

**Berry Petroleum – Section 22 Compressor Station
Full Compliance Evaluation (FCE)
Off-Site Clean Air Act (CAA) Inspections**

Inspection Date: May 4, 2021

Inspection Report Date: June 15, 2021

EPA Representatives: Michael Stovern

Tribal Representatives: N/A

Company Representatives: Jon Armstrong and Nick Michaelson

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Date: 2021.06.16 08:18:42 -06'00'

Last CAA Inspection: 6/29/2016

Applicable Rules: Clean Air Act (CAA) Synthetic Minor Permit,
40 C.F.R. Part 63, Subpart HH (MACT HH)
40 C.F.R. Part 63, Subpart ZZZZ (MACT ZZZZ)

CAA Permit History:

Synthetic minor permit application date: initial application 3/21/2014
Synthetic minor permit approved: 1/21/2016 (SMNSR-UO-000876-2014.001)

General Source Information

Parent Company name: Berry Petroleum

Facility Name: Section 22 Compressor Station

Facility Location: Latitude 40.030436, Longitude -110.329964

EPA Region: 8

County, State: Uintah, Utah

Reservation: Uintah & Ouray Reservation

Tribe: Ute Indian Tribe

Responsible Official: David Bowden

NAICS Code: 211111

ICIS-AIR ID Number: 080000004905700219

Overall Inspection Findings

MACT HH violations/concerns

1. No issues identified

MACT ZZZZ violations/concerns

1. No issues identified

Synthetic Minor Permit

1. The source provided the annual emission reports for 2016 through 2020. The reports included the emission calculations. However, these reports did not include formaldehyde in the total HAP calculations.

Previous Inspection Areas of Concern

MACT HH violations/concerns

1. The EPA observed an enclosed combustor (Messco, VOCinerator) located on site and used as the control device for the dehydrator reboiler emissions. That particular make and model of combustor is currently pending approval from the Office of Enforcement and Compliance in EPA headquarters for certification as a manufacturer tested device. Given its pending status, it does not mean the manufacturer has demonstrated compliance with the performance requirements for the control device. The synthetic minor permit requires a performance test by the due date of the first annual report which is April 1st 2017. However, the facility has been subject to MACT HH since the compliance date January 5, 2009 [per §63.760(f)(5)(ii)]. MACT HH requires a performance test within 180 days after the compliance date on the control device by [per §63.772(e)(3)(vi)(A)]. The facility tested the enclosed combustor on March 8, 2017 and demonstrated compliance with a 99.7% destruction efficiency for VOCs.
2. Only two inlet wet gas analyses were collected between 2011 and 2016. The facility did not meet the requirement that an extended wet gas analysis be completed once every 12-month period. Not in compliance. Records review show the source has been conducting wet gas analyses annually since 2016.

MACT ZZZZ violations/concerns

1. The Permittee shall monitor the pressure drop across the catalyst bed on the engine at least every 30 days and the pressure drop across the catalyst bed shall be maintained to within ± 2 inches of water from the baseline pressure drop. The EPA reviewed the June, 2016 Engine Field Service Report and found the observed catalyst pressure drop to be 0.0 inches of water. The catalyst pressure drop is not within 2 inches of water of the established baseline (2.5 inches) required by the permit. However, facility stated that the low differential pressure reading is the result of a light load on the engine and a clean catalyst. Records review show that the facility resolved this issue in October 2016 and was in compliance with this requirement from November 2016 through engine removal in September 2017.
2. The Permittee shall monitor the engine exhaust temperature at least every 30 days and the temperature shall be at least 500 °F and no more than 1,250 °F. The EPA reviewed the June, 2016 Engine Field Service Report and found the observed the pre-catalyst temperature to be 480°F Fahrenheit. The pre-catalyst temperature is less than the 500 degree minimum temperature required by the permit. However, facility stated that the pre-catalyst temperature was measured on the outside of the exhaust piping at the inlet to the catalyst, using a Raytek portable infrared thermometer. A temperature of 480°F recorded in that manner, as measured in June, correlates to an inlet gas temperature approximately 750°F. They have since installed a pyrometer temperature probes upstream and downstream of the catalyst. Records review show that the facility has been in compliance with this requirement since the previous inspection.

The Section 22 Compressor Station was subject to a September 24, 2013, Federal Combined Complaint and Consent Agreement and Final Order (CAFO) between the EPA and Berry Petroleum, formerly Linn Energy. (Docket No. CAA-08-2013-0014). The CAFO addressed 40 C.F.R. part 63 subpart ZZZZ violations at Section 22 compressor station. As a result of this enforcement action Berry Petroleum was required to route all emissions from the still vent of the glycol dehydrator at its Section 22 Compressor Station to an installed combustor, designed and operated to achieve at least a 95% reduction of volatile organic compounds (VOC) and hazardous air pollutant (HAP) emissions. Berry was also required voluntarily accept enforceable

restrictions on its potential to emit at its Section 22 Compressor Stations and, within 6 months of the date the Final Order is issued in this matter, to apply for "synthetic-minor" air permit. The facility has met all the requirements of the CAFO.

Current Areas of Concern

Following the on-site inspection and records review, the facility appears to be in compliance with all applicable regulations except for the issue listed in “Overall Inspection Findings”.

General Inspection Observations and Commentary

This inspection was conducted off-site via a series of information, data and records requests. The operational data below was provided by the operator via an inspection information request.

Table 1: Operating Specifics

Compressor Station Capacity (MMscf/day)	4.5
Compressor Station Throughput Actuals (MMscf/day)	2.15
Low Pressure Inlet (psi)	11 psi
Inlet Gas From	Wells
Outlet Gas to	Brundage Gas Plant
Outlet Pressure (psi)	752 psi
Last Gas Analysis	8/31/2020 at TEG inlet

Table 2: Engine Details

Make	Model	Serial #	Mfg Date	Max HP	Fuel	Stroke Burn	Engine Status
Caterpillar	G3512 LE	7NJ00764	3/2001	1004	NG	4SLB	Removed
Caterpillar	G3516 LE	4EK03561	2/24/1996	1265	NG	4SLB	Operating
Caterpillar	G3516 LE	WPW00483	11/1/2006	1171	NG	4SLB	Removed

MACT HH Requirements (Excluding Synthetic Minor Requirements)

Rule Applicability (63.760, 63.761)

Berry Petroleum operates an area source oil and natural gas production facility with less than 10 tpy of a single HAP (Benzene greater than 0.9 mg/yr and less than 10 tpy) or less than 25 tpy for total HAPs from the glycol dehydration unit and the oil storage tank outside an urbanized area (UA) plus offset.

Based on the 2020 annual emission report the facilities total Hazardous Air Pollutant (HAP) emissions from the dehydrator and oil storage tanks were 0.35 tons.

Determine the optimum glycol circulation rate (63.764(d)(2))

For an area source not located in a UA plus offset, Berry shall calculate the glycol circulation pump rate per MACT HH. Additionally, Berry must operate the dehydration unit's glycol circulation pump at or below the calculated optimum glycol circulation rate at all times.

Compliance with this requirement was conducted in the previous on-site inspection on September 13th 2011. The source calculated and submitted the optimum glycol circulation rate of 137.6 gph for the 12 MMscfd dehydrator in the MACT HH initial notification dated 5/7/2009.

Initial Notification (63.775(c)(7))

An initial notification is required including documentation of the sources location relative to the nearest UA plus offset, calculation of the optimum glycol circulation rate, make/model of the glycol circulation pumps in operation and statement from responsible official that glycol pumps will be operated per calculated optimum rate.

The source submitted an initial notification for the 12 MMscfd dehydrator on 5/7/2009.

MACT ZZZZ Requirements (Excluding Synthetic Minor Requirements)

Engine Unit #3 Applicability (63.6590(a)(2)(iii) & (c)(1))

Table 3: MACT ZZZZ New Engines

Engine Unit	Make	Model	Serial	Mfg Date	Max HP	Fuel	Stroke and Burn
Unit 3	Caterpillar	G3516 LE	WPW00483	11/1/2006	1171	NG	4SLB

Engine Unit 3 is a new (constructed after 6/12/2006), stationary, reciprocating internal combustion engine (RICE) located at an area source of HAP emissions complies with MACT ZZZZ by complying with NSPS JJJJ. However, NSPS JJJJ does not apply to engines manufactured before 7/1/2008, thus there are no requirements for this engine.

Engines Unit #1 and 2 Applicability and Requirements (63.6590(a)(1)(iii), 63.6603(a), Table 2d, #8)

Table 4: MACT ZZZZ Existing Engine

Unit ID	Make	Model	Serial	Mfg Date	Max HP	Fuel	Stroke and Burn
Unit #1	Caterpillar	G3512 LE	7NJ00764	3/2001	1004	NG	4SLB
Unit #2	Caterpillar	G3516 LE	4EK03561	2/24/1996	1265	NG	4SLB

Engines Units #1 and 2 are an existing (constructed before 6/12/2006), stationary, RICE, remote, non-emergency, spark ignition, 4-stroke, lean burn (4SLB), greater than 500 hp engine located at an area source for HAPs. Engines #1 and 2 are subject to work management practices including changing engine oil and filters, inspecting spark plugs, belts and hoses every 2,160 hours of operations or annually whichever comes first.

Engines #1 and 2 Recordkeeping (63.6655(e)(3)(2))

Records of all maintenance conducted for this engine must be kept to show compliance with the applicable work management practices.

The EPA reviewed the engine field service reports provided by the source. Engine maintenance was conducted on Unit #1 from June 2016 through June 2018. Engine Unit #1 was removed from the facility in September 2018. Maintenance was conducted on Unit #2 from June 2016 through April 2021.

Synthetic Minor Requirements (SMNSR-UO-000876-2014.001)

Requirements for the TEG Dehydration System

1. Construction and Operation Limits

- a) The Permittee shall install and operate emission controls as specified in this permit on one (1) TEG natural gas dehydration system meeting the following specifications:
 - i. Limited to a maximum throughput of 12 million standard cubic feet per day (MMscfd) of natural gas
 - ii. Equipped with no more than one (1) natural gas-fired TEG reboiler with a maximum rated heat input of 0.25 million British thermal units per hour (MMBtu/hr);
 - iii. Equipped with no more than one (1) TEG/gas separation unit and one (1) flash tank; and
 - iv. Equipped with no more than one (1) TEG recirculation pump limited to a maximum pump rate of 3.50 gallons per minute (gpm).
- b) Only the dehydration unit that is operated and controlled as specified in this permit is approved for installation and operation under this permit.

During the previous 2016 on-site inspection one dehydration system was observed that met these requirements.

2. Emission Limits

- a) Emissions from the TEG dehydration system shall not exceed the following limits:
 - i. VOC: 1.41 tons in any consecutive 12-month period; and
 - ii. Total HAP: 0.54 tons in any consecutive 12-month period.
- b) Emission limits shall apply at all times unless otherwise specified in this permit.

Following a review of the rolling 12-month emissions from 2016 through 2021, the facility had peak VOC emissions of 0.65 tons and peak HAP emissions of 0.36 tons.

3. Emission Calculation Requirements

- a) VOC and total HAP emissions must be calculated, in tons, and recorded at the end of each month, beginning with the first calendar month that this permit is effective.

Following a review of the monthly and 12-month rolling emission calculations, the VOC and total HAP emissions appear to be calculated as required.

- b) Prior to 12 full months of VOC and total HAP emissions calculations, the Permittee must, within seven (7) calendar days of the end of each month, add the emissions for that month to the calculated emissions for all previous months since the effective date of the permit and record the total. Thereafter, the Permittee must, within seven (7) calendar days of the end of each month, add the emissions for that month to the calculated emissions for the preceding 11 months and record a new 12-month total.

Following a review of the monthly and 12-month rolling emission calculations, the VOC and total

HAP emissions appear to be calculated as required.

- c) VOC and total HAP emissions shall be calculated, in tons, using a generally accepted simulation model or software (examples include ProMax and GRI-GLYCalc™ Version 4.0 or higher). Inputs to the model shall be representative of actual average monthly operating conditions of the glycol dehydration unit and may be determined using the procedures documented in the Gas Research Institute (GRI) report entitled, “Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions” (GRI-95/0368.1).

Following a review of the monthly and 12-month rolling emission calculations, the VOC and total HAP emissions appear to be calculated as required.

4. Control and Operational Requirements

- a) The Permittee shall route all emissions from the TEG dehydration system still vent through a closed-vent system to an enclosed combustion device designed and operated as specified in this permit.

During the 2016 on-site inspection, it was observed that emissions from the dehydrator still vent are routed through a CVS to an enclosed combustion device.

- b) The Permittee shall design, install, continuously operate, and maintain the closed-vent system such that it is compliant with the following requirements:
 - i. The closed-vent system shall route all gases, vapors, and fumes emitted from the still vent to the enclosed combustor;
 - ii. All vent lines, connections, fittings, valves, relief valves, or any other appurtenance employed to contain and collect gases, vapors, and fumes and transport them to control equipment shall be maintained and operated during any time the control equipment is operating;
 - iii. The closed-vent system shall be designed to operate with no detectable emissions;
 - iv. If the closed-vent system contains one or more bypass devices that could be used to divert all or a portion of the gases, vapors, or fumes from entering the control device, the Permittee shall meet the one of following requirements for each bypass device:
 - A. At the inlet to the bypass device that could divert the stream away from the control device and into the atmosphere, properly install, calibrate, maintain, and operate a flow indicator that is capable of taking periodic readings and sounding an alarm when the bypass device is open such that the stream is being, or could be, diverted away from the control device and into the atmosphere; or
 - B. Secure the bypass device valve installed at the inlet to the bypass device in the non-diverting position using a car-seal or a lock-and-key type configuration;
 - v. The Permittee shall minimize leaks of hydrocarbon emissions from all vent lines, connections, fittings, valves, relief valves, or any other appurtenance employed to contain, collect, and transport gases, vapors, and fumes to the control device.

During the 2016 on-site inspection, an IR camera inspection of the CVS did not detect emissions and the bypass device was secured in the non-diverting position using a car-seal.

- c) The Permittee shall design, install, continuously operate, and maintain an enclosed combustion device such that the mass content of the uncontrolled emissions of VOC and total HAP from the

TEG dehydration system still vent are reduced by at least 95.0% by weight.

A Messco VOCinerator is used as the control device for the dehydrator reboiler emissions. As of November 2020, this enclosed combustor was not on the EPA approved list of enclosed combustors that meet the manufacturer testing requirements. As such, the enclosed combustor will be subject to periodic performance testing. (https://www.epa.gov/sites/production/files/2020-11/documents/mfr-tested_combustor_list_november_2020.pdf)

- d) The Permittee shall ensure that each enclosed combustion device is:
- i. Operated properly at all times that natural gas is routed to it;
 - ii. Operated with a liquid knock-out system to collect any condensable vapors (to prevent liquids from going through the control device);
 - iii. Equipped with a flash-back flame arrestor;

During the 2016 on-site inspection, it was observed that the combustor was equipped with a liquid knock-out tank, flash back flame arrestor and appeared to be operating properly at the time of the inspection.

- iv. Equipped with one of the following:
 - A. A continuous burning pilot flame, a thermocouple, and a malfunction alarm and notification system if the pilot flame fails; or
 - B. An electronically controlled auto-ignition system with a malfunction alarm and notification system if the pilot flame fails while produced natural gas or natural gas emissions are flowing to the enclosed combustor;

During the 2016 on-site inspection, the source stated that “the combustors are equipped with a burner management system which has a malfunction alarm to notify the operators of any issues during their daily facility checks”.

- v. Maintained in a leak-free condition; and
- vi. Operated with no visible smoke emissions.

During the 2016 on-site inspection, the inspectors did not observe any leaks with the IR camera and no visible smoke was observed during the inspection.

- e) The Permittee shall follow the manufacturer’s recommended maintenance schedule and operational procedures to ensure optimum performance of the TEG dehydration system, closed-vent system, and enclosed combustion device.

The source provided a copy of the facility’s SOP which includes a schedule of manufacturer recommended maintenance for the combustor.

5. Testing Requirements

- a) The Permittee shall ensure that the enclosed combustion device has sufficient capacity to achieve at least a 95.0% VOC and HAP emission destruction efficiency for the minimum and maximum hydrocarbon volumetric flow rate and BTU content routed to the device.
- b) The Permittee shall ensure that the enclosed combustion device is:

- i. A model demonstrated by a manufacturer to meet the benzene destruction efficiency requirements of this permit using the procedures specified in 40 CFR 60.5413(d) for VOC emissions by the due date of the first annual report as specified in Condition I.F.1.(a) of this permit; or
- ii. Demonstrated by the Permittee to meet the VOC and HAP destruction efficiency requirements of this permit by using the appropriate EPA approved performance test methods specified in 40 CFR Part 63, Subpart HH for control device performance tests for enclosed combustion devices by the due date of the first annual report specified in Condition I.F.1.(a) of this permit.

The combustor is not currently certified to meet the 95% destruction efficiency. As stated in the requirements above, a performance test was required by the due date of the first annual report which was April 1st 2017. The source conducted a performance test on March 8, 2017 that demonstrated 99.7% destruction efficiency of VOCs.

- c) The Permittee shall perform testing of the inlet wet gas stream to the TEG dehydration system (extended wet gas analysis) at least once every consecutive 12-month period. Alternatively, wet gas from the facility inlet separator can be taken for use in a process simulation software package. The analysis shall include the inlet gas temperature and pressure at which the sample was taken.

The source provided copies of the inlet wet gas analyses from 2017 through 2021. The dates of the most recent analyses were 9/27/2016, 11/13/2017, 10/29/2018, 10/25/2019 and 8/31/2020. The facility met the requirement that an extended wet gas analysis be completed once every 12-month period.

6. Monitoring Requirements

- a) The Permittee shall inspect the enclosed combustion device on a monthly and bi-annual basis to ensure proper operation according to the manufacturer's maintenance recommendations.

The source provided records demonstrating monthly AVO inspections from June 2016 through April 2021.

- b) The Permittee shall inspect the pilot light on the enclosed combustion device at least once per calendar week to ensure that it is lit.

The source stated "field personnel are trained to inspect the combustion device for proper operation, including the presence of the pilot light, whenever they are on site. The combustors are equipped with a burner management system that will alarm if the pilot is not lit. The facility is inspected on a daily basis, however, a specific record of the combustion device operation is not recorded".

- c) The Permittee shall monitor the closed-vent system for leaks of hydrocarbon emissions from all vent lines, connections, fittings, valves, relief valves, or any other appurtenance employed to contain, collect, and transport gases, vapors, and fumes to the enclosed combustion devices as follows:
 - i. Visit the facility on a quarterly basis to inspect the closed-vent system for defects that could result in air emissions and document each inspection. Defects include, but are not limited to, visible cracks, holes, or gaps in piping; loose connections; or broken or missing caps or other closure devices. If a quarterly visit is not feasible due to sudden, infrequent, and unavoidable

- events (e.g. weather, road conditions), every effort shall be made to visit the facility as close to quarterly as possible;
- ii. The inspections shall be based on audio, visual, and olfactory procedures; and
- iii. Any leaks detected in the closed-vent system shall be addressed immediately unless the repair requires resources not currently available. If the resources are not available, the leak shall be repaired no later than 15 days after initial detection of the leak.

The source provided monthly AVO inspection documents that include verification of the closed-vent systems.

- d) The Permittee shall monitor the enclosed combustion device to confirm proper operation as follows:
 - i. Inspect the enclosed combustion device on a monthly and bi-annual basis to ensure proper operation according to the manufacturer's maintenance recommendations;
 - ii. Visually inspect the combustion source (continuous burning pilot flame or automatic igniter) to ensure proper operation whenever an operator is on site, at a minimum, once per calendar week; and
 - iii. Visually confirm that no smoke is present during operation of each smokeless enclosed combustion device whenever an operator is on site; at a minimum, quarterly.

The source provided records of monthly AVO inspection documents which provide documentation of control device inspections.

- e) The Permittee shall operate and maintain a meter that continuously measures the natural gas flowrate from the TEG dehydration system. The meter shall be inspected on a monthly basis to ensure proper operation per the manufacturer's specifications.
- f) The Permittee shall convert monthly natural gas flowrate to a daily average by dividing the monthly flowrate by the number of days in the month that the TEG dehydration system processed natural gas. The Permittee shall document the actual monthly average natural gas flowrate.

The source provided daily operator logs which document daily natural gas throughput from the TEG dehydrator.

7. Recordkeeping Requirements

The Permittee shall document compliance with the VOC and HAP emissions destruction efficiency and VOC and total HAP emission limits in this permit by keeping the following records:

- a) All manufacturer and/or vendor specifications for the TEG dehydration system, closed vent system, enclosed combustion device, and any monitoring equipment;
- b) The results of all required performance tests;
- c) All extended wet gas analyses;
- d) The actual monthly average natural gas flow rate;
- e) Monitoring system breakdowns or other events that result in invalid data, maintenance, and repairs;
- f) The date, time, and length of any events in which the still vent stream was bypassing the enclosed combustion device or was not otherwise controlled;
- g) Inspections of the closed-vent system, enclosed combustion device, and any defects observed and the corrective action taken;
- h) Maintenance conducted on the enclosed combustion device; and
- i) The total monthly and consecutive 12-month VOC and total HAP emissions calculations for the

TEG dehydration unit.

The source provided all requested documentation, meeting the recordkeeping requirements.

Requirements for the 1,171 Horsepower Compressor Engine (Caterpillar G3516, SN WPW00483)

1. Construction and Operational Requirements

The Permittee shall install and operate emission controls as specified in this permit on the existing engine used for natural gas compression, meeting the following specifications:

- a) Operated as a 4-stroke lean-burn engine;
- b) Fired with natural gas; and
- c) Limited to a maximum site rating of 1,171 horsepower (hp).

There is nothing to evaluate with this general requirement.

2. Emission Limits:

- a) Emissions from the engine shall not exceed the following:
 - i. CO: 0.50 pounds per hour (lb/hr);
 - ii. VOC: 0.71 lb/hr; and
 - iii. Formaldehyde: 0.44 lb/hr
- b) Emission limits shall apply at all times, unless otherwise specified in this permit.

Based on a review of the engine's previous performance test (3/13/2017) this engine met the emission requirements.

3. Control and Operational Requirements

- a) The Permittee shall install, continuously operate, and maintain a catalytic control system on the engine that is capable of reducing the uncontrolled emissions of CO by at least 93%, and VOC and formaldehyde by at least 45%, to meet the emission limits specified in this permit.

During the previous on-site inspection, the inspectors observed a catalyst control system on this engine.

- b) Except during startups, which shall not exceed 30 minutes, the engine exhaust temperature at the inlet to the catalyst bed shall be maintained at all times the engine operates with an inlet temperature of at least 500 °F and no more than 1,250 °F.

The source was able to produce records of inlet catalyst temperature from June 2016 Through August 2017. This engine was removed in September 2017. For the catalyst inlet temperature data provided it showed compliance with the required operating temperature range.

- c) During operation the pressure drop across the catalyst bed shall be maintained to within ± 2 inches of water from the baseline pressure drop reading taken during the most recent performance test or catalyst cleaning or replacement, whichever is more recent.

The baseline pressure drop measured during the previous performance test (2/6/2017) was 1.5 inches of water. The weekly pressure-drop records showed the engine stayed within 2 inches of the baseline through August 2017. The engine was shut-down and removed in September 2017.

- d) The Permittee shall fire the engine with natural gas only. The natural gas shall be pipeline-quality in all respects except that the CO₂ concentration in the gas is not required to be within pipeline-quality.

Based on a review of the facilities outlet gas analysis (8/31/2020), which it uses to fuel the engine, it shows the facility met this requirement.

- e) The Permittee shall follow, for the engine and its catalytic control system, the manufacturer recommended maintenance schedule and procedures, or equivalent procedures developed by the Permittee or vendor, to ensure optimum performance of the engine and its catalytic control system.

The facility's engine maintenance SOP includes a schedule of manufacturer recommended maintenance.

- f) The Permittee may rebuild an existing permitted engine or replace an existing permitted engine with an engine of the same hp rating, and configured to operate in the same manner as the engine being rebuilt or replaced. Any emission limits, requirements, control technologies, testing or other provisions that apply to the engines that are rebuilt or replaced shall also apply to the replaced engines.

The facility has removed the Caterpillar G3516 engine (serial number WPW00483) in September 2017. The facility has not replaced or rebuilt the engine.

- g) The Permittee may resume operation without the catalytic control system during an engine break-in period, not to exceed 200 operating hours, for rebuilt and replaced engines.

4. Performance Test Requirements

- a) Performance tests shall be conducted on the engine for measuring CO, VOC emissions to demonstrate compliance with the emission limits in this permit.
 - i. The initial performance tests shall be conducted within 90 calendar days after the effective date of this permit. The results of performance tests conducted prior to the effective date of this permit may be used to demonstrate compliance with the initial performance test requirements, provided the tests were conducted in an equivalent manner as the performance test requirements in this permit; and
 - ii. Subsequent performance tests shall be conducted every 3 years or 8,760 hours of operation, whichever comes first.

The facility conducted performance tests for a Caterpillar G3516 (SN: WPW00483) on 2/17/2016 and 3/13/2017. This engine was shut-down and removed from the facility in September 2017.

- b) All performance tests conducted on the engine shall meet the following requirements:
 - i. All tests for CO and VOC shall be conducted in accordance with the performance test procedures in the Standards of Performance for Stationary Spark Ignition Internal Combustion Engines at 40 CFR Part 60, Subpart JJJJ (NPS JJJJ) for the appropriate engine type and pollutant. The Permittee may submit to the EPA a written request for approval of alternate test methods, but shall only use the alternate test methods after obtaining written approval from the EPA.
 - ii. All tests shall be performed at a maximum operating rate (90% to 110% of the maximum

- achievable engine load available at the time of the test), and according to the requirements in 40 CFR 60.8 and under the specific conditions specified for the appropriate engine type in NSPS JJJJ. The Permittee may submit to the EPA a written request for approval of testing at an alternate load level, but may only test at that level after obtaining written approval from the EPA;
- iii. During each test run, data shall be collected on all parameters necessary to document how emissions were measured or calculated (such as test run length, minimum sample volume, volumetric flow rate, moisture and oxygen corrections, etc.);
 - iv. Each test shall consist of at least three 1-hour or longer valid test runs, as specified in 40 CFR 60.8(f). Emission results shall be reported as the arithmetic average of all valid test runs and shall be in terms of the emission limits (lb/hr) in this permit;
 - v. The pressure drop across each catalyst bed and the inlet temperature to each catalyst bed shall be measured and recorded at least once per test to establish a baseline pressure drop and to demonstrate compliance with the operating limitations of this permit;
 - vi. The Permittee shall not perform engine tuning or make any adjustments to engine settings, catalytic control system settings, processes or operational parameters immediately prior to the engine testing or during the engine testing. Any such tuning or adjustments may result in a determination by the EPA that the test is invalid. Artificially increasing an engine load to meet testing requirements is not considered engine tuning or adjustments;
 - vii. The Permittee shall not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in 40 CFR 60.8(c);
 - viii. The Permittee shall not abort any engine tests that demonstrate non-compliance with the CO, VOC, or formaldehyde emission limits in this permit;
 - ix. Performance test plans shall be submitted to the EPA for approval 60 calendar days prior to the date the test is planned;
 - x. Performance test plans that have already been approved by the EPA for the emission units approved in this permit may be used in lieu of new test plans unless the EPA requires the submittal and approval of new test plans. The Permittee may submit new plans for EPA approval at any time;
 - xi. The test plans shall include and address the following elements:
 - i. Purpose of the test;
 - ii. Engine and catalytic control system to be tested;
 - iii. Expected engine operating rate during the test;
 - iv. Sampling and analysis procedures (sampling locations, test methods, laboratory identification);
 - v. Quality assurance plan (calibration procedures and frequency, sample recovery and field documentation, chain of custody procedures); and
 - vi. Data processing and reporting (description of data handling and quality control procedures, report content); and
 - xii. The Permittee shall notify the EPA at least 30 calendar days prior to scheduled performance testing. The Permittee shall notify the EPA at least one (1) week prior to scheduled performance testing if the testing cannot be performed.
- c) If the permitted engine is not operating, the Permittee does not need to start up the engine solely to conduct the performance test. The Permittee may conduct the performance test when the engine is started up again.

The engine performance test for the Caterpillar G3516 on 3/13/2017 met all requirements above.

5. Monitoring Requirements

- a) The Permittee shall monitor the engine exhaust temperature at least every 30 days, and each time the catalyst is cleaned or replaced, using temperature-sensing device at the inlet to the catalyst bed to

obtain a direct reading of the temperature, in accordance with the manufacturer recommended maintenance schedule and procedures, or equivalent procedures developed by the Permittee or vendor, to ensure optimum performance of the catalytic control system.

The Caterpillar G3516 engine (serial number WPW00483) was operational from June 2016 through September 2017. From June through November 2016 the monthly temperature checks the pre-catalyst temperature was measured on the outside of the exhaust piping at the inlet to the catalyst, using a Raytek portable infrared thermometer. A temperature of 480°F recorded in that manner, as measured in June 2016, correlates to an inlet gas temperature approximately 750°F. From November 2016 through September 2017 the source has installed and operated a pyrometer temperature probes upstream and downstream of the catalyst.

- b) The Permittee shall monitor the pressure drop across the catalyst bed on the engine at least every 30 days, and each time the catalyst is cleaned or replaced, using pressure sensing devices before and after the catalyst bed to obtain a direct reading of the differential pressure, in accordance with the manufacturer recommended maintenance schedule and procedures, or equivalent procedures developed by the Permittee or vendor, to ensure optimum performance of the catalytic control system. [Note to Permittee: Engine exhaust temperature and differential pressure measurements, in general, are used to determine when the elements of the catalyst bed are fouling, blocked or blown out and thus require cleaning or replacement.]

The Caterpillar G3516 engine (serial number WPW00483) was operational from June 2016 through September 2017. The EPA reviewed the monthly pressure drop checks and they appeared to be within 2 inches of water of the established baseline for November 2016 through August 2017. For the period June 2016 through October 2016 the pressure drop readings were anomalously low with negative values. However, facility stated that the low differential pressure reading is the result of a light load on the engine and a clean catalyst.

- c) The Permittee shall perform the first measurements of the engine exhaust temperature and the pressure drop across the catalyst bed no more than 30 days from the effective date of this permit. Thereafter, the Permittee shall measure the engine exhaust temperature and pressure drop across the catalyst bed, at a minimum, every 30 days, and each time the catalyst is cleaned or replaced. Subsequent performance tests, as required in this permit, can be used to meet the periodic engine exhaust temperature and pressure drop monitoring requirements provided the test occurs within the 30-day window. The engine exhaust temperature and pressure drop readings can be a one-time measurement on that day, the average of performance test runs performed on that day, or an average of all the measurements on that day if continuous readings are taken.

The facility conducted their initial performance test on 2/17/2016 and the effective date of the permit is 2/20/2016.

- d) Except during startups, which shall not exceed 30 minutes, if the engine exhaust temperature at the inlet to the catalyst bed on the engine deviates from the acceptable range specified in this permit, then the Permittee shall follow the manufacturer recommendations for bringing the engine exhaust temperature back within the acceptable range.

No engine exhaust temperature deviations were reported by the facility.

- e) If the pressure drop across the catalyst bed exceeds $\pm$ two (2) inches of water from the baseline pressure drop reading taken during the most recent performance test, then the Permittee shall follow the manufacturer recommendations for bringing the pressure drop back within $\pm$ two (2) inches of

water from the baseline pressure drop reading taken during the most recent performance test.

A pressure drop deviation that exceeded 2 inches was reported from June through November 2016. The facility corrected the issue in November 2016 which brought the catalyst pressure drop to within 2 inches of the baseline.

- f) The Permittee is not required to conduct emissions monitoring and parametric monitoring of exhaust temperature and catalyst differential pressure on the engine if it has not operated during the monitoring period. The Permittee shall certify that the engine did not operate during the monitoring period in the annual report specified in this permit.

The Caterpillar G3516 engine (serial number WPW00483) was shut-down and removed from the facility in September 2017. As such, there is no parametric monitoring for September 2017 through the date of this inspection.

6. Recordkeeping Requirements

- a) Records shall be kept of manufacturer and/or Permittee or vendor-developed specifications and recommended maintenance procedures for the engine, catalytic control system, temperature-sensing device, and pressure-measuring device.
- b) Records shall be kept of all calibration and maintenance conducted for the engine and catalytic control system.
- c) Records shall be kept of all required testing and monitoring in this permit. The records shall include the following:
 - i. The date, place, and time of sampling or measurements;
 - ii. The date(s) analyses were performed;
 - iii. The company or entity that performed the analyses;
 - iv. The analytical techniques or methods used;
 - v. The results of such analyses or measurements; and
 - vi. The operating conditions as existing at the time of sampling or measurement.
- d) Records shall be kept of all catalyst cleanings or replacements, engine rebuilds and engine replacements.
- e) Records shall be kept of each rebuilt or replaced engine break-in period, pursuant to the requirements of this permit, where the existing engine that has been rebuilt resumes operation without the catalyst control system, for a period not to exceed 200 hours.
- f) Records shall be kept of each instance of a deviation of the operating limitations in this permit for the inlet temperature to the catalyst bed or pressure drop across a catalyst bed. The Permittee shall include in the record the cause of the problem, the corrective action taken, and the timeframe for bringing the pressure drop and/or inlet temperature range into compliance.
- g) Records shall be kept that are sufficient to demonstrate that the fuel for the engine is pipeline quality natural gas in all respects, with the exception of CO₂ concentrations.

The source provided all requested engine documentation, meeting the record keeping requirements.

7. Requirements for Reporting

- a) Annual Emission Reports
 - i. The Permittee shall submit a written annual report of the actual annual emissions from all emission units at the facility each year no later than April 1st. The annual report shall cover the period for the previous calendar year. All reports shall be certified to truth and accuracy by the responsible official.
 - ii. The report shall include VOC, NO_x, CO, total HAP, and formaldehyde emissions.

- iii. The report shall be submitted to:

U.S. Environmental Protection Agency, Region 8
Office of Partnerships and Regulatory Assistance
Tribal Air Permitting Program, 8P-AR
1595 Wynkoop Street
Denver, Colorado 80202

The report may be submitted via electronic mail to R8AirPermitting@epa.gov.

The source provided the annual emission reports for 2016 through 2020. The reports included the required emission calculations. However, in these emission reports they did not include formaldehyde in their total HAP calculations.

- b) All other documents required to be submitted under this permit, with the exception of the Annual Emission Reports, shall be submitted to:

U.S. Environmental Protection Agency, Region 8
Office of Enforcement, Compliance & Environmental Justice
Air Toxics and Technical Enforcement Program, 8ENF-AT
1595 Wynkoop Street
Denver, Colorado 80202

Documents may be submitted via electronic mail to R8AirReportEnforcement@epa.gov.

- c) The Permittee shall promptly submit to the EPA a written report of any deviations of emission or operational limits specified in this permit and a description of any corrective actions or preventative measures taken. A “prompt” deviation report is one that is post marked or submitted via electronic mail to r8airreportenforcement@epa.gov as follows:
- i. Within 30 days from the discovery of a deviation that would cause the Permittee to exceed the emission limits or operational limits if left un-corrected for more than five (5) days after discovering the deviation; and
 - ii. By April 1st for the discovery of a deviation of recordkeeping or other permit conditions during the preceding calendar year that do not affect the Permittee’s ability to meet the emission limits.
- d) The Permittee shall submit a written report for any required performance tests to the EPA Regional Office within 60 days after completing the tests.
- e) The Permittee shall submit any record or report required by this permit upon EPA request.

The facility did not report any deviations in the annual emission reports covering 2016 through 2020.

Appendix A: Satellite Imagery of Facility

