

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

N742155081

FACILITY: DTE Gas Company - Willow Run Compressor Station		SRN / ID: N7421
LOCATION: 3020 East Michigan Avenue, YPSILANTI		DISTRICT: Jackson
CITY: YPSILANTI		COUNTY: WASHTENAW
CONTACT:		ACTIVITY DATE: 09/10/2020
STAFF: Mike Kovalchick	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Scheduled Inspection. A methane survey of the facility yard was also conducted using a SEM5000 methane device.		
RESOLVED COMPLAINTS:		

**Major / ROP Subject Source. Full Compliance Evaluation (FCE) and Partial Compliance Inspections (PCEs) SRN N7421**

**Contact**

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**Purpose**

This was a scheduled inspection of the Willow Compressor facility located at 3020 East Michigan Ave. in Ypsilanti, MI owned by DTE Energy. The facility has two active Permits to Install (PTIs) numbered 246-07A and 44-16B for equipment necessary for the compression of natural gas onto distribution pipelines.

On September 10, 2020, AQD conducted an announced scheduled compliance inspection of the Willow Compressor facility owned and operated by DTE Energy (Company) located at 3020 East Michigan Ave in Ypsilanti, Michigan. The purpose of this inspection was to determine if this facility was in compliance with the requirements of the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the conditions of Permit to Install (PTI) 246-07A and 44-16B; the federal National Emission Standards for Hazardous Air Pollutants (NESHAP): Stationary Reciprocating Internal Combustion Engines 40 CFR Subpart ZZZZ; NESHAP Industrial, Commercial, and Institutional Boilers and Process Heaters(Gas 1 Fuel Subcategory) 40 CFR Subpart DDDDD(Boiler MACT); federal New Source Performance Standard (NSPS): Stationary Spark Ignition Internal Combustion Engines 40 CFR Subpart JJJJ and NSPS Stationary Combustion Turbines 40 CFR Subpart KKKK.

**Background**

This facility has become subject to Title V of the Clean Air Act (CAA) for Hazardous Air Pollutants (HAP). Per Rule 210(4) DTE was required to apply for a Renewable Operating Permit (ROP) not more than 12 months after commencing operation as a major source. A Title V application was received by AQD on March 20, 2019. This application has not yet been acted upon by the AQD.

The newly installed equipment is a part of a larger project that will handle natural gas moving operations in conjunction with the new Nexus pipeline. The equipment previously on site was projected to not be sufficient to handle the increased volume of natural gas. Nexus has installed a natural gas metering station directly adjacent to the compressor station, which also is the site of four (4) inline heaters (EUILHTR1-4) as listed in PTI 44-16B.

**Compliance Evaluation**

Inspection Observations/Comments:

Inspection consisted of conducting a survey of the facility yard looking for methane leaks using a SEM5000 Methane detector and visiting the control room to real time for any engines/turbines that were active. The methane survey was conducted for informational purposes only and was not used as a compliance tool during the inspection.

Upwind reading was determined to be around 2 ppm methane (natural methane background), downwind around 5 ppm. See attached graphic which shows the basic path followed while surveying the facility. I stayed outside the buildings during the survey. Overall, everything was tight as would be expected with new piping etc. Any

type of pipe fitting generally had about 20 ppm or less leakage with some exceptions. I did find one leak of 1100 ppm while doing the survey on a small pipe connection. After the survey was over, DTE asked me to re-check the leak as they had a repair man working on it while I was waiting. I was able to verify that they had fixed it. However, I noted about 50 ppm background in this part of the plant yard like what I found when I had walked through it the first time. Since it was clear it was not coming from the now fixed leak, I investigated further. I found a very significant leak on top of a 5000-gallon mixed hydrocarbon/used engine oil/water tank about 25 feet away from the other leak. The SEM5000 registered over 600,000 ppm methane. See photo of tank/leaking vent lid.) The DTE technician noted that they had noticed a natural gas odor coming from this tank about a week ago and ordered a replacement gasket for the lid on top of the tank but they ordered the wrong size and had yet to fix it. They estimated about 6000 gallons of liquid from this tank is loaded out each year but there was only 250 gallons in it when I was there as they had emptied it out 2 weeks ago. Liquids in the gas and oil from the engines flows into the tank in a batch fashion when pressure relief valves are triggered so it seems unlikely that the amount of methane released is over time is that significant sense the tank is isolated from the rest of the system.

A visit to control room confirmed that only one engine was operating. A 2500 hp engine. (It was either EURICE1 or EURICE2.) See attached photos of the control screen showing operating parameters. The fuel flow into the engine was 7498.97 scfm and was processing 3.5MMSCFM of natural gas through the pipeline. Per the operator, this amount was considered average. The compressor station is only operating at a fraction of capacity. The recent large increase in pumping capacity is mostly not being utilized. To date, the new Nexus pipeline has not generated the level of gas pressure that was expected. Therefore, the gas pressure from the ANR/Panhandle lines that go through the facility do not have to be significantly increased to match the nexus pipeline to be added into that piping system. Only small increases in engine usage has occurred since the Nexus pipeline went online.

Review of MAERS 2019: Included on only emission units with emissions greater than 1 ton of pollutant:

EUILHTR1 5 tons NOx

EUILHTR2 6 tons NOx, 1.5 tons CO

EUILHTR3 5 tons NOx, 1-ton CO

EUILHTR4 2 tons NOx

Source Totals: 23 Tons of NOx, 6 Tons of CO, 2 Tons of VOC.

Required records by both PTI 246-07B and PTI 44-16B for 2020 were requested by AQD prior to the inspection. The Company provided the records electronically on 7/27/2020. See attached records.

#### PTI 246-07B

EUENGINE1 (4,735 hp natural gas fired reciprocating engine with catalytic oxidation system)

Stack Test Review: (EUENGINE1 & FGENGMACT4Z required tests)

EUENGINE1 – 6/18 NOx, CO-DE, NMOC (40 CFR Part 60 Subpart JJJJ and 40 CFR Part 63 Subpart ZZZZ) (Compliance)

EUENGINE1 – 6/20 CO-DE (40 CFR Part 63 Subpart ZZZZ) (Compliance)

Review of required records:

VI. MONITORING/RECORDKEEPING Conditions 3, 4, 5, 6, 7, 8.

3. Maintain annual emission estimates of CO, NOx, and VOC's (Compliance)

4. Willow Run is operating EUENGINE1 in a certified manner and following all manufacturer recommendations. No maintenance required until 1,000 run hours, engines have not exceeded 1,000 run hours. (Compliance)

5. Engines at Willow Run Compressor Station have not been operated without catalyst in 2020 (Compliance)

6. Keep monthly fuel usage records. (Compliance)

7. Keep monthly and 12-month rolling time period NO<sub>x</sub>, CO, and VOC emission calculation records (Compliance)

8. Keep documentation/maintenance logs/manufacturer's recommendations for engine. (Compliance)

FGENGMACT4Z (New spark ignition RICE located at a Major Source of HAPs greater than 500 HP, non-emergency. This flexible group only includes EUENGINE1.)

Review of required records:

VI. MONITORING/RECORDKEEPING Conditions 3, 4, 5.

3. There have been no malfunction of operations at Willow Run Compressor. Annual maintenance is being conducted. No out of control emissions. (Compliance)

4. No malfunctions of the thermocouples. (Compliance)

5. Requires temperature/pressure drop data for the catalyst. (Compliance)

PTI 44-16B

EUTURBINE1 (A nominally rated 7,700 HP (ISO), simple-cycle natural gas-fired combustion turbine (CT) with electric start for compressing natural gas.)

Stack Test Review:

EUTURBINE1 – 12/18 NO<sub>x</sub> & CO (40 CFR Part 60 Subpart KKKK) (Compliance)

EUTURBINE1 – 6/20 NO<sub>x</sub> (40 CFR Part 60 Subpart KKKK) (Compliance)

Review of required records:

VI. MONITORING/RECORDKEEPING Conditions 1, 2.

1. Keep monthly natural gas usage for turbine. (Compliance)

2. Maintain necessary compliance information to show compliance with emission limit. (Compliance)

EUEMGRICE1 (A nominally rated 1,818 HP natural gas-fired emergency engine. The engine is used to provide electrical power to the station and support equipment in the event power is lost.)

Stack Test Review:

EUEMGRICE1 – 5/19 NO<sub>x</sub>, CO, NMOC (40 CFR Part 60 Subpart JJJJ) (Compliance)

Review of required records:

VI. MONITORING/RECORDKEEPING Conditions 1, 2, 3. A

1. & 2. Willow Run is operating EUEMGRICE1 in a certified manner and following all manufacturer recommendations. No maintenance required until 1,000 run hours, engines have not exceeded 1,000 run hours. (Compliance)

3. Keep monthly hours of operation. (Compliance)

FGENGINES (Requirements for RICE subject to New Source Performance Standards (NSPS) for RICE, 40 CFR Part 60 Subpart JJJJ and NO<sub>x</sub> emission limit. Includes EURICE1, EURICE2, and EURICE3. EURICE1 & 2 are each a nominally rated 2,500 HP natural gas fired reciprocating internal combustion engine with an oxidation catalyst for compressing gas. EURICE3 is a nominally rated 5000 HP natural gas fired reciprocating internal combustion engine with an oxidation catalyst for compressing gas.)

Stack Test Review:

EURICE1-3 – 12/19 NO<sub>x</sub>, CO-DE, NMOC (40 CFR Part 60 Subpart JJJJ and 40 CFR Part 63 Subpart ZZZZ) (Compliance)

EURICE1-3 – 6/20 CO-DE (40 CFR Part 63 Subpart ZZZZ) (Compliance)

Review of required records:

VI. MONITORING/RECORDKEEPING Conditions 1, 2.

1. & 2. Willow Run is operating FGENGINES in a certified manner and following all manufacturer recommendations. No maintenance required until 1,000 run hours, engines have not exceeded 1,000 run hours. (Compliance)

FGENGMACT4Z (New spark ignition RICE located at a Major Source of HAPs greater than 500 HP, non-emergency. This includes EURICE1-3.)

Review of required records:

VI. MONITORING/RECORDKEEPING Conditions 3, 4, 5.

3. Requires startup/notification of malfunction occurrences. No malfunctions have occurred. Requires annual maintenance documents. (Compliance)

4. Requires catalyst data and any out of control periods. No out of control periods. (Compliance)

5. Requires catalyst temperature/pressure drop data. (Compliance)

FGNOX (Boilers and heaters with NOx limits. This includes emission units EUBOILER1, EUBOILER2, EUBOILER3, EUBOILER4, EUMODHTR1, EUMODHTR2, EUMODHTR3, EUMODHTR4, EUMODHTR5, EUMODHTR6, EUILHTR1, EUILHTR2, EUILHTR3, EUILHTR4, EUHWHeater, EUBARD, and EUFURACE.)

Review of required records:

VI. MONITORING/RECORDKEEPING Conditions 1, 2.

1. Requires monthly natural gas usage for all the boilers/heaters. (Compliance)

2. Requires monthly and 12-month rolling time period NO<sub>x</sub> emission calculations. (Compliance)

FGBLRMACT (Gas 1 Fuel Subcategory requirements for new Boilers/Process Heaters at major sources of Hazardous Air Pollutants per 40 CFR Part 63, Subpart DDDDD. This includes EUBOILER1, EUBOILER2, EUBOILER3, EUBOILER4, EUILHTR1, EUILHTR2, EUILHTR3, and EUILHTR4.)

Review of required records:

VI. MONITORING/RECORDKEEPING Conditions 1, 3, 4.

1. Requires initial notification records. (Compliance)

3. & 4. Requires various records be kept for 2 years that show compliance with the NESHAP (Compliance)

### **Compliance Determination**

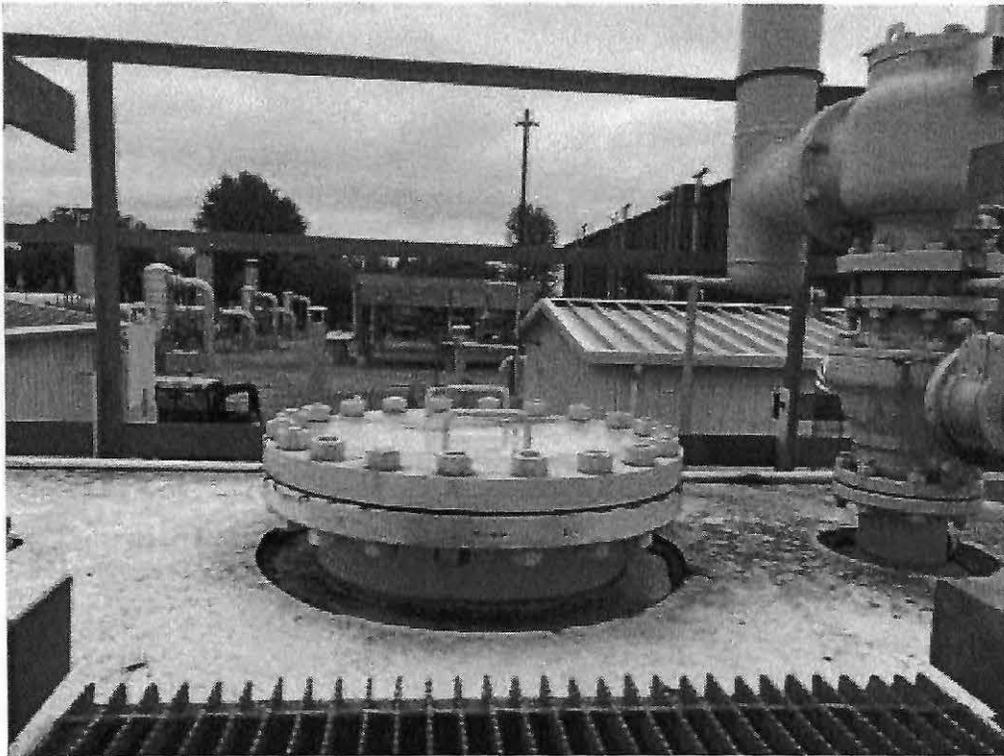
After onsite inspection and review of recordkeeping, AQD has determined that this facility is in compliance with State of Michigan and Federal air quality rules and regulations and PTIs 246-07A and 44-16B.



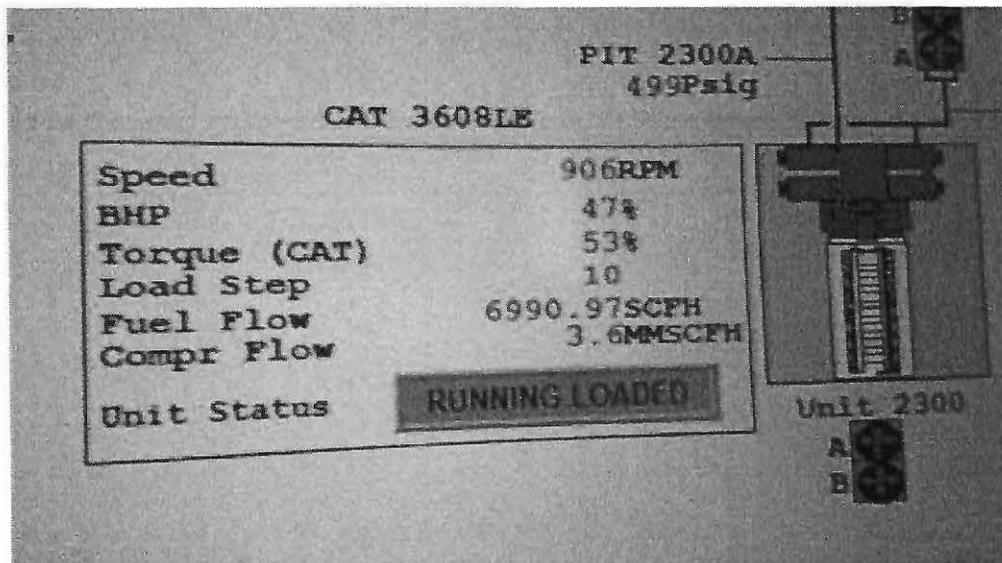
**Image 1(SEM Survey)** : Path followed and locations of methane leaks detected.



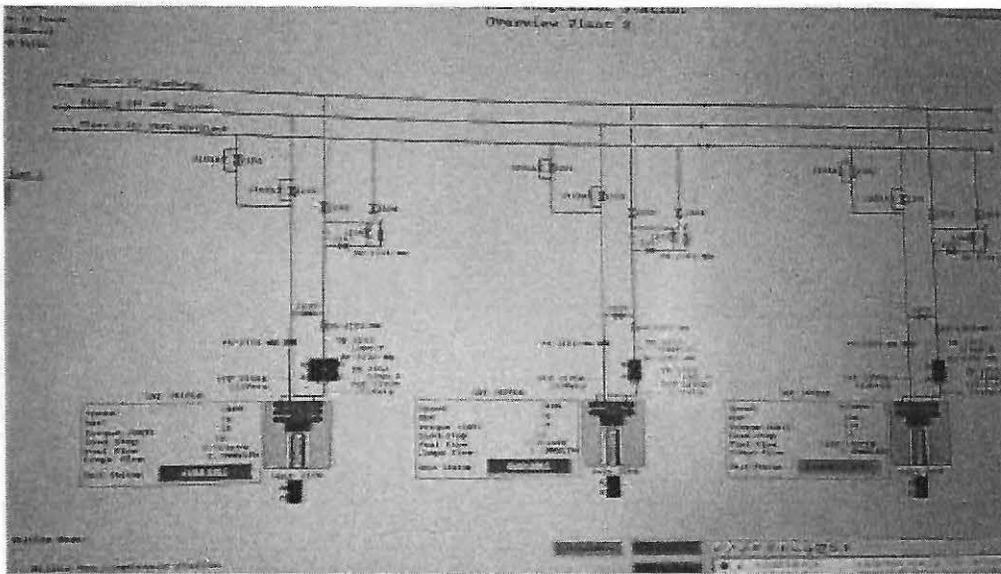
**Image 2(5000 gallon tank)** : 5000 gallon tank(on right) that had greater than 600,000 ppm methane leak coming out the top.



**Image 3(Top of tank) :** Top of tank showing where leak coming from.



**Image 4(EURICE1) :** Snapshot of EURICE1(Or EURICE2) showing fuel flow and compressor flow.



**Image 5(Plant 2) :** Plant 2 control diagram. Plant 1 was not operating.

NAME M. Khan / per Scott

DATE 9/11/20

SUPERVISOR [Signature]