B2814
MANILA

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

B281456288

FACILITY: DETROIT THERMAL BEACON HEATING PLANT		**SRN / ID:** B2814
LOCATION: 541 MADISON AVE, DETROIT		**DISTRICT:** Detroit
CITY: DETROIT		**COUNTY:** WAYNE
CONTACT: Dale Lane , Environment, H & S & Engineering Manager		**ACTIVITY DATE:** 12/07/2020
STAFF: Todd Zynda	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: December 7, 2020 Inspection and RATA Observation		
RESOLVED COMPLAINTS:		

REASON FOR INSPECTION: Onsite Inspection

INSPECTED BY: Todd Zynda, AQD

PERSONNEL PRESENT: Phil Malara, Plant Manager; Scott Venman, Barr Engineering

FACILITY WEBSITE: www.detroitthermal.com

FACILITY BACKGROUND

Detroit Thermal Beacon Heating Plant (DTBHP) is located in downtown Detroit, at 541 Madison Avenue. To the west of the facility is the 36th District Court, to the north is Ford Field Stadium, to the south are the Wayne County Jail and Wayne County Third Circuit Court, and to the east is the Chrysler Freeway (Interstate 375). The facility currently has 19 employees and operates 24 hours a day, 7 days a week.

DTBHP is subject to Title 40 of the Code of Federal Regulations, Part 70, because the potential to emit nitrogen oxides (NOx) and carbon monoxide (CO) each exceeds 100 tons per year. DTBHP is classified as a major source under the Prevention of Significant Deterioration regulations at Title 40 of the Code of Federal Regulations, Part 52.21, because its potential to emit of NOx and CO each is greater than the applicable thresholds of 100 tons per year pursuant to 40 CFR 52.21(b)(l)(i)(*a*).

The facility is a synthetic minor hazardous air pollutant (HAP) source, and therefore not subject to 40 Code of Federal Regulations (CFR) Part 63, Subpart DDDDD, the major source boiler maximum achievable control technology (MACT) standards.

Additionally, DTBHP is subject to the New Source Performance Standards for Industrial-Commercial-Institutional Steam Generating Units promulgated in Title 40 of the Code of Federal Regulations, Part 60, Subparts A and Db. Both Boiler 6 and Boiler 7 have capacities of 180.2 million British thermal units per hour (MMBtu/hr) and were constructed after June 19, 1984.

Boilers 1 through Boiler 4 have heat input capacities greater than 250 MMBtu/hr, however, they were constructed before June 19, 1984.

Boilers 1 through 4 were installed prior to August 15, 1967. In 1973 and 1974, Boilers 1 through 4 were converted from coal fired boilers to natural gas/No. 2 fuel oil fired boilers. Boilers 1 through 4 are not subject to 40 CFR Part 60, Subpart D, as the change from coal fired boilers to natural gas/No.2 fuel oil fired boilers does not constitute a modification as defined in 40 CFR 60.2, and Subpart D only applies to boilers constructed, modified, or reconstructed after August 17, 1971.

PROCESS OVERVIEW

DTBHP operates six boilers that are used to generate/supply steam to various commercial customers in the downtown Detroit area. The boilers primarily fire natural gas but have the capacity to fire No. 2 fuel oil as a backup. Boilers 1, 2, and 4 were installed in the 1920's and each have a rated heat input capacity of 570 MMBtu/hr. Boiler 3 was installed in the 1959, and has a rated heat input capacity of 600 MMBtu/hr. Boiler 5 was permanently shut down and removed from the facility. Boilers 6 and 7 were installed during 2007 and are rated at 180.2 MMBtu/hr. Boilers 6 and 7 are equipped with low NOx burners and flue gas recirculation.

COMPLAINT/COMPLIANCE HISTORY

The facility was recently inspected on December 11, 2018, November 18, 2016, December 2, 2014, May 31, 2013, April 13, 2010, February 16, 2010, May 12, 2008, May 1, 2007, October 20, 2006, and March 17, 2005. The facility was found to be in compliance during the above listed inspection dates.

On September 13, 2015, a relative accuracy test audit (RATA) and stack test on EU-BOILER7 were discontinued. Detroit Thermal alleged that a malfunction of the flue gas recirculation system resulted in high NOx emissions from EU-BOILER7. Following correction of the malfunctioning equipment, the test was rescheduled and took place on September 26, 2015. On November 13, 2015, Detroit Thermal provided the AQD with hourly predictive emissions monitoring system (PEMS) data for EU-BOILER7 from September 17, 2014 through September 30, 2015. Based on the records submitted, AQD identified over 1,400 individual exceedances of the hourly NOx emission limit between September 16, 2014 and September 30, 2015. On June 22, 2016, the facility entered Administrative Consent Order (ACO) AQD No. 24-2016. The Consent Order required the facility to comply with NOx emission limit under FG-BOILER_6,7 on an hourly basis and required the facility to submit quarterly NOx excess emission reports. Consent Order AQD No. 24-2016 was officially terminated on September 18, 2020.

On December 17, 2017, a violation notice was issued for PEMS monitor downtime at Boiler 6 during the 3rd quarter 2017. The facility response stated that the monitor downtime was due to an error in calculations from the PEMS vendor. A revised report was submitted on January 5, 2018 by the company indicating zero monitor downtime for Boiler 6. Based on the report provided and supporting information, this violation is considered resolved.

On January 10, 2018, a violation notice was issued for exceedance of the NOx emission limit of MI -ROP-B2814-2014, FG-BOILER_6,7, SC I.1.1d and ACO AQD No. 24-2016, Condition 9.A.1. The NOx emission limit was exceeded at Boiler 6 for a total of six hours during the 3rd quarter of 2017. As a result, a stipulated penalty letter was issued on February 6, 2018. According to AQD Enforcement the stipulated penalty was paid on March 9, 2018. There has not been a NOx emission limit exceedance reported since the 3rd quarter of 2017. The January 10, 2018 violation is considered solved.

On May 18, 2018, a violation notice was issued for failure to submit the 1st quarter 2018 report as required under ACO AQD No. 24-2016. The facility submitted the 1st quarter 2018 report on June 15, 2018 resolving the violation. A stipulated penalty letter was issued on June 8, 2018. According to AQD Enforcement, the stipulated penalty ($2,000) has not been paid.

On April 11, 2018 and May 18, 2018, violation notices were issued for failure to submit semi-annual and annual compliance certification reports. Ultimately these reports were received on June 21, 2018 resolving the violations.

CONSENT ORDERS

As described above, the facility Consent Order AQD No. 24-2016 was entered on June 22, 2016. The Consent Order required the facility to comply with the NOx emission limit under FG-BOILER_6,7 on an hourly basis and required the facility to submit quarterly NOx excess emission reports. As documented above, the facility had continued violations resulting in the stipulated penalties from the ACO; however, not since the 3rd quarter of 2017 have there been reported NOx emission exceedances at either Boiler 6 or Boiler 7. Under Condition 18 of the ACO, the facility may request termination of the ACO after two years, which the company requested on September 10, 2020. Consent Order AQD No. 24-2016 was officially terminated on September 18, 2020.

OUTSTANDING VIOLATION NOTICES

As described above, the violation notices issued in 2017 and 2018 have been resolved.

INSPECTION NARRATIVE

On December 7, 2020, the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD) inspector, Mr. Todd Zynda, conducted an inspection of DTBHP at 541 Madison Avenue, Detroit, Michigan. The inspection was conducted concurrently with the RATA of the Boiler 6 PEMS. During the inspection, Mr. Phil Malara, Plant Manager, and Mr. Scott Venman, Barr Engineering, provided information and a tour of facility operations relating to air quality permits. The inspection was conducted to determine the facility's compliance with the Natural Resources and Environmental Protection Act (NREPA), Act 451, Part 55, and ROP No. MI-ROP-B2814-2014.

At approximately 9:40 AM, Mr. Zynda arrived onsite and performed outside observations. No visible emissions were observed at the facility. No odors were detected during the site inspection. At 9:45 AM Mr. Zynda entered the facility, stated the purpose for the inspection, and was greeted by Mr. Malara, and Mr. Venman. Mr. Zynda provided an inspection checklist for items contained within MI-ROP-B2814-2014. The records required to demonstrate compliance with ROP conditions were discussed. Mr. Malara stated that both EUBOILER3 and EUBOILER4 are not operable. Mr. Malara also stated that none of the boilers have burned No. 2 fuel oil since the last inspection. According to Mr. Malara, the fuel oil storage tank has been decommissioned and left in place. If Detroit Thermal ever needs to use fuel oil in the future, the current plan is to bring a tanker trailer onsite to supply fuel oil. During the opening meeting, facility records were provided. Email correspondence and facility records are attached to this report.

The tour began with observation of the boiler control room. During the inspection Boiler 6 was operating at approximately 115 to 120 thousand pounds of steam per hour (k lb/hr). Boiler 6 PEMS data screen indicated the following operational data: 12.9 ppm NOx, 0.0175 lb/MMBtu NOx, 125.7 scfh gas, and 5.0% O2. Boiler 7 which was slated to be operating the following day for RATA, was down due to a tube leak. According to Mr. Malara, the RATA on Boiler 7 will be conducted following repairs (see correspondence regarding Boiler 7 repairs). Boilers 1 and 2 were in operation at the time of the inspection, but the gas flow rate or steam rate were not recorded.

The tour continued with observation of the facility boilers from the second floor. The intake lines to all boilers are color-coded. A red line indicates air intake, an orange line indicates oil intake, and a yellow line indicates natural gas. Boilers 6 and 7 are located in the former location of Boiler 5. During the inspection, each individual boiler was observed. Boilers 3 and 4 were

observed with burners removed and fuel lines capped. In addition, the turbine room was observed. None of the turbines present at the facility operate.

The tour concluded with observation of the Relative Accuracy Audit on the 6th floor. At that time, the relative accuracy for the NOx PEMS was 2.8% after the ninth run.

During the inspection, the maintenance shop was not observed. The maintenance shop contains machining equipment (saws, lathes, grinders, etc.) that is used for boiler repair and maintenance. Emissions from the maintenance shop are released to the general in-plant environment. According to the previous inspection, the maintenance shop is used on an infrequent basis, as most repair work is now contracted out.

APPLICABLE RULES/PERMIT CONDITIONS

Renewable Operating Permit No. MI-ROP-B2814-2014

The ROP was renewed with an effective date of April 23, 2014. The ROP expiration date is April 23, 2019 with an application due date of October 23, 2018. The ROP renewal application was received on September 12, 2018. The Special Conditions (SC) are listed as appropriate. For brevity, permit conditions and the language of federal and state rules have been paraphrased.

FG-FACILITY

SC I.1 and 2, and SC VI.1. COMPLIANCE. Individual hazardous air pollutant (HAP) shall not exceed 9 tons based on a 12 month rolling time period. Total HAP shall not exceed 22.5 tons based on 12 -month rolling time period. The highest reported 12-month rolling total HAP occurred at the end of February 2020 and was 3.74 tons.

SC II.1 and SC VI.4. COMPLIANCE. Sulfur content of No. 2 fuel oil and on-specification oil used in FG-FACILITY shall not exceed 0.30% by weight. Shall maintain records of fuel specifications. Fuel oil has not been fired in any boiler since the last inspection (or 9 years or more). It is unknown when and if on-specification has ever been fired at the facility (Boiler 4 only).

SC III.1. COMPLIANCE. Shall only fire natural gas, on-specification oil, or No. 2 fuel oil in EUBOILER 4. The facility has not operated Boiler 4 in the last two years.

SC I.3 and SC V.1. COMPLIANCE. Sulfur dioxide emissions (SO_2) shall not exceed 120 ppmv in exhaust gas (50 percent excess air). Testing shall be conducted at the request of the AQD. At this time AQD has not requested SO_2 testing. It should be noted that absent testing, compliance is determined through sulfur in fuel testing per SC II.1.

SC VI.2. COMPLIANCE. Shall keep records, individually, for each boiler of the number of hours during each calendar year that the boiler combusts liquid fuel. According to the facility, fuel oil has not been combusted for years and the fuel oil tank has been decommissioned.

SC VI.3. NOT APPLICABLE. Shall perform a daily noncertified visible emission observation when the boilers are combusting fuel oil continuously for more than 24 hours. The facility is not currently combusting fuel oil and is operating entirely on natural gas.

SC IX.1. NOT APPLICABLE. Shall comply with 40 CFR Part 63, Subpart JJJJJJ if liquid fuel is combusted for more than 48 hours. The facility is not currently combusting fuel oil and operates entirely on natural gas.

EU-BOILER3

DTBHP has not operated EUBOILER3 in the last 2 years. ROP conditions were not evaluated.

EU-BOILER4

DTBHP has not operated EUBOILER4 in the last 2 years. ROP conditions were not evaluated.

FG-BOILER_1,2

SC I.1. COMPLIANCE. NOx emission rate shall not exceed 0.20 lb/MMBtu when burning natural gas. The maximum NOx emissions at Boiler 1 and Boiler 2 were approximately 0.188 lb/MMBtu during the reporting period.

SC I.2. NOT EVALUATED. NOx emission rate shall not exceed 0.3 lb/MMBtu when using distillate oil. The facility is not currently combusting No. 2 fuel oil, and currently operates entirely on natural gas.

SC VI.1. COMPLIANCE. Shall keep records of NOx emissions as required by special condition SC I.2. Records shall be expressed as tons per cumulative 5 month time period beginning May 1st through September 30th each year. The facility has maintained records for NOx emissions as required by SC I.1.

FG-BOILER 6,7

SC I.1.1a and SC V.1. COMPLIANCE. CO emission rates shall not exceed 0.073 lb/MMBtu (for each boiler individually) when burning natural gas; testing required once during the term of the permit. On September 12 and September 26, 2015, the facility completed CO testing on Boiler 6 (0.0014 lb/MMBtu) and Boiler 7 (0.0111 lb/MMBtu). On March 6, 2018, the facility completed additional testing on Boiler 6 (0.0012 lb/MMBtu) and Boiler 7 (0.0011 lb/MMBtu).

SC I.1.1b and SC V.2. UNKNOWN. CO emission rates shall not exceed 0.155 lb/MMBtu (for each boiler individually) when burning No. 2 fuel oil. At this time, DTBHP has not completed CO testing when combusting No. 2 fuel oil. Per SC V. 2., testing is required once during the term of the ROP if No. 2 fuel oil is combusted for more than 48 hours. At this time, the facility has not combusted fuel oil during the term of the ROP.

SC I.1.1c. COMPLIANCE. CO emission rates shall not exceed 84.6 lb/hour (collectively for Boiler 6 and 7). The CO limit is evaluated over the length of the performance test when testing, and is evaluated over a calendar month, based on operation, otherwise. On September 12 and September 26, 2015, the facility completed CO testing on Boiler 6 (0.1 lb/hour) and Boiler 7 (1.7 lb/hour). The facility also maintains the CO emission rates as outlined in Appendix 7C of the ROP. The highest reported CO emissions for Boiler 6 occurred at the end of October 2020 at 0.166 lb/hour. The highest reported CO emissions for Boiler 7 occurred at the end of February 2020 at 1.282 lb/hour. Collective CO emissions from Boilers 6 and 7 are significantly less than 84.6 lb per hour. The highest collective CO emissions occurred at the end of February 2020 at 1.441 lb/hour.

SC I.1.1d, 1.1e, and 1.1f. COMPLIANCE. NOx emission rates shall not exceed 0.036 lb/MMBtu (for each boiler individually) when burning natural gas, 0.140 lb/MMBtu (for each boiler individually) when burning No. 2 fuel oil, and 76.4 lb per hour (collectively for Boiler 6 and 7). The emission limit of 0.140 lb/MMBtu is not applicable as the facility has not burned No. 2 fuel oil. The facility monitors and records the NOx emission rate using the PEMS. The AQD considers the NOx

emission rate of 0.036 lb/MMBtu as an hourly rate (see enforcement referral for Consent Order AQD No. 24-2016). The facility provided PEMS data for October 1, 2020 through December 6, 2020. The highest PEMS reading for Boiler 6 occurred on October 1, 2020 at 9:00 AM at 0.026 lb/MMBtu. The highest PEMS reading for Boiler 7 occurred between October 1, 2020 at 10:00 PM and October 2, 2020 at 2:00 AM at 0.018 lb/MMBtu. The facility is in compliance with NOx pound per hour emission limit (76.4 lb/hr / [180.2 MMBtu/hr x 2] = 0.212 lb/MMBtu). With the facility complying with the hourly NOx limit of 0.036 lb/MMBtu, it is not possible to exceed the pound per hour limit.

SC I.1.1g. COMPLIANCE. NOx emissions shall not exceed 155.3 tons per year (collectively for Boiler 6 and 7) based on a 12 month rolling period. The highest 12-month rolling NOx emission rate for Boiler 6 and Boiler 7 occurred at the end of November 2018 at 18.940 tons.

SC I. 1.1h and SC V.1. COMPLIANCE. PM10 emission shall not exceed 0.007 lb/MMBtu (for each boiler individually) when burning natural gas. On September 12 and September 26, 2015, the facility completed PM10 testing on Boiler 6 (0.0033 lb/MMBtu) and Boiler 7 (0.0020 lb/MMBtu). Additional PM testing was completed on March 6, 2018 on Boiler 6 (0.003 lb/MMBtu) and Boiler 7 (0.005 lb/MMBtu).

SC I.1.1i and SC V.2. UNKNOWN. PM10 emission shall not exceed 0.040 lb/MMBtu (for each boiler individually) when burning No. 2 fuel oil. At this time, DTBHP has not completed PM10 testing when combusting No. 2 fuel oil. Per SC V.2, testing is only required once during the term of the ROP if No. 2 fuel oil is combusted for more than 48 hours.

SC I.1.1j. COMPLIANCE. PM10 emission shall not exceed 21.8 lb/hour (collectively for Boiler 6 and 7). The facility maintains the PM10 emission rates as outlined in Appendix 7C of the ROP. The highest reported collective PM10 emissions occurred at the end of October 2020 at 0.967 lb/hour. The September 12 and 26, 2015 and March 6, 2018 stack testing results did not include PM10 emissions in lb/hour.

SC I.1.1k. COMPLIANCE. Sulfur dioxide emissions shall not exceed 39 tons per year (collectively for Boiler 6 and 7) based on a 12-month rolling time period. The facility has not fired No. 2 fuel oil at the facility since early 2007. Calculated SO_2 emissions calculated from natural gas combustion are significantly below 39 tons per year. The highest reported 12-month rolling SO_2 emissions occurred at the end of October 2018 at 0.307 tons per year.

SC V.3. COMPLIANCE. A RATA of the PEMS shall be conducted annually. During the inspection, the RATA was being conducted on Boiler 6. The most recent completed RATA was completed on

December 10, 2019. Please see the Detroit District Office files for RATA report and results. Completion of the RATA satisfied requirement of 40 CFR Part 60, Subpart Db.

SC V.4. COMPLIANCE. Quality assurance of the NOx PEMS shall be conducted by a relative accuracy audit (RAA). The facility has completed RAAs as required and typically submits RAA with quarterly reports. The facility completed RAAs on June 23, 2020 (2nd Quarter 2020 - RAA), March 10, 2020 (1st Quarter 2020- RAA), December 10, 2019 (4th Quarter 2019 - RATA), and September 26, 2019 (3rd Quarter 2019 - RAA).

SC VI.3. COMPLIANCE. Shall maintain records of the amount of natural gas consumed, fuel oil consumed, sulfur content and heat content of No. 2 fuel oil, and sulfur dioxide emissions. The facility maintains the amount of natural gas consumed in Boilers 6 and 7. The facility currently does not combust No. 2 fuel oil.

SC VI.4. COMPLIANCE. Shall maintain records of the predicted NOx emission rate and monitored boiler operating conditions. The facility maintains the required records.

SC VI.5. COMPLIANCE. Shall calculate the pound per hour CO and PM10 emission rates based upon calendar monthly average for both natural gas and fuel oil. The facility maintains the CO emission rates as outlined in Appendix 7C of the ROP. The facility maintains CO and PM10 emission rate calculations as required.

SC VI.6. COMPLIANCE. Shall keep records individually for Boilers 6 and 7, or the number of hours during each year that the boiler combusts No. 2 fuel oil. No. 2 fuel oil has not been combusted at the facility.

SC VIII. COMPLIANCE. The facility appears to be in compliance with stack requirements. Measurements were not collected.

FG-BOILER_3,6,7

SC III.1. COMPLIANCE. Shall not operate EU-BOILER3 while either of the package boilers are in operation. Boiler 3 is currently not operational and is likely not going to be operated for the foreseeable future.

FG-BOILER_4,6,7

SC I.1. COMPLIANCE. Sulfur dioxide emissions shall not exceed 39 tons per year based on a 12-month rolling time period. The highest reported 12-month rolling SO_2 emissions occurred at the end of October 2018 at 0.307 tons per year (collective for EU-BOILER6 and EU-BOILER7).

SC III.1. COMPLIANCE. Shall only fire natural gas, No. 2 fuel oil and/or on-specification oil in the boilers. The facility currently only fires natural gas in operational boilers.

SC VI.1. COMPLIANCE. Shall obtain and maintain fuel receipts from the fuel oil supplier which certify that on-spec oil meets definition outline in Appendix 3. The facility does not combust on-spec oil. Boiler 4 is not operational.

SC VI.2. COMPLIANCE. Shall maintain records of the amount of natural gas consumed, fuel oil consumed, on-spec oil consumed, sulfur content and heat content of No. 2 fuel oil, and sulfur dioxide emissions. The facility maintains the amount of natural gas consumed. The facility currently does not combust No. 2 fuel oil or on-spec oil.

PERMIT TO INSTALL EXEMPT EQUIPMENT

Underground Storage Tank

The 500,000 gallon underground storage tank used for storage of No. 2 fuel oil is exempt from PTI requirements under the following rule.

R 336.1284(2)(d): "Storage of ...diesel fuel oils nos. 2-D and 4-D specified in ASTM-D-975."

At this time, the facility does not store No. 2 fuel oil. According to Mr. Malara, the fuel oil storage tank has been decommissioned and left in place.

Maintenance Shop Area

The machining equipment (saws, lathes, grinders, etc.) in the maintenance shop area are exempt from PTI requirements under the following rule.

R336.1285(2)(l)(vi)(B): "Equipment for carving, cutting, routing, turning, drilling, machining, sawing, surface grinding, sanding, planing, buffing, ... which has emissions that are released only into the general in-plant environment."

APPLICABLE FUGITIVE DUST CONTROL PLAN CONDITIONS:

Not applicable. All lots are paved.

MAERS REPORT REVIEW:

On March 23, 2020, the 2019 MAERS audit was passed. Please see MACES report CA_B281453062 for information regarding the MAERS audit.

FINAL COMPLIANCE DETERMINATION:

At this time, DTBHP appears to be in compliance with ROP No. MI-ROP-B2814-2014. Boilers 3 and 4 are no longer operable.

NAME _____ DATE 1/6/21 SUPERVISOR JK