	130,529	gal/d
32	Stocker Creek	No	12/31/2019	243,644	gal/d

Table C-9. Outfall 46

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
46	EFAC - Ephemeral	No	4/30/2019	1,039,680	gal/d
46	EFAC - Ephemeral	No	12/31/2019	1,913,614	gal/d
46	EFAC - Ephemeral	No	1/31/2020	1,913,614	gal/d
Monthly Average Flow Rate					
46	EFAC - Ephemeral	No	4/30/2019	250,142	gal/d
46	EFAC - Ephemeral	No	12/31/2019	112,811	gal/d
46	EFAC - Ephemeral	No	1/31/2020	486,934	gal/d

Table C-10. Outfall 60

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
60	EFAC - Ephemeral	No	9/30/2017	245,606	gal/d
60	EFAC - Ephemeral	No	6/30/2018	41,760	gal/d
60	EFAC - Ephemeral	No	3/31/2019	165,600	gal/d
60	EFAC - Ephemeral	No	7/31/2019	1,218,240	gal/d
60	EFAC - Ephemeral	No	9/30/2019	227,520	gal/d
Monthly Average Flow Rate					
60	EFAC - Ephemeral	No	9/30/2017	8,186.88	gal/d
60	EFAC - Ephemeral	No	6/30/2018	1,347.1	gal/d
60	EFAC - Ephemeral	No	3/31/2019	9,801	gal/d
60	EFAC - Ephemeral	No	7/31/2019	609,120	gal/d
60	EFAC - Ephemeral	No	9/30/2019	227,520	gal/d

Table C-11. Outfall 61

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
61	EFAC - Ephemeral	No	3/31/2018	1,078,560	gal/d
61	EFAC - Ephemeral	No	11/30/2019	7,338,288	gal/d
61	EFAC - Ephemeral	No	12/31/2019	10,000,013	gal/d
Monthly Average Flow Rate					
61	EFAC - Ephemeral	No	3/31/2018	105,312	gal/d
61	EFAC - Ephemeral	No	11/30/2019	4,310,074	gal/d
61	EFAC - Ephemeral	No	12/31/2019	2,072,318	gal/d

Table C-12. Outfall 80

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
80	Spring Creek	Yes	6/30/2018	5,760	gal/d
Monthly Average Flow Rate					
80	Spring Creek	Yes	6/30/2018	185.8	gal/d

Table C-13. Outfall 101

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
101	West Fork Armells Creek	No	7/31/2019	1,357,920	gal/d
101	West Fork Armells Creek	No	9/30/2019	136,800	gal/d
101	West Fork Armells Creek	No	9/30/2019	253,440	gal/d
Monthly Average Flow Rate					
101	West Fork Armells Creek	No	7/31/2019	1,357,920	gal/d
101	West Fork Armells Creek	No	9/30/2019	136,800	gal/d
101	West Fork Armells Creek	No	9/30/2019	253,440	gal/d

Table C-14. Outfall 129

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
129	EFAC - Ephemeral	No	12/31/2018	1,776,960	gal/d
129	EFAC - Ephemeral	No	1/31/2019	2,067,840	gal/d
129	EFAC - Ephemeral	No	2/28/2019	2,246,400	gal/d
129	EFAC - Ephemeral	No	3/31/2019	2,525,760	gal/d
129	EFAC - Ephemeral	No	1/31/2020	6,511,284	gal/d
129	EFAC - Ephemeral	No	2/29/2020	7,100,221	gal/d
Monthly Average Flow Rate					
129	EFAC - Ephemeral	No	12/31/2018	164,578	gal/d
129	EFAC - Ephemeral	No	1/31/2019	1,628,640	gal/d
129	EFAC - Ephemeral	No	2/28/2019	1,521,600	gal/d
129	EFAC - Ephemeral	No	3/31/2019	1,010,323	gal/d
129	EFAC - Ephemeral	No	1/31/2020	4,963,304	gal/d

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
129	EFAC - Ephemeral	No	2/29/2020	5,056,509	gal/d

Table C-15. Outfall 13A

Outfall	Receiving Water	Western Alkaline (Y/N)	Monitoring Period End Date	Flow	Units
Maximum Daily Flow Rate					
13A	EFAC - Intermittent	No	9/30/2019	30,240	gal/d
Monthly Average Flow Rate					
13A	EFAC - Intermittent	No	9/30/2019	30,240	gal/d

Appendix D. Outfalls Related to Coal Preparation Areas

Table D-1. Outfalls Related to Coal Preparation Areas

Outfall	Mine Area	Latitude	Longitude	Receiving Water	Status
9	A	45°52'32"N	106°37'43"W	East Fork Armells Creek	Active Mining
09A	A	45°52'20"N	106°37'55"W	East Fork Armells Creek	Active Mining
16A	A	45°51'42"N	106°39'26"W	East Fork Armells Creek	Active Mining
43	C-East	45°51'24"N	106°41'25"W	East Fork Armells Creek	Active Mining
194	D	45°53'5"N	106°36'28"W	East Fork Armells Creek	Active Mining

Appendix E. Outfalls Related to Alkaline Mine Drainage

Table E-1. Outfalls Related to Alkaline Mine Drainage

Outfall	Mine Area	Latitude	Longitude	Receiving Water	Status
08D	A	45°55'8"N	106°35'26"W	East Fork Armells Creek	Active Mining
9	A	45°52'32"N	106°37'43"W	East Fork Armells Creek	Active Mining
09A	A	45°52'20"N	106°37'55"W	East Fork Armells Creek	Active Mining
13	A	45°52'13"N	106°38'11"W	East Fork Armells Creek	Active Mining
13A	A	45°52'8"N	106°38'19"W	East Fork Armells Creek	Active Mining
14	A	45°51'57"N	106°38'46"W	East Fork Armells Creek	Active Mining
16	A	45°51'52"N	106°38'58"W	East Fork Armells Creek	Active Mining
16A	A	45°51'42"N	106°39'26"W	East Fork Armells Creek	Active Mining
23	A	45°51'39"N	106°40'22"W	East Fork Armells Creek	Active Mining
24	A	45°51'36"N	106°40'50"W	East Fork Armells Creek	Active Mining
69	A	45°52'52"N	106°42'9"W	Stocker Creek	Active Mining
70	A	45°53'6"N	106°41'58"W	Stocker Creek	Active Mining
71	A	45°53'22"N	106°41'15"W	Stocker Creek	Active Mining
71C	A	45°53'31"N	106°40'51"W	Stocker Creek	Active Mining
72	A	45°53'45"N	106°40'5"W	Stocker Creek	Active Mining
75	A	45°53'33"N	106°39'5"W	East Fork Armells Creek	Active Mining
11	B-East	45°52'6"N	106°37'42"W	East Fork Armells Creek	Active Mining
12	B-East	45°52'1"N	106°38'3"W	East Fork Armells Creek	Active Mining
15	B-East	45°51'51"N	106°38'35"W	East Fork Armells Creek	Active Mining
18	B-East	45°51'36"N	106°39'12"W	East Fork Armells Creek	Active Mining
19	B-East	45°51'42"N	106°39'7"W	East Fork Armells Creek	Active Mining
20	B-East	45°51'30"N	106°39'44"W	East Fork Armells Creek	Active Mining
21	B-East	45°51'30"N	106°39'54"W	East Fork Armells Creek	Active Mining
22	B-East	45°51'31"N	106°39'56"W	East Fork Armells Creek	Active Mining
25	B-East	45°51'16"N	106°41'11"W	East Fork Armells Creek	Active Mining
26	B-West	45°51'7"N	106°41'37"W	East Fork Armells Creek	Active Mining
48	B-West	45°51'1"N	106°42'21"W	East Fork Armells Creek	Active Mining
56	B-West	45°50'42"N	106°44'5"W	East Fork Armells Creek	Active Mining
61	B-West	45°50'35"N	106°45'11"W	East Fork Armells Creek	Active Mining
127	B-West	45°50'39"N	106°46'49"W	East Fork Armells Creek	Active Mining
128	B-West	45°50'32"N	106°45'32"W	East Fork Armells Creek	Active Mining
128A	B-West	45°50'34"N	106°45'38"W	East Fork Armells Creek	Active Mining
128B	B-West	45°50'35"N	106°45'46"W	East Fork Armells Creek	Active Mining
128C	B-West	45°50'39"N	106°45'54"W	East Fork Armells Creek	Active Mining
128D	B-West	45°50'48"N	106°46'23"W	East Fork Armells Creek	Active Mining
129	B-West	45°50'38"N	106°44'26"W	East Fork Armells Creek	Active Mining

Outfall	Mine Area	Latitude	Longitude	Receiving Water	Status
133	B-West	45°50'37"N	106°43'50"W	East Fork Armells Creek	Active Mining
136	B-West	45°50'38"N	106°43'32"W	East Fork Armells Creek	Active Mining
137	B-West	45°50'52"N	106°42'53"W	East Fork Armells Creek	Active Mining
139	B-West	45°50'60"N	106°42'7"W	East Fork Armells Creek	Active Mining
130	B-West	45°49'56"N	106°45'6"W	Lee Coulee	Active Mining
130A	B-West	45°49'56"N	106°44'32"W	Lee Coulee	Active Mining
130B	B-West	45°49'56"N	106°44'26"W	Lee Coulee	Active Mining
131	B-West	45°49'56"N	106°44'2"W	Lee Coulee	Active Mining
131A	B-West	45°49'56"N	106°43'54"W	Lee Coulee	Active Mining
132	B-West	45°49'56"N	106°43'42"W	Lee Coulee	Active Mining
134	B-West	45°49'56"N	106°43'6"W	Lee Coulee	Active Mining
30	C-East	45°52'37"N	106°46'6"W	Stocker Creek	Active Mining
32	C-East	45°52'19"N	106°45'47"W	Stocker Creek	Active Mining
33	C-East	45°52'32"N	106°45'15"W	Stocker Creek	Active Mining
34	C-East	45°52'32"N	106°45'8"W	Stocker Creek	Active Mining
35	C-East	45°52'21"N	106°44'6"W	Stocker Creek	Active Mining
43	C-East	45°51'24"N	106°41'25"W	East Fork Armells Creek	Active Mining
44	C-East	45°51'16"N	106°41'39"W	East Fork Armells Creek	Active Mining
46	C-East	45°51'27"N	106°42'12"W	East Fork Armells Creek	Active Mining
49	C-East	45°51'11"N	106°42'55"W	East Fork Armells Creek	Active Mining
51	C-East	45°51'6"N	106°43'17"W	East Fork Armells Creek	Active Mining
52	C-East	45°50'57"N	106°43'42"W	East Fork Armells Creek	Active Mining
54	C-East	45°50'52"N	106°43'47"W	East Fork Armells Creek	Active Mining
58	C-East	45°50'51"N	106°44'24"W	East Fork Armells Creek	Active Mining
59	C-East	45°50'49"N	106°44'48"W	East Fork Armells Creek	Active Mining
59A	C-East	45°50'41"N	106°45'16"W	East Fork Armells Creek	Active Mining
60	C-East	45°50'40"N	106°45'45"W	East Fork Armells Creek	Active Mining
63	C-East	45°50'46"N	106°46'5"W	East Fork Armells Creek	Active Mining
64	C-East	45°50'59"N	106°46'33"W	East Fork Armells Creek	Active Mining
109	C-North	45°52'28"N	106°48'52"W	West Fork Armells Creek	Active Mining
96	C-West	45°53'17"N	106°52'31"W	Black Hank Creek	Active Mining
98	C-West	45°53'30"N	106°51'56"W	Donley Creek	Active Mining
95	C-West	45°53'14"N	106°51'31"W	West Fork Armells Creek	Active Mining
95A	C-West	45°53'20"N	106°51'35"W	West Fork Armells Creek	Active Mining
100	C-West	45°53'4"N	106°51'15"W	West Fork Armells Creek	Active Mining
101	C-West	45°52'56"N	106°50'57"W	West Fork Armells	Active Mining

Outfall	Mine Area	Latitude	Longitude	Receiving Water	Status
				Creek	
103	C-West	45°52'49"N	106°50'41"W	West Fork Armells Creek	Active Mining
104	C-West	45°52'46"N	106°50'30"W	West Fork Armells Creek	Active Mining
104A	C-West	45°52'41"N	106°47'40"W	West Fork Armells Creek	Active Mining
105	C-West	45°52'31"N	106°49'56"W	West Fork Armells Creek	Active Mining
106	C-West	45°52'33"N	106°49'42"W	West Fork Armells Creek	Active Mining
107	C-West	45°52'30"N	106°49'35"W	West Fork Armells Creek	Active Mining
108	C-West	45°52'33"N	106°49'27"W	West Fork Armells Creek	Active Mining
194	D	45°53'5"N	106°36'28"W	East Fork Armells Creek	Active Mining
10	A	45°52'12"N	106°37'6"W	East Fork Armells Creek	Active Mining
10A	A	45°52'30"N	106°36'42"W	East Fork Armells Creek	Active Mining

Appendix F. Outfalls Related to Western Alkaline Coal Mining

Table F-1. Outfalls Related to Western Alkaline Coal Mining

Outfall	Mine Area	Latitude	Longitude	Receiving Water	Status
73	A	45°53'43"N	106°39'48"W	Stocker Creek	Western Alkaline
73A	A	45°53'41"N	106°39'45"W	Stocker Creek	Western Alkaline
74	A	45°53'41"N	106°39'28"W	Stocker Creek	Western Alkaline
36	C-East	45°52'31"N	106°43'26"W	Stocker Creek	Western Alkaline
37	C-East	45°52'32"N	106°43'9"W	Stocker Creek	Western Alkaline
38	C-East	45°52'31"N	106°42'52"W	Stocker Creek	Western Alkaline
39	C-East	45°52'29"N	106°42'21"W	Stocker Creek	Western Alkaline
40	C-East	45°52'25"N	106°42'12"W	Stocker Creek	Western Alkaline
41	C-East	45°52'21"N	106°42'7"W	Stocker Creek	Western Alkaline
42	C-East	45°51'54"N	106°41'31"W	East Fork Armells Creek	Western Alkaline
116	C-North	45°53'36"N	106°46'34"W	Stocker Creek	Western Alkaline
116A	C-North	45°53'32"N	106°46'19"W	Stocker Creek	Western Alkaline
119	C-North	45°53'8"N	106°45'49"W	Stocker Creek	Western Alkaline
121	C-North	45°52'44"N	106°46'9"W	Stocker Creek	Western Alkaline
121A	C-North	45°52'53"N	106°46'2"W	Stocker Creek	Western Alkaline
112	C-North	45°53'24"N	106°48'15"W	West Fork Armells Creek	Western Alkaline
112A	C-North	45°53'24"N	106°47'24"W	West Fork Armells Creek	Western Alkaline
112B	C-North	45°53'31"N	106°47'8"W	West Fork Armells Creek	Western Alkaline
113	C-North	45°53'26"N	106°47'31"W	West Fork Armells Creek	Western Alkaline
028-2A	C-North	45°52'33"N	106°48'2"W	Stocker Creek	Western Alkaline
028-1A	C-North	45°52'35"N	106°47'47"W	Stocker Creek	Western Alkaline
028B	C-North	45°52'37"N	106°47'35"W	Stocker Creek	Western Alkaline
028A	C-North	45°52'40"N	106°47'30"W	Stocker Creek	Western Alkaline
113D	C-North	45°52'37"N	106°46'53"W	Stocker Creek	Western Alkaline
120A	C-North	45°52'47"N	106°46'36"W	Stocker Creek	Western Alkaline
6	D	45°53'48"N	106°35'10"W	Cow Creek	Western Alkaline
7	D	45°54'15"N	106°36'48"W	East Fork Armells Creek	Western Alkaline
77	D	45°55'7"N	106°36'36"W	East Fork Armells Creek	Western Alkaline
79	D	45°55'13"N	106°36'8"W	East Fork Armells Creek	Western Alkaline
80	D	45°55'19"N	106°35'37"W	Spring Creek	Western Alkaline
82	D	45°55'22"N	106°35'8"W	Spring Creek	Western Alkaline
83	D	45°55'18"N	106°34'52"W	Spring Creek	Western Alkaline
90	D	45°53'52"N	106°34'0"W	Cow Creek	Western Alkaline

Outfall	Mine Area	Latitude	Longitude	Receiving Water	Status
91	D	45°53'51"N	106°34'26"W	Cow Creek	Western Alkaline
92	D	45°53'50"N	106°34'38"W	Cow Creek	Western Alkaline
93	D	45°53'29"N	106°35'6"W	Cow Creek	Western Alkaline
141	D	45°54'53"N	106°36'51"W	East Fork Armells Creek	Western Alkaline
142	D	45°54'41"N	106°36'43"W	East Fork Armells Creek	Western Alkaline
143	D	45°54'33"N	106°36'46"W	East Fork Armells Creek	Western Alkaline
144	D	45°54'3"N	106°36'46"W	East Fork Armells Creek	Western Alkaline
151	D	45°52'56"N	106°35'32"W	Cow Creek	Western Alkaline
152	D	45°52'52"N	106°35'21"W	Cow Creek	Western Alkaline
153	D	45°53'7"N	106°35'22"W	Cow Creek	Western Alkaline
154	D	45°53'14"N	106°35'14"W	Cow Creek	Western Alkaline
155	D	45°53'23"N	106°35'11"W	Cow Creek	Western Alkaline
195	D	45°53'5"N	106°36'14"W	East Fork Armells Creek	Western Alkaline
173	D-East	45°53'58"N	106°32'0"W	Cow Creek	Western Alkaline
175	D-East	45°53'50"N	106°32'36"W	Cow Creek	Western Alkaline
176	D-East	45°53'54"N	106°33'4"W	Cow Creek	Western Alkaline
177	D-East	45°53'52"N	106°35'18"W	Cow Creek	Western Alkaline
178	D-East	45°53'50"N	106°33'30"W	Cow Creek	Western Alkaline
179	D-East	45°53'51"N	106°33'53"W	Cow Creek	Western Alkaline
165	D-East	45°54'45"N	106°32'59"W	Pony Creek	Western Alkaline
166	D-East	45°54'45"N	106°33'4"W	Pony Creek	Western Alkaline
167	D-East	45°54'45"N	106°33'9"W	Pony Creek	Western Alkaline
168	D-East	45°54'45"N	106°33'20"W	Pony Creek	Western Alkaline
169	D-East	45°54'37"N	106°33'25"W	Pony Creek	Western Alkaline
169A	D-East	45°54'30"N	106°33'25"W	Pony Creek	Western Alkaline
170	D-East	45°54'19"N	106°33'6"W	Pony Creek	Western Alkaline
171	D-East	45°54'14"N	106°32'58"W	Pony Creek	Western Alkaline
172	D-East	45°54'15"N	106°32'39"W	Pony Creek	Western Alkaline
84	D-East	45°55'6"N	106°34'21"W	Spring Creek	Western Alkaline
85	D-East	45°55'2"N	106°34'12"W	Spring Creek	Western Alkaline
86	D-East	45°55'7"N	106°34'0"W	Spring Creek	Western Alkaline
160A	D-East	45°55'8"N	106°33'42"W	Spring Creek	Western Alkaline
160B	D-East	45°55'8"N	106°33'48"W	Spring Creek	Western Alkaline
161	D-East	45°55'7"N	106°33'29"W	Spring Creek	Western Alkaline
161A	D-East	45°55'8"N	106°33'34"W	Spring Creek	Western Alkaline
162	D-East	45°55'8"N	106°33'25"W	Spring Creek	Western Alkaline
163	D-East	45°55'7"N	106°33'1"W	Spring Creek	Western Alkaline
164	D-East	45°55'3"N	106°32'56"W	Spring Creek	Western Alkaline

Appendix G. Reasonable Potential Analysis

The RPA was performed for the pollutants for which data were available using DEQ procedures for determining critical effluent and receiving water pollutant concentrations. The critical effluent concentration is a projected 95th percentile concentration. The critical effluent and receiving water pollutant concentrations were used in the following equation, which is based on a mass-balance equation, to calculate a projected receiving water concentration:

$$C_r = (C_d + DC_s) / (1 + D)$$

Where:

C_r = projected receiving water concentration
C_d = maximum projected effluent concentration
C_s = critical receiving water pollutant concentration
D = dilution factor for the appropriate effluent flow and mixing zone

East Fork Armells Creek –Intermittent and Lee Coulee have a critical low flow of 0 cfs, therefore the receiving water pollutant concentration (C_s) is zero and the dilution factor (D) is zero as no mixing zone is allotted. As a result, the projected receiving water concentration (C_r) is equal to the projected 95th percentile critical effluent concentration ($C_{95(est)}$). The method for calculating $C_{95(est)}$ from the maximum projected effluent concentration (C_d) is described in the EPA's *Technical Support Document for Water Quality Based Toxics Control* (TSD).

Where C_r exceeds the lowest applicable numeric water quality standard (C) for the parameter of concern, there is reasonable potential and WQBELs must be calculated.

Available effluent quality data included measurements collected from discharges during the period of January 2015 through December 2020 and results from representative sampling of the facility's sedimentation ponds. Effluent quality data from discharges and representative sampling sites were consolidated according to receiving water based on the assumption that both datasets are representative of effluent quality for those outfalls. See **Figures G-1 and G-2** for a location map of the sample sites and associated outfalls. See **Table G-1** for a summary of the relationship between sample sites, outfalls, and receiving waters.

RPA was performed for East Fork Armells Creek – Intermittent and Lee Coulee. See **Tables G-2 and G-3** for a summary of the RPA.

Figure G-1. Correlation between renewal application sampling sites and outfalls.
Outfalls which are correlated to a renewal application sampling site have been colored coded by respective site. Western Alkaline drainage outfalls have not been assigned to a sampling site and are identified on the map by grey symbols.

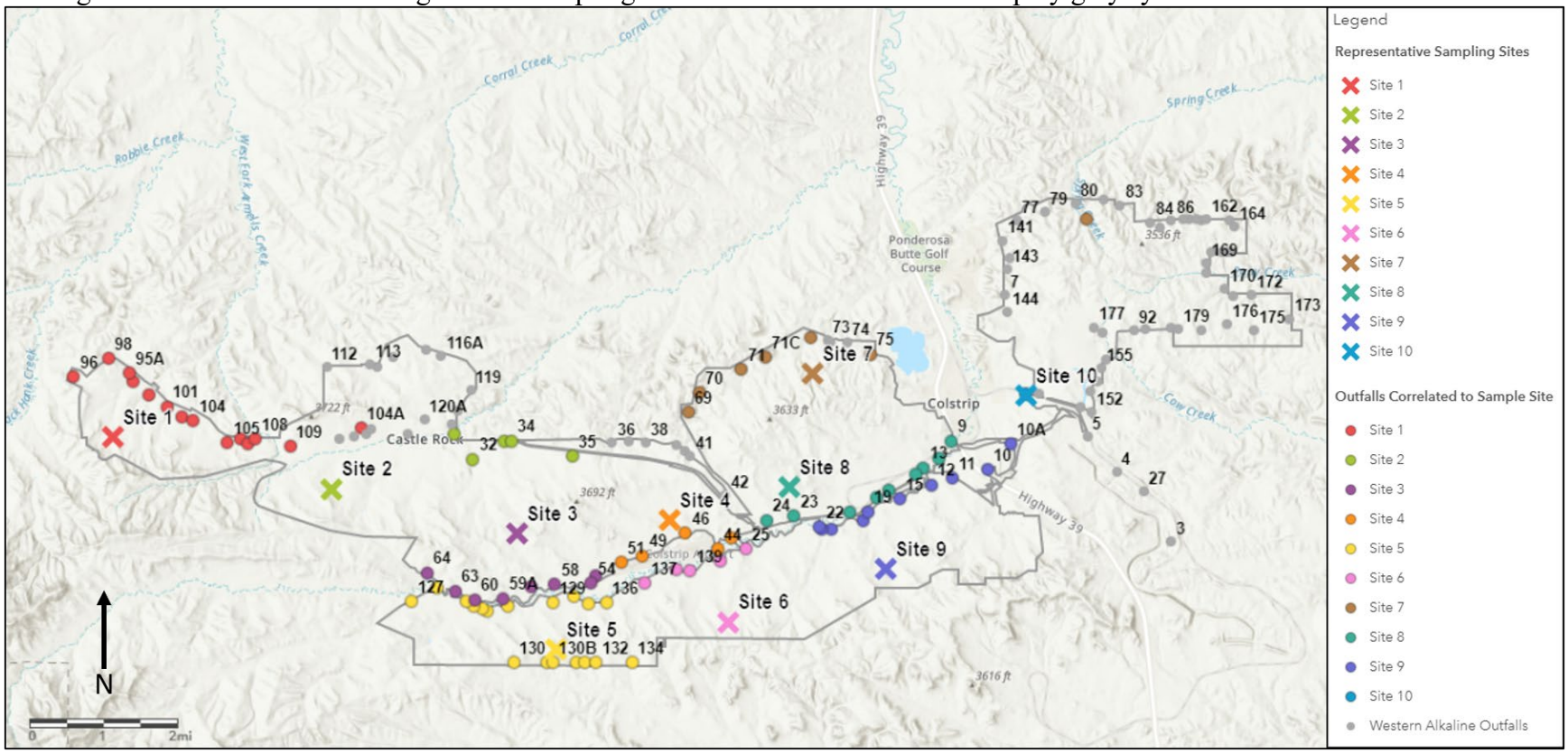


Figure G-2. Correlation between renewal application sampling sites and outfalls discharging to East Fork Armells Creek – Ephemeral and Intermittent.

The transition from ephemeral to intermittent on East Fork Armells Creek occurs 15-20 yards downstream of outfall 20. For RPA, outfalls 21 and 22 are included with the data for East Fork Armells Creek – Intermittent as discharges have the potential to reach the intermittent reach. It is assumed the in-channel dam between outfalls 22 and 23 prevent upstream discharges from reaching East Fork Armells Creek – Intermittent.

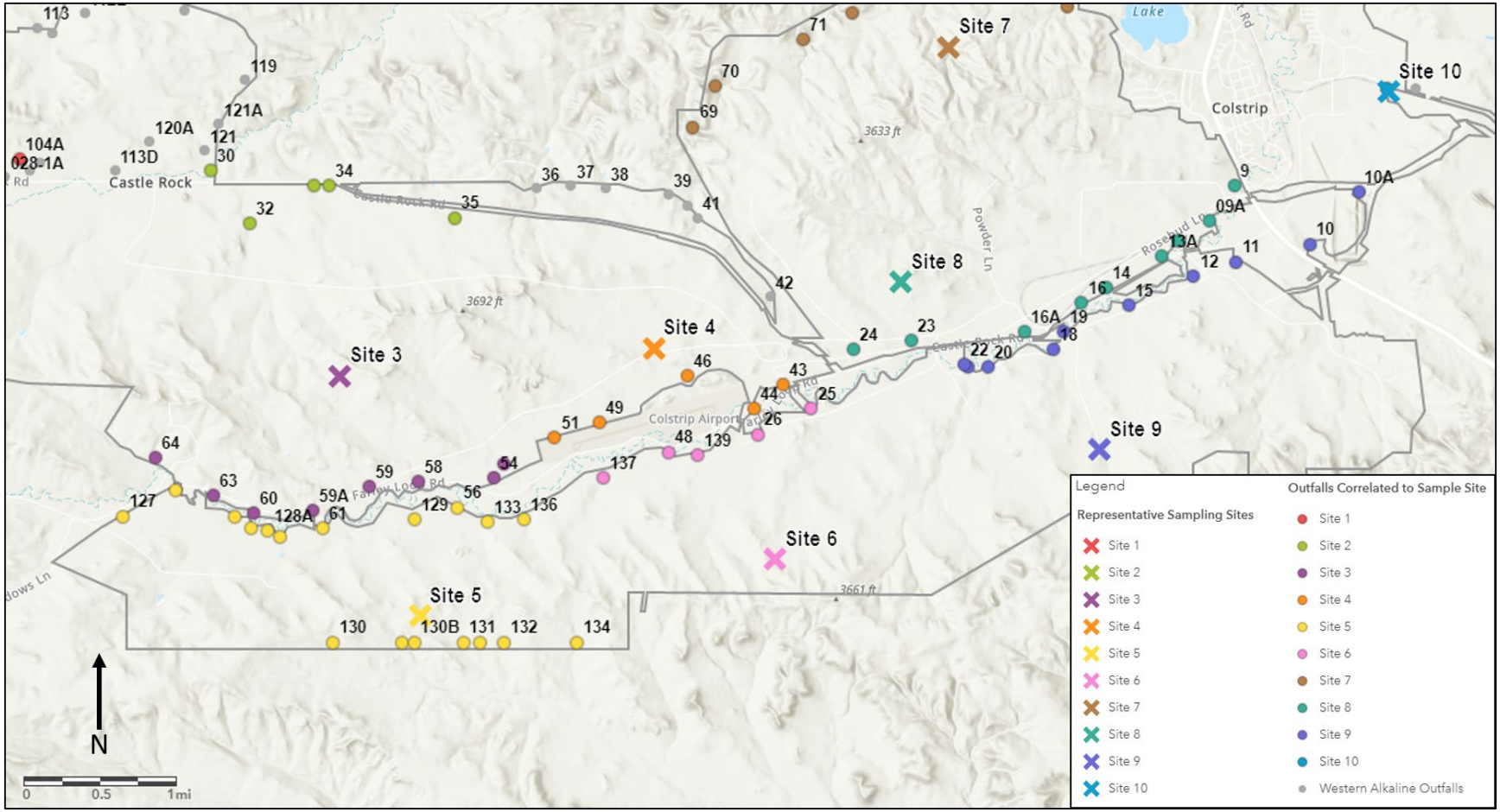


Table G-1. Correlation between renewal application sampling sites and outfalls

Representative Sample Sites	Outfall	Receiving Water	Mine Area	Discharge During POR (Yes/No)	Count of DMR Measurements
Site 1	96	Black Hank Creek	C-West	No	0
	98	Donley Creek	C-West	No	0
	95	West Fork Armells Creek	C-West	No	0
	100	West Fork Armells Creek	C-West	No	0
	101	West Fork Armells Creek	C-West	Yes	4
	103	West Fork Armells Creek	C-West	No	0
	104	West Fork Armells Creek	C-West	No	0
	105	West Fork Armells Creek	C-West	No	0
	106	West Fork Armells Creek	C-West	No	0
	107	West Fork Armells Creek	C-West	No	0
	108	West Fork Armells Creek	C-West	No	0
	109	West Fork Armells Creek	C-North	No	0
	104A	West Fork Armells Creek	C-West	No	0
	95A	West Fork Armells Creek	C-West	No	0
Site 2	30	Stocker Creek	C-East	Yes	11
	32	Stocker Creek	C-East	Yes	6
	33	Stocker Creek	C-East	No	0
	34	Stocker Creek	C-East	No	0
	35	Stocker Creek	C-East	No	0
Site 3	52	East Fork Armells Creek - Ephemeral	C-East	Yes	3
	54	East Fork Armells Creek - Ephemeral	C-East	No	0
	58	East Fork Armells Creek - Ephemeral	C-East	No	0
	59	East Fork Armells Creek - Ephemeral	C-East	No	0
	60	East Fork Armells Creek - Ephemeral	C-East	Yes	6
	63	East Fork Armells Creek - Ephemeral	C-East	No	0
	64	East Fork Armells Creek - Ephemeral	C-East	No	0
	59A	East Fork Armells Creek - Ephemeral	C-East	No	0
Site 4	43	East Fork Armells Creek - Ephemeral	C-East	No	0
	44	East Fork Armells Creek - Ephemeral	C-East	No	0
	46	East Fork Armells Creek - Ephemeral	C-East	Yes	11
	49	East Fork Armells Creek - Ephemeral	C-East	No	0
	51	East Fork Armells Creek - Ephemeral	C-East	No	0
Site 5	56	East Fork Armells Creek - Ephemeral	B-West	No	0
	61	East Fork Armells Creek - Ephemeral	B-West	Yes	3
	127	East Fork Armells Creek - Ephemeral	B-West	No	0
	128	East Fork Armells Creek - Ephemeral	B-West	No	0

Representative Sample Sites	Outfall	Receiving Water	Mine Area	Discharge During POR (Yes/No)	Count of DMR Measurements
	129	East Fork Armells Creek - Ephemeral	B-West	Yes	2
	133	East Fork Armells Creek - Ephemeral	B-West	No	0
	136	East Fork Armells Creek - Ephemeral	B-West	No	0
	128A	East Fork Armells Creek - Ephemeral	B-West	No	0
	128B	East Fork Armells Creek - Ephemeral	B-West	No	0
	128C	East Fork Armells Creek - Ephemeral	B-West	No	0
	128D	East Fork Armells Creek - Ephemeral	B-West	No	0
	130	Lee Coulee	B-West	No	0
	131	Lee Coulee	B-West	No	0
	132	Lee Coulee	B-West	No	0
	134	Lee Coulee	B-West	No	0
	130A	Lee Coulee	B-West	No	0
	130B	Lee Coulee	B-West	No	0
	131A	Lee Coulee	B-West	No	0
Site 6	25	East Fork Armells Creek - Ephemeral	B-East	No	0
	26	East Fork Armells Creek - Ephemeral	B-West	Yes	4
	48	East Fork Armells Creek - Ephemeral	B-West	No	0
	137	East Fork Armells Creek - Ephemeral	B-West	No	0
	139	East Fork Armells Creek - Ephemeral	B-West	Yes	2
Site 7	75	East Fork Armells Creek - Intermittent	A	No	0
	8D	East Fork Armells Creek - Intermittent	A	No	0
	69	Stocker Creek	A	No	0
	70	Stocker Creek	A	No	0
	71	Stocker Creek	A	No	0
	72	Stocker Creek	A	No	0
	71C	Stocker Creek	A	No	0
Site 8	23	East Fork Armells Creek - Ephemeral	A	No	0
	24	East Fork Armells Creek - Ephemeral	A	No	0
	9	East Fork Armells Creek - Intermittent	A	Yes	2
	13	East Fork Armells Creek - Intermittent	A	No	0
	14	East Fork Armells Creek - Intermittent	A	No	0
	16	East Fork Armells Creek - Intermittent	A	No	0
	13A	East Fork Armells Creek - Intermittent	A	Yes	1
	16A	East Fork Armells Creek - Intermittent	A	No	0
	9A	East Fork Armells Creek - Intermittent	A	No	0
Site 9	10	East Fork Armells Creek - Intermittent	A	No	0
	11	East Fork Armells Creek - Intermittent	B-East	No	0
	12	East Fork Armells Creek - Intermittent	B-East	No	0

Representative Sample Sites	Outfall	Receiving Water	Mine Area	Discharge During POR (Yes/No)	Count of DMR Measurements
	15	East Fork Armells Creek - Intermittent	B-East	Yes	3
	18	East Fork Armells Creek - Intermittent	B-East	No	0
	19	East Fork Armells Creek - Intermittent	B-East	Yes	3
	20	East Fork Armells Creek - Intermittent	B-East	No	0
	21	East Fork Armells Creek - Intermittent	B-East	Yes	6
	22	East Fork Armells Creek - Intermittent	B-East	Yes	2
	10A	East Fork Armells Creek - Intermittent	A	No	0
Site 10	194	East Fork Armells Creek - Intermittent	D	No	0

Table G-2. East Fork Armells – Intermittent RPA

Parameter	Units	Number of Measurements	Maximum Effluent Concentration	CV Multiplier[1]	C_d	C_r	Acute Aquatic Life Standard	Chronic Aquatic Life Standard	Human Health Standard
Aluminum, dissolved [as Al]	µg/L	9	300	1.8	540	540	750	87	*
Iron, total [as Fe]	mg/L	22	6.67	1.6	10.67	10.67	*	1	*
Mercury, total recoverable	µg/L	7	0.1	2	0.2	0.2	1.7	0.91	0.05
Nitrite + Nitrate total [as N]	mg/L	9	0.7	1.8	1.26	1.26	*	*	10
Nitrogen, total as N	µg/L	4	1870	2.6	4862	4862	*	*	150
Nitrogen, Ammonia as N	mg/L	4	1.5	2.6	3.9	3.9	6.95	1.94	*
Phosphorus, total as P	mg/L	4	0.038	2.6	0.0988	0.0988	*	*	1.3
Selenium, total [as Se]	µg/L	9	3	1.8	5.4	5.4	20	5	50
Silver total recoverable	µg/L	7	1	2	2	2	0.27[2]	*	100
Arsenic, total recoverable	µg/L	7	1	2	2	2	340	150	10
Cadmium, total recoverable	µg/L	7	1	2	2	2	10.42[2]	6.64[2]	5
Chromium, total recoverable	µg/L	7	5	2	10	10	*	*	100
Copper, total recoverable	µg/L	7	5	2	10	10	641.05[2]	446.17[2]	1300
Lead, total recoverable	µg/L	7	1	2	2	2	6670.54[2]	4.18[2]	15
Nickel, total recoverable	µg/L	7	42	2	84	84	7066.16[2]	11125.96[2]	100
Zinc, total recoverable	µg/L	7	10	2	20	20	51600.47[2]	51600.47[2]	7400
Footnotes:									

* Indicates there is no standard for the parameter.
1. The CV multiplier was determined using Table 3-2 of the TSD and a coefficient of variation of 0.6 for parameters with less than 10 measurements. For parameters with 10 or greater measurements, the CV = standard deviation ÷ mean and the CV multiplier was determined using Table 3-2 of the TSD.
2. For metals with WQS (C) that are calculated using the receiving water hardness, a hardness of 400 mg/L as $CaCO_3$ was used.

Table G-2. Lee Coulee RPA

Parameter	Units	Number of Measurements	Maximum Effluent Concentration	CV Multiplier[1]	C_d	C_r	Acute Aquatic Life Standard	Chronic Aquatic Life Standard	Water Quality Standard
Electrical Conductivity (EC)	µS/cm	1	1376	6.2	8531.2	8531.2	*	*	500

Footnotes:
* Indicates there is no standard for the parameter.
1. The CV multiplier was determined using Table 3-2 of the TSD and a coefficient of variation of 0.6 for parameters with less than 10 measurements. For parameters with 10 or greater measurements, the CV = standard deviation ÷ mean and the CV multiplier was determined using Table 3-2 of the TSD.