

Statement of Basis

PERMITTEE: **Soap Creek Associates, LLC**

FACILITY: **Soap Creek Oil Field**

PERMIT NUMBER: **MT-0023183**

RESPONSIBLE OFFICIAL: Rick VanSant, President
Soap Creek Associates, Inc.
11603 Teller Street, Suite A
Broomfield, Colorado 80020
(303) 444-5253

FACILITY CONTACT: Jerry Wemple, Field Superintendent
P.O. Box 107
St. Xavier, Montana 59075
(406) 666-2325 or (406) 665-5815
E-mail: jcwemple@aol.com

PERMIT TYPE: Minor Industrial (Renewal)
Indian Country

FACILITY LOCATION: NW ¼ Section 34, Township 6 South, Range 32 East in Big
Horn County, Montana

DISCHARGE POINT: Outfall 001, Lat. 45.272500, Long. -107.778056

1 Background Information

EPA directly implements the Clean Water Act (CWA) National Pollutant Discharge System (NPDES) on Indian country lands within the State of Montana. This facility is located on the Crow Indian Reservation and is thus in “Indian country” as defined at 18 U.S.C. § 1151. EPA has not approved the Crow Tribe (Tribe) or the State of Montana to implement the CWA NPDES program in Indian country.

This Permit authorizes the discharge of produced water from Outfall 001 at the oil production wastewater treatment facility for the Soap Creek Oil Field production facility located in Big Horn County, Montana. Refer to Figure 1 for location map.

This Permit is a renewal of NPDES Permit Number MT-0023183, which expired on May 31, 2013. The Permittee had timely submitted a complete application and thus the Permit was administratively extended until EPA could issue a new permit.

Produced oil and water are separated using cold water knockouts, treatment towers (gravity), and emulsion breaking chemicals. A flow diagram is shown in Figure 2. Produced water flows down two (2) declivitous aerators to a series of three (3) settling ponds where any remaining oil is removed by flotation and skimming prior to discharge to Soap Creek, which is tributary to the Bighorn River.

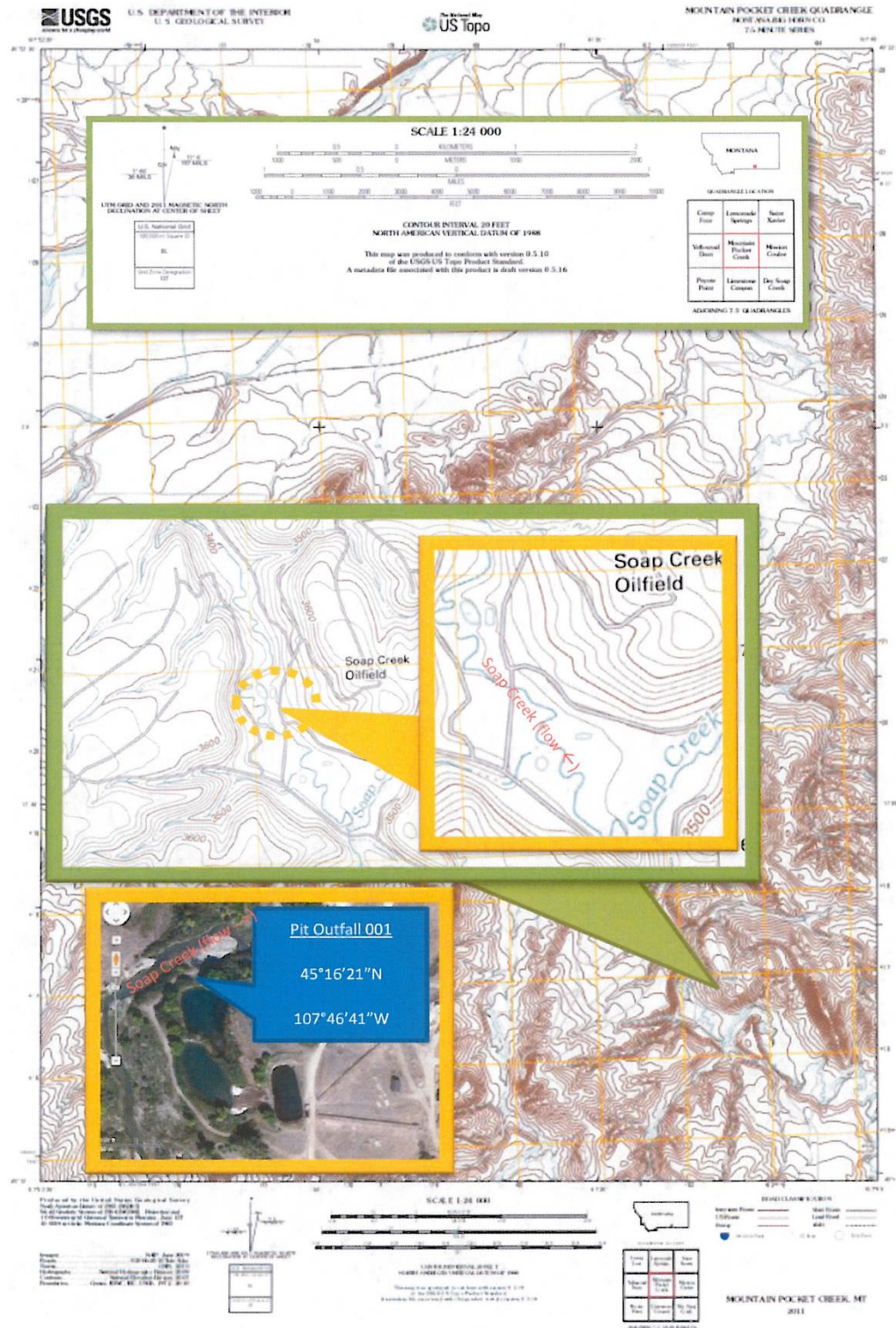
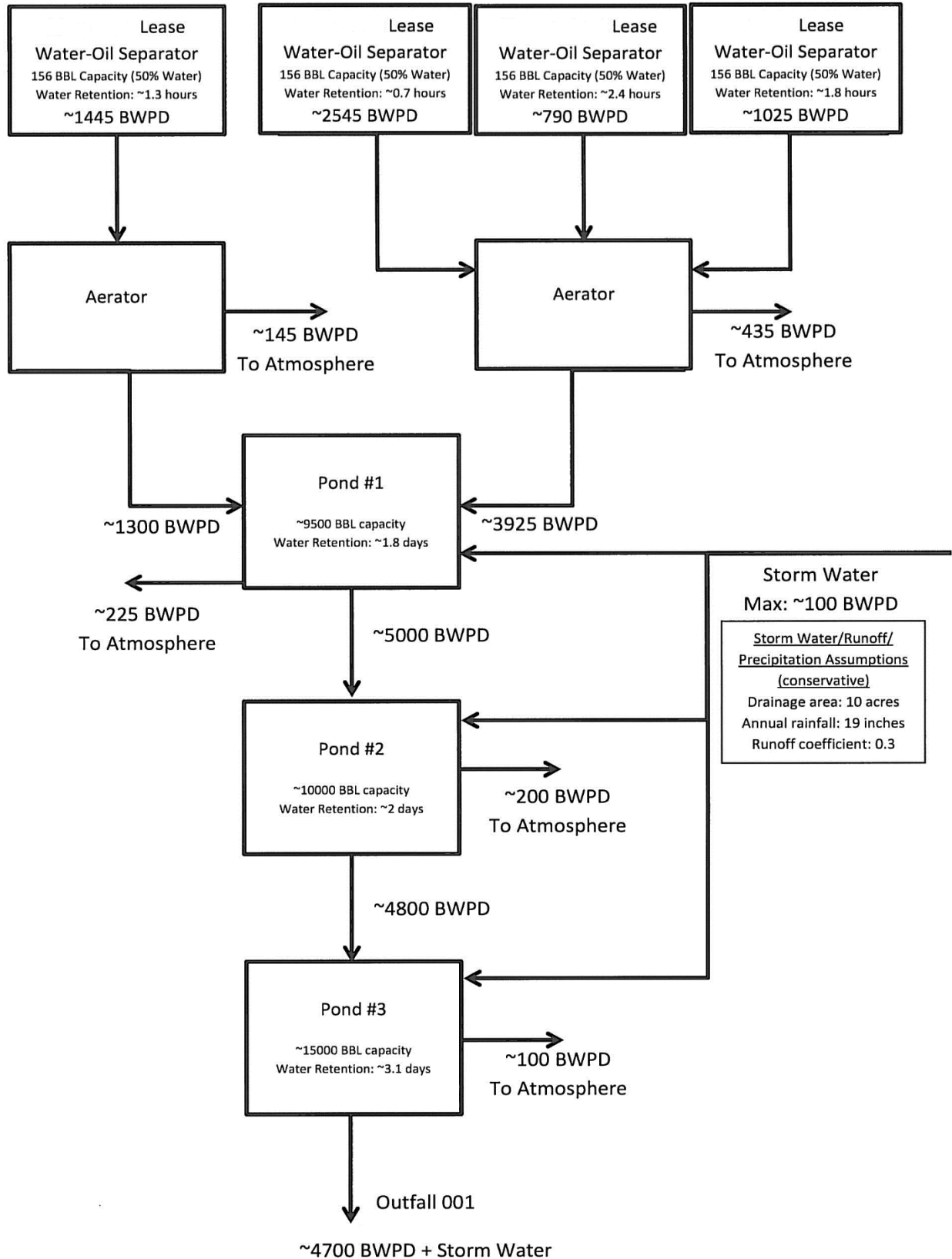


Figure 1. Soap Creek Associates, Inc. – Soap Creek Oil Field. Map showing location of facility and discharge point (Outfall 001).



**Figure 2. Soap Creek Associates, Inc. – Soap Creek Oil Field Flow Diagram
(BWPD = barrels of water per day)**

2 Receiving Waters

The discharge from Outfall 001 at this facility enters Soap Creek, which is a sinuous, free-flowing, perennial stream with a small diversion structure for an irrigation withdrawal downstream from the facility at 45.340242 latitude and -107.759607 longitude. Soap Creek discharges into the Bighorn River, which is tributary to the Yellowstone River, a jurisdictional waterway under section 10 of the Rivers and Harbors Act. From the facility discharge point Soap Creek passes through rangeland and crop land and crosses the Bighorn Canal before reaching the Bighorn River. The Soap Creek irrigation diversion downstream of the facility discharge passes through crop land before any remaining water empties into the Bighorn Canal. The United States Geological StreamStats application calculated a 7-day, 10-year low flow (7Q10) value of 0.622 cubic feet per second (cfs) for Soap Creek.

3 Discharge Monitoring Report Data

Table 1. – DMR Data Summary

Monitoring Period	pH max. (s.u.)	Oil and Grease (mg/L) Sheen ¹	Total Sulfide as Sulfur (mg/L, 30 day avg)	Total Sulfide as Sulfur (mg/L, 7 day avg)	Fluoride (mg/L)	Flow (mgd)	TDS (mg/L, 30 day avg)	TDS (mg/L, 7 day avg)
1/31/2017	8.72	Not observed	0.17	0.17	2.3	0.1884	1110	1110
2/28/2017	8.15	Not observed	0.30	0.30	2.8	0.1897	1320	1320
3/31/2017	8.38	Not observed	0.11	0.00	2.7	0.1951	1640	2300
4/30/2017	8.34	Not observed	0.14	0.14	2.6	0.1632	1220	1220
5/31/2017	8.25	Not observed	0.07	0.07	2.5	0.1858	1240	1240
6/30/2017	8.16	Not observed	0.12	0.12	2.7	0.1909	1300	1300
7/31/2017	8.09	Not observed	0.13	0.13	2.7	0.2085	1270	1270
8/31/2017	8.18	Not observed	0.11	0.11	2.8	0.1933	1290	1290
9/30/2017	8.01	Not observed	0.26	0.26	2.7	0.1966	1260	1260
10/31/2017	8.16	Not observed	0.22	0.22	2.8	0.2201	1270	1270
11/30/2017	8.34	Not observed	0.09	0.09	2.6	0.1881	1310	1310
12/31/2017	8.32	Not observed	0.01	0.01	2.6	0.2059	1330	1330
1/31/2018	8.16	Not observed	0.08	0.08	2.6	0.1984	1270	1270
2/28/2018	8.34	Not observed	0.00	0.28	2.9	0.2211	1280	1280
3/31/2018	8.34	Not observed	0.00	0.19	2.4	0.2190	1310	1310
4/30/2018	8.38	Not observed	0.00	0.07	2.6	0.2164	1320	1320
5/31/2018	8.11	Not observed	0.00	0.13	2.7	0.2334	1400	1400
6/30/2018	8.05	Not observed	0.00	0.10	2.8	0.2206	1300	1300

Monitoring Period	pH max. (s.u.)	Oil and Grease (mg/L) Sheen¹	Total Sulfide as Sulfur (mg/L, 30 day avg)	Total Sulfide as Sulfur (mg/L, 7 day avg)	Fluoride (mg/L)	Flow (mgd)	TDS (mg/L, 30 day avg)	TDS (mg/L, 7 day avg)
7/31/2018	8.06	Not observed	0.00	0.25	2.7	0.2394	1290	1290
8/31/2018	7.88	Not observed	0.00	0.00	2.6	0.1974	1310	1310
9/30/2018	7.95	Not observed	0.00	0.26	2.6	0.1962	1320	1320
10/31/2018	8.11	Not observed	0.00	0.18	2.4	0.1915	1260	1260
11/30/2018	8.14	Not observed	0.00	0.22	2.6	0.1733	1260	1260
12/31/2018	8.39	Not observed	0.00	0.51	2.5	0.1852	1320	1320
1/31/2019	8.48	Not observed	0.00	0.12	2.6	0.2194	1330	1330
2/28/2019	8.10	Not observed	0.00	0.20	2.9	0.1914	1340	1340
3/31/2019	8.10	Not observed	0.00	0.20	2.9	0.1914	1340	1340
4/30/2019	8.19	Not observed	0.00	0.37	2.8	0.1996	1340	1340
5/31/2019	8.17	Not observed	0.00	0.53	2.8	0.1994	1320	1320
6/30/2019	8.12	Not observed	0.00	0.25	3.1	0.1734	1230	1230
7/31/2019	8.13	Not observed	0.00	0.11	2.7	0.1981	1150	1150
8/31/2019	7.86	Not observed	0.00	0.34	2.7	0.1617	1350	1350
9/30/2019	7.99	Not observed	0.00	0.35	2.8	0.1711	1350	1350
10/31/2019	8.25	Not observed	0.00	0.22	2.8	0.1739	1340	1340
11/30/2019	8.43	Not observed	0.00	0.29	2.5	0.1471	1300	1300
12/31/2019	8.40	Not observed	0.00	0.07	2.5	0.1617	1360	1360
1/31/2020	8.33	Not observed	0.00	0.05	3.0	0.1688	1340	1340
2/29/2020	8.34	Not observed	0.00	0.26	2.8	0.1680	1350	1350
3/31/2020	8.29	Not observed	0.00	0.50	2.9	0.1702	1380	1380
4/30/2020	8.33	Not observed	0.00	0.17	2.7	0.1253	1430	1430
5/31/2020	8.03	Not observed	0.00	0.05	2.5	0.0743	1360	1360
6/30/2020	7.74	Not observed	0.00	0.06	2.5	0.0094	1350	1350
7/31/2020	8.11	Not observed	0.00	0.13	2.4	0.1799	1380	1380
8/31/2020	8.12	Not observed	0.00	0.40	2.4	0.1650	1400	1400
9/30/2020	8.25	Not observed	0.00	0.19	2.7	0.1906	1370	1370

Monitoring Period	pH max. (s.u.)	Oil and Grease (mg/L) Sheen ¹	Total Sulfide as Sulfur (mg/L, 30 day avg)	Total Sulfide as Sulfur (mg/L, 7 day avg)	Fluoride (mg/L)	Flow (mgd)	TDS (mg/L, 30 day avg)	TDS (mg/L, 7 day avg)
10/31/2020	8.38	Not observed	0.00	0.19	3.2	0.1635	1390	1390
11/30/2020	8.44	Not observed	0.00	0.22	2.7	0.1947	1340	1340
12/31/2020	8.48	Not observed	0.00	0.00	2.7	0.1812	1340	1340
1/31/2021	8.46	Not observed	0.00	0.43	3.0	0.1877	1350	1350
2/28/2021	8.41	Not observed	0.00	0.06	2.8	0.1899	1370	1370
3/31/2021	8.38	Not observed	0.00	0.24	2.7	0.1974	1320	1320
4/30/2021	8.20	Not observed	0.00	0.20	2.9	0.2121	1360	1360
5/31/2021	8.08	Not observed	0.00	0.12	3.0	0.1999	1310	1310
6/30/2021	8.04	Not observed	0.00	0.17	2.6	0.2136	1330	1330
7/31/2021	7.91	Not observed	0.00	0.00	2.9	0.1894	1330	1330
8/31/2021	7.88	Not observed	0.00	0.07	2.7	0.1991	1310	1310
9/30/2021	8.05	Not observed	not reported	not reported	2.6	0.2167	1290	1290
10/31/2021	8.02	Not observed	0.00	0.33	2.5	0.2411	1300	1300
11/30/2021	8.04	Not observed	0.00	0.27	2.7	0.2367	1290	1290
12/31/2021	8.17	Not observed	0.00	0.70	2.9	0.2054	1300	1300
1/31/2022	8.54	Not observed	0.00	0.36	2.9	0.1980	1310	1310
2/28/2022	8.08	Not observed	0.00	0.22	2.9	0.1699	1320	1320
Minimum	7.74	-	0.00	0.00	2.3	0.0094	1110	1110
Average	8.20	-	0.03	0.20	2.7	0.1880	1320	1294
Maximum	8.72	-	0.30	0.70	3.2	0.2411	1640	1430
Limit	6.0 MIN 9.0 MAX	10 mg/L	0.5 30DA AV	0.8 7DA AV	Report mg/L	Report MGD	1500 30 DA AV	2300 7DA AV

¹ All visual oil and grease was reported as not observed, so no analytical monitoring was conducted.

3.1 Effluent Monitoring Data

The permit renewal application provided data for pollutants believed to be present as well as: biochemical oxygen demand, chemical oxygen demand, total organic carbon, ammonia, temperature, pH and actual flow. EPA also reviewed the submitted data from discharge monitoring reports (DMR) for the period of January 31, 2017 to February 28, 2022, and a toxic pollutants screen report submitted with the permit application on November 21, 2012. A summary of data collected is given below in Tables 1 and 2.

Table 2. – Toxic Pollutants Screen/Permit Application Data

Parameter	Units	Data	Reporting Limit	No. of Samples
BOD ₅	mg/L	21	9	1
COD	mg/L	34	5	1
TOC	mg/L	4	1	1
TSS	mg/L	ND	10	1
Ammonia (as N)	mg/L	ND	0.05	1
Flow	mgd	0.219	--	12
Temperature (winter)	°F	50	--	1
pH	SU	7.4 - 8.5	0.1	12
Sulfate (as SO ₄)	mg/L	714	10	1
Oil and Grease	mg/L	ND	1	12
Conductivity	µmhos/cm	1570	5	1
Fluoride	mg/L	2.8	1	12
Nitrate-Nitrite (as N)	mg/L	0.01	0.01	12
Nitrogen, Total Organic (as N)	mg/L	0.01	Calculated	1
Sulfide as Sulfur	mg/L	0.16	0.04	12
Calcium	mg/L	228	1	1
Cobalt, Total	µg/L	ND	1	1
Hardness, as CaCO ₃	mg/L	842	10	1
Magnesium, Total	mg/L	66	1	1
Arsenic, Total	µg/L	ND	1	1
Aluminum	µg/L	ND	50	1
Boron, Total	µg/L	148	100	1
Cadmium, Total	µg/L	ND	5	1
Chromium, Total	µg/L	ND	1	1
Chloride	mg/L	8	2	1
Copper, Total	µg/L	ND	5	1
Lead, Total	µg/L	ND	2	1
Manganese	µg/L	4	1	1
Mercury, Total	µg/L	ND	0.2	1
Nickel	µg/L	ND	5	1
Selenium, Total	µg/L	ND	20	1
Zinc, Total	µg/L	24	1	1
Benzene	µg/L	2.1	0.50	1
Ethyl benzene	µg/L	0.97	0.50	1
Toluene	µg/L	0.57	0.50	1
WET, <i>Ceriodaphnia dubia</i>	Pass/Fail	Pass	--	8
WET, <i>Pimephales promelas</i>	Pass/Fail	Pass	--	7

4 Applicable Technology and Water Quality Considerations

Permit limitations for the Soap Creek Oil Field facility are derived through evaluating applicable treatment technology standards and the EPAs' numeric water quality criteria. The applicable treatment technology standards for the site are found in 40 CFR Part 435, Oil and Gas Extraction Point Source Category, Subpart E – Agricultural and Wildlife Water Use Subcategory.

Treatment technology standards establish a level of effluent quality that must be met by all facilities affected by the applicable category. The level of effluent quality established by the treatment standards may not be sufficient, however, to protect all water uses. As required by the CWA, EPA must conduct an evaluation of the numeric water quality criteria and the assimilative capacity for the receiving stream. The results of this evaluation are used to establish permit limits to ensure the receiving stream quality and its existing and designated uses are protected. An evaluation of the narrative water quality criteria that may be applicable to this facility is also typically performed to further protect the characteristics and water quality of the receiving stream.

The Tribe has not developed surface water quality requirements that identify designated uses for waters within the exterior boundaries of the Crow Reservation. EPA is considering its CWA § 304(a) national water quality criteria to determine reasonable potential (RP) and evaluate the need for any water quality-based effluent limitations (WQBELs) in this renewal permit. EPA is relying on CWA § 301(b)(1)(C) and principles of tribal sovereignty in establishing WQBELs based on national water quality criteria.

4.1 Technology Based Effluent Limitations

4.1.1 Applicable Effluent Guidelines and Standards

The Soap Creek Oil Field is an onshore facility located landward of the inner boundary of the territorial seas. The facility is also located west of the 98th meridian and, therefore, Subpart E applies, allowing the discharge of produced water for which the produced water has a use in agricultural or wildlife propagation. The effluent guideline defines “use in agricultural or wildlife propagation” to mean “that the produced water is of good enough quality to be used for wildlife or livestock watering or other agricultural uses and that the produced water is actually put to such use during periods of discharge.” 40 CFR § 435.51(c).

The actual effluent limitation from Subpart E is found in 40 CFR §435.52, which provides:

1. There shall be no discharge of waste pollutants into navigable waters from any source (other than produced water) associated with production, field exploration, drilling, well completion, or well treatment (*i.e.*, drilling muds, drill cuttings, and produced sands).
2. Produced water discharges shall not exceed the following daily maximum limitation:
Oil and Grease: 35 mg/L.

The current permit contains an oil and grease limit of 10 mg/L with a visual monitoring requirement for an oil sheen. If a sheen is observed during the visual monitoring the permittee is required to immediately collect a grab sample for oil and grease monitoring. Although no oil sheen has been observed on the effluent during the current permit period there is potential for oil and grease in the effluent due to the nature of the facility. However, since sampling was not previously required in the absence of a visible sheen, the concentration in the effluent relative to the permit limit of 10 mg/L cannot be evaluated. Along with the requirement for visual observations, semi-annual sampling will be required so a quantitative reasonable potential analysis can be conducted during the next permit cycle.

The Permittee provided EPA with documentation (letter dated January 9, 2013) that the discharge of produced water is actually put to use during periods of discharge. The Permittee corresponded with local landowners downstream of the discharge point to learn the beneficial uses they get from the produced water from the facility. Those beneficial uses include irrigation of agricultural crops and livestock watering. The agricultural uses included irrigation for sugar beets, corn, wheat, alfalfa, barley hay, and barley. Sugar beets are refined into sugar, barley is used for beer production, and wheat is used for bread

baking and/or feed crops. All other crops (corn, alfalfa, barley hay, and wheat) are used as feed crops for livestock.

4.1.2 Additional Technology Based Effluent Limitations

Under the applicable technology requirements for the Agricultural and Wildlife Water Use Subcategory of Part 435, discharges of produced water must be of good enough quality to be used for wildlife or livestock watering or other agricultural uses. The EPA's previous permit limitation for total dissolved solids (TDS) and the monitoring requirement for fluoride was based on similar requirements for livestock protection obtained from the of Montana and North Dakota Cooperative Extension Services bulletins. As both of those publications are many years old, for this renewal permit EPA reviewed current information from literature and studies to establish limitations which are protective of livestock and wildlife consumption of the produced water discharge. EPA also included the recommendations from *Water Quality for Wyoming Livestock & Wildlife Report*, M.F. Raisbeck, et al in this Permit (see below).

4.1.2.1 Water Quality for Wyoming Livestock and Wildlife Report

The *Water Quality for Wyoming Livestock & Wildlife, A Review of the Literature Pertaining to Health Effects of Inorganic contaminants* ("the Report") published in 2007 by the University of Wyoming Department of Veterinary Sciences, University of Wyoming Department of Renewable Resources, Wyoming Game and Fish Department, and Wyoming Department of Environmental Quality includes a review of the health effects of inorganic contaminants to livestock and wildlife. EPA evaluated this document to determine the impacts of these contaminants on the beneficial use of produced water, as contemplated in Subpart E.

4.1.2.1.1 Sulfate

For livestock watering the Report contains the following language in the section on sulfur: "*assuming normal feedstuff sulfate concentration, acute death may occur in ruminants at concentrations greater than 2,000 mg/L, especially if not allowed time to acclimate. Assuming normal feedstuff S concentrations, keeping water SO₄ concentrations less than 1,800 mg/L should minimize the possibility of acute death in cattle. Concentrations less than 1,000 mg/L should not result in any easily measured loss in performance.*"

4.1.2.1.2 Fluoride

The permit application data provided by the permittee included 12 samples result for fluoride. The long-term average value from the permit application for these 12 samples results was 2.8 mg/L. The Report recommends less than 2 mg/L fluoride for cattle consumption. The authors of the report reviewed a variety of scientific literature pertaining to fluoride intake in livestock. The authors concluded where fluoride concentrations in forage are less than 10 ppm fluoride, a water concentration of 3.75 mg/L fluoride would cause osteo-dental fluorosis in cattle. As a result, the report recommended that water for cattle contain less than 2 mg/L fluoride.

In selecting the 2 mg/L fluoride criterion, EPA also reviewed a 2009 report from Agriculture and Agri-food Canada titled "Livestock Water Quality: A Field Guide for Cattle, Horses, Poultry and Swine." This report also recommends a maximum fluoride concentration of 2 mg/L in livestock water. This recommendation is based on research indicating that a fluoride concentration of 2 mg/L in water leads to approximately 64-80 mg/day of fluoride ingestion through water intake. In areas with similar fluoride forage content to U.S. West (i.e., 10-20 ppm), the report indicates that cattle will ingest an additional

220-280 mg/day fluoride from forage intake. At these levels, total fluoride ingestion will be between 284-360 mg/day, which falls below the level identified in Canadian report as excessive. In both the University of Wyoming and Canada reports, the primary effect of fluoride ingestion at 2 mg/L in water is tooth mottling, but the Canada report also indicates other potential effects of low-level exposure including skeleton deposition, neonatal fluoride exposure via milk, impaired feed intake, stunted growth, and reduced milk yield. As a result, EPA has concluded that the 2 mg/L fluoride criterion is protective of the agriculture and wildlife designated uses.

4.1.2.1.3 Total Dissolved Solids (TDS)

The EPA's previous permit included the following limitations to meet the requirements of Subpart E: total dissolved solids (TDS) of 1,500 mg/L for a 30-day, and 2,300 mg/L for a 7-day average. The Report recommends identifying, quantifying, and evaluating produced water that is above 500 mg/L TDS for the individual constituents contributing to TDS. Therefore, monitoring and/or limitations will be required for chloride, fluoride and sulfate in this Permit. This allows the individual constituents to be evaluated against threshold criteria to ensure the discharge is of "good enough quality." As such, in its produced water discharge permits, EPA requires permit effluent monitoring and/or limitations for the ion and ionic constituents contributing to TDS such as chloride, fluoride and sulfate. By monitoring for and controlling these constituent parameters, in addition to TDS, EPA ensures compliance with the "good enough quality" provision in Subpart E. The previous permit limits for TDS of 1,500 mg/L for a 30-day, and 2,300 mg/L for a 7-day average will be maintained in this renewal.

4.1.2.1.4 Electrical Conductivity (EC)

Per *R. Ayers, and D. Westcot (1985). Water Quality for Agriculture. Food and Agriculture Organization of the United Nations, Irrigation and Drainage Paper, No. 29, Rev. 1.* EC values below 8,000 $\mu\text{S}/\text{cm}$ are generally considered satisfactory for all livestock. Significant changes in conductivity can be used as an indicator to demonstrate water quality changes in the discharge. As a result, EPA has concluded that a 8,000 $\mu\text{S}/\text{cm}$ limit for EC is protective of the agriculture and wildlife designated uses.

4.1.2.1.5 Technologically Enhanced Naturally Occurring Radioactive Material (TENORM)

Per the permit application, the permittee selected "believed to not be present" for alpha total, beta total, radium total, and radium 226 total. However, throughout the United States, geologic formations that contain oil and gas deposits also typically contain such naturally occurring radionuclides, which are referred to as naturally occurring radioactive materials. Because the oil and gas extraction process concentrates these naturally occurring radionuclides and exposes them to the surface environment and human contact, these wastes are classified as Technologically Enhanced Naturally Occurring Radioactive Material (TENORM). Produced waters often contain levels of radium and its decay products that are concentrated. In fact, 20 to 100 percent of the facilities in every state reported some TENORM in oil and gas heater/treaters per EPA's TENORM: Oil and Gas Production Wastes (<https://www.epa.gov/radiation/tenorm-oil-and-gas-production-wastes>). Despite the near ubiquity of TENORMs in produced water discharges, the Permittee has never sampled for TENORM. Therefore, in this Permit, EPA will require semi-annual monitoring for total radium 226 to determine if this pollutant is present or absent.

Therefore, the following Table outlines pollutants that have been established pursuant to 40 CFR Part 435, Subpart E:

Table 3. - 40 CFR Part 435, Subpart E Pollutants

Pollutant	Daily Max	7-day average	30-day average
Electrical Conductivity, $\mu\text{S}/\text{cm}$	8,000	NA	NA
Fluoride, mg/L	2.0	NA	NA
Total Radium 226, pCi/L	Report only	Report only	Report only
Sulfate, mg/L	1,800	NA	1,000
Total Dissolved Solids, mg/L	NA	2,300	1,500

4.2 Water Quality Based Effluent Limitations

As the Tribe has not adopted water quality criteria, designated uses or requirements, EPA is basing water-quality based effluent limitations for this Permit on the CWA § 304(a) National Water Quality Criteria.

4.2.1 Numeric Water Quality Requirements

To ensure that any potential permit effluent limitations are fully protective of aquatic life use for Soap Creek, EPA selected parameters from the CWA § 304(a) National Water Quality Criteria for freshwater aquatic life as a base level for use in evaluation of RP and setting permit effluent limitations. The water quality criteria were selected based on analytical data Soap Creek Associated submitted with their permit application and known pollutants of concern in produced water. The water quality criteria used for RP analysis are listed in Table 4.

Table 4– Applicable Water Quality Criteria: EPA National Water Quality Criteria, Freshwater Aquatic Life

Pollutant	Acute	Chronic
Aluminum, Total, µg/L	1 - 4,800 µg ⁽²⁾	0.63 - 3,200 ⁽²⁾
Arsenic, Total, µg/L	340	150
Cadmium, Total, µg/L	1.8 ⁽¹⁾	0.72 ⁽¹⁾
Chloride, µg/L	860,000	230,000
Chromium (III) , µg/L	570 ⁽¹⁾	74 ⁽¹⁾
Chromium (VI), Hexavalent, µg/L	16	11
Cyanide, µg/L	22	5.2
Iron, Total, µg/L	--	1,000
Lead, Total, µg/L	65 ⁽¹⁾	2.5 ⁽¹⁾
Nickel, Total, µg/L	470 ⁽¹⁾	52 ⁽¹⁾
pH, standard units	6.5 to 9.0	6.5 to 9.0
Silver, Total, µg/L	3.2 ⁽¹⁾	--
Sulfide (as H ₂ S) , µg/L	--	2
Zinc, Total, µg/L	120 ⁽¹⁾	120 ⁽¹⁾

1. Criterion is hardness dependent. Table values adjusted for hardness using the recommended cap of 400 mg/L for waters having a hardness value greater than 400 mg/L.
2. The criteria varies based on the water chemistry data (for pH, hardness and DOC) entered into the criteria calculator for a given location.

4.2.2 Narrative Water Quality Requirements

As the Tribe has not yet developed water quality standards, EPA used the publication *Quality Criteria for Water 1986*, EPA 440/5-86-001(1986 criteria) to derive narrative water quality requirements for aesthetic qualities. Aesthetic qualities are the general narrative criteria used to protect water quality and are often referred to as the “free from” criteria. The 1986 criteria define aesthetic qualities criteria as “All waters free from substances attributable to wastewater or other discharges that:

- (1) settle to form objectionable deposits;
- (2) float as debris, scum, oil, or other matter to form nuisances;
- (3) produce objectionable color, odor, taste, or turbidity;
- (4) injure or are toxic or produce adverse physiological responses in humans, animals or plants; and,
- (5) produce undesirable or nuisance aquatic life.”

4.2.2.1 Permit Limitations Based on Narrative Water Quality Requirements

To protect aesthetic qualities of Soap Creek the permit will contain the following narrative limitations.

- There shall be no discharge of floating solids or visible foam in other than trace amounts.
- The concentration of oil and grease shall not exceed 10 mg/L in any sample nor shall there be a visible sheen or cause a visible sheen in the receiving waters or deposits on the bottom or

shoreline of the receiving waters. Additionally, oil and grease monitoring will be required semi-annually to quantify the concentration and ensure it does not exceed 10 mg/L.

4.2.3 Reasonable Potential (RP) Evaluation for Water Quality Based Effluent Limitations

4.2.3.1 Quantitative RP Analysis

The NPDES regulations in 40 CFR § 122.44(d)(1)(i) – (iii) require permit writers to assess effluent with respect to EPA-approved water quality standards to evaluate the impact of direct dischargers on downstream water quality. This assessment is used to determine permit limitations that are protective of water quality uses. EPA considered it appropriate to assess effluent discharged from this facility and evaluate RP with respect to water quality criteria. Reasonable potential for pollutants in the discharge to cause or contribute to an exceedance of applicable water quality requirements was evaluated for all parameters of concern measured and reported in the permit application or DMR. The effluent data was compared to applicable acute and chronic aquatic life criteria values presented in Table 1 after consideration of pollutant variability in the discharge and available dilution in the receiving water. A quantitative RP evaluation was performed using the Region 8 RP Tool, which assesses RP from effluent data with statistical procedures consistent with EPA's Technical Support Document for Water Quality Based Toxics Control, March 1991. A confidence interval of 95% was used for all RP calculations. See results in Table 5 below.

Table 5.– Reasonable Potential Evaluation (metals, anions, etc.)

Parameter	Aquatic Life Water Quality Criteria Acute	Aquatic Life Water Quality Criteria Chronic	Maximum Reported Effluent Concentration	Reasonable Potential ? Acute	Reasonable Potential ? Chronic
Sulfide as Sulfur ⁽²⁾ , mg/L	N/A	N/A	0.92	N/A	N/A
Aluminum, µg/L	-- ⁽³⁾	-- ⁽³⁾	ND	No	No
Arsenic, µg/L	340	150	ND	No	No
Cadmium, µg/L	19.2 ⁽¹⁾	6.2 ⁽¹⁾	ND	No	No
Chromium (III), µg/L	1,773	231	ND	No	No
Copper, µg/L	49.6 ⁽¹⁾	29.3 ⁽¹⁾	ND	No	No
Lead, µg/L	280.9 ⁽¹⁾	10.9 ⁽¹⁾	ND	No	No
Mercury, µg/L	1.40	0.77	ND	No	No
Nickel, µg/L	1,513 ⁽¹⁾	168 ⁽¹⁾	ND	No	No
Selenium, µg/L	N/A	4.6	ND	N/A	No
Silver, µg/L	37 ⁽¹⁾	N/A	ND	No	No
Zinc, µg/L	379 ⁽¹⁾	382 ⁽¹⁾	24	No	No

1. Calculated based on hardness value of 400 mg/L.
2. There is no sulfide as sulfur (total sulfide/total dissolved sulfide) water quality criteria so no RP analysis was done.
3. The criteria is based on the water chemistry data (for pH, hardness and DOC) entered into the criteria calculator for a given location. EPA conducted a qualitative RP analysis since no

DOC data is available. EPA determined there was no RP for aluminum since all data was reported as non-detect.

The results of the quantitative evaluation did not identify any parameters as having RP to cause or contribute to exceedances of the water quality criteria. There are no water quality criteria for sulfide as sulfur (total sulfide or total dissolved sulfide), however, sulfide as H_2S in an effluent stream can be toxic to aquatic life. The chronic water quality criterion for sulfide as H_2S is $2\ \mu g/L$ ($0.002\ mg/L$) to protect aquatic life, there is no acute water quality criterion for sulfide as H_2S . The previous permit contains thirty-day and seven-day effluent limits for sulfide as sulfur set at $0.5\ mg/L$ and $0.8\ mg/L$ respectively, providing several years of analytical data results for this parameter, which can be used to estimate the sulfide as H_2S levels in the effluent stream. The sulfide as sulfur effluent limit is being removed from this permit and replaced with an effluent limit for sulfide as H_2S , calculated as described below, to be protective of Soap Creek based on the sulfide as H_2S water quality criterion.

Laboratory analytical reports submitted with the permittee's required monitoring results show that effluent samples were analyzed for sulfide as sulfur, per the requirements of standard method 4500- S^{2-} -D, the methylene blue colorimetric method for sulfide, which measures total sulfide in a water sample. As the discharge effluent is clear, thus not containing metal sulfides in particulate matter, the analytical results equate to total dissolved sulfide levels in the water samples, which is the sum of dissolved, un-ionized H_2S and the bisulfide ion (HS^-).

Un-ionized H_2S can be calculated from the dissolved sulfide concentration, the sample pH and the conditional dissociation constant of H_2S per standard method 4500- S^{2-} -H. Following method 4500- S^{2-} -H, EPA calculated the ionic strength of the effluent using the third equation in Table 2330:I, used the result to determine the conditional dissociation constant (pK'_{FW}) from Table 4500- S^{2-} :II, calculated an average $pH-pK'_{FW}$ for each month of discharge data, calculated an average $pH-pK'_{FW}$ value to use with Figure 4500- S^{2-} :3 and determined the fraction of un-ionized H_2S was 5 percent. A 5 percent value of all sulfide as sulfur effluent data was used to conduct an RP for sulfide as H_2S , which showed there is RP for sulfide as H_2S . Quarterly monitoring of the discharge will be required for the sulfide as H_2S parameter with a 30-day average limit of $0.002\ mg/L$.

4.2.3.2 Qualitative RP Analysis

Though there is only one value for chloride which is not enough data to support a RP analysis to determine if there is RP with the national water quality criteria. Therefore, EPA will require semi-annual monitoring for chloride to ensure there is enough data to do a thorough RP analysis at the next permit renewal. Since TDS is dominated by salts and minerals (primarily sodium and calcium-based), includes chlorides. Chlorides are a pollutant of concern in produced water and could be harmful to livestock and crops at high concentrations.

Though there is only one value for zinc, that value and the quantitative RP finding are below the acute and chronic aquatic life criteria. Using the additional zinc value from the 2007 permit application the quantitative RP analysis gives a lower value. Thus, EPA has reasonably determined there is no potential for zinc to cause or contribute to an exceedance of the water quality criteria and no monitoring will be put in this permit for zinc.

4.2.4 Organic Compounds

The permit application data submitted included one analysis of some volatile and semi-volatile organic compounds based on whether the permittee believes that the parameters are present in the discharge. The data presented in Table 3 indicates the effluent contains measurable concentrations of benzene, ethyl benzene, and toluene.

There are no aquatic water quality criteria for these compounds, so the data were evaluated with respect to the EPA's water quality criteria for human health protection and EPA Maximum Contaminant Levels (MCL) for drinking water to determine if there was RP for pollutants in the discharge to exceed those criteria in Table 6 below. Only benzene was identified at concentrations which meet the top level of the recommended criteria for human health protection. The benzene level was still less than half of the drinking water MCL. Since the Tribe has not designated the receiving water as a drinking water source, the human health criteria and MCLs are not directly applicable to the water body and effluent limitations will not be established based on this evaluation.

Table 6.- Effluent Organic Compounds Detected and Water Quality Criteria Comparison

Parameter	Effluent Concentration (µg/L)	Water Quality Criteria (Human Health) Water + Organism (µg/L)	Water Quality Criteria (Human Health) Organism only (µg/L)	Drinking Water MCL (µg/L)
Benzene	2.1	0.58-2.1	16-58	5
Ethyl Benzene	0.97	68	130	700
Toluene	0.57	57	520	1,000
Xylenes, total	1.7	-	-	10

Although no effluent limitations were established for these volatile and semi-volatile organic compounds in the Permit, the effort required to reduce the concentration of other pollutants (e.g. sulfide (as H₂S)) in the discharge will concurrently reduce the concentration of volatile organic compounds in the discharge. Additional monitoring for volatile and semi-volatile organic compounds will, however, be required as part of the toxic pollutants screening monitoring requirements in this renewal Permit.

4.2.5 Other Effluent Limitations

pH limitations have been revised from a range of 6.0 – 9.0 to a more stringent range of 6.5 - 9.0 based on the EPA's national recommended water quality criteria requirements for aquatic life protection. The basis for the previous minimum range value for pH of 6.0 could not be determined from review of the permit record and therefore the limit has been revised for this renewal permit.

4.2.6 Per- and Polyfluoroalkyl Substances (PFAS)

EPA's PFAS Strategic Roadmap directs the Office of Water to leverage NPDES permits to reduce PFAS discharges to waterways "at the source and obtain more comprehensive information through monitoring on the sources of PFAS and quantity of PFAS discharged by these sources."

PFAS monitoring is being required in the Permit based on the April 28, 2022 EPA memorandum, "Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations Where EPA is the Pretreatment Control Authority." This is consistent with the agency's commitments in the October 2021 "PFAS Strategic Roadmap: EPA's Commitments to Action 2021-2024 (PFAS Strategic Roadmap)" to restrict PFAS discharges to water bodies. In addition to evaluating the potential for PFAS discharges to waterbodies, the monitoring will inform future permitting actions.

PFAS chemicals are often used in the fluids used to extract oil and gas. The chemicals, which are extremely water-repellent, are used to make the chemical mixture more stable and more efficiently flush oil and gas out of the ground at high pressure.

Based on recommendations in the April 28, 2022 EPA memorandum, "Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations Where EPA is the Pretreatment Control Authority," in the absence of a final 40 CFR § 136 method, the Permit requires that EPA Draft Method 1633. (in accordance with 40 CFR 122.21(e)(3)(ii) and 40 CFR 122.44(i)(1)(iv)(B)) shall be used. Monitoring will include each of the 40 PFAS parameters detectable by Method 1633 and the monitoring frequency will be quarterly to ensure that there are adequate data to assess the presence and concentration of PFAS in discharges. Method 1633 may become approved under 40 CFR § 136 during the life of the Permit. All PFAS monitoring data, including individual PFAS pollutants, must be reported on DMRs, in accordance with 122.41(l)(4)(i).

If the results of the initial eight (8) quarterly PFAS monitoring samples using Method 1633 show there are non-detectable levels of PFAS, the Permittee may submit a request to EPA for a waiver from further testing without having to follow public notice procedures.

Should PFAS positive results occur in any effluent samples for any of the 40 PFAS parameters detectable by Method 1633, the Permittee must perform the steps indicated in Part 5.4 of the Permit, which include notification to EPA, additional monitoring, development and implementation of a PFAS source identification and reduction plan (PFAS Plan).

4.2.7 Whole Effluent Toxicity (WET) (Permit Part 5.2)

WET monitoring was required in the previous permit. The WET monitoring data from the current permit consists of 10 passing tests, performed between 2017 and 2021.

Many toxic pollutants have cumulative effects on aquatic organisms that cannot be detected by individual chemical testing. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. Because these tests measure the aggregate toxicity of the whole effluent, this approach is called whole effluent toxicity (WET) testing.

Section 101(a)(3) of the CWA states, "it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited." Due to CWA Section 101(a)(3), EPA has determined there is reasonable potential to discharge toxics in toxic amounts. Therefore, the requirement to perform chronic WET testing is being maintained in the Permit. Chronic WET testing shall be performed on an annually basis by the Permittee for two species: *Daphnia magna* and *Pimephales promelas*. If WET testing confirms reasonable potential to cause or contribute to an exceedance of the narrative standards, the Permit may

be reopened to include a WET limitation. Specific WET requirements are outlined in the Special Conditions section of the Permit (see section 5 of the Permit).

The Permittee will coordinate WET testing and its Toxic Pollutant Screens to assess the toxicity of the produced water that discharges to these streams. At least annually after the effective date of the Permit, the Permittee shall conduct chronic static-renewal toxicity tests on a composite sample of the produced water discharge from Outfall 001. These tests shall be coordinated with the Toxic Pollutants Screen required in Part 5 of this Permit to ensure that the chronic static-renewal toxicity tests are staggered with the Toxic Pollutants Screens to ensure a more even coverage during the permit term. To the extent practicable, the static-renewal toxicity tests should also be timed to provide results that represent seasonal variation in the discharge. Samples must be chilled to 0°C to 6°C.

The static-renewal toxicity tests shall be conducted in accordance with the procedures set out in the latest revision of “Short-term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms”, EPA-821/R-02-013 (October 2002). Chronic WET test shall be performed on two species; *Daphnia magna*, EPA 2021.0, as a 48-hr, static-renewal definitive test with renewals at each 24-hr interval, and *Pimephales promelas*, EPA 2002.0, as a 96-hour static-renewal definitive test with renewals at each 24-hr interval. Both tests shall utilize the standard dilution series of 100%, 75%, 50%, 25%, 12.5% and a 0 control, with moderately hard synthetic laboratory water for dilutions with test temperature set at 25°C.

For the purpose of this Permit, *Daphnia magna* will be utilized as a toxicity indicator testing organism in lieu of *Ceriodaphnia dubia* due to its higher tolerance for the high TDS levels within the produced water from the wells. The high TDS levels will cause WET toxicity, and the purpose of the WET testing in this Permit is to monitor for other sources of toxicity. This approach will ensure that any WET tests performed will control toxicity from other pollutants which may be present in the discharge that would be masked by the level of TDS in the discharge. There is no WET limit in this current permit.

Chronic toxicity is present in the effluent when a chronic WET test demonstrates that one (or both) of the two statistical test endpoints, either the NOEC or the IC25, are at any effluent concentration less than the in-stream waste concentration (IWC). The IWC for this permit is has been determined to be 100% effluent for Outfall 001. If more than 10 percent control mortality occurs, the test is not valid. The test shall be repeated until satisfactory control survival is achieved.

Regular chronic toxicity test results shall be reported on the Discharge Monitoring Report (DMR) submitted for the reporting period when the chronic toxicity monitoring was conducted. A laboratory reporting form consistent with the “Suggested R8 WET Toxicity Test Report Form”, including all chemical and physical data as specified shall also be submitted to the permit issuing authority as an attachment to the DMR. Copies of the format may be downloaded from the Region 8 web page at <https://www.epa.gov/sites/production/files/2016-01/wet-laboratory-reporting-forms.xlsm>.

If chronic toxicity occurs in a test, the Permittee shall do the following:

- (1) Notify the Permit issuing authority within 48 hours of when the Permittee learned of the initial test failure;
- (2) Promptly take all reasonable measures necessary to immediately reduce toxicity; and
- (3) Initiate an additional test within two (2) weeks of the date of when the Permittee learned of the test failure. If only one species fails, retesting may be limited to this species.

The Permit issuing authority may waive either or both requirements (2) or (3) with justification (e.g., the toxicity has been ongoing and the Permittee is in the process of conducting a toxicity identification evaluation/toxicity reduction evaluation (TIE/TRE) as required in Part 5.3 of this Permit).

Should chronic toxicity occur in the second test, the Permittee shall immediately begin testing once a month until further notified by the Permit issuing authority. Accelerated monthly testing is only required for the species that failed the initial and second tests.

In addition to the accelerated monitoring, the Permittee shall perform a toxicity identification evaluation/toxicity reduction evaluation as required by Part 5.3 of this Permit to establish the cause of the toxicity, locate the source(s) of the toxicity, and develop control of, or treatment for the toxicity.

Test results from additional toxicity testing conducted (i.e. two week retest, monthly testing and TIE/TRE testing) shall be reported by the 28th of the month through NetDMR and following the test to the following address:

Wastewater Section (8WD-CWW)
Attn: Regional WET Coordinator
U.S. EPA, Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

4.2.8 Method Detection Limits (Part 4)

Monitoring methods must be sufficiently sensitive to meet the Method Detection Limits specified in Table 7 below:

Table 7.- Required Method Detection Limits

Parameter	Required Detection Limits and Required Units
Arsenic, Total	1 µg/L
Aluminum, Total Recoverable	50 µg/L
Antimony, Total Recoverable	50 µg/L
Beryllium, Total Recoverable	1 µg/L
Cadmium, Total Recoverable	0.1 µg/L
Chromium, Total Recoverable	5 µg/L
Chloride	5 mg/L
Copper, Total Recoverable	5 µg/L
Lead, Total Recoverable	1 µg/L
Magnesium, Total Recoverable	30 µg/L
Manganese, Total Recoverable	2 µg/L
Nickel, Total Recoverable	1 µg/L

Parameter	Required Detection Limits and Required Units
Radium 226, Total Recoverable	0.2 pCi/L
Selenium, Total Recoverable	2 µg/L
Silver, Total Recoverable	5 µg/L
Sulfide/Hydrogen Sulfide (S=, HS-)	100 µg/L
Thallium, Total Recoverable	50 µg/L
Zinc, Total Recoverable	2 µg/L
Hardness, Total	10 mg/L as CaCO ₃
Uranium, Total Recoverable	5 µg/L
Gross Alpha and Beta Radiation	0.2 pCi/L
Dissolved Oxygen	1 mg/L
Calcium	10 mg/L
Fluoride	1 mg/L
Volatile Organic Compounds	5 µg/L
Acid & Base/Neutral Organic Compounds	10 µg/L
Chemical Oxygen Demand	3 mg/L

5 Effluent Limitations – Outfall 001

Based on the technology and water quality considerations and protecting beneficial uses, the following effluent limitations will be required for this facility:

Table 8.- Effluent Limitations for Outfall 001

Effluent Characteristics	30-day Average Effluent Limitation <u>a/</u>	7-day Average Effluent Limitation <u>a/</u>	Daily Maximum Effluent Limitation <u>a/</u>	Basis for Limitation <u>b/</u>
Sulfate, mg/L	1,000	N/A	1,800	RCLW
Sulfide as H ₂ S, µg/L	2.0	N/A	N/A	WQC
Oil and grease, mg/L	N/A	N/A	10	ELPP
Electrical Conductivity, µS/cm	N/A	N/A	8,000	RAYE
Total Dissolved Solids, mg/L	1,500	2,300	N/A	ELPP
Fluoride, mg/L	N/A	N/A	2.0	RCLW
The concentration of oil and grease shall not exceed 10 mg/L in any sample nor shall there be a visible sheen or cause a visible sheen in the receiving waters or deposits on the bottom or shoreline of the receiving waters.				ELPP, WQC

The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.	WQC
There shall be no discharge of floating solids or visible foam in other than trace amounts.	WQC

- a/ See Permit Part 1 for definition of terms.
- b/ ELPP = Effluent limitations in previous permit; WQC = EPA recommended national water quality criteria; RCLW = Recommended criteria for livestock and wildlife, based on the report “Water Quality for Wyoming Livestock & Wildlife, A Review of the Literature Pertaining to Health Effects of Inorganic Contaminants”, University of Wyoming department of Veterinary Sciences, et al. RAYE = R. Ayers, and D. Westcot (1985). Water Quality for Agriculture. Food and Agriculture Organization of the United Nations, Irrigation and Drainage Paper, No. 29, Rev. 1

6 Self-Monitoring Requirements – Outfall 001

Sampling and test procedures for pollutants listed in this part shall be in accordance with guidelines promulgated by the Administrator in 40 CFR Part 136, as required in 40 CFR § 122.41(j). At a minimum, the following constituents shall be monitored at the frequency and with the type of measurement indicated; samples or measurements shall be representative of the volume and nature of the monitored discharge. If no discharge occurs during the entire monitoring period, it shall be stated on the Discharge Monitoring Report that no discharge or overflow occurred.

Table 9.– Monitoring and Reporting Requirements for Outfall 001

Effluent Characteristic	Frequency	Sample/Monitoring Type <u>a</u>/
Total Flow, mgd <u>b</u> /	Monthly	Instantaneous
pH, standard units	Monthly	Grab
Total Radium 226, pCi/L	Semi-annually	Grab
Chloride, mg/L	Semi-annually	Grab
Electrical Conductivity, μ S/cm	Monthly	Grab
Oil and grease, mg/L <u>e</u> /	Semi-annually	Grab
Oil and grease, visual <u>e</u> /	Weekly	Visual
Sulfide as H ₂ S, μ g/L <u>c</u> /	Quarterly	Grab
Sulfate, mg/L	Quarterly	Grab
Fluoride, mg/L	Semi-annually	Grab
Total Dissolved Solids, mg/L	Semi-annually	Grab
Per- and Polyfluoroalkyl Substances (PFAS), ng/L, <u>f</u> /	Quarterly	Grab
Whole Effluent Toxicity at 25 °C, Chronic (see Part 5)	Annually <u>d</u> /	Composite
Toxic Pollutants Screen (see Part 5)	2-3 times/5 years	Grab

a/ See Permit Part 1 for definition of terms.

b/ Flow measurements of effluent volume shall be made in such a manner that the Permittee can affirmatively demonstrate that representative values are being obtained. The average flow rate

(in million gallons per day) during the reporting period and the maximum flow rate observed (in mgd) shall be reported.

- c/ The analysis for sulfide (as H₂S) shall be done with an approved procedure that has a method detection level of no greater than 0.10 mg/L (100 µg/L). In the calculation of average sulfide (as H₂S) concentrations, those analytical results that are less than 0.10 mg/L shall be considered to be zero. If all individual analytical results that would be used in the calculations are less than 0.10 mg/L, then “less than 0.10 mg/L” shall be reported on the discharge monitoring report form. Otherwise, report the maximum value and the calculated average value.
- d/ Tests shall be coordinated with the Toxic Pollutants Screen to ensure more even coverage as described in Part 5 of the Permit. To the extent practicable, tests shall be timed to provide results that represent seasonal variation in the discharge.
- e/ A weekly visual observation is required. If a visible sheen is detected, a grab sample shall be taken immediately and analyzed in accordance with the requirements of 40 CFR Part 136. The concentration of oil and grease shall not exceed 10 mg/L in any sample. Additionally, semi-annually a grab sample shall be taken regardless if a sheen is present/observed in order to quantify the concentration of oil and grease in the effluent.
- f/ Use EPA Draft Method 1633 until EPA approves a 40 CFR Part 136 method. Analysis shall be for the 40 PFAS parameters included in the method. If the results of the initial eight (8) quarterly PFAS monitoring samples using Method 1633 show non-detectable levels of PFAS, the Permittee may submit a request for a waiver from further testing for approval of the appropriate EPA delegated representative. Submit waiver requests to: U.S. EPA, Region 8 (8WD-CWW), Attention: Wastewater Section Chief, 1595 Wynkoop Street, Denver, Colorado 80202-1129.

Grab samples are required for most pollutants because the quality of discharge is assumed to be relatively consistent (minus any new chemical additives) and for the easy of routine sampling. WET samples are required to be collected as a composite because that is typically required for chronic WET testing. Weekly oil and grease (visual monitoring) is required due to the easy of observing the effluent for a leak/spill/treatment upset.

Monthly samples are required for flow, pH, and EC because these can be conducted using low-cost handheld meters; however, monitoring methods must still be CWA-approved. Radium, chloride, oil and grease (non-visual monitoring), fluoride, and TDS are required to be sampled semiannually. This is to obtain at least ten (10) samples for an RP analysis at the next permit issuance. Sulfide and sulfate are required to be monitored quarterly to be consistent with other NPDES oil and gas permits issued in Region 8. PFAS monitoring is required quarterly in line with the April 28, 2022 EPA memorandum, “Addressing PFAS Discharges in EPA-Issued NPDES Permits and Expectations where EPA is the Pretreatment Control Authority.” WET and Toxic Pollutant Screens are required to be monitored annually and 2 to 3 times per 5-year permit term, respectively. WET testing and Toxic Pollutant Screens shall be coordinated such that both tests are staggered to ensure even more coverage during the permit term. This is consistent with other NPDES oil and gas permits issued in Region 8.

7 Chemical Inventory Reporting Requirement

The Permittee shall maintain an inventory of the quantities and concentrations of the specific chemicals used to formulate well treatment and workover fluids. Unless these fluids are segregated, the Permittee shall submit the following information with the DMR, to the extent such information is obtainable after

making reasonable inquiries to suppliers: all chemical additives in the well treatment or workover fluid, their trade names, purposes, supplier, CAS number, concentrations and amounts. The type of operation that generated the well treatment or well workover fluids shall also be reported. To the extent a Safety Data Sheet (SDS) contains the information required above, it may be submitted for purposes of complying with this provision. For purposes of this provision, well treatment and workover fluids will be considered segregated if the Permittee takes steps to recover a volume of fluid equivalent to the volume of the well treatment or workover fluid used in the job.

“Well treatment fluids” means any fluid used to restore or improve productivity by chemically or physically altering hydrocarbon-bearing strata after a well has been drilled.

“Well workover fluids” means salt solutions, weighted brines, polymers, or other specialty additives used in a producing well to allow for maintenance, repair or abandonment procedures.”

The Chemical Inventory Reporting Requirement provides actual practices for well treatment and workover that occur at the facility. The facility can segregate fluids used in well treatment and workover. This Permit requires reporting of the chemical quantities, etc. used in well treatment and workover only when those fluids are not segregated and are actually discharged with the produced water.

7.1 Chemical Disclosure

As part of the permit development process, EPA requests chemical disclosure of all chemicals used in oil and gas production and treatment. The chemical product ingredients disclosed are listed below. The Permittee listed toluene, ethylbenzene and benzene on their permit application as “believed present” in their effluent; however, only one sample was reported on the permit application for each of these pollutants. These three chemicals (toluene, ethylbenzene and benzene) will be sampled as part of the Toxic Pollutant Scans required three times during the permit term (see below and Part 5.1 of the Permit).

7.1.1 Chemical Product Ingredients

Heavy Aromatic Naphtha
Solvent Naphtha
Naphthalene
Amines, N-(C14-18 and C16-18-unsatd. alkyl)trimethylenedi
Isopropyl alcohol
Nonylphenol ethoxylated
Rosin, maleated
Xylene
Ammonium Salt
Ethylbenzene
Petroleum Distillate
Polypropylene Glycol
Cumene
PolyAluminum chloride
Methanol
Ethanol, 2,2',2''-nitrilotris-, homopolymer, reaction products with chloromethane
Zinc chloride
Hydrochloric acid
Sulfamic Acid

Benzene, dimethyl-
Benzene, ethyl-
Benzene, methyl-

Additionally, the Permittee must submit any changes to the chemical additives it submitted to EPA when the permit was developed (the chemicals disclosed are listed above). If the Permittee uses any additional chemicals from those disclosed above during the Permit term, the Permittee must submit notification of those additional chemicals to EPA per the Planned Changes provision in Parts 8.1 and 8.1.1. of the Permit.

7.2 Additional Toxics Monitoring Requirements

7.2.1 Toxic Pollutants Screen

This Permit requires the Permittee to monitor for the constituents listed below in the toxic pollutants screen up to three times during the life of the Permit. One monitoring event will be during the first year after the effective date of this Permit, and the second monitoring event during the third year after the effective date of this Permit. A third monitoring event will be required only if the Permittee undertakes a hydraulic fracturing job for a well that sends produced water to this facility. In that instance, the Permittee must complete a third toxic pollutants screen within one week of returning the hydraulically fractured well to production. Each of the toxic pollutants screen datasets shall be submitted to the permit issuing authority at the time of the DMR submittal for that reporting period in which the screening results were obtained. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this Permit.

Pollutants to Be Screened:

Table 10.- All Volatile Organic Compounds, Base/Neutral, and Acid Organic Compounds listed in 40 CFR Part 122, Appendix D, Table II (see below)

Volatiles	Acid Compounds	Base/Neutral	Base/Neutral (continued)
acrolein	2-chlorophenol	acenaphthene	di-n-octyl phthalate
acrylonitrile	2,4-dichlorophenol	acenaphthylene	1,2-diphenylhydrazine (as azobenzene)
benzene	2,4-dimethylphenol	anthracene	fluroranthene
bromoform	4,6-dinitro-o-cresol	benzidine	fluorene
carbon tetrachloride	2,4-dinitrophenol	benzo(a)anthracene	hexachlorobenzene
chlorobenzene	2-nitrophenol	benzo(a)pyrene	hexachlorobutadiene
chlorodibromomethane	4-nitrophenol	3,4-benzofluoranthene	hexachlorocyclopentadiene
chloroethane	p-chloro-m-cresol	benzo(ghi)perylene	hexachloroethane
2-chloroethylvinyl ether	pentachlorophenol	benzo(k)fluoranthene	isophorone
chloroform	phenol	bis(2-chloroethoxy)methane	naphthalene
dichlorobromomethane	2,4,6-trichlorophenol	bis(2-chloroethyl)ether	nitrobenzene
1,1-dichloroethane		bis(2-chloroisopropyl)ether	N-nitrosodimethylamine
1,2-dichloroethane		bis (2-ethylhexyl)phthalate	N-nitrosodi-n-propylamine
1,1-dichloroethylene		4-bromophenyl phenyl ether	N-nitrosodiphenylamine
1,2-dichloropropane		butylbenzyl phthalate	phenanthrene
1,3-dichloropropylene		2-chloronaphthalene	pyrene
ethylbenzene		4-chlorophenyl phenyl ether	1,2,4-trichlorobenzene
methyl bromide		chrysene	
methyl chloride		dibenzo(a,h)anthracene	
methylene chloride		1,2-dichlorobenzene	
1,1,2,2-tetrachloroethane		1,3-dichlorobenzene	
tetrachloroethylene		1,4-dichlorobenzene	
toluene		3,3'-dichlorobenzidine	
1,2-trans-dichloroethylene		diethyl phthalate	
1,1,1-trichloroethane		dimethyl phthalate	
1,1,2-trichloroethane		di-n-butyl phthalate	
trichloroethylene		2,4-dinitrotoluene	
vinyl chloride		2,6-dinitrotoluene	

Table 11.- All metals listed in 40 CFR Part 122, Appendix D, Table III (see below)

40 CFR Part 122, Appendix D, Table III
Other Toxic Pollutants (Metals & Cyanide) and Total Phenols
Antimony, Total
Arsenic, Total
Beryllium, Total
Cadmium, Total
Chromium, Total
Copper, Total
Lead, Total
Mercury, Total
Nickel, Total
Selenium, Total
Silver, Total
Thallium, Total
Zinc, Total
Cyanide, Total
Phenols, Total

8 Reporting Requirements

Reporting requirements are based on requirements in 40 CFR §§ 122.44, 122.48, and Parts 3 and 127. A discharge monitoring report (DMR) frequency of semiannual was chosen, because much of the monitoring is required semiannually or annually and this is consistent with reporting frequencies in similar permits issued by EPA Region 8.

Notification of Planned Changes: The Permittee is required to give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Such notice is required when the alteration or addition could change the nature or increase the quantity of pollutant discharged. This would include any plans to increase production capacity that could result in increased flow rates and pollutant loadings from this facility. This notification requirement applies to all pollutants, whether or not they are subject to effluent limitations in the Permit. Depending on the scope and nature of the increases in flow and pollutant loading, EPA may determine whether or not one or more of the causes listed in 40 CFR Part 122.62(a) for modification exist and, if so, may modify the permit accordingly (e.g., to include a flow limit, to assess reasonable potential to impact downstream State waters, etc.) subject to the limitations of 40 CFR Part 124.5(c).

9 Endangered Species Act (ESA) Requirements

Section 7(a) of the Endangered Species Act requires federal agencies to ensure that any actions authorized, funded or carried out by an agency are not likely to jeopardize the continued existence of any federally-listed endangered or threatened species or adversely modify or destroy critical habitat of such species.

EPA searched the U.S. Fish and Wildlife Service’s *Information for Planning and Conservation* website (IPaC at <https://ecos.fws.gov/ipac/>) on April 29, 2022 for any federally listed threatened, endangered and candidate species found in Soap Creek Oil Field area of Big Horn County, Montana. The official species list resulting from that search stated there are a total of 4 threatened, endangered, or candidate species with no critical habitat in this project area (see table below). The search result listed twenty-four (24) migratory bird species “of particular conservation concern” that could potentially be affected by activities in the area. The search area included Big Horn, Yellowstone, and Treasure counties in Montana, which covers the extent of the Crow Reservation.

This permit renewal is for an existing activity that has been occurring at the site since at least 1981, when EPA records show a discharge permit was issued to the facility. In the application the permittee did not indicate any additional construction or activities would take place at the facility.

Table 12.- IPaC Federally listed Threatened and Endangered Species

Species	Scientific Name	Species Status	Designated Critical Habitat
Black-footed Ferret	<i>Mustela nigripes</i>	Endangered	“There are no critical habitats at this location”
Grizzly Bear	<i>Ursus arctos horribilis</i>	Threatened	“There are no critical habitats at this location”
Red Knot	<i>Calidris canutus rufa</i>	Threatened	“There are no critical habitats at this location”
Monarch Butterfly	<i>Danaus plexippus</i>	Candidate	“There are no critical habitats at this location”

9.1 Biological Evaluation

Black-footed Ferret, *Mustela nigripes* – This species can be found throughout central Montana’s intermountain and prairie grasslands, often coinciding with high density prairie dog populations. However, the permit reissuance will not authorize new ground disturbance or substantial changes in flows or pollutant loadings, and permit limits are protective of all applicable water quality criteria. Therefore, EPA finds that this permit action is *not likely to adversely affect this species*.

Grizzly bear, *Ursus arctos horribilis* – This species can be found throughout the Northern Continental Divide Ecosystem of north-central Montana, although they typically avoid areas with high human population. The ‘action area’ for the proposed action (renewal of an NPDES discharge permit) is comprised mainly of lower elevation pasture, rural homesteads, and hay fields, and is likely not primary habitat for this species. Regardless of whether grizzly bear are found in this area, the permit reissuance will not authorize new ground disturbance or substantial changes in flows or pollutant loadings, and permit limits are protective of all applicable water quality criteria. Therefore, EPA finds that this permit action is *not likely to adversely affect this species*.

Red Knot, *Calidris canutus rufa* - This species can be found from central to eastern Montana in wetland areas during migration season. However, the permit reissuance will not authorize new ground disturbance or substantial changes in flows or pollutant loadings, and permit limits are protective of all applicable water quality criteria. Therefore, EPA finds that this permit action is *not likely to adversely affect this species*.

Monarch butterfly, *Danaus plexippus* – This species is currently listed as a candidate species. There are generally no section 7 requirements for candidate species. However, EPA believes reissuance of the Permit will have minimal impact on this species for the same reasons provided for other species above.

Based on the IPaC information, EPA determined the permitting action may affect, but is not likely to adversely affect one or more of the species listed above. A copy of the draft Permit and this Statement of Basis was sent to the FWS requesting concurrence with EPA's finding that reissuance of this NPDES Permit *"may affect, but is not likely to adversely affect"* the species listed as threatened or endangered in the action area, or their critical habitat.

10 National Historic Preservation Act (NHPA) Requirements

Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470(f) requires that federal agencies consider the effects of federal undertakings on historic properties. The first step in this analysis is to consider whether the undertaking has the potential to affect historic properties, if any are present. See 36 CFR 800.3(a)(1). Permit renewals where there is no new construction are generally not the type of action with the potential to cause effects on historic properties.

11 . 401 CERTIFICATION CONDITIONS

At the time of the Permit reissuance, EPA was the Clean Water Act (CWA) Section 401 certifying authority for the Permit, because the Crow Tribe had not received authorization to implement Section 303(c) of the CWA. EPA has determined § 401 conditions are unnecessary, because EPA has determined the Permit protects Tribal water quality requirements.

12 Miscellaneous

The Crow Tribe does not have Clean Water Act (CWA) Section 401 certifying authority for this Permit.

The effective date of the permit is January 1, 2023, with an expiration date of December 31, 2027.

Permit writer: Amy Maybach, U.S. EPA, (303) 312-7014.

ADDENDUM

AGENCY CONSULTATIONS

On October 21, 2022, the FWS concurred with EPA's preliminary conclusion that the Permit reissuance *"may affect, but is not likely to adversely affect"* the species listed as threatened or endangered in the action area, or their critical habitat.

The Tribe's Tribal Historic Preservation Office did not comment on EPA's preliminary determination that the Permit reissuance will not impact any historic properties.

PUBLIC NOTICE AND RESPONSE TO COMMENTS

The draft Permit and statement of basis were public noticed on EPA's website and the *Big Horn County News* on October 6, 2022. The public notice period was from October 6, 2022 to November 21, 2022.

No public comments were received during this period. The signing of the Permit shall constitute EPA's Section 401 certification.