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

M364138465

FACILITY: UNIVERSITY OF MICHIGAN FLINT		**SRN / ID:** M3641
LOCATION: 502 MILL STREET, FLINT		**DISTRICT:** Lansing
CITY: FLINT		**COUNTY:** GENESEE
CONTACT: Michael Lane , EHS Director		**ACTIVITY DATE:** 01/31/2017
STAFF: Michelle Luplow	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: Scheduled, semi-announced partial compliance evaluation; determine compliance with PTI No 140-13.		
RESOLVED COMPLAINTS:		

Inspected by: Michelle Luplow
Personnel Present: Mike Lane, Director of Environment, Health & Safety (mjlane@umflint.edu)
Mike Malik, Project Coordinator/MAERS (mmalik@umflint.edu)
Jason, Boiler Operator
Intern

Purpose: Conduct a semi-unannounced, scheduled, partial compliance evaluation (PCE) inspection by determining compliance with University of Michigan – Flint's (UM-Flint) Permit No. 140-13 for two 33.6 MMBtu/hr boilers. This inspection was conducted as part of a full compliance evaluation (FCE).

Facility Background/Regulatory Overview: UM-Flint is a university located in downtown Flint. They operate multiple boilers campus-wide which are used for domestic hot water and heat. The two permitted boilers, EUBOILER1 and EUBOILER2, are the largest boilers present on campus. EUBOILER1 operates only on natural gas, EUBOILER2 is dual-fuel fired with natural gas as the primary fuel and fuel oil No. 2 (diesel) used for emergency backup purposes. These two new units replaced four existing boilers permitted under PTI No. 32-12. The remaining boilers throughout campus are natural gas-fired and much smaller, all rated under 5 MMBtu/hr.

There are also multiple generator sets located throughout campus used as backup power in emergency situations where the campus has lost power from the grid.

UM-Flint has recently acquired 2 additional buildings, which also contain boilers and generators.

This facility has been flagged as an opt-out facility in MACES; however, there are no facility-wide restrictions on HAPs or criteria air pollutants to opt UM Flint out of Title V, ROP requirements. Additionally, this is not a synthetic minor source, as the emission limits in place for NOx were not used to limit emissions but were rather based on PSD increment analysis. The evalform for this permit clearly states that UM Flint is a true minor source that is not subject to PSD requirements.

I have requested that a Potential to Emit Demonstration be submitted to AQD by April 17, 2017. At that time we will be able to further determine if UM Flint can remain a true minor source.

The 2 boilers are subject to the New Source Performance Standards (NSPS) Subpart Dc for steam-generating units with a maximum design heat input capacity of less than 100 MMBtu/hr, but greater than 10 MMBtu/hr.

Inspection: On January 25, 2017 I had planned to conduct an unannounced inspection at the university; however Mike Lane, Director of EHS, was not onsite that day, and Tim Barden, Assistant Director of Maintenance, was not able to provide employees to take me throughout the campus, as all were assigned jobs for the day. Because of this, I scheduled an inspection with M. Lane for January 31, 2017. At approximately 8:45 a.m. on January 31, 2017, I met with Mike Lane; his intern; Mike Malik; and Jason, one of the boiler operators; at the Hubbard Building located at 602 Mill St (you can park at the Mill Street Parking Deck and walk to Hubbard). M. Lane's office is located at Northbank Center, which is where he suggested we find him first, for future inspections. I provided him with a Boiler MACT outreach brochure, and via email I provided him with the recently updated Permit to Install Exemptions Handbook (January 2017). We discussed the various types of emission units throughout the campus (boilers, generators, paint booths, pottery kilns, parts washers) and I requested to visit each of these emission units, starting with the 2 permitted boilers.

FGBOILERS1&2 (EUBOILER1 and EUBOILER2)

II. Material Limits

UM-Flint is allowed to burn diesel during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. Periodic testing with liquid fuel should not exceed a combined total of 48 hours per calendar year. M. Lane said that they last time they used diesel was during their December 2013 opacity stack test. Diesel has not been used for any of the aforementioned periods. Both boilers are both only fired on natural gas at this time.

Boiler	Serial #	Snap-shot scf/ Scf per hour	% Load	Manufacture Date	Federal Regulation
EUBOILER1	S4000 150-42	4,254,254/ 7,022	20.2	2012	NSPS Dc
EUBOILER2	S4000 150-43	94,554,137/ 8,846	33	2013	NSPS Dc

III. Process/Operational Restrictions
The boilers are required to be operated according to manufacturer's recommendations for safe and proper operation in order to minimize emissions during periods of startup, shutdown, and malfunction.

Jason explained how UM-Flint ensures that the boilers are being properly maintained. The boilers are annually inspected using CSD1 testing, which tests the combustion outputs for air, oxygen, CO, NO, and NOx. This test is conducted for 4+ hours at 90% load. The data generated from these tests provide them with indicators as to whether or not the boilers are properly functioning. He said that all tests conducted have been showing consistent emissions of the aforementioned combustion products. If an output parameter were to deviate from this consistency, steps would be taken to ensure that the problem causing the deviation is corrected.

In addition to the annual testing, they also perform maintenance once per year, including cleaning the internal portions of the boiler, changing gaskets, vacuuming out debris, conducting safety checks, and cleaning the tubes on both the fire and water sides. Jason provided me with manufacturer recommendations for daily, weekly, and semi-annual/annual maintenance activities (attached). Based on maintenance activities Jason described, UM-Flint appears to be following manufacturer's recommendations.

IV. Design/Equipment Parameters
The device used to monitor and record the boiler's fuel use is required to be installed, calibrated, maintained and operated in a satisfactory manner.

In 2014, the original monitors were changed out for newer monitors because the original monitors had been "oversized." Jason explained that the calibrations on the monitor were conducted when the unit was first installed in 2013, and again after the new monitors were installed in 2014.

Jason explained that they use the steam output to verify that the fuel input is correct. Their target operating efficiency is 82-88%. He explained that if the efficiency were to change, but the fuel flow rate measure consistently, they would determine the cause, paying particular attention to the fuel flow meter as one of the possible causes.

VI. Monitoring/Recordkeeping
UM-Flint is required to monitor and record the monthly fuel use for FGBOILERS1&2. They must indicate the type and total amount of each fuel used monthly. UM-Flint is also required to keep monthly NOx emission calculations for both boilers. M. Lane provided me with the "Boilers 1 and 2 NOx Emissions Tracking Sheet" (attached) which contains both fuel usage for each type of fuel used as well as NOx emissions on a monthly and 12-month rolling basis. The permit does not specify which emission factor to use to calculate NOx emissions. M. Malik provided me with the emission factors they used to calculate the NOx emissions (attached). I have requested that UM-Flint also provide me with the source of the emission factors used in their calculations. I will update MACES with this follow-up information and verify it is an appropriate emission factor to use, once received.

From December 2015 – November 2016, the 12-month rolling NOx emissions were reported at 1.67 tons. The 12-month rolling NOx emission limit for both boilers combined is 23.16 tons per 12-month rolling time period. UM-Flint is in compliance with this emission limit.

Fuel supplier certification records or fuel sample test data are also required to be kept for each delivery of diesel fuel oil. M. Lane said they currently have diesel storage tanks on standby, but also said they were discussing getting rid of them completely. The diesel contained in the tanks, he said, is the same batch that was used back in December 2013 for the stack test. Since that time they have not used the fuel oil for any period of time. M. Lane showed me the test data from the 2013 diesel test. The spec sheet for the fuel oil said that it was an ultra-low sulfur diesel, which is defined as 15 ppm or less sulfur. UM Flint is limited to a maximum of 0.5 wt% of sulfur in their fuel oil, and is therefore in compliance with this limit.

VIII. Stack/Vent Restrictions
I will provide a follow-up report once UM-Flint is able to provide me with the as-built design stack heights to demonstrate compliance with the stack height minimum requirement of 62.0 feet per stack.

Exempt Equipment

Emergency Engines (Exemption Rule 285(2)(g))
Table 1 contains a snapshot of the information I was able to collect on generator sets campus-wide. I was told that these units are serviced semi-annually, and every Tuesday they are maintenance tested for 1 hour each. These would be considered emergency engines if they operate for less than 500 hours per calendar year. Maintenance testing results in 52 hours per year. M. Lane said they've had no emergencies where they have needed to operate the engines for backup power.

I have requested that UM-Flint send me an updated, complete list of all generator sets campus-wide, with the MMBtu/hr rating, serial number, model year, installation date, location, hours operated and which exemption applies to the unit's installation. When this is received, a complete review of the engines with respect to state and federal regulations can be made, and a follow-up report will be provided in MACES when this is received. Blank boxes indicate missing information. MMBtu/hr ratings have yet to be determined in order to demonstrate exemption under Rule 285(2)(g).

Table 1. Emergency Generators through UM-Flint's Campus

Engine	Serial #	Total Hours	kW	hp	Fuel	Location	Installation Date	Manufacture Date
Katolight KTI150G	T5946W-27519310	2801	310			Central Energy Plant -Plans to remove this		
Cummins	B160926111		230		Diesel	Central Energy Plant	Spring 2017 to replace Katolight	
Cummins 20ES	H970645600		20		Natural gas	Mill Street Parking Deck		
Cummins WSG1068	B080156462		100			First Street Residence Hall		
John Deere	RG6135G004974				Diesel	Murchie Science Building		
CAT	661747746	1647	200			University Center		
Cummins OSL-9-G2NR3	46873737		261	364	Diesel	French Hall		
Cummins NTA855G3	30341386	1398.8			Diesel	Library		1993
Generac						University Pavilion		
Detroit Diesel 80837305	8VF056821	162				Riverfront Residence Hall		
Cummins			500		Natural gas	Northbank Center		
Cummins GTA19	25249138	798.2			Natural gas	William White Building		June 2000

Paint Booths (Exemption Rule 287(2)(c))
UM-Flint has 4 paint booths throughout campus: 1 in the Murchie Science Building, 1 in the University Pavilion Annex, and 2 in the William White Building. These booths would likely fall under exemption Rule 287(2)(c).

The paint booth in the Murchie Science Building has not been used in over 20 years. The filters are in disrepair, and the booth itself appears to be used as storage space, although the ventilation ductwork for the stack is still intact. I have not requested usage rates for this booth as, by my professional judgement, its current condition demonstrates that it has not been used in quite some time. M. Lane said there was some talk of dismantling and uninstalling this unit.

The booth in the University Pavilion Annex is used for spray painting in a ceramics classroom. During the inspection, we entered the classroom while a class was being held, to inspect the booth. The fabric filters were not installed properly, as the filters were not installed tightly/flush with the exhaust opening, allowing the potential for particulate to escape around the filter. M. Lane spoke with the instructor of the class to point out these requirements and told me he would have a sign pinned

at this location to remind faculty and students of the requirement for fabric filters to be installed properly. He said he would email me a photo of this when it was done.

There are 2 booths located in the William White building, both in art classrooms. Both booths had fabric filters installed properly and M. Lane said the majority of painting conducted in these two was aerosol spray painting.

I requested that M. Lane submit recordkeeping for paint usage in all booths except for the unused one in Murchie Science Building. As of 2/27/2017 he has yet to provide this documentation which will likely be in the form of purchase order records. I will provide an update in MACES once this information is received.

Kilns
UM-Flint has 5 kilns for use in their pottery/ceramic classes located in the University Pavilion Annex. Four are electrically heat, one is natural gas-fired. These are exempt under Rule 282(2)(a)(iii) for electrically heated and natural gas-fired kilns for firing ceramic ware.

Boilers
The unpermitted boilers throughout campus are natural gas-fired and much smaller than the 2 permitted boilers, all rated under 5 MMBtu/hr. These boilers would meet exemption Rule 282(2)(b)(i) because they are rated at less than 50 MMBtu/hr.

Parts Washer
UM-Flint has one parts washer located on their campus that measures 6 square feet in air:vapor interface (2'x3'). It uses Safety Kleen solvent and operating instructions were present on the outside of the unit. This unit is used to clean oil filters and is exempt per Rule 281(2)(h).

MAERS
M. Malik and I discussed reporting of the various unpermitted boilers and emergency engines to MAERS.

As discussed, we decided that the emergency generator emissions do not have to be reported to MAERS because they are emergency generators used solely for backup power when the local utility service is interrupted (See MAERS User guide, page 27).

The unpermitted boilers' emissions only need to be reported if the total annual natural gas throughput for an individual boiler is equal to or greater than 50 $MMft^3$. Based on M. Malik's cursory review of the boilers' throughputs none of the unpermitted boilers' emissions will need to be reported to MAERS.

Compliance statement: UM-Flint appears to be in compliance with PTI No.140-13 at this time

NAME William Lane DATE 2/28/17 SUPERVISOR B. M.