

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

P027140088

FACILITY: SOUTH BUCKEYE 127 CPF - Gas Plant		SRN / ID: P0271
LOCATION: 278 BADGER ROAD, BEAVERTON		DISTRICT: Saginaw Bay
CITY: BEAVERTON		COUNTY: GLADWIN
CONTACT: Jim Clark , Safety & Facility Compliance Coordinator		ACTIVITY DATE: 05/24/2017
STAFF: Sharon LeBlanc	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: 2017 fiscal year compliance inspection (scheduled) for NGL processing facility. sgl		
RESOLVED COMPLAINTS:		

On Wednesday, May 24, 2017, AQD District Staff conducted a scheduled site inspection at the Cobra Oil & Gas Corporation (Cobra) South Buckeye 127 CPF Gas Plant (AKA South Buckeye) (SRN P0271) Badger Road, Beaverton, Gladwin County, Michigan. The facility is a sweet gas production facility and a minor source.

One Permit to Install (PTI) No. 136-11B is of record for the facility. The referenced permit was modified and issued on September 1, 2016.

Records provided by Cobra to show compliance with the permit may be found in District files.

#### **FACILITY DESCRIPTION**

Based on available information, the South Buckeye consists of an approximately 4 acres located within an approximately 53 acres, predominantly wooded parcel located approximately ½-mile west of the intersection of Badger Road and M-30. The facility is an unmanned, fenced facility which operates 24-hours a day, seven days a week. It is visible from Badger Road. The facility has a water well (non-potable use) and small office for use when staff is onsite.

On August 17, 2015, District Staff received written notice that the facility was purchased by Cobra from Whiting Oil & Gas Corporation (Whiting). Whiting had purchased an existing natural gas processing facility. Equipment in place at the time had been determined to have been exempt, and was unpermitted. In August 2011, Whiting submitted a permit application to expand the existing facility which was reported to be over 6 years old. The resulting Permit No. 136-11 was issued on December 22, 2011. The permit (136-11A) was modified on August 13, 2013. The most recent permit mod application identifies the source of Natural Gas (NG) processed at the facility as the PDC Glenwood zone.

#### **PROCESS EQUIPMENT**

Natural Gas enters the facility and goes thru the GPU (gas production unit) heater-treaters which results in the initial separation of condensate and any water from the incoming gas stream. A liquid knockout drum, secondary stage water separator and secondary stage condensate separator are used at various points to further remove entrained waters as well as to further reduce condensates in the gas.

Dehydration is achieved using a Tri Ethylene Glycol-dehydration unit (EUDHY-TEG) prior to the gas being processed and ready for sales or fuel. Condensate, water and Natural Gas Liquids (NGLs) are trucked out independently.

#### **Permitted Process Equipment:**

At the time of the site visit, the permitted equipment at the facility consisted of the following:

- EUDHY-TEG – TEG dehydration unit

The referenced EU was proposed in the 2013 PTI modification to be replaced by an EG dehydration unit. But Cobra does not plan to swap out the unit, and the EG dehydrator was removed from the permit in 2016. Actual flow rate of NG to the EU is determined by the dehy inlet meter before it reaches EUDHY-TEG. The individual wells also each have a meter that measures gas downstream of the GPUs before the EU.

- **EUENGINE2 – 405 Hp, NG-fired Caterpillar 3408TA, Spark Ignition (SI), 4 Stroke, Rich Burn, (4SRB) Reciprocating Internal Combustion Engine (RICE) with Non-Selective Catalytic Reduction (NSCR) with Air to Fuel Ratio Controls (AFRC). Manufactured on May 11, 1999 and last rebuilt on 2016 not resulting in manufacturer date reclassification .**

Note that at the time of the 2016 permit modification there were two Engines previously permitted to operate at the same time, EUENGINE1 (Waukesha F1197G) and EUENGINE2 (Ajax 2803LE) that was never installed, at the time of the permit modification. Then with the 2016 permit modification another EUENGINE2 (Caterpillar G3408) was proposed to replace EUENGINE1 when necessary. Therefore the sole EU under FGENGINEs at the time of the site inspection is EUENGINE2, as described above which was installed March 22, 2017.

#### **Exempt Process Equipment:**

The following process equipment was identified as exempt in the PTI modification application (2013 and/or 2016):

- One medium heat heater/boiler – Exempt (in 2013, not included in 2016)
- TEG Reboiler – Exempt
- Four GPU Burners – Exempt
- Seven 400-bbl Sweet Condensate Tanks (Tank #s 1-7) – Exempt
- One 400-bbl Blowdown Tank (Tank #8)– Exempt
- One 400-bbl produced water tank (Tank #11) – Exempt
- Two 400-bbl Spare Production Storage Tanks (Tank #s 9 & 19) – Exempt
- One 400-bbl water tank, FW Inj Mix - Exempt
- One Emergency/Process Flare with thermal camera and auto ignition- Exempt
- One 30K Natural Gas Liquid (NGL) Storage Tank – Exempt
- One 300-gallon TEG storage tank – Exempt
- One 180-gallon antifreeze storage tank – Exempt
- One 500-gallon propane storage tank – Exempt
- One 1K gallon methanol storage tank – Exempt
- One Liquid Nitrogen storage tank – Exempt

Note that the condensate and produced water storage tanks are all manifolded together such that they act as a single emissions source. Vapors are reported to be captured by a vapor recovery unit (VRU) and routed to compression and dehydration unit for final processing. If the VRU is down, the vapors are routed to the flare for combustion. The blowdown tank is used only for mechanical system blowdown during an upset.

#### **Disconnected Equipment:**

The facility contains a limited amount of disconnected equipment. This equipment includes the following:

- Old Flare System
- Surplus / out-of-service equipment along west fence

#### **FEDERAL STANDARDS**

Based on information provided by the Facility in their permit modification application the subject site is subject to the following Federal Standards:

##### **-40 CFR Part 63 Maximum Achievable Control Technology (MACT) Standards,**

- Subpart A –General Provisions
- Subpart HH – National Emission Standards for Hazardous Air Pollutants (NESHAP) for Oil and Natural Gas Production Facilities (EUDHY-TEG), and
- Subpart ZZZZ -National Emission Standards for Hazardous Air Pollutants for RICE (EUENGINE2)

##### **-40 CFR Part 60 New Source Performance Standards**

- Subpart A – General Provisions
- Subpart JJJJ –Spark Ignition (SI) RICE - (EUENGINE2)
- Subpart OOOO – NSPS for Crude Oil and NG Production, Transmission and Distribution (EUENGINE2), and
- Subpart KKK – NSPS for Equipment Leaks of VOC from Onshore NG Processing Plants for Which Construction, Reconstruction or Modification Commenced after January 20, 1984, and on or before August 23, 2011 (FGFACILITY)

As part of the 2013 permit modification, Whiting requested a federally enforceable limit that restricts the facility's capacity to 9.5 million standard cubic feet per day. In the application, Whiting indicated that the inclusion of the limit was requested to confirm the applicability of an exemption to 40 CFR 60.633(d) (NSPS KKK) for routine monitoring as defined in the exemption at facilities with a design capacity to process field gas of less than 10 million SCF/day.

#### Compliance History –

No records of complaints are of record for the facility. No Notices of Violation (VNs) or Letters of Violation (LOVs) of record for the facility. No previous compliance inspection is of record for the facility. Required reporting is limited to the annual MAERs submittals which have been submitted in a timely manner.

#### COMPLIANCE EVALUATION

As part of the compliance evaluation, District Staff confirmed the installation of appropriate control devices identified in the permit. The facility was operating at the time of the inspection.

#### Operational Limits – Operational limits outlined in Permit 136-11B include:

EUDEHY-TEG - Special Condition III.1 (SC III.1) requires the EU to comply 40 CFR Part 63, Subpart HH as they apply to the EU.

SC IV.1 requires that EUDEHY-TEG shall not be operated unless the condenser is installed, maintained and operated in a satisfactory manner. The condition further specifies that satisfactory operation includes routing of the condenser exhaust to a combustion device for destruction. To meet this requirement, the exhaust for the condenser is routed to the reboiler burner for destruction.

FGENGINES – No later than 30-days prior to the start-up of EUENGINE2, the permittee is required to submit a Preventative Maintenance/Malfunction Abatement Plan (PM/MAP). (SC III.1) The referenced document was submitted and approved on March 22, 2017. Operation in compliance with the PM/MAP is required under SC III.2.

SC III.2 and IV.1 requires that any engine that contains an add-on control device to be operated only with the control device properly installed, maintained and operated so that it is in compliance with emission limits and the PM/MAP. Based on information provided, the facility is in general compliance with the SCs.

SC IV.2 requires a device to monitor and record the hours of operation for EUs in FGENGINES on a continuous basis. EUENGINE2 has an hour meter to record operating times in compliance with the permit.

SC III.3 limits operation of any engine equipped with an add-on control device for more than 200 hours per engine per year without the control device and consistent with the PM/MAP. Per facility records, the new engine was run a total of 120 hours at the time of installation (March 22 – 27, 2017), below the 200 hour limit.

Permit 136-11B requires the housing of EUENGINE2 shall not exceed 17 feet in height from ground level. (SC III.4). The building height is 17' to the peak as confirmed by facility staff. EUENGINE 2 is required by permit to have a stack with a maximum diameter of 8-inches and minimum height of 25.5 ft above ground level. Facility staff confirmed the diameter to be 8-inches and the height to be 28 feet above ground level.

**FGFACILITY** - Process/Operational limits for the referenced flexible group includes a maximum process limit of no more than 9.5 million standard cubic feet of field gas per day. (SC III.1) Available records indicated that the daily throughput was well below the limit and in compliance with the permit condition. Measurements are taken from totalizing meters onsite and input into an electronic database for the facility in compliance with permit conditions (SC VI.2).

Permit 136-11B requires the loadout for any storage tank to have a vapor return system installed. Facility staff confirmed that the vapor goes back to the tanks. (SC III.4)

SC IV.1 requires the facility to install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the amount of field gas processed by FGFACILITY on a daily basis. Total flow is monitored on a continuous data logger, and is documented on a daily basis (VI.1), in compliance with the permit requirement.

SC III.2 & 3 require compliance with all provisions of 40 CFR 60 Subparts A and OOOO and 40 CFR Part 63, Subpart HH as they apply to the facility.

Material Limits – Material limits outlined in Permit 136-11B include:

**EUDHY-TEG** – SC II.1 restricts the EU from use of stripping gas. An internet search indicates that stripping gas is sometimes used to achieve a higher lean TEG concentration at a specific temp and pressure, and remove water from the NG stream. The facility reports that stripping gas has never been used onsite.

**FGFACILITY** – SC II.1 restricts the facility from burning any sour natural gas. Analysis of the wet gas stream for the facility was conducted on September 27, 2016. Analytical results indicated hydrogen sulfide concentrations below the detection levels of 1 ppm, which is in compliance with permit conditions. This verification meets SC V.1 for FGFACILITY.

#### Emission Points -

It should be noted that the facility is Subpart KKK VOC leak detection requirements. Per discussions with the facility the restriction of throughput to <9.5 MMSCFM allows the facility to use what is referred to as AVO (audio, visual and olfactory) measurements/monitoring of valve stems for leaks. Facility staff confirmed weekly leak check are being conducted.

**EUDHY-TEG** – Emission limits for the referenced EU are limited to 1 tpy of VOC (SC I.1) and 0.07 tpy of benzene (SC I.2). The facility has shown compliance with the referenced limits using GRI-GLYCalc 4.0 software to determine annual emissions. (SC VI.5)

SC V.1 requires the facility to have the wet gas stream analyzed at least once per year. The last required test was conducted September 27, 2016, and upon review appeared to include all parameters required under the referenced condition.

**EUENGINE2** - Emission limits for the referenced RICE for NOx (SCI.3) and CO (SCI.4) are 7 tpy and 10 tpy, respectively. Emissions for the referenced pollutants are calculated by the facility in compliance with SC VI.6 & 7 and Appendix A. 12-month rolling totals were not available at the time of the site visit as the EU was only installed in the spring. Emission factors used are manufacturer information presented in the permit application. Initial testing conducted by Archrock at the time of installation (March 27, 2017) appear to indicate lower emission factors for the EU than the manufacturer as well as higher control efficiencies for the catalyst.

In addition, no engine testing has been requested by the District for the EUENGINE2 (SC V.1). Testing conducted by the facility for EUENGINE2 has been to meet Federal requirements for RICE.

Monitoring, Testing and Record Keeping = Monitoring and recordkeeping requirements outlined in Permit 136-11B include requirements under 40 CFR Part 60 Subparts KKK and OOOO.

**EUDHY-TEG** – SC V.1 requires the permittee to analyze at least once per calendar year the wet gas stream for various parameters including but not limited to hydrogen sulfide, C1-C6 series hydrocarbons, BTEX components, nitrogen, carbon dioxide and heptanes plus. The most recent required analysis was

conducted on samples collected on September 27, 2016. Wet gas stream analysis records for the facility are maintained by Cobra and were readily available upon requirement (SC VI.2)

Monitoring/ Recordkeeping requirements for EUDHY-TEG (SC VI) are being met through conditions SC VI.1(c), 4 and 5. Under which the EU is meeting the exemption criteria for glycol dehydrators with actual average benzene emissions of less than 0.90 megagram per year based on GRI-GLYCalc Version 4.0 calculations. Copies of the referenced software calculations were readily available for review, and confirmed benzene emissions meeting the 40 CFR 63.764 exemption criteria. The referenced software is also used to determine annual emissions which are reported as part the MAERS program.

EUENGINE2 – SC associated with this EU include maintaining the following record keeping for each engine;

- continuous monitoring of hours of operation (SC VI.2) for each engine, as well as the monthly total hours of operation for each engine (SC VI.4),
- monthly and 12-month rolling total hours of operation without control device for each engine (SC VI.5),
- log of all maintenance activities according the PM/MAP (SC VI.3), as well as
- monthly and 12-month rolling total emissions for NOx (SC VI.6) and CO (SC VI.7).

The above referenced records were readily available for review, and in general compliance with permit conditions.

FGFACILITY – Under PTI 136-11B, the facility is required to record daily the amount of field gas processed by the facility on a daily basis (SC VI.2), as well as fuel use on a monthly and 12-month rolling total basis for the facility (SC VI.1). These records are readily available from the facility and are in general compliance with permit conditions.

Reporting – Reporting requirements under PTI- 136-11B include the following:

EUENGINE2 - SC VII.2 requires notification within 30 days after the completion of an installation, construction, reconstruction, relocation, or modification. AQD District Staff received notification of the installation of EUENGINE2 within the required time period.

Replacement of the permitted EUENGINE2 has not been conducted at the facility, so requirements regarding verification of equivalent –emitting or lower-emitting, and record keeping required under SC VII.1 & 3 are not applicable at this time.

### SUMMARY

On Wednesday, May 24, 2017, AQD District Staff conducted a scheduled site inspection at the Cobra Oil & Gas Corporation (Cobra) South Buckeye 127 CPF Gas Plant (AKA South Buckeye) (SRN P0271) Badger Road, Beaverton, Gladwin County, Michigan. The facility is a sweet gas production facility and a minor source.

One Permit to Install (PTI) No. 136-11B is of record for the facility. The referenced permit was modified and issued on September 1, 2016. Based on information obtained and observations made in conjunction with the site inspection, and supplemental information provided by Cobra, the facility is found to be in general compliance with the referenced permit.

NAME Sharon E. Stone

DATE 6/22/2017 SUPERVISOR C. Kice