

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

N294061134

<b>FACILITY:</b> DCP Antrim Gas LLC		<b>SRN / ID:</b> N2940
<b>LOCATION:</b> 6250 OLD STATE RD, JOHANNESBURG		<b>DISTRICT:</b> Gaylord
<b>CITY:</b> JOHANNESBURG		<b>COUNTY:</b> OTSEGO
<b>CONTACT:</b> Dave Bennett , Manager Area Operations		<b>ACTIVITY DATE:</b> 12/13/2021
<b>STAFF:</b> Sharon LeBlanc	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b> FY 2022 FCE of Major Source - Note activities include not only the on-site inspection, but the data evaluations for the Facility. sgl		
<b>RESOLVED COMPLAINTS:</b>		

On December 13, 2021, AQD District Staff conducted a scheduled site inspection of the DCP Antrim Gas, LLC South Chester Antrim Carbon Dioxide (CO2) Removal Facility.

The referenced facility is located at 6250 Old State Road, Johannesburg, Otsego County, Michigan (N2940). Facility operations are conducted under Renewable Operating Permit (ROP) MI-ROP-N2940-2015 issued on July 6, 2015, which expires on July 6, 2020. A complete ROP renewal application was received on December 4, 2019, and the application shield issued on December 11, 2019.

AQD District Staff met with the following DCP staff at the time of the site visit to discuss changes and operational practices at the Facility:

- Mr. David Bennett
- Mr. John Sehl

Supplemental information required to determine compliance was requested from DCP Midstream, LP (AKA DCP) Environmental Staff on January 13, 2022, and received supplemental records for review on February 7<sup>th</sup> and 10<sup>th</sup>, 2022.

The most recent scheduled site inspection were conducted on May 24, 2018, and October 7-9, 2019 (in conjunction with stack test activities) one compliance issue was identified as a result of the 2018 full compliance evaluation and involved recordkeeping activities associated with EUENGINE1 and EUENGINE2 (FGENGINES). The Violation Notice (VN) was resolved on June 21, 2019. No compliance issues were identified in association with the October 2019 site inspection.

### LOCATION

Located in South Chester Township, Otsego County, Johannesburg, Michigan, the facility is located at the NE corner of Turtle Lake and Old State Roads. Note that the Otsego County Property Records identified the following properties adjacent to the Facility:

- DTE Michigan Holdings, Inc. (West),
- CORE Midstream LLC (West),
- Wilderness-Chester Gas Process (North), and

To the south across Old State Road, as well as to the east and west are State of Michigan undeveloped properties. The ANR South Chester Pipeline Facility (B7219) is located less than ¼-mile to the east of the Facility on the south side of Old State Road.

The CORE Midstream LLC Facility is reported to take part of the CO<sub>2</sub> produced by the Facility and puts it “downhole”. Mr. Bennett, Facility Manager had previously reported that this is not a contracted agreement, that the NG producers actually “own” the NG, including the CO<sub>2</sub> removed. CORE Midstream deals with the producers directly, and that the quantity of CO<sub>2</sub> they receive reflects those agreements.

It was noted during the May 24, 2018, inspection that the Wilderness- Chester Facility to the north of the site has been decommissioned, the buildings and equipment formerly associated with it removed.

### FACILITY

Weather conditions at the time of the site inspection consisted of sunny with scattered clouds, temperatures in the 50s-60s. Some scant steam plumes associated with amine process stacks were visible but dissipated quickly. No VEs were noted.

Site Activities - Operations at the South Chester Antrim CO<sub>2</sub> Removal Facility consist of removal of high concentrations of CO<sub>2</sub> from Antrim Formation natural gas (NG) by an absorption treating process which utilizes amine. Higher CO<sub>2</sub> concentrations dilute the NG and reduce the heating value of the gas and increases the risk of internal corrosion problems in transmission and storage facilities. The CO<sub>2</sub> concentration of the natural gas is reduced to customer sales requirements and the Michigan Public Service Commission stipulations.

Incoming gas has been preprocessed to remove hydrocarbons, hydrogen sulfide and entrained water below pipeline quality. Records included in the September 13, 2019, submittal for the referenced flexible group, included a copy of a “Firm Gas Treating Agreement” between DCP Antrim Gas LLC and a blacked-out customer. A review of the agreement indicated that the gases would contain no more than ¼ grain of hydrogen sulfide per 100 cubic feet.

Energy for the Facility at the time of the inspection was provided by turbines (EUTUR01, EUTUR02 and EUTUR03).

Facility staff report that as the Antrim Formation is depleted over time that higher concentrations of CO<sub>2</sub> have been noted. It was also discussed that some locations on the west side of the State have identified H<sub>2</sub>S concentrations where previously none had been associated with the Antrim gas.

Equipment/Buildings - The Facility is fenced, gated and consists of 12 buildings which house not only process equipment for 6 amine plants, but staff offices, the maintenance shop, and motor control centers for each plant. No changes in process, or new processes are reported for the Facility. In addition, only maintenance activities have been conducted onsite.

EUPLANT6, also referred to by the Facility as the North Chester Turtle Lake Plant or EUCHESTER10 was acquired from DTE and was added to the Facility as part of the most recent ROP Renewal. Incoming gas is treated initially at EUPLANT6. EUPLANT6 is not a part of FGPLANTRA and is reported separately in semi-annual and annual reporting.

At the time of the October 7-9, 2019, site inspection. EUPLANT1 was not in operation. DCP Staff reported that the coolers associated with the amine plant were not operational, and that it was unclear if the plant would be restored at any time in the near future.

At the time of the December 13, 2021, site inspection the status of EUPLANT1 has not changed. EUPLANT2 was not operating, Facility staff reported that the plant is down until the amine absorber can be repaired.

Facility Changes - All engines associated with FGENGINES and FGENG5678, have been removed from site. Removal activities were reported to be completed on or before April 2019. As the engines were no longer present at the time of the inspection they are not part of the December 2021 compliance evaluation.

The six Reciprocating Internal Combustion Engines (RICE) were replaced with a turbine (EUTUR03) and a new emergency generator (EUEMERGEN01). Both units have been permitted under Permit to Install 162-18, issued on March 4, 2019, and were evaluated for compliance as part of this site inspection.

**PERMITTING**

A review of records indicate that activities onsite were initiated as early as 1991, with further permitted expansions of the facility through to 1997. Initial permits were issued to Antrim Limited Partnership, after 1994 permits associated with the facility were issued to MCN Oil & Gas Company, MCNIC Pipeline & Processing, DTE Michigan Holdings, Inc., CMS Antrim Gas Company and CMS Antrim Gas, LLC.

Records indicate that 8 permits were rolled into the existing ROP, five other permits were voided, as were three permit applications.

As noted above, PTI 162-18 was issued on March 4, 2019, for installation of one turbine (EUTUR03), one emergency generator (EUEMERGEN01) and a change in CO2 emission limits for EUPLANT6AMINE from daily to monthly (SC I.1). This permit is being rolled into the Renewal ROP for the Facility.

**REGULATORY**

Classifications based on Potential to Emit (PTE) and other significant comments:

PARAMETER	CLASSIFICATION	COMMENT
NOx	Major	Potential for Significant Deterioration (PSD) for NOx*
SO2	Minor	
CO	Synthetic Minor	

<b>Pb</b>	<b>Minor</b>
<b>PM</b>	<b>Minor</b>
<b>VOC</b>	<b>Synthetic Minor</b>
<b>HAPs</b>	<b>Area</b>

\* In 2009, the source acquired adjacent property owned by MichCon Pipeline Company. It was the combined sources that resulted in the Facility being designated a PSD Facility.

**Applicable Federal Requirements:**

<b>EMISSION UNIT</b>	<b>40 CFR SUBPART</b>	<b>TITLE</b>
<b>Source</b>	<b>Part 70</b>	<b>State Operating Permit Program</b>
<b>EUPLANT1HEATER, EUPLANT2HEATER, EUPLANT3HEATER, EUPLANT4HEATER, EUPLANT5HEATER, EUPLANT6HEATER (FGPLANTPH)</b>	<b>40 CFR Part 60, Subparts A and Dc</b>	<b>National Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units</b>
<b>EUTUR01, &amp; EUTUR02 (FGTURB1AND2)</b>	<b>Part 60, Subpart A and GG</b>	<b>National Standards of Performance for Stationary Gas Turbines</b>
<b>EUTUR03</b>	<b>40 CFR, Part 60, Subpart A and KKKK</b>	<b>National Standards of Performance for Stationary Combustion Turbines (supercedes subpart GG)</b>
<b>EUEMRGEN01</b>	<b>40 CFR Part 63, Subpart A and ZZZZ</b>	<b>National Emission Standards for HAPs (NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE)</b>
<b>EUEMRGEN01</b>	<b>40 CFR Part 60, Subpart A and IIII</b>	<b>National Standards of Performance for Stationary Combustion Ignition (CI) Internal Combustion Engines</b>

EUP1DEHY, EUP2DEHY, EUP3DEHY, EUP4DEHY, EUP5DEHY, & EUP6DEHY, (FGGD01)	40 CFR Part 63, Subparts A and HH	Glycol Dehydrators Area Source MACT
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The referenced facility does not process, or store petroleum liquids onsite and 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);

Review of a self-initiated site inspection report dated October 11, 2016, identified the facility as subject to 40 CFR Part 98, Subpart W, as an onshore NG Processing Facility under which is required equipment leak detection and compressor monitoring activities. At the time of the referenced inspection, as well as at the time of report preparation, the AQD has not been delegated authority for the referenced subpart.

The previously operating engines associated with FGGENINES and FGGEN6789 had manufacture dates prior to 2006, which exempted them from being subject to NSPS subparts IIII and JJJJ for Compression Ignition (CI) RICE and Spark Ignition (SI) Rice, respectively. However, EUEMERGEN01 was determined at the time of permitting to be subject to NSPS subpart IIII for CI RICE and is documented in above table. It should be noted that per 40 CFR 63.6590(c)(1), compliance with the NSPS Subpart IIII, meets the requirements under 40 CFR Part 63, Subpart ZZZZ.

Subpart OOOO 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.

### EQUIPMENT

The referenced facility consists of six process plants for removing high concentrations of CO<sub>2</sub> from Antrim formation NG using an absorption treatment process utilizing methyldithanolamine (MDEA), also referred to as amine. Each plant contained one NG fired media heater (EUPLANT#HEATER), one MDEA process (EUPLANT#AMINE), and one Triethylene glycol dehydrator (EUP#DEHY).

In addition to the six CO<sub>2</sub> removal plants the facility has:

- Two NG-fired 3.5 MW, Centaur 40-T4700 turbines. (EUTUR01 and EUTUR02)

As previously reported installation dates reported for above referenced equipment onsite from 1991 through 1997. Additional equipment onsite to be installed onsite and permitted under 162-18 include:

- One diesel-fired Emergency Generator (EUEMERGEN01), and

- One NG-fired Centaur 50 turbine with 4.0 MW nameplate capacity and SoLoNOx configuration (EUTUR03)

The two above referenced pieces of equipment were in the process of being installed at the time of the October 7-9, 2019, site visit, and permit conditions associated with the equipment did not apply at the time of the inspection. Installation has been completed, and the Eus are in operation and were evaluated as part of this compliance evaluation.

Flexible groups (FGs) are based on the type of equipment rather than plant numbers. MDEA processes 1-5 (EUPLANT1AMINE through EUPLANT5AMINE) make up the FGPLANTRA. MDEA process plant 6 is also referred to by the Facility as the " North Chester Turtle Lake Plant" and was reported to use FGENGINES as their power source. Since decommissioning and removal of the RICE onsite the power supply relies on turbine operation onsite. The Flexible Groups associated with the ROP are summarized below. Shaded EUs have been removed from site.

EMISSION UNIT	FLEXIBLE GROUP
EUENGINE1, EUENGINE2	FGENGINES
EUGEN06, EUGEN07, EUGEN08 and EUGEN09	FGGEN6789
EUENGINE1, EUENGINE2, EUGEN06, EUGEN07, EUGEN08 and EUGEN09	FGMACTZZZZ
EUTUR01 and EUTUR02	FGTURB1AND2
EUPLANT1AMINE, EUPLANT2AMINE, EUPLANT3AMINE, EUPLANT4AMINE and EUPLANT5AMINE	FGPLANTRA
EUPLANT1HEATER, EUPLANT2HEATER, EUPLANT3HEATER, EUPLANT4HEATER, EUPLANT5HEATER and EUPLANT6HEATER	EUPLANTPH
EUP1DEHY, EUP2DEHY, EUP3DEHY, EUP4DEHY, EUP5DEHY and EUP6DEHY	FGGD01

**Other equipment identified onsite includes:**

- Four 7,000 BTU/hr, NG-fired shop space heaters (EUSHOPHEAT1 through EUSHOPHEAT4),
- One 140,000 BTU/hr, NG-Fired, office building space heater (EUBUILDINGHEAT1), and
- One 105,000 BTU/hr, NG-fired, office building space heater (EUBUILDINGHEAT2).

The six above referenced heaters appear to be exempt from permitting under Rule 282 (2)(b)(i) for sweet gas fired, space heating with rated capacity of <50,000 BTU/hour.

### REPORTING

In addition to prompt reporting of deviations pursuant to General Condition 21 and 22 under MI-ROP-N2940-2015 the Facility is required to both semi-annual and annual reporting. Reports received for the periods of July 1, 2019, through June 30, 2021, included sufficient supplemental information to determine compliance with permit conditions. Reporting required under the ROP for operational EUs/FGs include the following:

<b>EMISSION UNIT</b>	<b>SEMI-ANNUAL (GC 23 and SC VII.2)</b>	<b>ANNUAL (GC 19 &amp; 20 and SC VII.3)</b>	<b>OTHER REPORTING</b>
<b>EUPLANT6AMINE</b>	<b>Y</b>	<b>Y</b>	
<b>EUEMERGEN01</b>	<b>Y</b>	<b>Y</b>	<b>40 CFR 63.6645 and Part 63 Subpart A (SC VII.4) and Subpart ZZZZ (SC IX.1)</b>
<b>FGTURB1AND2 (EUTUR01 and EUTUR02)</b>	<b>Y</b>	<b>Y</b>	
<b>EUTUR03</b>	<b>Y</b>	<b>Y</b>	<b>40 CFR 60.4375 Excess Emissions and Monitoring downtime</b>
<b>FGPLANTRA (EUPLANT1AMINE, through EUPLANT5AMINE)</b>	<b>Y</b>	<b>Y</b>	
<b>FGPLANTPH (EUPLANT1HEATER through EUPLANT6HEATER)</b>	<b>Y</b>	<b>Y</b>	<b>Subpart Dc (SC IX.1)</b>
<b>FGGD01 (EUP1DEHY through EUP6DEHY)</b>	<b>Y</b>	<b>Y</b>	<b>Subpart HH</b>

**TESTING**

Per ROP conditions, testing is conducted every 5 years. Testing was last completed in 2019, and will be required again in 2024. Emissions testing required under MI-ROP-N2940-2015 For operational EUs/FGs includes:

EMISSION UNIT	PARAMETER	EMISSION LIMIT	TESTING FREQUENCY	RECENT TESTING
FGTURB1AND2 (EUTUR01 and EUTUR02)	NOx	167 ppm, (corrected to 15% O <sub>2</sub> )(SC I.1) and 17.1 pph (SC I.2)	every 5 years (V.1)	June 5, 2014,  October 7-9, 2019
FGTURB1AND2 (EUTUR01 and EUTUR02)	CO	50 ppm, (corrected to 15% O <sub>2</sub> )(SC I.3) and 5.3 pph (SC I.4)	every 5 years (V.1)	June 5, 2014  October 7-9, 2019
EUTUR03	NOx*	25 ppm (corrected to 15% O <sub>2</sub> ) at temps above 0 degree F (SC I.1), and 5.35 pph (SC I.3)	Every 1 to 2 years dependent on if most recent results were less than or greater than 75% of limit (V.3)	March 12, 2020
EUTUR03	CO	6.47 pph at temp above 0 degree F (SC I.5)	Every 5 year (V.1)	March 12, 2020
EUPLANT1HEATER	NOX	5.6 pph (SC I.1)	every 5 years (V.1)	June 25, 2014  October 7-9, 2019
EUPLANT2HEATER, EUPLANT3HEATER, EUPLANT4HEATER	NOx	5.2 pph (SC I.2)	every 5 years (V.1)	June 23 – 25, 2014,

and EUPLANT5HEATER				October 7-9, 2019
EUPLANT3HEATER, EUPLANT4HEATER and EUPLANT5HEATER	CO	3.0 pph (SC I.4)	every 5 years (V.2)	June 23 – 25, 2014,  October 7-9, 2019

\*Note that as part of the ROP Renewal Review process, an error in NSPS requirements were noted, and what in PTI 162-18 was identified as a NOx limit of 42 ppm corrected to 15%O2 on a dry gas basis should have been 25 ppm NOx. The error is to be corrected as a supplemental permit in early 2022.

A review of District Files indicated that test protocols (SC VII.4), seven-day notifications (SC VII.5) and test reports (SC VII.6) appear to have been submitted in a timely manner in compliance with permit conditions.

Documentation in the District Files reported that the May and June 2014 CO test results of Turbine 1 of FGTURB1AND2 exceeded the CO lb/hr limit at that time. A VN was issued on August 21, 2014. The Facility response dated September 10, 2014, included a schedule of compliance which included re-permitting of the referenced EU with a higher CO emission limit (PTI 162-18). The VN was resolved on March 19, 2015.

**STACKS**

In order to determine compliance with stack dimensions in the ROP, Facility staff conducted As-built review and where necessary actual field measurement to confirm dimensions as part of the 2018 FCE. Stack information for EUTUR03 and EUEMERGEN01 was verified as part of the December 13, 2021, site inspection. Stack/Vent restrictions (VIII) for exhaust gases for operational EUs/FGs onsite include:

EU/FG	Maximum Exhaust Dimensions (inches)	Minimum Height Above Land Surface (feet)	Compliant	ROP Stack Dimensions
EUPLANT6AMINE	12	50	Yes	11" X 50'
EUTUR01	48	34	Yes	36" X 34'6"
EUTUR02	48	34	Yes	36" X 34'6"

EUTUR03	53	60	Yes	42" X 63'10 1/8"
EUEMRGENG01	8	9.5	Yes	8" X 9.5'
EUPLANT1AMINE	16	75	Yes	15.25" X 76.6'
EUPLANT2AMINE	16	75	Yes	15.25" X 75'
EUPLANT3AMINE	16	75	Yes	(5.25" X 75'
EUPLANT4AMINE	16	75	Yes	5.25" X 75'
EUPLANT5AMINE	16	75	Yes	15.25" X 75'
EUPLANT1HEATER	72	100	Yes	11" X 106'
EUPLANT2HEATER	72	95	Yes	11.5" X 95' 2.5"
EUPLANT3HEATER	72	95	Yes	11.5" X 95' 2.5"
EUPLANT4HEATER	72	95	Yes	11.5" X 95' 2.5"
EUPLANT5HEATER	72	95	Yes	11.5" X 95' 2.5"

### COMPLIANCE

VN History - VNs were issued in August 2014 as a result of failed CO verification testing for EUTURB01 of FGTURB1AND2, and in September 2016 for various compliance issues many related to implementation of the MAP for FGENGINES. Both VNs were resolved.

Supplemental data reviewed as part of the May 24, 2018, scheduled site inspection, identified a non-compliance issue for failure to provide NOX emission records for FGENGINES Monitoring/Recordkeeping Condition SC VI.1. The VN was issued on August 13, 2018, and resolved on June 4, 2019, as a result of stack testing activities conducted on October 23, 2018.

The compliance status for the facility has been based on information provided during and in association with the December 13, 2021, site inspection, as well as on supplemental data annual and semi-annual reports submitted upon request or to meet permit requirements identified under MI-ROP-N2940-2015. Information for the period of July 1, 2019, through June 30, 2021, was evaluated as part of the compliance determination.

### EUPLANT6AMINE –

The emission unit is also known as the “Plant 6 MDEA CO2 Process”, “North Chester Turtle Lake Plant” or former “EUCHESTER10”. NG is processed at a rate of 35 MMSCFD. The ROP (and PTI) contains no testing requirements for this EU. PTI 162-18, contains updated conditions for the EU. The following compliance review refers to the more recent PTI conditions where applicable.

Material/Operational Limits– Limits for EUPLANT6AMINE include a process in limit of no more than 4,950,000 cubic feet of CO2 in the EU per day (SC III.1) and CO2 emissions of no more than 8614 tons per month (note previously limit associated with ROP consisted of 574,250 lbs per day) (SC I.1). Data provided as part of semi-annual and annual compliance submittals confirmed compliance with the referenced limits and is presented below:

<b>Month</b>	<b>Highest Volume CO2 Processed per day (MCF)</b>	<b>Total CO2 Emission (ton/month)</b>
July- November 2019	0	0
December 2019	3135	177.28
January 2020	3285	1420
February 2020	4177	5487
March 2020	3274	5446
April 2020	3262	5193
May 2020	2949	4654
June 2020	2962	4627
July 2020	2850	4489
August 2020	3198	4753
September 2020	2892	4051
October 2020	3541	4035

November 2020	3639	5588
December 2020	3477	5961
January 2021	3419	4499
February 2021	3438	5032
March 2021	2756	4650
April 2021	2725	4505
May 2021	2889	4770
June 2021	3585	4916
July 2021	3153	5213
August 2021	3239	5304
September 2021	3252	5330
October 2021	3218	5516
November 2021	3289	5429
December 2021	3297	5700

<b>Limit</b>	<b>4,950,000 cubic ft/day</b>	<b>8,614 tons</b>
	<b>4,950 Mcf/day (SC</b>	<b>CO2/ calendar</b>
	<b>III.1)</b>	<b>month (SC I.1)</b>

Total CO2 emissions for the calendar years 2020 and 2021 were reported to be 55,704 and 60,866 tons of CO2 per calendar year, respectively.

**Design/Operational Restrictions** – Under the ROP, the permittee is required to install, calibrate, maintain and operate a device to monitor and record;

- NG flow entering EUPLANT6AMINE (continuously) (SC IV.1),

- CO2 content of NG entering EUPLANT6AMINE (daily)(SC IV.2).

Data provided by the Facility clearly indicated that CO2 content and NG flow are monitored by the Facility in compliance with permit conditions.

**Monitoring/Recordkeeping – The permittee shall monitor and record:**

- The flow rate of natural gas entering the plant on a continuous basis (SC VI.1),
- The CO2 content of the NG entering the EU on a daily basis (SC VI.2), and
- The calculated CO2 emission rate from EUPLANT6AMINE in tons/month for each calendar day (SC VI.3).

Period	Inlet Volume – low		Inlet Volume – high		CO2 Content	
	(MCF/day)	(SC VI.1)	(MCF/day)	(SC VI.1)	(Mole %)	(SC VI.2)
July 1 -December 31, 2019*	1352		16,753		19.3164-19.6785	
January 1 - June 30, 2020	6086		21,700		19.32 – 19.64	
July 1 – December 31, 2020	1		19,450		18.62 – 19.75	
January 1 – June 30, 2021	8,474		18,703		18.90 – 19.26	
July 1 – December 31, 2021	9,528		16,568		18.28 – 18.80	

**Reporting -** Prompt reporting of deviations pursuant to GC 21 & 22 of the ROP (SC VII.1 of the ROP) as well as semi-annual and annual reporting requirements (SC VI.2 & VII.3 also of ROP) have been addressed previously in this report.

**EUTUR03 –**

This EU consists of one NG-fired Centaur 50 turbine with 4.0 MW nameplate capacity and SoLoNOx configuration (EUTUR03). The referenced EU was installed in January 2020, though initial operation did not occur until March 3, 2020, and was followed by supplemental vendor testing.

AQD District Staff was notified electronically on January 7, 2020, of the installation status of EUTUR03, which was installed, but still in testing mode. As of March 3, 2020, the Facility

electronically notified District Staff that the unit had completed it’s initial operation, and that continued testing by manufacturer would be occurring that week. The EU was officially brought into service on March 10, 2020.

Documentation to meet the requirements of SC IX.2 which requires:

- permanent shutdown of FG ENGINES (April 2019) within 180 days after the initial startup and commissioning of EUTUR03, and MACES said permanent shut down on September 4, 2019
- shut down of FGGEN6789 (September 2019) prior to installation of EUTUR03, and MACES reports shut down date of August 9, 2019
- Notification withing 30 days after shutdown.

The required notifications were received on 9/9/2019, with notification date of 9/5/2019 in compliance with the permit condition.

**Emission Limits** – NOx and CO emission limits as 30-day rolling averages, hourly and 12-month rolling totals for EUTUR03 exist for temperature conditions both above and below 0 degrees F. Emission limits above 0 degrees F are summarized below:

DATE	NOx (ppm on a dry basis at 15% O2)	NOx (pph)	CO (pph)
March 12, 2020*	7.13	0.89	0.15
LIMIT	25 (SC I.1)**	5.35 (SC I.3)	6.47 (SC I.5)

**\*Stack Test Results**

\*\* Table 1 of 40 CFR Part 60 Subpart KKKK (applicable UAR) limits NOx for EU to 25 ppm not 42 ppm as indicated in PTI 162-18. Note that correction to emission limit to be made as a supplemental permit in Spring 2022.

Emission limits below 0 degrees F are summarized below:

DATE	NOx (ppm on a dry basis at 15% O2)	CO (ppm on dry basis at 15% O2)
March 12, 2020	Not Tested	Not Tested
LIMIT	150 (SC I.2)	165 (SC I.6)

12-month rolling emission limits are summarized below:

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<b>DATE</b>	<b>NOx (tpy) (based on 12-month rolling time period)</b>	<b>CO (tpy) (based on 12-month rolling time period)</b>
<b>December 31, 2021</b>	<b>2.056</b>	<b>0.3465</b>
<b>November 30, 2021</b>	<b>1.68</b>	<b>0.29</b>
<b>LIMIT</b>	<b>38.7 (SC I.4)</b>	<b>43.4 (SC I.7)</b>

\* The unit was reported to be down from September 17 to December 21<sup>st</sup> 2020.

Data provided by the Facility for calendar years 2020 and 2021 is summarized below:

<b>Month</b>	<b>Total Monthly Runtime (Hrs)</b>	<b>Total NOx Emissions (Ton/Month)</b>	<b>NOx 12-month rolling (tpy)</b>	<b>Total CO Emissions (Ton/Month)</b>	<b>CO 12-month rolling (tpy)</b>
<b>January 2020</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>February 2020</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>March 2020</b>	<b>524</b>	<b>0.23</b>	<b>0</b>	<b>0.04</b>	<b>0</b>
<b>April 2020</b>	<b>720</b>	<b>0.32</b>	<b>0</b>	<b>0.05</b>	<b>0</b>
<b>May 2020</b>	<b>744</b>	<b>0.33</b>	<b>0</b>	<b>0.06</b>	<b>0</b>
<b>June 2020</b>	<b>697</b>	<b>0.31</b>	<b>0</b>	<b>0.05</b>	<b>0</b>
<b>July 2020</b>	<b>576</b>	<b>0.26</b>	<b>1.45</b>	<b>0.04</b>	<b>0.24</b>
<b>August 2020</b>	<b>733</b>	<b>0.33</b>	<b>1.78</b>	<b>0.05</b>	<b>0.30</b>

<b>September 2020</b>	<b>733</b>	<b>0.17</b>	<b>1.94</b>	<b>0.05</b>	<b>0.33</b>
<b>October 2020</b>	<b>1</b>	<b>0</b>	<b>1.94</b>	<b>0</b>	<b>0.33</b>
<b>November 2020</b>	<b>0</b>	<b>0</b>	<b>1.94</b>	<b>0</b>	<b>0.33</b>
<b>December 2020</b>	<b>253</b>	<b>0.11</b>	<b>2.06</b>	<b>0.2</b>	<b>0.35</b>
<b>January 2021</b>	<b>641</b>	<b>0.29</b>	<b>2.06</b>	<b>0.05</b>	<b>0.39</b>
<b>February 2021</b>	<b>0</b>	<b>0</b>	<b>2.35</b>	<b>0</b>	<b>0.39</b>
<b>March 2021</b>	<b>1.23</b>	<b>0.05</b>	<b>2.35</b>	<b>0.01</b>	<b>0.36</b>
<b>April 2021</b>	<b>0</b>	<b>0.00</b>	<b>2.17</b>	<b>0</b>	<b>0.31</b>
<b>May 2021</b>	<b>45</b>	<b>0.02</b>	<b>1.54</b>	<b>0</b>	<b>0.26</b>
<b>June 2021</b>	<b>0</b>	<b>0.00</b>	<b>1.23</b>	<b>0</b>	<b>0.21</b>
<b>July 2021</b>	<b>0</b>	<b>0.00</b>	<b>0.97</b>	<b>0</b>	<b>0.16</b>
<b>August 2021</b>	<b>0</b>	<b>0.00</b>	<b>0.64</b>	<b>0</b>	<b>0.11</b>
<b>September 2021</b>	<b>0</b>	<b>0.00</b>	<b>0.47</b>	<b>0</b>	<b>0.08</b>
<b>October 2021</b>	<b>0</b>	<b>0.00</b>	<b>0.47</b>	<b>0</b>	<b>0.08</b>
<b>November 2021</b>	<b>381</b>	<b>0.17</b>	<b>0.50</b>	<b>0.03</b>	<b>0.11</b>

December 2021	58	0.03	0.67	0.0	0.09
Limit	NA	NA	38.7 (SC I.4)	NA	43.4 (SC I.7)

**Material Limits** - EUTUR03 in compliance with PTI 162-18 fires only NG (SC III.1). SC II.1 limits total sulfur content to 0.060 lb/MMBtu. In addition, the permittee is restricted to NG fuel of no more than 0.8% by weight total sulfur (40 CFR 60.633(b). (SC II.1). Records provided in the 2021 first semiannual submittal included a copy of a “Firm Gas Treating Agreement” between DCP Antrim Gas LLC and a blacked-out customer. A review of the agreement indicated that the gases would contain no more than ¼ grain of hydrogen sulfide per 100 cubic feet and are compliant with the referenced requirements.

Though no limits on NG usage exists for EUTUR03, the permittee is required to install, calibrate, maintain and operate a device to monitor and record ng usage rate on a continuous basis (SC IV.2). The Facility reports that a TG3 Meter is used to collect the required usage information in compliance with the permit condition.

In addition to the temperature relate emission limits referenced above, the permittee is limited to operations of no more than 650 hours per 12-month rolling time period at temperatures below 0 degrees F. Information provided indicated that EUTUR03 had no operations below 0 degrees F, for 2021.

At the time of the December 13, 2021, site inspection, total startup events per 12-month rolling time period (as determined at the end of each calendar month) totaled 4, and showed compliance with SC III.3 and III.4 which limits startups and shutdowns to 100 per 12-month rolling time period respectively. Since installation, the highest monthly number of startup-shutdown events was 45 in February 2020, when the EU was tested/commissioned.

**Testing/Sampling** - Under PTI 162-18, the Permittee is required to conduct NOx and CO verification emission testing for EUTUR03. Verification of CO emission rates by testing is required within 180 days after commencement of initial startup with subsequent testing every 5 years (SC V.1). Initial testing was conducted within the required timeframe, with the proposed test plan and test report being submitted in a timely manner. Test results are presented in the emission limit discussion above. Subsequent testing will be required on or before March 12, 2025.

Verification NOx testing was required within 60 days of having achieved the maximum production late but no later than 180 days after commencement of initial startup (SC V.2). With subsequent testing (SC V.3) to be determined by whether or not the most recent verification test results exceeding 75% of SC I.1 (42 ppm on a dry gas basis at 15% O2). For the March 12, 2020, testing, reported NOx emissions were 16.97% of the limit, requiring the next testing event to be conducted every 2 years, or no more than 26 months apart. Test plans and reports for the March 12, 2020, verification testing were submitted in a timely manner and in compliance with permit conditions. The next emissions testing should be conducted between March 12, 2022 and May 12, 2022.

**Monitoring/Recordkeeping** – Under PTI 162-18 the permittee is required to maintain a record of the gas quality characteristics specifying the maximum total sulfur content in the form of a current, valid purchase contract, tariff sheet or transportation contract for the gaseous fuel (SC VI.1). Documents provided indicate that the Facility is required to meet a ¼-grain H<sub>2</sub>S per 100 cubic feet.

The permittee is required to keep records of the hours of operation at temperatures below 0 degrees F to show compliance with SC III.3. Information provided and reviewed has indicated that the Facility is monitoring and documenting the required data in compliance with the permit condition. No operations below 0 degrees F is reported for the calendar year 2021. A total of 1248 hours of operation were reported for the 2021 calendar year.

The permittee is required to keep the following monthly total or 12-month rolling records:

- Total NO<sub>x</sub> and CO emissions for EUTUR03 (SC VI.3)
- Startup and shutdown events for EUTUR03 (SC VI.4)

The referenced information was presented upon request and been found to have been in compliance with permit conditions. The required data has been summarized earlier in this report.

SC VI.5 requires the permittee to maintain records of all information necessary for all notifications and reports as specified in the SC if the PTI. This information included but was not limited to:

- Any testing required under SC of 162-18
- Monitoring data
- Total sulfur content of the NG
- Verification of the capacity rating
- ID, type and amount of fuel combusted on a monthly basis
- All records required by 40 CFR 60.7, including the initial startup notification and performance tests
- Records of the number of all startup and shutdown events per turbine, and
- All calculations necessary to show compliance with the permit limits.

Information presented by the Facility as part of the December 13, 2021, site inspection and supplemental information requested show compliance with SC VI.5.

**Other Requirements** – In addition to SCs presented PTI 162-18 contains a high-level citation for 40 CFR Part 60 Subpart KKKK as it applies to EUTUR03 (SC IX.1). A review of the subpart identified excess emissions and monitor downtime reporting for the EU. Compliance with SC associated with 162-18 assumes compliance with this high-level citation.

#### **EUEMRGEN01** –

This EU consists of one 450 kW, 750 bhp, Cummins model QSX-15-G9, turbo-charged diesel- fired, emergency generator. The EU operates under PTI 162-18, which is under renewal. Installed October 31, 2019. EUEMERGEN01 was determined at the time of permitting to be subject to NSPS subpart IIII for CI RICE and is documented in above table. It should be noted that the referenced

emergency generator is a manufacturer certified engine, and as such no emissions demonstrations will be required under the subpart.

With respect to Subpart ZZZZ, 40 CFR 63.6590(c)(1) indicates that the requirements of Subpart ZZZZ are met for new or reconstructed stationary RICE located at an area source by meeting the requirements of 40 CFR Part 60, Subpart IIII. No Subpart ZZZZ requirements have been incorporated into PTI 162-18 or the ROP Renewal application.

**Material/Operational Limits-** SC II.1 limits the permittee to only ultra-low sulfur diesel as fuel for EUEMRGEN01, with maximum sulfur content of 5 ppm (0.0015 percent) by weight, and a minimum Cetane index of 40 or a maximum aromatic content of 35 volume percent. Documents provided as part of the First Semiannual submittal contained lab analysis dated 10/14/2019, which indicated sulfur concentrations of 7.1 ppm. Documentation provided met the recordkeeping requirements of SC VI.4.

Per Permit, EUEMRGEN01 is required to be equipped with and maintain a non-resettable hour meter to track operating hours (SC IV.1) Operation of EUEMRGEN01 is limited to

- no more than 300 hours per 12-month rolling time period, as determined at the end of each calendar month (SC III.1).

Limits associated with PTI 162-18 also included the following additional operational limits:

- no more than 100 hrs per calendar year for necessary maintenance checks and readiness testing (SC III.2) and
- operation of up to 50 hours per calendar year in non-emergency situations (SC III.3).

A review of records provided as part of the December 13, 2021, site inspection indicated that EUEMRGEN01 has operated less than 10 hours since it's initial installation in 2019 and less than 50 hours in total onsite (emergency and non-emergency). Records provided met recordkeeping requirements of SC VI.3.

**Design/Operational Limits-** As a certified engine being operated and maintained according to the manufacturers emission related written instructions, the following conditions are not applicable at this time: Emission limits SC I.1-3; Operational limits SC III.4 and III.5; and Testing V.1. However, documentation verifying that status must be kept per SC VI.2.

**Reporting** – Under PTI 162-18, the permittee is required to provide notification of completion of the installation, construction, reconstruction, relocation of modification of the EU as authorized by the permit (SC VII.1). In compliance with the condition, AQD District Office received notification of installation of EUEMRGEN01 in correspondence dated November 27, 2019 and received December 2, 2019.

Should the permittee change the operation of EUEMRGEN01 from certified to non-certified, written notification is required within 30-days (SC VII.2). No notification has been received to date by the AQD District Office, and the Facility has indicated that no such change has occurred with respect to the EU.

**Other** – SC IX.1 requires the permittee to comply with all applicable provisions of 40 CFR Part 60, Subpart A and Subpart IIII for Stationary CI combustion engines. As EUEMRGEN01 is a certified

engine, it appears that requirements associated with the requirements of PTI 162-18 have been met and that the EU is in general compliance with the requirements of the referenced subpart.

**FGENGINES -**

This FG no longer exists as the two engines have been decommissioned.

**FGMACTZZZZ -** This flexible group formerly contained not only the two engines of FGENGINES (equipped with three-way catalyst) but also four NG-fired, four-stroke, lean burn, Caterpillar 3516, 1,150 HP generator engines located in a remote area. All six units were reported to be subject to 40 CFR, part 63, Subpart ZZZZ (NESHAP for RICE). These units as previously indicated have been decommissioned and removed from site.

One existing, diesel-fired, emergency engine (EUEMERGENG01) exists onsite. Based on installation date, the referenced unit would be subject to requirements under 40 CFR, Part 63, Subpart ZZZZ. Per 40 CFR 63.6590(c)(1), the referenced EU may meet the referenced requirements by meeting requirements under 40 CFR Part 60, Subpart A and IIII and are identified in the associated PTI 162-18.

**FGTURB1AND2 –** This FG consists of two NG-fired, Centaur 40-T4700 turbines (EUTUR01 & EUTUR02) with name plate capacities of 3.5 MW.

**Operational & Material Limits -** The permittee shall use only sweet natural gas (< 15 ppmv) as fuel for FGTURB1AND2. (SC III.1) In addition, the permittee is restricted to NG fuel of no more than 0.8% by weight total sulfur (40 CFR 60.633(b). (SC II.1). Records provided in the 2021 semiannual submittals included a copy of a “Firm Gas Treating Agreement” between DCP Antrim Gas LLC and a blacked-out customer. A review of the agreement indicated that the gases would contain no more than ¼ grain of hydrogen sulfide per 100 cubic feet.

**Emission Limits -** NOx and CO emission limits for the two turbines associated with FGTURB1AND2 are limited to ppm and pph. As previously indicated, previous testing for 13 EUs onsite was conducted in May-June 2014, and more recently FGTURB1AND2 was conducted on October 9, 2019, with subsequent testing to be conducted in 2024.

**Testing Activities–** The permittee is required every 5 years to perform verification testing of NOx and CO emission rates associated with each turbine. (SC V.1) As previously indicated, the required testing was completed in May-June 2014. The required verification testing was conducted on October 9, 2019, in compliance with condition SC V.1. The following tables summarize the test data for the FG:

EMISSION UNIT	DATE	NOX (ppm corrected to 15% O2 on dry gas basis)	NOx (lb/Hr)
EUTUR01	6/5/2014	81	14.5
EUTUR01	10/7-9/2019	105	13.5

EUTUR02	6/5/2014	83	13.9
EUTUR02	10/7-9/2019	112	14.7
LIMIT		167 ppm (SC I.1)	17.1 lb/Hr (SCI.2)

EMISSION UNIT	DATE	CO (ppm corrected to 15% O2 on dry gas basis)	CO (lb/Hr)
EUTUR01	6/5/2014	24	2.6
EUTUR01	10/7-9/2019	0	0
EUTUR02	6/5/2014	22	2.2
EUTUR02	10/7-9/2019	0	0
LIMIT		50 ppm (SC I.3)	5.3 lb/Hr (SCI.4)

**Monitoring/Recordkeeping** – In compliance with the ROP, the Facility has maintained a record of the NG quality characteristics in the form of gas chromatograph analysis from each plant, as well as sample collection for laboratory analysis for gaseous fuel specifying the maximum total sulfur content. (SC VI.1) Data provided confirmed compliance.

The 2020 and 2021 annual submittal provided monthly total runtimes, NOx and CO emissions for each of the three turbines onsite. Emissions are based on the most recent stack test data for the EUs. The data for each EU is summarized below:

**Turbine #1**

Month	Total Monthly Runtime (Hrs)	Total NOx Emissions (Ton/Month)	Total CO Emissions (Ton/Month)
January 2020	744	5.02	0

<b>February 2020</b>	<b>696</b>	<b>4.70</b>	<b>0</b>
<b>March 2020</b>	<b>737</b>	<b>4.97</b>	<b>0</b>
<b>April 2020</b>	<b>720</b>	<b>4.86</b>	<b>0</b>
<b>May 2020</b>	<b>744</b>	<b>5.02</b>	<b>0</b>
<b>June 2020</b>	<b>533</b>	<b>3.60</b>	<b>0</b>
<b>July 2020</b>	<b>634</b>	<b>4.28</b>	<b>0</b>
<b>August 2020</b>	<b>735</b>	<b>4.96</b>	<b>0</b>
<b>September 2020</b>	<b>696</b>	<b>4.70</b>	<b>0</b>
<b>October 2020</b>	<b>744</b>	<b>5.02</b>	<b>0</b>
<b>November 2020</b>	<b>720</b>	<b>4.86</b>	<b>0</b>
<b>December 2020</b>	<b>497</b>	<b>3.35</b>	<b>0</b>
<b>January 2021</b>	<b>93</b>	<b>0.63</b>	<b>0</b>
<b>February 2021</b>	<b>684</b>	<b>4.62</b>	<b>0</b>
<b>March 2021</b>	<b>625</b>	<b>4.22</b>	<b>0</b>
<b>April 2021</b>	<b>714</b>	<b>4.82</b>	<b>0</b>
<b>May 2021</b>	<b>723</b>	<b>4.88</b>	<b>0</b>
<b>June 2021</b>	<b>719</b>	<b>4.85</b>	<b>0</b>
<b>July 2021</b>	<b>743</b>	<b>5.02</b>	<b>0</b>

<b>August 2021</b>	<b>744</b>	<b>5.02</b>	<b>0</b>
<b>September 2021</b>	<b>720</b>	<b>4.86</b>	<b>0</b>
<b>October 2021</b>	<b>743</b>	<b>5.02</b>	<b>0</b>
<b>November 2021</b>	<b>707</b>	<b>4.77</b>	<b>0</b>
<b>December 2021</b>	<b>731</b>	<b>4.93</b>	<b>0</b>
<b>Limit</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

**Turbine #2**

<b>Month</b>	<b>Total Monthly Runtime (Hrs)</b>	<b>Total NOx Emissions (Ton/Month)</b>	<b>Total CO Emissions (Ton/Month)</b>
<b>January 2020</b>	<b>744</b>	<b>5.47</b>	<b>0</b>
<b>February 2020</b>	<b>696</b>	<b>5.12</b>	<b>0</b>
<b>March 2020</b>	<b>263</b>	<b>1.93</b>	<b>0</b>
<b>April 2020</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>May 2020</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>June 2020</b>	<b>214</b>	<b>1.57</b>	<b>0</b>
<b>July 2020</b>	<b>350</b>	<b>2.57</b>	<b>0</b>
<b>August 2020</b>	<b>3</b>	<b>0.02</b>	<b>0</b>
<b>September 2020</b>	<b>324</b>	<b>2.38</b>	<b>0</b>

October 2020	744	5.47	0
November 2020	720	5.29	0
December 2020	744	5.47	0
January 2021	732	5.38	0
February 2021	683	5.02	0
March 2021	744	5.47	0
April 2021	714	5.25	0
May 2021	721	5.30	0
June 2021	719	5.28	0
July 2021	739	5.43	0
August 2021	744	5.47	0
September 2021	720	5.29	0
October 2021	743	5.46	0
November 2021	385	2.83	0
December 2021	676	4.97	0
Limit	NA	NA	NA

**Reporting** – As previously indicated, semi-annual, annual and testing reporting requirements have been completed in general compliance with the permit conditions. Back up documentation provided as part of the submittal verified compliance with permit requirements.

**Other Requirements-** The permittee is required to comply with the Federal Standards of 40 CFR, Part 60 Subpart GG as they apply to each turbine of FGTURB1AND2. (SC IX.1) Compliance with this high-level citation would appear to be met in compliance with the other EU conditions.

**FGGEN6789** -This FG consisted of four 1,150 Hp, NG-fired Caterpillar 3516 lean burn generator engines, (EUGEN06, EUGEN07, EUGEN08 and EUGEN09) with no associated pollution control devices. The generator engines before being removed from site provided backup power if there were issues with FGTURB1AND2. The referenced engines were removed in April 2019.

**FGPLANTRA** – This FG consists of five of the six MDEA processes (EUPLANT1AMINE through EUPLANT5AMINE) for removing CO2 from the NG stream. No pollution control devices are associated with the EUs. No material limits or process/operational restrictions are associated with the FG.

**Emission Limits** – Emission limits associated with the FG include both a monthly CO2 emission limit (SC I.1) as well as a 0% opacity limit for EUPLANT3AMINE and EUPLANT4AMINE (SC I.2). CO2 content of incoming gas streams are continuously monitored and recorded for FGPLANTRA (SC IV.1).

CO2 emissions are limited in tons per calendar month under the existing ROP. Monthly emissions for the 2020 and 2021 calendar year to date are summarized below:

<b>DATE</b>	<b>FGPLANTRA CO2 EMISSIONS (tons per calendar month)</b>
<b>January 2020</b>	<b>40245</b>
<b>February 2020</b>	<b>33307</b>
<b>March 2020</b>	<b>35009</b>
<b>April 2020</b>	<b>33460</b>
<b>May 2020</b>	<b>35511</b>
<b>June 2020</b>	<b>34982</b>
<b>July 2020</b>	<b>27727</b>
<b>August 2020</b>	<b>37415</b>
<b>September 2020</b>	<b>37421</b>

<b>October 2020</b>	<b>38057</b>
<b>November 2020</b>	<b>35876</b>
<b>December 2020</b>	<b>36414</b>
<b>January 2021</b>	<b>33036</b>
<b>February 2021</b>	<b>29426</b>
<b>March 2021</b>	<b>32442</b>
<b>April 2021</b>	<b>32708</b>
<b>May 2021</b>	<b>32724</b>
<b>June 2021</b>	<b>31580</b>
<b>July 2021</b>	<b>32122</b>
<b>August 2021</b>	<b>31805</b>
<b>September 2021</b>	<b>31134</b>
<b>October 2021</b>	<b>32363</b>
<b>November 2021</b>	<b>31035</b>
<b>December 2021</b>	<b>31469</b>

**LIMIT 73,343 tons (SC I.1)**

Per the requirements of the ROP, CO2 inlet concentrations are recorded on a daily basis as are the gas inlet and outlet volumes for each plant. The data is submitted as part of the Facilities semi-annual submittals.

12-Month rolling total CO2 emissions reported for the flexible group

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<b>12-month Rolling Period ending</b>	<b>CO2 Emission (tons/12-month)</b>
<b>December 2019</b>	<b>482497</b>
<b>December 2020</b>	<b>435987</b>
<b>December 2021</b>	<b>191926</b>

**Testing Activities**– Testing activities for the FG are limited to conducting and recording of daily 6-minute non-certified VE observations for EUPLANT3AMINE and EUPLANT4AMINE. The facility reports that the 6-minute time period is followed by staff. The intent of the condition is verification of the presence of VEs and need not follow the procedures specified in USEPA Test Method 9.

Should VEs be observed the permittee shall immediately initiate and document corrective actions (SC V.1) No VEs were noted at the time of the inspection. In addition to CO2 inlet concentrations the Facility reports visible emissions for Plants 3 & 4 on a daily basis. Copies of the daily documentation logs were available for review, and appeared to be in general compliance with the permit condition.

**Monitoring/Recordkeeping** –The permittee is required to install, calibrate, maintain and operate a device to monitor (continuously) and record the CO2 content of the NG entering each MDEA process (EUPLANT#AMINE) (SC IV.1 and VI.1). In addition, the permittee is required to:

- Monitor and record daily the gas processing rate for each MDEA process (EUPLANT#AMINE), (SC VI. 2) and
- Calculate and record the CO2 emission rate from FGPLANTRA in tons per calendar month at the end of each month (SC VI.3).

The data provided for each of the five plants indicated the records are complete and in compliance with permit requirements. Data provided identified the inlet and outlet gas volumes for each of the 5 MDEA processes and CO2 incoming and outgoing gas stream concentrations (by percent) as well as the hours of operation.

**Reporting** -- As previously indicated, semi-annual, annual and testing reporting requirements have been completed in general compliance with the permit conditions.

**FGPLANTPH** – This FG includes six media heaters consisting of:

- Four NG-fired media heaters, each with a rated capacity of 51.231 MMBTU/hr heat input, (EUPLANT2HEATER through EUPLANT5HEATER)

One NG-fired media heater with a rated capacity of 40 MMBTU/hr, (EUPLANT1HEATER) and

- One NG-fired media heater with a rated heat input capacity of 27 MMBTU/hr. (EUPLANT6HEATER)

No material or process/operational restrictions exist for this FG.

**Emission Limits -** With the exception of EUPLANT6HEATER, NOx and/or CO emissions in lb/hr and ton/month exist for EUs within this flexible group and include:

EU	NOX (lb/hr) *	NOX (tons/month)	CO (lb/hr)*	CO (tons/month)
EUPLANT1HEATER	5.6 lb/hr (SC I.1)	NA	NA	NA
EUPLANT2HEATER	5.2 lb/hr (SC I.2)	1.9 ton/month (SC I.3)	NA	NA
EUPLANT3HEATER	5.2 lb/hr (SC I.2)	1.9 ton/month (SC I.3)	3.0 lb/hr (SC I.4)	1.1 tons/month (SC I.5)
EUPLANT4HEATER	5.2 lb/hr (SC I.2)	1.9 ton/month (SC I.3)	3.0 lb/hr (SC I.4)	1.1 tons/month (SC I.5)
EUPLANT5HEATER	5.2 lb/hr (SC I.2)	1.9 ton/month (SC I.3)	3.0 lb/hr (SC I.4)	1.1 tons/month (SC I.5)
EUPLANT6HEATER	NA	NA	NA	NA

\*Emission limits are verified using stack test analysis.

A review of semiannual submittals for the Facility for the period of July 1, 2019 through November 2021. Reported the following NOx emissions (ton/month) for plants 2 through 5 (SC V.3):

MONTH	HIGHEST MONTHLY NOX CONCENTRATION (ton/month)	PLANT NO.
January 2020	1.80046	Plant #2
February 2020	1.68432	Plant #2

<b>March 2020</b>	<b>1.79866</b>	<b>Plant #2</b>
<b>April 2020</b>	<b>1.7240</b>	<b>Plant #2</b>
<b>May 2020</b>	<b>1.80048</b>	<b>Plant #2</b>
<b>June 2020</b>	<b>1.72304</b>	<b>Plant #2</b>
<b>July 2020</b>	<b>1.77628</b>	<b>Plant #2</b>
<b>August 2020</b>	<b>1.80049</b>	<b>Plant #2</b>
<b>September 2020</b>	<b>1.74240</b>	<b>Plant #2</b>
<b>October 2020</b>	<b>1.80048</b>	<b>Plant #2</b>
<b>November 2020</b>	<b>1.74240</b>	<b>Plant #2</b>
<b>December 2020</b>	<b>1.80048</b>	<b>Plant #2</b>
<b>January 2021</b>	<b>1.80048</b>	<b>Plant #2</b>
<b>February 2021</b>	<b>1.62624</b>	<b>Plant #2</b>
<b>March 2021</b>	<b>1.80048</b>	<b>Plant #2</b>
<b>April 2021</b>	<b>1.74240</b>	<b>Plant #2</b>
<b>May 2021</b>	<b>1.80049</b>	<b>Plant #2</b>
<b>June 2021</b>	<b>1.74240</b>	<b>Plant #2</b>
<b>July 2021</b>	<b>1.80048</b>	<b>Plant #2</b>
<b>August 2021</b>	<b>1.80048</b>	<b>Plant #2</b>
<b>September 2021</b>	<b>1.7240</b>	<b>Plant #2</b>

<b>October 2021</b>	<b>1.502088</b>	<b>Plant #4</b>
<b>November 2021</b>	<b>1.45440</b>	<b>Plant #4</b>
<b>December 2021</b>	<b>1.50288</b>	<b>Plant #4</b>
<b>Limit</b>	<b>1.9 ton/month</b>	
	<b>(SC I.3)*</b>	

\*Limit applies to EUPLANT2HEATER, EUPLANT3HEATER. EUPLANT4HEATER and EUPLANT5HEATER

CO emissions (ton/month) for plants 3 through 5 (SC V.3) are reported below detection based on the most recent stack test data. Reported data is presented below:

<b>MONTH</b>	<b>HIGHEST MONTHLY CO CONCENTRATION (ton/month)</b>	<b>PLANT NO.</b>
<b>July 2019</b>	<b>0.00372</b>	<b>Plant #3, Plant #4, and Plant #5</b>
<b>August 2019</b>	<b>0.00365</b>	<b>Plant #3</b>
<b>September 2019</b>	<b>0.00360</b>	<b>Plant #3, Plant #4, and Plant #5</b>
<b>October 2019</b>	<b>0.00372</b>	<b>Plant #3, Plant #4, and Plant #5</b>
<b>November 2019</b>	<b>0.00360</b>	<b>Plant #3, Plant #4, and Plant #5</b>
<b>December 2019</b>	<b>0.00370</b>	<b>Plant #3, Plant #4, and Plant #5</b>
<b>January – December 2020</b>	<b>0</b>	<b>Plant #3, Plant #4, and Plant #5</b>



**CO Test Results Summary-**

<b>Emission Unit</b>	<b>CO Emissions (May-June 2014) (lb/hr)</b>	<b>CO Emissions (October 7-9, 2019) (lb/hr)</b>	<b>CO Limit (lb/hr)</b>
EUPLANT1HEATER	3.8	Not Tested	NA
EUPLANT2HEATER	0	0	NA
EUPLANT3HEATER	0	0	3.0 lb/hr (SC I.4)
EUPLANT4HEATER	0	0	3.0 lb/hr (SC I.4)
EUPLANT5HEATER	0	0	3.0 lb/hr (SC I.4)
EUPLANT6HEATER*	Not Tested	Not Tested	NA

\*CO testing is not required for the referenced EU, which also has no NOx or CO emission limit. It should be noted that the EU was tested as part of stack testing activities conducted March 11-12, 2020. Emissions data reported indicated NOx emissions of 2.04 pph, and CO emissions of 0.00 pph.

**Monitoring/Recordkeeping** – The permittee is required to install, calibrate, maintain and operate a device to monitor and record the NG combusted for each of the six heaters under FGPLANTPH. (SC IV.1) Records of the amount of NG combusted monthly are required under SC VI.1 and the highest monthly usage reported for each plant for the referenced periods are presented below:

<b>Period</b>	<b>Plant 1 (mcf/month)</b>	<b>Plant 2 (mcf/month)</b>	<b>Plant 3 (mcf/month)</b>	<b>Plant 4 (mcf/month)</b>	<b>Plant 5 (mcf/month)</b>
January – June 2020	0	40840	40248	37966	29003
July – December 2020	0	45001	40833	35098	50162
	0	40779	39486	38489	45325

January –  
June 2021

July –  
December  
2021

0                      40134                      41765                      36116                      42173

No monthly limits to NG usage are identified in the permit.

The permittee is also required to calculate and record NOx (SC VI.2) and CO (SC VI.3) emission rates in tons/month. Data provided confirmed compliance. Calculated NOx and CO emission ranges submitted were previously presented.

Reporting - As previously indicated, semi-annual, annual and testing reporting requirements have been completed in general compliance with the permit conditions

Other Requirements- The permittee is required to comply with the applicable requirements of 40 CFR, Part 60, Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. Compliance with this high-level citation is based on compliance with conditions associated with FGPLANTPH.

FGGD01 – This FG consists of a total of six triethylene glycol (TEG) dehydrators (EUP1DEHY through EUP6DEHY). No emission, material or testing limits are associated with this FG. The previous site reports indicated that the Facility was not a major source of hazardous air pollutants and that as such the AQD has not been delegated authority to enforce 40 CFR 63 Subpart HH, AQD staff did not determine compliance with the Subpart as part of this site inspection and compliance evaluation.

GRI-GLYCalc Version 4.0 Aggregate Calculations reports for each of the six units onsite. A review of the reports indicated that each report used actual hours of operation. Emissions reported included total hydrocarbon, total VOC and total HAP emissions. With respect to benzene emissions, the Facility reports that antrim gas does not contain benzene.

EMISSION UNIT	2020 VOC (TPY)	March 04, 2021 VOC (TPY)
EUP1DEHY	2.2990	Not operating
EUP2DEHY	4.0366	3.8008
EUP3DEHY	3.9018	3.8266
EUP4DEHY	3.9988	2.9733
EUP5DEHY	3.1701	3.6541

EUP6DEHY

0.7474

3.4706

**Operational Limits** – The permittee is required to install and properly operate flash and processed water tanks for the dehydrators (SC III.1, III.2 and IV.1). Properly operating flash tanks will volatilize organic compounds from the rich glycol stream and re-route them to the process heater for use as fuel. (SC III.1 and .2) Facility operations are conducted in general compliance with permit conditions. Flash gas lines and pressures were verified during stack testing activities associated with the plant heaters conducted October 7-9, 2019. No changes have occurred since that date.

**Monitoring/Recordkeeping** – In order to meet the exemption criteria of 40 CFR 83.476(b)(1) for glycol dehydrators the facility shall either have:

- Actual annual average flow rate of NG of less than 85,000 cubic meters/day (3,001,746 cubic ft/day) (SC VI.1), or
- Actual average benzene emissions of less than 0.99 ton/year (SC VI.2)

The required monitoring is kept in compliance with permit conditions. The actual emissions were determined using GRI-GLYCalc 4.0. The software program utilizes actual operational and analytical data, and reports no benzene emissions. The Facility provided extended analytical reports for NG samples which indicated that benzene concentrations were below detection limits (<1 ppm/v).

The company does monitor and record flow rate data, however, the data is not used as exemption criteria, as noted above the exemption requirements based on benzene emissions. Previous data indicates that actual flow rates for the dehyds associated with the site are well above the 3.001746 MMSCF/day (SC VI.1) threshold.

**Reporting** -- As previously indicated, semi-annual, annual and testing reporting requirements have been completed in general compliance with the permit conditions.

**Other Requirements**- The ROP identifies compliance with the applicable requirements of 40 CFR, Part 63, Subpart HH – National Emission Standards for Hazardous Air Pollutants for Oil and Natural Gas Production Facilities. Compliance with this high-level citation is based on compliance with conditions associated with FGPLANTPH.

### **SUMMARY** -

On December 13, 2021, AQD District Staff conducted a scheduled site inspection of the DCP Antrim Gas, LLC South Chester Antrim Carbon Dioxide (CO<sub>2</sub>) Removal Facility. The referenced facility is located at 6250 Old State Road, Johannesburg, Otsego County, Michigan (N2940). Located in South Chester Township, Otsego County, Johannesburg, Michigan, the facility is located at the NE corner of Turtle Lake and Old State Roads. Operations at the South Chester Antrim CO<sub>2</sub> Removal Facility consist of removal of high concentrations of CO<sub>2</sub> from Antrim Formation natural gas (NG) by an absorption treating process which utilizes amine. Higher CO<sub>2</sub> concentrations dilute the NG and reduce the heating value of the gas and increases the risk of internal corrosion problems in transmission and storage facilities. The CO<sub>2</sub> concentration of the

natural gas is reduced to customer sales requirements and the Michigan Public Service Commission stipulations.

Facility operations are conducted under Renewable Operating Permit (ROP) MI-ROP-N2940-2015 issued on July 6, 2015, which expires on July 6, 2020. A complete ROP renewal application was received on December 4, 2019, and the application shield issued on December 11, 2019.

Supplemental information required to determine compliance was requested from DCP Midstream, LP (AKA DCP) Environmental Staff on January 14, 2022, and received on February 7<sup>th</sup> and 10<sup>th</sup>, 2022.

The most recent scheduled site inspection were conducted on May 24, 2018, and October 7-9, 2019 (in conjunction with stack test activities) one compliance issue was identified as a result of the 2018 full compliance evaluation and involved recordkeeping activities associated with EUENGINE1 and EUENGINE2 (FGENGINES). The Violation Notice (VN) was resolved on June 21, 2019. No compliance issues were identified in association with the October 2019 site inspection.

During the December 13, 2021, site inspection, and subsequent record review the Facility was determined to be in general compliance with their ROP and associated conditions.

NAME \_\_\_\_\_

DATE \_\_\_\_\_

SUPERVISOR \_\_\_\_\_