

ADDENDUM
Modified 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

Permit Modification Background:

On March 12, 2015, the U.S. Environmental Protection Agency (EPA) issued five National Pollutant Discharge Elimination System (NPDES) permits to oil and gas facilities operating on the Wind River Indian Reservation (the “Reservation”) in Wyoming, which is home to the Eastern Shoshone Tribe and the Northern Arapaho Tribe (collectively, the “Tribes”). These included NPDES Permit WY-0024953, which was issued to Phoenix Production Company for its Sheldon Dome Field facility. The permit effective date was to be May 1, 2015, and the expiration date is March 31, 2020.

On April 14, 2015, the Natural Resources Defense Council (NRDC) filed with the Environmental Appeals Board (EAB) a petition for review of three of the five permits, including the Winkleman Dome permit. On that same day, Public Employees for Environmental Responsibility (PEER) filed a petition for review of all five permits. On April 29, 2015, Phoenix Production Co. filed a petition for review of the permits issued to its Rolff Lake Unit and Sheldon Dome Field facilities. On April 30, 2015, Wesco Operating Inc. filed a petition for review of the permit issued to its Winkleman Dome permit.

On May 8, 2015, the EAB issued an order consolidating the four permit appeals, establishing a new briefing schedule, and giving Region 8 and the four petitioners until June 2, 2015, to

respond to an offer from the EAB for Alternative Dispute Resolution (ADR). All parties, as well as the Tribes, subsequently filed a joint notification indicating their intent to engage in ADR. On June 18, 2015, the EAB stayed the briefing schedule for proceeding, and the parties entered into ADR.

As a result of ADR, EPA agreed to propose modifications to certain provisions in three challenged permits to settle the four appeals. The final permit modification makes the following changes to the Sheldon Dome permit:

- Section 1.3.1. – modified effluent limitations for chloride, sulfate and sulfide.
- Section 1.3.2. – modified monitoring frequency for Acute Whole Effluent Toxicity Monitoring and Toxic Pollutants Screen
- Section 1.3.3. – modified compliance schedule to remove chloride
- Section 1.3.4. – modified requirements for Toxic Pollutants Screen
- Section 1.3.5. – modified requirements for Acute Whole Effluent Toxicity Monitoring
- Section 1.3.9. – modified requirements for Chemical Inventory Reporting

The reasoning and basis for each of these changes is described in greater detail below. In addition to these changes arising out of the ADR process, EPA is also making minor changes to Sections 2.4., 2.8., 2.10., 3.5., 3.7., and 4.14. to update contact information for the Eastern Shoshone Tribe and the Northern Arapaho Tribe, and to replace references to the Wind River Environmental Quality Commission with references to the Eastern Shoshone Business Council and the Northern Arapaho Business Council.

Effect of Statement of Basis Addendum

This addendum is intended to provide the reasoning and basis for the modified permit requirements being finalized. It serves as a supplement to the statement of basis originally issued with this permit on March 5, 2015 (effective date was May 1, 2015).

Water Quality Assessment Data

EPA is currently conducting a water quality assessment sampling effort on the Wind River Indian Reservation including some water bodies downstream of WY-0025232 Wesco Winkleman Dome and WY-0024953 Phoenix Sheldon Dome discharge locations. 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.

Final Modifications to Permit Requirements

Section 1.3.1.

On Page 5 of 21, Section 1.3.1.2, the Table for Interim Effluent Limitations effective until three years after issuance of the permit will be replaced with the following:

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, μ S/cm	N/A	7,500
Total Dissolved Solids, mg/L	N/A	5,000
Chloride, mg/L	N/A	2,000
Sulfate, mg/L	N/A	2,500
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.		

Summary of change:

- The original daily maximum sulfate limit was changed from 1,800 mg/L to 2,500 mg/L. The original 30-day average sulfate limit of 1,000 mg/L was removed.

Basis for change:

Sulfate limitations have been revised to reflect new information on livestock management practices occurring on the Wind River Indian Reservation provided by the Eastern Shoshone Tribe on January 26, 2016 and Northern Arapaho Tribe on January 25, 2016. The revised limits were determined to be protective of the “good enough quality” threshold for livestock use established under 40 CFR Part 435 Subpart E based upon the information provided to EPA by the Eastern Shoshone Tribe and the Northern Arapaho Tribe. This information was contained in a letter to the Eastern Shoshone Tribe from the Bureau of Indian Affairs (BIA) on January 21, 2016, which the Eastern Shoshone subsequently shared with EPA.

In developing the previous iteration of this permit, EPA reviewed a variety of scientific literature that indicated that sulfate in livestock water may cause adverse health effects in cattle. The literature showed that the highest risk of adverse effects from sulfur exposure occurs during the summer months when livestock drink larger quantities of water. During cooler periods, there is lower risk of adverse effects because cattle drink less water. Based on this literature, EPA established sulfate exposure thresholds to protect livestock from adverse effects by assuming that the source of water for the livestock on Range 38 was exclusively from the produced water discharge from this facility, and this water was consumed

throughout the year. The supplemental information from BIA, however, indicates that this assumption is incorrect, because the livestock that have access to the produced water discharge are managed in a manner where additional fresh water sources with a much lower sulfate concentration are available for the livestock during the entire grazing season.

The BIA letter identifies multiple sources of fresh water on Range 38 that are available to livestock. These sources include several perennial streams, two wells, several springs, and larger water bodies including the Little Wind River and the Wyoming Canal. BIA stated that the cattle use all of the available water sources within the Range Unit, not just the produced water.

BIA also indicated that the cattle are usually present in lowland areas near the produced water discharges only during the coolest parts of the permitted 9-month grazing period, which extends from May through January. Typically, the cattle are present from approximately May 1 to June 15, and then from September until the end of the roundup in mid-Fall. During the hottest periods of the year from late June to September, the cattle are moved to higher elevations away from the produced water discharges.

In addition to domestic cattle, BIA also noted the presence of up to 1,000 feral horses on Range Unit #38. These horses range freely, and would have access to all of the feed habitat and water resources available to the domestic cattle grazed on the range. As such, their sulfate intake and exposure rates would be similar. EPA has reviewed the available scientific literature on horses and sulfate, and has determined that the risk analyses for horses and cattle are very similar.^{1,2}

The additional information from BIA thus makes clear that livestock on Range 38 are not relying solely on the discharge from this facility for drinking water, that they have access to multiple sources of fresh water, and that they are not drinking the discharge water during the hottest months of the year. As a result, the risk of adverse effects to the cattle and horses from sulfur exposure, particularly during the hottest months of the year, is minimized. This information supports the revision of the daily maximum sulfate level to 2,500 mg/L, and removal of the 30-day average sulfate level.

On Page 6 of 21, Section 1.3.1.3, the Table for Final Effluent Limitations effective after three years after issuance of the permit will be replaced with the following:

- 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:

¹ M. F. Raisbeck, S. L. Riker, C. M. Tate, R. Jackson, M. A. Smith, K. J. Reddy and J. R. Zygmunt (2007): Water quality for Wyoming livestock and wildlife. A review of the literature pertaining to the health effects of inorganic contaminants. (UW AES bulletin B-1183). Available at <http://www.uwyo.edu/ces/pubs/b1183/> verified 23 February 2016.

² 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 verified 23 February 2016.

Parameter	Effluent Limitation	
	30-Day Average <u>a/</u>	Daily Maximum <u>a/</u>
Specific Conductance, μ S/cm	N/A	7,500
Total Dissolved Solids, mg/L	N/A	5,000
Chloride, mg/L	N/A	2,000
Sulfate, mg/L	N/A	2,500
Sulfide as H ₂ S, mg/L	200	N/A
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.		

Summary of changes:

- The original daily maximum chloride limit was changed from 860 mg/L to 2,000 mg/L, and the original 30-day average chloride limit of 230 mg/L was removed.
- The original daily maximum sulfate limit was changed from 1,800 mg/L to 2,500 mg/L. The original 30-day average sulfate limit of 1,000 mg/L was removed.
- The original 30-day average sulfide as H₂S limit was changed from .002 mg/L to 200 mg/L.

Basis for changes:

The chloride limitations have been revised to reflect the desired level of water quality for the receiving water as indicated by the clarifications provided by the Eastern Shoshone Tribe on January 26, 2016 and Northern Arapaho Tribe on January 25, 2016. In their letters, the Tribes explained that the aquatic life numeric criteria for chloride should not apply to waters dominated by effluent discharges from oil and gas operations, including streams such as the tributary to Bighorn Draw. Both Tribes also expressed an interest in ensuring that discharges from these facilities be of good enough quality to protect wildlife and livestock water, and other agricultural uses; and both indicated 2,000 mg/L chloride would protect such uses. EPA agrees that a single daily maximum limit of 2,000 mg/L chloride will ensure that the discharge is “of good enough quality” for wildlife and livestock watering, which is the threshold required by 40 CFR Part 435, Subpart E, and has modified the permit to reflect this. The modified chloride limit, 2,000 mg/L, is identical to the limit used in the 2005 iteration of this permit.

The final sulfate limitation has been revised for the reasons discussed above in the basis for the change to Section 1.3.1.2. As noted above, EPA received new information on livestock

management practices occurring on the Wind River Indian Reservation from the Eastern Shoshone Tribe and the Northern Arapaho Tribe. This information clarified that few, if any, cattle are present during the hottest times of the year, and that cattle on the relevant ranges have multiple supplies of fresh water in addition to the discharge from this facility. As noted above, EPA has also determined that the wild horses that live on the relevant ranges have similar access to feed habitats and water resources as domestic cattle. As a result of this new information, EPA has determined that the risk of adverse effects on both cattle and horses are lower than it previously estimated, and the discharge will meet the “good enough quality” threshold in 40 CFR Part 435, Subpart E with a daily maximum sulfate concentration of 2,500 mg/L and no 30-day average limitation.

The sulfide as H₂S limitation has also been revised to reflect the desired level of water quality for the receiving water as indicated by the clarifications provided by the Eastern Shoshone Tribe on January 26, 2016 and Northern Arapaho Tribe on January 25, 2016. The Tribes clarified their interpretation of the zone of passage requirement for chronic criteria, indicating that the limitation on water quality mixing zones for chronic criteria is not intended to apply to effluent dominated streams such as the tributary to Pasup (Dry) Creek. As a result, EPA has finalized a modified sulfide as H₂S effluent limitation that is based on a zone of non-attainment (mixing zone) that allows for the natural dissipation of hydrogen sulfide from the produced water. The extent of the zone is for a maximum length of approximately 1 mile, or at the point at which the receiving water crosses under Sheldon Dome Road. This location is the first non-effluent dominated stream downstream from the discharge and therefore provides a mixing zone that accords with the Tribes’ interpretation of their zone of passage requirements for chronic criteria.

Section 1.3.2.

On Page 6 of 21, Section 1.3.2, the Self-Monitoring Requirements will be replaced with the following:

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 H ₂ 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
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.)	At least four times after the effective date of permit <u>f/</u>	Grab
Toxic Pollutants Screen (see Part 1.3.4.)	Up to three times after effective date of permit	Grab

In addition, footnote /f of this chart has been changed to read as follows:

f/ Tests shall be coordinated with the Toxic Pollutants Screen to ensure more even coverage as described in Part 1.3.6. To the extent practicable, tests shall be timed to provide results that represent seasonal variation in the discharge.

Summary of changes:

- The original monitoring frequency for Whole Effluent Toxicity, Acute changed from “Quarterly” to “At least four times after the effective date of permit.”
- The original monitoring frequency for the Toxic Pollutants Screen changed from “Three times after effective date of permit” to “Up to three times after effective date of permit.”
- Change footnote f/ to require coordination of WET monitoring and Toxic Pollutants Screens to provide even coverage and to represent seasonal variation.

Basis for change:

The monitoring frequencies for Whole Effluent Toxicity, Acute and the Toxic Pollutant Screen were revised to reflect the change in monitoring requirements of Section 1.3.4. and Section 1.3.6, which are discussed below for Page 8 of 21 and Page 9 of 21, respectively.

Section 1.3.3.

On Page 6 and 7 of 21, Section 1.3.3, the Compliance schedule Requirements will be replaced with the following:

1.3.3. Compliance Schedule

The effluent limitation for sulfide is new with this permit renewal. In order to allow the permittee the opportunity to evaluate the measures necessary to meet the new limitation and if the permittee is not in compliance with the new sulfide effluent limitation, the permittee shall comply with the following schedule:

Sulfide (as H₂S)

For the new monthly average effluent limitation for sulfide (as H₂S), the EPA is proposing a three (3) year compliance schedule with the following requirements:

The permittee shall achieve compliance with the effluent limitation for sulfide (as H₂S) in Part 1.3.1 of this permit in accordance with the following schedule.

If not in compliance with the effluent limitations for sulfide (as H₂S) in Part 1.3.1 of this permit, 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 limitation for sulfide (as H₂S) 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 limitation for sulfide (as H₂S) 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.

Basis for change:

The Compliance Schedule provision was revised to remove the compliance schedule requirements for chloride. A schedule is no longer needed to meet the revised effluent limitation. The provision was also modified to clarify that the compliance schedule only applies if the permittee is not in compliance with the sulfide limitation at the date of final issuance of this permit modification.

Section 1.3.4.

On Page 8 of 21, Section 1.3.4 Toxic Pollutant Screen Requirements will be replaced with the following:

1.3.4. Toxic Pollutants Screen. This permit requires the permittee to monitor for the constituents listed below in the toxic pollutants screen up to three times during the life of the permit. One monitoring event will be during the 1st year after the effective date of this permit, and the second monitoring event during the 3rd year after the effective date of this permit. A third monitoring event will be required if the permittee undertakes a hydraulic fracturing job for a well that sends produced water to this facility. In that instance, the permittee must complete a third toxic pollutants screen within one week of returning the hydraulically fractured well to production. Each of the toxic pollutants screen datasets shall be submitted to the permit issuing authority at the time of the DMR submittal for that reporting period in which the screening results were obtained. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

1.3.4.1. Pollutants to Be Screened:

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 (Part 1.3.2.).

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

Summary of changes:

- The original monitoring frequency changed to make 3rd monitoring event contingent upon the permittee undertaking a hydraulic fracturing event.
- List of pollutants to be screened assigned a permit section.

Basis for change:

The Toxic Pollutants Screen provision was revised to reflect the greater coordination between toxicity monitoring requirements that is being established in this modification. In particular, the permittee is being required to coordinate its whole effluent toxicity (WET) monitoring and the Toxic Pollutants Screen to ensure even coverage over the permit term. In doing so, the two monitoring provisions will ensure that EPA has regular monitoring data about potential toxicants and toxic effects present in the discharge across time. Two Toxic Pollutants Screens required during the first and third year of the permit term will identify a wide variety of potentially toxic parameters that may be present in the normal discharge. In addition, if the permittee undertakes a hydraulic fracturing event at a well which sends produced water to the treatment facility, the permittee must complete a third toxic pollutant screen within one week of returning the hydraulically fractured well to production. This third Toxic Pollutants Screen will ensure that EPA and the permittee have data on potential toxicants or toxic effects that may be attributable to hydraulic fracturing.

Permit section 1.3.4.1. Pollutants to Be Screened added for clarity.

Section 1.3.6.

On Page 9 of 21, Section 1.3.6, Whole Effluent Toxicity Monitoring, the original first paragraph will be replaced with the following:

At least four times 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. These tests shall be coordinated with the Toxic Pollutants Screen required in Section 1.3.4. of this permit to ensure that the acute static-renewal toxicity tests are staggered with the Toxic Pollutants Screens to ensure a more even coverage during the permit term. To the extent practicable, the static-renewal toxicity tests should also be timed to provide results that represent seasonal variation in the discharge.

The following paragraph will be added:

The permittee or a laboratory performing the toxicity tests on behalf of the permittee is allowed to utilize the sample preparation procedure described in Section 9.1.7 of the Acute Method to remove sulfide (as H₂S) from the discharge sample. This procedure may only be performed in the laboratory testing facility. The dissolved oxygen (DO) concentration in the samples should be near saturation prior to laboratory analysis. Aeration may be used to bring the DO and other gases into equilibrium with air, minimize oxygen demand, and stabilize the pH.

Basis for change:

The Acute Whole Effluent Toxicity Monitoring provision is being revised to reflect the greater coordination between toxicity monitoring provisions that is being required in this modification. In particular, the permittee is being required to coordinate its WET monitoring and its Toxic Pollutants Screen to ensure even coverage over the permit term. In doing so, the two monitoring provisions will ensure that EPA has regular monitoring data about potential toxicants and toxic effects present in the discharge across time. At least four acute static-renewal toxicity tests will be required to ensure that the standard discharges from this facility have no latent or synergistic toxicity effects.

In accordance with the Technical Support Document for Water Quality-based Toxics Control EPA/505/2-90-001 March 1991, the permit conditions provide for toxics control using chemical specific criteria and Whole Effluent Toxicity testing. Limitations for sulfide (as H₂S) are established utilizing a zone of non-attainment (mixing zone) which protect against toxic effects at the edge of the mixing zone. The WET requirements for acute toxicity are applied at the end of the pipe without a mixing zone and as a result the WET tests are likely to fail due to the levels of sulfide (as H₂S) present. Since the permit contains a water quality based effluent limit for sulfide (as H₂S), the added provision allows the WET tests to be performed with potential toxicity due to sulfide (as H₂S) removed using the procedure in Section 9.1.7 of the Acute Test Method. This approach will ensure that any WET tests performed will control toxicity from other pollutants which may be present in the discharge that would be masked by the level of sulfide (as H₂S) in the discharge.

Section 1.3.9.

On Page 12 of 21, Section 1.3.9, Chemical Inventory Reporting Requirement will be replaced with the following:

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. Unless these fluids are segregated, the permittee shall submit the following information with the DMR, to the extent such information is obtainable after making reasonable inquiries to

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

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

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

Basis for change:

The Chemical Inventory Reporting Requirement was modified to reflect actual practices for well treatment and workover that occur at the facility. The facility can segregate fluids used in well treatment and workover. The requirement was changed to require reporting of the chemical quantities, etc. used in well treatment and workover only when those fluids are not segregated and are actually discharged with the produced water.

Miscellaneous

On Pages 13, 14, 15, 17, and 21 of 21, the requirements addressing notification, reporting and other matters referencing the Wind River Environmental Quality Commission will be replaced with equivalent requirements for notifications, etc. to be directed to the Eastern Shoshone Business Council and Northern Arapaho Business Council.

Response to Comments
Permit Modifications for Permits WY-0025232, WY-0024953, WY-0024945

Beginning on May 27, 2016, EPA took public comment on draft modifications to three National Pollutant Discharge Elimination System (NPDES) permits for the discharge of produced water on the Wind River Indian Reservation. The three NPDES permits being modified were issued to Wesco Operating, Inc. (WY-0025232) and Phoenix Production Company (WY-0024953, WY-0024945) on March 12, 2015. EPA public noticed draft modifications to six conditions contained in Section 1.3 of the permits. The remaining conditions of the permits became effective on May 1, 2015. EPA received comments from Marathon Oil Company and Halliburton Energy Services, Inc. (HESI).

1. Marathon commented that under the previous permit, effluent sampling was a semi-annual requirement for all constituents, and that with the permit modification USEPA is requiring quarterly sampling and analysis, monthly field measurements, and weekly sheen observations. Marathon stated that EPA should not increase the monitoring requirements for any constituent or characteristic by 6 to 26 times the frequency required by the previous permit. The company also stated that quarterly monitoring requirement for the constituents of concern will more than adequately protect the environment and ensure suitable water quality.

Response: It appears the commenter may have been comparing the draft permit modification against the final 2005 permits rather than the final 2015 permits. EPA did not modify any monitoring requirements with this permit modification, except for the Whole Effluent Toxicity, Acute provision (Section 1.3.6) and the Toxic Pollutant Screen provision (Section 1.3.4). The monitoring frequency for the remaining monitoring requirements is unchanged and not part of this permit modification decision. The whole effluent toxicity (WET) monitoring frequency was modified from “Quarterly” to “At least four times after the effective date of permit”, and the Toxic Pollutant Screen monitoring frequency was modified from “Three times after effective date of permit” to “Up to three times after effective date of permit.” Neither modification increased the sampling frequency.

No change has been made in response to this comment.

2. Marathon commented that WET testing was not required under the previous permit.

Response: It appears the commenter may have been comparing the draft permit modification against the final 2005 permits rather than the final 2015 permits. EPA modified only the frequency for the WET monitoring requirement; the requirement to conduct WET monitoring is not part of this permit modification decision. The requirement to conduct WET monitoring was included in the three permits this response pertains to when they were originally proposed, public noticed and, on March 12, 2015, finalized.

No change has been made in response to this comment.

3. Marathon commented that EPA's rationale for using WET monitoring to capture seasonal variation of the effluent quality is flawed, as the quality of the effluent at the outfall is not significantly impacted by the time of year. As described by Marathon, because WET monitoring is required at end-of-pipe, the treatment process is essentially limited to gravity separation and residence time within on-site pits, tanks and vessels, which will not change seasonally. As a result, Marathon commented that the staggered WET requirement to assess seasonal variability is not relevant and unnecessarily costly.

Response: EPA is requiring that, to the extent practicable, the WET monitoring be timed to capture seasonal variability in the discharge. EPA included this requirement to effectuate the requirement in the original WET condition in the final 2015 permits that annual monitoring events occur on a "two month progression." EPA included this requirement because, while the Agency recognizes that pollutant concentrations in the discharge may primarily vary with residence time and the effects of gravity separation, it is possible that pollutant concentrations may also vary due to seasonal effect, including increased evaporation during hot seasons and the effects of temperature on the oil/water separation performance.

EPA seeks to capture any potential seasonal variability, to the extent it is practicable for the operators to do so, when planning their WET monitoring. EPA has included this practicability consideration in recognition of the logistical challenges operators may face when scheduling sampling events at remote facilities. However, EPA has no reason to believe that the "seasonal variability" requirement will create additional costs for WET monitoring events. At a maximum, an operator will be required to conduct seven total WET monitoring and toxic pollutant screening events over the 60-month term of the permit, or roughly, one event every 8-9 months. In that instance, an operator could readily capture any seasonal variability by adhering to a 6-9 month sampling interval. If an operator does not undertake a hydraulic fracturing event, it will be required to conduct six total WET monitoring and toxic pollutant screening events over the 60-month term of the permit, or one toxic monitoring event every 10 months. In either instance, however, operators are not bound to a particular schedule, and have significant flexibility in scheduling and implementing their toxics monitoring events.

No change has been made in response to this comment.

4. Marathon provided a number of comments on elements of the WET monitoring provision at 1.3.6, including the TIE/TRE requirement and the accelerated testing that is required in case toxicity is identified.

Response: EPA modified only the frequency of the WET monitoring provisions; the other requirements of the WET testing provision are unchanged and not part of this permit modification decision.

No change has been made in response to this comment.

5. Marathon commented that the change from a single Hazard Screening Requirement to three Toxic Pollutant Screens is excessive.

Response: It appears the commenter may have been comparing the draft permit modification against the final 2005 permits rather than the final 2015 permits. With this permit modification, EPA modified only the frequency for the Toxic Pollutant Screen monitoring requirement. The other elements of the Toxic Pollutant Screen, including the list of chemicals to be monitored, are unchanged and not part of this permit modification decision. The Toxic Pollutant Screen frequency was modified from “Three times after effective date of permit” to “Up to three times after effective date of permit.” This change was made because the third toxic pollutant screen is now conditioned on the permittee undertaking a hydraulic fracturing job for a well that sends produced water to the permitted facility. In that instance, the permittee must complete a third toxic pollutants screen within one week of returning the hydraulically fractured well to production. If the permittee does not undertake any hydraulic fracturing jobs, then the permittee need only complete two Toxic Pollutant Screens.

No change has been made in response to this comment.

6. Marathon commented that the third Toxic Pollutant Screen is not warranted and the permits should include language that allows the operators to fully satisfy the requirements of the Toxic Pollutants Screen provision if they elect to perform a screen within one week of bringing a new hydraulically fractured well into production within the first year of the permit term. Marathon commented that allowing this option would provide EPA with post-hydraulic fracturing sampling data and save operators a significant amount of analytical and sampling costs.

Response: As EPA described above, and in the draft fact sheet included in the public notice, the WET monitoring and the toxic pollutant screening frequencies were modified to reduce the amount of monitoring while requiring better coordination of the two types of monitoring. This coordination will ensure that EPA obtains monitoring data that reflects the condition of the discharge across time, and will allow EPA to determine whether the regular discharge has any latent or synergistic toxicity effects. Additionally, conducting this monitoring in a way that provides more even coverage helps ensure that the monitoring brackets and potentially captures toxicity effects related to infrequent or sporadic well treatment or well maintenance events. Thus, while the third, conditional Toxic Pollutant Screen is intended to provide post-hydraulic fracturing monitoring data (should such hydraulic fracturing occur), the Toxic Pollutant Screen is also part of a broader monitoring approach designed to monitor and protect against toxicity in the facilities’ discharge.

EPA would also like to clarify that the third, conditional Toxic Pollutant Screen may be conducted at any time during the term of the permit, so long as it conducted “within one week of returning the hydraulically fractured well to production.” While this language may suggest that the Toxic Pollutant Screen requirement applies only to existing wells, EPA believes that the requirement will be satisfied in situations such as Marathon describes (i.e., a new well is hydraulically fractured and put into production).

No change has been made in response to this comment.

7. Marathon provided several comments raising technical concerns pertaining to the response required if there is a WET failure, including the requirement that the permittee notify EPA within 48 hours of becoming aware of the failure and "promptly take all reasonable measures necessary to immediately reduce toxicity."

Response: As noted in response to comment 4, EPA modified only the frequency of the WET monitoring provisions; the other requirements of the WET testing provision are unchanged and not part of this permit modification decision.

No change has been made in response to this comment.

8. Marathon commented that sulfide purging prior to conducting a WET test will be generally effective, but recommended that the requirement be changed so that no action be taken until after a confirmatory WET test is conducted. Marathon commented that this would ensure that unintended presence of sulfide and/or elevated TDS is not present in the in the prepared effluent or the static renewal at every step of the test.

Response: The intent of the sulfide purging by a laboratory is to remove the sulfide toxicity that may be present in the sample prior to commencement of a WET test. Specific requirements for sulfide purging are not mandated in the permit. Sulfide purging is dependent on pH and the amount of sulfide in the sample. Laboratories have a variety of methods for the purging of sulfide, as well as different methods to detect if the sulfide was removed from a sample (e.g. sulfide probes). These sulfide purging and detection methods should be employed by the laboratory to ensure that the sulfide was removed prior to the commencement of a WET test. Permittees are responsible for selecting qualified laboratories to ensure the accuracy of any resulting finding of toxicity. EPA modified the permit only to allow for sulfide purging prior to conducting a WET test; the other requirements related to WET testing are unchanged and not part of this permit modification decision.

No change has been made in response to this comment.

9. Marathon commented that operators ought to have the option to alternatively document WET compliance at a point immediately upstream of the effluent dominated drainage's confluence with natural waters (i.e., a monitoring point at the end of the mixing zone).

Response: The draft permits were developed to protect against toxic effects using chemical specific criteria (e.g., sulfide (as H₂S)) and WET monitoring. Monitoring data from the facilities indicates that sulfide (as H₂S) in the discharge has the potential to cause toxicity near the discharge point, but that it is quickly diluted or dissipated as it moves downstream. Thus, EPA has established water quality based effluent limitation for sulfide (as H₂S) using a zone of non-attainment (mixing zone) that protects against sulfide toxicity at the edge of the mixing zone. While sulfide (as H₂S) may be met after allowing a reasonable time for mixing, Section 9(a) of the Tribes' water quality provisions mandate that WET monitoring requirements for acute toxicity are applied at the end of the pipe. Because WET tests are likely to fail due to the levels of sulfide (as H₂S) present at the end of pipe, EPA added a

provision that allows the WET tests to be performed with potential toxicity due to sulfide (as H₂S) being removed using the procedure in Section 9.1.7 of the Acute Test Method. This approach will ensure that any WET tests performed will identify (and ultimately control) toxicity from other pollutants which may be present in the discharge that would be masked by the level of sulfide (as H₂S) in the discharge.

No change has been made in response to this comment.

10. Marathon provided a comment recommending that EPA neither issue additional permits, nor finalize the permit modifications until the Eastern Shoshone and Northern Arapaho Tribes and the operators agree on the appropriate designation of water bodies on the Wind River Indian Reservation, and complete a collaborative review and re-issuance of the Waterbody Classification List.

Response: In developing the March 12, 2015 permits, EPA considered the version of the water quality provisions adopted by the Joint Business Council of the Eastern Shoshone and Northern Arapaho Tribes on October 17, 2007, which included the Tribes' Waterbody Classification List. After the appeal of certain provisions of the March 12, 2015 permits, EPA entered into Alternative Dispute Resolution with the petitioners and the Tribes. As part of the resulting settlement, both the Eastern Shoshone Tribe and the Northern Arapaho Tribes sent EPA letters describing what each Tribe considered to be "good enough quality" for livestock and agricultural use within the meaning of 40 CFR Part 435, Subpart E, and clarifying their interpretation of the 2007 water quality provisions. EPA has considered this correspondence in developing these permit limits. If the Eastern Shoshone Tribe and the Northern Arapaho Tribe decide to review and revise their 2007 water quality provisions, EPA will consider any resulting water quality provisions in future permit cycles. Until that time, however, EPA will continue to utilize the 2007 water quality provisions and subsequent Tribal clarifications as it develops NPDES permit for the Wind River Indian Reservation.

No change has been made in response to this comment.

11. HESI commented that it supports the proposed modified Chemical Inventory Reporting Requirements in the NPDES permits, and requested that EPA clarify that a copy of the FracFocus disclosure form for each site can be provided to satisfy the Chemical Inventory Reporting Requirements as they relate to the use of hydraulic fracturing ("HF") fluids.

Response: The draft permit modification requires the following with regards to the information that must be reported when required under the Chemical Inventory Reporting Requirement:

“[T]he permittee shall submit the following information with the DMR, to the extent such information is obtainable after making reasonable inquiries to suppliers: all chemical additives in the well treatment or workover fluid, their trade names, purposes, supplier, CAS number, concentrations and amounts. The type of operation that generated the well treatment or well workover fluids shall also be reported. To the extent a Safety Data

Sheet (SDS) contains the information required above, it may be submitted for purposes of complying with this provision.”

Under this provision, an operator may provide their chemical inventory information in any format they choose, so long as that format includes the information being required. The provision identifies a Safety Data Sheet as a form that may suffice for reporting purposes; however, that is not intended to be exclusive. If a FracFocus disclosure form, or any other form an operator or their field services provider may develop, contains the information required in Section 1.3.9, that form may also be submitted to EPA to fulfil this requirement.

No change has been made in response to this comment.

12. HESI commented that its supports the language in the Chemical Inventory Reporting Requirement provision requiring disclosure of chemical information “to the extent such information is obtainable after making reasonable inquiries to suppliers.” HESI commented that this language allows for the protection of trade secret information, which is of critical importance as a means of fostering innovation.

Response: The comment is noted. EPA understands the issues with trade secrets that the service industry may have. The permit language was developed in an attempt to accommodate those issues while obtaining enough information to ensure that the permit are sufficiently protective. The Chemical Inventory Reporting Requirement requires operators to maintain an inventory of the quantities and concentrations of the specific chemicals used to formulate well treatment and workover fluids that are used at the wells that send produced water to the permitted facility. EPA expects that such well treatment and workover fluids, when injected down-hole, will typically return to the surface as flowback. If that flowback is segregated as described in the permit provision, the specific chemicals used in the well treatment and workover fluid formulation will be captured and thus not discharged to waters of the United States. If, however, an operator does not segregate well treatment and workover fluids, and they are discharged to waters of the United States, the reporting of the information required by Section 1.3.9 will provide EPA with the information necessary to determine whether the discharge from the permitted facility is “of good enough quality to be used for wildlife or livestock watering or other agricultural uses,” and whether the discharge will cause or contribute to an exceedance of Tribal water quality provisions.

No change has been made in response to this comment.