

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

M067571105

FACILITY: UNIVERSITY OF MICHIGAN		SRN / ID: M0675
LOCATION: 1239 KIPKE DR, ANN ARBOR		DISTRICT: Jackson
CITY: ANN ARBOR		COUNTY: WASHTENAW
CONTACT: Brandi Campbell , Occupational Safety & Environmental Health		ACTIVITY DATE: 03/25/2024
STAFF: Diane Kavanaugh Vetort	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Complete compliance inspection. FCE major source. 2nd day of inspection.		
RESOLVED COMPLAINTS:		

REVISED REPORT

PCE/FCE DATE 3/25/2024

M0675 UNIVERSITY OF MICHIGAN, 1239 Kipke Drive, Ann Arbor, MI 48109

CONTACT: Brandi Campbell (BC), Environment, Health, & Safety, Sr. Environmental Specialist, 734-647-9017, campbelb@umich.edu

AQD: Diane Kavanaugh Vetort (DKV), Jackson District Office

PURPOSE AND BACKGROUND

On March 25, 2024, EGLE AQD conducted an on-site compliance inspection, announced a short time prior, of numerous Emission Units / process equipment (EU), at the University of Michigan, Ann Arbor, Michigan. This is a partial compliance evaluation (PCE) of the Full Compliance Evaluation (FCE) of the stationary source.

Another PCE inspection was conducted on March 19, 2024, under a separate report. Today's inspection completes the FCE.

A separate email was sent on March 18, 2024, to request the required records for the powerhouses on campus and the Crematory. Additional records were reviewed on-site or discussed with Brandi during the inspection on the 25th and will also be submitted. All required and requested records for the FCE are referenced in and attached to this report.

Today's inspection covered the FG/EU at the North Campus Research Complex (NCRC), the Crematory, the Mott Children and Women's emergency generators, and the Hoover Heating Plant (HHP). Records were requested for Brehm boiler and generators; however, it was not inspected today.

The NCRC is the second largest campus power plant and has boilers, a turbine with ductburner and several associated emergency generators and a fire pump generator. The Matthew's Crematory and Mott/Women's generators are located at the UM Hospitals.

The purpose of the inspection is to determine the facility compliance status with the **applicable** federal and state Air Pollution Control regulations, specifically Act 451, Natural Resources and Environmental Protection, Part 55, Air Pollution Control, the administrative rules, and the conditions of UM's Renewal Operating Permit (ROP) MI-ROP-M0675-2021b.

The UM is a major source for criteria pollutants and hazardous air pollutants (HAP) and therefore is subject to one or more Major Source Maximum Achievable Control Technology (MACT) standards. UM also has installed many emergency diesel and natural gas internal combustion engine generators subject to Major Source (MACT) stands

SIGNIFICANT CHANGES SINCE THE PRIOR INSPECTION

1. In July 2022, UM verified removal of all their Ethylene Oxide Sterilizers. UM submitted the ROP minor modification form for the removal of the ethylene oxide sterilizers.
2. EUCPP-CHPHRSG: UM installed a Catalyst air pollution control for Formaldehyde in October 2023 and conducted performance testing and has demonstrated compliance with the federal MACT Subpart YYYY standard. UM submitted ROP M-001 form for the installation of the catalyst.
3. The ROP's three CIT Generators each 2,682 hp (FGCITENGINES: EUCIT01,02,03) are still not operational because the building is still under construction.

COMPLIANCE INSPECTION

The FCE compliance inspection consists of the UM campus two main power and heating facilities: UM Central Power Plant (CPP) main power and heating plant (on March 19) and North Campus Research Complex (NCRC) power and heating plant for the former Pfizer area complex. In addition, the Crematory, the Hoover Heating Plant (HHP), and the Mott Children & Women's Generators were prioritized for this inspection. Record review included Brehm building EUs. Today I met Brandi at 9:30 AM at the UM offices on Stadium near the Chrysler. We drove to the North Campus Research Complex (NCRC) power plant.

NCRC

I observed the stacks upon arrival and there were no visible emissions. We walked through the areas of all the boilers, turbine and ductburner. Overall, everything appeared to be in good condition and nothing unusual was observed. I met the Shift Plant Operator, Scott Sheppard. He verified what was operational today. EUTURBINE steam production is 17,000 lbs today, EUDUCTBURNER steam production is 10,000 lbs. and EUBOILER6 steam production is 19,000 lbs. Fuel storage is separate for the power plant and the emergency generators. He also verified that the boilers are tested monthly with fuel oil. In addition, the emergency generators are regularly tested. We then walked outside to the two separate buildings south of the plant that contain Emergency Generators and a Fire pump Generator. These units were not operating today and appeared to be in good condition. Everything related to the NCRC supplies power /heat to this complex only.

On the way, I observed the separate stack installed during Pfizer ownership is still there. It is not hooked to anything. Purpose was to allow for a portable boiler to be brought in for supplemental power. It has never been used and would require permit application.

NCRC EU OPERATING Today: EUTURBINE, EUDUCTBURNER, BOILER4 (steam boiler), EUBOILER6

NOT OPERATING: FGBOILERS1A&1B, FGBOILERS2&3, EUBOILER5, EUB080-GEN, EUB016-GEN, EUB0550-GEN, EUB800-GEN1, EUB85-FIREPUMP2, FGB85-EMERGENS, FGPATHGENS.

Brandi and I next drove across from the NCRC to view the EUB800GEN1, enclosed generator siting outside of a Chiller Plant Building. Not operating. EUB0550 - We did also look at Building 550 emergency generator (the one with the stack that matched the building).

EUI0213-02 is a Matthews Cremation Division model IE43-PPI (Power-Pak

I) human crematory incinerator

Brandi and I then drove to the main hospital to inspect the Crematory incinerator in the Anatomy Department. It is natural gas fired and has a 750 lbs. maximum capacity; 150 lbs./hr. burn rate located at the Medical Science II Building. We met with the new manager, Clayne Fraser, and Operator Kenny. The incinerator was operational today. They said the first burn was at 4:30 AM and it is on the second burn of the day (@11:00 AM).

Overall, the Unit appeared to be in good condition. Clayne and I discussed a proposed maintenance upgrade on the unit planned to be done by Matthews. This mostly includes a revamp of the Control Panel. There have been issues with lost data and connections to the UM main computer system. It is noted that the Crematory has one thermocouple in the secondary chamber. This has malfunctioned before, and Clayne said they monitor it regularly. They said the Unit runs itself, it has the timer setting. I observed there was 56 minutes left in the 2nd burn. Clayne said then there will be a cool down period.

Clayne said the most recent maintenance work by Matthew's (manufacturer) was to replace the refractory ceiling. The Thermocouple was replaced a couple years ago. I noted it was bad during my prior inspection and the Unit was not operating. Matthews recently conducted an inspection in the beginning of February 2024 per Clayne, and they recommend additional refractory will need replacing. I noted in my last inspection that Clayne opened the door, and I observed the refractory sides and bottom did look worn. Clayne said UM has a contract with Matthew's for regular maintenance @ 12-18 months and it includes numerous checks of the entire system.

Per Kenny and Clayne, they are still conducting Visible Emissions (VE) observations during daily cremations. He and Kenny said the Opacity Monitor in the stack has been working properly. I observed the light was illuminated on the Opacity Monitor (located in stack ductwork at the back corner of the room). Kenny also took us outside on the landing to view the stack exit, this is where they take VE observations.

We all discussed current recordkeeping; the ROP has several requirements. UM receives anatomy donations which they log in a book in the office that I observed. Per Clayne once per month they receive items from pathology/Forensic Sciences. They receive bodies from their morgue, medical student classes, and drums of anatomy parts. I had previously requested a better cross reference of the required monitored parameters (hours operation, temperature, burn weight). Records are required to verify that compliance with the minimum temperature during burns is met. Brandi offered to implement a different record so that the actual cremations, weight, and minimum temperature can be verified. Time and temperature appear to be key here. She sent me an email in follow-up to the inspection:

I think I came with a solution for cross referencing loads at the crematory. I am creating a monthly spreadsheet, listing the days, and Kenny will place a tally every time a burn takes place that day. This way we can look at the spreadsheet and cross reference the pathology log and the Donor database on that day. One could then pull up the temperature data daily report and see the number of burns. When they begin discussions on the upgrade, maybe Matthews can incorporate our requests. I will plan on putting this in place Monday April 1. Please let me know if this seems reasonable. It is still cross referencing, but with the new spreadsheet it will show right away how many burns on a particular day and then we can easily pull up the other logs (path log, donor database, and temperature log) for verification. I can add this into the e-mail response as well.

MISCELLANEOUS

During the inspections Brandi pointed out the continued construction of the site of the new UM Hospital Clinical Towers, that is the location of the permitted FGCITENGINES. This is near the current hospital and will be patient rooms. Therefore the newest permitted generators are still not operable.

CS MOTT & WOMEN'S GENERATORS

Brandi and I then drove to a separate dock entrance at the Children's and Women's hospital to inspect the generators there. We met with Ryan Strazinwiski, Operator. He took us to the 4 backup diesel generators FG4GENS-5173. These units were not operating, and the units and the room appear to be in excellent condition. I recorded the following from #4: Engine hours 343.5, Control hours 117202, kilowatt hours 191648.

Per Ryan the underground diesel storage tanks are located across the street from the dock entrance. Each unit has a day tank next to it. They maintain a logbook to check and log any issues. They are run for brief periods monthly to verify proper start up and operation.

We looked outside to see the stack location. Stacks are short and are between a parking garage and the building. It appears this could potentially be an issue as they are lower and in an alleyway like setting. Brandi said they have not had complaints to date.

HOOVER HEATING PLANT

Brandi and I then drove to the HHP and met with Glen Theeck, long time Supervisor. He also supervises all the Outlying Boilers. Today #3 and #4 Boilers were operating. EUB0805-02 EUB0805-03 and EUB0805-04 are natural gas with No. 2 fuel oil back-up capability. #2 and #3 are 31.4 MMBtu/hr heat input (750 HP) and #4 is 19 MMBtu/hr (500 HP). HHP has two underground fuel storage tanks 15K and 14K. Note: Boiler #1 is dismantled/disconnected in place.

These boilers provide heating to the building next door, the Recreation Building on State Street, and the Chrysler Arena. I asked about all the outlying boilers, and they are in many places. We decided the next inspection will include some of these locations.

As part of the Boiler MACT, an example Tune-up record was submitted later for each Boiler conducted in December 2023. UM measures the effluent stream concentration for CO, O₂ before and after the tune up.

HHP Monthly fuel usage record for January 2024 was provided with the submitted record. Only Boiler #2 and #4 operated.

Glen pointed out one small natural gas emergency generator that is run every Tuesday for 30-minute checks. He showed me their daily logbooks which are very thorough. He also provided some information on the Brehm Tower Building boilers. They log their natural gas throughput. Ryan (Strazinwiski) runs weekly checks for 30 minutes. Two boilers are operating today at Brehm per Glen.

BREHM TOWER

Due to construction this area was not inspected; only records were requested. This is connected to the Kellogg Eye Center. There is a plan to revamp the efficiency of the two larger boilers. I am unclear if this relates to the current construction. The Brehm is proposing to downsize the boiler burners - they are currently way oversized for what is needed. Derating the boilers may allow for them to become permit exempt. Brandi, Glen, and I discussed UM submitting a proposal related to their original PTI No. 13-08. The PTI contains other EU in the original project so it is not clear if they can be removed as exempt or if the entire permit could be voided. This will need further review.

Following the inspection Brandi emailed, *I have attached a copy of the final permit for you to reference. I will begin drafting a letter and provide the necessary data from the manufacturer showing the heat input of less than 20 MMBtu/hr and what they will be derated to. With Steve out of the office, it will take a couple weeks.*

Brehm has (4) boilers and (3) emergency generators. These were all operable during the requested record keeping time period of February 2023-Feb 2024. The records indicate there are (2) natural gas Boilers with fuel oil capability and (2) natural gas only boilers. There are (3) diesel emergency generators. The PTI 13-08 covered: (2) nat gas /distillate 24.8 MMBTU/hr; (2) nat gas (10 MMBtu/hr); and (3) diesel emergency generators (750 kW).

RECORDKEEPING REVIEW

2023 Supporting records were reviewed as part of UM's MIENVIRO annual reporting. Facility wide natural gas and distillate fuel usage is reported as well as hours of operation. Various other material gallons are reported such as paint. A significant number of combustion sources undergo regular performance testing, and the Emission Factors are used for these EU.

AQD received an email response from Brandi with the requested records on 3/29/2024. Brandi included responses to each listed request (copied below). (31 Attachments were received. All records were reviewed, determined acceptable, and filed in plant files. (Records for CPP and EUCPP-CHPHRSG are included in the 3/19/24 PCE report)

NCRC (include the Fuel Oil specification(s) as applicable)

EUB550-GEN: NOx monthly emissions and Hours of Operation

Attached is the monthly NOx emissions and hours of operation spreadsheet for B550. (*B550 Gen.pdf*)

EUTURBINE: Fuel Oil purchase record; NOx monthly emissions and Hours of Operation

Attached is the fuel oil purchase record during this time period. (*NCRC B080 Fuel Paperwork.pdf*)

Attached NOx monthly emissions and hours for Jan-Feb 2024. 2023 data was submitted via annual emissions report (*NCRC Boiler Turbine fuel emissions records.pdf*)

EUDUCTBURNER: NOx monthly emissions and Hours of Operation

Attached NOx monthly emissions and hours for Jan-Feb 2024. 2023 data was submitted via annual emissions report (*NCRC Boiler Turbine fuel emissions records.pdf*)

EUB800-GEN1: NOx monthly emissions and Hours of Operation

Attached (*B800 Records.pdf*)

EUB85-FIREPUMP2: NOx monthly emissions and Hours of Operation

Attached (*Fire pump 2 Records.pdf*)

FGBOILERS1A&1B: NOx monthly emissions and Hours of Operation

Attached NOx monthly emissions and hours for Jan-Feb 2024. 2023 data was submitted via annual emissions report (*NCRC Boiler Turbine fuel emissions records.pdf*)

FGBOILERS2&3: NOx monthly emissions and Hours of Operation

Attached NOx monthly emissions and hours for Jan-Feb 2024. 2023 data was submitted via annual emissions report (*NCRC Boiler Turbine fuel emissions records.pdf*)

FGBOILERS5&6: NOx monthly emissions and Hours of Operation.

Attached NOx monthly emissions and hours for Jan-Feb 2024. 2023 data was submitted via annual emissions report (*NCRC Boiler Turbine fuel emissions records.pdf*)

Demonstration of compliance with Opacity monitoring/standard.

NCRC only burns fuel oil less than 15 ppm sulfur and primary fuel is natural gas. UM is limited to fuel oil use per the Boiler MACT. UM monitors the stacks as well as performs annual maintenance on all units at NCRC. Attached is a fuel oil delivery showing the ppm sulfur. (*NCRC B080 Fuel Paperwork.pdf*)

Demonstration of compliance with NSPS Subpart Dc.

UM performs annual maintenance on all Boilers at NCRC which are attached for Boilers 1a, 1b, 2, 3, 5, and 6. Fuel usage and emissions are recorded monthly. UM provides annual emissions via MAERS.

(*NCRC B2_B3 inspection form.pdf*)(*NCRC B5_B6 inspection form.pdf*)(*NCRC 1a 1b Tune Up-Clayton.pdf*)

FGB85-EMERGENS: NOx monthly emissions and Hours of Operation

Attached (*B85 EMGENS Records.pdf*)

FGPATHDGENS: Hours of Operation (various SC III. 1., 2., 3.)

Attached (*Pathology Gens 1.pdf and Pathology Gens 2.pdf*)

CREMATORY

SC. III. 1 through 3. Demonstration of compliance, records, or other means.

As discussed during site visit on March 25, 2024, specimens are either documented on the pathology log or within the donation database. The date, weight, and smoke observation are marked both on the log and/or within the donation database. The temperature is continuously monitored during each burn. Attached is a sample of the daily temperature report for 1/20/2024 which correlates with a burn from the attached path burn log. The attached daily temperature report shows 1 burn which correlates to the pathology log. During the site visit, you requested a better system to cross-reference. UM created a burn log that will begin April 1, 2024. Each time there is a burn, a tally mark will be added to the day. The burn log will show the number of burns that day which can be cross-referenced with the pathology log and

the donation database showing details on those particular burns on that particular day and verify the temperatures on the daily temperature reports.

(Path Burn Log.jpg)

(Crematory temperatures 1_20_24.pdf)

(Daily burn log.pdf)

SC. VI. 1. Temperature records for the time period.

Attached is a sample daily temperature report.

(Crematory temperatures 1_20_24.pdf)

AQD: Prior inspection I determined this record needs to correlate with the VI.2 record in order to determine compliance during burn/cremation events. This is being addressed with the new daily burn log to cross-reference.

SC. VI. 2. Daily cremation records of time and weight (not personal ID records)

As shown during the site visit on March 25, 2024, all burns are either documented on the pathology log or within the donor database. Attached is a copy of the pathology log.

(Path Burn Log.jpg)

SC. VI. 3. Quarterly records

Attached is the quarterly percentage log.

(Crematory Percentage Log.pdf)

SC. VI. 5. Maintenance / service records during the period for Crematory / Control panel /Opacity monitor.

Matthews was on site February 6, 2024, performing maintenance and checks. Documented in the maintenance log kept on site.

SC. VI. 6. Visible Emissions records.

Performed daily and logged on pathology log or in donor database.

(Path Burn Log.jpg)

HOOVER

EUB0805-02: SC VI.1. Records of natural gas and fuel oil usage.

Daily usage logs were reviewed during site inspection on March 25, 2024. Attached are the fuel records for Boiler 2 Jan-Feb 2024. 2023 data was submitted via annual emissions report. Attached is Boiler MACT tune up for this reporting period.

(HooverHeatingPlant Fuel Recordkeeping.pdf)

(HHP Boiler MACT Tune Up.pdf)

SC VI. 2-6 if applicable due to fuel oil usage.

No fuel oil burned during this time period and no recent fuel deliveries.

EUB0805-03: SC VI.1. Records of natural gas and fuel oil usage.

Daily usage logs were reviewed during site inspection on March 25, 2024. Attached are the fuel records for Boiler 3 Jan-Feb 2024. 2023 data was submitted via annual emissions report. Attached is Boiler MACT tune up for this reporting period.

(HooverHeatingPlant Fuel Recordkeeping.pdf)

(HHP Boiler MACT Tune Up.pdf)

SC VI. 2-6 if applicable due to fuel oil usage.

No fuel oil burned during this time period and no recent fuel deliveries.

CHILDRENS AND WOMEN EMERGENCY GENERATORS

FG4GENS-5173. NOx emissions, hours, fuel usage.

Attached (*CW Mott generator 1_2sprdsht.pdf and CW Mott generator 3_4sprdsht.pdf*)

BREHM TOWER

FGB5102-01-02

Attached is the fuel usage and hours run for Jan-Feb 2024. 2023 data was submitted via the annual emissions report. No fuel oil burned during this time period. Also attached is the Boiler Tune Up form completed during this time period.

(BrehmB1_2Air PermitRecordkeeping

(BrehmTowerMACT2023.pdf)

FGB5102-03-04

Attached is the fuel usage and hours run for Jan-Feb 2024. 2023 data was submitted via the annual emissions report. Also attached is the Boiler Tune Up form completed during this time period.

(Brehm B3_B4 Records.pdf) - please note due to construction, the meter is not accessible. March number will include Jan-Feb usage in the 12-month rolling. Hours were available and documented.

(BrehmTowerMACT2023.pdf)

FG3GENS-5102

Attached is the fuel usage and hours run for each generator.

(Brehm Tower Gen Fuel Usage.pdf)

(Brehm Tower Gen Hours.pdf)

COMPLIANCE SUMMARY

The FCE includes two inspection dates (PCE) and the prior 12-month period includes 2023 and 2024. I reviewed all the referenced records received. AQD determined that UM is in substantial compliance with their ROP and the applicable federal and state requirements at this time. One record that is pending is the most recent version of the Malfunction Abatement Plan for the CHP. It has been revised and the draft is pending final review by Steve O'Rielly, RO. Brandi will submit later in April.

NAME _____

DATE _____

SUPERVISOR _____