

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection**

N753765363

FACILITY: RIVERSIDE - HAYES 29 - GRIDIRON BOOSTER STATION		SRN / ID: N7537
LOCATION: T28N R4W SECTION 34, HAYES TWP		DISTRICT: Gaylord
CITY: HAYES TWP		COUNTY: OTSEGO
CONTACT: Natalie Schrader , Compliance Coordinator		ACTIVITY DATE: 10/05/2022
STAFF: Sharon LeBlanc	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: FY2023 FCE inspection and records review. sgl		
RESOLVED COMPLAINTS:		

On October 5, 2022 AQD District Staff mobilized to the Riverside Energy of Michigan, LLC (AKA Riverside) – Gridiron III A2-34 Booster Station (N7537), located in the SE1/4, NE1/4, NW 1/4 Section 34, T29N, R4W, Hayes Township (South), Otsego County, Michigan to conduct an unannounced, scheduled compliance inspection of the facility. The referenced facility presently operates under Permit to Install No. 241-05. A records request was made electronically on September 24, 2022. Requested records were received electronically on November 9, 2022.

The most recent compliance inspections were conducted October 9, 2018, and October 23, 2014. No compliance issues noted at that time.

FACILITY

The referenced facility is an unfenced, ungated and unmanned booster station operated by Riverside. 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. Note that the station did not have a sign identifying the station. The station has also been referenced by multiple names over the years including:

- Gridiron 90
- Booster #90
- Gridiron A 2-34
- Fred III Booster and
- Hayes 29 Gridiron Booster

At the time of the inspection, it was in the upper 40s with mostly cloudy skies and little to no wind. No Visible Emissions (VEs) were noted at the time of the October 5, 2022, site inspection.

The Facility is located in the SW corner of Otsego County. To reach the Facility from the Gaylord Field Office, take old 275 south to old State Road, make a right onto County Road 38 and travel west. At the intersection of County Road 38 (aka Mancelona Road) and Mt. Frederick Road staff traveled south approximately 2 miles on Mt. Frederick Road to Coot Trail. Make a left (east) on Coot Trail (unmarked and unpaved) travel down the trail for approximately ½ mile. The trail is heavily wooded, but there is a clearing where you can see the station off to your right, the trail will just enter the woods then will curve to the right and end at the booster station. There were other 2-tracks curving off Coot Trail but stay on the better maintained road. No sign was noted on the building.

The Facility has changed hands over time. Historical aerial photographs reviewed indicated that structures associated with the site have been relatively unchanged since 1994. The 1998 Otsego

County, Michigan Plat Maps identify the Facility as being located on approximately 29.9 acres of Mercury Exploration property. Information in MAERS reported equipment onsite with installation dates of January 6, 2005.

District Files contain copies of a March 18, 2005, voluntary disclosure form indicating that the Fred III Facility should have been permitted, and that a permit application would be submitted prior to September 1, 2005. Operators of record based on correspondence in District files include:

- Mercury Exploration Company, (UNK -1998)
- Quicksilver Resources Inc., (1998 - 2007)
- Breitburn, (2007 - 2013)
- Linn (AKA Linn Energy, Linn Operating, Inc, Linn Operating LLC and later name change to Riviera Resources LLC) (2014 - 2019) and
- Riverside (2019 to present)

REGULATORY

Permitting -The referenced facility operates under Permit to Install (PTI) No. 241-05, which was issued to Quicksilver Resources, Inc. on April 14, 2006. The PTI was issued as an opt-out permit. At the time of permitting Rule 225 was determined not to apply based on a January 20, 2006, variance for certain NG combustion emissions.

At the time of permitting the facility consisted of two NG-fired compressor engines, two brine storage tanks (400 barrel each) and one mung oil (used compressor oil and water) storage tank (400 barrel). At the time of the October 5, 2022, site inspection only one RICE existed onsite. The permit application reports that the two brine storage tanks were exempt from Rule 201 permitting under Rule 284(h), and that the mung oil tank was exempt under Rule 284(c).

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, nor store them onsite and is therefore appears to 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, the existing engine has an installation date no of April 6, 1995, which would make them not subject to NSPS Subparts IIII and JJJJ for Compression Ignition (CI) RICE and Spark Ignition (SI) RICE, respectively.

40 CFR Part 60 Subpart OOOO - Standards of Performance for Crude Oil and Natural Gas Facilities for which construction, modification, or reconstruction commenced after August 23, 2011, and on or before September 18, 2015. Subpart OOOO as indicated would apply to onshore affected facilities that are constructed, modified or reconstructed after August 23, 2011 . Based on

available information it appears that the referenced subpart is not applicable at this time but that future changes may be subject to the referenced subpart.

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 JJJJJ (Boiler MACT) and
- Subpart ZZZZ (RICE)

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

NESHAP subparts JJJJJ pertain to Industrial, Commercial and Institutional Boilers and Process Heaters for Area source of HAPS, respectively. At the time of the site inspection there was no glycol dehydration process, and no process heater/reboiler to be subject to the referenced Subpart.

With respect to Subpart ZZZZ, based on date of installation, the engine would be considered an existing, stationary spark ignition (SI) RICE with a site rating of less than 500 brake Hp located at an area source of HAPs subject to the referenced subpart. The Facility reports compliance with the subpart is met through components of the MAP. Though the AQD has obtained delegation under the referenced subpart, no determination of compliance with the subpart has been made at this time.

EQUIPMENT

At the time of the October 9, 2018, site inspection, the Facility consisted of only one-NG fired compressor engine (Unit 90) in operation. A second small green engine sat on a small skid inside the building but appeared to have been disconnected (EUENGINE-EXEMPT). The facility has since reported that the exempt engine has been removed. Both units were in the western most of the two connected buildings onsite.

The eastern building appeared at one time to have housed dehy or other equipment, most of which had been removed. In addition, only one of the two brine/produced water tanks remain onsite in a secondary containment.

Review of District Files indicates that EUENGINE since the October 9, 2018, site inspection has experienced both an engine replacement (July 8, 2020) and two "like for like" engine swings (July 5, 2021, and May 16, 2022). At the time of the October 5, 2022, site inspection, the small exempt engine had been removed from site. No Visible Emissions (VEs) were or heat shimmers were noted from exhaust stacks onsite.

The Facility has historically only reported one engine, however in the MAERS submittal for the 2020 calendar year reports two engines. The Waukesha is identified as EUENGINE1 and the replacement CAT 3406TA is identified as EUENGINE2 for CY 2020 and 2021 reporting. Note that in the table below, the MAERS ID is used for the engine ID for identification, but the permit identifies the engine as EUENGINE.

ENGINE ID	ENGINE TYPE	INSTALLATION DATE	REMOVAL DATE	COMMENT
EUENGINE1, (AKA EUENGINE) S/N 2230921	Waukesha F2895 G 375 HP 4-Stroke Rich-burn No control	1/6/2005	7/8/2020	Note that catalytic converter may have been associated with this engine at time of permitting, Facility indicated intent to remove, and wanted permit to reflect as much.
EUENGINE2, (AKA EUENGINE) Unit 8302	CAT 3406TA 325 HP 1800 RPM	7/8/2020	7/5/2021	With Catalyst and AFRC, replaced Waukesha is referenced in MAERS as EUENGINE2
EUENGINE2, (AKA EUENGINE) Unit 11099 S/N 4FD00574	CAT 3406TA 325 HP 1800 RPM	7/5/2021	5/16/2022	With Catalyst and AFRC DOB October 1993
EUENGINE2, (AKA EUENGINE) Unit 11099 S/N 4FD00974	CAT 3406TA 325 HP	5/16/2022	NA	With Catalyst and AFRC Manufacture date of 4/6/1995 NESHAP <500 Remote RICE
EUENGINE2, (AKA EUENGINE- EXEMPT)	Ford 351 50 HP 4-Stroke Rich-burn No control	1/6/2005	UNK	Reported to be used only to start EUENGINE. Removed from MAERS in 2013. Reported to be removed in electronic correspondence dated 11/5/2018.

It was noted that the serial numbers identified for the RICE associated with Unit 11099 in the September 13, 2021 and June 24, 2022 is that associated with the RICE replaced in May 2022.

Operational parameters for the referenced engine at the time of the October 5, 2022, site visit consisted of the following:

EUENGINE – CAT 3406 TA Unit 1109

Parameter	Value
RPMS	1428
Fuel Pressure	15
Engine Oil Pressure	51
Engine Oil Temp	215
Catalyst pre-temp	721
Catalyst post- temp	756

COMPLIANCE

Since the October 9, 2018, site inspection there have been no complaints, violation notices or consent orders or other compliance issues identified for the Facility. Annual emissions are reported by Riverside for the Facility as part of the MAERS reporting system. Annual submittals are received in a timely manner.

Compliance status for the facility had been based on information provided in conjunction with the October 5, 2022, site inspection, as well as on supplemental data and reports submitted upon request or to meet permit requirements identified under PTI 241-15.

At the time of the October 5, 2022, site visit, no visible emissions were noted to be coming from onsite stacks, some liquids had collected in the secondary containment of the produced water tank due to recent rains.

MAERS- The permittee annually reports actual emissions for CO, NO_x, VOCs and HAPs. A review of the most recent MAERS submittal for the facility (received on January 24, 2022, for emissions associated with the calendar year 2021) included emissions for one engine onsite.

Annual emissions reported for the Facility since 2013 have been limited to emissions from a single engine. Except as previously noted in 2020, at which time two different engines are reported due to an engine replacement. The emissions from the engine reflects total emissions

for FGFACILITY. 12-Month rolling total emissions reported for the calendar years 2020, 2021 and 2022 to date are summarized below:

12-Month Rolling Time Period	EUENGINE NOX (tpy)	EUENGINE CO (tpy)	Fuel Usage (MMcf) 12-Month Rolling Total
2020 (2 engines)	11.3	18.78	16.56
2021 CY	0.13	1.89	12.77
September 2022	0.560	0.13	10.32
EUENGINE	51.7	47.9	NA
EMISSION LIMITs	SC 1.1a	SC 1.2a	
FGFACILITY	89	89	NA
EMISSION LIMITs	SC 2.1a	SC 2.1b	

Note that a review of emissions data provided indicated that emissions from EUENGINE1 without control are still well below NOx and CO emission limits.

12-Month Rolling Time Period	EUENGINE NOX (tpy)	EUENGINE CO (tpy)
2021 CY	42.93	3.19
September 2022	34.70	2.58
EUENGINE	51.7	47.9
EMISSION LIMITs	SC 1.1a	SC 1.2a

EUENGINE- The referenced EU consists of one NG-fired, CAT 3406 TA. 325 Hp RICE with three-way catalyst and AFRC (EUENGINE1). No material limits are associated with EUENGINE, however SC I.6 requires that the permittee monitors in a satisfactory manner a device to continuously record the NG usage for each engine. Records provided by Riverside staff indicate NG usage is being documented by the facility, in compliance with the permit. 12-month rolling total usage is summarized above.

Note that at the time of the 2018 site inspection, EUENGINE was not equipped with an add on control, and a number of permit conditions were therefore not applicable. However, the existing CAT 3406 TA 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 1.3)
- Proper installation, operation and maintenance of the add-on control device (SC 1.4)
- Documentation of the hours of engine operation without it’s control device (SC 1.9)

Information provided by the Facility indicates that EUENGINE did not operate in 2021 or 2022 without it’s control device. Data provided as part of the records request verified that the catalyst was installed and being operated in compliance with SC 1.4). The most recent catalyst testing/verification activities were conducted on June 24, 2022.

OPERATION LIMITS – No later than 60 days after the issuance of Permit 241-05 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 1.2) Documents contained in District files are summarized below:

PM/MAP Submittal Date	Approval Date	Engines included
March 30, 2007	August 9, 2007	EUENGINE with Catalytic Converter Exempt Engine, no control
December 9, 2010	UNK	EUENGINE, Catalytic Converter removed Exempt Engine, no control
July 7, 2020	July 9, 2020	EUENGINE WITH Catalytic Converter and AFRC

Per Table 1 of the July 7, 2020, MAP, the following activities are part of regular engine maintenance activities:

- •General Servicing (every 60-90 days)

This activity includes checks and adjustments of valves, engine compression, timing, fuel pressure, air filter, pre-air filter and all kill devices

- •Major Engine Servicing (every 3,000 hours or if oil analysis indicates)

All of the General Service activities in addition to change motor oil and filter

- •Swing/Overhaul (approximately every 85,000 hours of engine operation or as needed)

This includes replacement of existing engine with new or refurbished engine.

Permit 241-05, allows the Facility may replace an engine with an equivalent or lower-emitting engine with notification to the AQD District Supervisor (SC 1.8). As previously indicated that the existing Waukesha was replaced by a CAT 3406 TA in July 18, 2020, and then later replaced with like-for-like on July 5, 2021 and May 16, 2022.

Maintenance records/logs provided by Riverside for EUENGINE appear to indicate that proper maintenance and operations are being conducted by the facility and general compliance with permit conditions. The most recent service event occurred on October 7, 2022.

In addition to RICE maintenance logs, the Facility provided documentation of catalyst maintenance and testing activities. The documentation included monthly catalyst pre and post catalyst temperatures as well as differential readings.

EMISSION LIMITS

Emissions for RICE associated with the Facility are calculated using emission factors from Manufacturer Spec sheets (Appendix A) when available and are based on NG usage documented (SC 1.6, SC 1.11 and SC 1.12). Emissions are reported annually by the Facility in compliance with reporting requirements (see MAERS above). Emissions data was previously presented and indicates compliance with permit limits.

TESTING ACTIVITIES – Under the present permit verification of NOx and CO emissions are required upon request of the AQD District Supervisor. (SC 1.5) 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 1.7)
- Monitor and record NG usage for each engine on a continuous basis (SC 1.6)
- Maintain a log of all maintenance activities conducted according to the PM/MAP (SC 1.8 & 1.10) and
- Monthly and 12-month rolling time period NOx and CO emission calculation records for EUENGINE as required by SC 1.1a, SC 1.1b and Appendix A. (SC 1.11 and 1.12)

Electronic records provided by Riverside Staff, confirmed that the above referenced data is collected and that calculations are completed and maintained in compliance with permit conditions.

STACK/VENT - Permit 241-05 (SC 1.13) limits the exhaust dimensions for the stack associated with FGEngines to:

Emission Unit	Exhaust Diameter (inches)	Minimum Height Above Land Surface (feet)	Source
EUENGINE	8	24*	Linn e-mail December 13, 2018
LIMIT (SC 1.13)	16-inch Maximum	24-feet Minimum	

* Stack height was increased by Linn Staff/Operators when site inspection and records review indicated that the stack was only 14 ft above land surface. Facility requested time to correct the issue. Documentation of the correction was received on December 13, 2018.

Stack Height verification activities were conducted by AQD District Staff in conjunction with the October 5, 2022, site inspection. Stack Height associated with EUENGINE were found to be in compliance with permit conditions.

FGFACILITY- The referenced FG consists of all process equipment at the facility. Including equipment covered by other permits, grand-fathered equipment and exempt equipment. As previously indicated, equipment identified onsite at the time of the October 9, 2018, site inspection included one NG-fired Waukesha engine, what appeared to be one small, disconnected engine on skid, and one brine tank. The small engine was subsequently removed.

The Facility as of the October 5th, 2022, site inspection consisted of the CAT 3406 TA and one brine tank.

Only a limited number of conditions exist for FGFACILITY, and consist of:

- Permittee shall only burn sweet natural gas. (SC 2.2)
- Verification testing of H₂S and/or sulfur content of NG burned in FGFACILITY upon request of AQD District Supervisor. (SC 2.3)

Gas stream analysis data provided by Riverside, indicated that 0.75 ppm hydrogen sulfide (1 grain is 16.5 ppm hydrogen sulfide) was present in the incoming gas stream for the facility and in compliance with the above conditions.

- 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 2.4)
- Monthly and 12-month rolling time period NO_x and CO emission calculation records for FGFACILITY as required by SC 2.1a, SC 2.1b and Appendix A. (SC 2.5)

The above referenced data was provided upon request and confirmed compliance with the referenced permit conditions. Monthly and 12-month rolling emissions were provided and are summarized earlier in the report. Emissions for EUENGINE represent emissions for FGFACILITY.

SUMMARY

On October 5, 2022 AQD District Staff mobilized to the Riverside Energy of Michigan, LLC (AKA Riverside) – Gridiron III A2-34 Booster Station (N7537), located in the SE1/4, NE1/4, NW 1/4 Section 34, T29N, R4W, Hayes Township (South), Otsego County, Michigan to conduct an unannounced, scheduled compliance inspection of the facility. The referenced facility presently operates under Permit to Install No. 241-05. A records request was made electronically on September 24, 2022. Requested records were received electronically on November 9, 2022.

The most recent compliance inspections were conducted October 9, 2018, and October 23, 2014. This document summarizes not only information obtained during the site visit, but the records review as well. No compliance concerns were noted in preparation of this document, the Facility appears to be operating in general compliance with permit conditions.

NAME Maureen J LeBlanc

DATE 2-8-23

SUPERVISOR Shane Nixon