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

K324966553

FACILITY: Michigan State University		**SRN / ID:** K3249
LOCATION: 426 Auditorium Rd., EAST LANSING		**DISTRICT:** Lansing
CITY: EAST LANSING		**COUNTY:** INGHAM
CONTACT: Mary Lindsey , Environmental Compliance Officer		**ACTIVITY DATE:** 03/13/2023
STAFF: Daniel McGeen	**COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Inspection conducted on 3/13, 3/22, and 3/24/2023, and records reviewed as Partial Compliance Evaluation (PCE) activities, part of a Full Compliance Evaluation.		
RESOLVED COMPLAINTS:		

On 3/13, 3/22, and 3/24/2023, the Michigan Department of Environment, Great Lakes, and Energy (EGLE), formerly the Department of Environmental Quality, Air Quality Division (AQD), conducted an inspection of Michigan State University (MSU), State Registration Number (SRN) K3249. This inspection, spread over 3 days, was a Partial Compliance Evaluation (PCE) activity, conducted as part of a Full Compliance Evaluation (FCE). A FCE is required every two years for a major source.

Environmental contacts:

Section 1- Campus Wide Emission Units (other than those located at T.B. Simon)

- Mary Lindsey, Environmental Compliance Officer, MSU Environmental Health & Safety; 517-432-5542, lindseym@ehs.msu.edu
- Louis Faivor, Farm Assistant Manager and Anaerobic Digester Operator; 517-648-0930 faivor@msu.edu

Section 2- T.B. Simon Power Plant

- Sherri Jett, IPF - Director of Utilities; 517-355-3314; jettsher@msu.edu
- Amanda Groll, Utilities and Environmental Analyst; 517-884-7120; pulidoam@msu.edu
- Rick Johnson, P.E. Electrical Engineer; 517-884-7108; rjohnson@ipf.msu.edu

MSU's former MBI building, SRN N1162:

- Mary Lindsey, Environmental Compliance Officer, MSU Environmental Health & Safety; 517-432-5542, lindseym@ehs.msu.edu

MSU guest attendee on inspection:

- Robert Goodwin, GISP, Sr. Geospatial Analyst, RS&GIS; 517-432-0879; goodwinr@msu.edu

EGLE AQD Personnel:

- Dan McGeen, inspector; 517-648-7547; mcgeend@michigan.gov
- David Rauch, inspector; 517-216-0423; rauchd2@michigan.gov

Facility Description:

Michigan State University is a public research university, with a Renewable Operating Permit (ROP). The primary emission units are three pathological waste incinerators and the T.B. Simon Power Plant which is a co-generating facility.

Regulatory overview:

At the time of the 3 inspection dates, the following permits to install permits were active:

- PTI No. 175-11A, for modifications to FG-WSF at MSU.
- PTI No. 139-18, approved on 5/22/2019
- MI-ROP-K3249-2016a, revised on 3/7/2017
- PTI No. 75-14C, for removal of permitted coal-fired conditions from the TB Simon Power Plant PTI. This does not appear to have been incorporated into the ROP as a minor modification, as far as I can determine.
- PTI No. 99-17, for the new ethylene oxide sterilization unit, EU-ETO2.
- PTI No. 68-17A, for a revision to increase exhaust stack diameter for the EU-FLNRINC.
- PTI No. 127-07, for the anhydrous ammonia tank at the former MBI site, SRN N1162, was voided on 3/21/2023, as the tank had been removed from the site. It will not be rolled into the ROP.

The ROP is divided into 2 sections due to the size of the permit and the number of emission units. Section 1 of the permit contains units throughout campus and Section 2 of the permit contains units associated with the campus power plant.

Section 1 of the permit includes the 3 pathological waste incinerators and the many smaller emission units are associated with the MSU campus which includes 2 paint spray booths, 1 ethylene oxide sterilizer, 5 parts washers, 1 bio digester with flare and certified reciprocating engine, 3 engine test cells, 57 reciprocating engines associated with generators throughout the campus, and 63 boilers spread throughout the campus.

The former MBI laboratory facility, SRN N1162, has been owned by MSU since 4/1/2016. Any active permits to install will be rolled into the ROP which is currently undergoing renewal.

Section 2 of the ROP includes the entire T.B. Simon Power Plant. It is a co-generation facility, meaning that steam is generated for building heat and cooling, but can also be used to generate electricity which is only distributed to campus owned buildings. There are 2 boilers (EU-UNIT1 and EU-UNIT2) that have changed from firing coal, bio-fuel, and natural gas, to only firing natural gas, 1 boiler (EU-UNIT3) that has in the past and now still only fires natural gas, and 1 boiler (EU-UNIT4) that was permitted to fire a coal and natural gas which is now natural gas only. The plant also has 1 gas fired turbine generator (EU-UNIT6) and 1 heat recovery steam generator (EU-UNIT5).

Boiler EU-UNIT4 has fabric filters for particulate removal due to the use of sand on the boiler bed to assist in heat retention and a selective non-catalytic reduction system (SNCR) which is used during ozone season. EU-UNIT1, EU-UNIT2, and EU-UNIT3 have low NOx burners for nitrogen oxides control.

EUSTMBOILER, also known as Boiler 7, has recently started operating at T.B. Simon, under Permit to Install (PTI) No. 139-18.

Federal requirements:

There are numerous federal regulations which are already incorporated into the ROP:

- MSU is subject to 40 CFR Part 70, because the Potential to Emit (PTE) both nitrogen oxides (NOx) and sulfur dioxides (SO2) exceeds 100 tons per year (TPY), making it a major source for criteria air pollutants, the PTE to emit hydrochloric acid (HCl) is equal to or more than 10 TPY, making it a major source for hazardous air pollutants (HAPS), and the potential to emit greenhouse gases (GHG) is 100,000 TPY or more calculated as CO2e and 100 TPY or more on a mass basis.
- EU-UNIT1, EU-UNIT2, EU-UNIT3, and EU-UNIT4 are subject to the NOx SIP Call, during the ozone season May 1 through September 30. EU-UNIT4 is subject to the federal Acid Rain Program, promulgated in 40 CFR Part 72.
- EU-UNIT4 was once subject to the federal Compliance Assurance Monitoring (CAM) rule under 40 CFR Part 64, but after the switch from coal firing to natural gas as fuel, it was no longer subject. EU-UNIT1 EU-UNIT2, EU-UNIT3, EU-UNIT4, EU-UNIT5, and EU-UNIT6 were exempt from CAM requirements for NOx, at the time of the current ROP renewal. Further details on the applicable CAM exemptions are discussed in the 1/19/2017 amended ROP Staff Activity Report.

- EU-UNIT1, EU-UNIT2, EU-UNIT3, EU-UNIT4, and FG-UNITS5/6 were subject to review under Prevention of Significant Deterioration regulations of Part 18, Prevention of Significant Deterioration of Air Quality of Act 451 of 1994, the Michigan Natural Resources and Environmental Protection Act (NREPA). This is because at the time of New Source Review (NSR) permitting, the PTE for both NOx and SO2 was greater than 250 TPY. PSD-required BACT requirements for GHG are included in the ROP

Emission units at MSU are subject to the following federal regulations, as well:

40 CFR Part 60, New Source Performance Standards (NSPS):

- Subpart D - *Standards of Performance for Fossil-Fuel-Fired Steam Generators.*
- Subpart Db - *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units.*
- Subpart Dc - *Standards of Performance for* Small *Industrial-Commercial-Institutional Steam Generating Units.*
- Subpart GG - *Standards of Performance for Stationary Gas Turbines.*
- Subpart JJJJ - *Standards of Performance for Stationary Spark ignition Internal Combustion Engines.*

40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants (NESHAP):

- Subpart YYYY - *National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines*
- *Subpart ZZZZ - National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, also known as the RICE MACT.
- Subpart JJJJJJ - *National Emission Standard for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.*

40 CFR Part 75 applies, requiring continuous emission monitoring of Boilers 1-7.

MSU is currently NOT subject to the following NSPS standards:

- 40 CFR Part 60, Subpart Ec, *Standards of Performance for Hospital/Medical/Infectious Waste (HMW) Incinerators*. It is not subject for EU-FLNRINC, due to a permit restriction of less than 10% HMW allowed by the ROP. It is not subject to this for EU-DCPAHINC, due to the exemptions under Section 60.50c (b) and (c). It is not subject to this for EU-CREMATORY, due to the exemption under Section 60.50c (b).
- 40 CFR Part 60, Subpart FFFF - *Emission Guidelines and Compliance Times for Other Solid Waste Incineration (OSWI) Units That Commenced Construction On or Before December 9, 2004*.

MSU is currently NOT subject to the following NESHAP standards:

- 40 CFR Part 63, Subpart PPPPP, *National Emission Standards for Hazardous Air Pollutants for Engine Test Cells/Stands*, because the testing is for research and teaching activities only, and not for commercial testing, per Section 63.9290(d)(3). (Also, EUTESTSTAND is not subject to 40 CFR Part 63, Subpart ZZZZ because the test stand is for mobile engines.)
- 40 CFR Part 63, Subpart UUUUU - National Emission Standards for Hazardous Air Pollutants for Coal and Oil Fired Electric Utility Steam Generating Units for EU-UNIT1 and EU-UNIT2, because the output capability of each unit is less than 25 Megawatts (MW) and the electricity is not for sale per definition of electrical generating unit (EGU) in 40 CFR 63.10042. It is not subject for EU-UINIT3 and EU-UNIT4 because the electricity is not for sale per definition of EGU in 40 CFR 63.10042.
- 40 CFR Part 63, Subpart WWWWW, *National Emission Standards for Hospital Ethylene Oxide Sterilizers*, for FG-STERILIZERS (EU-ETO), because MSU is not a hospital and is not an area source of HAP emissions per Section 63.10382(a).

Fee status:

MSU is considered a Category B fee-subject source. Category B: facilities are "major" under Title III of the Clean Air Act (have the potential to emit 100 tons or more per year of any pollutant) and are not

Electric Providers, with the exception of municipally-owned electric generators with emissions over 646 tons per year.

MSU submits an annual air emission report to the Michigan Air Emissions Reporting System (MAERS) each year.

Location:

MSU has a vast campus, primarily in East Lansing, Ingham County. The MSU environmental offices are currently located at 4000 Collins Road, Lansing, 48910. The TB Simon Power Plant is located at 354 Service Road, East Lansing, MI 48824. The former Michigan Biotechnology Institute (MBI) facility, now owned by MSU, is located at 3900 Collins Road, Lansing, 48910.

Safety apparel required:

For Section 1 of the ROP (the MSU Campus), requirements for safety apparel are safety glasses with side shields, and hearing protection. For Section 2 of the ROP (T.B. Simon Power Plant), requirements are safety glasses with side shields, hard hat, steel toed boots, hearing protection as well as double hearing protection for certain areas, such as around the 3 RICE units installed under PTI 139-18 at the new RICE plant by the T.B. Simon Power Plant.

Recent stack testing:

Results of the stack tests below all showed compliance with regulatory limits.

- 3/28-29/2023: PEMS RATA testing of EU-STMBOILER, aka boiler #7, observed by Trevor Drost, AQD TPU.
- 1/31-2/2/2023: Stack testing of EU-STEAMBOILER, aka boiler #7, but extreme cold temperatures caused issues with the consultant's equipment. CO testing was done on 2/1, with remaining pollutants done on 2/2. Observed by AQD TPU and Lansing District Office (LDO) on 1/31, and by TPU only on 2/1 and 2/2.
- 10/20/2022: Stack test of EU-DIENGINE at South Campus Dairy Farm, for digester gas-fired generator. Tests were witnessed by the AQD LDO. The results of the tests were within the required limits for CO, NOx, and VOC.
- 10/19/2022: Stack testing of 4-Stroke lean burn RICE from FGENGINES at T.B. Simon Power Plant. Observed by AQD LDO.
- 7/28/-292022: Stack test of EUDCPAHINC completed. results were compliant at 0.05 gr/dscf at 7% excess O2, vs. a limit of 0.10 gr/dscf at 7% excess O2, and at 1.32 lbs/hr vs. 1.71 lbs/hr. Observed by AQD TPU and LDO (LDO was on 7/28 only.)
- 6/15/2022: Stack test of EUDCPAHINC, to be renamed EUVDLINC in current ROP renewal, which was cancelled in first run due to incinerator computer control system reportedly not communicating with the incinerator. Observed by AQD TPU and LDO.
- 6/14/2022: Particulate matter (PM) stack testing of the Farm Lane Road incinerator, EUFLRINC. Results were compliant, at 0.06 lbs/1000 lbs exhaust gas, vs. a limit of 0.20 lbs/1000 lbs exhaust gasses. Observed by AQD TPU and LDO.
- 3/9/2022: Stack test of EUENGINE1, also known as Engine #7, required by 40 CFR Part 60, Subpart JJJJ, and PTI No. 139-18. Observed by AQD LDO.

RATAs:

Relative Accuracy Test Audits (RATAs) are conducted in February of each year at MSU.

Recent permitting actions:

- PTI 175-11A was approved, for changes to the WSF.
- PTI application No. 139-18 was approved on 5/22/2019. This PTI application was for the installation and operation of 4 natural gas-fired reciprocating internal combustion engines (RICE), 2 natural gas-fired fuel heaters, a medium-pressure natural gas-fired steam boiler with diesel fuel (no. 2 fuel oil) back up capability, and a diesel fuel storage tank. It underwent public comment, as required. Not all the emission units were installed, ultimately.
- The most recent ROP, MI-ROP-K3249-2016 underwent minor modification, and became MI-ROP-K3249-2016a.
- PTI 75-14C: This PTI application was submitted with the intent of removing all coal references for Unit-4; it was issued on 3/16/17. A ROP Minor Modification has been submitted to incorporate PTI 75-14C into the ROP as of 4/14/17.
- MI-ROP-K3249-2016 was issued on 10/21/16.
- PTI 95-12A was issued on 8/1/16 for an increase in SO2 emissions from the bio digester flare. The PTI was not incorporated into the ROP at the time due to how far along the review process the ROP was. On 3/7/17 PTI 95-12A was added to the ROP through a minor modification application.
- PTI 127-07: This PTI was originally under separate ownership by MBI International SRN: N1162 and is located at 3900 Collins Road. On 4/1/16, MSU acquired the building and assumed control of PTI 127-07 which is a general permit for an anhydrous ammonia tank.
-

Violations noted in most recent prior inspection

None.

Previous Inspections:

- 3/22 and 6/28/2021, and 7/24/2019 - D. McGeen documented in a single activity report. No instances of noncompliance were found.
- 4/172017 and 4/18/2017- N. Hude, over 2 days, documented in a single activity report.

Recent Complaints (within 6 years):

None.

Arrival:

AQD was represented by inspector Dan McGeen (on 3 days) and inspector David Rauch (on the last day). Accompanying AQD as a guest on the inspection on all 3 days was MSU's Robert Goodwin, GISP, Sr. Geospatial Analyst, RS&GIS. He had recently been working with AQD's Assistant Division Director, Dr. Jay Olageur, on a project involving GIS and how it might be used to help AQD perform a number of important job functions. He had expressed interest in observing the inspection process, to better understand how this job function is done.

This was not an unannounced inspection. Because of the large amount of time needed for this inspection, and the need to have an MSU environmental contact available on more than 1 day, it is typical to pre-arrange this inspection in advance. Dates for the inspection were as follows:

- Day 1 of the inspection was on 3/13/2023, focusing on the T.B. Simon Power Plant, which is covered by Section 2 of the ROP.
- Day 2 of the inspection was 3/22/2023. The focus was on th MSU Campus, Section 1 of the ROP, including EU-DIENGINE, EU-ENCLOSEDFLARE, FG-COLDCLEANERS, FG-RULE287, and the MBI building boilers and emergency generators.

- Day 3 of the inspection was 3/24/2023. The focus was on the new RICE engines and EU-STMBOILER under PTI 139-18 adjacent to the T.B. Simon Power Plant, EU-ETO2 at the Veterinary Large Animal Clinic, and the 3 incinerators, EU-FLNRINC, EU-DCPAHINC, and EU-CREMATORY.

Because of the vast size of the MSU campus, not every single emission unit in the ROP could be observed. The individual emission units at the TB Simon Power Plant were inspected, but for the dozens of on-campus generators and boilers, which are found in Section 1 of the ROP, representative examples were checked for compliance.

NOTE: This inspection activity report combines all 3 days into a single report. It follows the order of the emission units in the ROP, rather than chronological order in which the emission units were observed. After the ROP, this inspection activity report documents compliance with the various PTIs for MSU. It also covers exempt boilers and generators at the former MBI building.

MSU ROP, SECTION 1 EMISSION UNITS AND FLEXIBLE GROUPS:

EU-FLNRINC, on 3/24/2023:

EMISSION UNIT DESCRIPTION: Consumat Pathological waste incinerator (Farm Lane Road Incinerator that burns 10% or less medical/infectious waste low-level nuclear waste, and low volumes of non-hazardous pharmaceutical waste. Fuel type: natural gas. Burn rate: 1000 lbs/hour. PTI-28-12A.

POLLUTION CONTROL EQUIPMENT: direct flame afterburner.

The Farm Lane Incinerator is a Consumat Pathological natural gas waste incinerator that burns 10% or less medical/infectious waste low-level nuclear waste, and low volumes of non-hazardous pharmaceutical waste. It is located on the southwest side of T.B. Simon in between the rail road tracks on what is technically called Storage Road.

During a recent internal inspection, it was found that the data plate on the device only rated it as a maximum of 825 lbs/hr; thus a PTI amendment was sent in and PTI 68-17 was issued on 5/3/17 with a change from 1,000 lbs/hr to 825 bs/hr. PTI No. 68-17A was subsequently issued on 8/2/2017, to change the stack diameter from 40 to 46 inches maximum. This change was completed after the issuance date of the current ROP, so the ROP contains the outdated EMISSION UNIT DESCRIPTION for EU_FLRINC having a 1,000 lbs/hr burn rate. weight. It also contains the outdated maximum exhaust stack diameter of 40 inches. The changes to 825 lbs/hr and 46 inches will be incorporated into the ROP during the next ROP renewal.

The low level radioactive waste materials incinerated here are reported to be at background levels. It is my understanding that the material is incinerated to reduce the volume that must be disposed of as low-level radioactive waste.

On 6/14/2022, EU-FLNRINC underwent particulate stack testing, observed by AQD. Results were as follows:

- 0.06 lbs/1000 lbs exhaust gasses corrected to 50% excess air, below the limit of 0.20 lbs/1000 lbs exhaust gasses corrected to 50% excess air.

On 3/24/2023, EU-FLRIINC was not operating, at the time. AQD met with the operator, Mr. Tom Anderson.

- Opacity: None.
- Odors: None
- Weather conditions: Mostly cloudy and 36 degrees F, with winds out of the ENE

The unit is equipped with a circular chart recorder for both the primary and secondary chamber temperatures. The unit has 4 burners for the primary chamber (2 on each side), and 1 for the secondary chamber.

Set Points (SP) and Process Values (PV) for the primary and secondary chambers were as follows:

- Lower (primary) chamber SP, degrees F: 1600
- Lower (primary) chamber PV, degrees F: : 67 (building temperature)
- Upper (secondary) chamber/afterburner SP, degrees F: 1825
- Upper (secondary) chamber/afterburner PV, degrees F: 68 (building temperature)

AQD's D. Rauch and D. McGeen examined the incinerator, and were able to see new refractory that had recetly been installed in the unit.

EU-FLNRINC ROP compliance checklist from 3/24/2023:

ROP Special Condition	Requirement	Comments	Complies?
EU-FLNRINC, SC I.1	Particulate matter (PM) limit: 0.20 Lbs/1000 lbs of exhaust gasses corrected to 50% excess air.	PM stack test results from 6/14/2022 indicated compliance, at 0.06 lbs/1000 lbs exhaust gasses corrected to 50% excess air.	Yes
EU-FLNRINC, SC II.1	Shall not burn polyvinyl chloride (PVC) plastics in EU-FLNRINC	AQD was assured PVC plastics are not burned.	Yes
EU-FLNRINC, SC II.2	Shall not burn chemotherapeutic waste in EU-FLNRINC	MSU has indicated they do not incinerate chemotherapeutic waste, and this is accomplished through training of all the MSU staff who would be sending materials to the EU-FLNRINC.	Yes
EU-FLNRINC, SC II.3	The permittee shall burn only pharmaceutical waste that is deemed non-hazardous in EU-FLNRINC.	AQD was advised they do not incinerate any hazardous pharmaceutical waste, accomplished through training of all the MSU staff who would be sending materials to EU-FLNRINC. It was stated that only MSU pharmaceutical waste is burned here except for certain drugs that may be	Yes

		brought to them by MSU's onsite police department.	
EU-FLNRINC, SC II.4	In any combination of waste, the permittee shall not burn less than 90% Pathological waste by weight to maintain status as a pathological waste incinerator unit. Failure to do so will require compliance with 40 CFR Part 60, Subpart FFFF.	The document 2022 Total Farm Lane categories.xlsx (attached) shows that for 2022, the Farm Lane Road Incinerator burned 96.79% pathological waste, 0.36% medical waste, and 2.86% solid waste. Their pathological waste was above the required minimum of 90%.	Yes
EU-FLNRINC, SC II.5	Shall not burn any waste in EU-FLNRINC other than the following wastes.		Yes
EU-FLNRINC, SC II.5.a	Institutional wastes as defined in 40 CFR 60.3078. Institutional waste means solid waste that is combusted at any institutional facility that generated the waste.	The solid wastes EU-DCPAHINC burns qualify as institutional since they come from MSU.	Yes
I EU-FLNRINC, SC I.5.b	Non-hazardous pharmaceutical wastes as defined in the DEQ Office of Waste Management and Radiological Protection Hazardous Waste Management Rules, R 299.9228(2)(m), Non-hazardous Pharmaceutical Waste means solid waste pharmaceuticals that are not hazardous.	EU-FLNRINC is said to burn non-hazardous pharmaceutical wastes.	Yes
EU-FLNRINC, SC II.5.c	Pathological Waste as defined in 40 CFR 60.51c. Pathological waste is waste material consisting of only human or animal remains, anatomical parts and/or tissue, the bags/containers used to collect and transport the waste material and animal bedding.	EU-FLNRINC burns pathological waste, as indicated in the spreadsheet 2022 Total Farm Lane categories.xslx (attached).	Yes
			Yes

EU-FLNRINC, SC II.5.d	**Medical/Infectious waste - as defined in 40 CFR 60.51c, medical/infectious waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals that is further listed in the above regulation. This waste shall not exceed 10 percent, by weight, in aggregate, of the total waste burned in EU-FLNRINC as measured on a calendar quarter basis. For purposes of this definition, pathological waste, chemotherapeutic waste, and low-level radioactive waste are considered "other" wastes when calculating the percentage of medical/infectious waste combusted.**	**EU-FLNRINC burns medical/infectious waste, as indicated in the spreadsheet 2022 Total Farm Lane categories.xslx (attached).**	
EU-FLNRINC, SC II.6	**The permittee shall not burn more than 10 percent, by weight, of medical/infectious waste as defined in SC II.4 of EU-FLNRINC.**	**The spreadsheet 2022 Total Farm Lane categories.xlsx (attached) shows that for 2022, the Farm Lane Road Incinerator burned 0.36% medical waste.**	**Yes**
EU-FLNRINC, SC II.7	**The permittee may incinerate animal carcasses and paper wastes containing byproduct materials defined in license to the permittee by the U.S. Nuclear Regulatory Commission, in accordance with the conditions of said license and all applicable federal regulations including 10 CFR Part 20**	**AQD was advised that the low-level radioactive waste that is burned is at background levels.**	**Yes**
EU-FLNRINC, SC II.8	**The permittee shall use only natural gas as fuel in EU-FLNRINC**	**EU-FLNRINC only burns natural gas as fuel, AQD has been advised.**	**Yes**
EU-FLNRINC, SC III.1	**Shall not combust waste in EU-FLNRINC unless a minimum temperature of 1750 °F and a minimum retention time of 0.5 second in the afterburner are maintained.**	**AQD reviewed the attached 5/3/2022 circular temperature chart recording provided as an example. During charging, the temperature briefly dropped below the 1750 degrees F minimum. This could be considered a reportable**	**Yes**

		deviation. M. Lindsey addressed AQD's concern in a 5/12/2023 email, stating that she "had the operators raise the temperature to 1875 during the day when any loading may occur, and this seems to have prevented the temperature from dropping below 1750."	
EU-FLNRINC, SC III.2	**The after burner shall be installed, maintained, and operated in a satisfactory manner to control emissions from EU-FLNRINC. A list of operating and maintenance procedures is specified in Appendix 9-1.**	**To the best of AQD's knowledge, the afterburner is being installed, maintained, and operated in a satisfactory manner, as evidence by the circular chart recording of secondary chamber temperature.**	**Yes**
EU-FLNRINC, SC III.3	**Shall not operate EU-FLNRINC unless the temperature setting and indicator light for the afterburner are calibrated in a satisfactory manner. The indicator light will turn on when the afterburner reaches the minimum temperature from SC III.1**	**It is AQD's understanding that a temperature readout is installed with a light that does not illuminate until the minimum required temperature is achieved.**	**Yes**
EU-FLNRINC, SC	**Shall not operate EU-FLNRINC unless the Section 1 Incinerators Malfunction Abatement Plan, or an alternate plan approved by the AQD District Supervisor, is implemented and maintained.**	**An updated MAP was emailed to AQD on 4/5/2023, reflecting the current environmental contacts.**	**Yes**
EU-FLNRINC, SC III.5	**Shall operate EU-FLNRINC as per the Waste Management Plan in Appendix 10-1 or via an alternate plan approved by the AQD District Supervisor.**	**It is AQD's understanding that they are following the existing waste management plan.**	**Yes**
EU-FLNRINC, SC IV.1	**Shall not operate EU-FLNRINC unless the afterburner is installed, maintained, and operated in a satisfactory manner.**	**To AQD's best available knowledge, the afterburner is installed , maintained, and operated in a proper manner.**	**Yes**
			Yes

EU-FLNRINC, SC IV.2	Shall equip and maintain the afterburner of EU-FLNRINC with a thermocouple control system.	It is AQD's understanding that they are doing this.	
EU-FLNRINC, SC IV.3	The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the temperature in the afterburner of EU-FLNRINC on a continuous basis	The secondary chamber temperature is being monitored and recorded on a continuous basis, per the attached circular chart record.	Yes
EU-FLNRINC, SC IV.4	The EU-FLNRINC afterburner temperature shall be interconnected with the primary chamber start relay so that the primary chamber burner will start only after the afterburner minimum temperature (1750 ° F) is reached.	It is AQD's understanding that a system was installed so that the load door cannot be opened until the unit reaches 1800-1825 degrees by design.	Yes
EU-FLNRINC, SC V.1	Visual inspection for abnormal/excessive smoke to be performed at least once a day, every day that the incinerator is operating	It is AQD's understanding that this is being done. See observation form, from 1/24/2022. All readings were 0%, and the average was 0%.	Yes
EU-FLNRINC, SC V.2	The permittee shall measure the opacity using Method 9 (Visual Determination of the Opacity of Emissions from Stationary Sources) upon request of the AQD.	AQD has not requested Method 9 readings, but MSU is doing them regardless, as evidenced by the attached visible emission observation forms, from 1/24/2022. All readings were 0%, and the average was 0%.	Yes
EU-FLNRINC, SC V.3	The permittee shall verify PM emission rates, by testing at owner's expense, in accordance with department requirements within 12 months of this permit renewal issuance, and once every five years thereafter, unless the permittee has submitted to the AQD District Supervisor an acceptable demonstration that the most recent acceptable test remains valid and representative. During performance testing, the permittee shall also determine	PM stack test results from 6/14/2022 indicated compliance, at 0.06 lbs/1000 lbs exhaust gasses corrected to 50% excess air. MSU uses a circular chart recorder to record afterburner temperature, as well as primary chamber temperature.	Yes

	and record the average operating temperature of the afterburner to control the emissions from the EU-FLNRINC		
EU-FLNRINC, SC VI.1	All required calculations shall be completed in a format acceptable to the AQD District Supervisor by the 30th day of the calendar month, for the previous calendar quarter, unless otherwise specified in any monitoring/recordkeeping special condition.	All records received were in an acceptable manner.	Yes
EU-FLNRINC, SC VI.2	The permittee shall monitor and record the temperature in the afterburner of EU-FLNRINC on a continuous basis in a manner and with instrumentation acceptable to the District Supervisor, AQD.	MSU records afterburner temperature as well as primary chamber temperature on a circular chart recorder in a manner and with instrumentation acceptable.	Yes
EU-FLNRINC, SC VI.3	The permittee shall keep, in a satisfactory manner, records on a calendar quarter basis of the description and weight of waste burned in EU-FLNRINC, as required by SC II.4, II.5 and II.6 specifically differentiating between pathological and other wastes.	M. Lindsey provided daily log sheets from 1/24/2022, which documented the waste type which was being burned. The description and weight of the wastes were given, as required. There were 4 separate loads of pathological waste burned that day.	Yes
EU-FLNRINC, SC VI.4	The permittee shall calculate the weight percent of medical/infectious waste burned in EU-FLNRINC, as required by SC II.6.	The document 2022 Total Farm Lane categories.xlsx (attached) shows that for 2022, the Farm Lane Road Incinerator burned 0.36% medical waste.	Yes
EU-FLNRINC, SC VII.1-3	Standard ROP reporting requirements.	MSU complies with this	Yes
EU-FLNRINC, SC VII.4	A complete test plan shall be submitted to the AQD no less than 30 days prior to testing for review. The final plan must be approved by the AQD prior to testing.	The 2022 stack test plan for EU-FLNRINC complied with this. It was approved for testing. EU-FLNRINC was stack tested on	Yes

	Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test.	**6/14/2022, but problems with EU-DCPAHINC delayed that test from 6/15 until 7/28-29/2022. Complete report of the test results for both incinerators was submitted to AQD on 9/6, within 60 days of 7/29/2022.**	
EU-FLNRINC, SC VIII.1	**Exhaust gases shall be discharged unobstructed vertically upwards through a stack with a maximum diameter of 40 inches, and minimum height of 29 ft above ground level.**	**PTI No. 68-17A, issued on 8/2/2017, incorporated a maximum allowed stack diameter of 46 inches, rather than the previous 40. This was done to reflect the actual stack itself.**	**Yes**
EU-FLNRINC, SC IX.1	**NA**	**NA**	**NA**

EU-DCPAHINC, now known as the VDL incinerator, on 3/24/2023:

Emission unit description: ASC design Pathological Waste incinerator located at DCPAH facility on Bennett Rd that burns 5% or less medical/infectious waste. Unit is gas fired with a 1,200 lb/hr capacity at 1,800 F and 1 second retention time in secondary chamber. (PTI 380-00)

POLLUTION CONTROL EQUIPMENT: direct flame afterburner.

In 2022, the EU-DCPAHINC underwent an overhaul for a number of repairs. A stack test had been planned for 6/15/2022, but was rescheduled, because the control panel for the incinerator was not communicating with the unit itself, MSU staff indicated. It subsequently underwent stack testing from 7/28-29/2022.

Particulate stack test results from 7/28-29/2022 were as follows:

- 1.32 lbs/hr, below the limit of 1.71 lbs/hr.
- 0.05 gr/dscf. @ 7% O2, below the limit of 0.10 gr/dscf @ 7% O2

On 3/24/2023, AQD observed the EU-DCPAHINC incinerator, at the Veterinary Diagnostic Laboratory (VDL), formerly known as the Diagnostic Center for Populations and Animal Health, or DCPAH) The incinerator is now known as the (VDL) incinerator, and the name will be updated in the current ROP renewal cycle.

The DCPAH/VDL incinerator is an extremely large unit. AQD has been advised that the unit is the largest pathological waste incinerator in the midwest. It has 6 burners for the primary chamber, and 2 burners for the secondary chamber, or afterburner.

EU-DCPAHINC was running on 3/24/2023, and was almost ready to be charged with a load of sheep heads which had been tested for the disease scrapes. The time was approximately 12:20 PM.

- Opacity: 0%
- Odors detected: none
- Weather conditions: Mostly sunny and 40 degrees F with winds out of the ENE at 10-15 mph

MSU's Tom Anderson was the operator and explained the operations of the unit. He pointed out that the load to be charged was identified on the computer monitor as :

Crapi Sheep 754
MDNR Necropsy cert "1208 S"
1962 lbs

AQD collected operating data as follows, at 12:28 PM:

- Primary chamber: 1,602 degrees F; no minimum temperature in ROP
- Secondary chamber or afterburner: 1,951 degrees F; above the 1,800 degree minimum temperature over a 15-minute average in the ROP

Primary burners P1 through P6, firing rates within incinerator:

- P1: 50%
- P2: Not in use, as they were getting ready to replace it.
- P3: 50%;
- P4: 50%;
- P5: 0%
- P6: 0%

Secondary burners S1 and S2, firing rates within incinerator:

- S1: 0%
- S2: 0%
- Pressure drop: -0.01 inches, water column (w.c.)

Once the waste was charged into EU-DCPAHINC, there was a scent of burnt hair in the control room. AQD went down to the lower levels of the building to observe the incinerator itself. AQD's D. Rauch and MSU's R. Goodwin elected to look through a sight glass to observe the incineration process taking place in the primary burn chamber. There were no fugitive emissions from the incinerator.

AQD was shown that the incinerator is designed so that grease from incineration of pig remains gets drained and goes into a bucket used as a grease trap. AQD was also shown the ash cart area, with a sealed ash cart, and two effluent decontamination tanks, which use heat for sterilization. The heat comes from two nearby boilers.

AQD was informed that the 2022 overhaul for EU_DCPAHINC included installation of new:

- Refractory
- Stoker heads
- Load door
- Burners
- Blowers

AQD was advised that they will also be replacing the control panel for EU-DCPAHINC.

EU-DCPAHINC ROP compliance checklist on 3/24/2023:

	Requirement	Comments	Complies?

ROP Special Condition			
EU-DCPAHINC, SC I.1	Particulate limit of 1.71 lbs/hr.	PM stack test results from 7/28-29/2022 were 1.32 lbs/hr.	Yes
EU-DCPAHINC, SC I.2	Particulate limit of 0.10 gr/dscf @ 7% O2.	PM stack test results from 7/28-29/2022 were 0.05 gr/dscf. @ 7% O2.	Yes
EU-DCPAHINC, SC II.1	Shall not burn any waste in the EU-DCPAHINC other than the following wastes.		Yes
EU-DCPAHINC, SC II.1.a	Pathological Waste as defined in 40 CFR 60.51c. Pathological waste is waste material consisting of only human or animal remains, anatomical parts and/or tissue, the bags/containers used to collect and transport the waste material and animal bedding.	Per the spreadsheet 2022 totals.xlsx (attached), received on 3/24/2023, EU-DCPAHINC burned 100% pathological waste in 2022.	Yes
EU-DCPAHINC, SC II.1.b	Medical/Infectious Waste as defined in 40 CFR 60.51c. This waste shall not contain any sharps or exceed 5 percent, by weight, in aggregate, of the total waste burned in the EU-DCPAHINC as measured on a calendar month basis.	NA, as EU-DCPAHINC did not burn any medical/infectious waste in 2022, per the attached spreadsheet.	NA
EU-DCPAHINC, SC II.1.c	Institutional wastes as defined in 40 CFR 60.3078. Institutional waste means solid waste that is combusted at any institutional facility that generated the waste.	The solid wastes EU-DCPAHINC burns qualify as institutional since they come from MSU.	Yes
EU-DCPAHINC, SC II.2	Shall burn 90 percent or more by weight pathological waste to maintain status as a pathological waste incinerator unit. Failure to do	Per the spreadsheet 2022 totals.xlsx (attached), received on 3/24/2023, EU-DCPAHINC burned 100% pathological waste in 2022.	Yes

	so will require compliance with 40 CFR Part 60, Subpart FFFF.		
EU-DCPAHINC, SC III.1	**Shall not charge or combust waste in the EU- DCPAHINC unless a minimum 15-minute average temperature of 1800°F is maintained.**	**At 12:28 PM, the afterburner temperature was 1951 degrees F, instantaneously. It later was at 2033 degrees F, prior to waste being charged.**	**Yes**
EU-DCPAHINC, SC III.2	**The after burner shall be installed, maintained, and operated in a satisfactory manner to control emissions from EU-DCPAHINC. A list or operation and maintenance procedures as specified in Appendix 9 -1.**	**The afterburner appeared to be installed, maintained, and operated in a satisfactory manner.**	**Yes**
NOTE: this condition in the ROP has no number associated with it.	**Shall not operate EU-DCPAHINC unless the Incinerators Malfunction Abatement Plan, or an alternate plan approved by the AQD District Supervisor, is implemented and maintained.**	**An updated MAP was emailed to AQD on 4/5/2023, reflecting the current environmental contacts.**	**Yes**
EU-DCPAHINC, SC III.3	**Shall not operate the EU-DCPAHINC unless the waste management plan specified in Appendix 10-1, or an alternate plan approved by the District Supervisor, is implemented and maintained.**	**MSU is following this.**	**Yes**
EU-DCPAHINC, SC IV.1	**Shall not operate EU-DCPAHINC unless the afterburner is installed, maintained, and operated in a satisfactory manner.**	**MSU appears to be doing this.**	**Yes**
EU-DCPAHINC, SC IV.2	**Shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and** **record the temperature in the afterburner of EU-DCPAHINC on a**	**MSU appears to be meeting this. On 3/24/2023, AQD received the attached circular temperature chart record, for 5/3/2022. It shows the afterburner instantaneous temperature in**	**Yes**

	continuous basis. The temperature monitoring device shall be installed, calibrated, operated and maintained properly	green ink, while the primary chamber temperature is in red ink. The afterburner appeared to be at or above 1800 degrees F, with a brief drop of 2-3 minutes below 1800 degrees F, when the unit was being charged. Over the 15-minute average, it appeared like it would be averaged out.	
EU-DCPAHINC, SC IV.3	The afterburner shall have a minimum retention time of 1.0 second.	See information on the unit's mechanical specifications, which was submitted during the original permit to install application process.	Yes
EU-DCPAHINC, SC V.1	Visual inspection for abnormal/excessive smoke to be performed at least once a day, every day that the incinerator is operating.	It is AQD's understanding that this is being done. On 3/24/2023, MSU provided the attached visible emission observation form, for 5/3/2022. All readings were 0%, as was the average.	Yes
EU-DCPAHINC, SC V.2	Shall measure the opacity using Method 9 (Visual Determination of the Opacity of Emissions from Stationary Sources) upon request of the AQD.	AQD has not requested that MSU take Method 9 readings, but they are doing this, per the attached visible emission observation form. All readings were 0%, as was the average.	Yes
EU-DCPAHINC, SC V.3	Shall verify PM emission rates, by testing at owner's expense, in accordance with department requirements within 12 months of permit renewal issuance, and once every five years thereafter, unless the permittee has submitted to the AQD District Supervisor an acceptable demonstration that the most recent acceptable test remains valid and representative. During performance testing, the permittee shall also determine and record the average operating temperature of the	EU-DCPAHINC underwent particulate stack testing from 7/28-29/2022. Results indicated compliance. MSU records afterburner temperature, as well as primary chamber temperature, on circular temperature chart recordings.	Yes

	afterburner to control the emissions from EU-DCPAHINC.		
EU-DCPAHINC, SC VI.1	**The permittee shall monitor and record the temperature in the secondary combustion chamber during operation on a continuous basis in a manner and with instrumentation acceptable to the District Supervisor, Air Quality Division.**	**MSU is monitoring and recording the temperature in the secondary combustion chamber in a manner and with instrumentation acceptable to AQD.**	**Yes**
EU-DCPAHINC, SC VI.2	**If excessive visible emissions are observed during the daily visual inspections, the permittee shall implement the following procedures:**	**AQD was advised by M. Lindsey that since the 2021 inspection of MSU by AQD, there have been no days with excessive visible emissions.**	**Yes**
EU-DCPAHINC, SC VI.2.a	**Immediately cease charging EU-DCPAHINC;**	**AQD was advised by M. Lindsey that since the 2021 inspection of MSU by AQD, there have been no days with excessive visible emissions.**	**Yes**
EU-DCPAHINC, SC VI.2.b	**Determine the cause of the excessive visible emissions within 4 hours of discovery;**	**AQD was advised by M. Lindsey that since the 2021 inspection of MSU by AQD, there have been no days with excessive visible emissions.**	**Yes**
EU-DCPAHINC, SC VI.2.c	**Identify and implement corrective measures to reduce/eliminate the excessive visible emissions within 8 hours; or**	**AQD was advised by M. Lindsey that since the 2021 inspection of MSU by AQD, there have been no days with excessive visible emissions.**	**Yes**
EU-DCPAHINC, SC VI.2.d	**Initiate shut down of the EU-DCPAHINC consistent with the provisions of the malfunction abatement plan.**	**AQD was advised by M. Lindsey that since the 2021 inspection of MSU by AQD, there have been no days with excessive visible emissions.**	**Yes**
			Yes

EU-DCPAHINC, SC VI.2.e	Notify AQD of deviations as per General Condition 21.	MSU notifies AQD of any deviations.	
EU-DCPAHINC, SC VI.3	Shall keep records on a daily basis of the type and weight of waste burned in EU-DCPAHINC specifically differentiating between pathological and medical/infectious waste. All records shall be kept on file and made available to the Department upon request.	MSU does this; on 3/24/2023, AQD received the attached VDL daily load sheet for 5/3/2022, as an example, when several loads of waste were incinerated. The type was pathological, and weights and times were provided.	Yes
EU-DCPAHINC, SC VII.1-3	Standard ROP reporting requirements.	MSU complies with these.	Yes
EU-DCPAHINC, SC VII.4	A complete test plan shall be submitted to the AQD no less than 30 days prior to testing for review. The final plan must be approved by the AQD prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test.	The 2022 stack test plan for EU-EU-DCPAHINC complied with this. It was approved for testing. Computer problems with EU-DCPAHINC delayed that test from 6/15 until 7/28-29/2022. A complete report of the test results for EU-DCPAHINC was submitted to AQD on 9/6, within 60 days of 7/29/2022.	Yes
EU-DCPAHINC, SC VIII.1	The exhaust gases shall be exhausted unobstructed vertically upwards from a stack with a maximum diameter of 56 inches and a minimum height above ground level of 85 feet.	The 2/1/2017 stack test confirmed a stack diameter of 37 inches, less than the permitted maximum. On 6/14/2017 an email was received from MSU's then-ECO Tom Grover, that the stack had been measured by survey, and found to be 99.1 feet above ground level.	Yes
EU-DCPAHINC, SC IX.1	NA	NA	NA

DCPAH/VDL building boilers, EU-DCPAH1 and EU-DCPAH2:

Emission units:

- EU-DCPAH1, a Johnston firetube boiler, 32.38 MMBtu/hr natural gas-fired high pressure steam boiler, Serial Number 403061, installed 2001.
- EU-DCPAH2, 32.38 MMBtu/hr natural gas-fired high pressure steam boiler, Serial Number 403062, installed 2001.

Flexible Group: FG-BOILERMACT

We also observed the two boilers in the DCPAH/VDL boiler room, which provide heat for the effluent decontamination tanks, and steam for the DCPAH/VDL building. Each boiler had a boiler plate heat input rating of 32,378 mmBtu/hr.

Both boilers were running, with data summarized, below. No instances of noncompliance were noted.

EU-DCPAH1, aka Boiler #1:

- Actual: 32 psi
- Set point (SP): 75 psi

EU-DCPAH2, aka Boiler #2:

- Actual: 105 psi
- SP: 102 psi
- Load: 10%
- Flame: 94.4%

There was an emergency generator near the two boilers, but it was not operating, at this time.

EU-CREMATORY, on 3/24/2023:

EMISSION UNIT DESCRIPTION: Crawford Model C500P, natural gas fired, animal crematory, with 200 pound maximum charge and a 75 pound per hour burn rate located at 4125 Beaumont Road. (PTI 226-05)

POLLUTION CONTROL EQUIPMENT: direct flame afterburner.

EU-CREMATORY is primarily for pets. The unit was operating on the date of the inspection, 3/24/2023. AQD observed the unit at approximately 12:30 PM.

- Opacity: 0%
- Odors detected: none
- Weather conditions: Mostly sunny and 40 degrees F with winds out of the ENE at 10-15 mph

Data was collected as follows:

- Primary chamber temperature: 1401 degrees F
- Secondary chamber temperature: 1,681 degrees F
- Time left in stage: 61 minutes

EU-CREMATORY ROP compliance checklist on 3/24/2023:

ROP Special Condition	Requirement	Comments	Complies?
EU-CREMATORY, SC I.1	PM limit of 0.20 pounds per 1,000 pounds of exhaust gases, corrected to 50% excess air.	Unknown, as it would take stack test to verify. Based upon lack of opacity, there is no reason to suspect noncompliance.	Unknown
EU-CREMATORY, SC II.1	The permittee shall not burn any waste in EU-CREMATORY other than the following wastes:		Yes
EU-CREMATORY, SC II.1.a	Pathological wastes as defined in 40 CFR 60.51c. Pathological waste means waste materials consisting of only human or animal remains, anatomical parts, and/or tissue; the bags/containers used to collect and transport the waste material; and animal bedding.	EU-CREMATORY is only used for pet cremations.	Yes
EU-CREMATORY, SC III.1	The permittee shall not combust waste in EU-CREMATORY unless a minimum temperature of 1600 °F is maintained.	On 3/24/2023, AQD observed an afterburner temperature of 1681 degrees F, above the minimum required temperature. Also, on 3/24/2023, AQD received a circular temperature chart (attached), from 11/25/2022. During two cremations, the afterburner temperature was always over 1700 degrees F, more than 100 degrees above the minimum required temperature.	Yes
EU-CREMATORY, SC III.2	The afterburner shall be installed, maintained, and operated in a satisfactory manner to control emissions from EU-CREMATORY. A list of operating and maintenance procedures is specified in Appendix 9-1.	The afterburner appeared to be installed, maintained, and operated in a satisfactory manner, based on the absence of visible emissions.	Yes
			Yes

EU-CREMATORY, SC IV.1	EU-CREMATORY shall have a minimum retention time of 1.0 second.		
EU-CREMATORY, SC IV.2	The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the temperature in the afterburner of EU-CREMATORY on a continuous basis.	On 3/24/2023, AQD received a circular temperature chart (attached), from 11/25/2022. During two cremations, the afterburner temperature was always over 1700 degrees F, more than 100 degrees above the minimum required temperature.	Yes
EU-CREMATORY, SC V.1	Visual inspection for abnormal/excessive smoke to be performed at least once a day, every day that the incinerator is operating.	It is AQD's understanding that this is being done. On 11/23/2023, MSU provided the attached visible emission observation form, for 5/3/2022. All readings were 0%, as was the average.	Yes
EU-CREMATORY, SC V.2	Verification of PM emission rates, by testing at owner's expense, in accordance with department requirements shall be completed upon the request of the AQD. During performance testing, the permittee shall also determine and record the average operating temperature of the afterburner to control the emissions from the EU-CREMATORY.	NA, as AQD has not requested testing.	NA
EU-CREMATORY, SC VI.1	The permittee shall monitor and record the temperature in the afterburner during operation on a continuous basis in a manner and with instrumentation acceptable to the District Supervisor, Air Quality Division.	The temperature pf the afterburner was recorded in a manner and with instrumentation acceptable. The afterburner temperature is in red ink, while the primary chamber temperature is in green ink.	Yes
EU-CREMATORY, SC VI.2	The permittee shall keep, in a satisfactory manner, daily records of the time, description and weight of waste combusted in EU-CREMATORY.	On 3/24/2023, AQD received an email with a log sheet (attached) for Nov. and the start of Dec. 2022. Time, description (name), and weight of deceased pets were	Yes

		all listed. AQD was shown the storage location. The attached spreadsheet, DCPAH Crematory Operation 2022.xlsx, shows yearly total weights and quarterly, as well as fuel usage.	
EU-CREMATORY, SC VII.1-3	**Standard ROP reporting requirements.**	**MSU follows these.**	**Yes**
EU-CREMATORY, SC VII.4	**Upon the request for testing, a complete test plan shall be submitted to the AQD no less than 30 days prior to testing for review. The final plan must be approved by the AQD prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test.**	**NA, as AQD has not requested stack testing.**	**NA**
EU-CREMATORY, SC VIII.1	**Exhaust gasses shall be exhausted unobstructed vertically upwards through a stack with a maximum diameter of 16 inches and a minimum height of 25 feet above ground level.**	**The stack appears to meet these dimensions.**	**Yes**
EU-CREMATORY, SC IX.1	**NA**	**NA**	**NA**

EU-TESTSTAND, on 3/22/2023:

EMISSION UNIT DESCRIPTION: An Engine Test stand capable of testing engines up to 750 HP for unleaded gasoline/ethanol engines and 1,000 HP for diesel engines located at 1149 Engineering Research Court. (PTI 229-05A)

POLLUTION CONTROL EQUIPMENT: catalytic converters while testing gasoline/ethanol engines.

EU-TESTSTAND is currently not in use, AQD was informed, and it has not been used for several years. It was designed for testing small engines, but a project for it never materialized. it is located in room E125.

On 3/22/2023, MSU staff took AQD to the Engineering Building, Automotive Research area, and met with Tom Stuecken. AQD was given the opportunity to see inside room E125, and it was apparent that EU-TESTSTAND was not in use. A compliance checklist was therefore not preoared for this emission unit, for this inspection report.

EU-TESTSTAND is their smallest engine cell, AQD was informed, compared with the larger EU-TESTCELL1 and EU-TESTCELL2. These larger emission units are covered by FG-TESTCELLS, which is discussed later in this inspection report.

EU-DIENGINE

EMISSION UNIT DESCRIPTION: One new uncertified non-emergency, spark ignition, stationary, 510 horsepower (380kilowatt), 4 stroke lean burn (4SLB), reciprocating internal combustion engine (RICE), used to produce electricity, fired by digester gas, manufactured on February 27, 2013 and rebuilt on April 15, 2016, subject to 40 CFR Part 60, Subpart JJJJ and 40 CFR Part 63, Subpart ZZZZ.

POLLUTION CONTROL EQUIPMENT: catalytic reduction.

This source is an engine, EU-DIENGINE, fueled by a digester at the MSU Dairy Cattle Teaching and Research Barn. The location is at the northwest corner of College at Bennett), East Lansing, MI 48823

Background:

The Dairy Cattle Teaching and Research Barn is located on the south end of campus. The milk produced is used for research purposes, and is also used for the production of cheese and ice cream at the MSU Dairy Store.

The site has a bio digester that was installed in 2012. The digester uses manure, campus food wastes, research waste, and restaurant grease for gas production. This is an agricultural digester, and processes agricultural waste. It is also a "complete mix" digester, rather than a "plug flow" digester, such as might be found on small farms. A drive accesses the dump pit area, which has sloped concrete towards the pit, for spill prevention, and rain retainment into the pit. The product is under frequent agitation, and is pumped into the digester thereafter.

The digester receives manure from the dairy barns, and added substrates from off-farm sources. These substrates include grease and associated rinse water from restaurants, as well as some food wastes from MSU's campus cafeterias. The food waste includes prepared food that has not made it onto people's trays. They cannot accept post-consumer food waste, because trash or other items like plastic would be bad for the digester. Human sewage waste is not used. The digester also receives dairy waste, which provides a lot of food for bacteria, but also lowers the pH. It is aalso source of sulfur, and this can lead to more odorous conditions.

Cow manure is not stored in tanks, but is piped directly to the receiving pits, while trucks unload additional substrates into the pits. The receiving pits are stirred or agitated, and the manure and substrates go into a mix tank, close by.

Prior to reaching the engine, the gas passes through a cleanup apparatus which includes sulfur and water knock-out. Sulfur is removed by injecting air into the digester, removal of water and passing through a carbon filter. The sulfur content of the digester gas today, pre-knockout, was 303.0 ppm and post-knockout, going to the engine, was 3.4 ppm (limit is 600ppm).

The gas produced is then used to fuel a 510 HP (380kW) four stroke lean burn reciprocating internal combustion engine for powering the farm. The initial engine was certified when initially purchased and installed in 2013. Since this time a major overhaul and maintenance occurred, giving a rebuilt date of April 15, 2016 which voided the certification. Shortly thereafter in late 2016 or early 2017, the engine had catastrophic failure from a piston which broke apart, damaging the crank case, crank shaft and other components. The damage was irreparable. A flare at the site is used to combust the fuel, if the engine is not able to operate for some reason.

A new engine was thus installed, with a 2017 model year. It should be noted that the generator including the data plate is from the old engine and was not replaced, thus the serial numbers do not match up.

- Make: MAN
- Model: E2842LE322
- Serial # 49246928084677
- kW: 380 (509hp using a conversion of 1.34)
- Speed: 1800 RPM
- Displacement: 219.27

Due to the engine size being >500hp, the engine is required to conduct testing every 8760 hours or 3 years, whichever comes first, per MI-ROP-K3249-2016a, and 40 CFR Part 60, Subpart JJJJ. The underlying applicable requirement is found at 40 CFR 60.4243(a)(2)(iii):

If you are an owner or operator of a stationary SI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test within 1 year of engine startup and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance.

The South Dairy Farm site is a relatively remote site, although a new teaching hospital has been built, roughly 3,000 feet to the west. northwest.

Recent stack testing:

The digester engine last underwent stack testing for CO, NOx, and VOC on 10/20/2022. D. McGeen was onsite, to witness the stack test and record operating parameters. Testing for the SI-RICE was required by 40 CFR Part 60, Subpart JJJJ, and by MI-ROP-K3249-2016a. Emissions of CO, NOx, and VOC were all below the NSPS emission limits.

10/20/2022 stack test results were as follows:

Emission unit	CO emissions, ppmvd at 15% O2	NOx emissions, , ppmvd at 15% O2	VOC emissions, measured as propane, ppmvd at 15% O2
EUDIENGINE	193	127	2.9
40 CFR Part 60, Subpart JJJJ emission limit	610	150	80

EU-DIENGINE inspection on 3/22/2023:

AQD arrived at the digester at 9:16 AM on 3/22/2023. EU-DIENGINE was operating.

- Opacity: None.
- Odors: Distinct and definite manure odor.
- Weather conditions: Overcast and 42 degrees F, with winds out of the south, 10 mph

There were no visible emissions from either the ICE or the enclosed flare. Only the ICE was running. The flare is just used in case the engine is not available, or in case the digester produces more digester gas than the engine alone can combust. There was a distinct and definite manure odor from the receiving pits, but the odor was not strong.

AQD met with the environmental contact, Mr. Lou Faivor, Farm Assistant Manager and Anaerobic Digester Operator.

As AQD observed, a tanker truck delivered grease from a restaurant into the north receiving pit, which receives more food waste than the south pit. L. Faivor indicated that 25,000 gallons of grease from MSU dorms had been delivered earlier this morning. The north receiving pit receives more food waste than the south pit. MSU also receives waste from a rendering plant.

The digester is a large, light gray tank with an inflatable dome. The waste goes into an anaerobic environment, and naturally occurring bacteria (acetigens and acetogens) break the wastes down into volatile fatty acids (VFAs). Methanogens convert the VFAs into methane gas. The process operates at mesophilic temperatures of about 100 degrees F, and the engine's heat exchanger can be used to route heat to another heat exchanger to warm the liquids, in cold weather. The pH should be neutral, AQD has been told, with a pH of 6.8 to 7.5 being ideal for the bacteria.

Inside the digester, the digestate is circulated frequently, though not constantly, with internal mixers. The digested waste then goes to the digestate tank, which is a large black tank, with an inflatable dome. Solids in the digestate get screened out, and then stockpiled, prior to eventual land application, while liquids go back into the digestate tank.

Operating data collected at 9:29 AM on 3/2322023 was as follows:

- Total flow: 93 scfm
- Methane content: 67.56
- H2S: 113 ppm
- Generator power: 325 Kilowatts
- Gas temperature: 105 degrees F
- Digester temperature: 96.4 degrees F

EU-DIENGINE ROP compliance checklist, from 3/22/2023 inspection:

ROP Special Condition	Requirement	Comments	Complies?
EU-DIENGINE, SC I.1	Emission limit CO: 5.0 g/hp-hr or 610 ppm @ 15% O2	CO results from 10/20/2022 stack test: 193 ppm	Yes
			Yes

EU-DIENGINE, SC I.2	Emission limit NOx: 2.0 g/hp-hr or 150 ppm @ 15% O2	NOx results from 10/20/2022 stack test: 127 ppm	
EU-DIENGINE, SC I.3	Emission limit VOC: 1.0 g/hp-hr or 80 ppm @ 15% O2	VOC results from 10/20/2022 stack test: 2.9 ppm	Yes
EU-DIENGINE, SC II.1	The heat input provided by digester gas must be equivalent to 10 percent or more of the gross heat input on an annual basis. 63.6590(b)(ii)(2)	100% of the fuel is digester gas	Yes
EU-DIENGINE, SC III.1	If the permittee purchased a non-certified engine or operates a certified engine in a non-certified manner, the permittee shall keep a maintenance plan and records of conducted maintenance for FGNSPSJJJJ and shall, to the extent practicable, maintain and operate each engine in a manner consistent with good air pollution control practice for minimizing emissions.	MSU is keeping records of conducted maintenance.	Yes
I EU-DIENGINE, SC V.1	The permittee shall equip and maintain EU-DIENGINE with a fuel meter to monitor and record the daily fuel usage and volumetric flow rate of the digester fuel used.	There is a fuel meter, and L. Faivor showed AQD the electronic recordkeeping.	Yes
EU-DIENGINE, SC V.1	The permittee must conduct an initial performance test within 1 year of engine rebuild and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first.	MSU conducts annual stack testing of EU-DIENGINE	Yes
EU-DIENGINE, SC V.2	Performance testing shall be conducted according to 40 CFR 60.4244.	Stack testing accordingly.	Yes
EU-DIENGINE, SC V.2.a	Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements in Section 60.8 and under the specific conditions that are specified by Table 2 to this subpart.	The 10/20/2022 stack testing was conducted at an average 92.11% of maximum rated capacity, which is	Yes

		consistent with data AQD collected.	
EU-DIENGINE, SC V.2.b	Prohibits tests during periods of startup, shutdown, or malfunction, as specified in Section 60.8(c).	On 10/20/2022, AQD verified that there were no periods of startup, shutdown, or malfunction, during the stack test.	Yes
EU-DIENGINE, SC V.2.c	Requires 3 separate test runs, and each run is to be conducted within 10% of the 100% peak (or the highest achievable) load, and each run must last at least 1 hour.	AQD confirmed this was done, on 10/20/2022.	Yes
EU-DIENGINE, SC V.2.d	Requires the concentration of NOx to be converted to mass per unit output (g/scm), using Equation 1.	NOx was converted to g/dscm.	Yes
EU-DIENGINE, SC V.2.e	Requires the concentration of CO to be converted to mass per unit output (g/scm), using Equation 2.	CO was converted to g/dscm	Yes
EU-DIENGINE, SC V.2.f	Requires that formaldehyde not be included as part of VOC emissions. To determine compliance with the VOC mass per unit output (g/scm), the VOC concentration should be converted, using Equation 3.	VOC was converted to g/dscm	Yes
EU-DIENGINE, SC V.2.g	This addresses three potential methods to measure VOC emissions; Method 25A, or Methods 18 or 320 of 40 CFR Part 63, Appendix A	U.S. Environmental Protection Agency Method 25A/ALT-096 was used, according to the stack test report.	
EU-DIENGINE, SC VI.1	The permittee shall keep the following records for EU-DIENGINE:		Yes
		MSU keeps records of stack testing and of the	Yes

EU-DIENGINE, SC VI.1.a	All notifications submitted to comply with Subpart JJJJ and all documentation supporting any notification	% of fuel which is digester gas.	
EU-DIENGINE, SC VI.1.b	Maintenance conducted on EU-DIENGINE	MSU is keeping maintenance records.	Yes
EU-DIENGINE, SC VI.1.c	If the engine is operating in a non-certified manner, documentation that the engine meets emission standards.	The 10/20/2022 stack testing results show EU-DIENGINE is meeting emission standards.	Yes
EU-DIENGINE, SC VI.2	The permittee shall record all fuel usage for EU-DIENGINE, including digester gas, on a daily basis with separate fuel meters to measure the volumetric flow rate of each fuel.	MSU keeps electronic records of fuel use. The only fuel is digester gas, so that is the only fuel recorded.	Yes
EU-DIENGINE, SC VI.3	The permittee shall maintain records of the hours of operation for determining performance testing requirements.	MSU is keeping records of hours of operation.	Yes
EU-DIENGINE, SC VII.1-3	Standard ROP reporting requirements.	MSU is complying with these.	Yes
EU-DIENGINE, SC VII.4	If testing is required, no less than 30 days prior to testing, a complete test plan shall be submitted to the AQD. The final plan must be approved by the AQD prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test.	MSU is meeting this requirement for EU-DIENGINE.	Yes
EU-DIENGINE, SC VII.5	The permittee shall submit an annual report to the appropriate AQD District Office by March 15 for reporting period January 1 to December 31. The following information shall be included in this annual report:		Yes, received 3/13/2023

EU-DIENGINE, SC VII.5.a	The permittee must demonstrate that the percentage of heat input provided by digester gas is equivalent to 10 percent or more of the total gross heat input for EU-DIENGINE on an annual basis.	Report states !00% of fuel for EU-DIENGINE was digester gas.	Yes
EU-DIENGINE, SC VII.5.b	The operating limits provided in this permit, and any deviations from these limits.	Report states there were no deviations.	Yes
EU-DIENGINE, SC VII.5.c	Any problems or errors suspected with the meters.	Report states there were no indicator errors.	Yes
EU-DIENGINE, SC VIII.	NA	NA	NA
EU-DIENGINE, SC IX.1	The permittee shall comply with all applicable provisions of the federal Standards of Performance for Stationary Spark Ignition Internal Combustion Engines as specified in 40 CFR Part 60, Subpart A and Subpart JJJJ.	MSU is complying.	Yes
EU-DIENGINE, SC IX.2	A new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis must meet the initial notification requirements of §63.6645(f) and the requirements of §§63.6625(c), 63.6650(g), and 63.6655(c). These stationary RICE do not have to meet the emission limitations and operating limitations of this subpart.	Compliance is demonstrated through stack testing results. The testing of EU-DIENGINE is conducted on an annual basis.	Yes

EU-ENCLSD_FLARE on 3/22/2023:

EMISSION UNIT DESCRIPTION: an enclosed, digester gas-burning flare, used as back up for the anaerobic digester. The flare is capable of burning up to 150 scfm, giving a heat input capacity of 5,400,000 Btu/hr, when using the estimated higher heating value of the digester gas of 600 Btu/scf. (PTI No. 95-12A.)

POLLUTION CONTROL EQUIPMENT: enclosed flare and fuel SO2 scrubber.

We arrived at the site of EU-ENCLSD_FLARE and EU-DIENGINE at 9:16 AM. EU-ENCLSD_FLARE was not operating.

- Opacity: None.
- Odors: Distinct and definite manure odor.
- Weather conditions: Overcast and 42 degrees F, with winds out of the south, 10 mph

EU-ENCLOSEDFLARE ROP compliance checklist on 3/22/2023:

ROP Special Condition	Requirement	Comments	Complies?
EU-ENCLOSEDFLARE, SC I.1	SO2 limit of 90 lbs/hr.	Stack test would be required to verify.	Unknown
EU-ENCLOSEDFLARE, SC II.1	Burn only gas produced by the dairy facility anaerobic digester (digester gas).	The only fuel is digester gas.	Yes
EU-ENCLOSEDFLARE, SC II.2	The hydrogen sulfide (H2S) concentration of the gas exiting the digester shall not exceed 600 ppmv.	H2S content on 3/22/2023 was 139 ppm.	Yes
EU-ENCLOSEDFLARE, SC III.1	Permittee shall not operate EU-ENCLSD_FLARE unless a MAP as described in Rule 911(2), is implemented and maintained. I	Updated MAP received on 7/12/2017. AQD has requested 2023 version.	Yes
EU-ENCLOSEDFLARE, SC IV.1	Install, calibrate, maintain and operate in a satisfactory manner, a device to monitor and record the volumetric flow rate of digester gas burned in EU-ENCLSD-FLARE, on a continuous basis.	This is being monitored and electronically recorded via spreadsheets which AQD observed.	Yes
EU-ENCLOSEDFLARE, SC V.1	The permittee shall verify the hydrogen sulfide or total reduced sulfur (TRS) content of the digester gas burned in EU-ENCLSD-FLARE on a quarterly basis by gas sampling. If, after a year, the average of the previous four (4) quarterly concentrations	A sensor is said to take hourly samples of digester gas to analyze. MSU	Yes

	of the hydrogen sulfide or TRS concentration of the digester gas is below 600 ppm (TRS equivalent), the permittee may petition the District Supervisor, Air Quality Division to reduce the frequency of gas sampling and recording … to once each calendar year. If at any time the average of the previous four concentration readings exceeds 600 ppm (TRS equivalent), the permittee shall resume sampling and recording on a quarterly basis and shall review all operating and maintenance activities for the digester gas collection and treatment system along with keeping records of corrective actions taken. Once the average of the previous four concentrations determined from the quarterly readings is maintained below 600 ppm of hydrogen sulfide/TRS concentration in the digester gas for one year after an exceedance, the permittee may resume annual monitoring and recordkeeping.	tracks the average H2S content for each quarter.	
EU-ENCLOSEDFLARE, SC VI. 1	Keep, in a satisfactory manner, records of the H2S content of the digester gas routed to EU-ENCLSD-FLARE as specified in SC V.1.	A sensor is said to take hourly samples of digester gas to analyze. MSU tracks the average H2S content for each quarter.	Yes
EU-ENCLOSEDFLARE, SC VI.2	Continuously monitor and record, in a satisfactory manner, the volumetric flow rate of digester gas burned in the flare.	This is being monitored and electronically recorded via spreadsheets which AQD observed.	Yes
EU-ENCLOSEDFLARE, SC VI.3	SO2 emission calculations shall be completed as per Appendix 7-1.	MSU is calculating SO2 emissions.	Yes
	Standard ROP reporting requirements.		Yes

EU-ENCLOSEDFLARE, SC VII.1-3		**MSU is complying with these.**	
EU-ENCLOSEDFLARE, SC VIII.1	**Exhaust gases shall be discharged unobstructed vertically upwards to the ambient air through a stack with a maximum diameter of 18 inches and a minimum height above ground level of 7 feet.**	**The flare stack appears to meet these requirements.**	**Yes**
EU-ENCLOSEDFLARE, SC IX.1	**NA**	**NA**	**NA**

FG-COLDCLEANER on 3/22/2023

EMISSION UNIT DESCRIPTION: Any cold cleaner that is grandfathered or exempt from Rule 201 pursuant to Rule 281(h) or Rule 285(r)(iv). Existing cold cleaners were placed into operation prior to July 1, 1979. New cold cleaners were placed into operation on or after July 1, 1979.

POLLUTION CONTROL EQUIPMENT: NA.

EUDEGLANDS1-2 are two cold cleaners which are part of the flexible group FG-COLDCLEANER. They were inspected as representative of the flexible group. They are both located at MSU Landscape Services, as follows:

- Safety-Kleen 150, a solvent-based unit, painted red. It utilized Safety-Kleen Premium Solvent (Virgin and Recycled), as indicated on a sticker on the underside of the lid.
- Safety-Kleen SKFL-250 front loading parts washer, painted gray. This is a heated but water-based unit. It had a sticker for using water-based based cleaner Arma Kleen "4 in 1 cleaner" cleaning solution..

FG-COLDCLEANER ROP compliance checklist on 3/22/2023:

ROP Special Condition	Requirement	Comments	Complies?
FG-COLDCLEANER, SC I.	**NA**	**NA**	**NA**
			Yes

FG-COLDCLEANER, SC II.1	**Do not use cleaning solvents containing more than 5% of select halogenated compounds (those in 40 CFR Part 63, Subpart T)**	**Red, solvent-based unit using Safety-Kleen Premium Solvent (Virgin and Recycled), 100% petroleum distillates hydrotreated light** **Gray, heated water-based unit using Arma Kleen "4 in 1 Cleaner"**	
FG-COLDCLEANER, SC III.1	**Cleaned parts shall be drained for no less than 15 seconds or until dripping ceases**	**Parts basket inside both cleaners allow parts to drain**	**Yes**
FG-COLDCLEANER, SC III.2	**The permittee shall perform routine maintenance on each cold cleaner**	**Both units serviced by Safety-Kleen**	**Yes**
FG-COLDCLEANER, SC IV.1	**Cold cleaner must meet at least one of following:**		
FG-COLDCLEANER, SC IV.1 a	**Air vapor interface < 10 feet^2**	**Surface area roughly 6 ft^2 for each**	**Yes**
FG-COLDCLEANER, SC IV.1.b	**Unit cleans metal parts and releases emissions to general in-plant environment**	**No exhaust to outside air for either**	**Yes**
FG-COLDCLEANER, SC IV.2	**Unit equipped with device for draining cleaned parts**	**Trays in each unit for draining parts**	**Yes**
FG-COLDCLEANER, SC IV.3	**Units equipped with a cover kept closed when parts not being cleaned**	**Gray unit's cover was closed; red unit's cover was affixed in an open position with a wing nut, but the wing nut was removed, and cover closed, as shown in photo the next day**	**Not at first, but corrected by next day**
FG-COLDCLEANER, SC IV.4	**Cover shall be mechanically assisted, if solvent agitated, heated, or has RVP > 0.3 psia**	**Covers in 2021 were said to be mechanically assisted**	**Yes**

FG-COLDCLEANER, SC IV.5	If RVP > 0.6 psia, or solvent in new unit is > 120 degrees F, unit must comply with at least one of following:	NA	NA
FG-COLDCLEANER, SC IV.5.a	Ratio of freeboard ht. to width of unit is > 0.7	NA	NA
FG-COLDCLEANER, SC IV.5 b	Solvent must be covered with water if solvent is insoluble and has specific gravity > 1.0	NA	NA
FG-COLDCLEANER, SC IV.5.c	Unit must be controlled by carbon adsorption, condensation system or equivalent control approved by AQD	NA	NA
FG-COLDCLEANER, SC V.	NA	NA	NA
FG-COLDCLEANER, SC VI.1	For each new unit in which solvent is heated, temperature must be monitored + recorded once/week	Red, solvent-based unit is unheated Gray, water-based unit is heated	Yes
FG-COLDCLEANER, SC VI.2	Maintain the following for each unit:		
FG-COLDCLEANER, SC VI.2.a	Serial #, model #, or unique identifier	Red, solvent-based, unheated unit: Safety-Kleen 150; Serial # 25019245 Gray, water-based, non-heated unit: model # Safety-Kleen SKFL-250	Yes
			Yes

V FG-COLDCLEANER, SC I.2.b	Date unit was installed, manufactured, or started operating	Each unit is listed as 9/1/1990 in ROP	
FG-COLDCLEANER, SC VI.2.c	Air vapor interface for any unit claimed to be exempt under MAPC Rule 281(h)	Interface at 6 ft^2 each is clearly <10 ft^2	Yes
FG-COLDCLEANER, SC VI.2.d	MAPC Rule 201 exemption	MAPC Rules 281(2)(h) or 285(2)(r)(iv)	Yes
FG-COLDCLEANER, SC VI.2.e	RVP of each solvent	Per AQD's N. Hude in 2017, vapor pressure was 0.067kPa @ 20 degrees C which equates to 0.001 psi	Yes
FG-COLDCLEANER, SC VI.2.f.	Compliance option for MAPC Rule 707(2)	Solvent type and management practices	Yes
FG-COLDCLEANER, SC VI.3	Maintain written operating procedures posted in accessible, conspicuous location near each unit	In 2019, AQD mailed two orange cold cleaner stickers to MSU, one was on red unit, next to gray unit; I provided updated EGLE stickers in 2023	Yes
FG-COLDCLEANER, SC	If waste solvent is a safety hazard and is stored in non-closed containers, verification that no more than 20% by wt. allowed to evaporate	Waste solvent disposed of by Safety-Kleen	Yes
FG-COLDCLEANER, SC VII.	NA	NA	NA
FG-COLDCLEANER, SC VIII.	NA	NA	NA
	NA	NA	NA

FG-COLDCLEANER, SC IX.			

FG-RULE287(c) on 3/22/2023:

Flexible group description: Any emission unit that emits air contaminants and is exempt from the requirements of Rule 201 pursuant to Rules 278 and 287(c).

Emission Units: EU-SPRAYBOOTH1, EU-SPRAYBOOTH2

POLLUTION CONTROL EQUIPMENT: particulate control filter.

EU-SPRAYBOOTH1 (as a representative of FG-RULE287(c))

This spray booth is located at MSU Infrastructure Planning and Facilities (IPF) near the intersections of Stadium Road and Chestnut Road. AQD was informed that it had been installed in 2020, replacing the original vintage EU-SPRAYBOOTH1, which had a water wash system. The new booth has dry filters, which are said to be cheaper to work with than the water wash system.

AQD visited EUSPRAYBOOTH1 on 3/22/2023, at 10:20 AM.

- Opacity: None.
- Odors: None..
- Weather conditions: Overcast and 42 degrees F, with winds out of the south, 10 mph

The paint booth was not in use as we arrived, and IPF personnel were not present, at the time. We did not enter the paint booth, but the air intake filters on the door of the booth appeared to be quite clean.

They keep daily records of paint use and transfer them to a monthly summary.After the inspection, on 4/22/2023, AQD emailed a request for a copy of 12 months of recordkeeping on coating use. On 4/24, AQD received the attached coating use records. They are broken down by month for calendar year 2022. Total yearly throughput of coatings was 76.5 gallons for 2022, well below the 200 gal/month allowed by MAPC Rule 287(2)(c).

AQD subsequently inquired, on 5/4/2023, if MSU was keeping records of filter replacements, as required by FG-R287(c) SC VI.1.a. On 5/8, M. lindsey emailed to AQD the attached photo of a stciker on the side of the booth on which the month and year of filter replacements are noted.

AQD observed that there was a long duration between the filter change of 9/21 and 7/22, andasked if this was due to the COVID-19 pandemic and associated restrictions. M. Lindsey replied tht this was correct, that there was a lull in demand for the paint booth, which picked up again in 2022.

FG-R287(c) ROP compliance checklist on 3/22/2023:

ROP Special Condition	Requirement	Comments	Complies?

FG-R287 (c), SC I.	**NA**	**NA**	**NA**
FG-R287 (c), SC II.1	**Limit of 200 gal coatings/month, as applied minus water, per unit.**		
FG-R287 (c), SC III.	**NA**	**NA**	**NA**
FG-R287 (c), SC IV.1	**Any exhaust system that serves only coating spray equipment shall be equipped with a properly installed and operating particulate control system.**	**AQD was only able to observe the outside of the booth, but the air intake filters were clean/new.**	**Yes**
FG-R287 (c), SC V.1	**NA**	**NA**	**NA**
FG-R287 (c), SC VI.1	**The permittee shall maintain records of the following information for each emission unit for each calendar month using the methods outlined in the DEQ, AQD Rule 287(c), Permit to Install Exemption Record form (EQP 3562) or in a format acceptable to the AQD District Supervisor.**	**MSU is keeping records in their own format, which is acceptable.**	**Yes**
FG-R287 (c), SC VI.1.a	**Volume of coating used, as applied, minus water, in gallons**	**Per AQD's 4/22/2023 request, MSU provided FG-RULE287 coating use records (attached) for 2022, showing monthly usage. The yearly total was 76.5 gal.**	**Yes**
FG-R287 (c), SC VI.1.b	**Documentation of any filter replacements for exhaust systems serving coating spray equipment**	**M. Lindsey emailed a photo of a filter change log on the side of the booth, in the form of a sticker.**	**Yes**
FG-R287 (c), SC	**Standard ROP reporting requirements**	**MSU follows these.**	**Yes**
	NA	**NA**	**NA**

FG-R287 (c), SC VIII.1			
FG-R287 (c), SC IX.1	NA	NA	NA

FG-STERILIZERS:

Note: Please see section of this report on PTI 99-17, after the ROP portion of this activity report, for inspection narrative and compliance checklist. PTI 99-17 was issued for a new ethylene oxide sterilizer, EU-ETO2. Thi PTI will be rolled into the ROP during the current ROP renewal cycle.

FG-WSF

Note: Please see section of this report on PTI 175-11A, after the ROP portion of this activity report, for inspection narrative and a compliance checklist. PTI 175-11A was issued for new exhaust hoods. This PTI will be rolled into the ROP during the current ROP renewal cycle.

FG-EMERGEN≤500ZZZZ:

Note: Compliance for this flexible group was not checked. However, AQD checked complaince for the 2 emergency generators at the former MBI building, EUBIGEN1 and EU-BIGEN2, which are not in the current ROP, but will be entered into the ROP upon renewal, in a flexible group, FG-NSPS-IIII.

Please rfer to the section near the end of this activity report for EU-BIGEN1 and EUBIGEN2, which will be the future FG-NSPS-IIII, upon renewal of the ROP.

FG-EMERGEN>500ZZZZ:

Note: Compliance for this flexible group was not checked. However, AQD checked complaince for the 2 emergency generators at the former MBI building, EUBIGEN1 and EU-BIGEN2, which are not in the current ROP, but will be entered into the ROP upon renewal, in a flexible group, FG-NSPS-IIII.

Please refer to the section near the end of this activity report for EU-BIGEN1 and EUBIGEN2, which will be in the future FG-NSPS-IIII, upon renewal of the ROP.

FG-TESTCELLS:

Two engine test cells capable of testing engines up to 750 HP for unleaded gasoline/ethanol engines and 1,000 HP for No.2 diesel engines located at 1149 Engineering Research Court. Emissions are controlled by catalytic converters. (PTI 229-05A)

Emission Units: EU-TESTCELL1, EU-TESTCELL2
Polution control equipment: Catalytic Converters

Location of test cells:

- EU-TESTCELL1 – large test cell, located in room E124
- EU-TESTCELL2 – small test cell, located in room E122

Note: In contrast, EU-TESTSTAND, discussed earlier in this report, is the smallest cell. It is not part of FG-TESTCELLS. It is located in room E125, and is said to have not been used in several years.

On 3/22/2023, MSU staff took AQD to the Engineering Building, Automotive Research area, and met with Tom Stuecken. The test cells were shown to AQD.

EUTESTCELL1 is being used, and there were 3 engines inside. The engine in the center of the cell was diesel-fuled, while the one to its right was ethanol-fueled. However, none of the engines were actually running, at the time of the inspection.

EUTESTCELL2, the smaller of the two test cells, contained a small engine which was no longer needed, and will be crushed for disposal, AQD was informed. .

FG-TESTCELLS compliance checklist on 3/22/2023:

ROP Special Condition	Requirement	Comments	Complies?
FG-TESTCELLS, SC I.	Acetaldehyde emissions limited to 0.12 lbs/hr, when burning Ethanol	A stack test would be required to verify.	Unknown
FG-TESTCELLS, SC II.1	Burn only unleaded gasoline, ethanol and No.2 diesel fuel in FG-TESTCELLS. Unleaded gasoline contains no more than 5/100ths of a gram of lead per gallon. The No. 2 diesel fuel shall contain no more than 0.05% sulfur.	They use only these fuel types. The No. 2 diesel fuel is Marathon Ultra Low Sulfur On Road Diesel, per a photo of the label on their fuel drum (see attached), from 4/24/2023 email from MSU.	Yes
	The permittee shall not burn more than 15,000 gallons of No.2 diesel fuel in FG-	For 2022, EU-TESTCELL1 used 110 gal. diesel, 3 gal.	Yes

FG-TESTCELLS, SC II.2	**TESTCELLS per 12-month rolling time period as determined at the end of each calendar month.**	**gasoline, and 0 gal. ethanol. For 2023 YTD, EU-TESTCELL1 used 45 gal. of diesel, 6 gal. of gasoline, and 0 gal. ethanol. EU-TESTCELL2 has used 0 gal. fuel in 2022 and 2023, so far. Records (attached) were received on 4/24/2023, per request.**	
FG-TESTCELLS, SC II.3	**The permittee shall not burn more than a total of 15,000 gallons of combined unleaded gasoline and ethanol fuel in FG-TESTCELLS per 12-month rolling time period as determined at the end of each calendar month.**	**For 2022, EU-TESTCELL1 used 110 gal. diesel, 3 gal. gasoline, and 0 gal. ethanol. For 2023 YTD, EU-TESTCELL1 used 45 gal. of diesel, 6 gal. of gasoline, and 0 gal. ethanol. EU-TESTCELL2 has used 0 gal. fuel in 2022 and 2023, so far. Records (attached) were received on 4/24/2023, per request.**	**Yes**
FG-TESTCELLS, SC III.1	**Operate each engine in FG-TESTCELLS for research and teaching purposes only and not for the development of engines or engine test services for commercial purposes**	**AQD was assured that engines are only operated for research and teaching purposes, not for commercial purposes.**	**Yes**
FG-TESTCELLS, SC IV.1	**The permittee shall equip and maintain each engine in FG-TESTCELLS with a catalytic converter when burning gasoline**	**AQD was shown catalytic converters in each test cell.**	**Yes**
FG-TESTCELLS, SC V.1	**If requested by the AQD, verify Acetaldehyde emission rates from EU-TESTCELL1 and EU-TESTCELL2, by testing at owner's expense, in accordance with Department requirement**	**NA, as AQD has not requested this.**	**NA**
FG-TESTCELLS, SC VI.1	**The permittee shall complete all required records in a format acceptable to the AQD District Supervisor by the 15th day of the calendar month, for the previous calendar month, unless otherwise specified in any**	**Records were kept in a satisfactory manner, although it is not known if they are finished y the 15th day of the calendar month,**	**Yes**

	monitoring/recordkeeping special condition.	**for the previous calendar month.**	
FG-TESTCELLS, SC VI .2	**The permittee shall keep, in a satisfactory manner, monthly and previous 12-month fuel use records for FG-TESTCELLS.**	**Records were kept in a satisfactory manner.**	**Yes**
FG-TESTCELLS, SC VI.3	**The permittee shall keep, in a satisfactory manner, records of the maximum lead content in the gasoline fuel to be used in FG -TESTCELLS upon each delivery.**	**On 4/24/2023, AQD received gasoline analysis (attached) from MSU, showing that no lead was detected.**	**Yes**
FG-TESTCELLS, SC VI.4	**The permittee shall keep, in a satisfactory manner, records of the maximum sulfur content in the diesel fuel to be used in FG-TESTCELLS upon each delivery.**	**Per photo (attached), received on 4/24/2023, the diesel fuel is Ultra Low Sulfur On Road Diesel.**	**Yes**
FG-TESTCELLS, SC VII.1-3	**Standard ROP reporting conditions.**	**MSU complies with this.**	**Yes**
FG-TESTCELLS, SC VII.4	**No less than 90 days prior to any testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test.**	**NA, as AQD has not required testing.**	**NA**
FG-TESTCELLS, SC VIII.	**The exhaust gases from the test cells shall be discharged unobstructed vertically upwards from stacks with the following dimensions:** 1. EU-TEST STAND1: Max. diameter of 10”, and minimum ht. above ground level of 37.83 feet. 2. EU-TESTSTAND2: Max. diameter of 10”, and minimum ht. above ground level of 37.83 feet.	**Unknown, as AQD did not examine during this inspection. A future inspection can focus on this.**	**Unknown**
	NA	**NA**	**NA**

I FG-TESTCELLS, SC X.			

MSU ROP, SECTION 2 EMISSION UNITS AND FLEXIBLE GROUPS:

All units at the T.B. Simon Power Plant currently burn natural gas. Some have the option to burn diesel fuel as backup. Coal-firing of the plant ceased years ago. Since coal was phased out around 1/31/2017, for EU-UNIT1 and EU-UNIT2, baghouses were removed from the flue gas stream. EU-UNIT3 still has an electrostatic precipitator, or ESP, which is turned off. Without the use of coal as fuel, they no longer have SO2 limits at T.B. Simon.

The plant provides power for MSU, although at night MSU may turn down the plant to purchase cheaper electrical power. AQD has been advised that the plant provides all of the steam on campus for heating, cooling, and research.

Arrival:

On 3/13/2023, I arrived in the parking lot of the T.B. Simon Power Plant at 8:07 AM. Steam was visible from the large brick exhaust stacks, but there was no opacity. The east stack serves Boilers 1 and 2, while the west stack serves Boilers 3 and 4. No odors were detected. Weather conditions were 28 degrees F, overcast and snowing, with no breeze.

I signed in, and met with MSU Environmental Compliance Officer Mary Lindsey, MSU Power and Water Department Utilities and Environmental Analyst Amanda Groll, MSU Health & Safety contact Jamie, and with MSU Remote Sensing & Geographical Information System (GIS) Geo-Spacial Analyst Robert Goodwin. R. Goodwin had been working with AQD Assistamt Director Dr. Jay Olageur on a project combining GIS with AQD activities, and was attending today to learn more about the AQD inspection process, and how their project may have the potential to enhance the inspection process..

Safety apparel:

For T.B. SImon inspection, safety galsses with side shields, hearing protection (double hearing protection if visiting the RICE units), and sturdy footwear are required. I wore a disposable paper mask during the COVID pandemic, out of personal preference.

Recent history:

PTI application No. 139-18 was approved on 5/22/2019, and is being rolled into the ROP during the current renewal cycle. The PTI allows for a new package steam boiler, and a RICE plant. This permit will be discussed later in this activity report, following the compliance check of the ROP.

T.B. Simon has been moving from continuous emission monitoring systems (CEMS) to predictive emissions monitoring systems (PEMS). Right now, they are using PEMS for Units 1, 2, 4, and 6, pursuant to 40 CFR Part 75, for ozone season, and all year long, for 40 CFR Part 60. However, one CEMS is still used, for Unit 3, A. Groll advised, because it is the only unit not presently qualifying as a low emitter, i.e. less than 50 TPY, for NOx. MSU evidently had to report it this way, even though it is not over 50 TPY for Nox.

AQD inquired as to what advantages PEMS offer, when compared with a CEMS. A. Groll explained that CEMS must be calibrated daily, and can have more downtime. PEMS rely on parameters which are collected all the time, and use claculations, and that past information is always available. Therefore, there is very little downtime.

Relative Accuracy Test Audits (RATAs) are required for the CEMS and the PEMS. MSU's RATAs are done in February, with the latest one being in February 2023.

A. Groll emailed a screenshot of PEMS data for the 6 boilers to AQD the morning of 3/13/2023, but it was later dsicovered that the screenshot defaulted to portrait mode, cutting off some of the data. She subsequentlyemailed to me a 4:27 PM screenshot. Please see data, below:

Boiler 1:

Parameter	Value	Status
B1 NOx 01M (PEMS)	98.208	4
B1 CO2 % 01M (PEMS)	7.505	4
B1 Gas Total kscf/hr 01M	197.168	1
B1 Heat Input mmBtu/hr 01M	205.055	1
B1 NOx lbs/mmBtu 01M	0.163	4
B1 LME NOx tons Ozone Season Sum	0.00	-

Boiler 2:

Parameter	Value	Status
B2 NOx 01M (PEMS)	74.902	4

B2 CO2 % 01M (PEMS)	7.163	4
B2 Gas Total kscf/hr 01M	187.545	1
B2 Heat Input mmBtu/hr 01M	195.047	1
B2 NOx lbs/mmBtu 01M	0.130	4
B2 LME NOx tons Ozone Season Sum	0.00	-

Boiler 3:

Parameter	Value	Status
B3 NOx 01M (PEMS)	59.793	3
B3 CO2 % 01M (PEMS)	5.398	3
B3 Gas Total kscf/hr 01M	259.210	1
B3 Heat Input mmBtu/hr 01M	269.578	1
B3 NOx lbs/mmBtu 01M	0.138	3

Boiler 4:

Parameter	Value	Status
B4 NOx 01M (PEMS)	0.000	0
B4 CO2 % 01M (PEMS)	0.000	0

B4 Gas Total kscf/hr 01M	0.000	0
B4 Heat Input mmBtu/hr 01M	0.000	0
B4 NOx lbs/mmBtu 01M	0.000	0
B4 LME NOx tons Ozone Season Sum	0.0	-

Boiler 7:

Parameter	Value	Status
B7 NOx ppm 01M	0.000	11
B7 O2% 01M	0.000	11
B7 NG Flow kscfh 01M	0.000	11
B7 Total Heat Input mmBtu/hr 01M	0.000	11
B7 NOX lb/mmBtu 01M	0.000	11
B7 PEMS Status 01M	0.000	11

Gas Turbine 6:

Parameter	Value	Status
GT6 NOx ppm 01M (PEMS)	0.000	0
GT6 O2 % 01M (PEMS)	0.000	0

GT6 CO ppm 01M (PEMS)	0.000	0
GT6 Gas Total kscf/hr 01M	0.000	0
GT6 Heat Input mmBtu/hr 01M	0.000	0
GT6 NOx lbs/mmBtu 01M	0.000	0
GT6 CO lbs/mmBtu 01M	0.000	0

Inspection:

EU-UNIT3 compliance with PTI 75-14C, rather than the ROP special conditions, on 3/13/2023:

DESCRIPTION: Dry bottom wall-fired natural gas fired boiler capable of generating 350,000 lb./hr. of steam. The boiler can be used to generate heating steam and electricity for the university. This boiler is equipped with overfire air. (PTI 75-14B)

Flexible Group ID: FG-BLRMACT-EXISTINGGAS1

POLLUTION CONTROL EQUIPMENT: Low-NOx burners.

EU-UNIT 3 was operating, at the time of the inspection. There were no visible emissions from the ehaust stack shared with EU-UNIT4, other than a partially attached steam plume. As previously mentioned, EU-UNIT3 has PEMS, in addition to still having a CEMS.

EU-UNIT3 data on 3/13/2023 was obtained from PEMS, from a 4:27 PM screenshot by A. Groll:

Boiler 3:

Parameter	Value	Status
B3 NOx 01M (PEMS)	59.793	3
B3 CO2 % 01M (PEMS)	5.398	3
B3 Gas Total kscf/hr 01M	259.210	1
B3 Heat Input mmBtu/hr 01M	269.578	1
B3 NOx lbs/mmBtu 01M	0.138	3

Note: Because PTI 75-14C was issued on 3/16/2017, after the existing ROP was renewed, the compliance check done on EU-UNIT3 was not done with the ROP special conditions, but with the PTI 75-14C secial conditions. Please see the section of this report devoted to PTI 75-14C, later in this report.

EU-UNIT4 on 3/13/2023:

Note: please see compliance checklist for PTI 75-14C later in this report. This PTI was issued on 3/16/2017, and will be rolled into the ROP, during the current renewal cycle.

EMISSION UNIT DESCRIPTION: Circulating fluidized bed boiler capable of firing natural gas and bituminous coal and is capable of generating 350,000 lb/hr of steam. The boiler is used to generate steam for the university and for the firing of a steam turbine to produce electricity for the university. Coal was ceased by January 31, 2017.per PTI 75-1C.

POLLUTION CONTROL EQUIPMENT:

- Baghouse collector for particulate control (was only used when firing solid fuel)
- Selective non-catalytic reduction (SNCR) system for nitrogen oxide control
- Limestone injection for sulfur dioxide control (was only used when firing solid fuel)

EU-UNIT4 was not operating, at the time of the inspection. There were no visible emissions from the shared exhaust stack with EU-UNIT3 other than steam . AQD has been advised that Unit 4 burns with a lower temperature than other boilers, with more staged combustion. It therefore produces less thermal NOx than other boilers.

EU-UNIT4 PEMS data at 4:27 PM on 3/13/2023:

Parameter	Value	Status

B4 NOx 01M (PEMS)	0.000	0
B4 CO2 % 01M (PEMS)	0.000	0
B4 Gas Total kscf/hr 01M	0.000	0
B4 Heat Input mmBtu/hr 01M	0.000	0
B4 NOx lbs/mmBtu 01M	0.000	0
B4 LME NOx tons Ozone Season Sum	0.0	-

EU-UNIT5, on 3/13/2023:

Note: Compliance was checked with PTI 75-14C, later in this report, rather than with ROP special conditions.

EMISSION UNIT DESCRIPTION: Heat recovery steam generator (HRSG) with natural gas fired duct burner capable of 80 MMBTU/hr heat input for EU-UNIT6. (PTI 13-04)

POLLUTION CONTROL EQUIPMENT: NA.

EU-UNIT5 was not running on 3/13/2023, as EU-UNIT6 was not running.

EU-UNIT6 on 3/13/2023:

Note: Compliance was checked with PTI 75-14C, later in this report, rather than with ROP special conditions.

EMISSION UNIT DESCRIPTION: 139 MMBtu/hr natural gas-fired turbine with dry-low NOx burner (considered a lean pre-mix turbine) and HRSG (EU-UNIT5), capable of generating 115,000 lbs of steam/hour and 12.0 mW. The heat rate based on lower heating value of the fuel for EU-UNIT6 is 10.6 kJ/Wh.

POLLUTION CONTROL EQUIPMENT: Low-NOx burner.

Recent history:

On 1/23/2023, MSU submitted to AQD a copy of a monitoring petititon to EPA titled, *Monitoring Petition – 40 CFR Part 63 Subpart YYYY, Combustion-Based Emission Control for Natural Gas-Fired Turbine, Michigan State University [SRN: K3249*].

EU-UNIT6, aka Gas Turbine 6, or GT6, was not running on 3/13/2023.

PEMS data from a 4:27 PM screenshot on 3/13/202 provided by A. Groll was as follows:

Parameter	Value	Status
GT6 NOx ppm 01M (PEMS)	0.000	0
GT6 O2 % 01M (PEMS)	0.000	0
GT6 CO ppm 01M (PEMS)	0.000	0
GT6 Gas Total kscf/hr 01M	0.000	0
GT6 Heat Input mmBtu/hr 01M	0.000	0
GT6 NOx lbs/mmBtu 01M	0.000	0
GT6 CO lbs/mmBtu 01M	0.000	0

EU-EMGENGINE:

DESCRIPTION: Kohler compression ignition1528 horsepower, 1020kW, black start existing reciprocating internal combustion engine, for EU-UNIT6.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT: NA

Note: Please see section of this activity report for PTI 75-14C, for a compliance checklist for EU-EMGENGINE. This PTI was issued on 3/16/2017, and will be rolled into the ROP, during the current renewal cycle.

FG-UNIT1/2 on 3/13/2023:

EMISSION UNIT DESCRIPTION: Two dry bottom wall-fired natural gas fired boilers each capable of generating 250,000 lb/hr of steam. The boilers are used to generate steam for the university and for the firing of a steam turbine to produce electricity (CHP). The boilers are equipped with overfire air. (PTI 75-14A

POLLUTION CONTROL EQUIPMENT: Low-NOx burners.

Units 1 and 2 share a stack. Unit 1 and 2 were operating on 3/13/2023. There were no visible emissions from the exhaust stack.

Note: Please see compliance checklist for PTI 75-14C, later in this report. PTI 75-14C was issued on 3/16/2017, and will be rolled into the ROP during the current renewal cycle.

FG-UNIT5/6 on 3/13/2023

EMISSION UNIT DESCRIPTION: 139 MMBtu/Hr heat input natural gas fired turbine with dry low-NOx burner, heat recovery steam generator (HRSG) and a natural gas fired duct burner rated at 80 MMBTU/hr. heat input. (PTI 13-04)

POLLUTION CONTROL EQUIPMENT: NA.

Note: Please see compliance checklist for PTI 75-14C, later in this report. PTI 75-14C was issued on 3/16/2017, and will be rolled into the ROP during the current renewal cycle.

FG-2COLDCLEANER on 3/13/2023:

EMISSION UNIT DESCRIPTION: Any cold cleaner that is grandfathered or exempt from Rule 201 pursuant to Rule 281(h) or Rule 285(r)(iv). Existing cold cleaners were placed into operation prior to July 1, 1979. New cold cleaners were placed into operation on or after July 1, 1979.

POLLUTION CONTROL EQUIPMENT: NA.

This flexible group includes EU-DEGTSIMONP1 and EU-DEGTSIMONP2. The solvent being used in both units was still Zep Dyna 143, which was in use during the 2017 inspection by AQD's N. Hude.

Note: Please see FG-2COLDCLEANER compliance checklist with PTI 75-14C, later in this report. This PTI was issued on 3/16/2017, and will be rolled into the ROP, during the current renewal cycle.

FG-4MATVENTS on 3/13/2023:

EMISSION UNIT DESCRIPTION: Material handling equipment associated with Unit 4 boiler. EU-CONVEYOR4 and EU-LIMESILO4 were no longer in use, as of January 31, 2017.

Emission Units: EU-CONVEYOR4, EU-ASHEXH4, EU-LIMESILO4, EU-ASHSILO4, EU-SANDSILO4

POLLUTION CONTROL EQUIPMENT:

- Bag filter on EU-CONVEYOR4
- Cyclone on EU-ASHEXH4
- Bag filter on EU-LIMESILO4
- Bag filter on EU-ASHSILO4
- Bag filter on EU-SANDSILO4

Note: Please see the section of this activity report which covers PTI 75-14C, for compliance checklist for FG-4MATVENTS.

FG-BLRMACT-EXISTINGGAS1, PTI 75-14C on 3/13/2023:

FG-BLRMACT-EXISTINGGAS1 DESCRIPTION Gas 1 Fuel Subcategory requirements for existing Boilers at major sources of Hazardous Air Pollutants per 40 CFR Part 63, Subpart DDDDD. EU-UNIT1, EU-UNIT2, and EU-UNIT3 must comply with this subpart no later than January 31, 2016, and EU-UNIT4 must comply with this subpart no later than January 31, 2017.

Emission Units: EU-UNIT1, EU-UNIT2, EU-UNIT3, EU-UNIT4

POLLUTION CONTROL EQUIPMENT NA

This flexible group applies to EU-UNIT1, EU-UNIT2, EU-UNIT3, and EU-UNIT4. On 6/22/2017, MSU stated that each boiler has continuous oxygen trim systems that maintain an optimum air to fuel ratio thus requiring a tune-up every 5 years per 63.7540(a)(12). Notes to add this fact to the next ROP have been added to the folder.

AQD has emailed a checklist of the numerous requirements in this flexible group to MSU's A. Groll, on 6/2/2023.

---------- ROP Section2 inspection complete ----------

Exempt emission unit not required to be in the ROP:

EU-LINENSERVICES; Rule 281(2)(f):

The MSU institutional laundromat known as Spartan Linen Services was inspected by AQD on 6/28/2021. This was pursuant to an initiative by the U.S. Environmental Protection Agency to inspect industrial or institutional laundromats. The main concern was not with the cleaning materials used, such as detergents, but with oils, grease, or solvents which could potentially be on cloth rags or towels sent to be cleaned. AQD has been advised that any rags which are contaminated with oils or solvents are not washed; rather, they are placed into a flammable container, which is sent to waste storage and shipped out as waste. There were no concerns noted at that time, and it did not warrant an inspection this year. I noted, on 6/28/2021, that there were no visible emissions from Spartan Linen Services, while passing by the building.

The facility, as described during the inspection, appears as if it should meet the exemption criteria of Rule 281(2)(f). It is not required to be in the ROP.

---------- PTIs which will be rolled into the current ROP renewal ----------

PTI 175-11A, for FG-WSF:

PTI 175-11A Emission units:

Emission Unit ID	EMISSION UNIT DESCRIPTION (Including Process Equipment & Control Devices(s))	Flexible Group ID	Compliance Status
EU-CHEM1	Chemical bench fume hood located on Jolly Road. Consolidation of small waste containers is conducted under this hood.	FG-WSF	Compliance; not operating
EU-FUMEHOOD1	Walk-in fume hood #1 located on Jolly Road. Consolidation of waste containers is conducted under this hood.	FG-WSF	Compliance; not operating

EU-FUMEHOOD2	Walk-in fume hood #2 located on Jolly Road. Consolidation of waste containers is conducted under this hood.	FG-WSF	Compliance; not operating
EU-FUMEHOOD3	Walk-in fume hood #3 located on Jolly Road. Consolidation of waste containers is conducted under this hood.	FG-WSF	Compliance; not operating

FG-WSF summary table:

Flexible Group ID ID	Flexible Group Description	Associated Emission Unit IDs	Compliance Status
FG-WSF	Waste Storage Facility (WSF), that receives, stores, and consolidates laboratory waste before sending it out for disposal.	EU-CHEM1, EU-FUMEHOOD1, EU-FUMEHOOD2, EU-FUMEHOOD3	Compliance; not operating

Background:

The Waste Storage Facility (WSF) receives, consolidates and stores waste from the laboratories throughout campus. During the consolidation process, waste is consolidated in laboratory hoods from small vessels into either 5 gallon carboys or 55 gallon drums dependent on the waste type. The laboratory hoods are not in constant use or constantly operating; consolidation times are tracked in minutes. This facility is permitted under the Resource Conservation and Recovery Act (RCRA), and has operated since the 1980s.

From the Permit Eval for PTI 175-11A:

The WSF was initially permitted under PTI No. 175-11 which was rolled into the facility's ROP. MSU currently operates under ROP No. MI-ROP-K3249-2016a. On 8/9/2022, PTI 175-11A was approved as a revision to the original PTI. The revision allowed for 4 new fume hoods at the WSF, as follows:3 walk-in fume hoods will replace existing fume hoods EU-CONSOL1 and EU-CONSOL2, and the new bench fume hood will replace existing fume hood EU-CHEM. The bench hood will be the same size as EU-

CHEM, and the existing fan and exhaust stack will not change. The revision increased the allowable hours of consolidation from 300 to 350 hours per 12-month rolling period.

Per the ROP, and the original PTI 175-11, MSU was required to conduct ambient air monitoring for air toxics, on an annual basis. In 2018, AQD agreed to reduce the frquency to every other year, based on 5 years of monitoring data which was provided. In 2022, MSU requested a further reduction in required air monitoring frequency, although it did not appear in PTI 175-11A. AQD agreed to reduce the air monitoring frequency to once every 5 years, following review of the previous air monitoring data, which showed no significant pollutants of concern.

PTI 175-11A will be rolled into the ROP during the current renewal cycle, allowed for some changes at the facility.

FG-WSF inspection on 3/22/2023:

On 3/22/2023, AQD inspected the WSF. There were no odors outside of the WSF building. There were no visible emissions from either exhaust stacks or the roofline. Weather conditions were overcast, 41 degrees F, and humid from recent rains.

Onsite was operator Brian Smith. The materials handled here are aqueous-based chemicals with some VOCs, and they do not mix incompatible chemicals.

AQD has been informed that over 50% of their waste is typically laboratory waste. The rest is said to come from support facilities, farms, and dorms. They typically pick chemical waste from campus and off-campus properties AQD was told. B. Smith explained their procedures and the PPE used here, including supplied air.

On Mondays, consolidation of smaller volumes of chemicals is done in a consolidation room, while on Tuesdays, consolidation of larger volumes of chemicals is done in a much larger room. Because today, 3/22/2023, was a Wednesday, no consolidation was occuring.

In a small room, the consolidation room, they do "lab packing," putting small bottles in larger containers. They were stored on shelves by type, such as:

- Flammable liquid
- Flammable solid
- Hg
- poisons
- Heavy Metals
- organics
- Oxidizers
- Inorganic peroxide
- Corrosive
- Organic solids
- inorganic solids

In this consolidation room they also handle occasional drums or totes, but usually the volumes are 5 gallons or less. The hood used for consolidation of small bottles of chemicals in the consolidation room is EU-CHEM1. The hood has a sash to protect workers, and so there are fewer PPE requirements.

Compatible chemicals are poured in drums, while incompatible chemicals are stored on the shelves. They no longer pour reagants, which are said to be too reactive or effervescent. AQD was informed that staff here always work in pairs, never alone. The floor has a barrier to prevent any spilled chemicals from leaving the room.

AQD was shown the main room, where consolidation of large volumes of chemicals occurs. It was observed that all floors were designed to contain any possible spillage of the various chemical types.

There is also a third room, their back warehouse, where they store:

- Used oil
- Non-RCRA-regulated waste
- Empty car boy containers
- Pharmaceuticals
- pesticide waste
- Latex paint
- Aerosols
- Flammable paint, more like resins or epoxies
- New, empty storage containers

AQD was shown the hardcopy air records for the WSF, for March 2023. AQD received electronic copies of records from the WSF from M. Lindsey, please see attached.

PTI 175-11A, FG-WSF compliance checklist, from 3/22/2023 inspection:

PTI Special Condition	Requirement	Comments	Complies?
FG-WSF, SC I.	NA	NA	NA
FG-WSF, SC II.	NA	NA	NA
FG-WSF, SC III.	Shall not consolidate waste in FG-WSF for more than 350 hours per 12-month rolling time period as determined at the end of each calendar month.	Excel spreadsheet (attached) sent to AQD on 3/23/2023 showed the rolling 12-month total for Feb. 2023 was 137.33 hrs.	Yes
FG-WSF, SC IV.	NA	NA	NA
FG-WSF, SC V.	NA	NA	NA
FG-WSF, SC VI.1	Every 5 years, conduct an ambient air monitoring study in a manner and with instrumentation approved by the AQD Air Monitoring Unit. Upon approval of the AQD District Supervisor, the permittee may change the frequency of the ambient air	This is being done. AQD was advised that these records are always accessible, even if they are stored at the MSU archives.	Yes

	monitoring. All ambient air monitoring data shall be kept on file at the facility and made available to the Department upon request.		
FG-WSF, SC VI. 2	**Keep, in a satisfactory manner, a log of the waste. The log will state the classification of the waste by chemical name, intake date, storage unit ID, disposal shipping date, and number of hours that waste is consolidated in FG-SWF. The log will be tracked via 12-month rolling time period, as determined at the end of each calendar month.**	**A scan (attached) of the January 2023 log shows they are doing this.**	**Yes**
FG-WSF, SC VI.3	**Keep, in a satisfactory manner, a log of each constituent evaluation occurrence. The permittee shall keep all records on file at the facility and make them available to the Department upon request.1**	**AQD was advised that they do not perform constituent evaluation occurrences here, as they do not accept unknown materials. Any unknowns are sent to an annex, to fingerprint the chemical. Once it has been identified, it can come to the FG-WSF as a characterized waste.**	**Yes**
FG-WSF, SC VI.4	**The permittee shall keep, in a satisfactory manner, the waste tags for the containers that have been consolidated in FG-WSF. The permittee shall keep all records on file at the facility and make them available to the Department upon request.1**	**AQD was shown that the waste tags are being kept.**	**Yes**
FG-WSF, SC VII.1	**NA**	**NA**	**NA**
FG-WSF, SC VIII.1	**Exhaust to be discharged unobstructed vertically upwards through stacks as follows:** 1. SV-CHEM1: Max. diam. 6”, min. ht. 18’ 2. SV-FUMEHOOD1: Max. diam. 12”, min. ht. 30’ 3. SV-FUMEHOOD2: Max. diam. 12”, min. ht. 30’	**Stack heights appeared to be appropriate.**	**Yes**

	4. SV-FUMEHOOD3: Max. diam. 12", min. ht. 30'		
FG-WSF, SC IX.1	**NA**	**NA**	**NA**

No instances of noncompliance were identified, and housekeeping appeared good. We left the WSF at 9:10 AM.

PTI 99-17, for EU-ETO2:

EU-ETO2, PTI No. 99-17, supplemental revision 9/28/2017:

EU-ETO2 is the only ethylene oxide (EtO) sterilizer on campus at this time. It is not currently part of MSU's ROP, having been issued on 8/22/2017, after the latest ROP issuance and minor modification. A supplemental revision was made n 9/28/2017, to correct an error. This PTI will be rolled into the ROP during the current ROP renewal cycle.

EU-ETO, the EtO sterilizer whose requirements are part of the MSU ROP, is no longer in service. AQD was advised that it has been removed, and that EU-ETO2 is located where it once was.

The ROP contains FG-STERILIZERS, a flexible group for one or more EtO sterilizers. In the ROP, it contains EU-ETO, which has now been removed, as mentioned above. EU-ETO2 can be added to this flexible group, upon renewal of the ROP.

AQD arrived at the MSU large animal veterinary facility at 9:47 AM. There were no visible emissions from the stack serving EU-ETO. Ms. Merrick Murray, the Vet Med Central Sterilization Operator, has over 23 years of experience. AQD was informed that there have been no changes to the equipment since the 2021 inspection by AQD. They are using the same EtO cartridges, by the same manufacturer.

In addition to the current EtO sterilizer, EU-ETO2, there are other sterilizer units, like a Sterrad brand unit, which uses hydrogen perioxide, and would qualify as exempt from needing a permit to install under Rule 281(2)(i), provided they process materials which are free of mercury. They use the Sterrad as much as possible, AQD was told, since it can clean a load in only 1 hour, versus 20 hours for EU-EtO2. AQD was shown the Sterrad unit, which was not operating, at the time. It uses two ampules of hydrogen peroxide, when it runs.

There is an autoclave onsite. Since this uses steam, it appears that it would meet the same exemption, provided mercury-containing materials are not processed.

Rule 281(2)(i) exempts the following:

(i) Sterilization equipment processing mercury-free materials at medical and pharmaceutical facilities using steam, hydrogen peroxide, peracetic acid, or a combination thereof.

There is also a washer onsite, I had been informed, during the 2019 inspection This could potentially meet the Rule 281(2)(e) exemption, which exempts:

(e) Equipment used for washing or drying materials, where the material itself cannot become an air contaminant, if no volatile organic compounds that have a vapor pressure greater than 0.1 millimeter of mercury at standard conditions are used in the process and no oil or solid fuel is burned.

A sonic cleaner is also said to be onsite. It is not expected to require a permit to install.

EU-ETO2, is located in an enclosed room. It was not running, at the time, since it operates overnight. There were no odors, nor any visible fugitive emissions from the sterilizer. Procedures and emergency contact numbers were posted, in the room.

EU-ETO2 runs once per night, and the cycle takes 20 hours. However, they may only operate it once every 4 days, as they wait to use it until there is a full load. They do not process partial loads, unless there is a special need for an item to be cleaned. The sterilizer conducts warm cycles, AQD was told, because these can be completed in 20 hours, whereas a cold load would take 3 days.

AQD was shown one of the ethylene oxide gas cartridges, from a storage cabinet. Each cartridge contains 100 grams, or 3.52 oz. of ethylene oxide. This ensures that a consistent amount of sterilant gas is introduced into the sterilizer each time it is operated. There were no odors or fugitive emissions from the cartridge, or from the cabinet where it was stored.

There are a number of safety features intended to protect employees from exposure to ethylene oxide, some of which were built into the sterilizer itself, and some of which were added to the room AQD was in. The storage cabinet for storing cartridges of ethylene oxide is itself said to have provisions for being exhausted in the event of a leaking cylinder, to protect staff inside the building. Additionally, EU-ETO2 has a hood for evacuating any released ethylene oxide.

After observing the EtO sterilizer itself, we observed the catalytic oxidizer control device for EU-ETO2, located on the building's second floor. The control device is also referred to as an abator. Although EU-ET)2 was not running, the temperature chart recorder for the abator was nonetheless functioning, showing the bed outlet temperature as 67.8-67.9 degrees F. AQD observed the Honeywell chart recorder, and the circular temperature chart on the unit, as well as boxes of circular chart recordings which are stored here.

The exhaust stack for the oxidizer is double walled, AQD was told, so it looks large in diameter, when seen from ground level. The inside diameter is said to be no more than 8 inches.. No visible emissions could be seen from ground level. The EtO sterilizer was not operating, at previously stated.

On 3/23/2023, M. Lindsey emailed copies of spreadsheets for EtO usage and emissions, abator temperature charts, and the abator Standard Operating Procedure, or SOP, please see attached.

.

<u>EU-ETO/PTI 99-17 Compliance checklist, from 3/22/2023 inspection of MSU:</u>

PTI 99-17 Special Condition	Requirement	Comments	Complies?
EU-ETO2, SC I.	ETO limit of 0.088 pounds per year	Calculations in an attached spreadsheet from 3/23/2023, based upon amount of EtO raw material utilized, and on the 99.9% control efficiency of the thermal oxidizer, indicate that in	Yes

		February 2023, rolling 12-month EtO emissions were 0.03564 lbs.	
EU-ETO2, SC II.1	**Only use a sterilant gas consisting of 100 percent EtO.**	**The EtO content of the sterilant gas cartridges is 100% EtO, as described on the manufacturer's label.**	**Yes**
EU-ETO2, SC II.2	**Do not use more than 100 grams (3.5 oz.) of EtO per sterilization cycle in EU-ETO2.** **Note: 100 grams is equal to 3.527 oz. The 3.5 oz. referenced in the PTI condition above is rounded down.**	**Cartridges of 100 grams (3.527 oz.) of EtO are used.**	**Yes**
EU-ETO2, SC II.3	**Do not perform more than 400 sterilization cycles in EU-ETO2 per 12-month rolling time period.**	**Because MSU never performs more than one sterilization cycle/day, in EU-ETO2, the yearly number of sterilization cycles is not expected to exceed 400. At the end of February 2023, MSU was at 162 cycles per 12-month rolling time period.**	**Yes**
EU-ETO2, SC III.	**The permittee shall not operate EU-ETO2 unless a malfunction abatement plan (MAP) as described in Rule 911(2), has been submitted within 30 days of permit issuance, and is implemented and maintained.**	**AQD has a copy of the 10/2017 MAP for EU-ETO2. It is attached to the AQD 2019 MSU inspection activity report, in the hardcopy file within the Lansing District Office.**	**Yes**
EU-ETO2, SC III.1.a	**A complete preventative maintenance program including identification of the supervisory personnel responsible for overseeing the inspection, maintenance, and repair of air-cleaning devices, a description of the items or conditions that shall be inspected, the frequency of the inspections or repairs, and an identification of the major replacement parts that shall be maintained in inventory for quick replacement.**	**The 10/2017 MAP identifies supervisory personnel, Vet Med Central Sterilization Operator Merrick Murray and MSU Environmental Compliance Officer Thomas Grover as emergency contacts. The MAP identifies the manufacturer of the unit, 3M, as responsible for examination, maintenance, and repairs. Items or conditions to be inspected are identified as computer programs,**	**Yes**

		main power, hood flow sensor, user interruption sensor, cold temperature sensor, door sensor, gas sensor, chamber leak test, moisture injection, and service switches.	
EU-ETO2, SC III.1.b	**An identification of the source and air-cleaning device operating variables that shall be monitored to detect a malfunction or failure, the normal operating range of these variables, and a description of the method of monitoring or surveillance procedures.**	**Variables to be monitored include a temperature monitor for the catalytic oxidizer, and a temperature chart recorder. Normal operating range of the oxidizer is 290 to 500 degrees F. The MAP states that if the oxidizer is operating at less than 286 degrees F, a light for the "abator" will come on in the sterilizer room, and the sterilization cycle will not continue. The MAP states that 3M would be called in for repairs, at that point.**	**Yes**
EU-ETO2, SC III.1.c	**A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.**	**The MAP indicates that if sterilizer or the thermal oxidizer are not operating properly, "the machine will go into shutdown mode. It will not allow a sterilization cycle to occur if all safety and temperature parameters are not met. In this case, employees evacuate the area, and call 3M for service to the machine." For loss of power, EU-ETO2 will shut down and enter into a locked mode, until the power is restored and the sterilization cycle will then continue.**	**Yes**
EU-ETO2, SC IV.1	**Shall not operate EU-ETO2 unless each respective closed loop recirculating-fluid vacuum pump, air ejector system, or other method of drawing a vacuum and evacuating the sterilizer chamber and which prevents the discharge of any EtO to a wastewater stream is installed,**	**Multiple fail-safes were built into this system, including alarm systems and emergency evacuation hood, and the ability to evacuate the chamber of the sterilizer.**	**Yes**

	maintained, and operated in a satisfactory manner on EU-ETO2.		
EU-ETO2, SC IV.2	Shall not operate EU-ETO2 unless the catalytic oxidizer is installed, maintained and operated in a satisfactory manner. Satisfactory operation of the catalytic oxidizer includes a minimum EtO control efficiency of 99.9 percent (by weight), a minimum catalyst bed outlet temperature of 290 °F, and a maximum space velocity of 6732 inverse hours.	AQD reviewed 4 circular chart recordings (attached) from January 2023, received on 3/23/2023. These showed temperatures of the catalyst bed outlet temperature. As M. Lindsey has previously explained, "The way the chart recorder is calibrated – line 0 equals 250^F and the last outer line equals 500^F. Each bold line in increments of 10 represents 25 additional degrees F. So as long as the abator is operating above line 16, it is above the mandated minimum 290^F." For the 4 dates, temperatures were always above the minimum 290 degrees F.	Yes
EU-ETO2, SC IV.3	Install, calibrate, maintain and operate in a satisfactory manner a temperature monitoring device to continuously monitor and record the outlet temperature of the catalytic oxidizer catalyst bed, during operation of EU-ETO2.	Based on the attached circular chart recordings from the Honeywell monitoring system, it appeared to be installed and operating properly. AQD was shown that several spare pen tips are kept nearby, in case the ink pen for the Honeywell chart recorder runs out.	Yes
EU-ETO2, SC V.	NA	NA	NA
EU-ETO2, SC VI.1	Complete all required calculations in a format acceptable to the AQD District Supervisor by the 15th day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition.	Records of emission calculations, received on 3/23/2023, were kept in an acceptable format.	Yes

EU-ETO2, SC VI.2	Monitor and record the outlet temperature of the catalytic oxidizer catalyst bed on a continuous basis during operation of EU-ETO2.	During the inspection, AQD was shown that a Honeywell data recording unit tracks outlet temperature of the catalyst bed on a continuous basis. AQD was also shown that the circular paper records are stored near the oxidizer itself. On 3/23/2023, AQD received examples of the temperature chart records, per request.	Yes
EU-ETO2, SC VI.3	The permittee shall keep the following information for EU-ETO2:		Yes
EU-ETO2, SC VI.3.a	The amount of EtO used per cycle.	The amount of EtO used per cycle is being recorded. Please see attached spreadsheet for January, 2023. Use is 3.52 oz. per cycle, equivalent to 100 grams, which is the limit in the ROP.	Yes
EU-ETO2, SC VI.3.b	The number of cycles processed per calendar month and 12-month rolling time period.	The attached spreadsheet shows cycles per month and 12-month rolling time period, from Jan. 2017 through Feb. 2023.	Yes
EU-ETO2, SC VI.3.c	EtO mass emission calculations determining the monthly emission rate in pounds per calendar month.	The attached spreadsheet for Jan. 2017 through Feb. 2023 shows monthly emissions of EtO.	Yes
EU-ETO2, SC VI.3.d	EtO mass emission calculations determining the annual emission rate in pounds per 12-month rolling time period as determined at the end of each calendar month.	The attached spreadsheet shows lbs of EtO emitted per 12-month rolling time period, from Jan. 2017 through Feb. 2023.	Yes
EU-ETO2, SC VII.1	Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by this Permit to Install, the permittee or the authorized agent pursuant to Rule 204,	AQD hard copy files do not contain a record of AQD having been notified upon completion of installation. It is unknown if notification was emailed to the	Unknown

	shall notify the AQD District Supervisor, in writing, of the completion of the activity.	previous AQD inspector, and did not get entered into the file.	
EU-ETO2, SC VIII.1	Exhaust gases shall be discharged unobstructed vertically upwards to the ambient air through a stack with a minimum height of 44 feet above ground level, and a maximum diameter of 8 inches.	The catalytic oxidizer stack is double walled, because of the heat from the oxidizer, and this was said to result in a thicker appearing stack. MSU's MAP for EU-ETO2 lists the stack height as 44 feet, and the inner diameter as 8 inches maximum. In 2021, AQD was assured that the stack height was measured, pursuant to N. Hude's 2017 inspection, and found to be 44 feet in height.	Yes
EU-ETO2, SC IX.1	The permittee shall not operate EU-ETO2 and EU-ETO (MI ROP #MI-ROP-K3249-2016a) simultaneously	AQD was advised that EU-ETO was removed from the site, and EU-ETO2 was installed where it had been located.	Yes

PTI No. 75-14C:

This PTI was issued on 3/16/2017, to remove all references to coal combustion and handling at the T.B. Simon Power Plant, which was ceasing the use of coal as a fuel.

EU-UNIT3 PTI 75-14C compliance checklist on 3/13/2023:

PTI 75-14C Special Condition	Requirement	Comments	Complies?
EU-UNIT3, SC I.	NOx limit 0.20 lbs/MMBtu	At 9:08 AM, EU-UNIT-3 NOx emissions were at 0.1106 lbs/mmBtu. In the 4:27 PM PEMS screenshot emailed to AQD, were at 0.138 lbs/mmBtu.	Yes

EU-UNIT3, SC II.1	**Shall only combust pipeline quality natural gas fuel in EU-UNIT3.**	**Natural gas is the only option for EU-UNIT3, as no coal or biomass is on site.**	
EU-UNIT3, SC III	**NA**	**NA**	**NA**
EU-UNIT3, SC IV.1	**Shall calibrate, maintain, and operate, in a satisfactory manner, devices to monitor and record** **the NOx and CO2 or O2 emissions and flow from EU-UNIT3, on a continuous basis and according to the procedures outlined in Appendix 3-2.**	**The PEMS for NOx and CO2 appear to be calibrated, maintained, and operated properly, from data available to AQD.**	**Yes**
EU-UNIT3, SC IV.2	**The maximum design heat input capacity for EU-UNIT3, shall not exceed 460 mmBtu per hour, based on the higher heating value (HHV) of the fuel.**	**Permit file information identifies the burner size as "a maximum of 460 MMBtu". On 6/22/17 Bob Ellerhorst had provided AQD's N. Hude a document stating that the unit had 4 burners rated at 115 MMBtu each for a total of 460 MMBtu using a heating value of 1050 btu/scf.**	**Yes**
EU-UNIT3, SC V.	**NA**	**NA**	**NA**
EU-UNIT3, SC VI.1	**The permittee shall continuously monitor and record, in a satisfactory manner, the NOx and CO2 or O2 emissions and flow from EU-UNIT3. The permittee shall operate the Continuous Emission Monitoring System** **(CEMS) (or Predictive Emissions Monitoring Systems (PEMS)) to meet the timelines, requirements and reporting detailed in Appendix 3 and shall use the CEMS (or PEMS) data for determining compliance with SC I.1.**	**MSU does monitor and record NOx and CO2 emissions from EU-UNIT3. Monitor downtime, if any, is submitted quarterly, in Excess Emissions Reports, as documented in MACES, under Reports Received , and under Excess Emissions Reports, then under Quality Assurance.**	**Yes**

EU-UNIT3, SC VI.2	**Records of all measurements including continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring systems' performance evaluations; all continuous monitoring system or monitoring device calibration checks; and records of adjustments and maintenance performed on these systems or devices.**	**It is AQD's understanding that these records are being kept.**	**Yes**
EU-UNIT3, SC VI.3	**The permittee shall monitor and maintain the following:**		**Yes**
EU-UNIT3, SC VI.3.a	**Amount of natural gas fired in EU-EUNIT3 on a monthly basis.**	**These records are being kept hourly, and can be sorted by calendar month.**	**Yes**
EU-UNIT3, SC VI.3.b	**Calendar month.**	**These records are being kept hourly, and can be sorted by calendar month.**	**Yes**
EU-UNIT3, SC VII.1	**The permittee shall submit two copies of an excess emission report (EER) and summary report for each CEMS (or PEMS) in an acceptable format to the AQD, quarterly and in accordance with 40 CFR 60.7(c) & (d). All reports shall be postmarked by the 30th day following each calendar quarter.**	**MSU complies with this.**	**Yes**
EU-UNIT3, SC VIII.1	**The exhaust gasses shall be exhausted unobstructed vertically upwards through a stack with a maximum diameter of 156 inches at a height of not less than 275 feet above ground level.**	**Per AQD's N. Hude: Aviation maps identify the stack heights of 1165msl and a base elevation in the area of approx. 860msl giving a stack height of at least 275 ft. The stack for Unit3 and Unit4 are shared as the stack for Unit1 and Unit2 are shared; both are the same height.**	**Yes**
			Yes

EU-UNIT3, SC IX.1	**The permittee shall meet the monitoring, recordkeeping, and reporting requirements of the NOx SIP Call during the ozone season (May 1 through September 30).**	**It appears MSU is compliant with this condition which requires the installation of a device to measure NOx mass(96.70(a)(1)), installation of a device to monitor heat input (96.70 (a)(2)), complete certification tests of the said devices(96.70(a)(3)), and record and report data (96.70(a)(4). Documented proof of compliance for these requirements has otherwise been covered in previous special conditions.**	
EU-UNIT3, SC IX.2	**The permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart DDDDD, for National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters by the initial compliance date.**	**Notification of compliance originally received on 2/25/2016.**	**Yes**
EU-UNIT3, SC IX.3	**The permittee shall comply with all applicable requirements of 40 CFR Part 60, Subpart D.**	**The requirements are to use pipeline quality natural gas and the MMBtu emission limit.**	**Yes**
EU-UNIT3, SC IX.4	**The permittee shall comply with all applicable requirements of 40 CFR Part 75.**	**The most recent RATA was conducted in February, 203.**	**Yes**
EU-UNIT3, SC IX.5	**The permittee shall provide written notification to the Air Quality Division not more than 30 days after the completion of the project and commencement of trial operation.**	**NA. This is carryover from a burner change out that had occurred as issued in PTI 75-14B and should not have been left in PTI 75-14C as notification was received. It can be removed from the ROP during the current ROP renewal cycle.**	**NA**

- 3rd QTR 2022 Excess Emission & Monitoring Performance Report for Unit 3,4, and 6 received 11/1/2022. Unit 3 NOx monitor had 0 downtime and 0 excess emission events. Operating hours reported.
- 2nd QTR 2022 Excess Emission & Monitoring Performance Report for Units 3, 4 & 6, received 7/28/2022. Unit 3 NOx monitor had 0 downtime and 0 excess emission events. Operating hours reported.
- 1st QTR 2022 Excess Emission & Monitoring Performance Report for Units 3, 4 & 6, received 5/3/2022 Unit 3 NOx monitor had 1 hr downtime due only to Daylight Savings Time (no loss of data) and 0 excess emission events. Operating hours reported.

EU-UNIT4 PTI 75-14C compliance checklist on 3/13/2023:

PTI 75-14C Special Condition	Requirement	Comments	Complies?
EU-UNIT 4, SC I.1	NOx limit of 0.076 lbs./MMBtu heat input	EU-UNIT4 was not operating during the entire 1st QTR 2023.	Not operating
EU-UNIT 4, SC I.2	NOx limit of 32.2 pph	EU-UNIT4 was not operating during the entire 1st QTR 2023.	Not operating
EU-UNIT 4, SC II.1	The permittee shall only combust pipeline quality natural gas fuel in EU-UNIT4.	Natural gas is the only option for EU-UNIT4, as there is no coal or biomass onsite.	Yes
EU-UNIT 4, SC III.1	The permittee shall not operate EU-UNIT4 unless a Malfunction Abatement Plan for EU-UNIT4 and its associated control equipment has been implemented and maintained. If at any time the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the permittee shall amend the MAP within 45 days after such an event occurs. The permittee shall also amend the MAP within 45 days, if new equipment is installed or upon request from the District Supervisor.	An updated MAP was received by AQD, on 5/12/2017.	Yes
		MSU uses PEMS for EU-UNIT4.	Yes

EU-UNIT 4, SC III.2	**The permittee shall calibrate, maintain, and operate continuous emission monitoring systems (CEMS) (or Predictive Emissions Monitoring Systems (PEMS)) to monitor and record the NOx, CO2 or O2 emissions for EU-UNIT4, on a continuous basis and according to the procedures outlined:**		
EU-UNIT 4, SC III.2.a	**The CEMS (or PEMS) shall complete a minimum of 1 cycle of operation for each successive 15-minute period.**	**The PEMS records data in 1-minute intervals.**	**Yes**
EU-UNIT 4, SC III.2.b	**The permittee shall check the zero and span calibration drifts for all CEM (or PEM) systems, at least once daily, and make the appropriate adjustments in accordance with the manufacturer's written procedure.**	**The PEMS documentation states that the PEMS does a daily zero and span calibration within the system.**	**Yes**
EU-UNIT 4, SC IV.1	**NA**	**NA**	**NA**
EU-UNIT 4, SC V.	**NA**	**NA**	**NA**
EU-UNIT 4, SC VI.1	**The permittee shall continuously monitor and record, in a satisfactory manner, the NOx, CO2 or O2 emissions from EU-UNIT4. The permittee shall operate each Continuous Emission Monitoring System (or Predictive Emissions Monitoring Systems)/Continuous Emission Rate Monitoring System (CEMS (or PEMS)/CERMS) to meet the timelines, requirements and reporting detailed in Appendix 3-2 and shall use the CEMS (or PEMS)/CERMS data for determining compliance with SC I.4-I.9 and I.12-13. Where the following data is required:**	**MSU is recording NOx and CO2 from EU-UNIT4 with PEMS. Please see below.**	**Yes**
			Yes

EU-UNIT 4, SC VI.1.a	**The 24-hour rolling average NOx emission rates in terms of pounds per million BTU heat input and pounds per hour.**	**MSU collects 24-hour rolling average NOx lbs/mmBtu emissions data. Please refer to 4/28/2023 Excess Emission and Monitoring System Performance Reports, for *BL4 Excess Emissions – NOx lb/mmBtu*; zero events reported, !st QTR 2023.**	
EU-UNIT 4, SC VI.2	**The permittee shall keep the following information on a monthly basis for EU-UNIT4:**	**Please see below.**	**Yes**
EU-UNIT 4, SC VI.2.a	**A record of the hours of operation.**	**Hours of operation are documented, as confirmed by Excess Emission Reports.**	**Yes**
EU-UNIT 4, SC VI.3	**The permittee shall calibrate, maintain, and operate a continuous emission monitoring system (CEMS) or Predictive Emissions Monitoring Systems (PEMS) to monitor and record the NOx, CO2 or O2 emissions from EU-UNIT4, on a continuous basis and according to the procedures outlined below and in Appendix 3-2:**	**MSU is recording NOx and CO2 from EU-UNIT4 with PEMS. Please see below.**	**Yes**
EU-UNIT 4, SC VI.3.a	**The CEMS (or PEMS) shall complete a minimum of 1 cycle of operation for each successive 15-minute period.**	**The PEMS data is recorded each minute.**	**Yes**
EU-UNIT 4, SC VI.3.b	**The permittee shall check the zero and span calibration drifts for all CEM (or PEM) systems, at least once** **daily, and make the appropriate adjustments in accordance with the manufacturer's written procedure.**	**It is AQD's understanding that this is being done.**	**Yes**
EU-UNIT 4, SC VI.4	**The permittee shall keep records of all measurements including continuous monitoring system, monitoring device,**	**It is AQD's understanding that this is being done.**	**Yes**

	and performance testing measurements; all continuous monitoring systems performance evaluations; all continuous monitoring system or monitoring device calibration checks; and records of adjustments and maintenance performed on these systems or devices.		
EU-UNIT 4, SC VI.5	**The Permittee shall monitor and maintain daily records on the following:**	**Please see below.**	**Yes**
EU-UNIT 4, SC VI.5.a	**Amount of natural gas fired in EU-UNIT4.**	**It is AQD's understanding that this is being done.**	**Yes**
EU-UNIT 4, SC VI.5.b	**Calendar date.**	**It is AQD's understanding that this is being done.**	**Yes**
EU-UNIT 4, SC VI.6	**The permittee shall keep records of the occurrence and duration of any startup, shutdown, or malfunction in** **the operation; any malfunction of the air POLLUTION CONTROL EQUIPMENT, or any periods during which a continuous monitoring system or monitoring device is inoperative.**	**It is AQD's understanding that this is being done. The Excess Emission Reports identify any time periods in which a CEMS or PEMS is inoperative.**	**Yes**
	"See Appendix 3-2"	**AQD emailed A. Groll on 5/24/2023, to inquire. On 5/25, she advised that for the PEMS calibrations, they do a Relative Accuracy Audit (RAA) in the 3rd quarter. She emailed the reports for Q3 2022 (please see attached). Because EU-UNIT4 was offline for the quarter, there was no RAA for it.**	**Yes**

EU-UNIT 4, SC VII.1	**Quarterly reporting of the "Excess Emission and Monitoring Systems Performance Report" and the "Summary Report" as specified in 40 CFR 60.7 (c) and (d) for NOx, (excess emissions shall be based on the limits identified in Section I). Due April 30 for reporting period January 1 to March 31, July 30 for reporting period April 1 to June 30, October 30 for reporting period July 1 to September 30, and January 30 for reporting period October 1 to December 31.**	**MSU is carrying this out as required. See MACES under "Emission Measurement," then "Excess Emission Reports." EU-UNIT4 had a single hour with monitor downtime reported for the 1st QTR 2022. Monitor availability was entered as 0.00%, because EU-UNIT4 was down for the entire 1st QTR.**	**Yes**
EU-UNIT 4, SC VII.2	**Quarterly reporting of the "Data Assessment Report" (ie. Linearity or CGA) as set forth in Appendix F of 40 CFR 60 for the CEMS (or PEMS). Due April 30 for reporting period January 1 to March 31, July 30 for reporting period April 1 to June 30, October 30 for reporting period July 1 to September 30, and January 30 for reporting period October 1 to December 31.2**	**These reports are submitted with the required reports in SCVII.1.and appear to be in compliance for QTRS 1-4 of 2022, after reviewing data entered by the Technical Programs Unit in MACES under "Excess Emissions Reports," then "Quality Assurance".**	**Yes**
EU-UNIT 4, SC VII.3	**The permittee shall notify the AQD of any physical or operational change which may increase the emission rate of any pollutant to which a standard applies, unless that change is specifically exempted. This notice** **shall be postmarked 60 days, or as soon as practical, before the change is commenced and shall include information on describing the precise nature of the change, present and proposed emission control systems,** **productive capacity before and after the change, and the expected completion date of the change.**	**Any changes would be handled through permit changes.**	**Yes**
EU-UNIT 4, SC VII.4	**No less than 30 days prior to testing, the permittee shall submit a complete test**	**No testing has been required since the 2017 AQD inspection.**	**Yes**

	plan to the AQD. The AQD must approve the final plan prior to testing. The permittee shall notify the District Supervisor or the Technical Programs Unit no less than 7 days prior to the anticipated test date. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test.		
EU-UNIT 4, SC VII.5	**Each calendar quarter, the permittee shall perform the Quality Assurance Procedures of the CEMS/PEMS set** **forth in 40 CFR Part 75, Subpart C. Within 30 days following the end of each calendar quarter, the permittee** **shall submit the results to the AQD**	**These reports are submitted to AQD with the required reports in SCVII.1. AQD's Technical Programs Unit reviewed the data and entered "Compliance" in MACES. This can be seen under "Excess Emissions Reports" then "Quality Assurance".**	**Yes**
"See Appendix 8-2"	**A. Annual, Semi-annual, and Deviation Certification Reporting** **The permittee shall use the MDEQ, AQD, Report Certification form (EQP 5736) and MDEQ, AQD, Deviation** **Report form (EQP 5737) for the annual, semi-annual and deviation certification reporting referenced in the Reporting Section of the Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Alternative** **formats must meet the provisions of Rule 213(4)(c) and Rule 213(3)(c)(i), respectively, and be approved by the** **AQD District Supervisor.** **B. Other Reporting** **Specific reporting requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special**	**MSU complies with this.**	**Yes**

	Conditions. Therefore, Part B of this appendix is not applicable.		
EU-UNIT 4, SC VIII.1	The exhaust gasses shall be exhausted unobstructed vertically upwards through a stack with a maximum diameter of 156 inches at a height of not less than 275 feet above ground level.	Per AQD's N. Hude: Aviation maps identify the stack heights of 1165msl and a base elevation in the area of approx. 860msl giving a stack height of at least 275 ft. The stack for Unit3 and Unit4 are shared as the stack for Unit1 and Unit2 are shared; both are the same height.	Yes
EU-UNIT 4, SC IX.1	The permittee shall meet the monitoring, recordkeeping, and reporting requirements of the NOx SIP Call during the ozone season (May 1 through September 30).	It appears MSU is compliant with this condition which requires the installation of a device to measure NOx mass (96.70(a)(1)), installation of a device to monitor heat input (96.70(a)(2)), complete certification tests of the said devices(96.70(a)(3)), and record and report data (96.70(a)(4). Documented proof of compliance for these requirements has otherwise been covered in previous special conditions.	Yes
EU-UNIT 4, SC IX.2	The permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart DDDDD, for National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters by the initial compliance date.	Notification of compliance originally received on 2/25/2016.	Yes
EU-UNIT 4, SC IX.3	The permittee shall comply with all applicable requirements of 40 CFR Part 60, Subpart Db.	MSU is meeting the requirements of this regulation as a natural gas fired steam generating unit greater than	Yes

		100MMBtu. The requirements are NOx emissions which are less restrictive than the permit limit.	
EU-UNIT 4, SC IX.4	**The permittee shall comply with all applicable requirements of 40 CFR Part 75.**	**These reports are submitted with the required reports in SCVII.1. The most recent RATA was conducted in February, 2023.**	**Yes**

- 3rd QTR 2022 Excess Emission & Monitoring Performance Report for Units 3, 4 & 6, received 11/1/2022. Unit 4 NOx lb/MMBtu monitor had 0 downtime, and 0 excess emissions. Unit 4 NOx lb/hr monitor had 0 excess emissions. Operating hours reported.
- 2nd QTR 2022 Excess Emission & Monitoring Performance Report for Units 3, 4 & 6, received 7/28/2022. Unit 4 NOx lb/MMBtu monitor had 0 downtime, and 0 excess emissions. Unit 4 NOx lb/hr monitor had 0 excess emissions. Operating hours reported.
- 1st QTR 2022 Excess Emission & Monitoring Performance Report for Units 3, 4 & 6, received 5/3/2022 Unit 4 NOx lb/MMBtu monitor had 1 hr downtime due only to DST, and 0 excess emissions. Unit 4 NOx lb/hr monitor had 0 excess emissions. Operating hours reported.

EU-UNIT5 PTI 75-14C compliance checklist on 3/13/2023 (the PTI incorrectly called it FG-UNIT5):

PTI Special Condition	Requirement	Comments	Complies?
EU-UNIT 5, SC I.	**NA**	**NA**	**NA**
EU-UNIT 5, SC II.	**NA**	**NA**	**NA**
EU-UNIT 5, SC III.	**NA**	**NA**	**NA**
EU-UNIT 5, SC IV.	**NA**	**NA**	**NA**

EU-UNIT 5, SC V.	**NA**	**NA**	**NA**
EU-UNIT 5, SC VI.	**Shall record and maintain records of the amount of fuel combusted in EU-UNIT5 during each calendar month.**	**It is AQD's understanding that this is being done.**	**Yes**
EU-UNIT 5, SC VII.			
"See Appendix 8-2"	**A. Annual, Semi-annual, and Deviation Certification Reporting** **The permittee shall use the MDEQ, AQD, Report Certification form (EQP 5736) and MDEQ, AQD, Deviation Report form (EQP 5737) for the annual, semi-annual and deviation certification reporting referenced in the Reporting Section of the Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Alternative** **formats must meet the provisions of Rule 213(4)(c) and Rule 213(3)(c)(i), respectively, and be approved by the** **AQD District Supervisor.** **B. Other Reporting** **Specific reporting requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, Part B of this appendix is not applicable.**	**MSU Complies with this**	**Yes**
EU-UNIT 5, SC VIII.	**NA**	**NA**	**NA**
EU-UNIT 5, SC IX.1	**The permittee shall comply with all applicable requirements of the New Source Performance Standards for**	**This unit is subject due to an install date of 2004 (after 1989) and having a heat input of 80MMBtu**	**Yes**

	Small Industrial –Commercial-Institutional Steam Generating Units as specified in 40 CFR Part 60, Subpart Dc.	**(>10MMBtu <100MMBtu) as a heat recovery steam generating unit. Sulfur dioxide requirements of this part are being met by fuel monitoring as allowed in 60.48c(e)(11) and 60.48c(f)(4).**	

EU-UNIT6 PTI 75-14C compliance checklist on 3/13/2023:

PTI 14C Special Condition	Requirement	Comments	Complies?
EU-UNIT 6, SC I.1	NOx limit of 204 ppm @15% O2 dry.	EU-UNIT6 was not operating today.	Not operating
EU-UNIT 6, SC II.1	Shall only fire natural gas containing 20.0 grains or less of total sulfur per 100 standard cubic feet.	The turbine is only able to fire natural gas. The natural gas in use is provided by Consumers Energy and meets the requirement.	Yes
EU-UNIT 6, SC III.	NA	NA	NA
EU-UNIT 6, SC IV.1	Shall equip and maintain EU-UNIT6 with a dry low-NOx combustor.	Information in permit files shows information regarding the low NOx combustor.	Yes
EU-UNIT 6, SC IV.2	Shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the NOx emissions for EU-UNIT6 on a continuous basis.	A PEMS monitors and records NOx. Additionally, the facility submits excess emissions reports on a quarterly basis.	Yes
EU-UNIT 6, SC IV.3	Shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and	A PEMS monitors and records CO. Additionally, the facility submits excess emissions reports on a quarterly basis.	Yes

	record the CO emissions for EU-UNIT6 on a continuous basis		
EU-UNIT 6, SC V.	NA	NA	NA
EU-UNIT 6, SC VI.1	Shall monitor the fuel sulfur content via a current, valid purchase contract, tariff sheet or transportation contract for the gaseous fuel, specifying that the maximum total sulfur content of the fuel is 20.0 grains/100 scf or less.	The turbine is only able to fire natural gas. The natural gas in use is provide by Consumers Energy and meets the requirement.	Yes
EU-UNIT 6, SC VI.2	The permittee shall keep, in a satisfactory manner, monthly NOx records for EU-UNIT6.	Please see attached records showing NOx emissions Jan.-March 2023, in tons/month, per AQD's 5/24/2023 email request to A. Groll: Jan. 2023: 0.000 tons Feb. 2023: 0.302 tons March 2023: 0>004 tons	Yes
EU-UNIT 6, SC VI.3	The permittee shall keep, in a satisfactory manner, monthly CO records for EU-UNIT6.	Please see attached records showing CO emissions Jan.-March 2023, in tons/month, per AQD's 5/24/2023 email request to A. Groll: Jan. 2023: 0.000 tons Feb. 2023: 0.004 tons March 2023: 0.000 tons	Yes
EU-UNIT 6, SC VII.1	Each calendar quarter, the permittee shall perform the Quality Assurance Procedures of the CEMS set forth in Appendix F of 40 CFR Part 60. Within 30 days following the end of each calendar quarter, the permittee shall submit the results to the AQD. This documentation can be	MSU is carrying this out, as required.	Yes

	submitted as a combined package for FG-UNITS-5/6.		
EU-UNIT 6, SC VII.2	**In accordance with 40 CFR 60.7(c) and (d), the permittee shall submit two copies of an excess emission report (EER) and summary report in an acceptable format to the AQD, within 30 days following the end of each calendar quarter. The Summary Report shall follow the format of Figure 1 in 40 CFR 60.7(d). The EER shall include the following information:**	**Please see below.**	**Yes**
EU-UNIT 6, SC VII.2.a	**A report of each exceedance above the limits specified in the conditions of FG-UNIT5/6. This includes the date, time, magnitude, cause and corrective actions of all occurrences during the reporting period.**	**MSU is carrying this out as required.**	**Yes**
EU-UNIT 6, SC VII.2.b	**A report of all periods of CEMS (or PEMS)/CERMS downtime and corrective action.**	**MSU is carrying this out as required.**	**Yes**
EU-UNIT 6, SC VII.2.c	**A report of the total operating time of FG-UNIT5/6 during the reporting period.**	**MSU is carrying this out as required.**	**Yes**
EU-UNIT 6, SC VII.2.d	**A report of any periods that the CEMS (or PEMS)/CERMS exceeds the instrument range.**	**MSU is carrying this out as required.**	**Yes**
EU-UNIT 6, SC VII.2.e	**If no exceedances or CEMS (or PEMS)/CERMS downtime occurred during the reporting period, the permittee shall report that fact.**	**MSU is carrying this out as required.**	**Yes**
	NA	**NA**	**NA**

EU-UNIT 6, SC VIII.			
EU-UNIT 6, SC IX.1	**The permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants from Stationary Combustion Turbines as specified in 40 CFR Part 63, Subparts A and YYYY, as they apply to EU-UNIT6.**	**As stated by AQD's N. Hude in 2017: *Compliance-per 63.6095(d), As a new or reconstructed stationary combustion turbine that is a lean premix gas-fired stationary combustion turbine or diffusion flame gas-fired stationary combustion turbine as defined by this subpart, you must comply with the Initial Notification requirements set forth in §63.6145 but need not comply with any other requirement of this subpart until EPA takes final action to require compliance and publishes a document in the Federal Register.***	**Yes**
EU-UNIT 6, SC IX.2	**The permittee shall comply with all applicable provisions of the New Source Performance Standards for Stationary Gas Turbines as specified in 40 CFR Part 60, Subpart GG, as applicable to EU-UNIT6.2**	**This regulation requires compliance with the NOx emission limit set in SCI.1. and sulfur dioxide emissions by use of fuel that is less than 0.015% by weight at 15% O2 per 60.333(a) or by not burning fuel which contains sulfur in excess of 0.8% by weight (8000 ppmw) per 60.333 (b). Monitoring is done by fuel tariff as allowed by 60.334(h)(3)(i).**	**Yes**

Excess Emission reports for EU-UNIT3, EU-UNIT4, and EU-UNIT6:

- 3rd QTR 2022 Excess Emission & Monitoring Performance Report for Units 3, 4 & 6, received 11/1/2022. Unit 6 NOx monitor had 0 downtime and 0 excess emissions. Unit 6 CO monitor had 0 downtime, and 0 excess emissions. Operating hours reported.
- 2nd QTR 2022 Excess Emission & Monitoring Performance Report for Units 3, 4 & 6, received 7/28/2022. Unit 6 NOx monitor had 0 downtime and 0 excess emissions. Unit 6 CO monitor had 0 excess emissions. Operating hours reported.
- 1st QTR 2022 Excess Emission & Monitoring Performance Report for Units 3, 4 & 6, received 5/3/2022 Unit 6 NOx monitor had 1 hr downtime only due to DST, and 0 excess emissions. Unit 6 CO monitor had 0 excess emissions. Operating hours reported.

EU-EMGENGINE on 3/13/2023:

DESCRIPTION: Kohler compression ignition1528 horsepower, 1020kW, black start existing reciprocating internal combustion engine, for EU-UNIT6.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT: NA

This engine is located on the north side of the plant behind a brick wall. The data plate provides a manufacture date of 07/05, Model Number 1000REOZDB, and Serial Number 2052665. On 3/13/2023, AQD did not examine EU-EMGENGINE. It was not operating, at the time of the inspection.

EU-EMGENGINE PTI 75-14C compliance checklist on 3/13/2023:

PTI 75-14C Special Condition	Requirement	Comments	Complies?
EU-EMGENGINE, SC I.	NA	NA	NA
EU-EMGENGINE, SC II.	NA	NA	NA
EU-EMGENGINE, SC III.1	May operate EU-EMGENGINE unlimited hours for emergency use. The permittee may also operate EU-EMGENGINE for no more than 100 hours per calendar year for the purpose of necessary maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. The permittee may petition the Department for approval of additional hours to be used for maintenance checks and readiness testing. A petition is not required if the owner or operator	AQD emailed A. Groll on 5/25/2023 to inquire. She indicated that the total running hours for 2022 were 15.8, and provided the attached spreadsheet of hours by month. The hours were clarified as being for maintenance and testing only.	Yes

	maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency internal combustion engines beyond 100 hours per calendar year. EU-EMGENGINE may operate up to 50 hours per calendar year in nonemergency situations, but those 50 hours are counted towards the 100 hours per calendar year provided for maintenance and testing. The 50 hours per calendar year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply non-emergency power as part of a financial arrangement with another entity.		
EU-EMGENGINE, SC IV.	**NA**	**NA**	**NA**
EU-EMGENGINE, SC V.	**NA**	**NA**	**NA**
EU-EMGENGINE, SC VI.1	**Shall keep, in a satisfactory manner, a written log of the monthly hours of operation and type of operation for EU-EMGENGINE. All records shall be kept on file for a period of at least five years and made available to the Department upon request.**	**AQD emailed A. Groll on 5/25/2023 to inquire. She indicated that the total running hours for 2022 were 15.8, and provided the attached spreadsheet of hours by month. The hours were clarified as being for maintenance and testing only.**	**Yes**
EU-EMGENGINE, SC VII.	**NA**	**NA**	**NA**
EU-EMGENGINE, SC VIII.	**NA**	**NA**	**NA**

EU-EMGENGINE, SC IX.1	The permittee shall comply with the applicable requirements of 40 CFR Part 63 ("National Emission Standard for Hazardous Air Pollutants for Source Categories"), Subparts A ("General Provisions') and ZZZZ ("National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines").	AQD emailed A. Groll on 5/25/2023 to inquire. She emailed electronic copies of work order records for EU-EMGENGINE.	TBD

FG-UNIT1/2; PTI 75-14C, on 3/13/2023:

EMISSION UNIT DESCRIPTION: Two dry bottom wall-fired natural gas fired boilers each capable of generating 250,000 lb/hr of steam. The boilers are used to generate steam for the university and for the firing of a steam turbine to produce electricity (CHP). The boilers are equipped with overfire air. (PTI 75-14A

POLLUTION CONTROL EQUIPMENT: Low-NOx burners.

Units 1 and 2 share a stack.

FG-UNIT1/2 PTI 75-14C compliance checklist on 3/13/2023:

PTI 75-14C Special Condition	Requirement	Comments	Complies?
FG-UNIT1/2, SC I.	NA	NA	NA
FG-UNIT1/2, SC II.1	Shall only combust pipeline quality natural gas fuel in EU-UNIT1 and EU-UNIT2.	Natural gas is the only fuel available for this device, as no coal or biomass is on site.	Yes
FG-UNIT1/2, SC III.1	Shall not operate either EU-UNIT1 or EU-UNIT2 unless a Malfunction Abatement Plan for EU-UNIT1 and EU-UNIT2, and their associated control equipment, has been implemented and is maintained for both units. If at any time the MAP fails to address or inadequately addresses an event that	An updated version of the MAP for Units 1, 2, and 4 was received on 7/18/17 covering the requirements.	Yes

	meets the characteristics of a malfunction, the permittee shall amend the MAP within 45 days after such an event occurs. The permittee shall also amend the MAP within 45 days, if new equipment is installed or upon request from the District Supervisor. The permittee shall submit the MAP and any amendments to the MAP to the AQD District Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the MAP or amended MAP shall be considered approved. Until an amended plan is approved, the permittee shall implement corrective procedures or operational changes to achieve compliance with all **applicable emission limits.**		
FG-UNIT1/2, SC IV.	**NA**	**NA**	**NA**
FG-UNIT1/2, SC V.	**NA**	**NA**	**NA**
FG-UNIT1/2, SC VI.1	**Shall monitor and maintain monthly records on the following:**		**Yes**
FG-UNIT1/2, SC VI.1.a	**Amount of natural gas fired in EU-UNIT1 and EU-UNIT2.**	**It is AQD's understanding that this is being done. Throughput of natural gas is reported in the annual MAERS report.**	**Yes**
FG-UNIT1/2, SC VI.1.b	**Calendar month.**	**It is AQD's understanding that this is being done. Throughput of natural gas is reported in the annual MAERS report.**	**Yes**
	NA	**NA**	**NA**

FG-UNIT1/2, SC VII.			
FG-UNIT1/2, SC VIII.	**Exhaust gases shall be discharged unobstructed vertically upwards from a stack with a maximum diameter of 132 inches, and a minimum height above ground level of 275 feet.**	**The shared stack appeared to be of the required dimensions. As stated by N. Hude in his 2017 inspection report, "Compliance- This could not be confirmed onsite due to the complexity of the task, yet aviation maps identify the stack heights of 1165msl and a base elevation in the area of approx. 860msl giving a stack height of at least 275 ft. (1165 – 860 = 305). The stack for Unit3 and Unit4 are shared as the stack for Unit1 and Unit2 are shared; both are the same height."**	**Yes**
FG-UNIT1/2, SC IX.1	**Shall meet the monitoring, recordkeeping, and reporting requirements of the NOx SIP Call during the ozone season (May 1 through September 30).**	**Compliance- It appears MSU is compliant with this condition which requires the installation of a device to measure NOx mass(96.70 (a)(1)), installation of a device to monitor heat input (96.70(a)(2)), complete certification tests of the said devices(96.70(a)(3)), and record and report data (96.70(a) (4). Documented proof of compliance for these requirements has otherwise been covered in previous special conditions**	**Yes**
FG-UNIT1/2, SC IX.2	**Shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart DDDDD, for National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters by the initial compliance date.**	**Initial notice of compliance was provided on 2/25/16 after conversion from solid fuel to natural gas only. The remaining requirement is identified in paragraph 63.7540(a) (10): If your boiler or process heater has a heat input capacity of**	**Yes**

		10 million Btu per hour or greater, you must conduct an annual tune-up of the boiler or process heater to demonstrate continuous compliance as specified in paragraphs (a)(10)(i) through (vi) of this section. You must conduct the tune-up while burning the type of fuel (or fuels in case of units that routinely burn a mixture) that provided the majority of the heat input to the boiler or process heater over the 12 months prior to the tune-up. This frequency does not apply to limited-use boilers and process heaters, as defined in §63.7575, or units with continuous oxygen trim systems that maintain an optimum air to fuel ratio. **(i) As applicable, inspect the burner, and clean or replace any components of the burner as necessary (you may perform the burner inspection any time prior to the tune-up or delay the burner inspection until the next scheduled unit shutdown). Units that produce electricity for sale may delay the burner inspection until the first outage, not to exceed 36 months from the previous inspection. At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune-up inspections, inspections are required only during planned entries into the storage vessel or process equipment;** **(ii) Inspect the flame pattern, as applicable, and adjust the burner**	

		as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available; **(iii) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly (you may delay the inspection until the next scheduled unit shutdown). Units that produce electricity for sale may delay the inspection until the first outage, not to exceed 36 months from the previous inspection;** **(iv) Optimize total emissions of CO. This optimization should be consistent with the manufacturer's specifications, if available, and with any NOX requirement to which the unit is subject;** **(v) Measure the concentrations in the effluent stream of CO in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer; and** **(vi) Maintain on-site and submit, if requested by the Administrator, a report containing the information in paragraphs (a)(10)(vi)(A) through (C) of this section,**	

(A) The concentrations of CO in the effluent stream in parts per million by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the boiler or process heater;

(B) A description of any corrective actions taken as a part of the tune-up; and

(C) The type and amount of fuel used over the 12 months prior to the tune-up, but only if the unit was physically and legally capable of using more than one type of fuel during that period. Units sharing a fuel meter may estimate the fuel used by each unit.

A request for documentation of compliance with paragraph 63.7540(a)(10) was requested by N. Hude on 5/16/2017, in follow up to his 2017 inspection. Records were received on 5/17/2017, yet appeared to be for smaller boilers located at the Ag Pavilion. A clarifying email was sent on 6/9/2017.

On 6/23/2017, N. Hude received an email stating that boilers 1-4 had "Continuous oxygen trim systems" and thus the annual tune-up is actually a 5 year tune-up. He sent a follow-up email stating that this

		information should be added to each boilers unit description.	

FG-UNITS5/6 on 3/13/2023:

DESCRIPTION 139 MMBtu/Hr heat input natural gas fired turbine with dry low-NOx burner, heat recovery steam generator (HRSG) and a natural gas fired duct burner rated at 80 MMBTU/hr. heat input. (PTI 13-04)

Emission Units: EU-UNIT5, EU-UNIT6

POLLUTION CONTROL EQUIPMENT NA

FG-UNITS5/6 PTI 75-14C compliance checklist on 3/13/2023:

PTI 75-14C Special Condition	Requirement	Comments	Complies?
FG-UNITS5/6, SC I.1	NOx limit of 34.9 TPY, as determined by a 12-month rolling value at the end of each calendar month.	Per the attached GT6 monthly report received on 5/31/2023, the 12-month rolling value for NOx at the end of March 2023 was 0.49 tons.	Yes
FG-UNITS5/6, SC 1.2	CO limit of 89.9 TPY, as determined by a 12 -month rolling value at the end of each calendar month.	Per the attached GT6 monthly report received on 5/31/2023, the 12-month rolling value for CO at the end of March 2023 was 1.42 tons.	Yes
FG-UNITS5/6, SC II.1	Shall only fire natural gas containing 20.0 grains or less of total sulfur per 100 standard cubic feet.	The turbine and recovery unit are only able to fire natural gas. The natural gas in use is provided by Consumers Energy and meets the requirement.	Yes
	NA	NA	NA

FG-UNITS5/6, SC III.			
FG-UNITS5/6, SC IV.1	**Shall equip and maintain FG-UNITS5/6 with a dry low-NOx combustor.**	**AQD permit files contain information on the low NOx combustor.**	**Yes**
FG-UNITS5/6, SC IV.2	**Shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the NOx emissions for FG-UNITS5/6 on a continuous basis.**	**This is being done, with PEMS.**	**Yes**
FG-UNITS5/6, SC IV.3	**Shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the CO emissions for FG-UNITS5/6 on a continuous basis.**	**This is being done, with PEMS.**	**Yes**
FG-UNITS5/6, SC V.	**NA**	**NA**	**NA**
FG-UNITS5/6, SC VI.1	**Shall keep, in a satisfactory manner, monthly and previous 12 month NOx records for FGUNITS5/6. All records shall be kept on file for a period of at least five years and made available to the Department upon request.**	**MSU is doing this.**	**Yes**
FG-UNITS5/6, SC VI.2.	**Shall keep, in a satisfactory manner, monthly and previous 12 month CO records for FGUNITS5/6. All records shall be kept on file for a period of at least five years and made available to the Department upon request.**	**MSU is doing this.**	**Yes**
FG-UNITS5/6, SC VII.1	**Each calendar quarter, the permittee shall perform the Quality Assurance Procedures of the CEMS set forth**	**In a same day response to a 5/31/2023 question by AQD, A. Groll indicated that MSU**	**Yes**

	in Appendix F of 40 CFR Part 60. Within 30 days following the end of each calendar quarter, the permittee shall submit the results to the AQD.	does "a RAA for this unit instead of a quarterly linearity. It is on the same schedule as the other units, completed in the third quarter."	
FG-UNITS5/6, SC VII.2	In accordance with 40 CFR 60.7(c) and (d), the permittee shall submit two copies of an excess emission report (EER) and summary report in an acceptable format to the AQD, within 30 days following the end of each calendar quarter. The Summary Report shall follow the format of Figure 1 in 40 CFR 60.7(d). The EER shall include the following information:	Please see below.	Yes
FG-UNITS5/6, SC VII.2.a	A report of each exceedance above the limits specified in the conditions of FG-UNIT5/6. This includes the date, time, magnitude, cause and corrective actions of all occurrences during the reporting period.	MSU is carrying this out, as required.	Yes
FG-UNITS5/6, SC VII.2.b	A report of all periods of CEMS (or PEMS)/CERMS downtime and corrective action	MSU is carrying this out as required.	Yes
FG-UNITS5/6, SC VII.2.c	A report of the total operating time of FG-UNIT5/6 during the reporting period.	MSU is carrying this out as required.	Yes
FG-UNITS5/6, SC VII.2.d	A report of any periods that the CEMS (or PEMS)/CERMS exceeds the instrument range.	MSU is carrying this out as required.	Yes
FG-UNITS5/6, SC VII.2.e	If no exceedances or CEMS (or PEMS)/CERMS downtime occurred during the reporting period, the permittee shall report that fact.	MSU is carrying this out as required.	Yes
	The exhaust gases from stack SV-2-TURB/DB1 shall be discharged	In 2017, the stack dimensions were measured. The height	Yes

FG-UNITS5/6, SC VIII.1	unobstructed vertically upwards through a stack with a maximum diameter of 72 inches, and a minimum height above ground level of 157.5 feet.	tis said to be 158.5 feet and the diameter to be 72" which comply with the ROP.	
FG-UNITS5/6, SC IX.	NA	NA	NA

FG-2COLDCLEANER on 3/13/2023:

EMISSION UNIT DESCRIPTION: Any cold cleaner that is grandfathered or exempt from Rule 201 pursuant to Rule 281(h) or Rule 285(r)(iv). Existing cold cleaners were placed into operation prior to July 1, 1979. New cold cleaners were placed into operation on or after July 1, 1979.

POLLUTION CONTROL EQUIPMENT: NA.

This flexible group includes EU-DEGTSIMONP1 and EU-DEGTSIMONP2. The solvent being used in both units was still Zep Dyna 143, which was in use during the 2017 inspection by AQD's N. Hude.

FG-2COLDCLEANER Compliance checklist with PTI 75-14C, from 3/13/2023 inspection of T.B. Simon Power Plant:

PTI 75-144C Special Condition	Requirement	Comments	Complies?
FG-2COLDCLEANER, SC I.	NA	NA	NA
FG-2COLDCLEANER, SC II.1	Do not use cleaning solvents containing more than 5% of select halogenated compounds (those in 40 CFR Part 63, Subpart T).	Solvent still appears to be Zep Dyna 143, containing light aliphatic naptha, CAS 64742-88-7.	Yes
FG-2COLDCLEANER, SC III.1	Cleaned parts shall be drained for no less than 15 seconds or until dripping ceases.	Parts basket inside both cleaners allow parts to drain.	Yes
			Yes

FG-2COLDCLEANER, SC III.2	The permittee shall perform routine maintenance on each cold cleaner.	Both units serviced by Safety-Kleen.	
FG-2COLDCLEANER, SC IV.1	Cold cleaner must meet at least one of following:		
FG-2COLDCLEANER, SC IV.1.a	Air vapor interface < 10 feet^{2}..	Surface area roughly 6 ft^{2} for each.	Yes
FG-2COLDCLEANER, SC IV.1.b	Unit cleans metal parts and releases emissions to general in-plant environment.	No exhaust to outside air for either.	Yes
FG-2COLDCLEANER, SC IV.2	Unit equipped with device for draining cleaned parts.	Basket in each unit for draining parts.	Yes
FG-2COLDCLEANER, SC IV.3	Units equipped with a cover kept closed when parts not being cleaned.	Covers were closed.	Yes
I FG-2COLDCLEANER, SC V.4	Cover shall be mechanically assisted, if solvent agitated, heated, or has RVP > 0.3 psia.	Units incapable of heat or agitation; RVP 0.001 psi, per AQD's N. Hude	Yes
FG-2COLDCLEANER, SC IV.5	If RVP > 0.6 psia, or solvent in new unit is > 120 degrees F, unit must comply with at least one of following:	NA	NA
FG-2COLDCLEANER, SC IV.5.a	Ratio of freeboard ht. to width of unit is > 0.7.	NA	NA
FG-2COLDCLEANER, SC IV.5.b	Solvent must be covered with water if solvent is insoluble and has specific gravity > 1.0.	NA	NA
		NA	NA

FG-2COLDCLEANER, SC IV.5.c	Unit must be controlled by carbon adsorption, condensation system or equivalent control approved by AQD.		
FG-2COLDCLEANER, SC V.	NA	NA	NA
FG-2COLDCLEANER, SC VI.1	For each new unit in which solvent is heated, temperature must be monitored + recorded once/week.	Neither unit is heated.	NA
FG-2COLDCLEANER, SC VI.2	Maintain the following for each unit:		
FG-2COLDCLEANER, SC VI.2.a	Serial #, model #, or unique identifier.	Maint. Shop: Model FB36, Serial # 10010394 Turbine deck: Model Super Brute 90660, Serial # 1079343.	Yes
FG-2COLDCLEANER, SC VI.2.b	Date unit was installed, manufactured, or started operating.	Each unit is listed as 9/1/1990 in ROP.	Yes
V FG-2COLDCLEANER, SC I.2.c	Air vapor interface for any unit claimed to be exempt under MAPC Rule 281(h).	Interface is clearly <10 $ft^{2.}$	Yes
FG-2COLDCLEANER, SC VI.2.d	MAPC Rule 201 exemption.	MAPC Rules 281(2)(h) or 285(2)(r)(iv).	Yes
FG-2COLDCLEANER, SC VI.2.e	RVP of each solvent.	Zep Dyna 143 = 0.001 psia.	Yes
FG-2COLDCLEANER, SC VI.2.f	Compliance option for MAPC Rule 707 (2).	Solvent type and management practices.	Yes

FG-2COLDCLEANER, SC VI.3	**Maintain written operating procedures posted in accessible, conspicuous location near each unit.**	**DEQ orange cold cleaner stickers on outside of units, and on underside of cover/lid.**	**Yes**
FG-2COLDCLEANER, SC VI.4	**If waste solvent is a safety hazard and is stored in non-closed containers, verification that no more than 20% by wt. allowed to evaporate.**	**Waste solvent disposed of by Safety-Kleen.**	**Yes**
FG-2COLDCLEANER, SC VII.	**See Appendix 8-2**	MSU complies with this.	Yes
FG-2COLDCLEANER, SC VIII.	**NA**	**NA**	**NA**
FG-2COLDCLEANER, SC IX.	**NA**	**NA**	**NA**

FG-4MATVENTS on 3/13/2023:

DESCRIPTION Material handling equipment associated with Unit 4 boiler

Emission Units: EU-SPENTSANDEXH4, EU-SPENTSANDSILO4, EU-SANDSILO4

POLLUTION CONTROL EQUIPMENT Cyclone on EU-SPENTSANDEXH4 Bag filter on EU-SPENTSANDSI

FG-4MATVENTS PTI 75-14C compliance checklist on 3/13/2023:

PTI 75-14C Special Condition	Requirement	Comments	Complies?
	Opacity limit of 5% over a 6-minute average.	**This process is no longer used,**	**NA**

FG-4MATVENTS, SC I.1		following the ceasing of coal firing at TB Simon.	
FG-4MATVENTS, SC I.2	Particulate matter limit of 0.002 gr/dscf.	This process is no longer used, following the ceasing of coal firing at TB Simon.	NA
FG-4MATVENTS, SC II.	NA	NA	NA
FG-4MATVENTS, SC III.	NA	NA	NA
FG-4MATVENTS, SC IV.	NA	NA	NA
FG-4MATVENTS, SC V.1	Shall measure the opacity using Method 9 (Visual Determination of the Opacity of Emissions from Stationary Sources) upon request of the AQD.	This process is no longer used, following the ceasing of coal firing at TB Simon.	NA
FG-4MATVENTS, SC VI.1	Shall perform, at a minimum, a semiannual maintenance check and repairs on each baghouse filter. A record of repairs and maintenance performed on the baghouse filters shall be maintained.	This process is no longer used, following the ceasing of coal firing at TB Simon.	NA
FG-4MATVENTS, SC VI.2	Visual inspection for abnormal/excessive dust to be performed at least once a week on all exhausts points. A record shall be made of all checks. Abnormal conditions shall trigger initiation of abatement/repair actions.	This process is no longer used, following the ceasing of coal firing at TB Simon.	NA
	See Appendix 8-2	MSU complies with this.	Yes

FG-4MATVENTS, SC VII.			
FG-4MATVENTS, SC VIII.	**The exhaust gases shall be discharged unobstructed vertically upwards from 4 exhaust vents (SVSPENTSANDEXH4A, SVSPENTSANDEXH4B, SVSPENTSANDSILO4, and SVSPENTSANDSILO); maximum diameter and minimum height above ground level are NA.**	**This process is no longer used, following the ceasing of coal firing at TB Simon.**	**NA**
FG-4MATVENTS, SC IX.	**NA**	**NA**	**NA**

FG-BLRMACT-EXISTINGGAS1 on 3/13/2023:

DESCRIPTION Gas 1 Fuel Subcategory requirements for existing Boilers at major sources of Hazardous Air Pollutants per 40 CFR Part 63, Subpart DDDDD. EU-UNIT1, EU-UNIT2, and EU-UNIT3 must comply with this subpart no later than January 31, 2016, and EU-UNIT4 must comply with this subpart no later than January 31, 2017.

Emission Units: EU-UNIT1, EU-UNIT2, EU-UNIT3, EU-UNIT4

POLLUTION CONTROL EQUIPMENT NA

PTI No. 139-18:

PTI 139-18 emission units:

Emission Unit ID	EMISSION UNIT DESCRIPTION	Flexible Group ID	Compliance Status

EUENGINE1, aka #7	**A 16,500 HP natural gas-fired reciprocating internal combustion engine (RICE) equipped with selective catalytic reduction (SCR) to reduce NOx emissions, as well as an oxidation catalyst to reduce CO and VOC emissions.**	**FGENGINES**	**Not operating on 3/22/2023**
EUENGINE2, aka #8	**A 16,500 HP natural gas-fired RICE equipped with SCR to reduce NOx emissions, as well as an oxidation catalyst to reduce CO and VOC emissions.**	**FGENGINES**	**Compliance**
EUENGINE3, aka #9	**A 16,500 HP natural gas-fired RICE equipped with SCR to reduce NOx emissions, as well as an oxidation catalyst to reduce CO and VOC emissions.**	**FGENGINES**	**Not operating on 3/22/2023**
EUENGINE4	**A 16,500 HP natural gas-fired RICE equipped with SCR to reduce NOx emissions, as well as an oxidation catalyst to reduce CO and VOC emissions.**	**FGENGINES**	**Not installed; will not go in ROP renewal**
EUSTMBOILER, aka Boiler 7	**A natural gas-fired medium-pressure steam boiler rated t 300 MMBtu/hr and designed to supply 200 thousand pounds of steam per hour for campus heating. Equipped with low -NOx burners and internal flue gas recirculation (FGR) to reduce NOx emissions, and wil also be capable of firing No. 2 fuel oil as backup.**	**FGBOILERMACT-NEW**	**Compliance**
EUOILTANK	**No. 2 fuel oil storage tank.**	**NA**	**Will not be installed; will not go in ROP renewal**
EUFUELHTR1	**A natural gas-fired fuel gas dew point heater rated at 25 MMBTU/hr for warming the natural gas fuel.**	**FGFUELHTRS, FGBOILERMACT-NEW**	**Will not be installed; will not go in ROP renewal**
EUFUELHTR1			**Will not be installed;**

	A natural gas-fired fuel gas dew point heater rated at 25 MMBTU/hr for warming the natural gas fuel.	**FGFUELHTRS, FGBOILERMACT-NEW**	**will not go in ROP renewal**

EUSTMBOILER, aka Boiler #7, PTI 139-18 on 3/13/2023:

EUSTMBOILER DESCRIPTION: A natural gas-fired medium-pressure steam boiler rated at 300 MMBtu/hr and designed to supply 200 thousand pounds of steam per hour for campus heating. The steam boiler will be equipped with low-NOX burners and internal flue gas recirculation (FGR) to reduce NOX emissions, and will also be capable of firing No. 2 fuel oil as backup.

Flexible Group ID: FGBOILERMACT-NEW

POLLUTION CONTROL EQUIPMENT Low NOX burners and internal flue gas recirculation (FGR)

EUSTMBOILER first operated on 10/24/2022, MSU informed AQD via required reporting.

EUSTMBOILER was operating on 3/13/2023, when observed by AQD. AQD was advised that it will have PEMS operating in the forseeable future, but right now, the manufacturer has CEMS running on the unit, to gather data for the purposes of building the PEMS model.

On 3/13/2023, there was no opacity, only steam. A sight glass on the side of the boiler allows for observation of the burners inside the boilers. The fuel at the time was natural gas. Operating data was collected at 9:39 AM, as follows:

- Boiler pressure: 189.4 psig
- Fuel flow: 238,700 dscfm:
- Boiler temperature: 585.2 degrees F
- Exhaust gas temperature: 303.1 degree F
- Stack: 3.309% O2
- PEMS NOx: 0.00 ppm, because the PEMS modell is still being built, AQD was advised.

Compliance checklist for selected special conditions for PTI 139-18, EUSTMBOILER on 3/13/2023:

PTI 139-18 Special Condition	Requirement	Comments	Complies?

EUSTMBOILER, SC I.1	**NOx limit of 0.04 lb/mmBtu, over a 30-day rolling average time period, when firing natural gas.**	**The 30-day rolling average value was 0.023 lb/mmBtu.**	**Yes**
EUSTMBOILER, SC I.2	**NOx limit of 0.20 lb/mmBtu, 30-day rolling average time period, per 40 CFR 60.44b(a).**	**NA, as EUSTMBOILER was not firing residual oil at this time.**	**NA**
EUSTMBOILER, SC I.3	**NOx limit of 0.07 lb/mmBtu, over a 30-day rolling average time period, when firing No. 2 fuel oil.**	**NA, as EUSTMBOILER was not firing No. 2 fuel oil at this time.**	**NA**
EUSTMBOILER, SC I.4	**CO limit of 0.05 lb/mmBtu hourly, when firing natural gas.**	**MSU stack tested for CO, and on 6/14/2023, per a request from AQD, provided copies of test data showing an average of 0.015 lb/mmBtu hourly.**	**Yes**
EUSTMBOILER, SC I.5	**0.08 lbs/mmBtu hourly, when firing No. 2 fuel oil.**	**NA, as EUSTMBOILER was not firing No. 2 fuel oil at this time.**	**NA**
EUSTMBOILER, SC I.6-13	**Emission limits for various pollutants.**	**Unknown, but noncompliance is not suspected.**	**Yes**
EU-STMBOILER, SC I.14	**Opacity limit: 20%, except for one 6-minute average per hour of not more than 27%.**	**No opacity was observed on 3/1/32023, only steam.**	**Yes**
EUSTMBOILER, SC II.1	**The permittee shall only burn natural gas or No. 2 fuel oil in EUSTMBOILER**	**EUSTMBOILER was burning natural gas during the inspection on 3/13/2023.**	**Yes**
EUSTMBOILER, SC II.2	**The permittee shall only burn No. 2 fuel oil during periods of gas curtailment, gas supply interruption, maintenance, operator training, or periodic testing on liquid fuel. The maintenance, operator training, and periodic testing on liquid**	**There has been zero operation with fuel oil, AQD was advised.**	**Yes**

	fuel shall not exceed a combined total of 48 hours, for EUSTMBOILER, during any calendar year.		
EUSTMBOILER, SC II.3	**The sulfur content of all No. 2 fuel oil used in EUSTMBOILER shall not exceed 0.0015% by weight. This subsumes the 0.30% by weight limit in 40 CFR 60.43b.**	**There has been zero operation with fuel oil, AQD was advised.**	**Yes**
EUSTMBOILER, SC III.1	**Within 180 days after trial operation, the permittee shall submit, implement, and maintain a malfunction abatement plan (MAP) as described in Rule 911(2) for EUSTMBOILER. The MAP shall, at a minimum, specify the following:**	**On 4/21/2023, AQD received a revision to the 2017 MAP for the T.B. Simon Power Plant, which added EUSTMBOILER to the MAP. The start-up date for EU-STMBOILER was reported as 10/24/2022, in a report received 11/1/2022 and this date is within the allowed 180 days.**	**Yes**
EUSTMBOILER, SC III.1.a	**A complete preventative maintenance program including identification of the supervisory personnel responsible for overseeing the inspection, maintenance, and repair of air-cleaning devices, a description** **of the items or conditions that shall be inspected, the frequency of the inspections or repairs, and an identification of the major replacement parts that shall be maintained in inventory for quick replacement**	**These elements are in the 4/21/2023 revised MAP for the T.B. Simon Power Plant which now includes EUSTMBOILER.**	**Yes**
EUSTMBOILER, SC III.1.b	**An identification of the source and air-cleaning device operating variables that shall be monitored to detect a malfunction or failure, the normal operating range of these variables, and a description of the method of monitoring or surveillance procedures.**	**These elements are in the 4/21/2023 revised MAP for the T.B. Simon Power Plant which now includes EUSTMBOILER.**	**Yes**

EUSTMBOILER, SC III.1.c	**A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.** **If at any time the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the permittee shall amend the MAP within 90 days after such an event occurs. The permittee shall also amend the MAP within 90 days, if new equipment is installed or upon request from the AQD District Supervisor. The permittee shall submit the MAP and any amendments to the MAP to the AQD District Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the MAP or amended MAP shall be considered approved. Until an amended plan is approved, the permittee shall implement corrective procedures or operational changes to achieve compliance with all applicable emission limits.**	**On 6/6/2023, D. McGeen emailed A. Groll to indicate approval of the 4/21/2023 revision to the MAP.**	**Yes**
EUSTMBOILER, SC IV.1	**The heat input capacity of EUSTMBOILER shall not exceed a maximum of 300 MMBTU per hour.**	**AQD was informed that the heat input capacity does not exceed 300 MMBTU/hr.**	**Yes**
EUSTMBOILER, SC IV.2	**The permittee shall not operate EUSTMBOILER unless the dry low NOX burners and internal flue gas** **recirculation system are installed, maintained, and operated in a satisfactory manner. Proper operation includes operating the equipment in accordance with an approved malfunction abatement plant (MAP) as required by SC III.1.**	**MSU appeared to be operating the equipment in accordance with the MAP, which was subsequently approved.**	**Yes**

EUSTMBOILER, SC IV.3	**The permittee shall install, calibrate, maintain and operate, in a satisfactory manner, a device to monitor and record the fuel usage rate for EUSTMBOILER on a continuous basis, for both natural gas and No. 2 fuel oil.**	**The fuel use rate for natural gas was being monitored and recorded.**	**Yes**
EUSTMBOILER, SC IV.4	**The permittee shall install, calibrate, maintain, and operate, in a satisfactory manner, devices to monitor and continuously record the NOX emissions, and oxygen (O2) (or carbon dioxide (CO2)) content of the exhaust gas from EUSTMBOILER. The permittee shall install and operate the Continuous Emission Monitoring System (CEMS) or alternative monitoring system (AMS) to meet the timelines, requirements and reporting detailed in Appendix A.**	**It was explained to AQD on 3/13/2023 that CEMS data was being collected by the manufacturer, to build the PEMS model which will be used. The CEMS was not present on 10/24/2022 during initial start- up, however, and was said to not be gathering data until early February 2023. This did not continuously meet the requirement s of Appendix A.**	**No**
EUSTMBOILER, SC V.1	**Within 60 days after achieving the maximum production rate, but no later than after 180 days after commencement of initial startup, the permittee shall verify CO, VOC, PM, PM10, and PM2.5 emission rates from EUSTMBOILER while operating on natural gas, by testing at the owner's expense, in accordance with Department requirements. The permittee shall complete the testing once every five years, thereafter, unless an alternate testing schedule is approved by the AQD District Supervisor. The hourly emission rates shall be determined by the average of three acceptable test runs per the applicable method requirements.**	**Testing was conducted on 2/1 and 2/2/2023, after unusually cold weather prevented stack testing on 1/31, due to issues with the sampling rain.**	**Yes**
EUSTMBOILER, SC V.2	**Upon request from the AQD District Supervisor, the permittee shall verify CO, VOC, PM, PM10, and PM2.5 emission rates from EUSTMBOILER while operating on backup No. 2 fuel oil, by testing at the**	**NA, as EUSTMBOILER has not been requested to stack test while burning fuel oil.**	**NA**

	owner's expense, in accordance with Department requirements. The hourly emission rates shall be determined by the average of three acceptable test runs per the applicable method requirements.		
EUSTMBOILER, SC V.3	Within 180 days after commencement of initial startup of EUSTMBOILER on No. 2 fuel oil, the permittee shall verify visible emission rates from EUSTMBOILER while operating on backup No. 2 fuel oil, by testing at the owner's expense, in accordance with Department requirements. The visible emission readings shall be performed by a certified visible emissions reader and done in accordance with EPA reference method 9. The permittee shall conduct subsequent testing on No. 2 fuel oil in accordance with 40 CFR 60.48b(a).	NA, as EUSTMBOILER has not used fuel oil.	NA
EUSTMBOILER, SC VI.2	The permittee shall continuously monitor and record, in a manner acceptable to the AQD District Supervisor, the NOX emissions and the O2 (or CO2) content from the exhaust gas from EUSTMBOILER. If the permittee elects to install an alternative monitoring system, the permittee shall submit an application to the Environmental Protection Agency (EPA) for approval in accordance with 40 CFR Part 60 Subpart A. The permittee shall operate the NOX Continuous Emission Monitoring System (CEMS) or alternative monitoring system (AMS) to meet the timelines, requirements and reporting detailed in Appendix A and shall use the monitoring data for determining compliance with SC I.1, SC I.2, and SC I.3.	AQD was informed that MSU did not have a CEMS in place at the time of the 10/24/2022 firing up of EUSTMBOILER, and a CEMS was reportedly not in place until early February 2023, when data was being gathered by a PEMS manufacturer to build a PEMS. This did not meet the requirements of Appendix A.	No
EUSTMBOILER, SC VII.1	Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by this Permit to Install, the permittee or the authorized agent pursuant to Rule 204,	On 11/1/2022, AQD received notification that completion of construction and trial operation began on 10/24/2022.	Yes

	shall notify the AQD District Supervisor, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than commencement of trial operation of EUSTMBOILER.		
EUSTMBOILER, SC VII.2	**The permittee shall submit notification of the date of initial startup, as provided by 40 CFR 60.7. This notification shall include information listed in 40 CFR 60.49b(a)**	**On 11/1/2022, AQD received Initial Notification of Completion of Construction & Initial Startup EUSTMBOILER - 40 CFR Part 60, Subpart Db (Notification of Initial Startup) & 40 CFR Part 63 Subpart DDDDD (Notification of Startup). Completion of construction and start of trial operation were 10/24/2022.**	**Yes**
EUSTMBOILER , SC VII.3	**The permittee shall submit all reports required by the federal Standards of Performance for New Stationary Sources, 40 CFR 60.49b, including performance test data from initial performance tests, performance evaluations of the CEMS, NOX emission reports, and excess emission reports. The permittee shall submit these reports to the AQD District Supervisor within the time frames specified in 40 CFR 60.49b and/or 40 CFR 60.7.**	**MSU was not tracking downtime for the temporary CEMS, they informed AQD, upon inquiry. Submittal of reports of continuous monitoring system downtime is required by 40 CFR 60.7(c)(3).**	**No**
EUSTMBOILER, SC VIII.1	**The exhaust gases shall be discharged unobstructed vertically upwards through a stack with a maximum diameter of 63 inches and a minimum height above ground level of 130 feet.**	**As observed on 3/13/2023, the stack appeared to meet these dimensions.**	**Yes**
EUSTMBOILER, SC IX.1		**AQD was advised that MSU believes they are**	**Yes**

	The permittee shall comply with all provisions of the federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60 Subparts A and Db, as they apply to EUSTMBOILER.	meeting these requirements.	
EUSTMBOILER, SC IX.2	The permittee shall comply with all provisions of the National Emission Standards for Hazardous Air Pollutants as specified in 40 CFR Part 63 Subparts A and DDDDD, as they apply to EUSTMBOILER.	AQD was advised that MSU believes they are meeting these requirements.	Yes

Compliance check with selected conditions of PTI 139-18, Appendix A:

PTI 139-18, APPENDIX A Special Condition	Requirement	Comments	Complies?
Appendix A, SC 1	Not less than 30 calendar days prior to commencement of initial start-up of a CEMS or alternative monitoring system (AMS) for compliance monitoring purposes, the permittee shall submit two copies of a Monitoring Plan to the AQD, for review and approval. The Monitoring Plan shall include drawings or specifications showing proposed locations and descriptions of the required CEMS/AMS.	Per a 2/13/2023 email from AQD TPU's Lindsey Wells, she was reviewing MSU's alternative monitoring plan. MSU informed TPU that had applied to EPA for approval. It is unclear why this monitoring plan does not show up in TPU or AQD LDO records. The district will ask MSU to resubmit this.	Yes
Appendix A, SC 2	Not less than 30 calendar days prior to commencement of initial start-up up of a CEMS/AMS for compliance monitoring purposes, the permittee shall submit two copies of a complete test plan for the CEMS/AMS to	On 1/23/2023, the district received a test plan, for a reported test date of 2/28/2023 for the AMS. However, the CEMS started up in early February, apparently,	No

	the AQD for approval.	**less than 30 days after the submittal of the test plan.**	

Post-inspection activities:

From 3/28-3/30/2023, MSU had a PEMS certification test program conducted on EUSTMBOILER. On 5/4/2023, AQD received MSU's PEMS RATA for the EUSTMBOILER Stack. All parameters were well within the required limits.

On 5/2/2023, EPA approved MSU's request to use PEMS as an alternative monitoring system on EU-STMBOILER at the T.B. Simon Power Plant, to demonstrate compliance with the NOx standard in Section 60.44b. Compliance will be demonstrated through monitoring steam generating unit operating conditions to predict NOx emission rates.. EPA also approved of the PEMS for the initial 30-day compliance test under Section 60.46(b)(e)(1).

On 6/6/2023, AQD reviewed and approved the 4/21/2023 revision to the 2017 malfunction abatement plan (MAP) for Units 1, 2, and 4, and EU-STMBOILER, which was submitted on 4/21. The revision was to add EU-STMBOILER to the MAP. The MAP met the requirements of MAPC Rule 911. Additionally, the MAP was received within 180 days of the 10/24/2022 start-up of the unit, satisfying the requirement of PTI 139-18, EU-STMBOILER, SC III.1(a)-(c).

FGENGINES, PTI 139-18 on 3/24/2023

FGENGINES DESCRIPTION: This flexible group consists of the three (3) natural gas-fired reciprocating internal combustion engines (RICE) -- a fourth was permitted but MSU has no plans to install it

Emission Unit: EUENGINE1, EUENGINE2, EUENGINE3, EUENGINE4

POLLUTION CONTROL EQUIPMENT: SCR for NOX control and oxidation catalyst for VOC and CO control.

SAFETY APPAREL: Double hearing protection is required when observing FGENGINES operate indoors.

EUENGINE1-EUENGINE3 are exceptionally large RICE engines, and are housed in their own building, near the T.B. Simon Power Plant. EUENGINE4 was never actually installed, although the PTI 139-18 allows for such.

The new RICE plant can reportedly respond within minutes to a sudden need for electricity. This supplements MSU's solar power collecting arrays, during cloudy weather, when the amount of megawatts (MW) generated by solar power can rapidly drop.

The new FGENGINES had operated briefly in November 2021, MSU had informed AQD at the time, but an electrical issue with all 3 units delayed the official start up, until January 2022.

The 3 RICE underwent initial stack testing in March, 2022, for a number of pollutants Semi-annual stack testing for either CO or formaldehyde began in October 2022. The semi-annual

testing can be reduced to annual testing, based on compliant test results. Test results apper to have complied with emission units.

The 3 RICE units start up at 11 AM on a daily basis, AQD was informed. On 3/22, AQD departed the site too early in the day to observe FGENGINES operating.

On 3/24/2023, EUENGINE2, also known onsite as Engine #8 (per the label on the unit), was running while AQD was still onsite. .

Data collected at 11:43 AM on 3/24 was as follows:

- Operating rate: 6.5 MW
- Bank A degrees F: 1008; 801
- Bank B degrees F: 1006; 745
- NOx inlet : 175 ppm; 10%
- NOx outlet: 10 ppm; 10%
- Inlet to SCR control degrees F: 761
- Stack temperature degrees F: 768
- Ambient temperature degrees F: 35.8
- Relative humidity: 54%
- Visible emissions: none

Compliance checklist for selected special conditions for PTI 139-18, FGENGINES on 3/13/2023:

PTI 139-18 Special Condition	Requirement	Comments	Complies?
FGENGINES, SC I.11	Formaldehyde limit of 14 ppmvd at 15% O2, on an hourly basis, except at start-up and shut down.	EUENGINES1-3 were tested on 10/18, 10/19, and 10/20/2022, respectively, and were far below the formaldehyde limit.	Yes
FGENGINES, SC I.12	CO or formaldehyde: 93 percent or more reduction in CO emissions or Formaldehyde concentration of ≤ 14 ppmvd at 15% O2.	EUENGINES1-3 were tested on 10/18, 10/19, and 10/20/2022, respectively, and were far below the formaldehyde limit.	Yes
FGENGINES, SC II.1	The permittee shall burn only natural gas in FGENGINES.	Natural gas is the only fuel for FGENGINES.	Yes

FGENGINES, SC III.1	**Within 180 days after trial operation, the permittee shall submit, implement, and maintain a malfunction abatement plan (MAP) as described in Rule 911(2) for FGENGINES. The MAP shall, at a minimum, specify the following:**	**AQD has requested a copy of the MAP from MSU.**	**To be determined**
FGENGINES, SC III.1.a	**A complete preventative maintenance program including identification of the supervisory personnel responsible for overseeing the inspection, maintenance, and repair of air-cleaning devices, a description of the items or conditions that shall be inspected, the frequency of the inspections or repairs, and an identification of the major replacement parts that shall be maintained in inventory for quick replacement**	**AQD has requested a copy of the MAP from MSU.**	**To be determined**
FGENGINES, SC III.1.b	**An identification of the source and air-cleaning device operating variables that shall be monitored to detect a malfunction or failure, the normal operating range of these variables, and a description of the method** **of monitoring or surveillance procedures.**	**AQD has requested a copy of the MAP from MSU.**	**To be determined**
FGENGINES, SC III.1.c	**A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.** **If at any time the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the permittee shall amend the MAP within 90 days after such an event occurs. The permittee shall also amend the MAP within 90 days, if new equipment is installed or upon request from the District Supervisor. The permittee shall submit the MAP and any amendments to the MAP to the AQD District**	**AQD has requested a copy of the MAP from MSU.**	**To be determined**

	Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the MAP or amended MAP shall be considered approved. Until an amended plan is approved, the permittee shall implement corrective procedures or operational changes to achieve compliance with all applicable emission limits.		
FGENGINES, SC III.5	**The permittee must meet the following operating limitations, except during periods of startup:**		**To be determined for a, yes for b**
FGENGINES, SC III.5.a	**a. Maintain the oxidation catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the** **catalyst that was measured during the initial performance test; and**	**AQD was unaware of a pressure drop gauge for the oxidation catalyst for each unit, and will follow up on this during the next inspection.**	**To be determined**
FGENGINES, SC III.5.b	**Maintain the temperature of your stationary engine exhaust so that the oxidation catalyst inlet temperature** **is greater than or equal to 450 °F and less than or equal to 1350 °F or as established pursuant to a petition for a different temperature range granted in accordance with 40 CFR 63.8(f).**	**Inlet to the catalyst for EUENGINE2, aka Engine #8, was 761°F, within the specified range.**	**Yes**
FGENGINES, SC VIII.	**The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards** **to the ambient air unless otherwise noted.**		**Yes**
FGENGINES, SC VIII.1	**SVENGINE1, the stack to EUENGINE1, aka Engine #7, shall have a maximum diameter of 55 inches, and a minimum height above ground level of 110 feet.**	**The stack appears to be of these dimensions.**	**Yes**

FGENGINES, SC VIII.2	SVENGINE2, the stack to EUENGINE2, aka Engine #8, shall have a maximum diameter of 55 inches, and a minimum height above ground level of 110 feet	The stack appears to be of these dimensions.	Yes
FGENGINES, SC VIII.3	SVENGINE3, the stack to EUENGINE3, aka Engine #9, shall have a maximum diameter of 55 inches, and a minimum height above ground level of 110 feet	The stack appears to be of these dimensions.	Yes
FGENGINES, SC VIII.4	SVENGINE1, the stack to EUENGINE1, shall have a maximum diameter of 55 inches, and a minimum height above ground level of 110 feet	NA, as EUENGINE4 was never installed.	NA

MSU's former MBI building, SRN N1162, on 3/22/2023:

Not included in the current ROP are the processes in the former MBI International building, SRN N1162. The building was acquired by MSU on 4/1/2016. It is at 3900 Collins Road, Lansing. It was associated with General PTI No. 127-07, now voided, for a removed anhydrous ammonia tank, and PTI 575-85, now voided, for one 250HP and two 400HP oil and gas fired boilers, which qualify as exempt from needing a PTI under MAPC Rule 282(b).

During the inspection, the former MBI building was visited on 3/22/2023..

Facility description

This facility is utilized for biotechnology development.

Emission units:

Emission unit*	EMISSION UNIT DESCRIPTION	PTI No., or MAPC rule	Federal regulations	Compliance status
EU-AMMONIA, now removed from site	Removed 1,000 gallon sanhydrous ammonia torage tank	127-07 to be voided	NA	PTI 127-07 voided on 3/21/2023, following dismantling and removal of ammonia tank
			NA	No longer in use

Ammonia Capture System (scrubber)	Countercurrent packed column ammonia absorber for liquid and/or gaseous ammonia	Rule 283(1)(a)(viii)		
EU-BIBOILER1, EU-BIBOILER2, and EU-BIBOILER3	Two 400 horsepower (hp) and one 250 hp natural gas and no. 2 fuel oil-fired boilers	282(b)(i), as PTI 575-85 voided	40 CFR Part 63, Subpart DDDDD	Compliance, PTI 575-85 voided on 9/27/2022
EU-BIGEN1	Cummins Model DFEK-7511871, Compression Ignition, 507 kW, 680 hp, SN: H110237490; build date 8/8/2011	Rule 285(g) rather than 285 (2)(g), because of installation pre-12/20/2016	40 CFR Part 63, Subpart ZZZZ	Compliance/not operating
EU-BIGEN2	Cummins Model DFEK-7511871, Compression Ignition, 507 kW, 680 hp, SN: H110237489; build date 8/8/2011	Rule 285(g) rather than 285 (2)(g), because of installation pre-12/20/2016	40 CFR Part 63, Subpart ZZZZ	Compliance/not operating

***An *emission unit* is any part of a stationary source which emits or has the potential to emit an air contaminant.**

Regulatory overview:

Prior to accquisition by MSU, MBI was considered a minor or *area source* for Hazardous Air Pollutants (HAPs), because it was not considered to have a PTE of 10 TPY or more for a single HAP, nor to have a PTE of 25 TPY or more for combined HAPs. However, subsequent acquisition of this facility by MSU, itself a major HAPs source, makes this facility a major source.

MBI received general PTI 127-07 on 4/5/2007, for an anhydrous ammonia storage and handling process. This PTI was voided on 3/21/2023, ecause the ammonia tank had been removed from the site.

In 1985, Michigan Biotechnology Institute, as MBI was known at that time, received PTI 575-85, for oil and natural gas-fired boilers. The boilers are not subject to 40 CFR Part 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, unless they were reconstructed or modified after 6/9/1989. To the best of AQD's knowledge, they have not been reconstructed or modified.As MSU is a major source, the boilers are therefore subject to the major source boiler National Emissions Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 63, Subpart DDDDD.

Note: MBI has had its own State registration Number (SRN), N1162, at least since the boiler PTI was issued in 1985. MSU, who has acquired this facility as of 4/1/2016, has its own SRN, K3249.

Location:

The former MBI facility is located just west of farm fields belonging to MSU, and immediately east of US-127.

Recent history:

The facility was most recently inspected by AQD on the following dates:

- 3/22, 3/28, and 7/24/2019, which were parts of a single inspection spread over 3 days. No violations were noted.
- 4/18/2017, as part of an overall MSU inspection by AQD's Nathan Hude. See activity report under MSU's SRN, K3249. The former MBI facility was found to be in compliance with air requirements at this time.
- 3/9/2016, prior to acquisition by MSU. A Violation Notice was subsequently sent by AQD, as emergency signage, while at the site, was not conspicuously placed, and there were no records available to document annual review of emergency plan with fire department or emergency response agency. The MBI response was acceptble for resolving the VN.

EU-BIGEN1 and EU-BIGEN2 on 3/22/203:

On 3/22/2023, AQD and MSU staff arrived at the former MBI building.

- Arrival time: 11:30 AM, approx.
- Visible emissions: None detected.
- Odors: None detected.
- Weaher conditions: Cloudy and 44 degrees F.

There are two emergency engines on site and are located near the boiler room on the south side of the building, EU-BIGEN1 and EU-BIGEN2. They will be rolled into the flexible group FG-NSPS-IIII upon renewal of MSU's ROP. A description of FG-NSPS- IIII is below:

Stationery spark ignition lean burn reciprocating internal combustion engines combusting natural gas fuel, producing greater than 25 hp (19 KW) but less than 500 hp, that were constructed, on or after June 12, 2006, and used to power emergency use generators

Both engines are classified as:

- “New” being installation after 2002 and 2006 per 63..6590.
- “CI” compression ignition burning diesel fuel
- “>500hp” as both are rated at 680hp
- “located at a major source of HAPS", with MSU, SRN K3249 being the major source of HAPs
- PTI exempt under MAPC Rule 285(g) (for pre-12/20/2016 installation)

EU-BIGEN1 (west generator) is a Cummins Model DFEK-7511871, Compression Ignition, 507kW, 680hp, SN: H110237490, Build Date 08/08/201. This is a diesel fuel-fired engine. It is considered exempt under MAPC Rule 285(g); it is subject to 40 CFR Part 63, Subpart ZZZZ:

EU-BIGEN1 was not running, at the time. AQD was informed it operates monthly, as part of its readiness testing. A hardcopy of the most recent load test report was posted alongside it.

EU-BIGEN2 (east generator) is a Cummins Model DFEK-7511871, Compression Ignition, 507kW, 680hp, SN: H110237489, Build Date 08/08/2011, This is a diesel fuel-fired engine. It is considered exempt under MAPC Rule 285(g); it is subject to 40 CFR Part 63, Subpart ZZZZ:

EU-BIGEN2 was not running, at the time. AQD was informed it operates monthly, as part of its readiness testing. A hardcopy of the most recent load test report was posted alongside it.

EUBIGEN1 and EUBIGEN2 compliance check with NSP IIII on 3/22/2023, using MSU's proposed/mark-up ROP FG-NSPS-IIII requirements from the ROP renewal application for reference:

MSU'S proposed /mark-up ROP Special Condition	Requirement	Comments	Complies?
FG-NSPS-IIII, proposed SC I.1	NMHC + NOx limit of 6.4 g/KW-hr	Engines are certified to meet emission standards for the model year and maximum engine power. MSU maintains emission certification documentation for the engines. (Certificate Number: CEX-STATCI-11-07)	Yes
FG-NSPS-IIII, proposed SC I.2	CO limit of 3.5 g/KW-hr	Engines are certified to meet emission standards for the model year and maximum engine power. MSU maintains emission certification documentation for the engines. (Certificate Number: CEX-STATCI-11-07)	Yes
FG-NSPS-IIII, proposed SC I.3	PM limit of 0.20 g/KW-hr	Engines are certified to meet emission standards for the model year and maximum engine power. MSU maintains emission certification documentation for the	Yes

		engines. (Certificate Number: CEX-STATCI-11-07)	
FG-NSPS-IIII, proposed SC II .1	**The permittee shall burn only diesel fuel, in each engine in FG-NSPS-IIII with the maximum sulfur content of 15 ppm (0.0015 percent) by weight and either a minimum cetane index of 40 or a maximum aromatic content of 35% by volume.**	**Only Ultra Low Sulfur diesel fuel is available.**	**Yes**
FG-NSPS-IIII, proposed SC III.1	**In order to be considered an emergency generator, the permittee must operate each engine in FG-NSPS-IIII according to the requirements below. Any operation other than this is prohibited. If not operated according to these requirements, then the engine must meet all requirements in 40 CFR Part 60, Subpart IIII for nonemergency engines:**		**Yes**
FG-NSPS-IIII, proposed SC II. 1.a	**There is no time limit on the use of the emergency engines in emergency situations.**		**Yes**
FG-NSPS-IIII, proposed SC III.1.b	**The permittee may operate each engine in FG-NSPS-IIII for the purposes specified in SC III.1.b.i below for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by SC III.1.c counts as part of this 100 hours per calendar year.**		**Yes**
FG-NSPS-IIII, proposed SC III.1.b.i	**FG-NSPS-IIII may be operated for maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with**	**MSU tracks and maintains records of hours of operation.**	**Yes**

	the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency RICE beyond 100 hours per calendar year.		
FG-NSPS-IIII, proposed SC III.1.c	**The permittee may operate each unit in FG-NSPS-IIII up to 50 hours per calendar year in non-emergency situations, but these 50 hours of operation are counted towards the 100 hours per calendar year allowed in SC III.1.b. The 50 hours per year for non-emergency situations cannot be used for peak shaving or nonemergency demand response, 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. The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the requirements in 40 CFR 60.4211(f)(3)(i) are met.**	**MSU tracks and maintains records of hours of operation.**	**Yes**
FG-NSPS-IIII, proposed SC III.2.	**The permittee shall install, maintain, and operate each unit of FG-NSPS-IIII according to the manufacturer's written instructions, or procedures developed by the owner/operator and approved by the engine manufacturer, over the entire life of the engine.**	**M. Lindsey provided a full work order (WO) history of the generators, attached, noting in her email, "…the IPF computer system just records one line item of maintenance for each generator that says "load bank test and change oil." But that line item is a full inspection and tune-up (as needed) of the generator. So, it includes all the other inspection items that are denoted in our air permit."**	**Yes**

FG-NSPS-IIII, proposed SC III.3.	**The permittee shall do all the following for a certified engine, except as permitted in 40 CFR 60.4211(g):**		**Yes**
FG-NSPS-IIII, proposed SC III.3.a	**Operate and maintain each engine and control device (if any) in FG-NSPS-IIII according to the manufacturer's emission-related written instructions;**	**MSU operates and maintains the engines according to the O&M manual.**	**Yes**
FG-NSPS-IIII, proposed SC III.3.b	**Change only those emissions-related settings that are permitted by the manufacturer; and**	**MSU operates and maintains the engines according to the O&M manual.**	**Yes**
FG-NSPS-IIII, proposed SC III.3.c	**Meet the requirements of 40 CFR Parts 89, 94 and/or 1068, as they apply to each engine in FG-NSPS-IIII.**	**MSU maintains emission certification documentation for the engines. (Certificate Number: CEX-STATCI-11-07)**	**Yes**
FG-NSPS-IIII, proposed SC III.4	**The permittee shall demonstrate compliance with the emission standards specified in Table 1 of 40 CFR Part 60, Subpart IIII for each engine in FG-NSPS-IIII according to one of the following methods:**		**Yes**
FG-NSPS-IIII, proposed SC III.4.a	**Purchasing an engine certified according to 40 CFR Part 89 or 40 CFR Part 94, as applicable, to meet the emission standards for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications;**	**MSU maintains emission certification documentation for the engines. (Certificate Number: CEX-STATCI-11-07)** **MSU operates and maintains the engines according to the O&M manual.**	**Yes**
FG-NSPS-IIII, proposed SC III.4.b	**Keeping records of performance test results for each pollutant for a test conducted on a similar engine and**	**NA**	**NA**

	using the same test methods specified in Subpart IIII;		
FG-NSPS-IIII, proposed SC III.4.c	Keeping records of engine manufacturer data indicating compliance with the standards;	NA	NA
FG-NSPS-IIII, proposed SC III.4.d	Keeping records of control device vendor data indicating compliance with the standards;	NA	NA
FG-NSPS-IIII, proposed SC III.4.e	Conducting an initial performance test to demonstrate compliance with the emission standards according to the requirements specific in 40 CFR 60.4212, as applicable	NA	NA
FG-NSPS-IIII, proposed SC III.5	If the permittee does not install, configure, operate and maintain the engines in FG-NSPS-IIII and control device(s), if any, according to the manufacturer's emission-related written instructions, or you change emissionrelated settings in a way that is not permitted by the manufacturer, compliance must be demonstrated by keeping a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. (In addition, the requirements in SC V.2 must be met.	MSU operates and maintains the engines according to the O&M manual.	Yes
FG-NSPS-IIII, proposed SC IV.1	The permittee shall equip and maintain each unit in FG-NSPS-IIII with a non-resettable hours meter to track the operating hours.	Each unit has a nonresettable hour meter.	Yes
FG-NSPS-IIII, proposed SC V.1	The permittee shall conduct an initial performance test for each unit in FG-NSPS-IIII within one year after startup	MSU maintains emission certification documentation for the	Yes

	of the engine to demonstrate compliance with the emission limits in 40 CFR 60.4205 unless the engine has been certified by the manufacturer and the permittee maintains the engine as required by 40 CFR Part 60, Subpart IIII. If a performance test is required, the performance tests shall be conducted according to 40 CFR 60.4212, and the hourly emission rates shall be determined by the average of the acceptable three test runs.	**engines. (Certificate Number: CEX-STATCI-11-07)**	
FG-NSPS-IIII, proposed SC V.2	**If the permittee does not install, configure, operate and maintain the engines in FG-NSPS-IIII and control device(s), if any, according to the manufacturer's emission-related written instructions, or the emission-related settings are changed in a way that is not permitted by the manufacturer, compliance shall be demonstrated by conducting an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer. The hourly emission rates shall be determined by the average of the acceptable three test runs.**	**MSU operates and maintains the engines according to the O&M manual.**	**Yes**
FG-NSPS-IIII, proposed SC V.3	**If a performance test is required, no less than 30 days prior to testing, a complete test plan shall be submitted to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing.**	**NA**	**NA**

	Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical **Programs Unit and District Office within 60 days following the last date of the test.**		
FG-NSPS-IIII, proposed SC VI.1	**The permittee shall keep, in a satisfactory manner, a record of testing required in SC V.1, SC V.2, or manufacturer's certification documentation indicating that each unit in FG-NSPS-IIII meets the applicable emission limitations contained in the federal Standards of Performance for New Stationary Sources 40 CFR Part 60, Subpart IIII. The permittee shall keep all records on file and make them available to the Department upon Request.**	**MSU maintains emission certification documentation for the engines. (Certificate Number: CEX-STATCI-11-07)**	**Yes**
FG-NSPS-IIII, proposed SC VI.2	**The permittee shall keep, in a satisfactory manner, fuel supplier certification records or fuel sample test data, for each delivery of diesel fuel oil used in FG-NSPS-IIII, demonstrating that the fuel sulfur content meets the requirement of 40 CFR 80.510(b). The certification or test data shall include the name of the oil supplier or laboratory, and the sulfur content of the fuel oil.**	**The engines only burn diesel fuel with the maximum sulfur content of 15 ppm (0.0015 percent) by weight and either a minimum cetane index of 40 or a maximum aromatic content of 35% by volume.**	**Yes**
FG-NSPS-IIII, proposed SC VI.3	**The permittee shall monitor and record the total hours of operation and the hours of operation during nonemergencies for each unit of FG-NSPS-IIII, on a calendar year time period basis, in a manner acceptable to the AQD District Supervisor. The permittee shall document how many hours are spent for emergency operation of each unit of FG-NSPS-IIII, including what classified the operation as emergency**	**MSU tracks and maintains records of hours of operation.**	**Yes**

	and how many hours are spent for non-emergency operation.		
FG-NSPS-IIII, proposed SC VI.4	If the permittee does not install, configure, operate and maintain the engines in FG-NSPS-IIII and control device(s), if any, according to the manufacturer's emission-related written instructions, or the emission-related settings are changed in a way that is not permitted by the manufacturer, maintenance records shall be kept as stated in SC III.5 and in accordance with 40 CFR 63.4211(g)(2).	MSU operates and maintains the engines according to the O&M manual.	Yes
FG-NSPS-IIII, proposed SC VII.1-3	Standard ROP reporting requirements.	MSU follows these.	Yes
FG-NSPS-IIII, proposed SC VII.4	The permittee must submit an initial notification as required in 40 CFR 63.6645(f) for each engine in FG-NSPSIIII. The notification must include the information in 40 CFR 63.9(b)(2)(i) through (v), and a statement that your stationary RICE has no additional requirements and explain the basis of the exclusion (for example, that it operates exclusively as an emergency stationary RICE if it has a site rating of more than 500 brake HP located at a major source of HAP emissions (40 CFR 63.6590(b))	MSU submitted the initial notification required by 40 CFR §63.6645(f) on 7/31/17	Yes
FG-NSPS-IIII, proposed SC VIII.	NA	NA	NA
FG-NSPS-IIII, proposed SC IX.1	The permittee shall comply with all provisions of the federal standards of Performance for new Stationary Sources as specified in 40 CFR Part 60, Subparts A & IIII, as they apply to FG-NSPS-IIII.	MSU is believed to be in compliance, based on the above.	Yes

FG-NSPS-IIII, proposed SC IX.2	**The permittee shall comply with all provisions of the National Emission Standards for Hazardous Air Pollutants as specified in 40 CFR Part 63, Subparts A and ZZZZ, as they apply to FG-NSPS-IIII.**	**MSU is believed to be in compliance, based on the above.**	**Yes**

AQD's understanding is tt the diesel fuel tank for the above generators is under the Spill, Prevention, Control and Countermeasure plan required by U.S. EPA for all petroleum storage tanks.

FG-BIBOILERS on 3/22/2023.

The proposed flexible group FG-BIBOILERS in MSU's proposed marked up copy of the current ROP, from their ROP renewal application, includes EU-BIBOILER1, EU-BIBOILER2, and EU-BIBOILER3), They are located in the former MBI building, which was accquired by MSU in recent years. There was a voided PTI 575-85 for the two 400HP (16.7MMBtu) boilers and one 250HP (10.46MMBtu) boiler capable of firing natural gas and no.2 fuel as back-up. They are considered exempt under MAPC Rule 282(b). They are used for heating the former MBI building, and for providing steam. For No. 2 fuel oil, they are said to burn only Ultra Low Sulfur Diesel fuel.

As noted by AQD's N. Hude in 2017, The data plates on the first two boilers indicated the following:

- EU-BIBOILER1: Cleaver Brooks; SN L80961; 16,738,000 Btu
- EU-BIBOILER2: Cleaver Brooks; SN L80962; 10,461,000 Btu

Due to the date of installation being on or prior to 1/28/1987, 40CFR60 Dc- Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units does not apply as per paragraph 60.40c(a) which states construction commencement after 6/9/1989.

- Departure time from the former MBI buildig: 11:52 AM.
- Visible emissions: None detected.
- Odors: None detected.
- Weaher conditions: Cloudy and 44 degrees F, with winds out of the SW at 0-5 mph, then out of the S at 12 mph, per a weather app.

EU-BIBOILER1 was running at the time, burning natural gas. Diesel fuel is available as a backup fuel. The diesel fuel sulfur content is said to be less than 15 ppm. There were no visible emissions from the stack shared by EU-BIBOILER1 and EUBIBOILER2.

Compliance concerns:

- PTI 139-18, EUSTMBOILER, SC IV.4 requires: *The permittee shall install, calibrate, maintain, and operate, in a satisfactory manner, devices to monitor and continuously record the NOX emissions, and oxygen (O2) (or carbon dioxide (CO2)) content of the exhaust gas from EUSTMBOILER. The permittee*

shall install and operate the Continuous Emission Monitoring System (CEMS) or alternative monitoring system (AMS) to meet the timelines, requirements and reporting detailed in Appendix A. It was explained to AQD on 3/13/2023 that CEMS data was being collected by the manufacturer, to build the PEMS model which will be used. The CEMS was not present on 10/24/2022 during initial start- up, however, and was said to not be gathering data until early February 2023. This did not continuously meet the requirement s of Appendix A.

- PTI 139-18, EUSTMBOILER, SC VI.2 requires: *The permittee shall continuously monitor and record, in a manner acceptable to the AQD District Supervisor, the NOX emissions and the O2 (or CO2) content from the exhaust gas from EUSTMBOILER. If the permittee elects to install an alternative monitoring system, the permittee shall submit an application to the Environmental Protection Agency (EPA) for approval in accordance with 40 CFR Part 60 Subpart A. The permittee shall operate the NOX Continuous Emission Monitoring System (CEMS) or alternative monitoring system (AMS) to meet the timelines, requirements and reporting detailed in Appendix A and shall use the monitoring data for determining compliance with SC I.1, SC I.2, and SC I.3.* AQD was informed that MSU did not have a CEMS in place at the time of the 10/24/2022 firing up of EUSTMBOILER, and a CEMS was reportedly not in place until early February 2023, when data was being gathered by a PEMS manufacturer to build a PEMS. This did not meet the requirements of Appendix A.

- **EUSTMBOILER , SC VII.3 requires: *The permittee shall submit all reports required by the federal Standards of Performance for New Stationary Sources, 40 CFR 60.49b, including performance test data from initial performance tests, performance evaluations of the CEMS, NOX emission reports, and excess emission reports. The permittee shall submit these reports to the AQD District Supervisor within the time frames specified in 40 CFR 60.49b and/or 40 CFR 60.7.* MSU was not tracking downtime for the temporary CEMS, they informed AQD, upon inquiry. Submittal of reports of continuous monitoring system downtime is required by 40 CFR 60.7(c)(3).**

- PTI 139-18, Appendix A, SC 2 requires: *Not less than 30 calendar days prior to commencement of initial start-up up of a CEMS/AMS for compliance monitoring purposes, the permittee shall submit two copies of a complete test plan for the CEMS/AMS to the AQD for approval.* On 1/23/2023, the district received a test plan, for a reported test date of 2/28/2023 for the AMS. However, the CEMS started up in early February, apparently, less than 30 days after the submittal of the test plan.

FINAL OVERALL COMPLIANCE STATEMENT:

MSU appeared overall to be in compliance with the conditions of their ROP and their PTIs, except for PTI 139-18 (SC IV.4, VI.2 and VII.3), for EUSTMBOILER. This PTI required a continuously operated CEMS for NOx. A CEMS was not present at the initial start-up of the boiler and was not in place until a temporary CEMS was gathering data to build a PEMS model. It is still unclear whether a NOx monitor is currently working as an email received on 9/19/2023 did not provide any details on required NOx monitoring and monitor downtime for the temporary CEMS was not recorded. Plus, a test plan for the CEMS was submitted less than 30 days in advance of the initial startup of the CEMS/AMS. A VN will be sent.

NAME  DATE 9/26/2023 SUPERVISOR RB