

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

N268851395

FACILITY: Advanced Disposal Services Arbor Hills Landfill Inc		SRN / ID: N2688
LOCATION: 10690 W. SIX MILE RD, NORTHVILLE		DISTRICT: Jackson
CITY: NORTHVILLE		COUNTY: WASHTENAW
CONTACT: Suparna Chakladar, Vice-President		ACTIVITY DATE: 11/14/2019
STAFF: Mike Kovalchick	COMPLIANCE STATUS: Non Compliance	
SUBJECT: Inspection of Fortistar. Previously identified violations remain unresolved.		SOURCE CLASS: MAJOR
RESOLVED COMPLAINTS:		

Major / ROP Source. Full Compliance Evaluation (FCE) and Partial Compliance Inspection (PCE) [Full Inspection of Arbor Hills Energy LLC portion of the Advanced Disposal Services Arbor Hills Landfill (ADS) Stationary Source.]

**Facility Contacts**

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**Purpose**

On November 14, 2019, I conducted an unannounced compliance inspection of Fortistar Methane Group-Arbor Hills Energy LLC (AHE) facilities located in Northville, Michigan (Washtenaw County) at 10611 West 5 Mile Road. The purpose of the inspection was to determine the facility's compliance status with applicable federal and state air pollution regulations, particularly Michigan Act 451, Part 55, Air Pollution Control Act and administrative rules, and the conditions of the Company's Renewable Operating Permit (ROP) number MI-ROP-N2688-2011a, issued on January 24, 2011 with an ownership revision taking place on March 28, 2018. (Note: The renewal of this ROP is currently on-going although further technical review has been postponed due to numerous active compliance issues at both AHE and Advanced Disposal Services (ADS).)

**Facility Location**

It is located at 1611 West Five Mile Road which is directly adjacent to the landfill on its southside. There are no nearby homes.

**Arrival & Facility Contacts**

No visible emissions or odors directly attributed to AHE were observed upon my arrival and parking at the facility, at approximately 10:00 am. I proceeded to the facility office to request access for an inspection, provided my identification and met with Carlos Wilson (CW) and Craig Hicks (CH) who are plant supervisors for the facility. I informed them of my intent to conduct a facility inspection and to review the various records as necessary. Both gentlemen extended their full cooperation and fully addressed my questions.

**Regulatory Applicability**

The stationary source is in Washtenaw County, which is currently designated by the U.S. Environmental Protection Agency (USEPA) as attainment/unclassified for all criteria pollutants except ozone. Washtenaw County is currently considered non-attainment for ozone.

The stationary source has emission units that were subject to R 336.1220 for Major Offset Sources. Now Part 19 Rules (i.e. Rule 1902) NSR for Major Sources Impacting Non-Attainment Areas applies.

Several emission units at the stationary source were subject to review under the Prevention of Significant Deterioration regulations of 40 CFR, Part 52.21. In particular, the potential to emit (PTE) of carbon monoxides exceeds 250 tons per years.

The stationary source is subject to 40 CFR Part 70 because the PTE of carbon monoxide, sulfur dioxide and nitrogen oxides exceed 100 tons per year.

The stationary source is considered a major source of Hazardous Air Pollutants (HAP) emissions because the potential to emit of a single HAP, hydrogen chloride, is greater than 10 tons per year.

ADS and AHE constitute one Major Stationary Source under Part 70 Title V program. The Stationary Source operates under ROP MI-ROP-N2688-2011a.

The ROP is structured into three (3) separate sections: Section 1 is for emission units owned and operated by ADS; Section 2 was modified in 2018 to indicate ADS now has ownership (previously BFI); and Section 3 is for emission units owned/operated by AHE.

The facility is also subject to the following federal requirements:

- Federal New Source Performance Standards for Municipal Solid Waste Landfills, 40 CFR Part 60 (NSPS Subpart WWW) (Note: This applies to EUTREATMENTSYS-S3.)

-40 CFR Part 63, Subpart AAAA - National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills. (Note: This applies EUTREATMENTSYS-S3.)

-Federal New Source Performance Standards for Stationary Gas Fired Turbines, 40 CFR Part 60 (NSPS Subparts A & GG) (Note: This applies to FGTURBINES-S3.)

-Federal New Standards of Performance for Stationary Combustion Turbines, 40 CFR Part 60 (NSPS Subparts A & KKKK) (Note: This applies to EUTURBINE4-S3)

-National Emissions Standards for Hazardous Air Pollutants for Stationary Combustion Turbines, 40 CFR Part 63 (MACT YYYY) (Note: This applies to EUTURBINE1-S3, EUTURBINE2-S3, EUTURBINE3-S3, EUTURBINE4-S3 and FGDUCTBURNERS-S3.)

-One 250 HP diesel fired emergency generator is subject to 40 CFR Part 60, Subpart IIII New Source Performance Standards for Stationary Compression Ignition Internal Combustion Engines (Meeting NSPS requirements satisfies RICE MACT Subpart ZZZZ.)

Note: PSD PTI application received on October 25, 2019 is currently under New Source Review. It includes requirements for EUTURBINE1 through 4-S3, FGNOX-S3 and FGTURBINES-S3. This application was submitted to address alleged SO2 emission violations. An incomplete application letter was sent to AHE on November 5, 2019 with required information due December 2, 2019.

The following table highlights key specific federal requirements that apply that may or may not already be outlined in the ROP.

Regulation	Emission Unit	Comments
WWW 60.753(f)	EUTREATMENTSYS-S3	Must be operated at all times when landfill gas is routed to it.
WWW 60.752(b)(2)(iii)(A) or (B)	EUTREATMENTSYS-S3	Any atmospheric vents or stacks that contain landfill gas must be controlled.
WWW 60.753(e) and (f)	EUTREATMENTSYS-S3	Collected gas needs to go to treatment system or flare. (Compressors part of treatment system, turbines not part.)
WWW 60.758(e)	EUTREATMENTSYS-S3	Records of all collection and control system exceedances of the operational standards in § 60.753
WWW 60.756(d)	EUTREATMENTSYS-S3	Records of preventative maintenance performed, complete description of treatment system, operating

		parameters that would indicate proper performance and appropriate monitoring procedures.
WWW 60.757(f)	EUTREATMENTSYS-S3	Semi Annual reporting of exceedances of monitored parameters in 60.756(d), diversions, bypass flow, when treatment system not operating. (AHE provides this via Subpart AAAA report.)
NESHAP General Provisions 63.10(a)(5) & (d)(5)	EUTREATMENTSYS-S3	Semi Annual startup, shutdown, and malfunction reports. (AHE provides this via Subpart AAAA report.)
WWW 60.755(e)	EUTREATMENTSYS-S3	Provisions of WWW 60.755(landfill gas collection system requirements) apply except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment or control devices.
NESHAP General Provisions 63.6(e)	EUTREATMENTSYS-S3	At all times, including periods of startup, shutdown, and malfunction, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. During a period of startup, shutdown, or malfunction, this general duty to minimize emissions requires that the owner or operator reduce emissions from the affected source to the greatest extent which is consistent with safety and good air pollution control practices.
NESHAP General Provisions Subpart A 63.6(e)(iii)(3)(i)	EUTREATMENTSYS-S3	Requires written startup, shutdown, and malfunction plan that describes, in detail, procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction; and a program of corrective action for malfunctioning process, air pollution control, and monitoring equipment used to comply with the relevant standard.
KKKK 60.4330(a)(1)	EUTURBINE4-S3.)	Can't emit any gases containing SO2 in excess of 0.90 pounds per megawatt-hour (lb/MWh) gross output; (Constructed/modified after February 18, 2005.)
AAAA 63.1960-63.1985	EUTREATMENTSYS-S3	If you are required by 40 CFR 60.752(b)(2) of Subpart WWW, to install a collection and control system, you must comply with the requirements in §§ 63.1960 through 63.1985 and with the general provisions of this part specified in table 1 of this subpart. (Same as WWW.)
KKKK 60.4315	EUTURBINE4-S3	Applies to NOx and SO2 emissions
KKKK 60.4320	EUTURBINE4-S3	74 ppm at 15 percent O2 or 460 ng/J of useful output (3.6 lb/MWh) for new turbines firing other than natural gas greater than 50 MM Btu/hr in size.
KKKK 60.4333	EUTURBINE4-S3	Must operate and maintain, turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.
KKKK 60.4340	EUTURBINE4-S3	Must perform annual performance tests in accordance with § 60.4400 to demonstrate continuous compliance. If the NOX emission result from the performance test is less than or equal to 75 percent of the NOX emission limit for the turbine, you may reduce the frequency of subsequent performance tests to once every 2 years (no more than 26 calendar months following the previous

		performance test). If the results of any subsequent performance test exceed 75 percent of the NOX emission limit for the turbine, you must resume annual performance tests.
KKKK 60.4360	EUTURBINE4-S3	Must monitor the total sulfur content of the fuel being fired in the turbine, except as provided in § 60.4365. The sulfur content of the fuel must be determined using total sulfur methods described in § 60.4415
KKKK 60.4370	EUTURBINE4-S3	Allows for custom sulfur content schedules
KKKK 60.4375	EUTURBINE4-S3	Reporting-For each affected unit required to periodically determine the fuel sulfur content under this subpart, you must submit reports of excess emissions in accordance with § 60.7(c). Excess emissions must be reported for all periods of unit operation, including start-up, shutdown, and malfunction.
YYYY 63.6090	EUTURBINE4-S3	Considered new turbine under subpart. Only 63.6125 (c) and 63.6150 applies.
YYYY 63.6125(c)	EUTURBINE4-S3	This turbine does not burn distillate oil.
YYYY 63.6150	EUTURBINE4-S3	Requires Semi-Annual reporting-if deviations then include the total operating time of each stationary combustion turbine during the reporting period.  (ii) Information on the number, duration, and cause of deviations (including unknown cause, if applicable), as applicable, and the corrective action taken.
GG 60.332	FGTURBINES-S3	Sets NOx limit.
GG 60.333	FGTURBINES-S3	Sets SO2 limits. Also, total sulfur can't exceed 0.8% by weight.
GG 60.334	FGTURBINES-S3	Requires sulfur/nitrogen content fuel monitoring.
YYYY 63.6125(c)	FGTURBINES-S3	These turbines burn distillate oil(diesel) so this section applies. However, turbines don't meet definition of lean premix gas fired or diffusion flame gas fired so no requirements.
YYYY 63.6150	FGTURBINES-S3	Requires Semi-Annual reporting-if deviations then include the total operating time of each stationary combustion turbine during the reporting period.
IIII and RICE MACT	250 hp diesel emergency generator	Generally, requires facility to record hours of operation using an installed hours meter and conduct regular maintenance.

#### Active Consent Orders:

AQD Consent Order No. 16-2015 which went into effect on 5/21/2015. It was issued due to a CO emission exceedance from one of the gas fired turbine's and associated duct burner. It required that extensive emission testing be conducted between June 1, 2015 and June 1, 2018.

EPA Finding of Violation (FOV) was issued on September 29, 2016 to AHE. A second FOV dated September 29, 2018 was also issued. To date, a Consent Order has yet to result from the FOV.

#### Facility Background

The facility last had a full compliance inspection conducted on January 8, 2019 and was found to be out of compliance with numerous federal and state requirements. AHE is a subsidiary of Fortistar Methane Group which is a subsidiary of Fortistar LLC. AHE uses landfill gas from the adjacent ADS Landfill to generate electricity through the operation of three Typhoon Turbines (EUTURBINE1-S3, EUTURBINE2-S3, and EUTURBINE3-S3) manufactured by European Gas Turbines(EGT) Ltd(each rated at 58.89 MMBtu/hr) that were first operated on June 12, 1996 and

one newer Solar Taurus Turbine (EUTURBINE4-S3) rated at 68 MMBtu/hr that was first operated in December 2005.

The 3 older turbines are each equipped with a duct burner. (EUDUCTTURBINE1-S3, EUDUCTTURBINE2-S3 and EUDUCTTURBINE3-S3.) These duct burners are devices that combust landfill gas that are placed in the exhaust duct from their associated turbine to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter the heat recovery steam generating systems. Diesel fuel is used during start-up of the 3 older turbines. There is an exhaust stack associated with each turbine. There are also by-pass stacks associated with the 3 older turbines that are used during start-up or when the heat steam generating systems are down for repairs or maintenance.

The three (3) EGT Typhoon turbines typically produce 3.2 to 3.7 Megawatts (MW) of electricity each, while the Solar Taurus turbine can produce up to 5 MW. The three EGT Typhoon turbines are equipped with heat recovery steam generators (HRSG) units that supply steam to steam turbines for additional electricity generation. The four turbines and HRSG supplemental heat duct burners are fueled exclusively with LFG recovered from the adjacent landfill, transferred to AHE, and treated (compressed, dewatered and filtered) prior to its use as fuel. The fuel (treated LFG) consumption rate for each turbine is regulated automatically to maintain the required heat input rate to support the desired operating rate and is dependent on the fuel heat value (methane content). The turbines are not equipped with add-on emission control equipment. NOx emissions are suppressed using dry low-NOx combustors and CO emissions are limited by proper operation of the combustion units to completely combust (oxidize) the methane in the treated LFG fuel.

An AQD enforcement action was taken against AHE which culminated into Consent Order 16-2015 on May 5, 2015. It was issued due to a carbon monoxide (CO) emission exceedance from one of the gas fired turbine's and associated duct burner. It required that extensive emission testing be conducted between June 1, 2015 and June 1, 2018. The Consent Order is still active but the only remaining relevant paragraph is a requirement to stay in compliance with the ROP's CO limits for FGTURBINES-S3 and FGDUCTBURNERS-S3.

Another AQD enforcement action was initiated against AHE with an AQD District referral package dated October 30, 2015 submitted to AQD Enforcement. It was due to SO2 emission exceedances from the turbines/duct burners that was result of an overall increase of the hydrogen sulfide content of the gas coming from the ADS landfill. The U.S. EPA has assumed the lead in resolving these violations. Further, EPA issued a FOV on June 4, 2018. It was also related to findings from an inspection conducted on May 4, 2016 and follow-up Section 114(a) request of information from AHE. To date, the EPA has yet to reach a settlement agreement with AHE.

On August 30, 2018, AQD issued a VN to AHE mostly related to emission stack testing results that was conducted by AHE between May 28 to June 1, 2018. AHE exceeded SO2 emission limits. During the test, 25 high sulfur content gas wells were not connected into the main landfill gas line that feeds into the AHE energy plant. Because of this, the test wasn't considered representative and a new test was required. The retest was conducted on October 16-19, 2018 and again AHE exceeded SO2 emission limits.

On February 1, 2019, AQD issued VN to AHE related to violations uncovered during a compliance inspection conducted on January 8, 2019 and after subsequent records review.

On March 14, 2019, AQD issued VN to AHE for violations related to being the operator for ADS's landfill gas collection and control system.

Another AQD enforcement action was initiated against AHE with an AQD District referral package dated March 15, 2019 submitted to AQD Enforcement. The U.S. EPA has also assumed the lead in resolving these and subsequent violations that occurred later in 2019.

On April 11, 2019, AQD issued VN to AHE for violations relating to being the operator for ADS's landfill gas collection and control system related to an on-going elevated temperature event at the landfill.

On October 22, 2019, AQD issued yet another VN to AHE for violations relating being the operator for ADS's landfill gas collection and control system related to on-going problem with excess of amount of liquid in the gas wells.

AHE reported the following air emissions for 2018 using MAERS provided emission factors as the basis for emission calculations: (NOTE MAERS reported SO2 emissions suggests exceedances of annual SO2 limits for all the emission units.)

Emission Unit	CO Tons	NOX Tons	PM10 Tons	SO2 Tons
EUDUCTBURNER1	25.6*	0.88	0.69	5.5
EUDUCTBURNER2	0.26	0.66	0.62	4.3
EUDUCTBURNER3	0.3	1.15	0.71	5.5

EUTURBINE1	8.77	17.7	4.25	14.03
EUTURBINE2	29.02	22.89	4.45	20.82
EUTURBINE3	11.73	27.6	4.5	25.2
EUTURBINE4	24.9	25.2	4.8	24.9
Totals 2017	100.6	96.1	20.02	100.3

\* Appears to have been an error in MAERS emission report for the amount of CO emissions reported.

Recent Stack Testing Summary AHE:

-May 29, 2018 through June 1, 2018

FGTURBINES-S3 (EGT Typhoon), FGDUCTUBURNERS-S3, EUTURBINE4-S3(Solar Taurus)

CO, NOx, VOC, SO2, HCL. Failed for S02. (Limit 2.9 lb/hour, Actual 3.9, 5.47, 5.68 for Turbine 1, 2, and 3) (This caused failure of annual limit as well.) Duct burners also failed for S02. Also failed for S02 for EUTURBINE4-S3 Limit 0.9 lb/MW hr, Actual 2.15. Note: Test considered invalid as 25 high sulfur content wells turned off during test.) Here is a summary of results for just the SO2 portion of the test. Bold type indicates emission limit exceedance.

Emission Unit	Test Result	Limit	Calculated	Limit
	SO2 (lb/hr)	SO2 (lb/hr)	(T/Yr) S02*	SO2 (T/Yr)
Turbine 1	3.9	2.9	17.1	12.5
Turbine 2	5.47	2.9	24.0	12.5
Turbine 3	5.68	2.9	24.9	12.5
Turbine 4	2.15 lb/MW hr	0.9 lb/MW hr		
Duct Burner 1	2.64	0.3	11.5	1.5
Duct Burner 2	2.24	0.3	9.8	1.5
Duct Burner 3	2.43	0.3	10.6	1.5

\* Annual ton per year values are based on continuous operation (8760 hrs/yr) at the measured lb/hr emission rate.

-October 16, 2018 through October 19, 2019.

Re-test for FGTURBINES-S3 (EGT Typhoon), FGDUCTUBURNERS-S3, EUTURBINE4-S3(Solar Taurus). Similar results to previous test. Again, S02 emissions exceeded permit limits. Hourly SO2 limits were as much as 159% over the emission limit for the turbines and as much as 533% over limit for the duct burners. Here is a summary of results for just the SO2 and NOx portion of the test. Bold type indicates emission limit exceedance. NOx emission results were included since the stack test for NOx on Turbine 3 was close to the emission limit.

Emission Unit	Test Result	Limit	Calculated	Limit	Test Result	Limit
	SO2 (lb/hr)	SO2 (lb/hr)	(T/Yr) S02**	SO2 (T/Yr)	NOx (lb/hr)	NOx (lb/hr)
Turbine 1	4.4	2.9	19.2	12.5	5.6	8.8
Turbine 2	6.3	2.9	27.6	12.5	6.9	8.8
Turbine 3	7.5	2.9	32.85	12.5	8.2*	8.8
Turbine 4	1.4 lb/MW hr	0.9 lb/MW hr			7.4	9.02
Duct Burner 1	1.9	0.3	8.3	1.5	0.3	1.6
Duct Burner 2	1.6	0.3	7	1.5	0.3	1.6
Duct Burner 3	1.9	0.3	8.3	1.5	0.4	1.6

\*o\*\* Annual ton per year values are based on continuous operation (8760 hrs/yr) at the measured lb/hr emission rate.

Note: A new stack test for Turbine #4 is tentatively scheduled for December 20, 2019.

Pre-Inspection Meeting

I met with CW and CH starting at 10 am and lasting for more than an hour as there was many different topics to cover. These topics included the current plant wide outage, the upcoming December stack test for Turbine 4,

Fortistar's role as operator of the well field, status of the PTI application, status of AQD/EPA's enforcement action, compressor venting events and other topics.

CW indicated that there has been a plant wide DTE forced outage since Monday and it was expected to continue till Friday afternoon. They were given about a two week notice prior to the forced shutdown. The flares were on upon arrival. All turbines were offline and Fortistar was taking advantage of the downtime to do some scheduled maintenance, so they were very busy during the visit

#### Onsite Inspection

Below is a brief summary of the inspection followed by evaluation of the compliance requirements for each regulated emission unit evaluated as observed/investigated during and after the onsite inspection.

#### Inspection Summary:

I first asked to view the turbine name plate capacities for Turbines 1-3. The results were as follows:

Turbine 1 was rated at 3.9 MWe (Megawatts electrical)

Turbine 2 faceplate did not have rated capacity. The info is located in a file somewhere.

Turbine 3 faceplate was rated at 4.55 MWe.

I asked CW why these purportedly identical units appeared to have different rated capacity. He didn't know but did say that they all operate in an equivalent manner from their operational perspective in the control room. Because of how the turbines are changed out and refurbished, it wasn't even clear if the faceplate ratings on the turbines themselves should be considered definitively correct. (See AHE response Attachments. Statement provided by AHE from a company that does maintenance on the turbines. They say they all built to operate at 4.9MWe with a 28.5% thermal efficiency consuming 58.7 MMBtu/hr gas fuel.)

Next, we visited the treatment building to investigate the issue of venting of landfill gas during compressor shutdowns. I confirmed that there are 4 vent stacks, one for each of the 4 compressors (compressors are 1000 to 1200 hp in size each) all located in the treatment building roof. Venting occurs each time a compressor is shutdown. (He estimated that this occurs about once a month with exact number of times being determine via required preventative maintenance/SSM reporting forms.) The venting is automatic/computer controlled. When the compressor shuts down, it is isolated both up/down stream then the gas contents are evacuated. CW estimated the venting all occurs in a couple of seconds. He showed me the various valves/skip plate associated with the venting system and where it ties in an exhaust stack. (4 separate venting systems that all operate in a similar manner.) While CW explained to me how the system worked, I noted a pipe several inches in diameter that was coming from below the grated floor of the building that tied directly into the exhaust stacks for one of the compressors below the roof line but above the valve skid plate. CW mentioned that this pipe is venting sewer gas to the roof using the same exhaust pipe as the compressor vent. As noted in previous visits, there is a large volume of odorous liquid below the floor grate which at least suggests the possibility that this is potentially another odor source to be concerned with.

CW showed me the venting system associated with the 2 smaller compressors. In this case, the vents are pressure relief valves. They would only open during some sort very unusual malfunction. The vents combine to a single stack on the roof.

Visited the roof of the treatment system to note the exhaust stacks. They are short stacks no more than six feet above the roofline a few inches in diameter. Due to ice on the roof, I couldn't inspect them closely or able to determine if there were any odorous emissions. I was able to observe the flares. Heatwaves were obvious from the 2 enclosed flares but couldn't visually confirm that the candlestick flare was on due to poor lighting conditions. It was clear that the flares had been on for some time as a very wide area around them contained no snow as a lot of heat was being given off which was felt even on the roof of the building. I didn't visit the flare control room since that is controlled by ADS and not part of the inspection.

#### EUTREATMENTSYS-S3: Non-Compliant

This emission unit treats landfill gas as it first enters the facility before it is used for subsequent use or sale. The landfill gas is directed from the well field through the following stages; 1) suction scrubber; 2) first stage compression; 3) gas cooler; 4) liquid knockout vessel; 5) second stage compression; 6) gas cooler; 7) refrigerant

chiller; 8) liquid knockout vessel; 9) third stage compression; 10) final filtration and coalescing (removes oil and water); and 11) transport to turbine plant gas header. During the cooling stages the temperature of the landfill gas drops resulting in generation of condensate. Thus, the chilling stages serve to cool, dehumidify, and to reheat the gas. The treatment system removes particulate to at least the 10-micron level and removes enough moisture to ensure good combustion of gas for subsequent use; therefore, guaranteeing that the intent of the destruction of the non-methane organic compounds (NMOC) will be maintained. An estimated 3000 to 4000 gallons of odorous condensate is removed from the landfill gas every day and stored in an 10,000 above ground storage tank. The condensate is shipped off-site every other day. A u-shaped vent pipe is located on top of the tank. Everything was offline during the inspection There are 4 main compressors for the turbines and 3 smaller compressors (referred to as auxiliary compressors) for the duct burners. See AHE response attachments. Shows gallons of condensate collected per month in 2019. Amounts per month have roughly doubled from the beginning of the year to more than 100,000 gallons per month.

New during this inspection was discovery of sewer gas vent pipes on the roof of the treatment building. The main concern being that it is a possible source of odors. Post inspection, AHE provided the following description:

"Sewer gas is required by code to be vented to the atmosphere as a safety precaution. As a result, each process unit that has a condensate drain or that otherwise utilizes a drain is considered part of the sewer system and requires a vent. Water collected by the sewer system is composed of condensate from the compressors and water from a sump that collects the "wash-down" water from cleaning of the compressor area. Sewer gas from the system is vented out of the roof of the treatment building via seven (7) unobstructed vertical vents on the roof of the building. Five of the seven sewer gas vents are tied into vents associated with process equipment (primarily compressors servicing the turbines.) As noted above, venting is required under applicable building codes as a safety measure and to allow for proper function of the sewer system (rather than to address any meaningful emissions.)"

-Emission Limits N/A

-Process/Operational Restrictions

See On-Site Inspection Summary discussion paragraph about non compliant atmospheric vents.

-Monitoring/Recordkeeping

AHE appears to be in compliance with these conditions.

AHE response attachments shows all preventative maintenance activities performed in 2019.

-Reporting

Requires Semi-annual reporting including a start-up, shutdown, and malfunction (SSM) report. See AHE response attachments.

-Other Requirements

AHE response attachments contain the latest copy of the SSM plan dated 5/15/2019. It appears that AHE has implemented and is following the plan. AHE response attachments also contain the latest copy of the preventative maintenance plan dated May 2019. It appears that AHE has implemented and is following the plan.

EUTURBINE4-S3: Non-Compliant

EUTURBINE4-S3 is a stationary gas turbine as defined in 40 CFR 60.331 that has an enclosed firebox which maintains a relatively constant limited peak temperature generally using a limited supply of combustion air. Solar Taurus Turbine (EUTURBINE4-S3) rated at 68 MMBtu/hr was first operated in December 2005.

-Emission Limit

0.9 lbs S02/MW hr heat input. Stack test conducted on 10/19/2018 resulted in a value of 1.4 lb/MW hr. This is a violation of the ROP limit, a PSD violation and a violation of Subpart KKKK. This violation has been previously cited and will not be resolved until issuance of a new PTI.



**-Design/Equipment**

Requires continuous monitor/record landfill gas flow to this turbine. AHE response attachments shows this information for 2019.

Requires monitor/record weekly BTU content of the landfill gas. AHE response attachments shows this information for 2019. It varied between 416 to 489 Btu/cubic foot which is similar to 2018.

**-Monitoring/Recordkeeping**

Requires a sulfur content monitoring program for the landfill gas. AHE response attachments shows the H2S results for 2019. Landfill gas entering the plant currently contains about 400 ppm H2S. A recent increase maybe do to the recent addition of capturing gas from the TS-01R sump.

**-Other Requirement(s)**

Requires compliance with NSPS Subpart KKKK. Due to the SO2 emission test failure, AHE is out of compliance with KKKK.

Requires compliance with NESHAP YYYY. Mostly reporting requirements. (Note: Stack testing conducted in October 2018 for hazardous air pollutant HCL which is the principal HAP emitted from this facility showed compliance with emission limits with actual test values much lower than permitted values.)

**FGNOX-S3: Non-Compliant**

This flexible group applies to the NOx emission limit associated with the following specific emission units: EUTURBINE1-S3, EUTURBINE2-S3, EUTURBINE3-S3, EUTURBINE4-S3, EUDUCTBURNER1-S3, EUDUCTBURNER2-S3, EUDUCTBURNER3-S3, EUENCLOSEDFIARE1-S2, and EUENCLOSEDFLARE2-S2; and to all other process equipment at the source, including equipment covered by other new source review permits, R336.1201 grand-fathered equipment and R336.1201 exempt equipment.

**-Emission Limit**

NOx limit of 205 tons per year of which 165.6 tons is for the turbines/duct burners. Stack testing conducted in October 2018 showed compliance with hourly emission limitations which leads to compliance with calendar year limit. AHE response attachments shows 12-Month Rolling Averages for NOx.

**-Monitoring/Recordkeeping**

Requires landfill gas usage for all 4 turbines. AHE response attachments that was mentioned earlier in the report.

Requires monitoring heat content of the landfill gas. AHE response attachments that was mentioned earlier in the report.

Requires monthly NOx emission rate calculations. See AHE response attachments which shows compliance with this requirement in 2019.

**-Other Requirement(s)**

Requires compliance with NSPS Subpart GG and NESHAP. AHE is out of compliance with Subpart GG. See FGTURBINES-S3.

**FGTURBINES-S3: Non-Compliant**

This flexible group only contains requirements for the three (3) EGT turbines that have come from NSR, the turbine NSPS, or the turbine MACT. Since there is a treatment system before the turbines, there are no applicable NSPS WWW requirements for the turbines.

**-Emission Limits**

2.9 lbs SO/hr, 12.5 tpy for FGTURBINES-S3. (Note: Limit applies to each individual turbine-not the combined total as erroneously outlined in ROP.) October 2018 stack test showed exceedances of all SO2 emissions limits for all the turbines by as much as 100% for the turbines and several hundred % for the duct burners. AHE was previously cited for not meeting this requirement.

-Process/Operational Restrictions

Requires sulfur content of the landfill gas shall not exceed 0.8% by weights. MAERS reports showed 0.1% by weight sulfur content of the gas which converts to around 300 to 400 ppm.

-Monitoring/Recordkeeping

Requires sulfur content and nitrogen content monitoring of the landfill gas. AHE is out of compliance with Subpart GG for the following reasons:

Diesel fuel is being used to startup the 3 older turbines. AHE failed to notify AQD that diesel fuel is being used as an alternate fuel as required by Subpart GG. Furthermore, AHE has been operating under a waiver issued by U.S. EPA on January 19, 1996 that waived the requirement for daily fuel sampling for sulfur and nitrogen as long as only landfill gas was being fired in the turbines. AHE was previously cited for not meeting this requirement.

-Other Requirement(s)

Requires compliance with NSPS Subpart GG and NESHAP Subpart YYYYY. AHE is out of compliance NSPS Subpart GG as already stated.

FGDUCTBURNERS-S3: Non-Compliant

Three (3) 20 MM Btu/hr duct burners associated with three (3) EGT-Typhoon turbines used for heat recovery enhancement to operate a common steam turbine generator. These duct burners are devices that combust landfill gas that are placed in the exhaust duct from their associated turbine to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter the heat recovery steam generating systems.

-Emission Limits

0.3 lbs SO/hr, 1.5 tpy for each duct burner. October 2018 stack test showed exceedances of all SO2 limits by several hundred %. AHE was previously cited for not meeting these emission limits.

-Monitoring/Recordkeeping

Requires the amount of landfill gas combusted daily. AHE is in compliance with this requirement.

-Other Requirement(s)

Requires compliance with NSPS Dc. AHE is in compliance with this section as the only substantive requirement is to record the amount of landfill gas combusted daily.

AQD Consent Order No. 16-2015: Compliant

This Consent Order requires compliance with CO emission limits for the turbines and to conduct an additional round of emission testing by for CO, SO2, NOx, VOC's and HCL for all the turbines when the duct burners were on and off.

Paragraph 9.B.2 reads as follows:

"In addition to emission testing required by the Company's ROP, between June 1, 2015 and June 1, 2018, the Company shall complete emission testing for carbon monoxide, sulfur dioxide, nitrogen oxide, volatile organic compounds, and hydrogen chloride from FGTURBINES-S3 and FGDUCTBUNERS-S3 in accordance with methods and procedures approved by the AQD Technical Programs Unit Supervisor. The testing shall occur during two operating conditions when the duct burner is in operation and when the duct burner is not in operation."

Paragraph 13 reads as follows:

“...On and after the effective date of this Consent Order, if the Company fails to comply with paragraph 9.B.1, 9.B.2, 9.B.3, or 9.B.4 of this Consent Order, the Company is subject to a stipulated fine of up to \$5,000.00 per violation. The amount of the stipulated fines imposed pursuant to this paragraph shall be within the desecration of the MDEQ.”

This testing was to be completed by no later than June 1, 2018. Due to problems during the test related to shutting off 25 high sulfur content gas wells, a valid test was not conducted till October 2018. This Violation was noted in AQD VN dated August 30, 2018 and again on 2/01/2019 and an AQD Enforcement Stip Demand was made on April 18, 2019 to AHE for \$5000. Payment of the fine resolved the violation.

Emergency generator:

A 250 HP diesel fired emergency generator was not inspected during this visit. It is used to power office lighting and maintenance tools in the event of a power failure. Attachment (XX) is the information submitted by AHE to demonstrate compliance with the RICE MACT and/or NSPS IIII.

10,000-gallon diesel storage tank: Non-Compliant

The use of diesel fuel from this tank into the turbines is not covered by any existing PTI and is therefore an unpermitted process and violation of Rule 201-No permit to install. (Note: This requirement was previously cited. Current in-house PTI application addresses this issue.) AHE response attachments outlines the monthly amount of low sulfur diesel fuel that was used in 2019. About 3963 gallons were used in the turbines.

EUCRSCOLDCLEANERS-S3: Not evaluated.

EUGRSRULE 290-S3: Not evaluated. AHE has previously indicated that there are currently no emission units at the facility that fall under Rule 290 applicability.

Wellfield-Operator: Non-Compliant.

Refer to VN issued on October 22, 2019, March 14, 2019 and associated inspection reports. AHE remains out of compliance as an operator of the well field.

Post-Inspection Meeting

I held a brief post-inspection meeting with CW. I indicated that I had concerns about the discrepancy of rated capacity of Turbines 1 to 3 and would be seeking more documentation to sort it out. I further indicated that I would be reviewing the records that AHE would be forwarding me for compliance. I also indicated that a VN would be forthcoming that documented all current unresolved violations that were outlined in previous inspections that have yet to be addressed. I thanked CW for his time and cooperation, and I departed the facility at approximately 12:10 pm. Later in the afternoon, I sent the following request to Suparna Chakladar for documents:

DEQ-AQD Records Request: Fortistar Inspection November 14, 2019

RESPONSE DUE BY COB NOVEMBER 26<sup>th</sup>.

- 1) Copy of latest Preventative Maintenance Plan-for EUTREATMENTSYS-S3.
- 2) Copy of latest Start-up, Shutdown & Maintenance Plan (SSM) for EUTREATMENTSYS-S3.
- 3) For 2019 (i.e. through Oct 31<sup>st</sup>), all records of all preventative maintenance performed in accordance with the preventative maintenance plan for EUTREATMENTSYS-S3 including what was performed on the main gas compressors, air to air heat exchanger and 10 micro coalescing filters.
- 4) For 2019, total daily landfill gas flow that is burned from the landfill to each turbine.
- 5) For 2019, total daily landfill gas flow rate that is burned from the landfill to FGDUCTBURNERS-S3.

- 6) For 2019, BTU content of landfill gas for each calendar week.
- 7) For 2019, monthly calculated nitrogen oxides rates for each of the four gas turbines and three duct burners.
- 8) For 2019, monthly diesel usage records. (Separate out diesel used for emergency generator if possible.)
- 9) For 2019, daily averaged landfill suction draw in H2O generated by the compressors.
- 10) For 2019, all required records for CI diesel fired emergency generator per NSPS IIII/RICE MACT and for any other CI engine at the facility that the NSPS/MACT applies to.
- 11) For 2019, all H2S gas analysis results of the landfill gas not otherwise already provided to EGLE.
- 12) For 2019, monthly amounts of condensate in gallons trucked off site for disposal.
- 13) Number of venting events in 2019 for each of the 4 main compressors.
- 14) Complete description of sewer gas venting system in the treatment building which ties in the compressor vent(s) that discharge out the roof.
- 15) Definitive documentation for Turbines 1, 2 and 3 that show rating capacity of currently installed turbines.

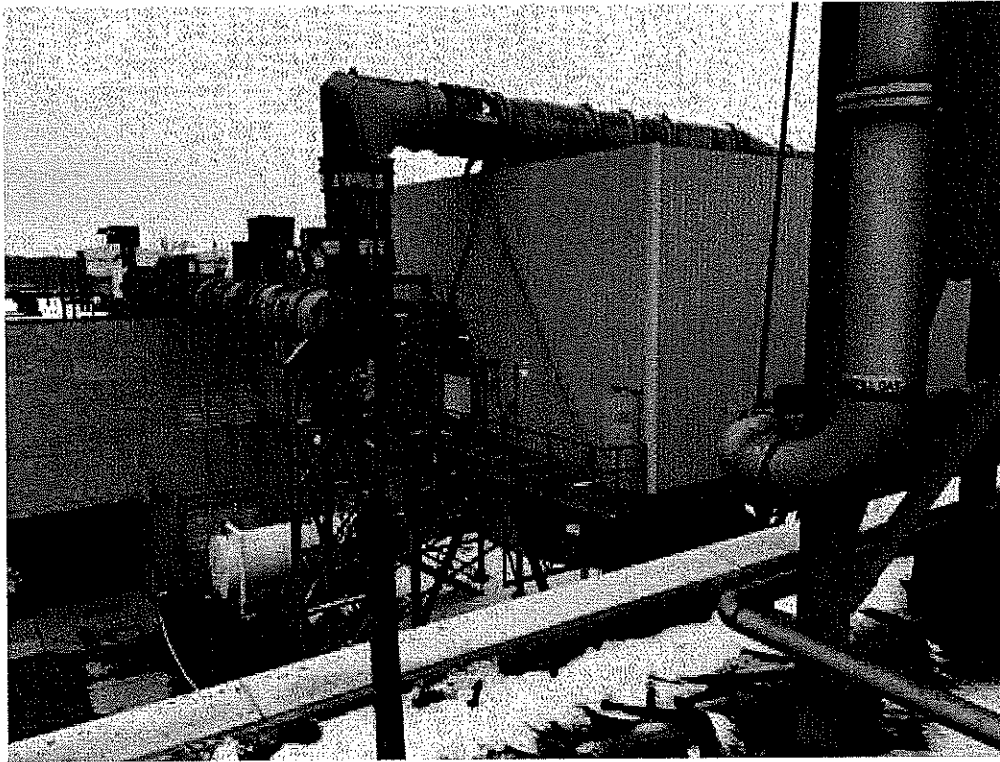
NOTE: Response was received on November 27, 2019. Attachments from that submittal are included as part of this report.

**Compliance Summary**

The Company remains out of compliance. The following table list violations that have yet to be resolved. AHE will be sent a Violation Notice (VN). They will have 21 days to respond.

Process Description	Rule/Permit	Condition Violated	Comments
FGTURBINES-S3 consisting of EUTURBINE1-S3, EUTURBINE2-S3, EUTURBINE3-S3.	ROP, FGTURBINES-S3,	Condition I. S02 limits.	October 16-18, 2018 stack testing results indicated that SO2 pounds per hour (lbs/hr) exceeded permit limits of 2.9 lbs/hr and 12.5 tons per year (tpy) limit for each turbine. VN issued 2/1/19 for this violation has yet to be resolved.
FGDUCTBURNERS-S3 consisting of EUDUCTBURNER1-S3, EUDUCTBURNER2-S3, EUDUCTBURNER3-S3.	ROP, FGDUCTBURNERS-S3,	Condition I.	October 16-18, 2018 stack testing results indicated that SO2 lbs/hr exceeded permit limits of 0.3 lbs/hr and 1.5 tpy limit for each duct burner. VN issued 2/1/19 for this violation has yet to be resolved.
EUTURBINE4-S3	ROP, EUTURBINE4-S3	Condition I. 6. S02 limit.	October 16-18, 2018 stack testing results indicated that SO2 lb /MW hr exceeded permit limit of 0.9 lb/MW hr. VN issued 2/1/19 for this violation has yet to be resolved.
FGTURBINES-S3, FGDUCTBURNERS-S3 and EUTURBINE4-S3.	Part 18. Prevention of Significant Deterioration (PSD) of Air Quality. 40 CFR 52.21 and R 336.2802 (Rule 1802), R 336.1201 (Rule 201).		Unpermitted PSD major modification that has resulted in a significant emissions increase and a significant net emissions increase (Rule 1802(4)(a)) of SO2 greater than 40 tons per year. This also triggers a requirement for a Permit to Install (PTI) permit. VN issued 2/1/19 for this violation has yet to be resolved.
FGTURBINES-S3,	Rule 201-No PTI. Use of diesel fuel		3 turbines are using diesel fuel as an

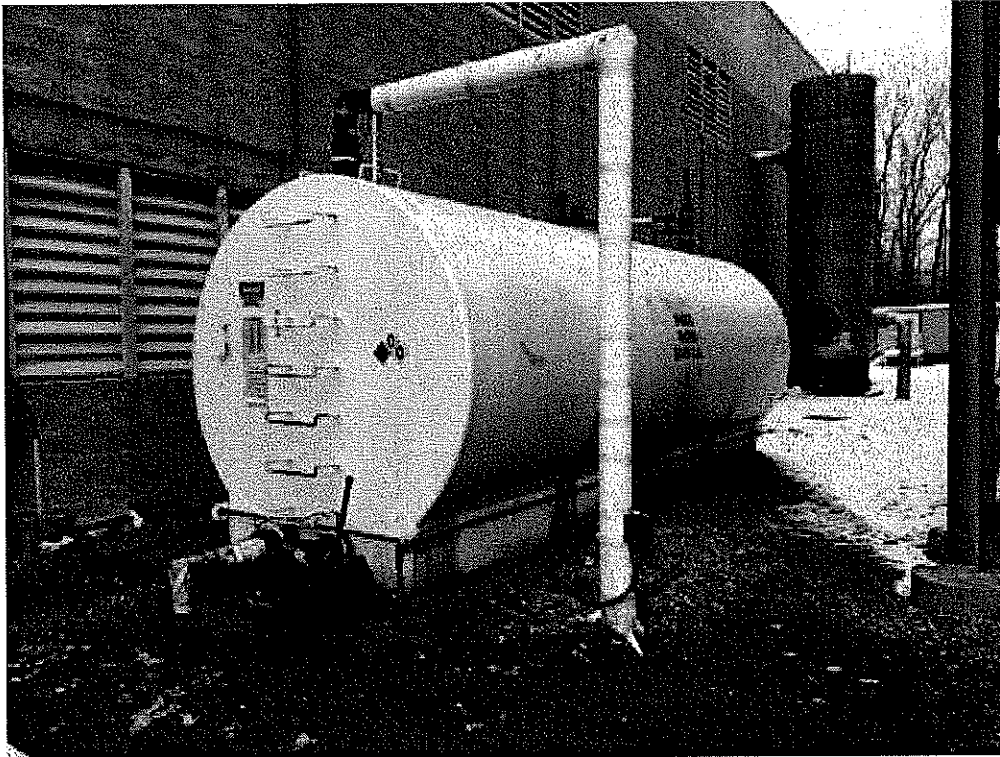
<p>FGDUCTBURNERS-S3, 10,000-gallon underground diesel storage tank and 3 bypass stacks using during start-up and when heat steam recovery systems are undergoing maintenance.</p>	<p>is a change in the method of operation from how these turbines were originally permitted, therefore, the usage of diesel fuel would require a modification to the existing permit.</p>	<p>alternate fuel to landfill gas during start-up. This represents reconstructing an emission unit and a meaningful change in the quality and nature of emissions compared to the original permit application for these turbines which failed to describe this process. VN issued 2/1/19 for this violation has yet to be resolved.</p>
<p>FGTURBINES-S3</p>	<p>ROP, FGTURBINES-S3 Condition VII.1., 40 CFR, Part 60, Subpart GG Standards of Performance for Stationary Gas Turbines.</p>	<p>Diesel fuel is being used to start-up the 3 turbines. AHE failed to notify AQD that diesel fuel is being used as an alternate fuel as required by Subpart GG. Furthermore, AHE has been operating under a waiver issued by U.S. EPA on January 19, 1996 that waived the requirement for daily fuel sampling for sulfur and nitrogen as long as only landfill gas was being fired in the turbines. VN issued 2/1/19 for this violation has yet to be resolved.</p>
<p>EUTREATMENTSYS-S3</p>	<p>ROP, EUTREATMENTSYS-S3, Condition III.2., 40 CFR Part 60, Subpart WWW - Standards of Performance for Municipal Solid Waste Landfills (WWW)</p>	<p>Treatment system contains 4 stacks; one each associated with the 4 main compressors plus 2 pressure relief valves associated with the auxiliary compressors with one combined stack that vents to atmosphere generally whenever one of the compressors is turned off to vent residual landfill gas or if a pressure relief set point is triggered with the auxiliary compressors. These vents are not controlled by a flare or other control device as required per WWW 60.752(b)(2)(iii)(C). VN issued 2/1/19 for compressor vents has yet to be resolved.</p>
<p>Operator of Gas Collection Control System (GCCS)</p>	<p>WWW 40 CFR 60.759; NESHAP 40 CFR 63.6(e)(1)(i)</p>	<p>GCCS wells impaired due to high liquid levels or otherwise compromised. VNs issued for this violation on 3/14/19 and again on 10/22/19 have yet to be resolved.</p>



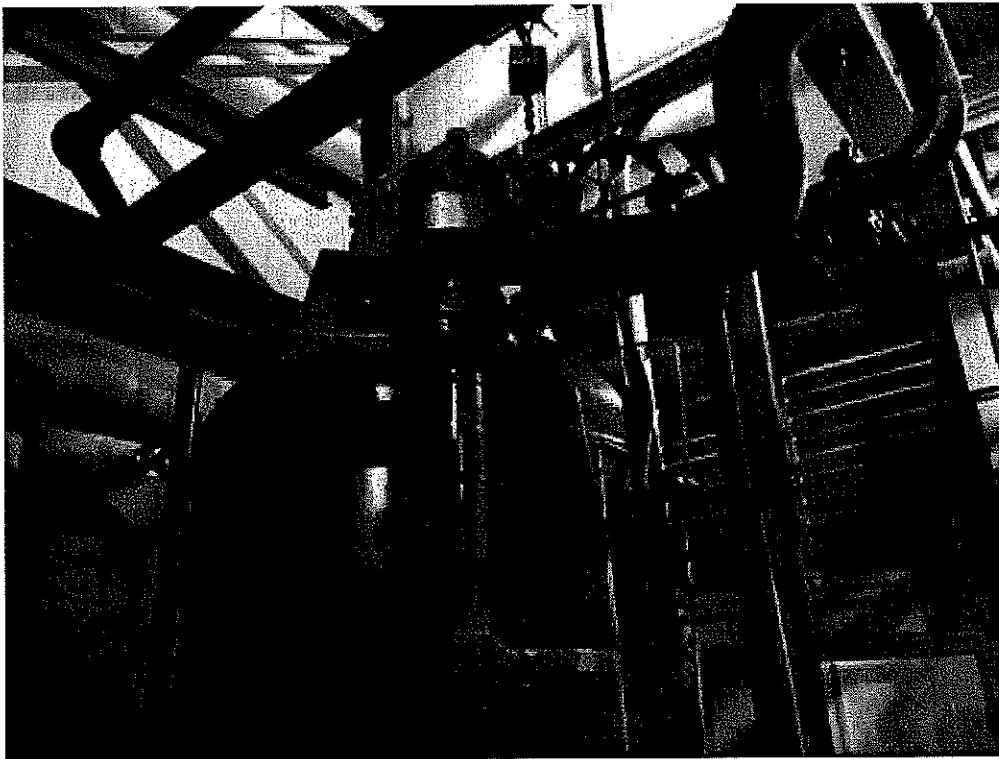
**Image 1(Compressor Vent)** : Lower center of photo; One of the 4 compressor vent stacks.



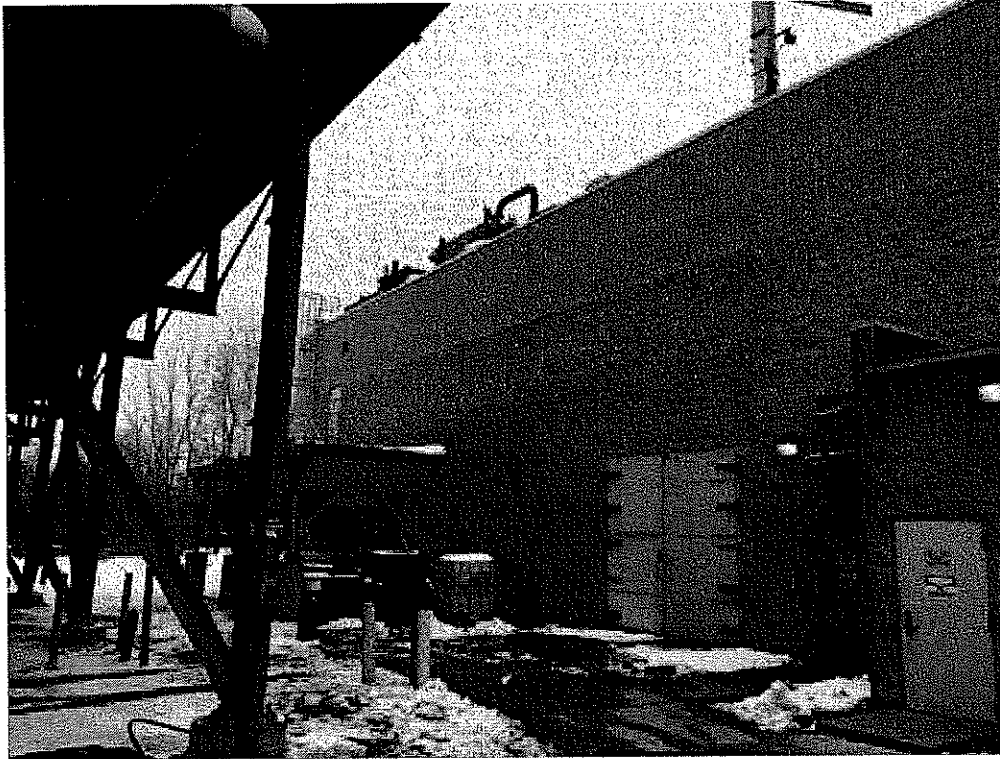
**Image 2(Compressor Vent)** : One of four compressor vent stacks.



**Image 3(Condensate Tank) :** Condensate Tank



**Image 4(Duct Burner Relief) :** One of 2 relief valves associated with the 2 smaller compressors.

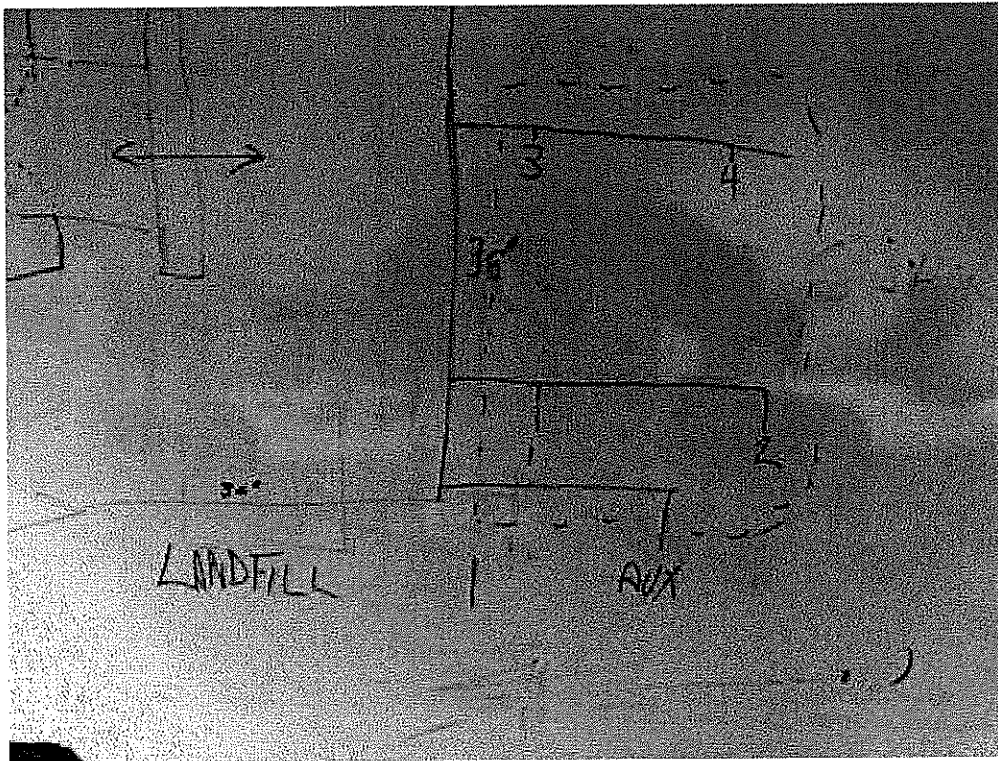


**Image 5(Duct Burner Stack)** : Far left stack on roof is the combined stack from 2 duct burner relief valves.



**Image 6(3 Flares)** : 3 flares



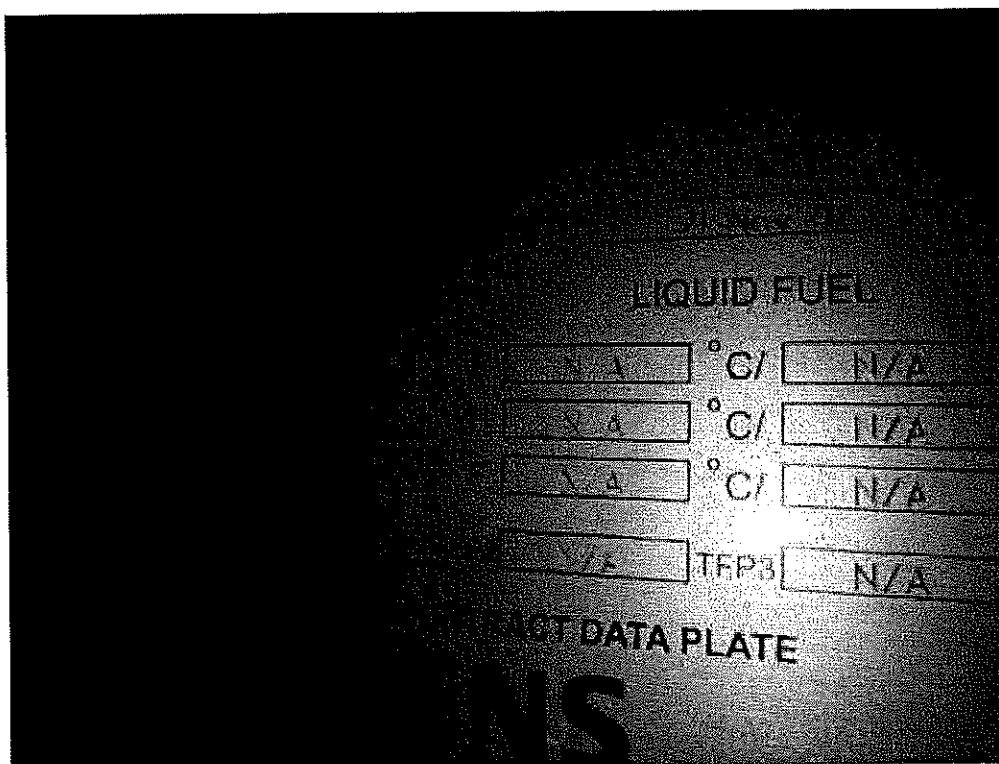


**Image 7(Gas line diagram) :** Diagram showing the 3 different gas lines that enter the treatment building an another line that goes to the flares. 1 line provides gas to the duct burners, a second line to Compressor 1 and 2 and a 3rd line to Compressor's 3 and 4.

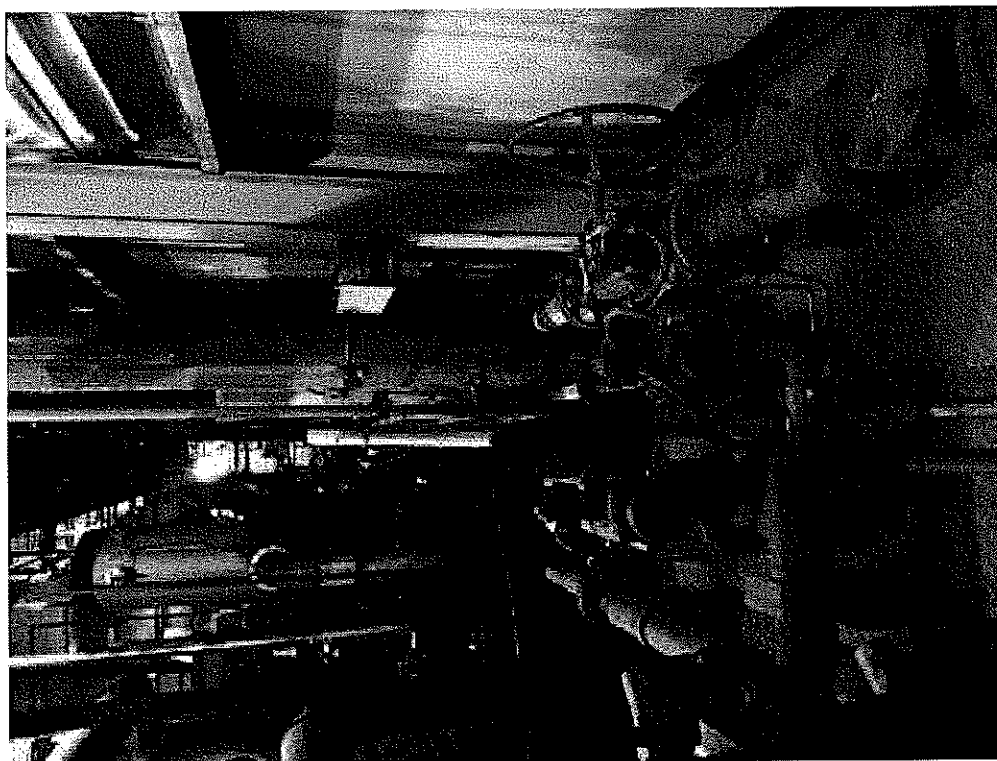




Image 9(Turbine 2 Faceplate) : Turbine 2 Faceplate. No capacity given.



**Image 10(Turbine 3 Faceplate)** : Turbine 3 Faceplate. 4.55 MWe.



**Image 11(Valve Skid-Compresso)** : Valve Skid plate for a Compressor with vent stack in background.

NAME M. Kovalchuk

DATE 12/10/19

SUPERVISOR 