

Statement of Basis

PERMITTEE: **Eagle Oil and Gas Company**

FACILITY: **Sheldon Dome Field**

PERMIT NO: **WY-0020338**

RESPONSIBLE OFFICIAL: Darrell Lohoeffer, Vice President of Engineering
Eagle Oil and Gas Company
5950 Berkshire Lane, Suite 1100
Dallas, Texas 75225
214-369-1545
dallas@eagleog.com

FACILITY CONTACTS: Kenneth Pearce, Engineer
2525 Kell Blvd., Suite 510
Wichita Falls, Texas 76308
214-323-4524

PERMIT TYPE: Minor Industrial (Renewal)
Indian Country

FACILITY LOCATION NE ¼ NW ¼, Section 22, Township 5 North, Range 2 West
Fremont County, Wyoming

DISCHARGE POINT Outfall 001, Lat. 43.40196° N, Long. 108.98288° W

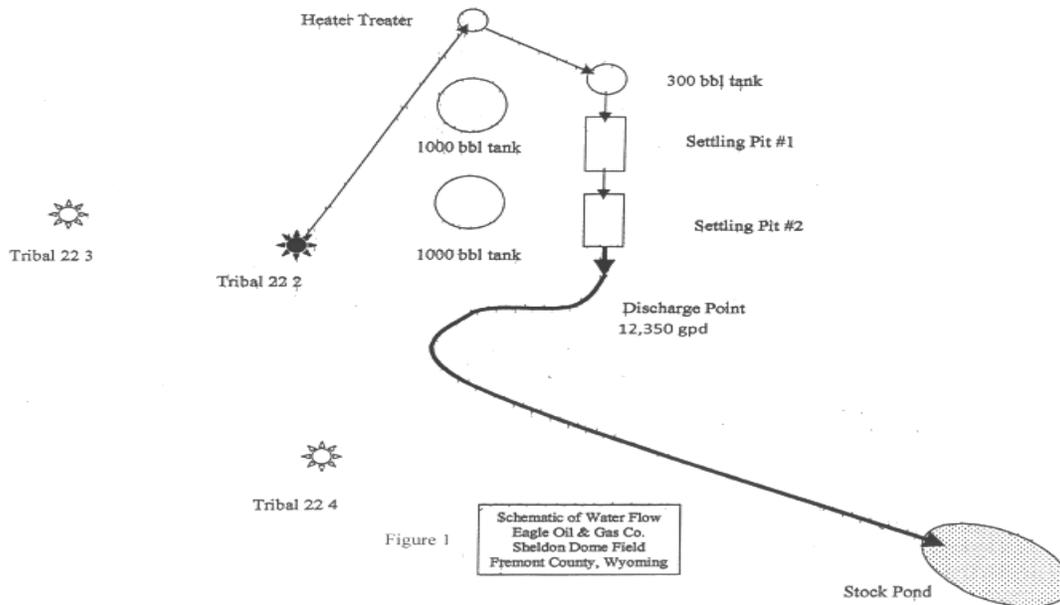
Background Information

The Environmental Protection Agency (EPA) directly implements the Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) on Indian country lands within the State of Wyoming. This facility is located on the Wind River Indian Reservation and is thus in "Indian country" as defined at 18 U.S.C. 1151. The EPA has not approved the Eastern Shoshone or Northern Arapaho Tribes (Tribes) or the State of Wyoming 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 Eagle Oil and Gas Company - Sheldon Dome Field oil production facility located in Fremont County, Wyoming. This facility is within the exterior boundaries of the Wind River Indian Reservation.

This permit is a renewal of NPDES Permit Number WY-0020338, which expired on September 30, 2010, and was administratively extended.

Produced oil, water, and gas are separated in tanks by gravity, heat and emulsion breaking chemicals. Water is discharged through settling ponds where the remaining oil is removed by floatation and skimming prior to discharge for a distance of ½ mile down a draw to a stock pond where it is used by livestock and wildlife. Occasional overflow from the stock pond due to runoff from storms or snowmelt flows down a normally dry wash in a generally south and west direction for a distance of approximately 3 miles to an unnamed ephemeral tributary to Dry (Pasup) Creek. This facility produces about 12,350 gallons per day of produced water. Figure 1 shows a schematic of produced water flow for this facility.



This facility only has one contributing well and produced about 13 barrels per day when in operation during 2010. There are no chemicals being injected down into the well and no stimulation or chemical treatments have been pumped into this well. Since there is no stimulation activity, there are no flowback fluids.

Receiving Waters

The discharge from Outfall 001 will enter to an ephemeral tributary and flows about ½ mile into a stock pond that is used for livestock and wildlife around this facility. The occasional overflow from the pond flows to an unnamed ephemeral tributary to Dry (Pasup) Creek. Dry (Pasup) Creek is located in the Wind River drainage basin. The discharge provides wildlife and stock watering opportunities. Aquatic communities that have developed in this ephemeral drainage, are dependent upon the flow of this produced water.

The Tribes adopted surface water quality requirements that apply to waters within the exterior boundaries of the Wind River Indian Reservation. These water quality requirements were adopted into tribal code as Water Quality Rules and Regulations effective September 25, 2007. The water quality requirements were submitted to the EPA and returned to the Tribes with comments. The tribal water quality requirements have not yet been formally approved by the EPA, however, the EPA is considering them when determining reasonable potential (RP) and evaluating the need for any water quality based effluent limitations (WQBELs) in this renewal permit. EPA relied on CWA Section 301(b)(1)(C) and principles of tribal sovereignty in establishing WQBELs based on these tribally-adopted water quality requirements.

In the Tribes' water quality requirements, designated uses were established in which the Tribes classified this segment of Dry (Pasup) Creek and its tributaries from the confluence with Wind River, upstream to perennial flow, as Class 3B. Class 3B waters are tributary waters including adjacent wetlands that are not known to support fish populations or drinking water supplies and where those uses are not attainable. Class 3B waters are intermittent and ephemeral streams with sufficient hydrology to normally support and sustain communities of aquatic life including invertebrates, amphibians, or other flora and fauna which inhabit waters of the Reservation at some stage of their life cycles. In general, 3B waters are characterized by frequent linear wetland occurrences or impoundments within or adjacent to the stream channel over its entire length. Such characteristics will be a primary indicator used in identifying Class 3B waters. Uses designated on Class 3B waters include aquatic life other than fish, primary contact recreation, wildlife, industrial, agricultural, cultural/traditional and aesthetic uses.

Applicable Technology and Water Quality Considerations

Permit limitations for the Eagle - Sheldon Dome facility are derived through evaluating applicable treatment technology standards, as well as the Tribes' and EPA's and narrative and numeric water quality requirements. 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, the 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 performed to further protect the characteristics and water quality of the receiving stream.

Technology Based Effluent Limitations

Applicable Effluent Guidelines and Standards

Eagle - Sheldon Dome facility 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 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:

- (a) 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).
- (b) Produced water discharges shall not exceed the following daily maximum limitation:
Oil and Grease: 35 mg/L.

Based on beneficial uses documentation and the water management plan submitted by grazing lessees and approved by the Wind River Environmental Quality Commission, the produced water has a use in livestock and wildlife propagation after discharge into the receiving waters. A letter from the Bureau of Indian Affairs (BIA) dated May 31, 2011, also indicates that the produced water meets the above beneficial use requirements. The permit application contained two letters representing two ranchers that documented the beneficial use of the discharged water to their livestock.

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 limitations for total dissolved solids (TDS), chloride, and sulfate were based on similar requirements for livestock protection imposed by the State of Wyoming on oil and gas production facilities outside the Wind River Indian Reservation in the State of Wyoming. For this renewal permit, the EPA reviewed current information from literature and studies to establish limitations which are protective of livestock and wildlife consumption of the produced water discharge.

In the previous permit, emphasis was placed on controlling conductance, chloride, sulfate, and TDS for protection of livestock.

Water Quality for Wyoming Livestock and Wildlife Report

The Water Quality for Wyoming Livestock and Wildlife document 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. The EPA evaluated this document to determine the impacts of these contaminants on the beneficial use of produced water, as contemplated in Subpart E.

For livestock watering, the 3,000 mg/L limit on sulfate in the previous permit may not be adequately protective. In the report, “Water Quality for Wyoming Livestock & Wildlife, A Review of the Literature Pertaining to Health Effects of Inorganic contaminants”, the summary for sulfur contained the following statement: *“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.”*¹

Therefore, the following limit was determined to be protective of the beneficial use:

Pollutant	Acute	Chronic
Sulfate, mg/L	1,800	1,000

In addition, the study recommends that water for cattle consumption contain less than 2.0 mg/L of fluoride and assumes that this concentration should be safe for sheep, cervids, and horses.² Fluoride is addressed below.

Water Quality Based Effluent Limitations

The Tribes developed water quality requirements including numeric criteria and narrative requirements that apply to waters within the exterior boundaries of the Wind River Indian Reservation. These requirements were adopted into tribal code as Water Quality Rules and Regulations effective September 25, 2007. The water quality requirements were submitted to the EPA for review. Comments were returned to WREQC, which is now in the process of reviewing the requirements based on the EPA’s comments. The Tribes’ updated requirements have not been formally submitted to the EPA for approval. EPA relied on CWA Section 301(b)(1)(C) and principles of tribal sovereignty in establishing WQBELs based on these tribally-adopted water quality requirements.

Numeric Water Quality Requirements

To ensure that any potential permit effluent limitations based on the Tribes’ adopted water quality requirements are fully protective of the designated aquatic life use, a comparison of the Tribes’ requirements with the EPA’s published recommended CWA Section 304(a) criteria was performed.

¹ M. F. Raisbeck, S. L. Riker, C. M. Tate, R. Jackson, M. A. Smith, K. J. Reddy and J. R. Zygmunt (2007): Water quality for Wyoming livestock and wildlife. A Review of the Literature Pertaining to Health Effects of Inorganic Contaminants UW AES bulletin B-1183. pp 94; Fluoride Chapter 4, pp 15-19 <http://www.wyomingextension.org/agpubs/pubs/B1183.pdf> (verified March 22, 2011)

² M. F. Raisbeck, S. L. Riker, C. M. Tate, R. Jackson, M. A. Smith, K. J. Reddy and J. R. Zygmunt (2007): Water quality for Wyoming livestock and wildlife. A Review of the Literature Pertaining to Health Effects of Inorganic Contaminants UW AES bulletin B-1183. pp 94; Sulfate Chapter 10, pp 45-48 <http://www.wyomingextension.org/agpubs/pubs/B1183.pdf> (verified March 22, 2011)

In most cases, the Tribes' requirements were equivalent to EPA's published criteria. The tribal exceptions were for cadmium (acute - 19.12 µg/L; chronic - 6.22 µg/L) and silver (acute - 37.44 µg/L), which were higher than the EPA's criteria. Where the two sets of criteria varied, the EPA chose the more stringent of the two. The selected criteria used in evaluation of RP and setting permit effluent limitations are listed in Table 1.

Table 1 – Applicable Water Quality Criteria - expressed as µg/L

Pollutant	More Stringent of EPA Water Quality Criteria and Adopted Wind River Tribal Water Quality Criteria	
	Aquatic Life	
	Acute	Chronic
Aluminum, Total	750	87
Arsenic, Total	340	150
Cadmium, Total	7.7 ⁽¹⁾	0.64 ⁽¹⁾
Chloride	860,000	230,000
Chromium (III)	1,773.3 ⁽¹⁾	230.7 ⁽¹⁾
Chromium (VI), Hexavalent	16	11
Copper, Total	49.6 ⁽¹⁾	29.3 ⁽¹⁾
Iron, Total	--	1,000
Lead, Total	280.8 ⁽¹⁾	10.9 ⁽¹⁾
Manganese, Total	9,033.8	3,105
Mercury, Total	1.4	0.77
Nickel, Total	1,513 ⁽¹⁾	168 ⁽¹⁾
Oil and Grease	Narrative, 10 mg/L	
pH	6.5 to 9.0	
Selenium, Total	--	4.6
Silver, Total	34.9 ⁽¹⁾	--
Sulfide (as H ₂ S)	--	2
Zinc, Total	379 ⁽¹⁾	382 ⁽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.

Narrative Water Quality Requirements

The narrative water quality requirements for the Wind River Indian Reservation were evaluated to determine if permit limits were necessary to protect the characteristics and uses of the receiving stream. The Tribes have adopted narrative requirements for toxic pollutants, settleable solids and floating and suspended solids. The following are the Tribes' narrative water quality requirements:

Section 13 - Toxic Pollutants. Except for those substances referenced in Section 21 (e) and (f) of these regulations, toxic pollutants attributable to or influenced by human activities shall not be present in any Reservation surface water in concentrations or combinations which constitute pollution as defined herein.

Section 15 - Settleable Solids. In all Reservation waters, substances attributable to or influenced by human activities that will settle to form sludge, bank, or bottom deposits shall not be present in quantities which could result in significant aesthetic degradation, significant degradation of habitat for aquatic life or adversely affect public water supplies, agricultural or industrial water use, plant life or wildlife.

Section 16 - Floating and Suspended Solids. In all Reservation surface waters, floating and suspended solids attributable to or influenced by human activities shall not be present in quantities which could result in significant aesthetic degradation, significant degradation of habitat for aquatic life or adversely affect public water supplies, agricultural or industrial water use, plant life or wildlife.

Permit Limitations Based On Narrative Water Quality Requirements

Floating, Suspended and Settleable Solids

Permit requirements for implementing the narrative requirements for discharges of floating solids and oil which causes a visible sheen or deposits on the bank or bottom are included in the renewal permit as effluent limitations:

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.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

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

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. The EPA also reviewed the submitted data from discharge monitoring reports (DMR) for the period of June 2006 to December 2012. A summary of data collected is given in Tables 2-4:

DMR monitoring data from the period June, 2006 to December, 2012 is presented in Table 2:

Table 2 - DMR data – Eagle - Sheldon Dome

Sample Date	Specific Conductivity (µS/cm)	TDS (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Total Radium 226 (pCi/L)	Oil and Grease (mg/L)	pH max (s.u.)	Flow (mgd)
6/30/2006	2,980	2,490	196	992	29.4	7.4	8	0.020
12/31/2006	3,020	2,770	207	1,309	30.5	8.0	7.9	-
6/30/2007	2,840	2,450	194	1,220	28.7	9.4	7.8	0.019
12/31/2007	2,940	2,730	204	1,110	27.5	9.8	7.8	0.015
6/30/2008	2,970	2,350	133	1,030	13.8	8.3	7.8	0.014
12/31/2008	2,710	2,540	125	1,050	15.8	9.9	7.6	0.014
6/30/2009	2,760	2,423	191	1,160	22.5	9.7	7.4	0.013
12/31/2009	2,780	2,480	191	1,130	26.2	9.4	7.6	0.013
6/30/2010	2,740	2,456	188	1,318	23.5	9.4	8.2	0.013
12/31/2010	3,590	2,500	190	595	26.5	5.9	7.6	0.013
6/30/2011	3,110	3,120	259	1,250	39.0	10.0	7.7	0.019
12/31/2011	2,980	2,433	241	1,830	20.8	7.0	7.8	0.015
6/30/2012	2,910	2,370	218	1,860	25.2	6.7	7.9	0.019
12/31/2012	2,840	2,400	208	1,200	7.4	8.2	8.4	0.015
minimum	2,710	2,350	125	595	7.4	5.9	7.4	0.013
average	2,941	2,537	196	1,218	24.1	8.5	7.4-8.4	0.016
maximum	3,590	3,120	259	1,860	39.0	10	8.4	0.020
Limit	7,500	5,000	2,000	3,000	60	10	6.5-8.5	-

There are no permit limit violations during the permit cycle.

Table 3 – Permit Application Data

Parameter	Units	Max	No. of Samples
BOD	mg/L	59	1
COD	mg/L	81	1
TOC	mg/L	6.99	1
TSS	mg/L	4.0	1
Ammonia (as N)	mg/L	0.76	1
Flow	gpd	12,350	1
Temperature (winter)	°C	4	1
Temperature (summer)	°C	21	1
Sulfate	mg/L	1,283	1
Color	mg/L	20	1
Fluoride	mg/L	3.9	1
Nitrogen, Total Organic (as N)	mg/L	0.76	1
Radioactivity Alpha, Total	pCi/L	30.7	1
Radioactivity Beta, Total	pCi/L	70.7	1
Radium, Total	pCi/L	23.5	1
Radium 226	pCi/L	23.5	1
Sulfide (as H ₂ S)	mg/L	42	1
Boron, Total	mg/L	0.88	1
Magnesium, Total	mg/L	81.4	1
Titanium, Total	mg/L	0.006	1
Selenium, Total	mg/L	0.001	1
Benzene	µg/L	510	1
Ethyl benzene	µg/L	200	1
Toluene	µg/L	630	1

Reasonable Potential (RP) Evaluation

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 tribally-approved water quality requirements. 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, hazard screening, 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 4.

Table 4 - RP

Parameter	Aquatic Life Water Quality Criteria		Maximum Reported Effluent Concentration	RP?	
	Acute	Chronic		Acute	Chronic
Chloride, mg/L	860	230	259	No	Yes
Fluoride, mg/L	2 ⁽³⁾	N/A	3.9	Maybe ⁽⁴⁾	Maybe ⁽⁴⁾
Sulfate, mg/L	1,800 ⁽³⁾	1,000 ⁽³⁾	1,860	Yes	Yes
Sulfide (as H ₂ S), mg/L	N/A	0.002	63	N/A	Yes
Aluminum, µg/L	750	87	<50 (ND)	No	No
Arsenic, µg/L	340	150	39	No	No
Cadmium, µg/L	7.7 ⁽²⁾	0.64 ⁽²⁾	<1 (ND)	No	Maybe ⁽⁴⁾
Chromium (III), µg/L	1,773 ⁽²⁾	231 ⁽²⁾	<5 (ND)	No	No
Copper, µg/L	49.6 ⁽²⁾	29.3 ⁽²⁾	<5 (ND)	No	No
Iron, µg/L	N/A	1,000	110	-	No
Lead, µg/L	280.9 ⁽²⁾	10.9 ⁽²⁾	<2 (ND)	No	No
Manganese, µg/L	9,033 ⁽²⁾	3,105 ⁽²⁾	30	No	No
Mercury, µg/L	1.40	0.77	<50 (ND) ⁽¹⁾	Maybe ⁽⁴⁾	Maybe ⁽⁴⁾
Nickel, µg/L	1,513 ⁽²⁾	168 ⁽²⁾	<5 (ND)	No	No
Selenium, µg/L	N/A	4.6	<1 (ND)	No	No
Silver, µg/L	34.9	N/A	<5 (ND)	No	No
Zinc, µg/L	379 ⁽²⁾	382 ⁽²⁾	11	No	No

Note: ND Not detected at the reporting limit.

- (1) The lab note states that “the client requested ultra low level Mercury, but they were only sent a regular metals bottle. Per the project manager, analyze for the lowest level mercury we can reach.” This sample was analyzed with the detection limit of 50µg/L.
- (2) 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.
- (3) Criteria limit is not an aquatic life water quality limit, but rather a recommended limit for livestock and wildlife propagation.
- (4) Insufficient data to confidently determine existence of RP. Additional data is necessary.

The results of the quantitative evaluation identified chloride, sulfate, sulfide (as H₂S), fluoride, cadmium and mercury as having RP to cause or contribute to exceedances of the water quality criteria. For fluoride, cadmium and mercury, insufficient quantitative data is available to adequately assess RP to exceed the numeric criteria.

To confidently evaluate quantitatively the RP of a pollutant to impair the receiving body of water in which the facility discharges, a sufficient quantity of data of known quality to assess variability must be available.

Qualitative RP Analysis

In cases where the permittee reported a pollutant present at concentrations far in excess of the applicable water quality criterion and there are only one or two data points available, the EPA is proposing to add effluent limitations in order to protect the designated uses and applicable criteria for aquatic life in the renewal permit. In this case, the EPA believes further monitoring to support a RP analysis is unnecessary. In some cases, however, where sampling shows small exceedances of the applicable water quality criterion, but there is insufficient monitoring data to support a RP determination, EPA is not proposing to add an effluent limit and is instead imposing monitoring requirements.

Sulfide as H₂S

Sulfide can be toxic to aquatic life. The water quality criterion for sulfide (as H₂S) is 2 µg/L (chronic) to protect aquatic life. An evaluation of the data provided by the permittee indicates a significant exceedance of the criterion. An effluent limit, therefore, has been included in this permit.

Fluoride, Cadmium

The fluoride and cadmium data above indicates that RP may be present. Additional qualitative review of the limited data for fluoride and cadmium has raised questions about the finding of RP through quantitative methods. For example, only one data point was provided for both fluoride and cadmium. Also, the reported result approximates the criteria value (fluoride) or an analytical method was used that provided a reporting level at or above the criteria value (cadmium). For these pollutants, the data provided is insufficient to confidently determine the potential for these pollutants to impact the receiving streams in which the facility discharges. Effluent limitations will not be established for fluoride or cadmium at this time, however, monitoring will be required using sufficiently sensitive analytical methods in order to collect adequate data to quantitatively assess RP during the next permit renewal.

Mercury

Although the mercury level did not exceed the aquatic life water quality criterion, an analytical method was used that provided a reporting level at or above the criteria value and only one data point was provided. Therefore, additional monitoring using clean methods is required in order to compile a more complete data set for future evaluation. Also, the reissued permit includes a trigger level established at the chronic water quality criterion of 0.77 µg/L and a requirement to develop and implement a mercury minimization plan if that trigger level is detected.

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 analyte is present in the discharge. The data presented in Table 3 indicates the effluent contains measurable concentrations of benzene, ethyl benzene, and toluene.

The data were evaluated with respect to EPA and Tribal 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 the criteria in Table 5. Only benzene was identified at concentrations which exceeded the recommended criteria for human health protection and the MCL. Since the Tribes have 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 5 - Effluent Organic Compounds Detected and Water Quality Criteria Comparison

<u>Parameter</u>	<u>Effluent Concentration (µg/L)</u>	<u>Water Quality Criteria (Human Health) (µg/L)</u>		<u>Drinking Water MCL (µg/L)</u>
		<u>Water + Organism</u>	<u>Organism only</u>	
Benzene	510	2.2	51	5
Ethyl Benzene	200	530	2,100	700
Toluene	630	1,300	15,000	1,000

Although no effluent limitations were established for benzene in the renewal 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.

Other Effluent Limitations

The daily maximum limitations for Total Radium 226 of 60 pCi/L, Specific conductance of 7500 µS/cm and total dissolved solids of 5000 mg/L have been retained in this renewal permit and are based on previous permit limitations.

pH limitations have been revised from a range of 6.5 - 8.5 to a range of 6.5 - 9.0 based on tribal water quality requirements for aquatic life protection. The basis for the previous maximum range value for pH of 8.5 could not be verified from review of the permit record and therefore the limit has been revised for this renewal permit.

Additional Toxics Monitoring Requirements

Included in the permit is additional effluent monitoring to screen for hazardous/toxic constituents (Permit Part 1.3.4.). The requirement to monitor for these pollutants of concern is to develop a dataset to evaluate the reasonable potential for these pollutants to impact the receiving streams into which the facility discharges and to comply with the tribal narrative water quality requirements for toxic pollutants.

Whole Effluent Toxicity (WET) (Permit Part 1.3.6.)

As a means to demonstrate compliance with the tribal narrative requirements for toxic pollutants, WET has been included in this permit. In the permit application, there were two reported failures for WET tests, one with the *Pimephales promelas* and the other with *Ceriodaphnia dubia* in September, 2002. As a result, RP is present for acute WET and a limit is will be placed in the permit three years after the effective date of the permit. WET monitoring requirements that are representative of the discharge effluent are included in this permit.

For this permit, acute testing will be required on a quarterly basis after the effective date of the permit until the permittee demonstrates no test failures for either species (*Daphnia magna*, *Pimephales promelas*) tested for four consecutive quarters. Upon successful completion of four consecutive quarterly tests demonstrating no acute toxicity in the discharge, annual monitoring shall be required.

For the purposes 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 naturally occurring high TDS levels within the produced water from the wells.

If acute toxicity occurs in a test, e.g. $LC_{50} < 100\%$ effluent, the permittee will be required to:

- (1) Notify the EPA Regional WET Coordinator within 48 hrs 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 EPA Regional WET Coordinator 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).

If acute toxicity occurs in the two week re-test, the permittee will be required to:

Immediately begin testing once a month until further notified by the EPA Regional WET Coordinator. Accelerated monthly testing is only required for the species that failed the initial and second tests.

Follow conditions for Toxicity Identification/Toxicity Reduction Evaluation (Permit Part 1.3.7) In addition to the accelerated monitoring, the permittee shall perform a toxicity identification evaluation/toxicity reduction evaluation (TIE/TRE) as to establish the cause of the toxicity, locate the source(s) of the toxicity, and develop control of, or treatment for the toxicity.

The permittee will be required to submit a TRE Plan within 30 or 45 days of learning of the second test failure depending on whether the toxicant is known or unknown at that time.

The TRE Plan may be reviewed by EPA to ensure its adequacy for addressing toxicity in the discharge. EPA may provide comments to the permittee on the TRE Plan and may request that the Plan include additional or specific monitoring, etc. to ensure that all potential sources of toxicity are addressed during the evaluation.

The permittee will be required to implement the provisions of the Plan within 75 or 90 days after learning of the second test failure depending on whether the toxicant is known or unknown at that time.

EPA has provided a summary of useful reference materials in Permit Part 1.3.7.2.1.1 for assistance in developing a TRE Plan should toxicity occur during the term of the permit.

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:

Interim Effluent Limitations

Table 6 - **Effective immediately after permit issuance and expiring three (3) years after effective date of this permit**, the quality of effluent discharged by the facility shall, as a minimum, meet the limitations as set forth below:

Effluent Characteristic	Effluent Limitation		Basis for Limitation <u>b/</u>
	30-Day Average <u>a/</u>	Daily Maximum <u>a/</u>	
Specific Conductance, $\mu\text{S}/\text{cm}$	N/A	7,500	ELPP
Total Dissolved Solids, mg/L	N/A	5,000	ELPP
Chloride, mg/L	N/A	2,000	ELPP
Sulfate, mg/L	1,000	1,800	RCLW
Total Radium 226, pCi/l	N/A	60	ELPP
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, WQR
The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.			WQR
There shall be no discharge of floating solids or visible foam in other than trace amounts			ELPP, WQR

a/ See Permit Part 1.1., for definition of terms.

b/ ELPP = Effluent limitations in previous permit; WQR = water quality requirements adopted by the Tribes for the Wind River Indian Reservation; 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.

Final Effluent Limitations

Table 7 - **Effective three (3) years after the effective date of this permit and lasting through the life of this permit**, the quality of effluent discharged by the facility shall, as a minimum, meet the limitations as set forth below:

Effluent Characteristic	Effluent Limitation		Basis for Limitation b/
	30-Day Average a/	Daily Maximum a/	
Specific Conductance, $\mu\text{S}/\text{cm}$	N/A	7,500	ELPP
Total Dissolved Solids, mg/L	N/A	5,000	ELPP
Chloride, mg/L	230	N/A	WQR
Sulfate, mg/L	1,000	1,800	RCLW
Sulfide (as H_2S), mg/L	0.002	N/A	WQR
Total Radium 226, pCi/l	N/A	60	ELPP
Whole Effluent Toxicity, Acute	LC ₅₀ > 100%		WQR
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, WQR
The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.			WQR
There shall be no discharge of floating solids or visible foam in other than trace amounts			ELPP, WQR

a/ See Permit Part 1.1., for definition of terms.

b/ ELPP = Effluent limitations in previous permit; WQR = water quality requirements adopted by the Tribes for the Wind River Indian Reservation; 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.

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 Form (EPA No. 3320-1) that no discharge or overflow occurred.

Table 8 - Effective immediately and lasting through the effective term of this permit

Effluent Characteristic	Frequency	Sample/Monitoring Type <u>a/</u>
Total Flow, MGD <u>b/</u>	Monthly	Instantaneous
pH, std units	Monthly	Grab
Specific Conductance, $\mu\text{S/cm}$	Monthly	Grab
Oil and Grease, mg/L <u>c/</u>	Weekly	Visual
Sulfide (as H_2S), mg/L <u>d/</u>	Quarterly	Grab
Sulfate, mg/L	Quarterly	Grab
Chloride, mg/L	Quarterly	Grab
Total Radium 226, pCi/L	Quarterly	Grab
Total Dissolved Solids, mg/L	Semi-Annually	Grab
Mercury, Total, $\mu\text{g/L}$ <u>e/</u>	Three times after effective date of permit	Grab
Whole Effluent Toxicity, Acute (Permit Part 1.3.6.)	Quarterly <u>f/</u>	Grab
Toxic Pollutants Screen (Permit Part 1.3.4.)	Three times after effective date of permit	Grab

a/ See Permit Part 1.1., 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/ 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.

d/ The analysis for sulfide (as H_2S) shall be done with an approved procedure that has a method detection level of no greater than 0.10 mg/L (100 $\mu\text{g/L}$). In the calculation of average sulfide (as H_2S) 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.

- e/ Monitoring periods shall be during the 1st, 3rd and 5th years after the effective date of this permit. Based on current approved analytical mercury method, Method 1631, Revision E, the method detection limit (MDL) for mercury is 0.0002 µg/L. If the mercury trigger level of 0.77 µg/L is detected during the life of the permit, the permittee is required to develop and implement the Mercury Minimization Plan (MMP), as described further below in this Statement of Basis.
- f/ At a minimum, quarterly monitoring shall be conducted until the completion of four consecutive quarterly tests demonstrating no acute toxicity is present in the discharge for either test species. Thereafter, monitoring shall be conducted at least annually for the remainder of the term of this permit. See Permit Part 1.3.6.

Compliance Schedules (Permit Part 1.3.3.)

The effluent limitations for chloride and sulfide (as H₂S) have become either more restrictive or are new with this permit renewal. In order to allow the permittee the opportunity to evaluate the measures necessary to meet these new limitations, the permittee shall comply with the schedule outlined in Permit Part 1.3.3. The compliance schedule for sulfide (as H₂S) shall be 36 months in duration. Based on provided data, chloride limits can be met, therefore, a compliance schedule is not necessary.

The sulfate limit shall be met immediately since this limit is a technology based limit under 40 CFR Part 435, Subpart E. Under the CWA and EPA's regulations, compliance schedules may not be used for technology-based effluent limits.

Toxic Pollutants Screen (Permit Part 1.3.4.)

This permit requires the permittee to monitor for the constituents listed below in the toxic pollutants screen three times during the life of the permit. One monitoring period will be during the 1st year after the effective date of this permit and the second during the 3rd year after the effective date of this permit. Reporting of each of the first two screening datasets shall be submitted to the permit issuing authority, at the time of the DMR submittal for that reporting period in which the screening occurred. A third monitoring will be required as part of the application documentation for the renewal of this permit. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

- All Volatile Organic Compounds listed in 40 CFR Part 122, Appendix D, Table II.
- All Base/Neutral and Acid Organic Compounds listed in 40 CFR Part 122, Appendix D, Table II.
- All metals listed in 40 CFR Part 122, Appendix D, Table III, except mercury which is included in the regular self-monitoring.
- Fluoride as listed in 40 CFR Part 122, Appendix D, Table IV.

Method Detection Limits (Permit Part 1.3.5.)

Monitoring methods must be sufficiently sensitive to meet the Method Detection Limits specified in Table 9:

Table 9 - 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	5 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
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 and Base/Neutral Organic Compounds	10 µg/L
Chemical Oxygen Demand	3 mg/L

Mercury Minimization Plan (MMP) (Permit Part 1.3.8.)

Section 301(a) of the CWA prohibits the discharge of any pollutant, including mercury, from a point source into waters of the United States except in compliance with Section 402 of the CWA. CWA Section 402 establishes the NPDES program, under which the EPA are authorized to administer the program issue permits that allow the discharge of pollutants into waters of the United States. These permits must contain (1) technology-based effluent limitations, which represent the degree of control that can be achieved by point sources using various levels of pollution control technology and (2) WQBELs, when necessary to ensure that the receiving waters achieve applicable water quality requirements.

Most WQBELs are expressed as numeric limits on the amounts of specified pollutants that may be discharged. However, WQBELs may also be expressed in narrative form such as Best Management Practices (BMPs) or pollutant minimization measures when it is infeasible to calculate a numeric limit (40 CFR § 122.44(k)(3)). In addition, BMPs may be imposed in the form of NPDES permit conditions to supplement numeric effluent limitations when the permitting authority determines that such requirements are necessary to carry out the purposes and intent of the CWA (40 CFR § 122.44(k)(4)).

On January 8, 2001, the EPA announced the availability of its recommended CWA Section 304(a) water quality criterion for methylmercury. This water quality criterion, 0.3 milligram (mg) methylmercury per kilogram (kg) fish tissue wet weight, describes the concentration of methylmercury in freshwater and estuarine fish and shellfish tissue that should not be exceeded. The EPA recommended that the criterion be used as guidance by states, territories, and authorized tribes in establishing or updating water quality standards for waters of the United States. The EPA completed the Guidance for implementing the January 2001 Methylmercury Water Quality Criterion in April 2010.³

According to the Methylmercury Guidance, where a water column translation is not available and the permit writer determines that a numeric limit is infeasible to calculate, the permit writer should include the following permit conditions:

1. The reissued permit will include a trigger level established at the chronic water quality criteria of 0.77 µg/L and a requirement to develop and implement a Mercury Minimization Plan (MMP) if that trigger level is detected;
2. Require the permittee to implement a MMP tailored to the facility's potential to discharge mercury. This MMP may be used as a trigger level, reduction goal or used to supplement an enforceable numeric limit to further manage mercury discharges;
3. Require effluent monitoring using a sufficiently sensitive EPA-approved method to determine if the MMP is effective. (EPA Clean Sampling Method 1669 and Analytical Method 1631); and
4. Include a reopener clause to modify the permit conditions if the MMP is not found to be effective or if a water column of the fish tissue criterion is developed.

The permittee is required in the reissued permit to develop an MMP tailored to the facility's potential to discharge mercury. At a minimum, the MMP shall include the following:

- Evaluation of existing best management plans or spill prevention and containment control plans;
- Identification and evaluation of current and potential mercury sources;

³ United States Environmental Protection Agency, Office of Science and Technology (April 2010): Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion – Final, <http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/pollutants/methylmercury/upload/mercury2010.pdf>

- Monitoring to confirm current or potential mercury sources;
- Identification of potential methods for reducing or eliminating mercury, including material substitution, material recovery, spill control and collection, waste recycling, process modifications, good housekeeping and disposal practices;
- Implementation of appropriate minimization measures identified in the MMP; and
- Effluent monitoring using sufficiently sensitive analytical methods to verify the effectiveness of the MMP.

Chemical Inventory Reporting Requirement (Permit Part 1.3.9)

In response to public comment, the following chemical inventory requirement has been added:

The Permittee shall maintain an inventory of the quantities and concentrations of the specific chemicals used to formulate well treatment and workover fluids. If there is a discharge of these fluids, the chemical formulation, concentrations and discharge volumes of the fluids shall be submitted with the DMR. For discharges of well treatment and workover fluids, the type of operation that generated the discharge fluids shall also be reported.

Reporting Requirements

Effluent monitoring results obtained during the previous six (6) months shall be summarized and reported on **one** Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28 day of the month following the reporting period. If no discharge occurs during the reporting period, “no discharge” shall be reported.

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. Federally listed threatened, endangered and candidate species found in Fremont County, Wyoming include:

<u>Species</u>	<u>Status</u>
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	R
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	C
Greater Sage Grouse (<i>Centrocercus urophasianus</i>)	C
Blowout Penstemon (<i>Penstemon haydenii</i>)	E
Fremont County Rockcress (<i>Boechera pusilla</i>)	C
Ute Ladies Tresses (<i>Spiranthes diluvialis</i>)	T
Desert Yellowhead (<i>Yermo xanthocephalus</i>)	T
Grizzly Bear (<i>Ursus arctos horribillis</i>)	T
Black-footed Ferret (<i>Mustela nigripes</i>)	E
Gray Wolf (<i>Canis lupus</i>)	R
Canada Lynx (<i>Lynx canadensis</i>)	T
North American Wolverine (<i>Gulo gulo luscus</i>)	C

T Threatened	R Recovery
E Endangered	C Candidate

It does not appear that discharges from the Eagle Oil and Gas Company - Sheldon Dome Field facility will result in significant impact to any endangered species or critical habitats. This permit renewal is not likely to adversely affect any of the species listed by the U. S. Fish and Wildlife Service under the Endangered Species or critical habitats of the tributary leading to Dry (Pasup) Creek.

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 EPA has evaluated its planned reissuance of the NPDES permit for Eagle Oil and Gas Company – Sheldon Dome Field to assess this action’s potential effects on any listed or eligible historic properties or cultural resources. This correspondence is typically conducted with the Tribal Historic Preservation Office (THPO). The EPA does not anticipate any impacts on listed/eligible historic or cultural properties because this permit is a renewal and will not be associated with any new ground disturbances or changes to the volume or point of discharge. During the public comment period, the EPA notified the Tribal Historic Preservation Offices (THPOs) of the Eastern Shoshone and Northern Arapaho Tribes of the planned issuance of this NPDES permit and requested their input on potential effects on historic properties and EPA’s preliminary determination in this regard. No comments were received.

Miscellaneous

The effective date and the expiration date of the permit will be determined at the time of permit issuance. The intention is to renew the permit for a period of approximately five years, but not to exceed 5 years.

Permit drafted by Staff, 8P-W-WW

Permit reviewed by Robert Shankland, SEE, 8P-W-WW

Permit reviewed by Bruce Kent, Senior Environmental Scientist, 8P-W-WW

Addendum to the Statement of Basis and Permit

The proposed permit was public noticed on June 10, 2013. Comments were received from the permittee and the general public. The comments received and the responses to those comments are given in separate documents titled “Response to General Comments on Permits WY-0020338, WY-0024953, WY-0024945, WY-0025232, WY-0025607” and “Response to Comments Specific to Eagle Oil and Gas Sheldon Dome WY-0020338.” The changes listed below were made as a result of comments received. The changes will not require going back to public notice.

Changes to Statement of Basis

1. Pages 2-3: The definition of a 3B stream classification has been corrected.
2. Page 4: The statement “The limits of 7,500 $\mu\text{S}/\text{cm}$ for conductance, 2,000 mg/L for chloride, 3,000 mg/L for sulfate, and 5,000 mg/L for TDS have been in effect since the facility has been covered under an NPDES permit.” was deleted.
3. Page 6, Table 1; Page 9, Table 4; Page 10, Sulfide; Page 14, Table 7; Page 15, Table 8 and footnote d/; and Page 16, Compliance Schedule: The clarification of the pollutant sulfide “as H_2S ” in lieu of Total Sulfide has been added.
4. Page 12, Subnote (3): Changed “Conduct an additional test...” to read “Initiate an additional test...”.
5. Page 17: A section heading “Method Detection Limits (Permit Part 1.3.5.) was added to provide a physical document separation and clarification from the “Toxic Pollutants Screen” requirements. This is intended to provide detection limits for those compounds/elements should they be required to be monitored.
6. Page 19: A new section “Chemical Inventory Reporting Requirement (Permit Part 1.3.9)” has been added.

Changes to the Permit

1. Page 2, Table of Contents: Part 1.3.5. – Method Detection Limits was added. All subsequent Part numbering was adjusted accordingly.
2. Page 2, Table of Contents: Part 1.3.9. – Inventory Reporting Requirement was added.
3. Page 5, Part 1.3.1.3. Table; Page 6, Part 1.3.2. Table and footnote d/; Page 7, Compliance Schedule: For the pollutant sulfide, “as H_2S ” was added in lieu of Total Sulfide.
4. Page 8, Method Detection Limits Part 1.3.5.: The new Part heading was added.

5. Page 15, Part 3.2, Penalties for Violations of Permit Conditions: This Part was updated to read “... February 13, 2004 (69 Fed. Reg. 7121-7127) and December 11, 2008 (73 Fed. Reg. 75340-75346). On November 6, 2013 (78 Fed. Reg. 66643-66648) EPA once again adjusted its civil monetary penalties. The civil and criminal penalties, as of December 6, 2013, for violations of the CWA (including permit conditions) are given below:”
6. Page 16, Part 3.2.5.: This Part was updated to read “...Where an administrative enforcement action is brought for a Class II civil penalty, the assessed penalty may not exceed \$16,000 per day for each day during which the violation continues, with the maximum amount not to exceed \$187,500.”

In addition to the above changes, EPA also made other minor editorial clarifications to the permit and the statement of basis documents.

Revised by EPA Staff February 24, 2015