

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

FCE Summary Report

Facility : Linn Operating LLC - Loud 15 CPF Unit 170	SRN : P0894
Location : SE 1/4 NE 1/4 Sec 9 T29N R3E	District : Gaylord
	County : MONTMORENCY
City : LOUD TWP State: MI Zip Code : 49709	Compliance Status : Compliance
Source Class : SM OPT OUT	Staff : Sharon LeBlanc
FCE Begin Date : 10/2/2017	FCE Completion Date : 10/2/2018
Comments : FCE for synthetic minor Facility for 2019 Fiscal Year. sgl	

List of Partial Compliance Evaluations :

Activity Date	Activity Type	Compliance Status	Comments
10/02/2018	Scheduled Inspection	Compliance	unannounced, scheduled site inspection for FY 2019.
04/27/2018	Malfunction Abatement Plan	Compliance	Revised Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) for Linn Sites was submitted and reviewed by District Staff. Note submittal was determined to be complete, and approval letter issued the week of April 30, 2018. sgl

Name: Sharon LeBlanc Date: 11/7/2018 Supervisor: SN

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

P089446502

FACILITY: Linn Operating LLC - Loud 15 CPF Unit 170		SRN / ID: P0894
LOCATION: SE 1/4 NE 1/4 Sec 9 T29N R3E, LOUD TWP		DISTRICT: Gaylord
CITY: LOUD TWP		COUNTY: MONTMORENCY
CONTACT: Lundin Diane , EHS Advisor		ACTIVITY DATE: 10/02/2018
STAFF: Sharon LeBlanc	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: unannounced, scheduled site inspection for FY 2019.		
RESOLVED COMPLAINTS:		

On October 2, 2018, AQD District Staff mobilized to the Linn Operating LLC – Loud 15 Unit 170 Booster (P0894), located at the Loud B4-9 wellsite location in the SE1/4, NE1/4, Section 9, T29N, R3E, Loud Township, Atlanta, Montmorency County, Atlanta, Michigan to conduct an unannounced, scheduled compliance inspection of the facility. The referenced facility presently operates under Permit to Install (PTI) No. 11-18. A records request was made electronically on September 24, 2018. Records were received electronically on November 5, 2018.

The referenced site was permitted on March 12, 2018, no prior site inspection is of record for the Facility.

FACILITY

The referenced facility is a un-fenced and unmanned booster station operated by Linn Operating LLC (AKA Linn) 5660 Francisco Road, Atlanta, Michigan. The station is reported to service Antrim Formation wells in the area. Activities onsite are limited to compression of NG, which pushes it through the pipeline to the Loud 15 Central Production Facility (CPF) (N6158).

To reach the Facility from the intersection of M-33 and Beauregard Road, travel west on Beauregard Road approximately 2-miles to Francisco Road. Make a right (north) on Francisco Road and travel approximately 0.5-mile on a straight road, from there the road makes a jog to the left and becomes more curving. Travel an additional 0.25-miles the Facility will be on the right-hand side from there the road forks again. Address markers at the site indicate 5640-5660. Sign at site identifies well onsite as “State Loud B4-9”. A review of readily available aerials appears to indicate that the compressor building was constructed between 1998 and 2005.

Weather conditions at the time of the site visit included overcast skies, and temperature of approximately 54 degrees Fahrenheit. Slight winds, and intermittent showers. Stack emissions were limited to heat waves off the compressor stack.

REGULATORY

Permitting -The referenced facility operates under PTI No. 11-18, which was issued to Linn on March 12, 2018. The PTI was issued as an opt-out permit. The referenced permit was issued for the replacement of a Rule 201 exempt booster Reciprocating Internal Combustion Engine (RICE) (Cummins KTA19G5) with a CAT 3408 TA with control device.

Though not identified in the permit, the facility may be subject to Federal Regulation. Subparts frequently associated with oil and gas facilities are identified below. Note however, that compliance with these subparts has not been determined as part of this inspection.

Federal Regulations - The referenced facility does not process or store petroleum liquids and is therefore not be subject to 40 CFR Part 60 (New Source Performance Standards AKA NSPS) Subparts;

- K, Ka or Kb (Storage vessels for Petroleum Liquids);
- KKK (Equipment Leaks of VOC from onshore NG Processing Plants);
- VV (Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry);

In addition, based on information provided in the engineers eval form for PTI 11-18, the existing engine is reported to have a manufacture date that would exempt the existing RICE from NSPS Subparts JJJJ for Spark Ignition (SI) RICE.

Per the permit application, the Facility is reported to not be subject to NSPS Subpart OOOOa (finalized in 2016). The Facility as a whole would be considered the affected facility for purpose of Leak Detection and Repair (LDAR) requirements if horsepower increased. However, the engine swap out resulted in a decrease in horsepower, so the LDAR requirements do not appear to be required at this time.

With respect to 40 CFR Part 63 (Maximum Achievable Control Technology Standards) the following Subparts may apply:

- Subpart HH (HAPS from Oil and NG Production Facilities)
- Subpart ZZZZ (RICE)

With respect to Subpart HH, the affected unit is believed to be dehy units. However, the facility has no dehydrator onsite, and is therefore not subject to the subpart.

With respect to Subpart ZZZZ, the permit application reports that the Facility RICE are subject to 40 CFR Part 63, Subpart ZZZZ, maintenance plan requirements for engines ≤500 hp. These requirements appear to have been incorporated into the Site Preventative Maintenance/Malfunction Abatement Plan (PM/MAP) submitted on April 27, 2018 and approved on May 14, 2018.

EQUIPMENT

The October 2, 2018, site visit identified only one compressor engine, with add on control device (catalyst). Review of District Files indicates that the following compressor engines are of record for the site.

ENGINE ID	ENGINE TYPE	INSTALLATION DATE	REMOVAL DATE	COMMENT
Cummins	Cummins KTA 19G5 420 Hp	Unk	May 15, 2018	Rule 285(g) exempt engine, replaced
EUENGINE S/N 6NB0092	Cat 3408 TA 405 Hp Rich Burn With Catalyst	May 15, 2018*	NA	Permit 11-18 no plate visible on engine Operator logs indicate Unit 170 location 15 Unit is also referenced as Unit 170 RM, and "the mule"

* start-up on May 17, 2018. Catalyst test date on June 14, 2018 and October 19, 2018.

Maintenance activities for EUENGINE are presently contracted through Natural Gas Services Group (NGSG). At the time of the site inspection, onsite NGSG log sheets indicated at least monthly site visits and equipment inspections were being conducted. Operational parameters for the referenced engine consist of the following:

EUENGINE –CAT 3408 TA, 405 Hp, with catalyst.

Date	Engine	RPMS	Source
10/2/2018	EUENGINE	1593	Inspector/Onsite Daily Log
7/55/2018 – 8/2/2018	EUENGINE	1530	Operator Field Sheets
7/12/2018 – 7/24/2018 and 9/5/2018 – 9/12/2018	EUENGINE	1640	Operator Field Sheets
	EUENGINE	1587	Operator Field Sheets

9/19/2018 – 9/26/2018			
6/13/2018-8/22/2018	EUENGINE	1606-1653	NGSG Field Sheets
10/19/2018	EUENGINE	1615	NGSG Field Sheets during catalyst testing

COMPLIANCE

At the time of the October 2, 2018, site visit, no visible emissions were noted to be coming from onsite stacks, nor were there. Due to the overcast conditions at the time of the site inspection, no Visible Emissions (VEs) were noted. Only heat shimmers were noted from exhaust stacks onsite.

MAERS- Annual reporting of actual emissions for the facility under the MAERS reporting system, has not been historically required of the Facility. But is anticipated to begin with reporting for the 2018 calendar year in 2019.

EUENGINE- The referenced EU consists of one NG-fired, CAT 3408 TA, 405 Hp, RICE (EUENGINE). The referenced EU is equipped with a pollution control device (catalyst with AFRC O2 sensor). No material limits are associated with EUENGINE, however S.C. IV.2, VI.2 and VI.5 requires that the permittee installs, calibrates, maintains and operates in a satisfactory manner a device to continuously record the NG usage for each engine. Records provided were sufficient to confirm compliance with permit conditions.

As EUENGINE is equipped with an add-on control device the following special conditions are applicable to EUENGINE at this time:

- Operational limit of 200 hours per year for engine without it’s control device. (SC III.2)
- Proper installation, operation and maintenance of the add-on control device (SC IV.1 and VI.3)
- Documentation of the hours of engine operation without it’s control device (SC VI.4)

Records provided by Linn reported that since installation, the unit was operated without it’s control during a catalyst blowdown on 10/19/2018. At which time the catalyst was inspected and tested to verify proper operation and control efficiencies. The Facility maintains a separate form to document operation of EUENGINE without its control device in compliance with the permit conditions.

OPERATION LIMITS – No later than 60 days after the issuance of Permit 11-18 the permittee is required to submit for review and approval a Preventative Maintenance/Malfunction Abatement Plan (PM/MAP). Records indicate that the required document was submitted in a timely manner in compliance with the permit condition. (SC III.1) Documents contained in District files are summarized below:

PM/MAP Submittal Date	Approval Date	Engines included
April 27, 2018	May 14, 2018	EUENGINE with Catalytic Converter and Air to Fuel Ratio Controller (AFRC) O2 sensor

Per the PM/MAP, the Facility conducts the following Subpart ZZZZ maintenance requirements for EUENGINE (Non-emergency, non-black start, 4SRB, stationary RICE >25 Hp and <500 Hp):

- Inspection of spark plugs, hoses and belts, and replacement as necessary.
- Oil and oil filter changes.
- Hose and belt inspection, and replacement as necessary.

The frequency of the referenced activities are based on the “remote” status of the Facility. Non-remote stationary RICE are required to conduct the referenced maintenance activities every 1,440 hours of operation or annually, which ever comes first. Records provided indicate that since installation of

EUENGINE maintenance activities were conducted on approximately a monthly basis, with operation time between visits ranging from 694 hours to 554 hours. However, the extent of onsite activities were too poorly documented to truly verify the scope of work completed.

Operating parameters for the Catalyst are reported per the PM/MAP to be monitored on a daily (pre and post-catalyst temperatures) and monthly (differential pressure across the catalyst) are collected per the PM/MAP. District Staff noted at the time of the October 2, 2018, site inspection that the operator had not implemented daily reporting of the pre and post catalyst temperatures. Discussions with Linn Staff confirmed that despite discussions at the time of start-up that the data had not been collected by the operator. The reporting has been initiated by the operator and will be confirmed again during the fiscal year. Select data is presented below:

DATE	Pre-Catalyst Temperature	Post-Catalyst Temperature	Differential Pressure Across Catalyst
7/6/2018	NR	NR	4.1
9/1/18	NR	NR	3.8
10/19/18	NR	NR	2
ACCEPTABLE RANGE	> 700 °F	>700°F & <1350°F	0-2 inches above established baseline (2.6)

Per the PM/MAP within 5 days of an operating parameter being reported out of range the Facility will confirm NOx and CO control efficiencies with a portable analyzer. Should control efficiencies not be within the manufacturer's specs, the catalyst will within an additional 5 days be cleaned, and the catalyst gasket replaced. Should supplemental work be required, a replacement catalyst will be installed while the catalyst is sent to vendor. A review of records indicate that the catalyst was inspected, blown down and verification testing was conducted on June 14, 2018 and October 19, 2018. Documentation provided confirmed that the minimum compliance values were met at that time.

The AFRC O2 sensor per the PM/MAP will be replaced either when the emission checks are conducted or when engine operation determines that sensor failure has occurred. Emission checks are conducted using a portable emissions analyzer and are conducted approximately every 12-18 months unless the catalyst operating variable go out of range. Linn staff report that the AFRC sensor was replaced at the time of RICE installation. Archrock documentation provided indicates that the AFRC was adjusted, and the Catalyst washed and tested on June 14, 2018.

EMISSION LIMITS

Emissions for RICE associated with the Facility are calculated using emission factors from Manufacturer Spec sheets (SC VI.6, VI.7 and Appendix A) when available and are based on NG usage documented (SC IV.2, SC 1.11 and SC VI.5). Emissions reported for EUENGINE are summarized below:

Emission Unit	NOx Emissions (TPY)	CO Emissions (TPY)	Reporting Period
EUENGINE	0.23	0.48	June 2018
EUENGINE	0.27	0.57	July 2018
EUENGINE	0.27	0.57	August 2018
LIMIT	9*	12*	12-month rolling*

*Due to the recent installation of EUENGINE, 12-month rolling total emissions were unable to be reported as part of post inspection data submittal by Linn. Based on highest values reported for the three months, it appears that would result in 12-month rolling emissions of 3.24 ton of NOx and 6.84 ton of CO. Both well below permit limits.

TESTING ACTIVITIES – Under the present permit verification of NOx and CO emissions are required upon request of the AQD District Supervisor. (SC V.1) District files contain no copies of written requests for verification testing, and the permit condition not applicable at the time of report preparation.

MONITORING/RECORDKEEPING –Permit requirements for monitoring and recordkeeping include the following:

- Completion of all required calculations by the last day of the calendar month for the month prior and made available to AQD staff upon request, (SC VI.1)
- Monitor and record NG usage for EUENGINE on a continuous basis (SC VI.2)
- Maintain a log of all maintenance activities conducted according to the PM/MAP (SC VI.3) and
- Monthly and 12-month rolling time period NOx and CO emission calculation records for EUENGINE as required by SC I.1 and SCI.2 and Appendix A. (SC VI.6 and SC VI.7)

Records provided by the Facility were sufficient to indicate compliance with the above referenced permit conditions. These records with respect to emission calculations and NG usage are summarized on a spreadsheet generated monthly, which summarizes all the required information, as well as equipment descriptions and emission factor sources.

With respect to maintenance activities however, as previously noted, the written field documentation of activities completed was insufficient to verify the extent of maintenance activities being conducted. Based on the frequency of the visits, it would appear that the maintenance activities with respect to the engines as required by permit are being conducted as required. Linn Staff will be notified of the issue, and requests will be made for their contractor to provide better documentation on future field reports.

STACK/VENT - Permit 11-18 (SC VIII.1) limits the exhaust dimensions for the stack associated with FG ENGINES to:

Emission Unit	Exhaust Diameter (inches)	Minimum Height Above Land Surface (feet)	Source
EUENGINE	6-inch	40 feet	Facility Operator
LIMIT	6-inch Maximum	40-feet Minimum	

SUMMARY

On October 2, 2018, AQD District Staff mobilized to the Linn Operating LLC – Loud 15 Unit 170 Booster (P0894), located at the Loud B4-9 wellsite location in the SE1/4, NE1/4, Section 9, T29N, R3E, Loud Township, Montmorency County, Michigan to conduct an unannounced, scheduled compliance inspection of the facility. The referenced facility presently operates under Permit to Install (PTI) No. 11-18. The referenced site was permitted on March 12, 2018, no prior site inspection is of record for the Facility.

A records request was made electronically on September 24, 2018, and were received on November 5, 2018. Based on observations made at the time of the site inspection, as well as supplemental data received from the company it appears that the facility is operating in general compliance with it's permit conditions. Documentation issues with respect to pre and post catalyst temperature documentation have been resolved, and subcontractor documentation will be addressed in the future.

NAME Sharon G. Blane DATE 11/7/2018 SUPERVISOR NS