

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

N209656892

FACILITY: OMIMEX ENERGY- CLAYBANKS 2 FACILITY		SRN / ID: N2096
LOCATION: 5954 W. Arthur Road, NEW ERA		DISTRICT: Grand Rapids
CITY: NEW ERA		COUNTY: OCEANA
CONTACT: Ken Prior , Operations Manager - Michigan		ACTIVITY DATE: 02/02/2021
STAFF: Chris Robinson	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: REVISED FY'21 inspection to determine the facility's compliance status with respect to PTI no. 201-89A and any other applicable air quality rules and regulations.		
RESOLVED COMPLAINTS:		

Inspection report revised to address facility comments. The purpose of this report is to document the findings of an onsite scheduled inspection of Omimex Energy's Claybanks 2 facility (Claybanks, SRN N2096) located at 5954 West Arthur Road in New Era, Michigan. The inspection was conducted by AQD staff Chris Robinson (CR) on February 2, 2021 to determine Claybanks compliance status with the requirements of the federal Clean Air Act and Part 55 (Michigan's Air Pollution Control Rules) of Act 451 (Natural Resources and Environmental Protection Act (NREPA)), which includes the requirements established in Permit to Install (PTI) No. 201-89A.

Following current field work guidance CR contacted Ken Prior, Omimex Energy's Operations Manager, on January 21, 2021 to schedule the inspection. Typically, AQD inspections are unannounced. However, due to the Covid19 pandemic and since this facility is a remote unmanned station, inspections are being scheduled in advance to ensure proper staff will be onsite and to prepare for any Covid19 related entry procedures.

In accordance with the Memo of Understanding (MOU) between EGLE's Air Quality Division and Oil, Gas and Minerals Division (OGMD), CR contacted Stafford Dusenbury to inform him of the upcoming inspections of Omimex Energy's Claybanks 2 and White River facilities which were going to be conducted on the same day. CR met with both Mr. Dusenbury and Mr. Prior onsite on February 2, 2021, again notifying Mr. Prior that the purpose behind the inspection was to determine compliance with applicable air quality rules and regulations including the requirements established in the PTI. The PTI and Process/Processing equipment changes made since AQD's last inspection were discussed along with permitting of the facility's amine plant. Mr. Prior provided a walk-through of the facility as well as pertinent information. Proper PPE and social distancing were maintained by AQD staff throughout the entire inspection.

Weather conditions were approximately 32°F, mostly cloudy with northerly winds at approximately 14 mph (www.weatherunderground.com). No odors or visible emissions were observed, however none of the equipment was operating during this inspection.

A) Facility Description

Construction of the Claybanks facility was completed on September 8, 1989. The facility has been owned by Conoco inc., Michigan Production Co., and Omimex Energy. Omimex Energy owned this facility at some point between 1989 and 1992. In 1992 it switched ownership to Michigan Production Company. Omimex Energy then repurchased the facility in 2002 and has owned it since.

Claybanks is a crude oil/natural gas production facility that extracts from twelve local wells. The natural gas that is separated from the oil is considered to be sour gas since the hydrogen sulfide (H₂S) concentration is more than 1 grain of H₂S or more than 10 grains of total sulfur per 100 standard cubic feet.

The facility separates extracted crude oil/sour gas, storing the oil onsite in two (2) 400-gallon atmospheric tanks until it is sold and trucked offsite. The sour gas used to be transported (via pipeline) to a processing facility for sweetening where the H₂S was then removed from the gas stream. Currently the facility only sells the oil. In the past the facility's amine plant and dehydrator prepared some of the extracted sour gas for use onsite. Since the facility purchases their fuel now the extracted sour gas is reinjected into the formation. This helps maintain pressure on the formation allowing Claybanks to extract without the aid of the compressor engine. This is known as "free flow".

Even though the facility operates differently now than it had in the past all of the equipment is still onsite.

There are typically five (5) production stages. Each stage lowers the pressure of the gas stream allowing for the extraction of additional sour gas. The five (5) stages typically used are described below:

STAGE #1

The crude oil/sour gas is extracted from the wells and sent to one of six (6) 500,000 Btu/hr natural gas fired high-pressure separators. The separators lower the pressure allowing the sour gas to separate from the oil. The oil is sent to the storage tanks and the natural gas is now being reinjected.

STAGE #2

Although no longer in use the two (2) 1.86 MMBtu/hr. natural gas fired heated treaters would have heated the crude oil mixture to approximately 90°F – 100°F to help the process. The treaters continued to lower the pressure of the gas to approximately 30 lbs., preparing it for stage #3.

STAGE #3

The engine, which is no longer used, is equipped with a three-stage compressor. At each of the engine's three (3) stages the pressure would have been increased to correct the pressure of the gas for pipeline transfer.

STAGE #4

Although no longer being used since the facility operates off from pipeline quality natural gas provided by an outside utility provider this stage would have been conducted to prepare natural gas for onsite fuel use only. Prior to combustion the liquid must be removed from the gas stream. All of the sour gas would have entered the triethylene glycol dehydrator's contact tower passing the gas stream through a series of baffles allowing it to come into contact with the glycol absorbing the water. The glycol and water would then be separated by boiling off the water by use of the dehydrators re-boiler. Emissions would have been captured in the VRU and reinjected into the formation. Now that the facility purchases their fuel, this unit is no longer being used but remains onsite.

Stage #5

The facility has an amine plant for H₂S removal from the gas stream. This is called "sweetening". However, it had only been used for processing sour gas that the facility uses for fuel onsite. Now that the facility purchases their fuel, this plant is no longer being used but remains onsite.

B) Compliance Evaluation

1) PTI No. 201-89A

Claybanks has a Title V Opt-out permit because the facility's potential to emit (PTE) of NO_x from the single on-site engine is greater than 100 tpy (136.8tpy).

EUENGINE01

The facility's compressor engine is a Waukesha three stage engine with no add-on controls. Mr. Prior has indicated that there have been no modifications since at least Omimex Energy purchased the facility from Conoco Inc. in 1992. Therefore, the engine is not subject to NSPS 40CFR Part 60 Subpart JJJJ because it was installed prior to 12/2006. The engine may be subject to the "RICE MACT" 40CFR Part 63 Subpart ZZZZ. However, EPA, not AQD, has delegation of authority over the Area Source Rice MACT.

The model number and horsepower rating for this engine, provided in a PTE table included with a 2002 letter from Omimex Energy (Model L5108GU, 650 HP) is not consistent with what was presented in the 1989 application (Model 3521G, 500HP) nor are either of these HP ratings consistent with what was verified during the last AQD inspection of 644hp. It is unclear if this indicates that Conoco installed a different

engine as specified in their application, that an engine swap out occurred, or that it is a mistake. If Omimex decides to retain the engine instead of scrapping it as planned, then these discrepancies should be reconciled.

EUENGINE01 is subject to an annual 12-month rolling NOx emission limit of 85.4 tons (Special Condition (SC) 1.1) and an annual 12-month rolling 29.5 MMscf natural gas usage limit (SC 1.2). Per Mr. Prior and a review of records onsite the engine has not operated since the last AQD inspection conducted on July 18, 2017. NOx testing was not requested during this inspection.

As required by SC 1.3 the facility maintains a Preventative Maintenance Plan onsite. Per Mr. Prior no changes have been made to it since the previous AQD inspection. The records for EUENGINE01 as required by SC 1.8-1.12 were available and reviewed onsite. The facility has installed and properly maintains a meter for continuously monitoring fuel usage onsite as required by SC 1.7.

EUDEHY

The facility utilizes a 2 gallon/minute triethylene glycol dehydrator equipped with a 250,000 Btu/hr. reboiler for extracting water vapor from the sour gas. Since fuel is being purchased and not treated the dehydrator is no longer being used. When the dehydrator was used any extracted water vapor and trace hydrocarbons were sent to a temporary holding tank controlled by the VRU and eventually removed for disposal.

Per special condition 2.1 of PTI No. 201-89A the facility is required to comply with all provisions of 40 CFR Part 63 Subpart HH for area sources with a triethylene glycol dehydrator. Past compliance evaluations for 63 Subpart HH have considered this facility exempt per 40 CFR 63.764(e)(i) & (ii):

- (i) The actual annual average flowrate of natural gas to the glycol dehydration unit is less than 85 thousand standard cubic meters per day, as determined by the procedures specified in §63.772(b)(1) of this subpart; or (ii) The actual average emissions of benzene from the glycol dehydration unit process vented to the atmosphere are less than 0.90 megagram per year, as determined by the procedures specified in §63.772(b)(2) of this subpart.

NESHAP 63.764(e)(i) & (ii) only exempts a facility from 63.764(d), not the entire standard. Therefore, the facility is subject to this federal standard. However, Claybanks is considered an area source of HAPS and AQD does not have Area source delegation for this MACT.

63.764(e) Exemptions. (1) The owner or operator of an area source is exempt from the requirements of paragraph (d) of this section if the criteria listed in paragraph (e)(1)(i) or (ii) of

this section are met, except that the records of the determination of these criteria must be maintained as required in §63.774(d)(1).

63.764(d) Except as specified in paragraph (e)(1) of this section, the owner or operator of an affected source located at an existing or new area source of HAP emissions shall comply with the applicable standards specified in paragraph (d) of this section.

Flexible Group FGFACILITY

FGFACILITY contains the federally enforceable restrictions required for Claybanks to opt-out of the Title V program. This is accomplished by capping the facility-wide NOx emissions to 89.9 tpy per any given 12-month rolling time period. Records were reviewed on site and the highest facility-wide 12-month rolling NOx total was 0.023 tons in December 2020. Per discussions with Mr. Prior, except for emergency flaring or maintenance, the facility does not burn any sour gas on-site.

Special Condition 3.3 (Testing) states that verification of H₂S and/or sulfur content of the natural gas burned in FGFACILITY may be required, upon request by the AQD. The AQD has not requested testing. However, the facility conducts this testing on their own for determining the BTUs of the natural gas for calculating NOx emissions. The most recent test was conducted on 12/21/2015. Laboratory analysis was provided during the 2017 AQD inspection.

2) Rule 201/Significance Levels and Rule 201 Permitting Exemptions

The current state of the Claybanks facility appears to have involved several stages. The 1989 application submitted by Conoco for PTI 201-89 specified the process equipment being installed as a "Production Battery" and included installation of one (1) storage tank (2,000 bbl.), flare system (John Zink EEF-U-4), vapor recovery unit (Fuller Model T-55), compressor engine (Waukesha 3521G 500HP), two (2) production units (500,000 Btu/hr.), two (2) heater treaters (1,500,000 Btu/hr.), glycol system heater reconcentrator (125,000 Btu/hr.), propane storage vessel (18,000 gallons), and six (6) 400 bbl oil/brine storage tanks.

As noted in a letter dated July 10, 1998 and received by the AQD on July 13, 1998 Michigan Production Co. installed three (3) additional 500,000 Btu/hr. production units under exemption Rule 282(b) which appears to be sufficient since they are used for oil and gas production, per Mr. Prior only burn sweet natural gas, and have a rated heat input capacity of not more than 50,000,000 Btu/hr. At this time Michigan Production Co. also connected extraction wells Farris Hopper#1-2, Jonseck #5-2A, and Miller Fox #1-11.

Per a letter dated November 22, 2002, received by the AQD on November 25, 2002, Omimex Energy planned on adding the amine plant, connecting additional extraction wells, and installing a 2nd engine (Caterpillar Model 398 naturally aspirated w/catalytic

converter). Exemptions cited were Rule 285(g), for the engine and Rule 282(b) for the amine plant. The November 22, 2002 letter provided the NOX, CO, and VOC PTE for this engine which incorrectly factored in the efficiency of the catalytic converter. Therefore, a proper evaluation of “project” significance levels was not completed. However, this engine is no longer onsite.

Omimex Energy’s November 22, 2002 letter claimed that the amine plant’s heater was exempt from permitting under Rule 282(b) and that the overall unit was exempt because there are no emissions. However, as recently determined and discussed below there does appear to be emissions being generated from this plant. In addition, exemptions cannot be applied to components of an emission unit, in this case the heater. Therefore, this exemption is not applicable to the amine plant.

CR and Mr. Prior also discussed Exemption Rule 288(2)(d) which exempts equipment used for the separation or fractionation of sweet natural gas but specifically excludes natural gas sweetening equipment. Per discussions with Mr. Prior during the inspection, Mr. Prior felt that this exemption would apply to the amine plant since he felt that Claybanks, by definition, was not a sweetening facility. Rule 288(2)(d) refers to the equipment used in the process of sweetening natural gas not a “Sweetening facility” as it is defined in Rule 119(cc). Therefore, this exemption would also not be applicable to the facility's natural gas sweetening equipment. A Rule 201 violation for installing and operating process equipment without a PTI will be cited.

Rule 201 permitting exemption Rule 288(2)(c) for sweet gas flares was discussed with Mr. Prior. Although the stationary flare at Claybanks typically burns sweet gas, it is designed to burn sour gas in cases of emergencies or repairs. Mr. Prior has indicated that there have been past incidents when sour gas has been directed to the flare for combustion. Since the stationary flare is capable of combusting sour gas and it has done so in the past this exemption would not apply. Nor would it apply to any portable maintenance type flares attached directly to the well heads since they only combust sour gas. The facility has claimed exemption Rule 282(2)(g) for the flare in the past. This exemption allows for sour gas burning equipment as long as actual SO₂ emissions do not exceed one (1) pound per hour. The initial 1989 application provided by Conoco Inc. stated that SO₂ emissions from just the oil load out, sent to the flare, could be 9 pounds per hour, which is far more than allowed by this exemption. During the 2007 PTI modification flare requirements were removed from the PTI. Therefore, the flare is no longer covered by the PTI and since neither exemption Rules 288(2)(c) or 282(2)(g) apply, operating the flare is a Rule 201 violation.

3) Michigan’s Part 4 Rules

Michigan's Part 4 Rules pertain to sulfur bearing compounds, more specifically Rule 403 applies to Oil and Natural gas producing or transporting facilities and natural gas-processing facilities. Claybanks is an oil/natural gas producing facility and is therefore subject to these Rules.

The original PTI for this facility (No. 201-89) included Special Conditions for these Rules but were removed from PTI No. 201-89A since Omimex Energy did not feel that the facility met the definition of a "Sweetening Facility" with the bases being that the system operates in a "closed loop" system with no H₂S emissions. It is a misconception that if a facility is not defined as a Sweetening Facility, it is therefore not subject to Rule 403.

Under Rule 403, facilities that are not considered to be a "Sweetening Facility" would only be excluded from Rules 403(4-6); the remaining requirements, Rules 403(1-3), would still apply and should have remained in the facility's PTI. However, CR discussed Claybanks "closed-loop" system with Mr. Prior. Since the amine plant is designed with a high-pressure safety relief (bypass) allowing sour gas to be routed to the flare for combustion, the facility is not operating in a true closed-loop system. Therefore, the amine plant would not meet the requirements to be excluded from the definition of a "sweetening facility" and all requirements of Rule 403 are applicable. Also, since the sweetened gas is combusted in the flare and it is not likely that the amine plant can remove 100% of the H₂S from the sweet gas stream the ability to combust the sweetened gas alone demonstrates that the system is not "enclosed" with no H₂S emissions as required in order to be excluded from the definition.

*Per Rule 119(cc), "sweetening facility" means a facility or process that removes hydrogen sulfide or sulfur-containing compounds, or both, from a sour gas, sour crude oil, or sour condensate stream and converts it to sweet gas, sweet crude, or sweet condensate. **The term "sweetening facility" does not include a facility or process that operates in an enclosed system and does not emit hydrogen sulfide to the outer air.***

Although, these requirements should be re-added to the facility's PTI the lack of them being in the PTI does not excuse a facility from having to comply with the requirements. A review of the Part 4 Rule requirements is below.

- **Rule 403(1)** "Except as provided in subrule (3) of this rule, it is unlawful for a person to cause or allow the emission of sour gas from an oil- or natural gas-producing or transporting facility or a natural gas-processing facility without burning or equivalent control of hydrogen sulfide and mercaptans".
***Typically, any H₂S removed from the natural gas being used for fuel or the remaining sour gas is collected by the VRU and reinjected. However, in emergencies or for repairs sour gas is directed to the flare for combustion. Claybanks appears to be in compliance with these control requirements.**
- **Rule 403(2)** Except as provided in subrule (3) of this rule, sour gas that is burned at an oil- or natural gas-producing or transporting facility or at a natural gas-processing facility shall be burned in a properly engineered flare, incinerator, or other combustion system with elevated discharge to the atmosphere. If the flare, incinerator, or other combustion system burns sour gas in such volume and with such hydrogen sulfide concentration that the daily quantity of hydrogen sulfide in the gas is less than 28

pounds, then it shall be equipped with either a pilot flame which will burn continuously when gas flows to the flare, incinerator, or other combustion system or with an automatic ignition system, unless otherwise authorized by the department. If the flare, incinerator, or other combustion system burns sour gas in such volume and with such hydrogen sulfide concentration that the daily quantity of hydrogen sulfide in the gas is 28 pounds or more, then it shall be equipped with a continuously burning pilot flame and a mechanism which will operate, upon failure of the pilot flame, to shut off the flow of gas, unless otherwise authorized by the department.

*** Mr. Prior informed CR that the flare is equipped with a continuous pilot and a mechanism for shutting off the well supply if loss of flame is detected. Since the facility is already equipped for the worst-case scenario, they appear to be in compliance with this requirement.**

- **Rule 403(3)** *“The provisions of subrules (1) and (2) of this rule do not apply to either of the following: (a) Crude oil-producing facilities that serve a well or group of wells which attained an average production level of 10 or less barrels per day per well before January 1, 1978, unless the department has received 1 complaint of odors regarding the facility, and the owner or operator is unable to or fails to demonstrate, to the satisfaction of the department, that the uncontrolled hydrogen sulfide and mercaptan emissions do not cause an odor nuisance or health hazard”.*

*** Since the facility was constructed after January 1, 1978, Subrules 1 and 2 are applicable.**

(b) “A vessel or a battery of vessels that releases a total daily volume of vapors of less than 5,000 standard cubic feet, if the owner or operator demonstrates both of the following: (i) Combustion of the vapors is not economically reasonable. (ii) The uncontrolled release of the vapors will not cause a violation of the provisions of R 336.1901”.

*** Vapors from the tank battery are controlled by the VRU and either reinjected or combusted by the stationary flare. Claybanks appears to be in compliance with this requirement.**

- **Rule 403(4)** A person shall not cause or allow the emission of sulfur dioxide from a new sweetening facility, unless such emissions are controlled using the best available control technology.

*** Emissions generated by the sweetening facility are either reinjected into the formation or combusted in the stationary flare. Claybanks appears to be in compliance with this requirement.**

- **Rule 403(5)** *The operator of a sour gas-, crude-, or condensate-sweetening facility-ties shall do all of the following:*

(a) Monitor the mass flow rate of hydrogen sulfide either entering the plant or going to the waste gas flare or flares on a periodic schedule specified by the department. The monitoring program shall include a determination of the hydrogen sulfide concentration using colorimetric detector tubes or their equivalent and a determination of the volumetric gas flow rate. The monitoring data shall be submitted to the department in an acceptable format within 30 days following the end of the month in which the data were collected.

*** The facility does take samples and has them analyzed. However, there is no specified frequency nor is the data being sent to the AQD. Going forward a frequency will need to be established and the data will need to be sent to the AQD for review.**

(b) Provide fencing, warning signs, or other measures as necessary to warn or deter unauthorized individuals from entering the plant property or buildings. Signs shall read: "Danger--Poison Gas," with at least 1 sign on each side of the plant property.

*** The property appears to be properly posted with fencing and warning signs.**

(c) Provide control of malodorous emissions from any pressure relief valve or valves, storage tanks, and dehydrator vent or vents by burning or equivalent control.

*** Control of malodorous emissions is being conducted as required by Rule 403(c) by using the VRU to capture emissions and either reinjecting or combusting them in the flare.**

(d) Conduct a program of continuous monitoring of concentrations of hydrogen sulfide in any building enclosing a sweetening process. The sensor shall be placed as close to process equipment as practicable. The system shall be designed, installed, and maintained to provide a visual alarm when the hydrogen sulfide concentration is more than 50 ppm.

*** Each building is equipped with H2S monitors with both audible and visual alarms. Per Mr. Prior the alarms are set to go off when H2S concentrations exceed 10 ppm.**

(e) Automatically begin a safe and orderly shutdown of all process inflow streams to the facility if the concentration of hydrogen sulfide is more than 100 ppm in any building enclosing a sweetening process. Full operation may be resumed only after successful corrective measures have been applied.

*** Per Mr. Prior if the building H2S concentrations reach 20 ppm, the facility shuts down which includes closing the Axelson valves at the production packs which stops flow into the facility from the wells. Claybanks appears to be in compliance with this requirement.**

(f) Automatically commence shut-in of the facility within 1 second after extinguishment of the flare flame, unless otherwise authorized by the department. Operation of the facility shall not continue unless corrective measures taken to reignite the flame are successful.

*** Per Mr. Prior the flare is equipped with a flare outage detector that shuts off the flow from the wells and shuts down the facility if flame loss is detected. Claybanks appears to be in compliance with this requirement.**

- **Rule 403(6)** *A new sweetening facility shall not be installed at a distance of less than 1,300 feet from an existing residence, unless otherwise authorized by the department. Such authorization shall depend upon a satisfactory showing by a permit applicant that an odor nuisance shall not result from a lesser setback distance.*

*** There are no residences within 1,300-ft. of this facility.**

3) MAERS

This facility's 2020 submission, for 2019 emissions, was not selected for audit during FY'20. The facility's 2021 submission, for 2020 emissions, was not available nor due by the time this inspection was conducted. Therefore, in order to meet the requirements of an FCE, CR conducted a cursory review of their 2019 data on March 9, 2021. The facility is using MAERS emission factors. Low emissions are most likely the result of not operating the engine, flare, or dehydrator the entire year. The 2019 Source totals reported are summarized in the table below.

Pollutant	Amount (tons)
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CO	0.03
NOx	0.14
PM10	0.003
SO2	0.0006
VOC	0.03

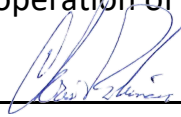
4) Other

New Source Performance Standards (NSPS) for Crude Oil and Natural Gas Facilities promulgated in **40 CFR Part 60, Subparts OOOO and OOOOa** do not apply to Claybanks since this facility was constructed prior to August 23, 2011.

C) Compliance Determination

Based on the information discussed above Omimex Energy's Claybanks II facility does not appear to be in compliance with all applicable air quality rules and regulations, specifically Rule 201 of Michigan's Air Pollution Control Rules for the construction and/or operation of the amine plant and flare. A violation notice will be issued.

NAME

DATE 5/19/2021

SUPERVISOR

