

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

P022264072

FACILITY: C&C Energy LLC		SRN / ID: P0222
LOCATION: 19401 15 MILE RD, MARSHALL		DISTRICT: Kalamazoo
CITY: MARSHALL		COUNTY: CALHOUN
CONTACT: Mike Cleeney , Plant Operator		ACTIVITY DATE: 08/09/2022
STAFF: Matthew Deskins	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Unannounced Scheduled Inspection		
RESOLVED COMPLAINTS:		

On August 9, 2022 AQD staff (Matt Deskins) went to conduct a scheduled unannounced inspection of the C&C Energy (formerly Gas Recovery Systems) facility located in Marshall, Calhoun County. C&C Energy also used to be owned by Fortistar but is now owned by or known as Opal Fuels. C&C Energy is a landfill gas to energy facility that leases property from the C&C Expanded Sanitary Landfill and is a separate entity. C&C Energy currently has been permitted for and installed three Waukesha stationary spark ignited internal combustion engines and one Solar Turbine. The processes involved at C&C Energy revolves around the disposal of municipal solid waste (household and industrial non-hazardous waste) at C&C Landfill. Over time, the waste will decompose within the landfill, which produces a gas primarily made up of methane and carbon dioxide that C&C Landfill sells to C&C Energy under a contract. The landfill gas also contains a small percentage of non-methane organic compounds, which can consist of various organic hazardous air pollutants (HAPs), greenhouse gases, and volatile organic compounds. The landfill gas is collected by an active collection system (under vacuum) through a network of wells and piping that is owned and operated by C&C Landfill, but is routed to the internal combustion engines and turbine owned and operated by C&C Energy. Once routed to the engines and/or turbine, the landfill gas is combusted and the energy created is transferred to generators. The generators produce electricity that is purchased by the utility company that services the area and is transmitted to their power lines for distribution. If for any reason both the engines and turbine are not in operation, the landfill gas is routed to an open flare owned by C&C Landfill for combustion. The open flare may also be ran at times in conjunction with the engines and turbine to keep a certain amount of vacuum on the well field.

C&C Energy had historically been included as Section 2 of C&C Landfill's Renewable Operating Permit (ROP). However, in 2011/2012, both the landfill and C&C Energy requested that they both be issued separate ROPs which the AQD has allowed at other facilities. The AQD approved the request. However, the AQD still considers them to be one stationary source with the landfill for permitting and regulatory purposes because at the present time, C&C Energy is totally dependent on the landfill gas supplied by C&C Landfill to run their engines and turbine. The SRN for C&C Landfill remains N2896 and C&C Energy was assigned the SRN P0222.

The current ROP for C&C Energy is MI-ROP-P0222-2018 and it contains conditions pertaining to the landfill gas treatment system, internal combustion engines, turbine, and an emergency generator. Currently, the turbine is subject to 40 CFR Part 60 Subpart KKKK (NSPS for Stationary Combustion Turbines) and 40 CFR Part 63 Subpart YYYY (NESHAP for Stationary Combustion Turbines). The emergency generator is subject to 40 CFR Part 63 Subpart ZZZZ (NESHAP for Reciprocating Internal Combustion Engines (See NOTE below for further information on these

regulations). The landfill gas treatment systems for both the engines and the turbine had been subject to the requirements of 40 CFR Part 60 Subpart WWW (NSPS for MSW Landfills) and 40 CFR Part 63 Subpart AAAA (MACT for MSW Landfills). However, within the past year the treatment systems became subject to 40 CFR Part 60 Subpart XXX and an updated MACT AAAA. NSPS Subpart XXX is a new NSPS that applies to MSW landfills (ultimately replacing the NSPS WWW) and its applicability is based on the date of the most recent construction permit issued to the landfill. C&C Landfill was issued a new construction permit to expand their waste disposal area on April 16, 2018. Compliance timelines with the regulation don't start until the landfill actually commences construction on the approved expansion which they did on March 15 2019. Ultimately, the landfill and energy plant will have to be in compliance with the requirements of the NSPS XXX within 30 months of the March 15, 2019 effective date which would be approximately September 15, 2021. The facility was also subject to the Consent Order Nos. AQD No. 4-2012 and AQD No. 17-2015. The terms of both COs were fulfilled and have been terminated. The purpose of staff's inspection was to determine C&C Energy's compliance status with their ROP, any of the federal air regulations previously mentioned, and any other state and/or federal air regulation that may be applicable.

**HISTORIC NOTE:** When C&C Energy received the permit for their turbine in 2006, it allowed emissions of hydrochloric acid of 8.3 tons. When that is combined with the hydrochloric acid emission limit of 7.9 tons for their internal combustion engines permit that was issued in 1997, it totaled 16.2 tons, thus making them a major source of HAPs which in turn made them subject to 40 CFR Part 63 Subpart YYYY with regards to the turbine. This issue was discovered in 2011 while reviewing their ROP Renewal Application and drafting the ROP renewal. C&C Energy could not opt-out of any past maximum achievable control technology standards because of the USEPA's "Once In Always In" policy. The AQD sent C&C Energy a violation notice regarding this and proceeded with enforcement proceedings because of the situation. C&C Energy ultimately agreed to enter into a consent order with the AQD (Consent Order No. 4-2012) which had been in effect for 5 years and was terminated on August 13, 2018. The consent order compliance program had stated that C&C Energy will comply with their ROP as well as 40 CFR Part 63 Subpart YYYY. Lastly, the emergency generator at the facility is subject to the Maximum Achievable Control Technology Standards for Reciprocating Internal Combustion Engines promulgated in 40 CFR, Part 63, Subparts A and ZZZZ, and the internal combustion engines would be if any modification, reconstruction, or construction as defined in the General Provisions of 40 CFR Part 63, Subpart A, occurs at the facility. The internal combustion engines could also be Subject to 40 CFR Part 60 Subpart JJJJ should they be replaced by newer engines (the applicability of this regulation is dependent on the manufacturer date of the engine(s)).

AQD staff arrived at C&C Energy at approximately 1:35 p.m. after inspecting the C&C Landfill. Staff proceeded into the control room/office area of the plant and noticed Mike Clenney (Plant Operator) in the office and staff greeted them. Staff then signed in and stated the purpose of the visit. Mike then asked staff for their business card and he proceeded to follow the corporate procedures that they do for when they have visitors to the plant. A few minutes later, Kiel Clenney (Plant Operator) also came in and staff greeted them also. Staff then asked Mike and Kiel if they would have to get with Suparna or Mike Langfelder again for the emission records. They mentioned that under Opal Fuels, staff would have to submit a request for them via an e-mail to

environmentalreporting@opalfuels.com which staff did the following day on August 10.

Staff then and asked Mike and Kiel some general questions about the facility. The following is a summary of that discussion followed by the various permit conditions and their compliance status with them.

According to Mike and Kiel, the facility still has three Waukesha ICEs and the Solar Turbine. He said that all the engine and turbine production data still gets recorded on the computer and is sent to headquarters where Suparna and/or their Environmental Manger (now Mike Langfelder) keeps track of the records. Staff then asked what equipment was currently operating and Mike said that two of the engines and the turbine were. He said that engines 1 and 2 were running and that 3 needed to be rebuilt. He said that with the amount of landfill gas that is being collected right now they can run the engines at approximately 65% load and the turbine at 85% load. Also, the open flare owned by the landfill was not running currently but had been earlier that day because the turbine had been down. The flare is typically only used for back-up purposes.

Staff then asked if any of the equipment had been rebuilt or replaced since staff's last inspection in 2020. Mike said that all the equipment was the same and nothing had been replaced. Staff then asked if they knew the serial number and date of manufacture of the engine. According to their records and Kraft Power, who does their engine re-builds, the Serial Number for engine #1 was C-12054/2 with a manufacture date of 6-30-96. The same information for engines #2 and engines #3 was as follows: Engine #2: Serial No. C-10812/7 with a manufacture date of 4-29-93 and Engine #3: Serial No. C-10622/6 with a manufacture date of 8-31-92. According to what Mike has told staff during previous inspections, Waukesha doesn't manufacture the type of engine that they use at their plant anymore and they haven't done so for years, so all the replacement engines are going to be older re-builds. Staff has always noted that the engines definitely didn't look new during any of their past inspections and they had been told previously that corporate has not purchased any new engines since 2006, so all engines that are being swapped out are being replaced by rebuilt ones from other locations.

Staff then checked some of the current plant readings and the following is what staff noted:

Landfill Gas Quality: Methane – 52.9%, Carbon Dioxide – 36.9%, Oxygen 1.3%, and Balance Gas – 8.9%.

Engine and Turbine landfill gas consumption and electrical output:

Engine #1 – 287 scfm and 578 kilowatts

Engine #2 – 323 scfm and 640 kilowatts

Engine #3 – Not Operating and Needs to be Re-Built

Turbine – 1,266 scfm and 2,566 kilowatts

Staff then went over the various Emission Units contained in the ROP and the following is what staff noted:

## Conditions of MI-ROP-P0222-2018

### **EUTREATMENTSYS: Appears to be in COMPLIANCE**

The treatment systems appear to be set-up as required to meet the new NSPS XXX and/or MACT AAAA requirements which means it removes particulate matter, removes moisture, and compresses the landfill gas prior to combustion. It appears that they are operating the treatment systems anytime landfill gas is routed to the internal combustion engines and turbine. It also appears that C&C Energy personnel are keeping up to date records of engine and treatment system maintenance (They have a binder with all the information as well as maintaining it on their computer). They also still have a computer program reminds them of upcoming maintenance as well. They are submitting the ROP Certifications as required and SSM Reports are no longer required.

**NOTE:** The main difference in the treatment system requirements of the new and/or updated federal regulations is that a Treatment System Monitoring Plan had to be developed along with operating parameters to be monitored. The facility has developed a plan for both treatments systems (engines and turbine) and they appear to be following them.

### **EU-EMERGEN#1: Appears to be in COMPLIANCE**

The only conditions contained in the ROP for the emergency generator are from the NESHAP ZZZZ (RICE MACT), which the AQD is not delegated to enforce at Area Sources of HAPs, and the only requirements from the regulation for existing ones are as follows:

(1) If you own or operate an emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that was installed prior to June 12, 2006, you must operate the engine according to the conditions described in paragraphs (f)(2)(i) through (iii) of this section. If you do not operate the engine according to the requirements in paragraphs (f)(2)(i) through (iii) of this section, the engine will not be considered an emergency engine under this subpart and will need to meet all requirements for non-emergency engines.

(i) There is no time limit on the use of emergency stationary RICE in emergency situations.

(ii) You may operate your emergency stationary RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by the manufacturer, the vendor, or the insurance company associated with the engine. Required testing of such units should be minimized, but there is no time limit on the use of emergency stationary RICE in emergency situations and for routine testing and maintenance.

(iii) You may operate your emergency stationary RICE for an additional 50 hours per year in non-emergency situations. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to

supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

According to Mike, they've only had to run it 30 minutes each month for a maintenance check and haven't had to run it for any other reasons in a long time. Mike said that it was manufactured by Kohler and it has a Detroit Diesel engine in it. They keep track of engine hours before and after it has been run and they are recording that information on a computer spreadsheet. Staff looked at the spreadsheet for 2022 and noted it has been run for 4.5 total hours for the year to date.

#### **EUTURBINE: Appears to be in COMPLIANCE**

The turbine is subject to the NSPS 40 CFR Part 60 Subpart KKKK for the Standards of Performance for Stationary Combustion Turbines. The main components of this NSPS deal with NOx and SOx. Under the ROP and the NSPS, the facility is required to test VOC, CO, NOx, HCL, and SOx emissions from the turbine. NOx (since they don't have a CEMs) and SOx are typically tested annually to show compliance with the emission limits, however; the regulation does include options for the frequency of testing if the NOx limit is below a certain percentage of the limit. As has been mentioned in previous inspection reports, the facility had originally failed the first several tests up until the EPA realized they erred when they didn't take into account the higher sulfur content of and lower btu ratings of some biofuels. The EPA amended the NSPS to allow turbines fired on biofuels to have SOx emission up to 0.15 lbs/mmbtu. The amendment took effect on May 19, 2009 and C&C Energy has since been in compliance with the limit. Also, the turbine is subject to 40 CFR Part 63 Subpart YYYY which had been explained earlier. Staff received by e-mail the emission records from Eric Kataja (Senior Environmental Analyst for Opal Fuels) the day after the inspection on August 10th. The following are the emission limits for the turbine and what staff noted:

**Total VOCs:** 2.5 tons per year based on a 12-month rolling time period. Appears to be in COMPLIANCE. Staff reviewed the records and the highest emissions noted were 0.13 tons for the 12-month rolling time period ending July 2022.

**CO Limit:** 89 tons per year based on a 12-month rolling time period. Appears to be in COMPLIANCE. Staff reviewed the records and the highest emissions noted were 9.60 tons for the 12-month rolling time period ending July 2022.

**NOx Limit:** 26 tons per year based on a 12-month rolling time period. Appears to be in COMPLIANCE. Staff reviewed the records and the highest emissions noted were 21.77 tons for the 12-month rolling time period ending July 2022.

**NOx Limit:** 96 ppm @ 15% O2 or 5.5 lbs per megawatt hour based on annual stack testing (in this case). Appears to be in COMPLIANCE. The most recent stack test data from 2020 indicated average emissions of 5.1 lbs per hour.

**HCL Limit:** 8.3 tons per year based on the initial stack test. Appears to be in COMPLIANCE. Staff reviewed the records and the highest emissions noted were 0.30 tons for the 12-month rolling time period ending July 2022. The most recent stack test data from 2017 indicated average emissions of 0.07 lbs per hour.

**SOx Limit:** NSPS KKKK amended limit of 0.15 lbs per mmbtu based on annual stack testing (in this case). Appears to be in COMPLIANCE. In 2021, the sulfur testing on the turbine used an ASTM Method to demonstrate compliance with the limit. The results indicated potential sulfur emissions at 0.08 lb/MMBtu. Normally in the past, they would do stack testing for NOx and SO2 emissions concurrently. However, the last stack test indicated NOx emissions were 75% or lower than the permitted limit, so they could go to every 2 years for NOx testing. So that's why they did the ASTM Method for sulfur for last year at least.

**NOTE:** The facility will be stack testing for all the above again on August 23, 2022.

The turbine also has a sulfur fuel analysis condition as required by NSPS KKKK. They have been doing the periodic monitoring (monthly) with a Draeger Tube which is allowed under an ASTM for Gaseous Fuel Monitoring mentioned in NSPS KKKK and referenced in 60.17. Records reviewed by staff for 2022 showed all sulfur results were between 110 and 190 ppm.

The height and diameter of the stack appear to meet the requirements. The turbine was operating during staff's inspection and was consuming approximately 1,266 scfm.

### **TURBINE COMPLIANCE WITH NESHAP YYYY:**

Appears to be in COMPLIANCE. The following lists the requirements of YYYY as they apply to turbines firing landfill gas as fuel. The semi-annual/annual ROP reports that are already submitted appear to contain the required information below except for the amount of landfill gas consumed for the reporting period (although that is reported in their annual MAERs Report). Also, we know the facility only combusts landfill gas at the present time. Lastly, the facility constantly monitors, records, and keeps record of fuel consumption.

(2) A stationary combustion turbine which burns landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, or a stationary combustion turbine where gasified municipal solid waste (MSW) is used to generate 10 percent or more of the gross heat input on an annual basis does not have to meet the requirements of this subpart except for:

(i) The initial notification requirements of §63.6145(d); and

(ii) Additional monitoring and reporting requirements as provided in § §63.6125(c) and 63.6150.

**§ 63.6125** What are my monitor installation, operation, and maintenance requirements?

(c) If you are operating a stationary combustion turbine which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, or a stationary combustion turbine where gasified MSW is used to generate 10 percent or more of the gross heat input on an annual basis, you must monitor and record your fuel usage daily with separate fuel meters to measure the volumetric flow

rate of each fuel. In addition, you must operate your turbine in a manner which minimizes HAP emissions.

**§ 63.6145 What notifications must I submit and when?**

**(a) You must submit all of the notifications in §§63.7(b) and (c), 63.8(e), 63.8(f)(4), and 63.9(b) and (h) that apply to you by the dates specified.**

**(c) As specified in §63.9(b), if you start up your new or reconstructed stationary combustion turbine on or after March 5, 2004, you must submit an Initial Notification not later than 120 calendar days after you become subject to this subpart.**

**§ 63.6150 What reports must I submit and when?**

**(c) If you are operating as a stationary combustion turbine which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, or a stationary combustion turbine where gasified MSW is used to generate 10 percent or more of the gross heat input on an annual basis, you must submit an annual report according to Table 6 of this subpart by the date specified unless the Administrator has approved a different schedule, according to the information described in paragraphs (d)(1) through (5) of this section. You must report the data specified in (c)(1) through (c)(3) of this section.**

**(1) Fuel flow rate of each fuel and the heating values that were used in your calculations. You must also demonstrate that the percentage of heat input provided by landfill gas, digester gas, or gasified MSW is equivalent to 10 percent or more of the total fuel consumption on an annual basis.**

**(2) The operating limits provided in your federally enforceable permit, and any deviations from these limits.**

**(3) Any problems or errors suspected with the meters.**

**(d) Dates of submittal for the annual report are provided in (d)(1) through (d)(5) of this section.**

**(1) The first annual report must cover the period beginning on the compliance date specified in §63.6095 and ending on December 31.**

**(2) The first annual report must be postmarked or delivered no later than January 31.**

**(3) Each subsequent annual report must cover the annual reporting period from January 1 through December 31.**

**(4) Each subsequent annual report must be postmarked or delivered no later than January 31.**

**(5) For each stationary combustion turbine that is subject to permitting regulations pursuant to 40 CFR part 70 or 71, and if the permitting authority has established the date for submitting annual reports pursuant to 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A), you may submit the first and subsequent compliance reports according to the dates the permitting authority has established instead of according to the dates in paragraphs (d)(1) through (4) of this section.**

**§ 63.6155 What records must I keep?**

(b) If you are operating a stationary combustion turbine which fires landfill gas, digester gas or gasified MSW equivalent to 10 percent or more of the gross heat input on an annual basis, or if you are operating a lean premix gas-fired stationary combustion turbine or a diffusion flame gas-fired stationary combustion turbine as defined by this subpart, and you use any quantity of distillate oil to fire any new or existing stationary combustion turbine which is located at the same major source, you must keep the records of your daily fuel usage monitors.

**FGICENGINES: Appears to be in COMPLIANCE**

As mentioned earlier, only Engine #1 and Engine #2 were operational. Engine #3 hasn't been ran in a while and needs to be rebuilt. These engines are not subject to the NSPS JJJJ since they were manufactured before July 1, 2008. As mentioned previously, information that has been provided to staff indicates they all were manufactured well before this date.

The engines stack heights (minimum of 27 feet) and diameters (maximum of 14 inches) appear to be in compliance with the ROP requirements. As mentioned earlier, only two engines were running during staff's inspection and they were operating at about 65% load. The horsepower output for each engine doesn't appear to exceed the 1478 Hp ROP limit. The facility is continuously recording landfill gas consumption for all internal combustion engines, the kilowatt output of each engine, and the hours of operation of each one as required.

The following is what staff noted with regards to emissions for the engines:

**NOx Limit:** 2.93 # per hour, 1.07 tons per month, and 0.90 grams per horsepower hour per engine. Appears to be in COMPLIANCE. The facility met the pounds per hour limit according to their last stack test in September of 2014 at 2.28 lbs per hour. As for the tons per month, staff reviewed records for the 12-month time period ending July of 2022 and the highest monthly emissions noted were 0.71 tons for engine. Previous testing has also shown them in compliance with the grams per horsepower hour. They will have to test again at least 180 days prior to the expiration date of the current ROP and they have scheduled testing for October 4, 2022.

**CO Limit:** 7.33 # per hour, 2.68 tons per month, and 2.30 grams per horsepower hour per engine. Appears to be in COMPLIANCE. The facility met the pounds per hour limit according to their last stack test in January of 2015 at 6.25 lbs per hour. As for the tons per month, staff reviewed records for the 12-month time period ending July of 2022 and the highest monthly emissions noted were 1.95 tons for engine #1. Previous testing has also shown them in compliance with the grams per horsepower hour. They will have to test again at least 180 days prior to the expiration date of the current ROP and they have scheduled testing for October 4, 2022.

**VOC Limit:** 0.81 # per hour, 0.30 tons per month, and 0.25 grams per horsepower hour per engine. Appears to be in COMPLIANCE. The facility met the pounds per hour limit according to their last stack test in October of 2015 at 0.32 lbs per hour. As for the tons per month, staff reviewed records for the 12-month time period



ending July of 2022 and the highest monthly emissions noted were 0.10 tons for engine #1. Previous testing has also shown them in compliance with the grams per horsepower hour. They will have to test again at least 180 days prior to the expiration date of the current ROP and they have scheduled testing for October 4, 2022.

HCL Limit: 0.60 # per hour and 0.22 tons per month per engine. Appears to be in COMPLIANCE. The last performance test in October 2013 for Engines #1 and #3 show the emissions at 0.04 pounds per hour. The last test for engine #2 in September 2014 showed its emissions at 0.03 pounds per hour. As for the tons per month, staff reviewed records for the 12-month time period ending July 2022 and the highest monthly emissions noted were 0.01 tons for Engine #1. They will have to test again at least 180 days prior to the expiration date of the current ROP and they have scheduled testing for October 4, 2022.

**INSPECTION CONCLUSION:** C&C Energy appears to be in COMPLIANCE with ROP No. MI-ROP-P0222-2018 and the Treatment System Requirements of the NSPS XXX and/or MACT AAAA at the present time. Staff thanked Mike and Kiel for their time and departed at approximately 3:05 p.m.

NAME Matt Dark

DATE 8-18-22

SUPERVISOR RIL 8/23/22