



GUIDANCE FOR AUDITORS

Version 1.6

Adopted: August 19, 2013; Amended: December 18, 2017

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DEFINITIONS

Centralized Impoundment – Any in-ground impression constructed off of the well site or shared by multiple wells which is used to store and aggregate flowback and produced water within the scope of this program.

Core Area – an area of well concentration that is being developed and produced with the area defined based on the concentration of leases, geography, transportation distance, drilling intensity/density, number of exploratory wells, gathering systems, boundaries defined in gathering agreements, topography.

Fresh Groundwater – Water in that portion of the generally recognized hydrologic cycle which occupies the pore spaces and fractures of saturated subsurface materials.

Pit – Any in-ground impression constructed on a well site that is used for the storage or disposal of residual waste from the development of a natural gas well.

Reportable Spill – A spill or release of a substance associated with natural gas extraction that must be reported to the government pursuant to applicable state and federal regulation.

Wastewater – Water returned to the surface from drilling, well stimulation, production, or plugging operations in connection with unconventional natural gas development.

WATER PERFORMANCE STANDARDS

PERFORMANCE STANDARD 1.1

Operators shall maintain zero direct or indirect intentional discharges of shale wastewater (including drilling, flowback and produced waters) to surface water except as provided by this Standard.

PERFORMANCE STANDARD 1.1 GUIDANCE FOR AUDITORS

Operator should provide:

1. Measurement of drilling, flowback and produced volume
2. Documentation of wastewater disposition with chain of custody tracking

Chain of custody documentation applies to water moved out of the field. Volumes within the field will be documented, but will not be barrel by barrel. Auditor should verify that all wastewater is accounted for and properly disposed of to a CWT or deep well injection. Vendor volume tickets valid as documented.

PERFORMANCE STANDARD 1.2

In order to facilitate comprehensive wastewater management programs that consider environmental, safety, health, and economic factors, Operators may send shale wastewater to a Centralized Waste Treatment facility (CWT) for treatment and discharge if the Operator demonstrates the following conditions are satisfied at the CWT:

- a. The CWT has, and is in substantial compliance with, a NPDES discharge permit to treat and directly discharge shale wastewater;
- b. The CWT meets or exceeds a CRSD shale wastewater effluent performance standard to be based on current best available technology designed to prevent the discharge of toxic pollutants in toxic amounts;
- c. The CWT must use best available technology for all fluids discharged. Best available technology requires a combination of distillation and biological treatment, with the addition of reverse osmosis if CRSD determines based on further analysis that it provides protection necessary to ensure effluent quality. CRSD may authorize the use of different technologies or combinations of technologies that provide equivalent or superior treatment;
- d. The CWT adheres to acceptance procedures designed to assure that the wastewater delivered by the Operator is compatible with the other wastes being treated at the facility, treatable by the treatment system, and consistent with the specific waste stream the facility was permitted to treat and discharge;
- e. The CWT does not indirectly discharge wastewater from a CRSD Operator through a POTW.

PERFORMANCE STANDARD 1.2 GUIDANCE FOR AUDITORS

1.2.a.

Operator should submit to Auditor and CRSD, the complete NPDES permit and any applicable attachments for the CWT the Operator proposes to use.

Operator should provide auditor with sufficient information to allow the auditor to determine that the CWT has, and is in substantial compliance with, an active NPDES permit. Evidence may include monthly DMRs, non-compliance reporting submitted to permitting agency by the CWT, NOV's or other non-routine communications pertaining to compliance between the CWT and the permitting agency or EPA, Operator analysis of any discovered effluent limit violations, etc.

Evidence of the following may be used to determine that a CWT is not in substantial compliance with its NPDES permit:

- a. Chronic violations of wastewater discharge limits, where “chronic violations” are those in which 66 percent or more of all of the measurements taken for the same pollutant parameter during a 6-month period exceed (by any magnitude) a numeric permit standard or requirement, including instantaneous limits);
- b. Any other violation of a standard or requirement (daily maximum, long-term average, instantaneous limit, or narrative standard), or discharge of a pollutant, or unauthorized bypass that has alone or in combination with other violations endangered the health of CWT personnel, the general public, or the environment (as determined by the CRSD Board);
- c. Failure to meet, within 90 days after the schedule date, a compliance schedule milestone contained in a local control mechanism or enforcement order for starting construction, completing construction, or attaining final compliance;
- d. Failure to provide, within 30 days after the due date, required reports such as baseline monitoring reports, 90-day compliance reports, periodic self-monitoring reports, and reports on compliance with compliance schedules;
- e. Failure to accurately report noncompliance;
- f. Violations of narrative requirements (e.g., requirements to develop Spill Prevention Control and Countermeasure Plans and requirements to implement Best Management Practices), which are of substantial concern to the regulatory agency.
- g. Any other violation or group of permit violations which the regulatory agency or auditor considers to be of substantial concern.

1.2.b.

At this time, a CRSD shale wastewater effluent performance standard to be based on current best available technology designed to prevent the discharge of toxic pollutants in toxic amounts has not been developed. No documents must be submitted by operator in order to satisfy this audit until standard is complete.

1.2.c.

Operator should provide evidence of treatment technologies used by CWT. This may include a flowline diagram of the CWT demonstrating the technologies used and/or the CWT's permit application or applicable amendments.

If the CWT has split stream capabilities, Auditors should confirm that all water discharged is treated by technologies required by the Standard or approved by CRSD.

1.2.d.

Operator should provide written evidence that the CWT adheres to a wastewater acceptance and compatibility procedure that satisfies the Standard. As an example, features of a suitable acceptance policy are discussed in EPA's Small Entity Compliance Guide for the CWT ELG and Pretreatment Standards for 40 CFR Part 437, at 5-1.9.

The operator should provide a copy of the CWT's acceptance procedure and documentation evidencing adherence to that procedure.

Demonstration that a CWT adheres to an acceptance procedure that satisfies the Standard may include, where obtainable by the Operator, the following:

1. If required by the CWT procedure, a copy of the Operator's completed wastewater profile report or testing required to be submitted prior to delivery of wastewater
2. If required by the CWT procedure, a copy of any summary reports presenting results of testing programs conducted by the CWT
3. Evidence indicating whether any loads sent by the Operator have been rejected by the CWT, and if so, why.

Demonstration may also include a copy of an acceptance letter from the CWT granting permission to initiate wastewater deliveries based on testing or other required documentation; sample manifests completed by the facility summarizing screening data for accepted incoming loads; any other documentation the Auditor feels is necessary to show adherence.

1.2.e.

Auditor should confirm whether the CWT used by Operator is authorized to indirectly discharge through a POTW, or discharges to a facility that is authorized to indirectly discharge through a POTW.

Operator should provide the NPDES permit, a flowline diagram, manifests or truck logs depicting final disposition of wastewaters discharged from the CWT to demonstrate whether the CWT indirectly discharges to a POTW.

If an Operator delivers wastewater to a CWT with an indirect discharge permit authorizing deliveries to a POTW, or to another CWT that delivers to a facility authorized to indirectly discharge to a POTW, the Operator should provide Auditor with confirmation in the form of accounting records, manifests, truck logs or other documents to demonstrate that the volume of water delivered to a facility that does not qualify for CRSD deliveries is returned to, and reused by the Operator. See 1.

PERFORMANCE STANDARD 1.3

An uncertified Operator must meet the following obligations prior to certification to this Standard and a certified Operator must meet the obligations prior to the use of a new CWT for discharge:

- a. Operator shall review, compile, analyze, and deliver to CRSD, publicly available information pertaining to the CWTs performance and permit compliance to demonstrate that the CWT satisfies Part 2(a).
- b. In order to help assure the permit writer has all information necessary to consider establishing limits on all pollutants in the expected influent, the permitting agency shall be provided the current CRSD list of chemicals believed to occur in the region's wastewater.
- c. In order to confirm the CWT is operating as intended, the Operator shall demonstrate to CRSD that testing at the CWT satisfies the Initial Confirmatory Testing Program or a facility-specific Protocol approved by CRSD.
- d. In order to evaluate the potential for CWT effluent toxicity, Operator shall complete WET Testing pursuant to the WET Testing Program or an alternative facility-specific Protocol approved by CRSD.

PERFORMANCE STANDARD 1.3 GUIDANCE FOR AUDITORS

1.3.a.

Operators should provide auditor the records developed, and results of Operator's review, compilation and analysis of publically available information pertaining to the performance and permit compliance of each CWT utilized by Operator. Auditor should confirm that review, compilation, and analysis was conducted by the time required in this section of the standard.

1.3.b.

CRSD will submit the current list of chemicals to the agency. Operator should provide to the auditor a copy of the list presented to the permitting agency and proof of submittal by CRSD.

1.3.c.

Operators should provide a letter from CRSD indicating that, by the time required in this section of the standard, Operator demonstrated that testing at the facility satisfied the Initial Confirmatory Testing Program or a facility-specific Protocol approved by CRSD.

1.3.d.

Operators should provide evidence that testing pursuant to the WET Testing Program or an alternative facility-specific Protocol has been completed by the Operator by the time required in this section of the standard. Operator should provide a copy of the WET Testing Program or facility-specific Protocol, whichever followed, proof of accreditation from the laboratory that conducted the WET testing, and results that are sufficiently clear to allow Auditor to confirm that testing was completed as required. Operator should prepare a summary report including any conclusions or recommendations based on the lab's findings and procedures, including a conclusion regarding whether all testing was conducted in accordance with the applicable requirements.

PERFORMANCE STANDARD 1.4

For so long as the Operator delivers shale wastewater to a CWT:

- a. Operator shall conduct effluent monitoring as specified in the CRSD Ongoing Monitoring Program or facility-specific Protocol approved for that CWT by CRSD.
- b. Every six months, Operator shall review, compile, analyze and deliver to CRSD publically available information about the CWT's performance and permit compliance.
- c. Unless CRSD determines that ongoing WET testing is not necessary, Operator shall complete WET testing at a frequency to be determined in the WET Testing Program or facility-specific Protocol.

PERFORMANCE STANDARD 1.4 GUIDANCE FOR AUDITORS

1.4.a.

Operator should provide a copy of the Ongoing Monitoring Program or an ongoing monitoring Protocol approved for the CWT.

Operator should provide the results of any ongoing monitoring that has been performed at the facility in accordance with the monitoring Program or Protocol since the Operator's last audit. Results should be sufficiently clear to enable auditors to determine that the tests were performed as required.

1.4.b.

Operator should provide a summary of review and analysis conducted as required under the standard in six month intervals, since the time of the Operator's last audit, and proof that summary and all necessary supporting documentation was submitted to CRSD.

Supporting documentation should include publically available information about the CWT's performance and permit compliance. See Section 2 elements for examples of documents to be obtained.

1.4.c.

Operator should provide evidence that WET testing in accordance with the WET Testing Program or an approved alternative has been continued at the established frequency required by the applicable Program or Protocol since the time of the Operator's last audit.

Operator should provide any approved facility-specific Protocol.

Operator should provide all WET testing results obtained since the time of the Operator's last audit. Results of such testing should be sufficiently clear to enable auditors to determine that the tests were performed as required. Operator should prepare a summary report for any WET test conducted, including any conclusions or recommendations based on the lab's findings and procedures, including a conclusion regarding whether all testing was conducted in accordance with the applicable requirements.

PERFORMANCE STANDARD 1.5

Operators may not initiate, and will immediately cease, deliveries to a CWT:

- a. If the CRSD Board determines that discharges from the CWT may increase the risk of harm to human health or the environment. This determination may take into account data and reports submitted to CRSD under this standard, deterioration in effluent quality, research to be sponsored by CRSD or by other parties, and/or any other data or available research.
- b. That exhibits substantial non-compliance with its NPDES permit.

Deliveries shall not be resumed until the Operator demonstrates to the satisfaction of CRSD that appropriate corrective measures have been made.

PERFORMANCE STANDARD 1.5 GUIDANCE FOR AUDITORS

1.5.a.

If the CRSD Board determines that discharges from a CWT may increase the risk of harm to human health or the environment, CRSD will provide the auditor with appropriate documentation.

In the event CRSD has not issued such a document for the facility, no documentation is required from the Operator for the audit.

In the event CRSD has issued documentation finding an increased risk of harm to human health or the environment, Operator should provide accounting records, manifests, truck logs or other documents to show that Operator ceased deliveries to the CWT immediately upon notification from CRSD of the finding.

In the event Operator demonstrates to CRSD that appropriate corrective measures have been made at the CWT, CRSD will provide Operator with documentation of clearance to allow deliveries to resume to the CWT in question. An Operator using such a CWT should provide the Auditor a copy of the documentation regarding clearance and evidence such as truck logs, manifests, etc. that deliveries were not resumed until the time of clearance.

1.5.b.

Operator should provide evidence indicating the CWT is in substantial compliance with its permit. See Section 2 examples of substantial non-compliance.

In the event there has been a determination by the Operator, or CRSD, that the CWT in use exhibits substantial non-compliance with its NPDES permit, the Operator should provide accounting records, manifests, truck logs or other documents to show that Operator ceased deliveries to the CWT immediately upon the determination of substantial non-compliance.

In the event Operator demonstrates to CRSD that appropriate corrective measures have been made, CRSD will provide Operator with documentation of clearance to allow deliveries to resume to the CWT in question.

Operator should provide the Auditor a copy of the documentation regarding clearance and evidence that deliveries were not resumed until the time of clearance.

PERFORMANCE STANDARD 1.6

Operator reporting under this standard shall be as follows:

- a) Data from all testing and any additional information gathering required under this standard, shall be analyzed, compiled, and submitted to CRSD by the Operator.
- b) Where an operator discovers a potential non-compliance with an existing NPDES discharge permit as part of the monitoring and auditing requirements required under this Standard, the Operator shall immediately report such findings to the CWT, the permitting agency, and CRSD.

**PERFORMANCE STANDARD 1.6
GUIDANCE FOR AUDITORS**

1.6.a.

Operator should provide evidence that all necessary data and analysis was submitted to CRSD where required by the Standard. Reporting to CRSD may be evidenced by copies of transmittals including letter certification, email notification, email attachments, etc. Auditor should review documents submitted to confirm reporting was sufficient.

1.6.b.

Operator should provide evidence that Operator reported any discovered potential non-compliance with a CWT's NPDES permit to the CWT, the permitting agency, and CRSD. Reporting may be evidenced by copies of transmittals or documentation of verbal discussion. Operator should provide the Auditor with documentation of any discovered potential non-compliance.

PERFORMANCE STANDARD 2.1

Operators shall maintain and adhere to a plan to recycle, to the maximum extent practicable, flowback and produced water for use in fracturing and in drilling wells at depths below the surface casing.

PERFORMANCE STANDARD 2.1 GUIDANCE FOR AUDITORS

Operator should provide a copy of the plan with monthly/annual tracking of all water volumes and calculation of recycle % and explanation of limiting factors (distance, timing, chemistry, etc.). Auditor should verify calculations.

PERFORMANCE STANDARD 2.2

For water withdrawals, operators shall develop an evaluation, monitoring, and action plan that prevents and/or minimizes site-specific and cumulative adverse impacts to surface and ground water resources. The plan should include the following:

- a. For surface waters, the plan should identify measures taken to protect flow regime of the waterway, and avoid temporary or permanent impairment.
- b. Plans should justify, and describe protection measures utilized, for withdrawals from any of the following:
 - i. Waters classified or designated as Tier 3 (or state regulatory equivalent); or Tier 2 (or state regulatory equivalent) by an appropriate state or federal authority under the Clean Water Act's anti-degradation program.¹
 - ii. Headwaters or creeks (waters having an upstream drainage area less than 38.61 square miles)
 - iii. Waters classified or designated as Intermittent by an appropriate state or federal authority.
 - iv. If applicable, any waterway during seasonal or periodic (e.g. drought) low flow conditions, as identified by state or federal regulatory agencies.
- c. For ground waters, the Plan should assess the feasibility and sustainability of the groundwater source at the proposed withdrawal rate and withdrawal location, and identify all groundwater management measures taken in order to ensure that there are no adverse impacts to: groundwater availability (allowing for the rate of groundwater recharge); hydraulically connected wetlands; private water wells; and the baseflow of hydraulically connected surface waters.
- d. Operators shall meter (or otherwise measure) and record daily the volume of water withdrawals. Measuring devices and methods shall be accurate to within 5% of actual flow.

¹ Exceptional Value or High Quality waters in Pennsylvania; Special High Quality Waters in Ohio; and Tier 2 Protection (high quality waters) and Tier 3 Protection (Outstanding National Resource Waters) streams in West Virginia. **[Internal Note: Ohio has not designated any Tier 3 streams under the antidegradation rules]**

PERFORMANCE STANDARD 2.2 GUIDANCE FOR AUDITORS

This standard does not apply to water used from public water supplies.

This standard will immediately apply to water withdrawals permitted after the approval of this standard. Plans for existing water withdrawals will meet this revised standard within 2 years following standard approval.

Operators will provide a specific individual plan for each water withdrawal source. The plan will identify the classification of the withdrawal source per applicable state and/or federal guidance, in accordance with the footnote 1 in the standard. The source of this information will be included in the plan. The plan will ensure coordination with the authorized agency to address seasonal and/or drought conditions, where applicable.

All flow measurements will be obtained using in line flow meters.

PITS/IMPOUNDMENTS PERFORMANCE STANDARDS

PERFORMANCE STANDARD 3.1

Any new pits designed shall be double-lined and equipped with leak detection.

PERFORMANCE STANDARD 3.1 GUIDANCE FOR AUDITORS

Operator should provide:

1. Site design, permit information, other documentation and photos of all new pits showing double-lining and installation of leak detection equipment.

PERFORMANCE STANDARD 3.2

Operators, by March 20, 2014 or initial date of application for certification (whichever is later), shall contain drilling fluid, when using oil-containing drilling fluids to drill a well, in a closed loop system at the well pad (e.g. no ground pits).

PERFORMANCE STANDARD 3.2 GUIDANCE FOR AUDITORS

Operator should provide

1. Photos, permits, and service company documents to verify use of closed loop system.
2. Auditor should verify use of non-oil-containing drilling fluids or use of closed loop system.

PERFORMANCE STANDARD 3.3

Operators, by March 20, 2015 or initial date of application for certification (whichever is later), shall contain drilling fluid and flowback water in a closed loop system at the well pad, eliminating the use of pits for all wells.

PERFORMANCE STANDARD 3.3 GUIDANCE FOR AUDITORS

Operator should provide:

1. Photos, site design documents, permits, and invoices for containment equipment demonstrating the use of closed use equipment and absence of pits.

PERFORMANCE STANDARD 4.1

2. Auditor to confirm use of closed loop system and absence of pits.

When utilizing centralized impoundments for the storage of flowback and/or produced waters, operators shall ensure that free hydrocarbons are removed from the water prior to storage and that new impoundments are double-lined with an impermeable material, equipped with leak detection and take measures to reasonably prevent hazards to wildlife. Total hydrocarbons should be substantially removed.

PERFORMANCE STANDARD 4.1 GUIDANCE FOR AUDITORS

Free hydrocarbons are removed from the water prior to storage. Total hydrocarbons should be substantially removed:

Operator should provide documentation that a static sheen test (EPA Method 1617 or equivalent) has been performed at least once daily except during periods of when no wastewater has been added to the impoundment to detect the presence of free hydrocarbons. If sheen test indicates the presence of free hydrocarbons in the wastewater, operators should document corrective action that was taken.

New impoundments are double-lined with an impermeable material and equipped with leak detection:

1. See 3.2.

New impoundments are those installed any time after three (3) months prior to initial application.

Take measures to reasonably prevent hazards to wildlife:

1. Operator should provide documentation listing and describing all measures taken to prevent wildlife hazards.
2. Auditor should verify compliance with these measures.

GROUNDWATER PROTECTION PERFORMANCE STANDARDS

PERFORMANCE STANDARD 5.1

Operators shall establish an Area of Review (AoR), prior to drilling a well, which encompasses both the vertical and horizontal legs of the planned well. Within the AoR, the operator must conduct a comprehensive characterization of subsurface geology, including a risk analysis, that demonstrates the presence of an adequate confining layer above the production zone that will prevent adverse migration of hydraulic fracturing fluids. As part of the risk analysis, and before proceeding with hydraulic fracturing, the operator must also conduct a thorough investigation of any active or abandoned wellbores within such area of review or other geologic vulnerabilities (e.g., faults) that penetrate the confining layer and adequately address identified risks.

PERFORMANCE STANDARD 5.1 GUIDANCE FOR AUDITORS

Operator should provide the AoR report as discussed below:

Establishing and assessing the area of review (AoR).

For the fractured portion of the well, the outer bound of the AoR will be the distance of the maximum predicted length of hydraulic fractures in each direction plus a margin of safety to be determined by the operator. For the un-fractured section of the well, the minimum radius of the AoR will be 1000 ft. or greater as conditions and risk requires. One AoR may incorporate multiple wells from a single pad.

Undertake the geologic study and risk analysis in the established AoR, and document the following:

- How the AoR was delineated. Provide map and cross sections/block diagram illustrating the AoR volume encompassing the surface trace and depth of the wellbores to be drilled and any known features (e.g. old wells) that might pose a risk of fluid or gas migration.
- A summary of the geologic evaluation including relevant maps, cross sections and seismic lines needed for illustrative purposes along the proposed wellbore. These should describe/illustrate the depth-relevant stratigraphy and structural elements such as faults, fracture zones, etc. Potential supporting data may include seismic images, well logs, predrill well plans, wellbore schematics, etc.
- Identify and document the presence of an overlying confining system / seal, independent of the formation to be drilled, hydraulically fractured and produced.
- Identify and map (and show on cross section) base of fresh water.
- Provide a summary narrative of both surface and subsurface vulnerabilities and potential risk and describe how risks have been mitigated prior to drilling. Explain adequacy of AoR and any adjustments made.
- Data to show that the fracturing treatment is designed to focus growth only in target formation such as fracture modeling results, micro-seismic from nearby well, etc.

Investigation and Mitigation of Abandoned Wells

1. Identify all active and abandoned wells in the AoR and describe what methods and databases were utilized to do so:
 - Provide a history of the field and indicate what methods may have been used to install, cement casing and whether casing may have been removed subsequently.
 - Indicate which penetrate the confining zone above the production formation and provide on a map and cross section of planned well
 - Provide documentation that each well penetrating the confining layer was adequately plugged and abandoned or other mitigation steps (e.g. accommodations within the fracture design or location) taken to address any risk posed by any well for which adequate abandonment cannot be demonstrated.

PERFORMANCE STANDARD 6.1

Operators shall develop and implement a plan for monitoring existing water sources, including aquifers and surface waters within a 2,500 foot radius of the wellhead (or greater distance, if a need is clearly indicated by geologic characterization), and demonstrate that water quality and chemistry measured during a pre-drilling assessment are not impacted by operations.

PERFORMANCE STANDARD 6.1 GUIDANCE FOR AUDITORS

Operator should provide a copy of the monitoring plan and test results. The plan should:

- a. Include sampling of existing sources of water. Sources of water including aquifers and surface water which may include both natural and man-made groundwater monitoring locations.
- b. Be informed by the proximity of sensitive areas and/or receptors. Reference the geological characterization and summarize surficial geology/ geomorphology and topography streams, identifying potential ground and surface water flow directions and vulnerabilities such as water supplies, homes, wetlands etc. and how risks were identified and mitigated during well pad design.
- c. Include baseline testing before drilling as well as periodic testing after completion to ensure that drilling, fracturing and other operations do not compromise groundwater.
- d. Be performed by qualified 3rd parties using recognized methods.

Operators are not required to resample each water source sampled as part of pretesting. For the purpose of guidance to the auditor for conformance to this standard, “existing water sources” is intended to include accessible surface and ground water (i.e. streams, ponds, existing water wells, seeps).

Auditor should confirm that the plan contains the required elements and that pre- and post-drilling testing is being accomplished and results meet specified standards.

At a minimum additional monitoring should reflect initial monitoring.

PERFORMANCE STANDARD 6.2

Operators must conduct periodic monitoring for at least one year following completion of the well. Such monitoring must be extended if results indicate potential adverse impacts on water quality or chemistry by operations.

**PERFORMANCE STANDARD 6.2
GUIDANCE FOR AUDITORS**

1. Operator should provide a copy of the plan for monitoring existing water sources and periodic test results.
2. Auditor to verify whether potential adverse effects related to operations have occurred or that they have been addressed under 6.3.

PERFORMANCE STANDARD 6.3

In the event that monitoring establishes a possible link between an Operator's activities and contamination of a water source, the Operator shall develop and implement an investigative plan and, if a positive link is established, implement a corrective action plan.

**PERFORMANCE STANDARD 6.3
GUIDANCE FOR AUDITORS**

If triggered, operator should provide a copy of the investigative plan, corrective actions, and follow-up testing.

PERFORMANCE STANDARD 6.4

The testing and monitoring plan should provide for additional monitoring in the event a well is re-stimulated.

**PERFORMANCE STANDARD 6.4
GUIDANCE FOR AUDITORS**

See 6.1

PERFORMANCE STANDARD 7.1

Operators shall design and install casing and cement to completely isolate the well and all drilling and produced fluids from surface waters and aquifers, to preserve the geological seal that separates fracture network development from aquifers, and prevent vertical movement of fluids in the annulus.

PERFORMANCE STANDARD 7.1 GUIDANCE FOR AUDITORS

Operator shall provide such documentation and explanatory material that evaluator believes is needed to demonstrate that the standard has been achieved. Requested information should relate both to well design and to the results of particular tests run on particular wells.

CRSD recognizes that the objective of “preventing vertical movement of fluids in the annulus” is arguably redundant to the extent it is part of “completely isolating the well and all drilling and produced fluids from surface waters and aquifers.” The objective regarding annular migration is separately stated because of its importance to well integrity and to assure that evaluators will be especially thorough in assessing this element.

The auditor should examine the Operator's characterization of the geologic interval between protected water and frac zones, including its modeling of the patterns and extent of fractures. In addition, the auditor should examine the Operator's efforts to confirm precision and accuracy of the model results. Operators should demonstrate the presence of a confining zone and how zonal isolation and prevention of vertical movement in the annulus will be achieved.

PERFORMANCE STANDARD 7.2

Operators will not use diesel fuel in their hydraulic fracturing fluids.

PERFORMANCE STANDARD 7.2 GUIDANCE FOR AUDITORS

Operator should provide:

1. Composition of the hydraulic fracturing fluids based on vendor data and/or certifications. Auditor to review data and verify absence of “diesel fuel”.

Definition of “diesel fuel” based on EPA provided guidance to the industry in May 2012 in the Permitting Guidance for Oil and Gas Hydraulic Fracturing Activities Using Diesel Fuels – Draft: UIC #84. This document has **NOT** been finalized. Language from EPA document – “EPA selected these six CASRNs because either the primary name, or common synonyms, contain the term “diesel fuel” and they meet the chemical and physical description of “diesel fuel.”

68334-30-5 Primary Name: Fuels, diesel Common Synonyms: Automotive diesel oil; Diesel fuel; Diesel oil (petroleum); Diesel oils; Diesel test fuel; Diesel fuels; Diesel Fuel No. 1; Diesel fuel [NA199311]; Diesel fuel oil; EINECS12 269-822-7

68476-34-6 Primary Name: Fuels, diesel, no. 2
Common Synonyms: Diesel Fuel No. 2; Diesel fuels no. 2; EINECS 270-676-1, No. 2 Diesel Fuel

68476-30-2 Primary Name: Fuel oil No. 2
Common Synonyms: Diesel fuel; Gas oil or diesel fuel or heating oil, light [UN1202]
#2 Home heating oils; API No. 2 fuel oil; EINECS 270-671-4; Fuel Oil No. 2; Home heating oil No. 2; Number 2 burner fuel; Distillate fuel oils, light; Fuel No. 2; Fuel oil (No. 1,2,4,5 or 6) [NA1993];

68476-31-3 Primary Name: Fuel oil, no. 4
Common Synonyms: Caswell No.13 333AB; Cat cracker feed stock; EINECS 270-673-5; EPA Pesticide Chemical Code 063514; Fuel oil no. 4; Diesel Fuel No. 4

8008-20-6 Primary Name: Kerosene
Common Synonyms: JP-5 navy fuel/marine diesel fuel; Deodorized kerosene; JP5 Jet fuel; AF 100 (pesticide); Caswell No. 517; EINECS 232-366-4; EPA Pesticide Chemical Code 063501; Fuel oil No. 1; Fuels, kerosine; Shell 140; Shellsol 2046; Distillate fuel oils, light; Kerosene, straight run; Kerosine, (petroleum); Several others

68410-00-4 Primary Name: Distillates (petroleum), crude oil
Common Synonyms: Fuel, diesel (VDF) (EPA SRS14), Straight PWN diesel (EPA SRS), Aruba gas oil; EINECS 270-072-8”

PERFORMANCE STANDARD 7.3

Operators will publically disclose the chemical constituents intentionally used in well stimulation fluids. Disclosures will include: information identifying the well, the operator and the dates of the well stimulation; the type and total volume of the base fluid; the type and amount of any proppant; all chemical additive products used in a well stimulation, including the name under which the product is marketed or sold, the vendor, and a descriptor of additive's purpose or purposes (e.g. biocide, breaker, corrosion inhibitor, etc.); the common name and Chemical Abstracts Service registry number for each chemical ingredient used in a stimulation fluid; the actual or maximum concentration of each chemical ingredient, expressed as a percent by mass of the total stimulation fluid. Chemical ingredients should be disclosed in a manner that does not link them to their respective chemical additive products. Disclosure of the above information will be offered to the relevant state agency and will also be posted on FracFocus.org. If an operator, service company or vendor claims that the identity of a chemical ingredient is entitled to trade secret protection, the operator will include in its disclosures a notation that trade secret protection has been asserted and will instead disclose the relevant chemical family name. Operators will implement measures consistent with state law to assist medical professionals in quickly obtaining trade secret information from the operator, service company or vendor holding the trade secret that may be needed for clinical diagnosis or treatment purposes.

PERFORMANCE STANDARD 7.3 GUIDANCE FOR AUDITORS

Operator should provide disclosures for all the information listed in the description of the standard as well as evidence of submission to local regulators and FracFocus.

Auditor to confirm that all required information has been submitted or offered as required.

Where the state requires submission to FracFocus in lieu of direct submission, the submission to FracFocus will be sufficient for this requirement.

PERFORMANCE STANDARD 7.4

Operators will also work toward use of more environmentally neutral additives for hydraulic fracturing fluid.

PERFORMANCE STANDARD 7.4 GUIDANCE FOR AUDITORS

Operator should provide description of what actions they have taken towards the use of environmentally neutral additives. This will facilitate development of best practices in this arena. Auditor will review actions and document best practices.

PERFORMANCE STANDARD 7.5

Mechanical integrity tests shall be performed when refracturing an existing well.

**PERFORMANCE STANDARD 7.5
GUIDANCE FOR AUDITORS**

Operator will describe the mechanical integrity tests that have been run and provide acceptable results.

PERFORMANCE STANDARD 7.6

CRSD will develop a standard relating to the public disclosure of chemicals other than well stimulation fluids by September 1, 2013.

**PERFORMANCE STANDARD 7.6
GUIDANCE FOR AUDITORS**

None

PERFORMANCE STANDARD 8.1

Operators shall design each well pad to minimize the risk that drilling related fluids and wastes come in contact with surface waters and fresh groundwater.

PERFORMANCE STANDARD 8.1 GUIDANCE FOR AUDITORS

1. Operator should provide a containment plan (including drilling related fluids) including engineered site plan design addressing surface water and groundwater protection including:
 - Ensure the integrity of primary containment in tanks, hoses, vessels.
 - Utilize secondary containment such as liners under all tanks, equipment, and pump trucks.
 - Implement an effective erosion and sedimentation control plan that includes a detailed engineering design, with multiple barriers, to prevent storm water or other release from sites.
 - Conduct rigorous, regular inspections to confirm integrity of all controls.
 - A summary of the surficial geology/ geomorphology and topography to show streams, potential flow directions of surface soils and non-point source runoff, and vulnerabilities such as water supplies, homes, wetlands etc. and how risks were identified and mitigated during pad design.)
 - Provide documentation through photos, site drawings or permit information.

2. Auditor to verify completeness and implementation of plan.

PERFORMANCE STANDARD 8.2

In preparation for any spill or release event, Operators shall prior to commencement of drilling, develop and implement an emergency response plan, ensure local responders have appropriate training in the event of an emergency, and work with the local governing body, in which the well is located, to verify that local responders have appropriate equipment to respond to an emergency at a well.

PERFORMANCE STANDARD 8.2 GUIDANCE FOR AUDITORS

1. Operator should provide a copy of the emergency response plan and documentation on training of local respondents.
2. Auditor to verify completion of plan and coordination with local responders.

PERFORMANCE STANDARD 8.3

In addition, in the event of spill or release, beyond the well pad, Operators shall immediately provide notification to the local governing body and any affected landowner.

PERFORMANCE STANDARD 8.3 GUIDANCE FOR AUDITORS

1. Operator should provide documentation to show that notification has occurred for all reportable spills plus any additional items based on discussion points below.
2. Auditor to verify that notification has occurred for any reportable events.

AIR PERFORMANCE STANDARDS

PERFORMANCE STANDARD 9.1

Beginning on January 1, 2014, or date of an operator's initial application for certification (whichever is later), in accordance with the conditions set forth in Paragraphs 3 and 4 below, an operator must direct all pipeline-quality gas during well completion of development wells, and re-completion or workover of any well into a pipeline for sales.

PERFORMANCE STANDARD 9.1 GUIDANCE FOR AUDITORS

1. Operator should provide:
 - a. P&IDs and monthly meter readings of their process to show delivery of pipeline-quality gas into a pipeline for sales.
 - b. Show that flow is sent to separator as soon as gas was present - timestamp.
 - c. Invoice/equipment documentation for REC equipment
 - d. Pipeline/gathering system receipt records
 - e. A copy of facility's Subpart W data and state reporting results.
2. Auditor to verify whether gas is being recovered as required.

PERFORMANCE STANDARD 9.2

Any gas not captured and put in the sales pipeline may not be vented² and must be flared in accordance with Standard No. 10 below.

For purposes of this standard, venting does not include the de minimis fugitive emissions from gas busters (i.e. that may occur from separator vessels during the initial cleanup period of the well).

PERFORMANCE STANDARD 9.2 GUIDANCE FOR AUDITORS

1. Operator should provide:
 - a. Copies of flare permits if any
 - b. Documentation of timing of initiation of flowback and transition to gathering
 - c. State Emissions reporting requirements
 - d. Flaring equipment documentation
 - e. Information related to Subpart W requirements
 - f. Documentation for upset and/or emergency flaring events where applicable
2. Auditor to verify whether gas is being flared rather than vented and appropriate flaring equipment is being used.

² For purposes of this standard, venting does not include the de minimis fugitive emissions from gas busters (i.e. that may occur from separator vessels during the initial cleanup period of the well). Immediately upon detection of gas in the flowback, operators must divert the flowback into reduced emission completion ("REC") equipment.

PERFORMANCE STANDARD 9.3

Acceptable reasons for sending gas to a flare and not directing gas into the sales line include:

- a) Low content of flammable gas. Such low-flammability gas must be directed through a flare, past a continuous flame, to insure combustion begins when gas composition becomes flammable.
- b) For safety reasons.

PERFORMANCE STANDARD 9.3 GUIDANCE FOR AUDITORS

Operator should provide documentation of date, time, duration, quantity, and reasons for flaring. Auditor to verify appropriate reasons for flaring.

PERFORMANCE STANDARD 9.4

Circumstances unacceptable for sending gas to flare, instead of directing it into a sales line, are:

- a) Beginning on January 1, 2014, a lack of a pipeline connection except for wells that are designated as either exploratory or extension wells using SEC definitions (however, Operator should minimize flaring and maximize the use of reduced emissions completions on exploratory or extension wells, where possible);
- b) Inadequate water disposal capacity;
- c) Undersized flow back equipment, lack of flow back equipment or lack of equipment operating personnel.

PERFORMANCE STANDARD 9.4 GUIDANCE FOR AUDITORS

See 9.3

PERFORMANCE STANDARD 9.5

Any upset or unexpected condition that leads to flaring of gas, instead of directing it into a sales line, must be documented and records maintained by the operator, including a description of the condition, the location, date, and quantity of gas flared.

PERFORMANCE STANDARD 9.5 GUIDANCE FOR AUDITORS

See 9.3

PERFORMANCE STANDARD 9.6

Using the SEC definitions, an exploratory well is a well drilled to find a new field or to find a new reservoir in a field previously found to be productive of oil or gas in another reservoir. An extension well is a well drilled to extend the limits of a known reservoir. Wells with these designations must be consistent with Operator reporting of such designations to the SEC, if applicable.

PERFORMANCE STANDARD 9.6 GUIDANCE FOR AUDITORS

1. Operators to provide documentation to verify status of exploratory wells, including SEC designation. (SEC definitions are found at 17 CFR Section 210.4-10.)
2. Auditor is to verify status.

PERFORMANCE STANDARD 10.1

When flaring is permitted during well completion, re-completions or workovers of any well, pursuant to Standard No. 9 above, operators must adhere to the following requirements:

- a) Operators must either use raised/elevated flares or an engineered combustion device with a reliable continuous ignition source, which have at least a 98% destruction efficiency³ of methane. No pit flaring is permitted.
- b) Flaring may not be used for more than 14-days on any development well (for the life of the well). Flaring may not be used for more than 30-days on any exploratory or extension wells (for the life of the well), including initial or recompletion production tests, unless operation requires an extension.⁴ If flaring continues beyond 30-days for an exploratory or extension well, Operators must document the extent of additional flaring and reasons requiring flaring beyond the 30-days.
- c) Flares shall be designed for and operated with no visible emissions, except for periods not to exceed a total of five minutes during any two consecutive hours.

³ Certification of the 98% destruction efficiency may be obtained through either of the following options: (1) a manufacturer's certification and where operation is in accordance with the manufacturer's specifications and parameters; or (2) where the flares are designed and operated in accordance with the following: (a) meet specifications for minimum heating values of waste gas, maximum tip velocity, and pilot flame monitoring found in 40 CFR § 60.18; (b) if necessary to ensure adequate combustion, sufficient gas shall be added to make the gases combustible; (c) an infrared monitor is considered equivalent to a thermocouple for flame monitoring purposes; (d) an automatic ignition system may be used in lieu of a continuous pilot; (e) flares must be lit at all times when gas streams are present; (f) fuel for all flares shall be sweet gas or liquid petroleum gas except where only field gas is available and it is not sweetened at the sites; and (g) flares shall be designed for and operated with no visible emissions, except for periods not to exceed at total of five minutes during any two consecutive hours.

⁴ For performance standard 10, the 30-day time limit for flaring was based on West Virginia's rules which allow 30-days of temporary flaring before a permit is required. W. Va. CSR § 45-6-6.1a. Additionally, because all states that have developed a flaring time-limit allow flaring to continue longer than the time limit with approval, certain exceptions to the 30-day time limit were provided in performance standard 10 for emergency and upset conditions and well purging and evaluation tests. These exceptions were based on Wyoming's rules. WOGCC Rules and Regulations, Chapter 3, Section 40. Pennsylvania currently has no regulations addressing flaring directly.

PERFORMANCE STANDARD 10.1 GUIDANCE FOR AUDITORS

Operator should provide

1. Date, time, duration, quantity and reason for flaring events.
2. Description of flaring equipment showing its compliance with the standard.
3. Meter readings of gas flow to flare.
4. The flare should be visually observed either directly or via camera at regular intervals – typically four times per day. If visible emissions are detected, operator must keep monitoring for the next two hours to determine whether there is an exceedance of the standard. Company must document time and extent of any exceedance of the standard and record actions taken to address the exceedance.
5. For flaring extension over 30 days, provide documentation extent and justification for extension or, for wells in WV, provide regulatory documentation.

“Development,” “Extension” and “Exploratory” wells are as defined in SEC Regulations at 17 CFR Section 210.4-10.

Well Completion: means the process that allows for the flowback of petroleum or natural gas from newly drilled wells to expel drilling and reservoir fluids and tests the reservoir flow characteristics, which may vent produced hydrocarbons to the atmosphere via an open pit or tank. [40 CFR Part 60.]

Workover: the repair or refracturing of an existing well to enhance or prolong production. [Argonne National Laboratory definition]

Well Completion: See SEC regulations at 17 CFR Section 210.4-10.

PERFORMANCE STANDARD 11.1

The following standard applies only to nonroad dedicated diesel horizontal drilling rig engines at the wellpad. CRSD encourages and supports the conversion of drilling rig engines to either dual-fuel, electricity or natural gas. The following emissions standards apply to the nonroad dedicated diesel drilling rig engines.

- a) By March 20, 2013, Operator and contractor nonroad engines shall achieve horse power-hour weighted average⁵ site emissions equivalent to U.S. EPA Tier 2 nonroad diesel engine standards or better.
- b) By March 20, 2015, 25% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter.⁶
- c) By September 24, 2015, 75% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter.⁷
- d) By September 24, 2016, 95% of Operator or contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter.⁸
- e) All nonroad equipment must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.

⁵ Weighted average emissions are based on an annual weighted average using the certified emissions level of each engine (g/bhp-hr), the rated power of each engine (HP), and the run time (hrs) of each engine over the course of the year.

⁶ Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

⁷ Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

⁸ Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

PERFORMANCE STANDARD 11.1 GUIDANCE FOR AUDITORS

Operator should provide:

1. A listing of the engines employed, including VIN/EIN, engine brand, model, serial number, emission certification level and hours of operation during compliance period;
2. A spreadsheet showing all calculations needed to demonstrate compliance with the weighted emission rate;
3. A copy of the manufacturer's recommended operation and maintenance practices;
4. Documentation of compliance with recommended O&M, including a periodic determination that all required parts of the pollution control system are present and functioning properly;
5. Where an emissions recall is initiated by EPA/CARB or the manufacturer, documentation that the remedy was installed within a reasonable time of receipt of notice of the recall;
6. Where a unit is outside of the useful life of the emissions certification, perform a periodic smoke test and correct excess emissions.

PERFORMANCE STANDARD 11.2

The following standard applies only to dedicated diesel fracturing pump engines at the wellpad. CRSD encourages and supports the conversion of fracturing pump engines to either dual-fuel, electricity or natural gas.

- a) If the fracturing pump is a nonroad dedicated diesel engine powered solely by diesel fuel, then the following emissions standards apply:
 - i) By March 20, 2014, operator and contractor nonroad engines shall achieve horse power-hour weighted average⁸ site emissions equivalent to U.S. EPA Tier 2 nonroad diesel engine standards or better.
 - ii) By September 24, 2015, 25% of all operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter.⁹
 - iii) By September 24, 2016, 75% of all operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter.¹⁰
 - iv) By September 24, 2017, 95% of all operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter.¹¹
 - v) These engines must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.

- b) If the fracturing pump is powered by a dedicated diesel heavy-duty vehicle engine, then the following emissions standards apply:
 - i) By March 20, 2013, 50% of the heavy-duty vehicle engines used to power fracturing pumps, must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter emissions.¹²

⁸ Weighted average emissions are based on an annual weighted average using the certified level of each engine (g/bhp-hr), the rated power of each engine (HP), and the run time (hrs) of each engine over the course of the year.

⁹ Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

¹⁰ Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

¹¹ Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

¹² Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources

- ii) By September 24, 2014, 80% of the heavy duty vehicle engines used to power fracturing pumps, must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter emissions.¹³
- iii) These engines must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.

PERFORMANCE STANDARD 11.2 GUIDANCE FOR AUDITORS

Operator should provide:

1. A listing of the engines employed, including VIN/EIN, engine brand, model, serial number, emission certification level and hours of operation during compliance period;
2. A spreadsheet showing all calculations needed to demonstrate compliance with the weighted emission rate;
3. A copy of the manufacturer's recommended operation and maintenance practices;
4. Documentation of compliance with recommended O&M, including a periodic determination that all required parts of the pollution control system are present and functioning properly;
5. Where an emissions recall is initiated by EPA/CARB or the manufacturer, documentation that the remedy was installed within a reasonable time of receipt of notice of the recall;
6. Where a unit is outside of the useful life of the emissions certification, perform a periodic smoke test and correct excess emissions.
7. Issues relating to Performance Standard 11.2(b), relating to the use of engines subject to EPA's emission standards for onroad HDDE engines are addressed in the discussion of Performance Standard 15.

Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

¹³ Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

PERFORMANCE STANDARD 12.1

The following standard is only applicable to compressor engines dedicated to unconventional activities.

1. By March 20, 2014, existing compressor engines greater than 100 horsepower may not emit more than 1.5 grams of NO_x per horsepower-hour.
2. Any new, purchased, replacement, reconstructed, or relocated lean-burn engines greater than 100 horsepower and up to 500 horsepower may not emit more than 1.0 g/hp-hr for NO_x; 2.0 g/hp-hr for CO; 0.70 g/hp-hr for VOCs.
3. Any new, purchased, replacement, reconstructed, or relocated lean-burn engines greater than 500 horsepower may not emit more than 0.50 g/hp-hr for NO_x; 47 ppmvd at 15% O₂ or 93% reduction for CO; 0.25 g/hp-hr for VOCs; 0.05 g/hp-hr HCHO.
4. Any new, purchased, replacement, reconstructed, or relocated rich-burn engines greater than 100 horsepower and up to 500 horsepower may not emit more than 0.25 g/hp-hr for NO_x; 0.30 g/hp-hr for CO; 0.20 g/hp-hr for VOCs.
5. Any new, purchased, replacement, reconstructed or relocated rich-burn engines greater than 500 horsepower may not emit more than 0.20 g/hp-hr NO_x; 0.30 g/hp-hr CO; 0.20 g/hp-hr VOCs; 2.7ppmvd at 15% O₂ or 76% reduction for HCHO.

Note: This standard will be updated to reflect any future determinations from regulatory agencies with regard to the NO_x limitation.

PERFORMANCE STANDARD 12.1 GUIDANCE FOR AUDITORS

Operator should provide:

1. Copies of permits, make, model and S/N of engines.
2. Copies of state compliance submissions
3. Either the manufacturer certified emission rate or results of required stack testing to show compliance.

PERFORMANCE STANDARD 13.1

By October 15, 2013, all (existing or new) individual storage vessels at the wellpad with VOC emissions equal to or greater than 6 tpy must install controls to achieve at least a 95% reduction in VOC emissions.

PERFORMANCE STANDARD 13.1 GUIDANCE FOR AUDITORS

1. Operator should provide:
 - a. Copies of permits
 - b. Identification and proof of controls used for emissions reductions.
 - c. Manufacturer's certification of D/RE and operating conditions under which that reduction is achieved
 - d. A copy of facility's NSPS data for new sources.
 - e. For flares – vendor conditions and operating conditions.
 - f. For VRUs – Records showing operation of VRUs in manufacturers operating constraints for temp and throughput.
 - g. Certification of emission reduction performance and work practices/record-keeping.
 - h. Breakthrough indicators and carbon regeneration coupled with onsite work practices and recordkeeping.
 - i. Results of “EPA Tanks” software or equivalent and document inputs for calculation of emission threshold for tanks <6 tpy.
2. Auditor to verify that appropriate tanks are controlled and that controls are achieving required reductions.

PERFORMANCE STANDARD 14.1

This standard is applicable to new and existing equipment dedicated to unconventional activities unless stated otherwise.

Change rod packing at all reciprocating compressors (both existing and new), including those at the wellhead, either every 26,000 hours of operation or after 36 months.

PERFORMANCE STANDARD 14.1 GUIDANCE FOR AUDITORS

1. Operator should provide:
 - a. Make, model and S/N for all reciprocating compressors at their facilities
 - b. Provide documentation for changing out the rod packing per the conditions listed.
 - c. A copy of facility's NSPS data for new sources.
2. Auditor to verify change-out at appropriate intervals.

PERFORMANCE STANDARD 14.2

This standard is applicable to new and existing equipment dedicated to unconventional activities unless stated otherwise.

By October 15, 2013, or date of an operator's initial application for certification (whichever is later), pneumatic controllers (both existing and new) must be low-bleed, with a natural gas bleed rate limit of 6.0 scfh or less, or zero bleed when electricity (3-phase electrical power) is on-site.

PERFORMANCE STANDARD 14.2 GUIDANCE FOR AUDITORS

1. Operator should provide:
 - a. P&IDs and inventory of components.
 - b. Manufacturer documentation to demonstrate compliance with rated bleed rate.
 - c. A copy of facility's NSPS data for new sources.
 - d. Operational compliance with standard to be determined through DI&M.
2. Auditor to verify whether controllers meeting the standard are installed.

PERFORMANCE STANDARD 14.3

This standard is applicable to new and existing equipment dedicated to unconventional activities unless stated otherwise.

New centrifugal compressors may not contain wet oil seals. Operators must replace worn out wet seals on existing centrifugal compressors with dry seals.

PERFORMANCE STANDARD 14.3 GUIDANCE FOR AUDITORS

Operator should provide

1. Manufacturer's documentation of dry seals for all new centrifugal compressors
2. A copy of facility's NSPS data for new sources.
3. Historical data on seal leakage rate. If leakage rate shows a sudden increase, wet seals should be replaced with dry seals.

PERFORMANCE STANDARD 14.4

This standard is applicable to new and existing equipment dedicated to unconventional activities unless stated otherwise.

By March 20, 2014 or date of an operator's initial application for certification (whichever is later), operators will implement a directed inspection and maintenance program (DI&M) for equipment leaks from all existing and new valves, pump seals, flanges, compressor seals, pressure relief valves, open-ended lines, tanks and other process and operation components that result in fugitive emissions. Process components subject to DI&M are monitored by a weekly visual, auditory, and olfactory check, and once a year by a mechanical or instrument check to detect leaks. Once significant leaks are detected, they are required to be repaired in a timely manner.

PERFORMANCE STANDARD 14.4 GUIDANCE FOR AUDITORS

1. Operator should provide:
 - a. A copy of the DI&M plan showing procedures for on-site OVA inspection that includes getting as close to equipment as safely possible and annual mechanical/instrument checks.
 - b. Results of inspections, including repair of any leaks discovered.
 - c. Examples of available mechanical or instrument methodologies (from EPA Lessons Learned⁹)
 - i. For leak detection
 1. Infrared Camera
 2. Organic or toxic vapor analyzer (OVA,TVA)
 3. Acoustic and ultrasound leak detector
 4. Soap bubble screening
 5. Electronic screening devices ("sniffers")
 - ii. For leak measurement
 1. Organic or toxic vapor analyzer (OVA,TVA)
 2. High volume sampler
 3. Bagging techniques
 4. Rotameter
 5. Acoustic and ultrasonic leak detectors (often equipped with estimation algorithm)
2. Auditor to verify that procedures are appropriate and that inspections and appropriate repairs are taking place.

⁹ PEA Lessons Learned (<http://www.epa.gov/gasstar/tools/recommended.html>) for Directed Inspection and Maintenance

PERFORMANCE STANDARD 14.5

This standard is applicable to new and existing equipment dedicated to unconventional activities unless stated otherwise.

Eliminate VOC emissions associated with the prevention of well-bore freeze-up (only de minimis emissions are permitted).

PERFORMANCE STANDARD 14.5 GUIDANCE FOR AUDITORS

Operator should provide documentation of non-pneumatic methodologies used – technologies other than natural gas pneumatically driven equipment for chemical injection or use of the vent gas for useful application.

Auditor to verify use of technology other than gas-driven pneumatic chemical injectors.

PERFORMANCE STANDARD 14.6

This standard is applicable to new and existing equipment dedicated to unconventional activities unless stated otherwise.

Existing and new compressors are required to be pressurized when they are off-line for operational reasons in order to reduce blowdown emissions.

PERFORMANCE STANDARD 14.6 GUIDANCE FOR AUDITORS

1. Operator should provide operating/idle-pressurized/idle-depressurized hours for all compressors.
2. Venting gas back to the gathering line rather than depressurizing is an acceptable alternative to keeping equipment pressurized.
3. This standard permits the de minimis venting of lines necessary for compressor start-up

PERFORMANCE STANDARD 15.1 & 15.2

15.1

By March 20, 2014, 80% of all trucks used to transport fresh water or well flowback water must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions.¹⁰

15.2

By September 24, 2015, 95% all trucks used to transport fresh water or well flowback water must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter emissions.¹¹

PERFORMANCE STANDARD 15.1 & 15.2 GUIDANCE FOR AUDITORS

Operator should provide:

1. A listing of the engines employed, including VIN/EIN, engine brand, model, serial number, emission certification level and hours of operation during compliance period;
2. A spreadsheet showing all calculations needed to demonstrate compliance with the weighted emission rate;
3. A copy of the manufacturer's recommended operation and maintenance practices;
4. Documentation of compliance with recommended O&M, including a periodic determination that all required parts of the pollution control system are present and functioning properly;
5. Where an emissions recall is initiated by EPA/CARB or the manufacturer, documentation that the remedy was installed within a reasonable time of receipt of notice of the recall;
6. Where a unit is outside of the useful life of the emissions certification, perform a periodic smoke test and correct excess emissions.

¹⁰ Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

¹¹ Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

PERFORMANCE STANDARD 15.3

All on-road vehicles and equipment must limit unnecessary idling to 5 minutes, or abide by applicable local or state laws if they are more stringent.

PERFORMANCE STANDARD 15.3 GUIDANCE FOR AUDITORS

1. Operator should provide work practice requirements of signage and notification at the check in station.
2. Auditor to verify development and application of work practices.

PERFORMANCE STANDARD 15.4

All on-road and non-road vehicles and equipment must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.

PERFORMANCE STANDARD 15.4 GUIDANCE FOR AUDITORS

1. Operator should provide records of the diesel fuel being used.
2. Auditor to verify use of ULSD.

Acronyms

AOR	Area of Review
CARB	California Air Resources Board
CO	Carbon Monoxide
CRSD	Center for Responsible Shale Development
CWT	Centralized Waste Treatment facility
DI&M	Directed Inspection and Maintenance
EPA	Environmental Protection Agency
g/hp-hr	Grams per Horsepower Hour
g/bhp-hr	Grams per Brake Horsepower-Hour
HCHO	Formaldehyde
NO _x	Mono-nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standard
O ₂	Oxygen
PM	Particulate Matter
POTW	Publicly Owned Treatment Works
ppm	Parts per Million
ppmvd	Parts Per Million, Volumetric Dry
scfh	Standard Cubic Feet per Hour
SEC	Security and Exchange Commission
tpy	Tons per Year
VOC	Volatile Organic Compound
WET	Whole Effluent Toxicity