



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8**

1595 Wynkoop Street  
Denver, CO 80202-1129  
Phone 800-227-8917  
[www.epa.gov/region08](http://www.epa.gov/region08)

March 12, 2015

Ref: 8P-W-WW

**CERTIFIED MAIL**  
**RETURN RECEIPT REQUESTED**

Thomas Faulkner, P.E., Senior Petroleum Engineer  
Phoenix Production Company  
P.O. Box 2653  
Cody, Wyoming 82414

Re: NPDES Permit No. WY-0024953 Sheldon Dome Field

Dear Mr. Faulkner:

Enclosed is the NPDES permit WY-0024953, the Statement of Basis and the response to comments for the Phoenix Production Company – Sheldon Dome Field. This permit shall become effective upon the date specified unless, within thirty (30) days following the date of your receipt of this permit, a petition is received by the Environmental Appeals Board (EAB) to review any condition of the permit pursuant to the provisions of 40 CFR §124.19. If you decide to file a petition for review with the EAB, the petition must contain all information required by 40 CFR §124.19(a). Additional information about EAB requirements is available at the EAB's web site: <http://epa.gov/eab/>.

A petition submitted through the U. S. Postal Service (except by Express Mail) must be addressed to:

Clerk of the Board  
U.S. Environmental Protection Agency  
Environmental Appeals Board  
1200 Pennsylvania Avenue, NW  
Mail Code MC 1103M  
Washington, D.C. 20460-0001

All documents that you hand-carry in person or that you arrange to have delivered by courier, Express Mail, or a non-U.S. Postal Service carrier (such as Federal Express), must be delivered to:

Clerk of the Board  
U.S. Environmental Protection Agency  
Environmental Appeals Board  
1201 Constitution Avenue, NW  
WJC East, Room 3334  
Washington, D.C. 20004

The preprinted Discharge Monitoring Report (DMR) forms for the enclosed permit are being processed and will be mailed to you before the due date of the first DMR. Your facility should use these forms to report all discharge data in your permit.

If you have any questions regarding monitoring requirements, schedules and permit limitations, please direct them to Colleen Rathbone at (303) 312-6133. If you have not received your DMR forms prior to the end of the first monitoring period, please contact William Kennedy at (303) 312-6285.

Sincerely,



Callie A. Videtich  
Acting Assistant Regional Administrator  
Office of Partnerships and Regulatory Assistance

Enclosure

1. NPDES Discharge Permit
2. Statement of Basis
3. Response to Comments

cc: Dean Goggles, Chairman, Northern Arapaho Tribe  
Darwin St. Clair, Jr., Chairman, Eastern Shoshone Tribe

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8  
1595 WYNKOOP STREET  
DENVER, COLORADO 80202-1129

AUTHORIZATION TO DISCHARGE UNDER THE  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. § 1251 et seq; "the Act"),

**the Phoenix Production Company,**

is authorized to discharge from its **Sheldon Dome Field** wastewater treatment facility located in NE 1/4 SW 1/4 of Section 15, Township 5 North, Range 2 West, latitude 43.40820° N and longitude 108.98613° W, in Fremont County, Wyoming

to an unnamed ephemeral tributary of Pasup (Dry) Creek, which is tributary to the Wind River,

in accordance with discharge point(s), effluent limitations, monitoring requirements and other conditions set forth herein. Authorization for discharge is limited to those outfalls specifically listed in the permit.

This permit shall become effective *May 1, 2015*

This permit and the authorization to discharge shall expire at midnight, *March 31, 2020*

Signed this *12* day of *March 2015*



Callie A Videtich  
Acting Assistant Regional Administrator  
Office of Partnerships and Regulatory Assistance

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## 1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

### 1.1. Definitions.

The *30-day (and monthly) average*, other than for microbiological organisms (e.g., bacteria, viruses, etc.), is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. Geometric means shall be calculated for microbiological organisms unless specified otherwise in the permit. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.

The *7-day (and weekly) average*, other than for microbiological organisms (e.g., bacteria, viruses, etc.), is the arithmetic mean of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. Geometric means shall be calculated for microbiological organisms unless specified otherwise in the permit. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week, which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains the Saturday.

*Daily Maximum (Daily Max.)* is the maximum measured value for a pollutant discharged during a calendar day or any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with daily maximum limitations expressed in units of mass (e.g., kilograms, pounds), the daily maximum is calculated as the total mass of pollutant discharged over the calendar day or representative 24-hour period. For pollutants with limitations expressed in other units of measurement (e.g., milligrams/liter, parts per billion), the daily maximum is calculated as the average of all measurements of the pollutant over the calendar day or representative 24-hour period. If only one measurement or sample is taken during a calendar day or representative 24-hour period, the single measured value for a pollutant will be considered the daily maximum measurement for that calendar day or representative 24-hour period.

*Daily Minimum (Daily Min.)* is the minimum value allowable in any single sample or instantaneous measurement collected during the course of a day.

*Grab sample*, for monitoring requirements, is defined as a single "dip and take" sample collected at a representative point in the discharge stream.

*Instantaneous measurement*, for monitoring requirements, is defined as a single reading, observation, or measurement.

*Composite samples* shall be flow proportioned. The composite sample shall, at a minimum, contain at least four (4) samples collected over the compositing period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours, nor more than twenty-four (24) hours. Acceptable methods for the preparation of composite samples are as follows:

- a. Constant time interval between samples, sample volume proportional to flow rate at the time of sampling;
- b. Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time of the first sample was collected may be used;
- c. Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every "X" gallons of flow); and,
- d. Continuous collection of sample with sample collection rate proportional to flow rate.

*Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

*Upset* means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

*Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

*Director* means the Regional Administrator of the EPA Region 8 or an authorized representative.

*EPA* means the United States Environmental Protection Agency.

*Storm Water* means storm water runoff, snow melt runoff, and surface runoff and drainage.

*CWA* means the Clean Water Act (formerly referred to as either the Federal Water Pollution Act or the Federal Water Pollution Control Act Amendments of 1972), Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, Pub. L. 97-117, and Pub. L. 100-4. In this permit the CWA may be referred to as “the Act”.

*Whole Effluent Toxicity (WET)* is the total toxic effect of an effluent measured directly with a toxicity test. Acute toxicity occurs when 50 percent or more mortality is observed for either species (see Part 1.3.6) at any effluent concentration. Mortality in the control must simultaneously be 10 percent or less for the effluent results to be considered valid.

- 1.2. Description of Discharge Point(s). The authorization to discharge provided under this permit is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under an NPDES permit is a violation of the CWA and could subject the person(s) responsible for such discharge to penalties under Section 309 of the CWA.

Outfall

Serial Number(s)

Description of Discharge Point(s)

001

Any discharge from the skim pond to an unnamed, ephemeral tributary to Pasup (Dry) Creek  
(Latitude 43.40820° N and Longitude 108.98613° W).

1.3. Specific Limitations and Self-Monitoring Requirements.1.3.1. Effluent Limitations - Outfall 001.

## 1.3.1.1. General Effluent Limitations:

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 sand).

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

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

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

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

Parameter	Effluent Limitation	
	30-Day Average <u>a/</u>	Daily Maximum <u>a/</u>
Specific Conductance, $\mu\text{S}/\text{cm}$	N/A	7,500
Total Dissolved Solids, mg/L	N/A	5,000
Chloride, mg/L	230	860
Sulfate, mg/L	1,000	1,800
Sulfide (as $\text{H}_2\text{S}$ ), mg/L	0.002	N/A
Total Radium 226, pCi/L	N/A	60
Zinc, $\mu\text{g}/\text{L}$	380	380
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.		
The pH of the discharge shall not be less than 6.5 or greater than 9.0 at any time.		
There shall be no discharge of floating solids or visible foam in other than trace amounts.		

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

1.3.2. Self-Monitoring Requirements - Outfall 001.

**Effective immediately and lasting through the effective term of this permit.** 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.

Parameter	Frequency	Sample/Monitoring Type <u>a/</u>
Total Flow, MGD <u>b/</u>	Monthly	Instantaneous
Specific Conductance, $\mu\text{S}/\text{cm}$	Monthly	Grab
pH, std units	Monthly	Grab
Oil and Grease, mg/L <u>c/</u>	Weekly	Visual
Sulfide (as $\text{H}_2\text{S}$ ), mg/L <u>d/</u>	Quarterly	Grab
Chloride, mg/L	Quarterly	Grab
Sulfate, mg/L	Quarterly	Grab
Total Radium 226, pCi/L	Quarterly	Grab
Total Dissolved Solids, mg/L	Semi-Annually	Grab
Zinc, ug/L	Quarterly	Grab
Mercury, Total, $\mu\text{g}/\text{L}$ <u>e/</u>	Three times after effective date of permit	Grab
Whole Effluent Toxicity, Acute (see Part 1.3.6.)	Quarterly <u>f/</u>	Grab
Toxic Pollutants Screen (see 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  $\text{H}_2\text{S}$ ) shall be done with an approved procedure that has a method detection level of no greater than 0.10 mg/L (100 ug/L). In the calculation of average sulfide (as  $\text{H}_2\text{S}$ ) 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 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> 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  $\mu\text{g}/\text{L}$ . If the mercury trigger level of 0.77  $\mu\text{g}/\text{L}$  is exceeded during the life of the permit, the permittee is required to develop and implement the Mercury Minimization Plan (MMP), as described in Part 1.3.8.

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 Part 1.3.6.



### 1.3.3. Compliance Schedule.

The effluent limitations for chloride, zinc and sulfide (as H<sub>2</sub>S) have become either more restrictive or 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 following schedule:

#### **Chloride, Sulfide (as H<sub>2</sub>S), and Zinc**

For the new daily maximum and monthly average effluent limitations for chloride, sulfide (as H<sub>2</sub>S) and zinc, a three (3) year compliance schedule with the following requirements:

The permittee shall achieve compliance with the effluent limitations for chloride, sulfide (as H<sub>2</sub>S) and zinc in Part 1.3.1 of this permit in accordance with the following schedule.

The permittee shall submit the following to the permit issuing authority:

- a. An outline of the measures to be taken to achieve compliance with the effluent limitations for chloride and sulfide (as H<sub>2</sub>S) in Part 1.3.1 of this permit; and
- b. A schedule for implementing the measures described in Part a above. The schedule should include, but does not need to be limited to, milestones for planning, design, bidding, construction, etc. of the necessary site improvements.

The measures and implementation schedule described above shall be submitted no later than **12 months after the effective date of this permit.**

The permittee shall submit to the permit issuing authority a report reflecting the progress made towards achieving the milestones outlined in the schedule in Part b above by no later than **18 months after the effective date of this permit.**

The permittee shall begin implementing the measures outlined in Part a above by no later than **24 months after the effective date of this permit.**

The permittee shall submit to the permit issuing authority a report reflecting the progress made towards achieving the milestones outlined in the schedule in Part b above by no later than **30 months after the effective date of this permit.**

The permittee shall achieve compliance with the effluent limitations for chloride and sulfide (as H<sub>2</sub>S) in Part 1.3.1 of this permit by no later than **36 months after the effective date of this permit.**

Reports of compliance or noncompliance with, or any progress reports, on interim and final requirements contained in this Compliance Schedule shall be submitted no later than 14 days following each schedule date described above. If noncompliance is being reported, the reason for noncompliance shall be reported and the expected date when compliance will be achieved shall be given. The letter shall include the certification statement given in Part 4.7.4 of this permit and the letter shall be signed by a principal executive officer. All deliverables required in this section shall be submitted to the EPA at the address listed in Part 2.4.

- 1.3.4. Toxic Pollutants Screen. 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 1<sup>st</sup> year after the effective date of this permit and the second during the 3<sup>rd</sup> 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 and zinc which are included in the regular self-monitoring (Part 1.3.2).

Fluoride and iron as listed in 40 CFR Part 122, Appendix D, Table IV.

1.3.5. Method Detection Limits.

Monitoring methods must be sufficiently sensitive to meet the Method Detection Limits specified in the following table:

<b>Parameter</b>	<b>Required Detection Limits and Required Units</b>
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
Iron, Total Recoverable	50 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 <sub>3</sub>
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

- 1.3.6. Acute Whole Effluent Toxicity Monitoring. At least once each calendar quarter after the effective date of the permit, the permittee shall conduct acute static-renewal toxicity tests on a grab sample of the produced water discharge from Outfall 001. 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. Quarterly monitoring shall be done on a one (1) week progression (i.e. if the first sample is in the first week of the quarter, during the next sampling period, sampling shall occur in the second week of the quarter, etc.). Annual monitoring shall be on a two (2) month progression (i.e. if the first sample is in January, during the next sampling period, sampling shall occur in March, etc). Regular quarterly/annual samples shall be collected and tested during the life of the permit term. Samples must be chilled to 0° to 6°C.

The static-renewal toxicity tests shall be conducted in accordance with the procedures set out in the latest revision of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms", EPA-821/R-02-012 (October 2002). The permittee shall conduct an acute 48-hour static-renewal toxicity test using *Daphnia magna* and an acute 96-hour static-renewal toxicity test using *Pimephales promelas*. A multi-dilution test consisting of five concentrations (12.5%, 25%, 50%, 75%, 100%) and a control is required.

Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration. If more than 10 percent control mortality occurs, the test is not valid. The test shall be repeated until satisfactory control survival is achieved.

Regular quarterly/annual acute toxicity test results shall be reported on the Discharge Monitoring Report (DMR) submitted for the reporting period when the acute toxicity monitoring was conducted. A laboratory reporting form consistent with the Region 8 Toxicity Test Report Format for Acute Whole Effluent Toxicity, 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 WET

If acute toxicity occurs in a test, the permittee shall do the following:

- (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 as required in Part 1.3.7. of this permit).

Should acute toxicity occur in the second test, the permittee shall 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.

In addition to the accelerated monitoring, the permittee shall perform a toxicity identification evaluation/toxicity reduction evaluation as required by Part 1.3.7 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 28<sup>th</sup> of the month following the test to the following address:

Regional WET Coordinator  
Wastewater Unit (8P-W-WW)  
U.S. EPA, Region 8  
1595 Wynkoop Street  
Denver, CO 80202-1129

- 1.3.7. Toxicity Identification Evaluation/Toxicity Reduction Evaluation (TIE/TRE). Should acute toxicity occur in the second test following failure in the first test, the permittee shall initiate corrective actions as follows:
- 1.3.7.1. Where the source of toxicity is known, the permittee shall:
- 1.3.7.1.1. Submit a TRE plan and schedule to eliminate acute toxicity in accordance with the whole effluent toxicity definition in Part 1.1. The plan and schedule shall be submitted to the EPA Regional WET Coordinator **within 30 days** of the date of when the permittee learned of the second test failure.
- 1.3.7.1.2. The EPA will review the TRE plan and schedule, and may provide written comments to the permittee. A final TRE plan and schedule that addresses any EPA comments, if provided, shall be submitted to the EPA Regional WET Coordinator prior to the initiation of any activities specified in the TRE plan and schedule.
- 1.3.7.1.3. Initiate the TRE plan **within 75 days** of the date of when the permittee learned of the second test failure.
- 1.3.7.1.4. Alternately, if the source of toxicity is known and can immediately be controlled through operational changes, and if follow-up testing indicates an absence of whole effluent toxicity, the permittee shall provide a written request for relief from accelerated testing and/or completion of a TRE.
- 1.3.7.1.5. Alternately, if the source of toxicity is known but the operational changes or site improvements as identified in the TRE plan and schedule, necessary to remove the toxicity require an extended period to implement, the permittee may provide a written request for relief from accelerated testing until operational changes or site improvements are complete and retesting can begin.
- 1.3.7.2. Where the source is unknown and the toxicity cannot be immediately controlled through operational changes, the permittee shall:
- 1.3.7.2.1. Initiate a TIE and develop and implement a TRE plan and schedule to eliminate acute toxicity in accordance with the whole effluent toxicity definition in Part 1.1 in accordance with the following schedule:
- 1.3.7.2.1.1. Submit a toxicity reduction (TRE) study plan detailing the toxicity reduction procedures to be employed and the schedule for completing the plan. The plan and schedule shall be submitted to the EPA Regional WET Coordinator **within 45 days** of the date of when the permittee learned of the second test failure. The EPA publications listed below shall be considered in developing the plan and schedule. Copies of the publications may be downloaded from the Region 8 WET web page.
- "Methods for Aquatic Toxicity Identification Evaluations, Phase I Toxicity Characterization Procedures", Second Edition, EPA/600/6-91/003, February 1991.
- "Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity", EPA/600/R-92/080, September 1993.

"Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity", EPA/600/R-92 /081, September 1993.

"Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants", EPA/833B-99/002, August 1999.

"Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (TREs)", EPA/600/2-88/070, April 1989.

- 1.3.7.2.1.2. The EPA will review the TRE plan and schedule, and may provide written comments to the permittee. A final TRE plan and schedule that addresses any EPA comments, if provided, shall be submitted to the EPA Regional WET Coordinator prior to the initiation of any activities specified in the TRE plan and schedule.
- 1.3.7.2.1.3. Initiate the TRE plan **within 90 days** of the date of when the permittee learned of the second test failure.
- 1.3.7.3. The permittee shall comply with the final schedule for implementing the TRE plan; failure to comply with the schedule is a violation of the permit. Any modification to the TIE/TRE plan schedule must be submitted to the EPA Regional WET Coordinator for review prior to implementation of the modification.
- 1.3.7.4. The permittee shall submit quarterly TIE/TRE progress reports, including summary of findings, corrective actions required, and data generated in accordance with the final schedule for implementing the TRE plan, to the EPA Regional WET Coordinator.
- 1.3.7.5. The permittee shall complete required construction, if necessary, to implement the TRE controls as described in the final TRE report in accordance with the final schedule for implementing the TRE plan.
- 1.3.7.6. The permittee shall eliminate acute toxicity in accordance with the whole effluent toxicity definition in Part 1.1 and in accordance with the final schedule for implementing the TRE plan as soon as possible, but no later than the final compliance date specified in the final TRE plan and schedule.
- 1.3.7.7. Should the results for ten consecutive monthly acute tests indicate no acute toxicity prior to the end of the TRE scheduled completion, the TRE may be considered complete. The permittee may provide a written request to the EPA Regional WET Coordinator, allowing a reduction to regular quarterly whole effluent toxicity monitoring. The EPA Regional WET Coordinator may approve or deny the request based on the results and other available information without an additional public notice. If the request is approved, the regular test procedures are to be the same as specified above (Part 1.3.6.) for both *Daphnia magna* and *Pimephales promelas*, unless otherwise specified in writing by the EPA Regional WET Coordinator.
- 1.3.7.8. Upon completion of the scheduled TIE/TRE, the permittee shall provide a written request to return to regular quarterly whole effluent toxicity monitoring and reporting as specified in Part 1.3.2 of the permit, to the EPA Regional WET Coordinator. If the request is approved, the regular test procedures are to be the same as specified above (Part 1.3.6.) for both *Daphnia magna* and *Pimephales promelas*, unless otherwise specified in writing by the EPA Regional WET Coordinator.

- 1.3.8. Mercury Minimization Plan (MMP). Within 90 days following an exceedance of the trigger value of 0.77 µg/L, the permittee is required to develop and implement 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;
  - 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.
- 1.3.9. 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. 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.

## 2. MONITORING, RECORDING AND REPORTING REQUIREMENTS

- 2.1. Representative Sampling. Samples taken in compliance with the monitoring requirements established under Part 1 shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Sludge samples shall be collected at a location representative of the quality of sludge immediately prior to use-disposal practice.
- 2.2. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Sludge monitoring procedures shall be those specified in 40 CFR Part 503, or as specified in the permit.
- 2.3. Penalties for Tampering. The CWA provides that any person who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than two years, or by both. Second conviction is punishable by a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four years, or both.
- 2.4. Reporting of Monitoring Results. 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 28th day of the month following the completed reporting period. If no discharge occurs during the reporting period, "no discharge" shall be reported. Until further notice, sludge monitoring results may be reported in the testing laboratory's normal format (there is no EPA standard form at this time), but should be on letter size pages. Whole effluent toxicity (biomonitoring) results must be reported on the most recent version of the EPA Region 8's Guidance For Whole Effluent Reporting. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the Signatory Requirements (see Part 4), and submitted to the EPA Region 8 Policy, Information Management & Environmental Justice Program and the Wind River Environmental Quality Commission at the addresses given below:

original to: U.S. EPA, Region 8  
Policy, Information Management & Environmental Justice Program (8ENF-PJ)  
Attention: Director  
1595 Wynkoop Street  
Denver, Colorado 80202-1129

copy to: Director  
Wind River Environmental Quality Commission  
Wind River Indian Reservation  
P.O. Box 217  
Fort Washakie, WY 82514

- 2.5. Additional Monitoring by the Permittee. If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136, 40 CFR Part 503, or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated.
- 2.6. Records Contents. Records of monitoring information shall include:
- 2.6.1. The date, exact place, and time of sampling or measurements;
  - 2.6.2. The initials or name(s) of the individual(s) who performed the sampling or measurements;
  - 2.6.3. The date(s) analyses were performed;
  - 2.6.4. The time(s) analyses were initiated;
  - 2.6.5. The initials or name(s) of individual(s) who performed the analyses;
  - 2.6.6. References and written procedures, when available, for the analytical techniques or methods used; and
  - 2.6.7. The results of such analyses, including the bench sheets, instrument readouts, computer disks or tapes, etc., used to determine these results.
- 2.7. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. Records of monitoring required by this permit related to sludge use and disposal activities must be kept at least five years (or longer as required by 40 CFR Part 503). This period may be extended by request of the Director at any time. Data collected on site, data used to prepare the DMR, copies of Discharge Monitoring Reports, and a copy of this NPDES permit must be maintained on site.
- 2.8. Twenty-four Hour Notice of Noncompliance Reporting.
- 2.8.1. The permittee shall report any noncompliance which **may endanger health or the environment** as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The report shall be made to the EPA, Region 8, Site Assessment/Emergency Response Program at (303) 293-1788, and the Wind River Environmental Quality Commission at (307) 332-3164.
  - 2.8.2. The following occurrences of noncompliance shall be reported by telephone to the EPA, Region 8, NPDES Enforcement Unit at (800) 227-8917 (8:00 a.m. - 4:30 p.m. Mountain Time), and the Wind River Environmental Quality Commission at (307) 332-3164 - (8:00 a.m. - 4:30 p.m. Central Time) by the first workday following the day the permittee became aware of the circumstances.

- 2.8.2.1. Any unanticipated bypass which exceeds any effluent limitation in the permit (See Part 3.7, Bypass of Treatment Facilities.);
- 2.8.2.2. Any upset which exceeds any effluent limitation in the permit (See Part 3.8, Upset Conditions.);  
or
- 2.8.2.3. Violation of a maximum daily discharge limitation for any of the pollutants listed in Part 1.3.1 of the permit.
- 2.8.3. In addition to the notifications described in Part 2.8.1 and Part 2.8.2., a written submission shall also be provided to the USEPA, Office of Enforcement, Compliance and Environmental Justice and to the Wind River Environmental Quality Commission within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:
  - 2.8.3.1. A description of the noncompliance and its cause;
  - 2.8.3.2. The period of noncompliance, including exact dates and times;
  - 2.8.3.3. The estimated time noncompliance is expected to continue if it has not been corrected; and
  - 2.8.3.4. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
- 2.8.4. The Director may waive the written report on a case-by-case basis for an occurrence of noncompliance listed under Part 2.8.2 above, if the incident has been orally reported in accordance with the requirements of Part 2.8.2.
- 2.8.5. Reports shall be submitted to the addresses in Part 2.4., Reporting of Monitoring Results.
- 2.9. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for Part 2.4 are submitted. The reports shall contain the information listed in Part 2.8.3.
- 2.10. Inspection and Entry. The permittee shall allow the Regional Administrator, or authorized representative of the Administrator (including an authorized contractor acting as a representative of the Administrator) or the Wind River Environmental Quality Commission, upon presentation of credentials and other documents as may be required by law, to:
  - 2.10.1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
  - 2.10.2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
  - 2.10.3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  - 2.10.4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

### 3. COMPLIANCE RESPONSIBILITIES

- 3.1. Duty to Comply. The permittee must comply with all conditions of this permit. Any failure to comply with the permit may constitute a violation of the CWA and may be grounds for enforcement action, including, but not limited to permit termination, revocation and reissuance, modification, or denial of a permit renewal application. The permittee shall give the director advance notice of any planned changes at the permitted facility that will change any discharge from the facility, or of any activity that may result in failure to comply with permit conditions.



- 3.2. Penalties for Violations of Permit Conditions. The CWA provides for specified civil and criminal monetary penalties for violations of its provisions. However, the Federal Civil Penalties Inflation Adjustment Act of 1990, as amended by the Debt Collection Improvement Act of 1996, requires the EPA to adjust the civil monetary penalties for inflation on a periodic basis. The EPA previously adjusted its civil monetary penalties on December 31, 1996 (61 Fed. Reg. 69359-69365), with technical corrections and additions published on March 20, 1997 (62 Fed. Reg. 13514-13517), June 27, 1997 (62 Fed. Reg. 35037-35041), 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:
- 3.2.1. Any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Sections 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed \$37,500 per day for each violation.
- 3.2.2. Any person who *negligently* violates Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment for not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation, or by imprisonment for not more than 2 years, or both.
- 3.2.3. Any person who *knowingly* violates Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment for not more than 6 years, or both.
- 3.2.4. Any person who *knowingly* violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than \$250,000 or imprisonment for not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment for not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.
- 3.2.5. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Where an administrative enforcement action is brought for a Class I civil penalty, the assessed penalty may not exceed \$16,000 per violation, with a maximum amount not to exceed \$37,500. 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.

- 3.3. Need to Halt or Reduceivity not a Defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- 3.4. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
- 3.5. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit. However, the permittee shall operate, at a minimum, one complete set of each main line unit treatment process whether or not this process is needed to achieve permit effluent compliance.
- 3.5.1 The permittee shall, as soon as reasonable and practicable, but no later than six (6) months after the effective date of this permit, do the following as part of the operation and maintenance program for the wastewater treatment facility:
- 3.5.1.1. Have a current O & M Manual(s) that describes the proper operational procedures and maintenance requirements of the wastewater treatment facility;
- 3.5.1.2. Have the O & M Manual(s) readily available to the operator of the wastewater treatment facility and require that the operator become familiar with the manual(s) and any updates;
- 3.5.1.3. Have a schedule(s) for routine operation and maintenance activities at the wastewater treatment facility; and
- 3.5.1.4. Require the operator to perform the routine operation and maintenance requirements in accordance with the schedule(s).
- 3.5.2. The permittee shall maintain a daily log in a **bound notebook(s)** containing a summary record of all operation and maintenance activities at the wastewater treatment facility. At a minimum, the notebook shall include the following information:
- 3.5.2.1. Date and time;
- 3.5.2.2. Name and title of person(s) making the log entry;
- 3.5.2.3. Name of the persons(s) performing the activity;
- 3.5.2.4. A brief description of the activity; and
- 3.5.2.5. Other information, as appropriate.
- The permittee shall maintain the notebook in accordance with proper record-keeping procedures and shall make the log available for inspection, upon request, by authorized representatives of the U.S. Environmental Protection Agency or the Wind River Environmental Quality Commission.
- 3.6. Removed Substances. Collected screenings, grit, solids, sludge, or other pollutants removed in the course of treatment shall be buried or disposed in a manner consistent with all applicable federal (e.g., 40 CFR Part 257, 40 CFR Part 258, 40 CFR Part 503) and tribal regulations and in a manner so as to prevent any pollutant from entering any waters of the United States or creating a health hazard.

### 3.7. Bypass of Treatment Facilities.

3.7.1. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts 3.7.2 and 3.7.3.

3.7.2. Notice:

3.7.2.1. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass to the USEPA, Technical Enforcement Program, and the Wind River Environmental Quality Commission.

3.7.2.2. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required under Part 2.8, Twenty-four Hour Noncompliance Reporting, to the USEPA, Technical Enforcement Program, and the Wind River Environmental Quality Commission.

3.7.3. Prohibition of bypass.

3.7.3.1. Bypass is prohibited and the Director may take enforcement action against a permittee for a bypass, unless:

3.7.3.1.1. The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

3.7.3.1.2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

3.7.3.1.3. The permittee submitted notices as required under Part 3.7.2.

3.7.3.2. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in Part 3.7.3.1.

### 3.8. Upset Conditions

3.8.1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of Part 3.8.2 are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review (i.e., Permittees will have the opportunity for a judicial determination on any claim of upset only in an enforcement action brought for noncompliance with technology-based permit effluent limitations).

3.8.2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

3.8.2.1. An upset occurred and that the permittee can identify the cause(s) of the upset;

3.8.2.2. The permitted facility was at the time being properly operated;

3.8.2.3. The permittee submitted notice of the upset as required under Part 2.8, Twenty-four Hour Notice of Noncompliance Reporting; and

- 3.8.2.4. The permittee complied with any remedial measures required under Part 3.4, Duty to Mitigate.
- 3.8.3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.
- 3.9. Toxic Pollutants. The permittee shall comply with effluent standards or prohibitions established under Section 307 (a) of the CWA for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.
- 3.10. Changes in Discharge of Toxic Substances. Notification shall be provided to the Director as soon as the permittee knows of, or has reason to believe:
- 3.10.1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
- 3.10.1.1. One hundred micrograms per liter (100 µg/L);
- 3.10.1.2. Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter 500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
- 3.10.1.3. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR § 122.21(g)(7); or
- 3.10.1.4. The level established by the Director in accordance with 40 CFR § 122.44(f).
- 3.10.2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
- 3.10.2.1. Five hundred micrograms per liter (500 µg/L);
- 3.10.2.2. One milligram per liter (1 mg/L) for antimony;
- 3.10.2.3. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR § 122.21(g)(7); or
- 3.10.2.4. The level established by the Director in accordance with 40 CFR § 122.44(f).

#### 4. GENERAL REQUIREMENTS

- 4.1. Planned Changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
- 4.1.1. The alteration or addition could significantly change the nature or increase the quantity of pollutant discharged. This notification applies to pollutants which are not subject to effluent limitations in the permit; or
- 4.1.2. There are any planned substantial changes to the existing sewage sludge facilities, the manner of its operation, or to current sewage sludge management practices of storage and disposal. The permittee shall give the Director notice of any planned changes at least 30 days prior to their implementation.

- 4.1.3. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source.
- 4.2. Anticipated Noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- 4.3. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- 4.4. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application should be submitted at least 180 days before the expiration date of this permit.
- 4.5. Duty to Provide Information. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.
- 4.6. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.
- 4.7. Signatory Requirements. All applications, reports or information submitted to the Director shall be signed and certified.
  - 4.7.1. All permit applications shall be signed by either a principal executive officer or ranking elected official.
  - 4.7.2. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
    - 4.7.2.1. The authorization is made in writing by a person described above and submitted to the Director; and
    - 4.7.2.2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
  - 4.7.3. Changes to authorization. If an authorization under Part 4.7.2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part 4.7.2 must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

4.7.4. **Certification.** Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- 4.8. **Penalties for Falsification of Reports.** The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- 4.9. **Availability of Reports.** Except for data determined to be confidential under 40 CFR Part 2, Subpart B, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Director. As required by the CWA, permit applications, permits and effluent data shall not be considered confidential.
- 4.10. **Oil and Hazardous Substance Liability.** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the CWA.
- 4.11. **Property Rights.** The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, tribal or local laws or regulations.
- 4.12. **Severability.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
- 4.13. **Transfers.** This permit may be automatically transferred to a new permittee if:
- 4.13.1. The current permittee notifies the Director at least 30 days in advance of the proposed transfer date;
- 4.13.2. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and
- 4.13.3. The Director does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in Part 4.13.2.
- 4.14. **Permittees in Indian Country.** The EPA has not approved the Eastern Shoshone or Northern Arapaho Tribes or the State of Wyoming to implement the CWA NPDES program on the Wind River Indian Reservation. "Indian country" is defined at 18 U.S.C. § 1151. Therefore, the EPA directly implements the CWA NPDES program on the Wind River Indian Reservation.
- 4.15. **Reopener Provision.** This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations (and compliance schedule, if necessary), or other appropriate requirements if one or more of the following events occurs:

- 4.15.1. Water Quality Standards. The water quality standards of the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.
- 4.15.2. Wasteload Allocation. A wasteload allocation is developed and approved by the Wind River Indian Reservation and/or the EPA for incorporation in this permit.
- 4.15.3. Water Quality Management Plan. A revision to the current water quality management plan is approved and adopted which calls for different effluent limitations than contained in this permit.
- 4.16. Toxicity Limitation-Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include whole effluent toxicity limitations if whole effluent toxicity is detected in the discharge.
- 4.17 Mercury Limitation – Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) if the Mercury Minimization Plan is not found to be effective or if a water column of the fish tissue criterion is developed.





## Statement of Basis

PERMITTEE: **Phoenix Production Company**

FACILITY: **Sheldon Dome Field**

PERMIT NUMBER: **WY-0024953**

RESPONSIBLE OFFICIAL: Chris Williamson (Vice President)  
Phoenix Production Company

FACILITY CONTACT: Tom Faulkner (Senior Petroleum Engineer)  
Phoenix Production Company  
P.O. Box 2653  
Cody, Wyoming 82414  
(307) 587-6440, Ext 15

PERMIT TYPE: Minor Industrial (Renewal)  
Indian Country

FACILITY LOCATION: NE ¼ SW ¼ of Section 15, Township 5 North, Range  
2 West in Fremont County, Wyoming

DISCHARGE POINT: Outfall 001, Lat. 43.40820° N, Long. 108.98613° 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 wastewater treatment facility for the Phoenix Production Company – Sheldon Dome oil production facility located in Fremont County, Wyoming. Refer to Figure 1 for location map. This facility is within the exterior boundaries of the Wind River Indian Reservation.

This permit is a renewal of NPDES Permit Number WY-0024953, which expired on September 30, 2010, and was administratively extended.

This facility produces oil and gas from a total of 19 wells, with six wells producing gas only. The gas-only wells produce just under 200 mcf of gas/day with very little produced water being discharged. Any produced water from the six gas wells is sent to an evaporation pond (volume of 200 yd<sup>3</sup>) located approximately one half mile west of the facility. There is no discharge of this produced water to surface water.

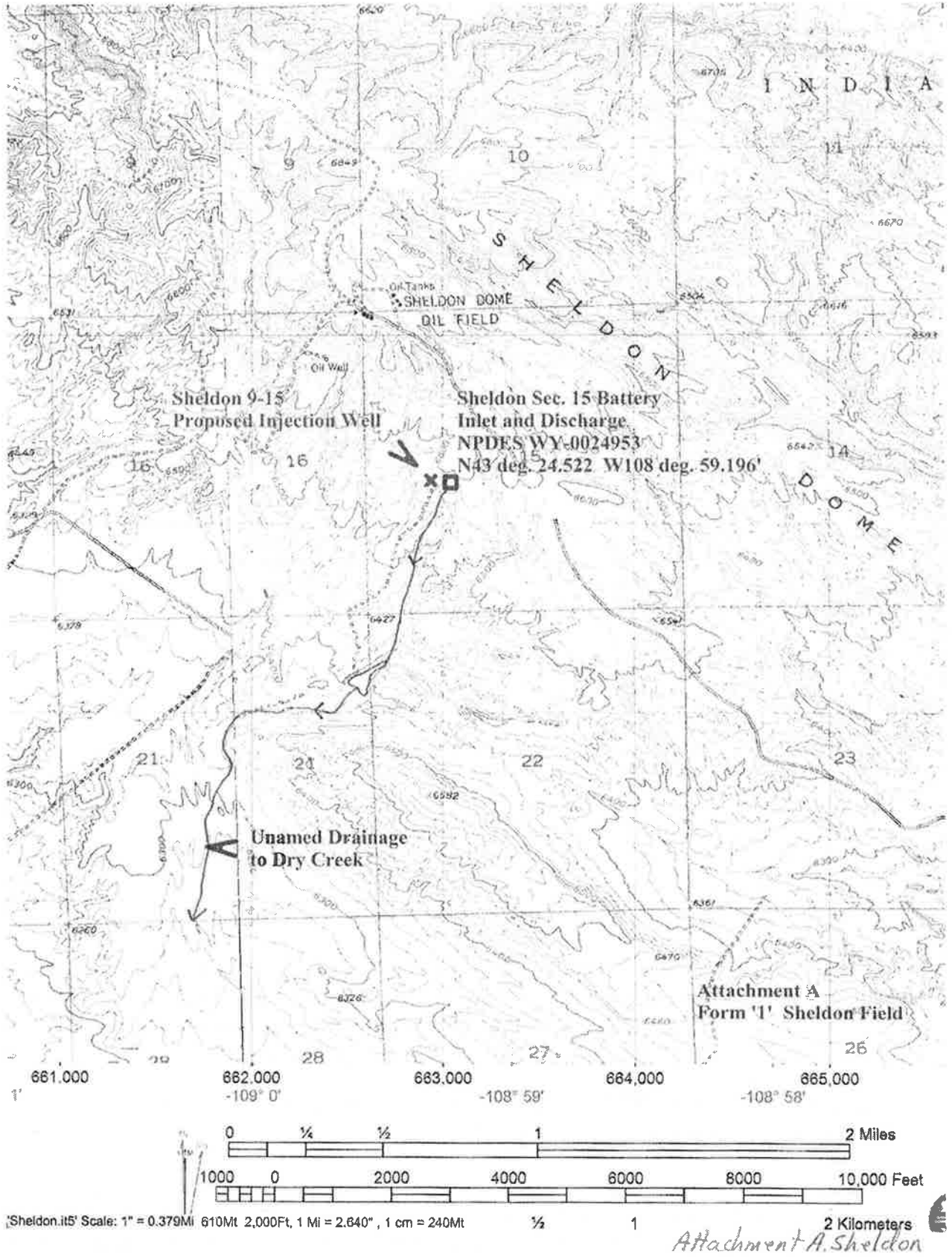


Figure 1. Phoenix Sheldon Dome Field Location Map and Discharge Point



The Sheldon Dome facility treats oil and produced water from 13 oil wells. Combined, the 13 wells produce approximately 85 barrels of oil per day and approximately 1,900 barrels of produced water per day. Produced water is discharged via Outfall 001 after treatment. Other infrastructure at this facility includes: one 400 barrel free water knockout, one vertical heater treater, four 400 barrel oil sales tanks, two 400 barrel water holding tanks, one rupture pond, one open top oil skim tank, and one unlined wastewater holding pit.

When hydrocarbons (oil and/or gas) are produced, they are brought to the surface as a produced fluid mixture. The composition of this produced fluid generally includes a mixture of either liquid or gaseous hydrocarbons, produced water, dissolved or suspended solids, produced solids such as sand or silt, and injected fluids and additives that may have been placed in the formation as a result of exploration and production activities. Production activities include extraction, well maintenance and stimulation.

**Extraction.** When the formation fluid is brought to the surface, it contains a spectrum of substances including natural gas, produced water, sand, silt, and any additives used to enhance extraction. The general order of separation is: separation of gaseous components, removal of solids and water, and the breaking up of oil-water emulsions. In Sheldon Field, production fluid from the wells (approximately 0.087 mgd) flows to a common line to an emulsion header. An emulsion breaker (Nalco EC2007) is added through this header continuously through the day to facilitate the separation of water from oil. The facility reports that approximately 1-2 quarts of this emulsion breaker are added per day. The emulsion header also has the ability to allow the facility to divert individual wells from this system. From the emulsion header, production fluid flows to the free water knock out. Here, gases are generally removed by passing the pressurized fluid through one or two decreasing pressure chambers. Less and less gas will remain dissolved in the solution as the pressure is lowered. Sediment and water is removed through a process called free water knockout, in which the sediment and water are removed primarily by gravity. Oil-water emulsions are broken by heating the fluid in a heater-treater to a temperature of 100-160 degrees Fahrenheit and by periodic treatment with emulsion breaking chemicals. The facility reports use of emulsion breaking chemicals (Nalco EC2462) to aid in water separation approximately twice a year when emulsion issues are especially problematic. Following the emulsion breaking, the oil is about 98% pure which is sufficient for transportation to a refinery.

All produced water gravity flows from the free water knockout and heater treaters consecutively into the following: two 400 barrel water holding tanks set up in series, to a 200 barrel skim tank, to an open top tank for final separation before it is sent to the final discharge pond (50 ft x 55 ft x 6 ft) that feeds Outfall 001. Floating oil is skimmed by a vacuum truck from the skim tank if there is more than 0.5 inches of oil on the surface; skimming occurs on average once every other month. The facility indicates that it takes approximately 18 hours for production fluid to move from the wells to Outfall 001. Discharge from Outfall 001 is approximately 0.082 mgd.

**Well maintenance.** Production wells periodically require maintenance. Two procedures are performed at Sheldon Field to improve the flow of fluid: 1) removing scaling and 2) inhibiting corrosion.

The Sheldon Field well maintenance procedures are described below (see Table 1):

**Daily chemical program.** The daily chemical treatment program involves a slow drip of demulsifier (Nalco EC2007) and emulsion breaker (Nalco EC2462) into the treatment system at the battery header, battery tester, and battery knock out to treat produced water after it has been brought to surface. Approximately 0.5 gallons of demulsifier and 0.75 gallons of emulsion breaker are introduced gradually into the system through a continuous chemical pump over a 24 hour period. One well (well #15-15) at this facility is also receiving daily chemical treatments to minimize scaling and corrosion. This well receives a total of 0.25 gallons of scale inhibitor (Nalco EC6485) and 0.25 gallons of corrosion inhibitor (Nalco EC1076) daily introduced down casing into the well through an electronic valve that opens up for short periods of time each hour. Well 15A-15 receives daily treatment with 0.375 gallons of water clarifier (Nalco EC6033).

**Bimonthly chemical program.** Bimonthly downhole well maintenance is conducted for eight oil production wells (wells 7-15, 6-15, 15A-15, 9-15, 8-15, 14A-15, 9A-15, and 11-15). During this bimonthly program, the facility prepares a mixture of 1 gallon of corrosion inhibitor (Nalco EC1317) along with 1 gallon of scale inhibitor (Nalco EC6485) and 40 barrels of produced water in the back of a vacuum truck and puts this chemical mixture in equal proportions downhole, four wells at a time. That same day, this recipe is then replicated for the remaining four wells. Due to the nature of pumping wells, the pressure sink that is created flows formation fluid and maintenance chemicals into the wellbore rather than into the formation. Thus, this chemical mixture is produced back up the wellbore and to the treatment system with minimal mixing into the producing formation. Conversations with the facility indicate that it takes approximately 2 days for all of the chemical mixture to come back to surface.

**Table 1. Daily and bi-monthly chemical program at Sheldon Dome Field.**

	DAILY (Units all in gallons)						BI-MONTHLY (gallons)	
	EC2007 (Demulsifier)	EC2462 (Emulsion Breaker)	EC6485 (Scale)	EC1076 (Corrosion)	EC6033 (Clarifier)	EC1317 (Corrosion)	EC6485 (Scale)	
Battery header	0.25	0.25						
Battery tester	0.25	0.25						
Battery ko		0.25						
Well 15-15			0.25	0.25				
Well 15A-15					0.375			
<b>TOTAL DAILY</b>	<b>0.5</b>	<b>0.75</b>	<b>0.25</b>	<b>0.25</b>	<b>0.375</b>	<b>0</b>	<b>0.25</b>	
Well 7-15						0.25	0.25	
Well 6-15						0.25	0.25	
Well15A-15						0.25	0.25	
Well 9-15						0.25	0.25	
Well 8-15						0.25	0.25	
Well14A-15						0.25	0.25	
Well 9A-15						0.25	0.25	
Well 11-15						0.25	0.25	
<b>TOTAL EACH MONTHLY TRT</b>						<b>2</b>	<b>2</b>	

**Well treatment / stimulation.** The applicant indicates that on average, hydraulic fracturing may occur every other year at the Sheldon Dome Field and that no acid treatments have been conducted over the last five years. Produced water containing well treatment/stimulation fluids are then discharged via Outfall 001.

### **Receiving Waters**

The discharge from Outfall 001 at this facility is a continuous discharge and will enter an unnamed, ephemeral tributary to Dry (Pasup) Creek. Without the continuous, significant volume of discharged produced water, the unnamed tributary would be an ephemeral drainageway with only precipitation runoff providing water. The total distance from the point of discharge into the unnamed, ephemeral tributary to the point of confluence with Dry (Pasup) Creek is approximately 3.95 stream miles. From this confluence, Dry (Pasup) Creek is an intermittent stream and travels for approximately 18.67 stream miles to the juncture of the Wind River.

The Tribes adopted surface water quality requirements for waters within the exterior boundaries of the Wind River Indian Reservation. 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 requirement, 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.

### **Inspections**

An inspection report completed by U.S. EPA inspectors following a site visit on June 30, 2010 indicated that the facility had submitted a letter dated December 7, 2005 indicating plans were in place to conduct underground injection of produced water from wells with characteristically high total dissolved solids (TDS) and Specific Conductance by October 2006. A summary of monitoring data from December 2005 to June 2010 shows general compliance with effluent limits established in the previous permit.

### **Applicable Technology and Water Quality Considerations**

Permit limitations for the Phoenix - Sheldon Dome facility are derived through evaluating applicable treatment technology standards and narrative/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. The EPA also conducts an evaluation of the numeric water quality requirements 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 requirements 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**

The Phoenix - Sheldon Dome is an onshore facility located landward of the inner boundary of the territorial seas. The facility is also located west of the 98<sup>th</sup> 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 a water management plan submitted by grazing lessees to and approved (March 2010) by the Wind River Environmental Quality Commission, the produced water has a use in livestock and wildlife propagation after discharge into the receiving waters. The permit application contained two letters (dated January 20, 2010 and February 4, 2010) representing five 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 SO<sub>4</sub> 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.*”<sup>a</sup>

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

<b>Pollutant</b>	<b>Acute</b>	<b>Chronic</b>
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.<sup>b</sup> Fluoride is addressed below.

### **Water Quality Based Effluent Limitations**

The Tribes adopted surface water quality requirements for waters within the exterior boundaries of the Wind River Indian Reservation. 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.

<sup>a</sup> 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)

<sup>b</sup> 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)

### Numeric Water Quality Requirements

To ensure that any potential permit effluent limitations based on the Tribes' adopted water quality requirement 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. 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 2.

Table 2 – Applicable Water Quality Criteria - expressed as µg/L

Pollutant	More Stringent of EPA Water Quality Criteria and Adopted Wind River Tribal Water Quality Requirements	
	Aquatic Life	
	Acute	Chronic
Aluminum, Total	750	87
Arsenic, Total	340	150
Cadmium, Total	7.7 <sup>(1)</sup>	0.64 <sup>(1)</sup>
Chlorides	860,000	230,000
Chromium (III)	1,773.3 <sup>(1)</sup>	230.7 <sup>(1)</sup>
Chromium (VI), Hexavalent	16	11
Copper, Total	49.6 <sup>(1)</sup>	29.3 <sup>(1)</sup>
Iron, Total	--	1,000
Lead, Total	280.8 <sup>(1)</sup>	10.9 <sup>(1)</sup>
Manganese, Total	9,033 <sup>(1)</sup>	3,105 <sup>(1)</sup>
Mercury, Total	1.4	0.77
Nickel, Total	1,513 <sup>(1)</sup>	168 <sup>(1)</sup>
Oil and Grease	Narrative, 10 mg/L	
pH	6.5 to 9.0	
Selenium, Total	--	4.6
Silver, Total	34.9 <sup>(1)</sup>	--
Sulfide, as H <sub>2</sub> S	--	2
Zinc, Total	379 <sup>(1)</sup>	382 <sup>(1)</sup>

- <sup>(1)</sup> 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 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 requirement 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 and Toxic Pollutants Screening 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 December 31, 2005 to December 31, 2012. A summary of data collected is given below in Tables 3-4:

Table 3 - DMR Data

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)
12/31/2005	6,420	5,330*	828	1,900	24.8	10	7.5	0.058
6/30/2006	5,760	4,180	579	1,609	22.8	4.33	8.0	0.105
12/31/2006	7,120	4,260	571	2,280	29.8	9.26	7.8	0.108
6/30/2007	5,270	4,040	1,080	784	2.1	8.4	8.2	0.098
12/31/2007	5,890	4,570	713	2,390	33.2	9.4	8.2	0.096
6/30/2008	5,740	4,060	624	1,780	10.6	9.83	8.3	0.097
12/31/2008	5,360	4,070	544	2,030	25.3	9.78	7.8	0.087
6/30/2009	5,600	4,060	624	1,780	10.6	9.83	8.3	0.097
12/31/2009	5,470	4,100	517	1,670	21.6	9.82	7.9	0.09
6/30/2010	6,680	4,283	612	2,075	0.9	9.31	8.1	0.088
12/31/2010	5,210	4,115	385	2,110	38.0	8.74	8.0	0.096
6/30/2011	4,930	3,714	522	1,860	-	9.8	8.0	0.084
12/31/2011	4,940	3,830	436	2,060	31.4	9.8	8.1	0.087
6/30/2012	-	-	-	-	-	-	-	-
12/31/2012	4,610	3,830	393	1,900	34.0	8.15	7.8	0.074
minimum	4,610	3,714	393	784	0.9	4.33	7.5	0.058
average	5,643	4,174	602	1,873	21.9	9.03	7.5-8.3	0.090
maximum	7,120	5,330*	1,080	2,390	38.0	10.0	8.3	0.108
Limit	7,500	5,000	2,000	3,000	60.0	10.0	6.5-8.5	-

\*Not an exceedence of the permitted limit since the limit of 5,000 mg/L did not become effective until one year after the effective date of the permit.

Table 4 – Permit Application Data

Parameter	Units	Max	No. of Samples
BOD	mg/L	121	1
COD	mg/L	143	1
TOC	mg/L	2.9	1
TSS	mg/L	24	1
Ammonia (as N)	mg/L	1.7	1
Flow	mgd	0.09	2
Temperature (winter)	°C	22	1
Temperature (summer)	°C	N/A	0
Fluoride	mg/L	3.4	1
Nitrogen, Total Organic (as N)	mg/L	ND	1
Oil and Grease	mg/L	18.6	15
Alpha, Total	pCi/L	108	1
Beta, Total	pCi/L	136	1
Radium, Total	pCi/L	45.9	1
Radium 226, Total	pCi/L	38	5
Sulfate (as SO <sub>4</sub> )	mg/L	2,070	5
Sulfide (as H <sub>2</sub> S)	mg/L	61	1
Sulfite (as SO <sub>3</sub> )	mg/L	3	1
Boron, Total	mg/L	3.4	1
Iron, Total	mg/L	0.3	1
Magnesium, Total	mg/L	87	1
Manganese, Total	mg/L	0.06	1
Titanium, Total	mg/L	ND	1
Arsenic, Total	mg/L	0.007	1
Mercury, Total	µg/L	ND	1
Selenium, Total	mg/L	ND	1
Zinc, Total	mg/L	0.11	1
Benzene	µg/L	710	1
Ethylbenzene	µg/L	190	1
Toluene	µg/L	830	1
Naphthalene	µg/L	73	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 tribal 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 tribal 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

Parameter	Aquatic Life Water Quality Criteria		Maximum Reported Effluent Concentration	Reasonable Potential?	
	Acute	Chronic		Acute	Chronic
Chloride, mg/L	860	230	1,080	Yes	Yes
Fluoride, mg/L	2 <sup>(2)</sup>	N/A	3.4	Yes <sup>(3)</sup>	N/A
Oil & Grease, mg/L	N/A	10	18.6	Yes	Yes
Sulfate, mg/L	1,800 <sup>(2)</sup>	1,000 <sup>(2)</sup>	2,390	Yes	Yes
Sulfide (as H <sub>2</sub> S), mg/L	-	0.002	61	-	Yes
Arsenic, µg/L	340	150	7	No	No
Iron, µg/L	N/A	1,000	300	-	No <sup>(3)</sup>
Manganese, µg/L	9,033	3,105	60	No	No
Mercury, µg/L	1.40	0.77	ND	No	No
Selenium, µg/L	N/A	4.6	ND	N/A	No
Zinc, µg/L	379 <sup>(1)</sup>	382 <sup>(1)</sup>	110	Yes <sup>(4)</sup>	Yes <sup>(4)</sup>

- (1) Calculated based on hardness value of 400 mg/L
- (2) Criteria limit is not an aquatic life water quality limit, but rather a recommended limit for livestock and wildlife propagation.
- (3) Insufficient data to confidently determine existence of RP. Additional data is necessary.
- (4) See qualitative RP discussion below.

The results of the quantitative evaluation identified chloride, fluoride, oil and grease, sulfate and sulfide (as H<sub>2</sub>S) as having RP to cause or contribute to exceedances of the water quality criteria. For fluoride and iron, insufficient quantitative or qualitative data is available to adequately assess RP to exceed the numeric criteria.

To confidently evaluate quantitatively the reasonable potential 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 criteria and there are only one or two data points available, the EPA is adding effluent limitations in order to protect the designated uses and applicable criteria for aquatic life in the renewal permit. In this case, further monitoring to support a RP analysis is unnecessary. In some cases, however, there is insufficient monitoring data to support a RP determination, in which case EPA is not adding an effluent limit and is instead imposing monitoring requirements.

#### Sulfide as H<sub>2</sub>S

Sulfide can be toxic to aquatic life. The water quality criterion for sulfide (as H<sub>2</sub>S) 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, Iron

Additional qualitative review of the limited data for fluoride and iron showed inconclusive results that raised questions about the finding of RP through quantitative methods with only one data point being reported. 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, and iron 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.

#### Zinc

See Addendum at the end of the document. EPA determined sufficient qualitative information from Material Safety Data Sheets for emulsion breaking chemicals exists to cause or contribute to an excursion of the acute and chronic aquatic life criteria and has imposed a daily maximum and monthly average limitation for zinc.

#### Mercury

Although the mercury level was not detected in the one sample, additional monitoring using clean methods will be required in order to compile a more complete data set for future evaluation. Also, 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 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, toluene and naphthalene.

The data were evaluated with respect to EPA and Tribal water quality requirements 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 6. 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. Only benzene was identified at concentrations which exceeded the recommended criteria for human health protection and the MCL.

Table 6- 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	710	2.2	51	5
Ethyl Benzene	190	530	2,100	700
Toluene	830	1,300	15,000	1,000
Napthalene	73	N/A	N/A	N/A

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 H<sub>2</sub>S)) 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 pollutant monitoring requirements in this renewal permit.

The EPA has not published recommended water quality criteria for naphthalene, but there is a previous criteria document (1980) which indicates there could be aquatic toxicity from naphthalene at 2,300 µg/L (acute) and 620 µg/L (chronic).

#### 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 requirement 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 Toxic Pollutant Monitoring Requirements

Included in the permit is additional effluent monitoring to screen for toxic pollutants (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 requirement for toxic pollutants.

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

As a means to demonstrate compliance with the tribal narrative water quality requirement for toxic pollutants, WET has been included in this permit. WET monitoring requirements that are representative of the discharge effluent are included in this permit to generate data used to determine whether RP for WET has been demonstrated.



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 7 - **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		
	30-Day Average <u>a/</u>	Daily Maximum <u>a/</u>	Basis for Limitation <u>b/</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 nor 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 8 - **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 <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	230	860	WQR
Sulfate, mg/L	1,000	1,800	RCLW
Sulfide (as $\text{H}_2\text{S}$ ), mg/L	0.002	N/A	WQR
Total Radium 226, pCi/L	N/A	60	ELPP
Zinc, $\mu\text{g}/\text{L}$	380	380	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 9 – Effective immediately and lasting through the effective term of this permit**

<b>Effluent Characteristic</b>	<b>Frequency</b>	<b>Sample/Monitoring Type <u>a/</u></b>
Total Flow, mgd <u>b/</u>	Monthly	Instantaneous
Specific Conductance, $\mu\text{S}/\text{cm}$	Monthly	Grab
pH, std units	Monthly	Grab
Oil and grease, <u>c/</u>	Weekly	Visual
Sulfide (as $\text{H}_2\text{S}$ ), mg/L <u>d/</u>	Quarterly	Grab
Chloride, mg/L	Quarterly	Grab
Sulfate, mg/L	Quarterly	Grab
Total Radium 226, pCi/L	Quarterly	Grab
Total Dissolved Solids, mg/L	Semi-Annually	Grab
Zinc, $\mu\text{g}/\text{L}$	Quarterly	Grab
Mercury, Total, $\mu\text{g}/\text{L}$ <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 and analyzed 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  $\text{H}_2\text{S}$  shall be done with an approved procedure that has a method detection level of no greater than 0.10 mg/L (100  $\mu\text{g}/\text{L}$ ). In the calculation of average sulfide as  $\text{H}_2\text{S}$  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 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> 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, sulfide (as H<sub>2</sub>S), and zinc have become either more restrictive or 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 chloride, sulfide (as H<sub>2</sub>S), and zinc shall be 36 months in duration.

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 1<sup>st</sup> year after the effective date of this permit and the second during the 3<sup>rd</sup> 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 and iron as listed in 40 CFR Part 122, Appendix D, Table IV.

**Method Detection Limits**

Monitoring methods must be sufficiently sensitive to meet the Method Detection Limits specified in Table 10:

Table 10- Required Method Detection Limits

<b>Parameter</b>	<b>Required Detection Limits and Required Units</b>
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
Iron, Total Recoverable	50 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 <sub>3</sub>
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

**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.<sup>c</sup>

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;

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<sup>c</sup> 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 (New Permit Section 1.3.9)**

In response to public comment, the following chemical inventory reporting 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 Phoenix - Sheldon Dome 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 and Wind River.

### **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 Phoenix - Sheldon Dome facility 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 will notify the Tribal Historic Preservation Offices (THPOs) of the Eastern Shoshone and Northern Arapaho Tribes of the planned issuance of this NPDES permit and request 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**

EPA is currently conducting a water quality assessment sampling effort on the Wind River Indian Reservation including some water bodies downstream the WY-0024953 Phoenix Sheldon Dome discharge location. EPA NPDES staff have reviewed preliminary monitoring results for these locations and have not identified any specific ambient water quality conditions which indicate the need for additional effluent limitations or monitoring beyond what is currently contained in the final permits as written.

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 Phoenix Production Company Sheldon Dome WY-0024953.” 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. Page 7: The definition of a 3B stream classification has been corrected.
2. Page 7: Updated the stream miles of the ephemeral stream and Dry (Pasup) Creek.
3. Page 8: Corrected the beneficial use letter reference to represent 5 ranchers instead of 2.
4. Page 9: 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.
5. Page 10, Table 2; Page 13, Table 4; Page 14, Table 5; Page 15, Sulfide; Page 19, Table 8; Page 20, Table 9 & footnote d/; and Page 21, Compliance Schedule: The clarification of the pollutant sulfide “as  $\text{H}_2\text{S}$ ” in lieu of Total Sulfide has been added.
6. Page 12: Added footnote to Table 3 to indicate non-violation.
7. Page 17, Subnote (3): Changed “Conduct an additional test...” to read “Initiate an additional test...”.
8. Page 21: Iron, which was inadvertently omitted from the public noticed Statement of Basis, has been added to the “Toxic Pollutants Screen” monitoring requirement.
9. Page 22: 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.

10. Page 24: 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. – Chemical 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<sub>2</sub>S” was added in lieu of Total Sulfide.
4. Page 8, Toxic Pollutants Screen Part 1.3.4.: Iron has been added to the list of required elements to be monitored.
5. Page 8, Method Detection Limits Part 1.3.5.: The new Part heading was added.
6. 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 Act (including permit conditions) are given below:”
7. 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.”
8. In response to comments received, EPA reexamined information received on the composition of the emulsion breaking chemicals used in produced water treatment and has concluded there is sufficient qualitative/quantitative information on the MSDS Sheets combined with facility flow data provided in the application provided to show RP to exceed the acute and chronic aquatic life criteria. EPA is therefore imposing a limitation for Daily Maximum and Monthly Average limitation for zinc of 380 µg/L.

EPA also determined there was an additional substance present in the emulsion breaking chemicals, trimethylbenzene, that has some published aquatic life toxicity information, however, there is not an approved 40 CFR Part 136 Method to analyze specifically for the trimethyl benzene or a published EPA aquatic life criterion or Tribal water quality requirement. EPA determined that additional monitoring for trimethyl benzene will not be required.

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

**Response to Comments Specific to Phoenix Production Company Sheldon Dome WY-0024953**  
**March 9, 2015**

1. The permittee noted typographical and definition errors in the 3D and 3E tribal water quality descriptions included in the Statement of Basis.

**Response:** *EPA also notes the typographical errors in the 3D and 3E definitions in the Eastern Shoshone and Northern Arapaho Tribes' (Tribes') water quality requirements, which were reproduced in the Statement of Basis.*

2. The permittee indicates that the distance from the discharge point in the unnamed ephemeral drainage to the confluence with Dry Creek is 3.95 **stream miles** and the distance from the Dry Creek confluence to the confluence with the Wind River is 18.67 **stream miles**.

**Response:** *Comment noted. The Statement of Basis has been updated to reflect changes.*

3. The permittee states EPA incorrectly classified the receiving waters and provided an incorrect definition of a Class 3B water in paragraph 2 of the Statement of Basis. The permittee states further that after review of the Tribal water quality requirements they believe the unnamed ephemeral tributary should be classified as a 3E water, **whose flows are exclusively the result of permitted effluent discharges...** and under natural conditions (i.e., without the Sheldon Dome effluent) would be designated as a Class 4B and Dry Creek below the confluence with the unnamed ephemeral tributary would be 3B or 4B.

**Response:** *EPA acknowledges it included the incorrect definition of a 3B water in the Statement of Basis and will update the document to include the correct definition of a 3B water. EPA believes it correctly classified the unnamed ephemeral tributary. The following definition is from the Tribes' water quality law:*

(ii) 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.

The table below is excerpted from the Tribal Stream Classification and Lists:

<p style="text-align: center;"><b>Wind River (above Boysen Res upstream to Red Creek)</b>  <b>2AB</b></p>
<p style="text-align: center;">Mission Cr  <b>(from confluence with Wind R upstream to Wyoming Canal)</b>                  2C</p>
<p style="text-align: center;">Mission Cr  <b>(upstream from Wyoming Canal)</b>                  2E</p>
<p style="text-align: center;">Dry (Pasup) Cr  <b>(from confluence with Wind River, upstream to perennial flow)</b>                  3B</p>
<p style="text-align: center;">Dry (Pasup) Cr  <b>(from perennial flow, upstream)</b>                  2C</p>

The unnamed ephemeral tributary to which the Sheldon Dome facility discharges has not been assigned a class in the Tribal water quality requirements. The tributary flows into Dry Creek and the table above indicates Dry Creek is considered a 3B water from the confluence with the Wind River upstream to perennial flow. The perennial flow stops just upstream of the confluence of the unnamed tributary and Dry Creek. Thus, the tributary flows into an ephemeral portion of Dry Creek. The tributary exhibits the same ephemeral characteristics as Dry Creek for at least 3 miles upstream until the Sheldon Dome flow is present in the drainage. From this point upstream to the Sheldon Dome discharge (0.67 stream miles), the flow in the drainage is dominated by the discharge. Given the lack of stream classification in tribal law, the ephemeral characteristics of the majority of the stream reach, and its shared characteristics with Dry Creek, EPA has concluded that it is best characterized as a Class 3B water.

- Comment stated that there was misunderstanding of the Discharge Monitoring Report (DMR) data reported for total dissolved solids (TDS) (method and interpretation) and that no violation of the existing permit occurred.

**Response:** EPA acknowledges that no violation for TDS occurred for the second half of 2005 since the limit of 5,000 mg/L did not become effective until one year after the effective date of the permit (September 2005). EPA has corrected the Statement of Basis.

- The permittee notes that the Statement of Basis indicates that two ranchers submitted documentation of the beneficial use of the discharge, when in fact the two letters actually represent five ranchers.

**Response:** EPA acknowledges the correction and has updated the Statement of Basis.

- The permittee commented that the Statement of Basis contains an incorrect statement on the limits for conductance, chloride, sulfate, and TDS, asserting that they have been in effect as long as the facility has been covered by National Pollutant Discharge Elimination System (NPDES) permits. The permittee noted that these specified limits have only been in place since the 2005 issuance of the permit.

**Response:** *EPA concurs that this is an error and has removed the sentence.*

7. The permittee commented that if a fluoride limitation of 4 mg/L or less was placed in the permit, they would likely be out of compliance based on the one effluent sample collected for permit renewal in 2010. They also stated the use of a 2 mg/L fluoride value to evaluate reasonable potential (RP) for permit limitations was overly protective of requirements under Section 20 of the Tribal water quality law.

**Response:** *EPA is not proposing to place a fluoride limitation in the permit at the present time. EPA lacks sufficient effluent monitoring data to determine the variability of the discharge and to assess the RP of the discharge. Permit monitoring requirements for fluoride will remain unchanged from the proposed permit.*

*Fluoride has had a recommended safe concentration for livestock for the last 40 years (see EPA's Water Quality Criteria 1972) the University of Wyoming Agriculture Extensions Service bulletin B-1183. After review of the comment provided, EPA did not find any additional compelling research to alter the recommended concentration of 2.0 mg/L fluoride referenced in the Statement of Basis. In addition, the numeric standards for fluoride in water for cattle consumption containing less than 2.0 mg/L of fluoride also assumes that this concentration should be safe for sheep, cervids, and horses. (1972 WQ criteria). EPA believes the 2.0 mg/L fluoride is an appropriate standard to evaluate for ensuring the discharge is of good enough quality for livestock consumption.*

1972. Water Quality Criteria 1972. Section V. National Academy of Sciences. Washington D.C. Available through <http://www.epa.gov/nscep/index.html> verified 10 March 2014. (Note: You will need to search for the specific document by title.)

2008. M. F. Raisbeck, Riker S.L., Tate C.M., Jackson R., Smith M.A., Reddy K.J., Zygmunt J.R., Water Quality for Wyoming Livestock and Wildlife: A review of the literature pertaining to the health effects of inorganic contaminants. (UW AES bulletin B-1183). Available at <http://www.uwyo.edu/ces/pubs/b1183/> verified 10 March 2014.

8. The permittee commented on monitoring requirements for fluoride, iron and zinc and suggested that sufficient monitoring data to establish RP could be obtained with the Toxic Pollutant Screen requirement. The permittee further states that data obtained during the Toxic Pollutants Screens is adequate and that quarterly monitoring for these constituents is unnecessary.

**Response:** *EPA agrees with this comment. EPA has determined, based on the limited data currently provided, that fluoride, iron and zinc are possible constituents of concern. The Toxic Pollutant Screen requirements will provide EPA with the necessary data points to make a RP determination for fluoride and iron.*

*An effluent limit has been included for zinc and will have quarterly monitoring requirements. Zinc will be excluded from the Toxic Pollutants Screen to remove duplicative monitoring requirements.*

*The proposed permit contained a Method Detection Limit table in Section 1.3.4 Toxic Pollutant Screen which implied the listed detection limits applied only to the Toxic Pollutant Screen requirements. The EPA intended to have a separate section designation for the Method Detection Limits table and has revised the Statement of Basis and Permit to reflect that the table applies to all monitoring requirements under section 1.3 of the permit. The Method Detection Limits table will be renumbered as section 1.3.5 in the final permit.*

9. The permittee argues that testing for many of the acid and base/neutral organic compounds and volatile organic compounds required in the toxic screen are unnecessary because either the pollutants are not expected to be present in the discharge (chlorinated and fluorinated compounds) or there are not aquatic life standards for the pollutants and the receiving water does not have a human health use (e.g. benzene, ethylbenzene, toluene, naphthalene, and xylene).

**Response:** *As discussed in the Statement of Basis, EPA believes there is insufficient data to fully characterize the effluent. As a result, EPA cannot determine if the discharge has RP and, thus, if effluent limitations are necessary for many pollutants expected to be present in the discharge. Although the presence of chlorinated or fluorinated compounds were not detected in the discharge during one historic monitoring event, the analytical method used for other pollutants of concern will include these compounds and EPA cannot modify the method for purposes of this individual permit. The new Toxic Pollutant Screen requirement for volatile and base/neutral organics, metals listed in 40 CFR Part 122 Appendix D, Tables II, III, and IV is necessary to provide supplemental data to EPA so that the variability of these pollutants in the discharge can be evaluated for purposes of evaluating RP of such pollutants to exceed tribally-adopted water quality requirements. Such variability is required to be evaluated under 40 CFR § 122.44(d)(1)(ii) when assessing RP with respect to EPA-approved WQSs, and therefore, EPA considered it appropriate to evaluate such variability when assessing RP with respect to tribally-approved water quality requirements. EPA believes that sufficient data will be collected as part of the Toxic Pollutant Screen requirement along with future permit re-application requirements to evaluate RP for the list of pollutants.*

*The permittee identified several of the organic constituents, i.e. naphthalene, benzene, toluene, and ethyl benzene, as lacking aquatic life standards. While EPA does not have recommended aquatic life criteria for these pollutants, the pollutants are known toxics which could contribute to whole effluent toxicity (WET) failure and violate the Tribes' narrative requirement for toxics.*

10. The permittee stated that additional monitoring for chloride and total recoverable Radium 226 should be removed from the toxic pollutants screening because the information is already provided in required monitoring. Further comments state that reported DMR data for Radium 226 misleadingly reflected only semi-annual results when in fact the permittee did the quarterly monitoring required by the permit.



**Response:** Chloride and total recoverable radium 226 were not included in the Toxic Pollutants Screen for this permit and were only included in the quarterly monitoring in the self-monitoring requirements in Section 1.3.2 of the permit. As noted in response to comment above, however, the proposed permit contained a Method Detection Limit table in Section 1.3.4 Toxic Pollutant Screen which may have caused confusion for readers. EPA recognizes this and has revised the Statement of Basis and Permit to separate the Toxic Pollutant Screen requirements, and to reflect that the Method Detection limit table applies to all monitoring requirements under Section 1.3 of the Permit.

The DMR form provides for reporting of the maximum, minimum, and average of the pollutant as well as the frequency of analysis for the reporting period. The quarterly monitoring results were reflected in the semiannual DMR in the frequency of analysis column.

11. The permittee commented that WET monitoring should not be included because they did not believe the test is appropriate for a Class 3B water.

**Response:** WET monitoring and/or limitations are appropriate for discharges containing pollutants in amounts that may cause or contribute to an excursion of numeric or narrative water quality requirements. This includes all waters classified for aquatic life use, not just large rivers. WET requirements ensure that all aquatic life uses are protected through the entire waterbody including those areas immediately downstream of a discharge. The Tribes' water quality requirements designate aquatic life as a use for Class 3B waters. Because the receiving water and the downstream Dry Creek are Class 3B waters, and because aquatic life is present in the receiving water, WET testing is appropriate for this permit.

12. The permittee commented that "The aquatic communities present in the Sheldon Dome discharge have adapted and evolved to live in the produced water under ambient discharge conditions... and there would naturally be zero aquatic life in this drainage if not for the presence of the discharge water. Under natural conditions this drainage would be totally dry **almost 100%** of the time with **no associated aquatic life.**"

**Response:** EPA disagrees with several assertions in the permittee's statements including the premise that the receiving water would contain zero aquatic life if not for the discharge. With respect to protection of aquatic life uses, EPA considered tribally adopted designated uses as well as existing uses for determining appropriate criteria for use in establishing water quality based effluent limits (WQBELs) and/or monitoring requirements. The Sheldon Dome facility discharges to an ephemeral tributary to Dry Creek, which the Tribes have designated as a Class 3B water. For the reasons described in response #3, EPA has concluded that the ephemeral tributary is also best described as a Class 3B water. Class 3B water are those waters which 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. Given this classification and description, EPA believes protection of the full potential of aquatic resources is required.

*As described in EPA's response to the permittees comments on the receiving water classification, only a small portion of the receiving stream (~0.67 stream miles of ~3.95 stream miles) may at the present time contain what the permittee described as "aquatic communities ...that have adapted and evolved to live in the produced water." EPA does not agree that this small portion of the receiving water represents the conditions of the stream nor represents the fully attainable aquatic life use that would be present if appropriate aquatic life criteria were met in the entire receiving water. Therefore, EPA believes the WET monitoring requirement is appropriate to ensure all aquatic life uses and narrative water quality requirements are maintained in the receiving water.*

13. The permittee further states "Sour oilfield discharges, such as Sheldon Dome, are likely to fail an acute WET test without extensive treatment to remove sulfide. The permittee commented that such treatment is expensive, that it is likely that it will be uneconomic for Phoenix to treat the water to remove potential toxicity, and that Phoenix would rely on injection of all of the produced water to keep this facility in compliance."

**Response:** *The EPA agrees that discharges high in sulfide like sour oilfield wastewater are likely to fail an acute WET test. No cost information was provided by the permittee on possible treatment options for sulfide (as H<sub>2</sub>S) or other information demonstrating that the injection option is the only means for facility compliance. The EPA notes, however, that it has worked with a similar facility on the Wind River Indian Reservation with a similar discharge to successfully implement a low cost treatment alternative for sulfide, and demonstrate compliance with permit WET requirements. WET requirements are established to ensure that this permit will comply with the CWA. Such treatment technology could be applied to the discharge from this facility, as well. If the permittee chooses injection as a disposal option for the wastewater, the permittee will need to comply with EPA Safe Drinking Water Act Underground Injection Control regulations.*

14. The permittee commented that on page 9 of the permit the use of the phrase "conduct an additional test within two (2) weeks of the date the permittee learned of the test failure" implied completion of an additional test within that time frame, and they suggested the word "conduct" be replaced with "initiate". The permittee also requested the timeframe for conducting an additional test be changed to four (4) weeks instead of two (2) weeks due to lab issues.

**Response:** *EPA agrees to modify the permit language to "initiate an additional test" on page 9 of the permit. EPA does not agree to change the re-testing requirement to four weeks. WET testing labs are fully equipped and prepared to conduct the testing as required by the NPDES Regulations. If the permittee's laboratory has difficulty in meeting the testing requirements in the specified time, EPA recommends the permittee pursue testing services with other qualified lab(s) to conduct WET testing.*

15. The permittee requested that the second paragraph of section 1.3.1.1., discussing monitoring and permit limits relative to periods of reinjection and discharge conditions, be removed. The permittee stated that since Phoenix has no injection capacity at this facility, the paragraph should not be included in the permit.

**Response:** *The language from Page 5 of the permit appears as follows:*

1.3.1.1. General Effluent Limitations:

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 sand).

During reinjection conditions, monitoring is not required, however, if the need to discharge into the adjacent drainageway arises, all monitoring shall be required and effluent limitations met as described in this permit.

*EPA has removed the second paragraph of this section from the final permit. All discharges must be in accordance with the terms and conditions of the permit and it is unnecessary to reiterate that those terms and conditions must be met during various production scenarios.*

16. The permittee states that Sheldon Dome effluent will not meet the proposed limit for sulfate (daily max or 30-day average). The permittee further cites the following issues: 1) the University of Wyoming report is overly conservative and highly speculative; 2) many natural sources for livestock watering in Wyoming are naturally high in sulfate; 3) there are many variables affecting the performance of livestock including breed genetics, quality of forage, living conditions, availability of water, climate, precipitation, predators, etc.

The permittee argues that the Tribal water quality requirements for agricultural water supply state that “Degradation of such waters shall not be of such an extent to cause a measurable decrease in crop or livestock production,” and that there have not been any cases of such a measureable decrease to elevated levels of sulfate or fluoride in its discharge.

**Response:** *The sulfate limitation is a technology based effluent limit (TBEL) based on an EPA Effluent Limitation Guideline (ELG), not a WQBEL based on the Tribes’ water quality requirements. Under the applicable technology-based 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.*

*The University of Wyoming Report, “Water Quality for Wyoming Livestock and Wildlife Report” (the “AES bulletin”) was published first in 2007 as a research paper and then in 2008 by the University of Wyoming Extension as Experiment Station Bulletin. (2008. M. F. Raisbeck, et al). To become an Experiment State Bulletin the document must be peer reviewed, with additional reviews from the US Department of Agriculture (USDA). EPA believes that, having gone through both peer review and review by the USDA, the AES bulletin represents the best available science concerning the effects of drinking water quality in Wyoming on livestock. EPA has no indication that the research captured in this bulletin is speculative and thus has chosen to adopt its recommendations for the purposes of writing these permits.*

*Before adopting the recommended sulfate concentrations in the AES bulletin, however, EPA evaluated them to ensure they would ensure that discharges of produced water are of good enough quality for wildlife and livestock uses. That evaluation is summarized as follows:*

*The AES bulletin includes a review of the health effects of inorganic contaminants on livestock and wildlife. The AES bulletin recommends, "Assuming normal feedstuff [Total Sulfur] concentrations, keeping water SO<sub>4</sub><sup>2-</sup> 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." The AES bulletin recommendation is based on the common understanding of total intake. The EPA evaluated this recommendation to determine the impacts of these contaminants, including sulfur, on the beneficial use of produced water, and what level of such contaminants would provide water of 'good enough quality' as contemplated in Subpart E.*

*When evaluating the Total Sulfur(S) intake by livestock, the dry matter intake and the intake of S through drinking water together yield the total intake. The National Research Council (NRC) "2005 Mineral Tolerance of Animals: Second Revised Edition" recommends maximum tolerable levels (MTL) for a variety of minerals. The MTL is the maximum intake of a mineral that an animal can ingest without suffering adverse effects, and is typically presented as a concentration in feed or water. The 2005 NRC report recommends an MTL for sulfur of 0.5 % of the daily intake of feed and water based on dry weight equivalent for ruminants fed diets of at least 40% forage. EPA used this MTL as the basis for evaluating what concentration of sulfur in produced water discharges would be of good enough quality for cattle. EPA assumed that if the total concentration of sulfur in feed and water for cattle was greater than .5%, the cattle would suffer adverse effects and the water would not be of good enough quality.*

*For purposes of this analysis, EPA assumed that 100% of feed for cattle consuming the produced water discharges is forage. A University of Wyoming Extension document looked at forage mineral concentrations, including Sulfur in Big Horn County, Wyoming (See Horn No Date). This document provided the following concentrations:*

- 0.17 % S Median*
- 0.17% Mean*
- 0.22% was 85 %tile*
- 0.26% was the 95<sup>th</sup>tile.*

*EPA is confident that this data indicates Wyoming forage concentrations range from 0.1% to 0.3% S with an average of approximately 0.2% (see Horn). These concentrations are also reflected in the AES bulletin, which assumed sulfur concentrations in forage of 0.1%S, 0.2%S and 0.3%S on a dry matter basis.*

To determine likely total sulfur intake for cattle consuming produced water discharges, EPA utilized a sulfur calculator developed by Colorado State University Veterinary Teaching Hospital. EPA looked at each forage S content (0.1%, 0.2%, 0.3%) with various concentrations of sulfate, ranging from 500 mg/l to 4,000 mg/L. The calculator EPA employed the following assumptions and inputs when running the sulfur calculator:

1. Young rapidly growing cattle 600# Estimate at 7-9 months
2. Recently placed on water
3. Mineral Tolerance of Animals 2005
4. Maximum Tolerable Levels (Sheep and Cattle) as 0.3 %Dry Matter for those on High Concentrate diet
5. 0.5% as Dry matter for high forage diet (as % DM includes Food and Water). We used 0.5%
6. For Calculation used Sulfur calculator from CO VTH at <http://dlab.colostate.edu/webdocs/tools/sulfurcalc.cfm>
7. Three temperatures used to describe the impact of additional water intake at higher temperatures.
8. Area shaded greater than or equal to 20% above MTL of 0.5% S as DM

The sulfur calculator generated the following output for forage with .1%S:

In-take of S as % DM			
Feed 100% - 0.1%	Air Temperature		
SO <sub>4</sub> in H <sub>2</sub> O (mg/L)	40°F	70°F	90°F
500	0.15	0.17	0.22
1000	0.21	0.23	0.34
1500	0.26	0.3	0.46
1800	0.29	0.34	0.53
2000	0.31	0.37	0.58
2500	0.37	0.43	0.7
3000	0.42	0.5	0.82
3500	0.47	0.57	0.94
4000	0.53	0.63	1.06

The sulfur calculator generated the following output for forage with .2%S:

In-take of S as % DM			
Feed 100% - 0.2%	Air Temperature		
SO <sub>4</sub> in H <sub>2</sub> O (mg/L)	40°F	70°F	90°F
500	0.25	0.27	0.32
1000	0.31	0.33	0.44
1500	0.36	0.4	0.56
1800	0.39	0.44	0.63
2000	0.41	0.47	0.68
2500	0.47	0.53	0.8
3000	0.52	0.6	0.92
3500	0.57	0.67	1.04
4000	0.63	0.73	1.16

The sulfur calculator generated the following output for forage with .3%S:

In-take of S as % DM			
100% - Feed 0.3%	Air Temperature		
SO <sub>4</sub> in H <sub>2</sub> O (mg/L)	40°F	70°F	90°F
500	0.35	0.37	0.42
1000	0.41	0.43	0.54
1500	0.46	0.5	0.66
1800	0.49	0.54	0.73
2000	0.51	0.57	0.78
2500	0.57	0.63	0.9
3000	0.62	0.7	1.02
3500	0.67	0.77	1.14
4000	0.73	0.83	1.26

These three charts indicate that at all concentrations of S in forage there is a direct relationship between water intake and temperature: the higher the temperature the greater the water intake. As a result, as temperature increases, the total intake of sulfate (and, therefore, sulfur) also increases. UW AES bulletin B1183 utilized a forage S content of 0.2%, and the Horn study indicates that the average S content of forage in Wyoming is about .2%. As a result, EPA concluded that it is reasonable to base its analysis on an S content of 0.2% in forage for cattle on the Wind River Indian Reservation.

Thus, EPA relied upon the 0.2% forage content chart:

In-take of S as % DM			
Feed 100% - 0.2%	Air Temperature		
SO <sub>4</sub> in H <sub>2</sub> O (mg/L)	40°F	70°F	90°F
500	0.25	0.27	0.32
1000	0.31	0.33	0.44
1500	0.36	0.4	0.56
1800	0.39	0.44	0.63
2000	0.41	0.47	0.68
2500	0.47	0.53	0.8
3000	0.52	0.6	0.92
3500	0.57	0.67	1.04
4000	0.63	0.73	1.16

Assuming a forage content of 0.2%, this chart indicates that during times when the temperature is 70F, the sulfur MTL for cattle is exceeded by 20% when the water consumed by the cattle exceeds 3,000 mg/L SO<sub>4</sub>. When the temperature is 90F, the sulfur MTL for cattle is exceeded by 26% when the water consumed by the cattle exceeds 1800 mg/L SO<sub>4</sub>. EPA believes that this aligns with the AES bulletin with the same forage content of 0.2%, which recommended “keeping water SO<sub>4</sub><sup>2-</sup> concentrations less than 1,800 mg/L” to minimize the possibility of death in cattle.

As the permittee notes in its comments, the impact of the intake of sulfur (and other inorganic chemicals) in cattle and other livestock depends on many variables. These can include livestock breed, livestock producer management practices, livestock acclimation to waters with high sulfate concentrations, water management practices (e.g., mixing high sulfate concentration water with low sulfate concentration water to achieve desired ambient conditions), and many others. Thus, EPA must write permits to ensure that discharges of produced water are “of good enough quality” for livestock and wildlife regardless of other factors that come into play during the water’s beneficial use. EPA’s reevaluation of the recommendations in the AES bulletin using base information from the NRC 2005 Mineral Tolerance of Animals 2nd Revised Edition and the Sulfur calculator from Colorado State University Veterinary Teaching Hospital produced similar water quality to the recommendations in the AES bulletin. EPA has thus concluded that the recommendation made in the AES bulletin are reasonably safe for most circumstances. Moreover, EPA has found no other compelling criteria to suggest that a different sulfate limit is appropriate. As a result, the sulfate permit limitations in the final permit remain unchanged.

Horn, Blaine E. (no date) Mineral Content of Range Grass Big Horn Mountain Area. University of Wyoming Cooperative Extension Service Available at <http://www.uwyo.edu/ces/county/johnson/files/mineral-report.pdf> verified 18 March 2014.

2005. National Research Council. *Mineral Tolerance of Animals: Second Revised Edition*. Washington, DC: The National Academies Press, 2005 Available from [http://www.nap.edu/catalog.php?record\\_id=11309](http://www.nap.edu/catalog.php?record_id=11309) verified 10 March 2014.

2008. M. F. Raisbeck, Riker S.L., Tate C.M., Jackson R., Smith M.A., Reddy K.J., Zygmunt J.R.. Water Quality for Wyoming Livestock and Wildlife: A review of the literature pertaining to the health effects of inorganic contaminants. (UW AES bulletin B-1183). Available at <http://www.uwyo.edu/ces/pubs/b1183/> verified 10 March 2014.

Sulfur calculator from CO VTH at <http://dlab.colostate.edu/webdocs/tools/sulfurcalc.cfm>

17. The permittee commented on sulfide toxicity and the relationship between total sulfides and the dissociation product hydrogen sulfide. The permittee requested the limit for sulfide be expressed as hydrogen sulfide instead of total sulfide.

**Response:** *EPA agrees with the permittee that the effluent limitation in the proposed permit was expressed incorrectly as total sulfide. The references to "sulfide" in the effluent limit table in Section 1.3.1.3 and the monitoring requirement table 1.3.2 and footnote d of that table have been replaced with "sulfide as H<sub>2</sub>S." Since there currently is no approved analytical method for sulfide (as H<sub>2</sub>S) under 40 CFR Part 136 which can detect the pollutant at that low of a concentration, EPA added in a Reporting Level for sulfide (as H<sub>2</sub>S) in the final permit of 0.10 mg/L (100 µg/L) which is achievable under the approved procedures of 40 CFR Part 136. As described in the permit, any detection of sulfide (as H<sub>2</sub>S) above the Reporting Level will be considered a violation of the permit. Values reported below 0.10 mg/L (100 µg/L) will be considered in compliance with the permit conditions.*

18. The permittee commented that the proposed limit for total sulfide is not appropriate for the type of receiving water and that although EPA has allowed a compliance period in the permit to achieve the limitation, they will not be able to meet the limit without "extensive treatment" and they would rely on 100% injection of the produced water.

**Response:** *EPA disagrees that the limitation for sulfide (as H<sub>2</sub>S) is not appropriate for the receiving water. As explained above in the response to previous comments, the receiving water is a Class 3B water, and the permit limitation is based on protection of the aquatic life designated use for that class. The aquatic life criterion for sulfide as H<sub>2</sub>S, 0.002 mg/L, is contained in the Tribes' water quality requirements, and the value is equivalent to EPA's published recommended criterion for sulfide (as H<sub>2</sub>S) for protection of aquatic life. Since there is no dilution available in the receiving water, the value is to be met at the end of the pipe.*

19. The permittee commented that the proposed limit for chloride should not be applied to a Class 3B receiving water and the permit conditions be changed back to the previous permit limit of 2000 mg/L.

**Response:** *EPA established a new permit limit for chloride based on protection of the aquatic life use of the receiving water. The chloride criteria for acute and chronic receiving water concentrations were adopted by the Tribes and are equivalent to EPA's 304(a) recommended water quality criteria for protection of aquatic life. The acute and chronic criterion were established as daily maximum 860 mg/L and monthly average 230 mg/L due to the lack of dilution in the receiving water. See response to comments #12 and #18 above.*



20. The permittee requested that the existing oil and grease monitoring frequency (i.e., monthly) be retained, rather than the new weekly monitoring requirement in the proposed permit. The permittee stated that the existing oil and grease monitoring frequency has been adequate to detect any oil and grease pass through at this facility.

**Response:** *After reviewing the compliance monitoring information submitted by the permittee, EPA believes the increase in monitoring frequency for Oil and Grease is appropriate due to the frequent reporting of results close to the permit limit of 10 mg/L. The average concentration reported in the fourteen results reported since 2005 was 9.0 mg/L and 71% (10/14) of those results exceeded 9.3 mg/L Oil and Grease. EPA therefore believes increasing monitoring of the pollutant is appropriate and a weekly frequency will be retained in the final permit.*

21. The permittee requests that the implementation of the mercury monitoring plan be based on two mercury samples exceeding 0.77 mg/L rather than one. The permittee believes any detection of mercury in a sample will likely be due to lab error, and argue that is likely the case of the October 25, 2005 sample. Re-analysis of the same sample or analysis of a follow up sample is needed to validate the mercury results over 0.77 mg/L. The permittee further requests that any mercury monitoring requirements and permit limits be based on dissolved mercury instead of total mercury, as dissolved mercury would be the bio-available form. A dissolved mercury standard, for purposes of aquatic life protection, would be consistent with the Tribes' water quality requirements.

**Response:** *The permittee has submitted no documentation to substantiate that the results from the 2005 sample were due to lab contamination. However, an older mercury sampling and analysis method was used at that time. Use of proper sampling and lab techniques for analysis is critical; the permit requires use of clean methods and should be strictly adhered to. Any exceedance of the 0.77 mg/L using the proper sampling and analytical methods would be a cause for concern and a second sample is not necessary. The EPA disagrees with the request that any mercury monitoring requirements and permit limits be based on dissolved mercury. The total mercury monitoring requirements and permit limits are based on the EPA recommended water quality criteria and the Tribes' water quality requirements, which are expressed as the total recoverable form and which include the dissolved and suspended fractions. Therefore, the EPA is not going to change these requirements in the permit.*

22. The permittee requests a compliance schedule for all new or more stringent effluent limits in the final permit for which they cannot immediately achieve compliance.

**Response:** *EPA agrees the facility cannot meet the proposed discharge limitations for sulfate, sulfide, and chloride without treatment and will address each pollutant separately due to the basis of the limit. EPA's ability to provide a period of compliance under the Clean Water Act (CWA) and the NPDES permitting rules at 40 CFR Part 122 is limited. Section 301(b)(1)(A) requires point sources to immediately comply with effluent limitations based on technological standards. As a result, compliance schedules providing for a delay in achieving compliance are unavailable for TBELs. However, EPA has long interpreted CWA Section 301(b)(1)(C) as allowing compliance schedules for WQBELs if authorized under State law. See *In the Matter of Star-Kist Caribe, Inc.*, 3 E.A.D. 172, 175, 177 (1990); Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits, memorandum from James Hanlon, Office of Wastewater Management to Alexis Strauss, Director, Water Division, Region 9, May 10, 2007.*

*The Tribes have adopted water quality requirements that include a provision authorizing the use of compliance schedules. Thus, compliance schedules are available for WQBELs in this permit.*

*The permit limit for sulfate is a TBEL under 40 CFR Part 435, Subpart E. As a result, a permit compliance period is not allowed for this pollutant. The permit limits for chloride and sulfide are WQBELs based on the Tribes' water quality requirements. As a result, EPA has provided a 36-month compliance period in part 1.3.3. of the permit.*

23. A comment was received stating that the existing beneficial use of water would be jeopardized by the loss of the discharge. The comment supported the use of the discharge in providing riparian habitat and benefits to aquatic and non-aquatic life including plants, as well as domestic and wildlife uses, in an area where little or no water is available for this type of habitat or uses.

**Response:** *EPA understands that the discharge currently provides riparian meadow/wetland and open surface water habitat for many aquatic and non-aquatic species, as well as providing a source of drinking water for livestock and terrestrial wildlife. EPA evaluated appropriate water quality criteria for aquatic life, and livestock and wildlife, in establishing the effluent limitations for the renewal permit. The new and revised permit limitations will ensure that the discharge quality is sufficient to maintain both aquatic life and agricultural/wildlife uses in those riparian/wetland and open water areas.*

**Response to General Comments on Permits  
WY-0020338, WY-0024953, WY-0024945, WY-0025232, WY-0025607  
March 9, 2015**

Beginning on June 10, 2013, EPA took public comment on five National Pollutant Discharge Elimination System (NPDES) permits for the discharge of produced water during the same public comment period. Many comments were applicable to all five permits. Those general comments and responses are represented in this document.

**Hydraulic Fracturing:**

EPA received a significant number of comments addressing various issues related to hydraulic fracturing or fracking. These issues can be broadly summarized as comments regarding the permitting process, permit implementation and permit enforcement.

Several commenters posed questions or raised concerns about the adequacy of EPA's permitting process as it relates the regulation of discharges from oil and gas operations that engage in hydraulic fracturing. One commenter stated that EPA should require oil and gas operators to prove that a discharge is not unsafe before permitting a discharge. Some commenters questioned what authorities EPA relies upon to write NPDES permits for these operations; others questioned the process employed to develop permit limitations. Other commenters raised concerns about the protectiveness of the permits and the long term consequences on human health and the environment, including effects on air quality and the human food chain.

***Response:***

*NPDES Permitting Authority:* EPA's authority to issue NPDES permits derives from authorities granted to the Administrator by Congress in the Clean Water Act (CWA). These authorities are not unlimited, and NPDES permits may only include conditions that implement the requirements of the CWA and its implementing regulations.

*CWA Section 301(a) prohibits the discharge of any pollutant by any person except in compliance with certain requirements of the CWA, including Sections 301 and 402. CWA Section 402 authorizes EPA to issue permits for discharges of pollutants that meet all applicable requirements under Section 301, among other provisions. CWA Section 501 authorizes EPA to promulgate regulations to carry out the function of the CWA.*

*Section 301(b) requires point sources to achieve two different types of effluent limits. Section 301(b)(1)(A), which applies to non-municipal point sources such as oil and gas operations, requires point sources to achieve technology based effluent limitations (TBELs) established pursuant to CWA Section 304(b). Section 304(b) authorizes EPA to publish effluent limitation guidelines (ELGs) for classes and categories of point sources. Under this provision, EPA has promulgated a wide variety of ELGs that establish limitations for pollutants discharged by the industry covered by a particular ELG. The ELGs EPA has developed to-date for different industries are contained in 40 CFR parts 425-471.*

*When EPA has promulgated an ELG, Section 301(b)(1)(A) requires the effluent limits it contains to be incorporated into a NPDES permit for a point source subject to the ELG. EPA has promulgated an ELG that applies to oil and gas facilities on the Wind River Indian Reservation at 40 CFR Part 435, Subpart E – Agricultural and Wildlife Water Use Subcategory.*

*Section 301(b)(1)(C) requires all point sources to implement controls necessary to achieve ‘any more stringent limitation, including those necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations, . . . or required to implement any applicable water quality standards established pursuant to this chapter.’ Effluent limitations based on these types of requirements are known as water quality based effluent limitations (WQBELs), and are included in permits if “any more stringent limitation” beyond TBELs is required under Section 301(b)(1)(C). The Eastern Shoshone and Northern Arapaho Tribes (the Tribes) of the Wind River Indian Reservation have adopted water quality requirements into Tribal law, and EPA has included WQBELs based on these requirements under section 301(b)(1)(C) and principles of tribal sovereignty.*

*NPDES Permit Process: EPA’s authority to issue NPDES permits derives from CWA Sections 402 and 301, as described above. The procedures for issuing NPDES permits are found in 40 CFR Parts 122, 124 and 125. The permitting process begins when an operator of a point source submits an individual permit application pursuant to 40 CFR § 122.21. Existing oil and gas operations must include the information required by 40 CFR §§ 122.21(f)-(g) in their permit application. Upon receipt of a permit application, the permit writer uses information in the permit application to identify the pollutants of concern in the discharge, and to characterize their nature and quantity in the effluent.*

*Having characterized the effluent discharge, the permit writer then develops technology-based effluent limits for those pollutants. For the permits being issued today, the TBELs are based on the ELG at 40 CFR Part 435, Subpart E. This ELG provides at 40 CFR § 435.50 that produced water may only be discharged if it is 1) of good enough quality to be used for wildlife or livestock watering or other agricultural uses, and 2) it is actually put to that use. Thus, for purposes of developing conditions for these permits, the permit writers relied upon research and data concerning the effects of produced water on livestock and wildlife to determine what level of effluent could be considered “of good enough quality.”*

*Once the permit writer has developed TBELs, they must then determine whether any “more stringent limitation” is necessary to protect water quality under section 301(b)(1)(C).*

*To begin the WQBEL development process, the permit writer must identify the applicable water quality requirements that address the pollutants of concern in the discharge. Typically, these are State water quality standards composed of designated uses for the receiving water and the pollutant-specific criteria necessary to protect the designated uses. For the permits being issued today, the applicable water quality requirements are found in Tribal law adopted by the Tribes. These Tribal requirements also contain designated uses and pollutant-specific criteria. Once the water quality requirements are identified, the permit writer then determines whether dilution is available in the receiving stream, and what concentrations of each pollutant are expected in-stream under critical low-flow conditions.*

*If this analysis demonstrates that in-stream concentrations are reasonably expected to exceed the criterion for a pollutant contained in the water quality requirements, then the permit writer must translate the applicable criteria into a WQBEL for that pollutant.*

*Having established effluent limits for a permit, the permit writer must determine what monitoring and reporting requirements will be included in the permit. The regulatory bases for establishing such requirements are found at 40 CFR §§ 122.41(j)-(l), 122.42(a), 122.44(i), 122.45(e)-(f), and 122.48. Permit monitoring requirements have three primary purposes: 1) determining compliance with effluent limits, 2) creating a basis for enforcement decisions, and 3) other goals such as characterizing effluents and assessing treatment efficiency. The permit writer must establish monitoring locations, monitoring frequency, and sampling and analytical methods. Finally, most permits require monitoring results to be reported to EPA using a Discharge Monitoring Report (DMR).*

*Permit writers also include standard conditions and, as necessary, special conditions in permits. Standard conditions, which are found at 40 CFR §§ 122.41 & 122.42, are included in every permit and provide the means by which the permit is implemented and enforced by the permittee and EPA. Special conditions are included as necessary to address unique situations. Special conditions may include pretreatment requirements, compliance schedules, and additional monitoring or special studies to be used in the development of future limitations. The permits being issued today include special conditions relating to compliance schedules for certain parameters and additional monitoring for toxics and mercury.*

*The permit development process outlined above applies to all NPDES permits, including permits for discharges that may contain hydraulic fracturing wastes. Thus, EPA followed the process outlined above in drafting the permits that are the subject of this document. The permitted facilities submitted timely permit renewal applications containing the information required by 40 CFR §§ 122.21(f) & (g). While EPA has not required the permittees to prove that their discharges are not unsafe, it has – as it would in any permit development process – relied on the information and research at its disposal to develop appropriate permit limits consistent with the CWA and its implementing regulations. As described in the Statement of Basis, EPA developed the effluent limits in these permits using a number of technical documents, as well as information in similar Wyoming oil and gas permits and the Tribes' water quality requirements. In instances where information necessary to develop an effluent limitation is unavailable, EPA has included monitoring requirements to gather sufficient information for the development of such limits in future permit cycles. EPA is confident that the permit development process for these permits fully accords with the statutory and regulatory requirements of the CWA, and disagrees that this process is or was inadequate.*

*Permit Protectiveness/Long-Term Consequences: EPA developed these NPDES permits using the authorities and process described above. The permits include TBELs based on the Subpart E - Agricultural and Wildlife Water Use ELG, and WQBELs based on the Tribes' water quality requirements adopted into Tribal law. The TBELs EPA has developed for sulfate, specific conductance, chloride and TDS are based on the latest research, contained in the administrative record, concerning the effects of these pollutants on agricultural and wildlife use. The limits ensure that animal consumption of the discharged water will not cause acute or chronic health effects that would render the water unsuitable for agricultural or wildlife use.*

*The remaining effluent limitations in the permits are WQBELs written to protect the quality of the receiving waters for these discharges. EPA has treated each of these receiving waters, four of which are not classified in the Tribal water quality requirements, as Class 3B waters. Class 3B waters are defined in tribal water quality requirements as follows:*

(ii) 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.

*Uses designated for Class 3 waters in tribal water quality requirements, generally, include aquatic life other than fish, recreation, wildlife, industry, agriculture and scenic value. As the Class 3B definition, and information in the permit applications regarding livestock watering, makes clear, the primary uses of the receiving water for these permits are aquatic life and livestock watering. There are no drinking water or primary or secondary contact recreation uses. Thus, the WQBELs are written to meet criteria that protect the designated aquatic life and livestock watering uses, not other uses (e.g., human health, food chain, etc.) that commenters suggest should be the basis for the WQBELs. WQBELs cannot be written to meet designated uses that have not been adopted for the waterbody. Similarly, these are NPDES permits for discharges of pollutants to water, and thus written to meet the requirements of the CWA and implementing regulations – not to address potential air quality impacts of these facilities subject to regulation under the Clean Air Act.*

Several commenters had questions about permit implementation, and the permittees' responsibility to treat wastewater from fracking, to self-monitor, and restore water impacted by drilling and fracking. One commenter asked for the amount of water polluted per well fracked.

**Response:** *As described above, EPA develops NPDES permits with TBELs and WQBELs that set limits on the concentrations of pollutants in the discharge. Permittees have to ensure their discharges meet those limits, but EPA does not specify the treatment that must be used. The permits require the permittees to monitor for pollutants at regular frequencies to ensure that the effluent limits are being achieved and to gather data which may be used in future permits. These monitoring provisions, which are discussed in greater length in the Statement of Basis for each permit, include the Self-Monitoring Requirements (Part 1.3.2), the Toxic Pollutants Screen (Part 1.3.4), the Acute Whole Effluent Toxicity (WET) Monitoring (Part 1.3.6), and the Chemical Inventory Reporting Requirement (Part 1.3.9). The permittees submit the sampling and analysis results of the self-monitoring quarterly; the Toxic Pollutants Screen results on the 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> years of the permit cycle; and the WET results quarterly or annually depending on the frequency of the testing. The permittees submit the chemical formulation, concentration and discharge volume of well treatment chemicals in their chemical inventory only in event of a discharge of such chemicals. The effluent limits in NPDES permits are developed to protect the designated uses. As a result, there are no restoration requirements in NPDES permits and EPA lacks the authority to include them.*

*The amount of pollutants permitted to be discharged by a well subject to hydraulic fracturing is a function of the concentration of pollutants discharged and the volume of discharge. This varies by well.*

Several commenters asked about permit enforcement, and how EPA will hold the permittees accountable for environmental damage from hydraulic fracturing. Commenters specifically mentioned environmental restoration, restitution, and bonding. They also asked how EPA will ensure transparency of the fracturing process, assess environmental damage, and correlate human health issues with fracking.

***Response:** As described above, the CWA gives EPA the authority to regulate the discharge of pollutants in wastewater. Thus, with these permits, EPA is not regulating the process of hydraulic fracturing, or directly monitoring that process or its effects. Rather, these NPDES permits are written to conform to EPA's CWA authority and regulate the discharge of produced water from the five oil and gas facilities to surface waters. The effluent limits in the permits were developed to protect water quality and the designated uses.*

*EPA evaluates effluent data from the facilities and inspects them to ensure compliance with the permit. In the event of NPDES permit violations, EPA can order the permittee to take steps to return to compliance and levy substantial fines. A permittee who has violated the law can voluntarily agree to conduct a supplemental environmental project to offset part of the fines; these environmentally beneficial projects relate to the violation in some way, but must be beyond what the permittee is required to do by the law.*

*For members of the public wishing to obtain additional information regarding the nature of discharge from these facilities, the permit applications, permits, and effluent data are publicly available on EPA's Envirofacts website. The information on this website is updated periodically as permittees submit effluent data.*

Other commenters state that the science used to make determinations for these permits is outdated and asks EPA to consider pending [unspecified] WQS to address fracking.

***Response:** The EPA considered tribally adopted existing uses as well as designated uses for determining appropriate criteria for use in establishing water quality based permit limitations. Commenters did not provide enough information about the other WQS to which they were referring to evaluate the comment any further.*

### **Beneficial Use:**

Commenters stated that if the facilities decide to cease discharging, local ranchers will lose access to the facilities' surface water discharges, which provide rangeland resources where there is little or no other water available. Commenters also assert that loss of the surface water discharge will have a negative effect on wildlife, tribal livestock ranching operations, and riparian wetland habitat, as well as cause damage to stream channels. Commenters argue that the loss of water for cattle will force ranchers out of the livestock business.

Some commenters stated that the discharged water supports beneficial uses and is of good enough quality for use by wildlife and livestock.

Other commenters stated concerns regarding the damage that hydraulic fracturing-related activities will cause on both surface water and groundwater sources, and voiced concerns over potential harm that hydraulic fracturing waste products may cause to indigenous species and aquatic habitat. Additionally, commenters asserted that hydraulic fracturing could cause earthquakes.

**Response:** *EPA notes that commenters provided both negative and positive comments on the beneficial use of produced water. EPA did not write the five permits to guarantee or prohibit the ongoing discharge of that water. Rather, EPA developed the permit limitations in each permit to meet the technology-based requirements of 40 CFR Part 435, Subpart E, which prohibits the discharge of produced water unless “it is of good enough quality to be used for wildlife or livestock watering, or other agricultural uses.” EPA also included permit limitations to ensure that discharges meet the tribally adopted water quality requirements that apply to the receiving water. EPA developed the permit limitations and monitoring requirements after a thorough evaluation of available information sources including the tribally adopted water quality criteria for pollutants present in the discharge, and available data on the effects of these types of pollutant discharges on wildlife, aquatic life and livestock. The administrative record for the final permits includes all references used in the evaluation. The resulting limitations that are included in the final permits ensure that the discharged produced water is good enough quality for wildlife and livestock use, and will not exceed the tribal water quality criteria for protection of aquatic life.*

*It is important to note that EPA's rules and policies for preparing NPDES permits do not include a process for the direct accounting of the economic impacts of particular permit decisions. Instead, economic impacts are considered during the development of effluent guidelines such as 40 CFR Part 435 under Section 304 of the CWA and WQS under Section 303 of the CWA.*

One commenter stated that the proposed discharges from the five permitted facilities do not qualify for the agricultural and wildlife use exemption contained in 40 CFR Part 435, Subpart E because the discharges are not composed exclusively of produced water. The commenter stated that EPA regulations and supporting technical documents indicate that fracking flowback and used well treatment fluids do not qualify as produced water, based on the regulatory text and supporting technical documents. The commenter concluded that EPA did not consider the presence of fracture chemicals in produced water while developing 40 CFR Part 435, Subpart E, and did not expect them in waste streams.

**Response:** *The ELG in 40 CFR Part 435, Subpart E – Agriculture and Wildlife Water Use Subcategory, is applicable to onshore oil and gas facilities in the continental United States west of the 98<sup>th</sup> meridian that generate produced water that has a use in agriculture and wildlife propagation. If an oil and gas facility is so situated, then its produced water may be discharged subject to the requirements of 40 CFR § 435.52.*

*Section 435.52 establishes two limitations related to produced water: a numeric limitation and a narrative limitation. The numeric limitation on produced water is an oil and grease limit of 35 mg/L. The narrative limitation is a broad prohibition, with one exception, against the discharge of waste pollutants from oil and gas facilities. It provides:*



*“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).”*

*The regulation identifies five activities undertaken at oil and gas facilities: production, field exploration, drilling, well completion, and well treatment. The regulation also identifies, in parentheses, four sources of pollutants associated with oil and gas activities: produced water, drilling muds, drill cuttings, and produced sands. EPA has historically read the parentheses in the regulation to identify the sole four pollutant sources associated with oil and gas activities subject to Subpart E. Thus, all pollutants must be identified with a particular source. If a pollutant is contained in drilling muds, drill cuttings or produced sands, it may not be discharged. If a pollutant is contained in produced water, it may be discharged. Because the list of pollutant sources in Section 435.53 is fairly limited, for the purposes of permitting, produced water may contain a variety of pollutants including those present in the formation water and those arising out of well treatment activities. Such pollutants may be discharged with the produced water so long as that water is of good enough quality for wildlife or livestock water, or other agricultural uses (i.e., “is of good enough quality), and is actually put to that use.*

*The commenter challenges EPA’s long-standing interpretation of the regulatory text of Subpart E to allow the discharge of produced water that contains well treatment wastes, so long as it is of good enough quality. The commenter includes citations to some sections of the technical development document (TDD) EPA issued in September 1976 as it prepared to promulgate the interim final rules for Part 435. The TDD, titled “Development Document for Interim Final Effluent Limitations Guidelines and Proposed New Source Performance Standards for the Oil and Gas Point Source Category,” compiled EPA’s findings concerning the nature and treatment of wastewater discharges from oil and gas operations, both onshore and offshore. Among other things, the TDD divided the oil and gas industry into the different sub-categories currently found in Part 435, and recommended ELGs for each category. In doing so, the TDD characterized the waste streams generated by these different industry categories.*

*EPA agrees that certain parts of the TDD appear to state that well treatment and well workover fluids are a separate waste stream from produced water. However, the TDD is not uniform in this regard, and ultimately EPA has treated well treatment and well workover wastes as part of the production waste stream, which includes produced water. The TDD provides support for this approach. In characterizing these waste streams in the TDD, EPA clearly understood that well treatment and well workover wastes are similar to those produced by drilling and production activities. TDD, p. 41. More specifically, EPA anticipated that spent well acidizing and fracturing fluids are wastes that “are moved through the production, process and treatment systems after the well begins to flow again. Therefore initial production from the well will contain some of these fluids.” TDD, p. 23. Ultimately, EPA concluded that spent acid and fracturing fluids “do not appear as a discrete waste source.” TDD, p. 96. For most onshore oil and gas operations (i.e., those covered by Subpart C), this finding has no effect, as those operations are prohibited from discharging pollutants associated with produced water. However, because Subpart E does allow the discharge of pollutants in produced water, this finding supports EPA’s historic understanding of the regulatory language at Subpart E allowing discharge of well treatment wastes that appear in produced water, as long as it is of good enough quality to be used for wildlife or livestock watering or other agricultural uses and that produced water is actually put to such use during periods of discharge.*

*In the context of the TDD, the text of the regulatory language makes sense. While well treatment is a separate activity from the basic process of production, the waste streams are similar. Production entails the flow of oil and produced water from the well bore. When such flows wane, sands, acids, and other fluids are pumped down the well bore to stimulate additional production. Depending on rates of mixing, residence time downhole, and other factors specific to the well bore and the producing formation, the chemicals placed downhole return to the surface over time along with produced water and oil. For this reason, both the onshore ELG (i.e., Subpart C) and the agriculture and wildlife use ELG (i.e., Subpart E) do not refer to well treatment as a separate source of wastes. The onshore ELG prohibits discharge of all wastes, and the agriculture and wildlife ELG require treatment of wastes to ensure that the produced water is of good enough quality before it can be discharged.*

Several commenters requested that EPA not renew the permits. Some suggested they should not be renewed because the water cannot be of good enough quality for wildlife.

***Response:*** *EPA disagrees that the water cannot be of good enough quality for wildlife. Beyond the good enough quality issue commenters did not provide any specific reason why EPA should not renew these permits. EPA can only terminate an NPDES permit or deny permit renewal for specific reasons outlined at 40 CFR § 122.64, including noncompliance by the permittee with the permit; a determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit termination or modification; or a change in condition that requires temporary or permanent reduction or elimination of the discharge such as plant closure or termination of the discharge by connection to a publicly-owned treatment works.*

### **Clean Water Act:**

Commenters stated that EPA has ignored its CWA NPDES authority by failing to require the five permitted facilities to disclose or list chemicals used in the oil and gas extraction process.

***Response:*** *The NPDES authority under Section 402 of the CWA and implementing regulations under 40 CFR Part 122 control the discharge of pollutants. In response to comments received on chemical usage at these facilities, EPA has added a new permit condition including a chemical inventory requirement to maintain records on the types, quantities and chemical formulations used in well treatment and workover activities and an additional reporting requirement for well treatment and workover fluids if these fluids are discharged.*

Comments stated that the NPDES regulations for Oil and Gas Production in 40 CFR Part 435 Subpart E are outdated and did not consider fracking chemicals. Comments stated that fracking-related activities are exempt from major environmental laws that currently protect the public and the oil and gas industry does not have to comply with key provisions of the CWA. Other comments suggested that EPA should ban all fracking.

***Response:*** *EPA takes note of these comments, but is not responding. These comments are outside the scope of the NPDES permitting process.*

### **Compliance Schedules for Sulfide:**

One commenter stated that the permits do not protect the aquatic life use and are contrary to the CWA because the permits provide a three-year compliance schedule to achieve compliance with the WQBEL for sulfide.

***Response:** EPA has long interpreted CWA Section 301(b)(1)(C) as allowing compliance schedules for WQBELs if a State has indicated that it intends to allow them. See In the Matter of Star-Kist Caribe, Inc., 3 E.A.D. 172, 175, 177 (1990). The Tribes have adopted water quality requirements that include a provision authorizing the use of compliance schedules. Thus, because the effluent limit for sulfide is a WQBEL written to protect the aquatic life use of the receiving water, the compliance schedule for sulfide is consistent with the CWA and EPA's regulations.*

### **Monitoring/Disclosure of Toxic Chemicals:**

Several commenters noted that toxic chemicals from fracking and well maintenance are not listed in the permit, expressed concern that EPA is not addressing the toxicity from these chemicals, and stated that effluent limits should be established. Commenters specifically questioned the lack of limitations to protect public health for the chemicals glycol, xylene, ethylene glycol, benzyl chloride, isopropanol, and naphthalene. Commenters also noted that the health effects for many of these chemicals are unknown and therefore the permit limits don't protect public health.

Commenters also stated the permits should mandate the testing of chemicals that, while not listed in the Tribes' water quality requirements, have material safety data sheet information indicating they could pose animal and human health risks. Commenters also noted that the chemicals the companies used are proprietary and are not released for review. A related comment states that only one permit (Phoenix-Sheldon Dome) listed the trade names of the maintenance fluids used and that it is dangerously inconsistent for the other Wind River permits to exclude this similar product information.

Commenters stated that Wyoming requires operators to provide a full list of chemicals they propose to use in fracturing and requires operators to disclose the chemical abstract service numbers for all additives used along with the concentrations of those additives.

Comments expressed concern that the WET monitoring frequency and the toxics pollutant screen frequency do not adequately represent the discharge, particularly related to well maintenance and fracking. Comments suggest that monitoring should be tied to fracking or well treatment events.

***Response:** EPA is providing below a more detailed rationale with respect to permit discharge limitations and/or monitoring requirements associated with on-site activities which include well maintenance, produced water treatment, and well treatment (stimulation).*

*Well Maintenance and Produced Water Treatment: Produced water is generated by the operation as long as the well is in production. The amount of produced water varies depending on many individual factors at the well. In some cases, produced water from one individual oil production well is treated and discharged while in other cases, produced water from multiple wells is comingled and sent to a common treatment system and then discharged.*

*Some activities such as produced water treatment occur on a continuous basis. Some activities such as well maintenance occur at frequent regular intervals, e.g. biweekly. Due to the physical layout of the produced water treatment systems in place (emulsion breaking, heat treating, oil water separation, and holding ponds) the produced water discharge has a high probability of containing pollutants originating from both well maintenance activities and produced water treatment activity at any time.*

*EPA evaluated material safety data sheet (MSDS) chemical information for produced water treatment and well maintenance with usage frequency for one facility, Phoenix Production Sheldon Dome (WY-0024953). The information was used to evaluate if there was reasonable potential (RP) to cause an excursion above Tribal water quality criteria for any of the chemical substances listed in the MSDS sheets. EPA found there were only two pollutants in the maintenance and produced water treatment fluids that may occur at a concentration in the discharge which demonstrated RP to exceed water quality criteria established by the Tribes or published EPA water quality criterion established under Section 304(a) of the CWA. As explained in the Statement of Basis for that proposed permit, those pollutants were zinc and trimethyl benzene. A limitation was placed in that permit for zinc. For trimethyl benzene, an appropriate monitoring method could not be established due to the lack of an approved analytical method under 40 CFR Part 136 or other readily available analytical method. Only one potential solid waste analytical method was found that required a procedure modification to quantify trimethyl benzene. EPA determined the use of this method with the modification would be impractical and costly for the permittee to implement as part of a regular monitoring requirement.*

*For the other four permits, no specific information on chemicals used in the well maintenance and produced water treatment was provided in the permit applications. EPA did evaluate the permit application information and previous self-monitoring conducted by the permittees to determine whether they contain pollutants that have associated water quality criteria. Where the data indicated the presence of pollutants subject to water quality criteria, EPA sought to determine if the pollutants were present at levels that would cause or contribute to an excursion of water quality criteria. However, without the information from monitoring required in the renewal permit, a decision to include (or not) new permit limitations would be based on insufficient data (e.g. one point). Due to the lack of sufficient information on potential pollutant concentrations and the variability of those pollutants in the discharge, all the proposed permits contain monitoring requirements for metals, volatile and semi-volatile organics, and WET. These sample results will be sufficient to allow EPA to further characterize the pollutants in the discharge and, if necessary, establish limits to prevent the discharge of toxic substances in toxic amounts.*

*As explained above, chemicals associated with well maintenance activities and produced water treatment activity have a high probability of being in the discharge at any particular time. Therefore, the monitoring frequencies established in the proposed permits are appropriate to characterize the discharge of potential toxic pollutants which may be present as a result of added produced water treatment and well maintenance chemicals. Because of the likelihood that any pollutants in the well maintenance and produced water treatment fluids will be present at times during the monitoring event, the resulting monitoring data will be representative of the actual discharge.*

*Well Treatment:* For other infrequent activities such as well treatment (e.g., acidizing, stimulation), EPA did not have sufficient information on quantities and concentrations of chemical substances either provided by the permittee or available from publically available information sources (e.g., websites such as FracFocus), to assess whether any of the pollutants potentially present in the well treatment fluids will cause or contribute to an excursion of Tribal water quality requirements or cause toxicity in the produced water discharge. In order to gather more information on chemical usage in well treatment and workover activities as discussed above, EPA has added a new chemical inventory requirement. The chemical inventory requires the permittee to maintain records on the types, quantities and chemical formulations used in well treatment and workover activities; as well as instituting an additional reporting requirement for well treatment and workover fluids if these fluids are discharged.

In some cases where EPA was able to identify what pollutants are present in well treatment fluids, EPA nonetheless lacked sufficient information to develop effluent limitations. EPA evaluated well treatment chemical quantity and concentration information provided by Phoenix Production to determine whether those chemicals had RP to exceed WQS pursuant to 40 CFR § 122.44(d)(1)(i). However, EPA did not find any applicable water quality requirements established by the Tribes, or a published EPA water quality criterion established under Section 304(a) of the CWA, for the substances identified in Phoenix Production's well treatment fluids and, as a result, could not complete a RP determination.

The ability of the permittees to collect samples at the frequencies specified in the renewal permits is achievable, but can be challenging because of geographical location and physical site conditions. The locations of the facilities are very remote and are not staffed 24 hours per day. Meeting sample holding times and performing on-site testing can be difficult also due to these conditions.

Commenters suggested that monitoring requirements be tied specifically to well treatment events. Additional monitoring to try and specifically monitor (i.e., target) a produced water discharge containing well treatment fluids after a treatment was performed would require a highly complex and very expensive testing scheme that would not guarantee accurate or representative results. Targeting those discharges would require calculating, or otherwise determining, when the produced water impacted by a treatment event would actually discharge from the outfall. The presence of well treatment related pollutants at the outfall would depend on a number of site specific factors at each facility that affect hydraulic detention times and mixing characteristics, which in turn greatly influence the potential pollutant concentrations that will be present in a facility's discharge. These site-specific factors include the physical layout of the wells, the produced water treatment system in place, and the presence of final holding ponds prior to the actual discharge. EPA considered different methods of detecting well treatment pollutants in facility discharges including requiring the inclusion of "tracer" substances in the well treatment fluids, or requiring enhanced monitoring of an indicator substance such as Total Dissolved Solids (TDS) before, during and after well treatment events. These approaches could provide some indication of when the well treatment fluids and formation water mixture was actually being discharged; however, neither approach proved workable. Requiring the inclusion of a "tracer" substance in well treatment mixtures to be injected downhole would require a complex special study and extensive modeling.

*Moreover, EPA does not have CWA authority to require the addition of substances or pollutants into an actual industrial operation, such as an oil and gas well, and such activity may require modification of an Underground Injection Well (UIC) permit. Enhanced sampling of an indicator substance would require extended and frequent sampling which, given the factors described above, would be extremely difficult. Further, well treatment often uses significant volumes of water and the utility of any indicator substance would depend on the characteristics of the water used.*

*EPA does not have or has not seen sufficient compelling information from the NPDES permit application data and other information sources (i.e. Phoenix Production, FracFocus) on the chemical composition of the well treatment fluids to justify such highly complex and expensive testing requirements. However, EPA has added a requirement for a chemical inventory to the permits which will supply more data to inform future permitting.*

*More broadly, EPA is improving our scientific understanding of hydraulic fracturing and providing regulatory clarity and protections against known risks. Information on these activities is available here:*

*<http://www2.epa.gov/hydraulicfracturing>*

### **Environmental Justice:**

Comments stated that these permits as currently drafted don't serve their intended purpose of protecting water quality, public, wildlife, and livestock health and would not provide equal protection to all the citizens of Wyoming. Commenters assert that under current state regulations these discharges would not be permissible elsewhere in Wyoming, mainly based on the lack of disclosure of fracking chemicals. Permitting these discharges therefore is counter to the standards the state of Wyoming has established in the rest of the state and would unfairly burden the residents of the Wind River Indian Reservation with potential exposure to hazardous constituents in these waste streams.

***Response:** Because these permits are for discharges on the Wind River Indian Reservation, EPA has written them to meet the water quality requirements adopted into Tribal law by the Tribes. Nonetheless, the permits drafted by EPA are as, or more, stringent in controlling specific pollutants as similar permits issued by the Wyoming Department of Environmental Quality (WDEQ). Regarding the lack of a reporting requirements for well treatment and maintenance chemicals, in response to this and other comments, EPA has added a requirement that the facilities disclose any such chemicals that are discharged.*

### **Groundwater:**

Comments stated there is no discussion about the contamination of groundwater.

***Response:** These permits are for discharges to surface water. Under the CWA, EPA has only the authority to issue NPDES permits for discharges of pollutants to surface waters. EPA cannot issue NPDES permits that directly regulate discharges to groundwater.*

### **Public Health/ Effect on People/ Side Effects/Benzene:**

Commenters stated that the permits do not protect human health in their current state. Commenters stated that the permits should consider the effects of the permitted discharges on the food chain, either through the consumption of cattle that ingested the produced water or the consumption of plants irrigated by the produced water.

***Response:** As described above, EPA developed both TBELs and WQBELs for these permits. The TBELs for sulfate, specific conductance, chloride and TDS were developed to ensure that the discharges are of good enough quality for wildlife and livestock watering and other agricultural uses. EPA has historically interpreted this to mean that the water may be consumed by wildlife or livestock without causing chronic or acute health effects. Thus, the TBELs are written to protect use of the water by wildlife and livestock based on the latest research, which is contained in the administrative record for the permit.*

*The WQBELs in the permit are written to protect the aquatic life uses designated for Class 3B waters by the Tribes in their water quality laws. There are no human consumption or recreation uses designated for these waters.*

Commenters questioned the lack of limitations to protect public health for various chemicals, including glycol, ethylene glycol, benzyl chloride, isopropanol, naphthalene, and xylene. Commenters stated that the health effects for many of these chemicals are unknown and therefore the permit limits are lacking in protection of public health.

***Response:** As described above, EPA developed TBELs and WQBELs for these permits to ensure the discharges are of good enough quality for livestock and wildlife water and other agricultural uses, and to protect the aquatic life uses of the receiving waters. EPA considered tribal water quality requirements, recommended CWA 304(a) criteria, and available literature in determining whether the uses were protected and if limitations for glycol, xylene, and ethylene glycol, benzyl chloride, isopropanol, naphthalene, and xylene in the discharge would be required. The EPA determined that it is unlikely there is RP for these pollutants in the discharge to cause or contribute to an excursion of the Tribal aquatic life water quality criteria or EPA criteria. However, the EPA does not believe it has sufficient information on the concentrations of these constituents in the discharge to evaluate all applicable CWA requirements for establishing potential effluent limitations and is requiring monitoring of the effluent to gather that data. Using the information gathered during the monitoring, EPA will reevaluate the data against regulatory requirements under 40 CFR Part 122 to determine if limits are needed for future permit renewals.*

One commenter stated that because benzene levels in the discharge may be higher than a drinking water standard, there should be an effluent limit for benzene. Other commenters stated that benzene is a known carcinogen and although the stream has not been determined to be a tribal drinking water source, no level should be permitted.

**Response:** *As described above, EPA can only write NPDES permit limits - including no discharge limits – using the authorities provided by CWA Sections 301 and 402. Thus, the permit writer must determine whether a pollutant may be limited by a TBEL or a WQBEL. As described in the Statements of Basis for each permit, the permit writers had limited data regarding the concentrations of benzene in the effluent from these facilities. The permit writers reviewed the available literature on benzene to determine what concentration of benzene in the discharges would ensure that they are of good enough quality for livestock and wildlife watering, as required by 40 CFR Part 435, Subpart E. Neither EPA nor the Tribes have water quality criteria for benzene for livestock watering. Likewise, there is very little research into the effects of benzene in drinking water on cattle. The permit writers identified a single published report by the American Petroleum Institute and based on Canadian research suggesting that benzene concentrations of 31,400 µg/L in drinking water would be protective of beef cattle. This is roughly three orders of magnitude higher than the limited concentration data available to EPA for the discharges. Without a firm scientific basis to establish a TBEL based on livestock watering, permit writers could not establish a TBEL for benzene.*

*The permit writers also considered whether a WQBEL for benzene would be necessary. There are no uses of the receiving waters that implicate human health, including drinking water use or recreational uses. Thus, the only designated use for the receiving waters other than livestock watering is aquatic life. While there are recommended human health criteria and a Safe Drinking Water Act (SDWA) Maximum Contaminant Level (MCL) for benzene, there are no aquatic life criteria for benzene. Without a designated use or criterion against which to develop a discharge limit, permit writers could not establish WQBELs for benzene.*

*While EPA could not establish a TBEL or WQBEL for benzene in these permits, it recognizes that the limited dataset suggests that benzene concentrations in the effluent exceed both EPA's human health criterion and the SDWA MCL for benzene. To allow permit writers to better characterize benzene concentrations in the effluent, and thus aid in permit development in future cycles, EPA has included additional benzene monitoring of the effluent.*