

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

B264747616

<b>FACILITY:</b> LBWL, Eckert Station & REO Cogeneration		<b>SRN / ID:</b> B2647
<b>LOCATION:</b> 601 Island Ave, LANSING		<b>DISTRICT:</b> Lansing
<b>CITY:</b> LANSING		<b>COUNTY:</b> INGHAM
<b>CONTACT:</b> Nathan Hude , Environmental Services		<b>ACTIVITY DATE:</b> 12/14/2018
<b>STAFF:</b> Julie Brunner	<b>COMPLIANCE STATUS:</b> Non Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b> Compliance inspection of LBWL – Eckert Power Station and REO Town Plant (ROP No. MI-ROP-B2647-2018)		
<b>RESOLVED COMPLAINTS:</b>		

As part of a Full Compliance Evaluation (FCE), AQD staff conducted a compliance inspection of Lansing Board of Water and Light (LBWL) – Eckert Power Station and REO Town Plant on December 12 & 14, 2018. The last compliance inspection was on March 1, 2017.

LBWL Contacts:

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Facility Description:

The stationary source consists of two utility power plants that generate electricity and steam. Eckert Station has only three (3) coal-fired boilers capable of generating electric power, two of which also provide back-up steam to the Lansing Central Steam District, fly-ash handling systems and storage silo, and mechanical draft cooling towers. REO Town Plant is a combined-cycle, cogeneration facility consisting of two natural gas-fired turbines, two heat recovery steam generators (HRSG) with duct burners, steam turbines, a natural gas-fired auxiliary boiler, a natural gas-fired emergency engine, and a four cell mechanical draft cooling tower. Eckert station was co-located with Moores Park Steam Station. Moores Park Steam Station was shut down as part of the project to build the REO Town Plant. Eckert Station is scheduled to retire in 2020.

LBWL – Eckert Station and REO Town Plant are considered to be one stationary source. The REO Town Plant is located diagonally to the northeast of Eckert Station, and the two plants share a steam distribution line to GM and downtown Lansing. The stationary source is located in central Lansing and the surrounding area is a mix of residential, commercial, and industrial properties. Also, Moores Park is located directly south of Eckert Station on the other side of the Grand River.

Regulatory Overview:

The facility operates per the conditions of Renewable Operating Permit (ROP) No. MI-ROP-B2647-2018. The ROP was renewed on March 6, 2018. With the renewal, the conditions for the emission units at the Moores Park Steam Station were removed from the ROP and EUBOILER2 which has been dismantled. Also, there are no plans to operate EUBOILER1 and EUBOILER3 but they remain on the ROP at the request of LBWL.

LBWL – Eckert Station and REO Town Plant is currently a major Prevention of Significant Deterioration (PSD) source due to the potential to emit of greater than 250 tons per year (tpy) of regulated pollutants. Potential emissions of carbon monoxide (CO), nitrogen oxides (NOx), coarse and fine particulate matter (PM), and sulfur dioxide (SO<sub>2</sub>) at this facility are greater than 250 tpy. The facility is also major for hazardous air pollutants (HAPs) with the potential to emit (PTE) in equal or greater quantities of 10 tpy of any single HAP and 25 tpy of aggregate HAPs. The PTE of greenhouse gases (GHG) in carbon dioxide equivalents (CO<sub>2</sub>e) is greater than 75,000 tpy. CO<sub>2</sub>e is a calculation of the combined global warming potentials of six GHGs: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The facility is subject to the Title V - Renewable Operating Permit Program, and also the following federal regulations for air pollutants as discussed below.

40 CFR 60, Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units - The provisions of this subpart apply to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984, and that has a heat input capacity from fuels combusted in the steam generating unit of greater than 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)). The natural gas-fired auxiliary boiler (EUAUXBOILER) at REO Town is subject.

40 CFR 60, Subpart Y for Coal Preparation and Processing Plants - The coal handling system (EU COAL) at Eckert has an installation date of July 1979. It was confirmed with the facility that they are subject based on the following applicability criteria:

**§60.250 Applicability and designation of affected facility.**

(a) The provisions of this subpart apply to affected facilities in coal preparation and processing plants that process more than 181 megagrams (Mg) (200 tons) of coal per day.

(b) The provisions in §§60.251, 60.252(a), 60.253(a), 60.254(a), 60.255(a), and 60.256(a) of this subpart are applicable to any of the following affected facilities that commenced construction, reconstruction or modification after October 27, 1974, and on or before April 28, 2008: Thermal dryers, pneumatic coal-cleaning equipment (air tables), coal processing and conveying equipment (including breakers and crushers), and coal storage systems, transfer and loading systems. Eckert has coal storage systems and conveying equipment that are subject. The ROP application was amended to include 40 CFR 60, Subpart Y. Notification under 40 CFR 60.7 of construction, initial startup, and performance testing (opacity) was requested on April 21, 2017.

40 CFR 60, Subpart KKKK, Standards of Performance for Stationary Combustion Turbines - The provisions of this subpart apply to stationary combustion turbines with a heat input at peak load equal to or greater than 10 MMBtu per hour, based on the higher heating value of the fuel, which commenced construction, modification, or reconstruction after February 18, 2005. The two (2) natural gas-fired turbines (EUTURBINE1 and EUTURBINE2) at at REO Town are subject.

40 CFR 60, Subpart JJJJ, Standards of Performance for Spark Ignition Internal Combustion Engines (SI ICE) - The provisions of this subpart apply to SI ICE that commence construction (ordered) after June 12, 2006 for the natural gas-fired engine (EUNGENINE).

40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE MACT) – This subpart establishes emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. For the natural gas-fired engine (EUNGENINE), compliance with RICE MACT is demonstrated through compliance with 40 CFR 63, Subpart JJJJ. For the RICE MACT, the conditions are already incorporated into the special conditions for the diesel fuel-fired emergency engines at Eckert Station.

40 CFR 63, Subpart UUUUU, National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units (Utility MACT) - This subpart establishes emission limitations and operating limitations for HAPs emitted from coal- and oil-fired utility boilers located at major sources of HAP emissions. The regulation is commonly referred to as MATS. The coal-fired boilers at Eckert Station are subject to this regulation.

40 CFR 63, Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters (Boiler MACT) - This subpart establishes emission limitations and operating limitations for HAPs emitted from industrial, commercial, and institutional boilers and process heaters located at major sources of HAP emissions. Conditions for Boiler MACT were added for EUAUXBOILER. The initial notification for Boiler MACT was submitted on July 24, 2013 for EUAUXBOILER (constructed after June 4, 2010 so new as construction was commenced on June 9, 2011 and startup was July 1, 2013).

The coal-fired boilers at Eckert and the natural gas-fired turbines at REO Town are subject to 40 CFR 72 Acid Rain Permit requirements which are on the ROP.

The Cross State Air Pollution Rule (CSAPR) requirements (40 CFR 97) for the coal-fired boilers at Eckert replaced the CAIR requirements in the ROP renewal. The requirements for the NOx Annual Trading Program, NOx Ozone Season Group 2 Trading Program, and SO<sub>2</sub> Group 1 Trading Program were added. The natural gas-fired turbines at REO Town are not subject to CSAPR.

The following is a list of emission units (EU) on ROP No. MI-ROP-B2647-2018.

Eckert Station:

EU	Description (Install Date/Mod Date)	Notes / Standards
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EU	Description (Install Date/Mod Date)	Notes / Standards
EUBOILER1	Babcock and Wilcox pulverized coal-fired boiler with No. 2 fuel oil for startup and flame stabilization. Rated at 509 MMBtu/hr. Controlled with Low NOx Burners (LNB), Overfire Air (OFA) and Electrostatic Precipitator (ESP). Production of steam is used for electric power generation and for providing backup steam for sale to customers. (January 1954/January 1986)	Not operational / 40 CFR 63, Subpart UUUUU / 40 CFR 72 Acid Rain / 40 CFR 97 CSAPR
EUBOILER3	Combustion Engineering pulverized coal-fired boiler with No. 2 fuel oil for startup and flame stabilization. Rated at 522 MMBtu/hr. Controlled with LNB, OFA, and ESP. Production of steam is used for electric power generation and for providing backup steam for sale to customers. (January 1961/January 1986)	Not operational / 40 CFR 63, Subpart UUUUU / 40 CFR 72 Acid Rain / 40 CFR 97 CSAPR
EUBOILER4	Babcock and Wilcox pulverized coal-fired boiler with No. 2 fuel oil for startup and flame stabilization. Rated at 807 MMBtu/hr. Controlled with LNB, OFA and ESP. Production of steam for electric power generation. (January 1964/January 1982)	A backup steam line was installed on February 8, 2016. ACI system installed on February 26, 2016. / 40 CFR 63, Subpart UUUUU / 40 CFR 72 Acid Rain / 40 CFR 97 CSAPR
EUBOILER5	Babcock and Wilcox pulverized coal-fired boiler with No. 2 fuel oil for startup and flame stabilization. Rated at 807 MMBtu/hr. Controlled with LNB, OFA and ESP. Production of steam for electric power generation. (January 1968/January 1982)	A backup steam line was installed on February 8, 2016. ACI system installed on February 26, 2016. / 40 CFR 63, Subpart UUUUU / 40 CFR 72 Acid Rain / 40 CFR 97 CSAPR
EUBOILER6	Babcock and Wilcox pulverized coal-fired boiler with No. 2 fuel oil for startup and flame stabilization. Rated at 807 MMBtu/hr. Controlled with LNB, OFA and ESP. Production of steam for electric power generation. (January 1970/January 1982)	ACI system installed on February 26, 2016. / 40 CFR 63, Subpart UUUUU / 40 CFR 97 CSAPR
EUASHECKERT	Two fly ash handling systems for Eckert Station including a 1,000 ton ash silo, two (2) fabric filters, two (2) mechanical vacuum producers, one (1) wetted ash rotary unloader, and two (2) telescopic discharge chutes. (April 1981)	Serves EUBOILER4, 5, & 6
EUCOAL	The process is a coal handling system that serves Eckert Station. It includes coal conveyors, coal bunkers, coal pile, and equipment to apply dust suppressant to the coal. (July 1979)	Serves EUBOILER4, 5, & 6
EUENGINE1	Compression ignition diesel fuel fired 2628 hp emergency engine (RICE). Engine drives a standby 1,825 kW electric generator. (June 2006)	Not operational / 40 CFR 63, Subpart ZZZZ

EU	Description (Install Date/Mod Date)	Notes / Standards
EUENGINE2	Compression ignition diesel fuel fired 2628 hp emergency engine (RICE). Engine drives a standby 1,825 kW electric generator. (June 2006)	Not operational / 40 CFR 63, Subpart ZZZZ
EUENGINE3	Compression ignition diesel fuel fired 2628 hp emergency engine (RICE). Engine drives a standby 1,825 kW electric generator. (June 2006)	Not operational / 40 CFR 63, Subpart ZZZZ
EUENGINE4	Compression ignition diesel fuel fired 2628 hp emergency engine (RICE). Engine drives a standby 1,825 kW electric generator. (June 2006)	Not operational / 40 CFR 63, Subpart ZZZZ
EUPARTSWASHER	Thirty gallon parts washer for cleaning/degreasing parts using Stoddard solvent/mineral spirits	NA

REO Town Plant:

EU	Description (Install Date/Mod Date)	Notes / Standards
EUCOOLTWR	A four-cell, mechanical draft cooling tower. (4/11/2013)	NA
EUNGINE	A nominally rated 12.8 MMBtu/hr (1,365 kW) natural gas-fired spark ignition internal combustion engine for emergency use. (5/8/2013)	40 CFR 60, Subpart JJJJ, 40 CFR 63, Subpart ZZZZ
EUAUXBOILER	A nominally rated 245 MMBtu/hr natural gas-fired auxiliary boiler. (7/1/2013)	40 CFR 60, Subpart Db / 40 CFR 63, Subpart DDDDD
EUTURBINE1	A 430 MMBtu/hr natural gas-fired turbine with an electrical generator. (4/11/2013)	40 CFR 60, Subpart KKKK / 40 CFR 72 Acid Rain
EUTURBINE2	A 430 MMBtu/hr natural gas-fired turbine with an electrical generator. (4/15/2013)	40 CFR 60, Subpart KKKK / 40 CFR 72 Acid Rain
EUHRSG1	A heat recovery steam generator (HRSG) with a 71.4 MMBtu/hr natural gas-fired duct burner. (6/20/2013)	NA
EUHRSG2	A heat recovery steam generator (HRSG) with 71.4 MMBtu/hr natural gas-fired duct burner. (6/16/2013)	NA

Exempt Equipment:

The cooling towers at Eckert are exempt per Rule 280(2)(d).

Cold Cleaner: Thirty gallon parts washer for cleaning/degreasing parts using stoddard solvent/mineral spirits per Rule 281(2)(h) or Rule 285(2)(r)(iv).

Michigan Air Emission Reporting System (MAERS) - 2017 Reporting Year:

EUAUXBOILER:

CO – 0.97 tpy

NOx – 1.65 tpy

PM10/2.5, primary – 0.90 tpy

SO<sub>2</sub> – 0.036 tpy

VOC – 0.34 tpy

EUNGINE:  
CO – 0.022 tpy  
NOx – 0.0009 tpy  
PM10/2.5, primary – 0.0006 tpy  
SO<sub>2</sub> – 0.000015 tpy  
VOC – 0.004 tpy

EUBOILER1, 2, & 3 (RG-ECK01):  
CO – 0 tpy  
NOx – 0 tpy  
PM10 – 0 tpy  
PM2.5 – 0 tpy  
SO<sub>2</sub> – 0 tpy  
VOC – 0 tpy

EUBOILER4, 5, & 6 (RG-ECK02):  
CO – 66.86 tpy  
NOx – 566.2 tpy  
PM10 – 22.0 tpy  
PM2.5 – 5.74 tpy  
SO<sub>2</sub> – 1217.7 tpy  
VOC – 8.0 tpy  
HCl – 2.05 tpy  
Hg – 3.23 lb

FGTURB/HRSG1:  
CO – 82.37 tpy  
NOx – 31.9 tpy  
PM10/2.5, primary – 7.07 tpy  
SO<sub>2</sub> – 0.60 tpy  
VOC – 2.31 tpy

FGTURB/HRSG2:  
CO – 57.78 tpy  
NOx – 32.80 tpy  
PM10/2.5, primary – 14.12 tpy  
SO<sub>2</sub> – 0.60 tpy  
VOC – 1.92 tpy

Inspection – REO Town Plant:

I inspected the REO Town Plant on December 12, 2018. There were no odors from operations and no visible emissions from the stacks. Upon arrival, the weather was 29°F, wind SE@11 MPH, and UV Index 0 Low.

Both EUTURBINE1 and EUTURBINE2 were operating in combined-cycle (FGTURB/HRSG1 and FGTURB/HRSG2), and producing steam and electricity (co-generation mode). The duct burners were not operating on the HRSGs (which the operators refer to as boilers). The turbines operate as baseload units and are not load following. The turbines actually can only operate in combined-cycle due to operating in bypass mode for the HRSG would actually stress the unit.

The following production was noted from the operator screens in the control room:

EUTURBINE1 – 42 MW of electricity, 3738.2 hscf of gas flow, 365.9 MMBtu of heat input, 108,674.0 lb/hr of steam  
EUTURBINE2 – 43 MW of electricity, 3713.9 hscf of gas flow, 361.2 MMBtu of heat input, 103,409.5 lb/hr of steam

A preventative maintenance program and malfunction abatement plan is implemented per the requirements in Special Condition (SC) III.1 for each turbine and duct burner. Turbines #1 and #2 have not yet gone through a major overhaul which will be completed when the manufacturer specifies it. This is based on operating hours on the turbine or if performance of the turbine degrades. Total operating hours on the turbines at the time of inspection were as follows:

EUTURBINE1 – 32,010 hours

EUTURBINE2 – 31,380 hours

FGTURB/HRSG1 and FGTURB/HRSG2 are scheduled to be tested for CO, PM, PM10, and PM2.5 the week of February 11<sup>th</sup>. This meets the testing requirements in Section V for performance testing every 5 years. The test protocol was submitted on 1/9/2019.

The permittee is required to properly measure fuel flow to each turbine, duct burner, and the auxiliary boiler on a continuous basis per SC VI.3. The devices to monitor fuel flow are properly installed and operated. Copies of the calibration certificates were obtained and are attached. The monitor on the auxiliary boiler was calibrated on 9/15/2018, and the monitors on the turbines and duct burners were calibrated between 9/21-25/2018.

NOx emissions for each turbine are required per SC VI.2 to be measured using a CEMS. (CO is also measured using a CEMS, and the data is used by the manufacturer.) The following snapshot information was collected from the CEMS readouts at approximately 11:55 am and in the control room:

#### EUTURBINE1

NO uncorrected – 12.38 ppm  
NO<sub>2</sub> uncorrected – 2.84 ppm  
O<sub>2</sub> – 14.87%  
CO – 15.78 ppm  
NOx corrected – 15.22 ppm  
NOx – 15.4 ppmc (30-day)  
NOx – 0.055 lb/MMBtu  
NOx – 20.1 lb/hr (24-hr)

#### EUTURBINE2

NO uncorrected – 8.69 ppm  
NO<sub>2</sub> uncorrected – 3.85 ppm  
NOx uncorrected – 12.53 ppm  
O<sub>2</sub> – 15.19%  
CO – 16.37 ppm  
NOx corrected – 12.9 ppm  
NOx – 12.8 ppmc (30-day)  
NOx – 0.048 lb/MMBtu  
NOx – 17.6 lb/hr (24-hr)

The total sulfur content of the pipeline quality natural gas is verified through gas sampling but the facility can also use a purchase contract or tariff sheet. The results of gas sampling done on 11/8/18 showed 0.00 wt % of sulfur in the gas meeting the intent of SC VI.5.c for EUTURBINE1 and EUTURBINE2, and in compliance with the limit in 40 CFR 60.4365(a).

#### EUAUXBOILER:

The REO Town Aux Boiler is a Victory package steam generator with ultra low NOx burners and a continuous oxygen trim system. The auxiliary boiler was not operating on the day of the inspection. It was off-line for maintenance (flange repair). The auxiliary boiler doesn't operate very often due to cost, but with Eckert scheduled to go to zero generation, it will be operated for the rest of the winter.

A preventative maintenance program and malfunction abatement plan is implemented per the requirements in SC III.1 for EUAUXBOILER and FGMACTDDDDDD. And, EUAUXBOILER is scheduled to be tested for CO, PM, PM10, and PM2.5 the week of February 11<sup>th</sup>. This meets the testing requirements in Section V for performance testing every 5 years.

The first tune-up of the boiler was completed on April 28, 2018 and is required every 5 years per the requirements of the Boiler MACT (listed in FGMACTDDDDDD), specifically 40 CFR 63.7515(d). A copy of the Aux Boiler Report is attached. The findings which demonstrate compliance with SC IX.1 included the following:

1. The single burner boiler operates reliably over the load range.
2. The boiler efficiency was 84.1% which matches the design criteria.
3. The burner design provides optimum combustion control.
4. The boiler and burner components are maintained properly and function per the design specifications.

#### EUNGENINE:

The emergency non-certified engine at REO Town is part of a CAT generator set with the following tag information:

Engine Model: G3516B

Manufacture Year: 2012

Engine Output: 1,625 kVA, 1,300 kW\*

Make: SR4B

Serial No. 4FN03092

\* The engine tag indicates that the engine is a little smaller than maximum design capacity of 1,356 kW (SC IV. 1) that was permitted.

The engine has 167 hours on the clock. The engine is restricted to less than 500 hours per 12-month rolling time period per SC III.1, and no more than 100 hours for maintenance checks and readiness testing per SC III.2. There was no emergency operations during 2017 and 2018 to the date of the inspection. For the 2017 year, the engine operated 15 hours for maintenance checks and readiness testing. For the first 11-months of the 2018 year, the engine operated 24 hours for maintenance checks and readiness testing. The engine operation is tested, at a minimum, monthly with the engine loaded and unloaded. Copies of the operating and maintenance logs were obtained as part of the inspection. The logs show regular testing, reason for operation, and maintenance (oil tests or oil changes) on the engine is being performed meeting the NSPS and MACT requirements. Emission testing on the engine was last performed on 9/13/2018, and is required every 3 years or 8,760 hours for a non-certified engine. Emissions of NO<sub>x</sub>, CO, PM, and VOC were measured at below the emission limits in ROP No. MI-ROP-B2647-2018 and 40 CFR 60, Subpart JJJJ. PM<sub>10</sub> and PM<sub>2.5</sub> emissions exceeded the permit limits and retesting was performed on 12/12/2018. Test results are pending.

#### EUCOOLTWR:

The four-celled mechanical draft cooling tower is vender certified for maximum drift rate of 0.001% or less as required by SC IV.1. Water samples are collected weekly and analyzed for total dissolved solids (TDS) content. Records including maintenance on the cooling towers, TDS content of the water, and water recirculation rates used to calculate TDS are all kept as satisfactorily as required by SC VI.3.

#### Records Review:

The following records were received for the inspection:

1. REO Emergency Engine Maintenance and Operation Logs – Auxiliary Gas Generator (AGG) Test Report from 3/3/17 to 9/13/18, PM work orders dated 3/3/2017 and 6/6/2017, CAT Inspection and Preventative Maintenance Checklist dated 9/19/2018, Operating Hours for 2017 and 2018.

2. REO CEMS NO<sub>x</sub> data in ppm (30-day rolling average) on July and August-18, and 11/1-30/2018, and pph (24-hour rolling average) July and August-18, and Nov-2018 for simple- and combined-cycle operation, and in tons per month for 2018 for EUTURBINE1 (OSTG1) and EUTURBINE2 (OSTG2) for combined-cycle operation as summarized below.

#### EUTURBINE1 (OSTG1)

NO<sub>x</sub> ppmv (30-day rolling average) = 15.1 ppm at 15% O<sub>2</sub> < 25 ppm at 15% O<sub>2</sub>

NO<sub>x</sub> pph (24-hour rolling average) = max 11.6 pph < 39.6 pph (simple) and 42.5 pph (combined)

NO<sub>x</sub> (tpy) = 48.8 tpy (2018)

#### EUTURBINE2 (OSTG2)

NO<sub>x</sub> ppmv (30-day rolling average) = 12.2 ppm at 15% O<sub>2</sub> < 25 ppm at 15% O<sub>2</sub>

NO<sub>x</sub> pph (24-hour rolling average) = max 11.9 pph < 39.6 pph (simple) and 42.5 pph (combined)

NO<sub>x</sub> (tpy) = 39.0 tpy (2018)

The permit limits for NO<sub>x</sub> in combined-cycle mode are 25 ppmv dry at 15% oxygen, and 42.5 lb/hr on a 24-hour rolling basis and 179.6 tpy on a 12-month rolling time period. EUTURBINE1 (OSTG1) and EUTURBINE2 (OSTG2) are operating in compliance with the permitted emission limits. Also, for simple-cycle operation the NO<sub>x</sub> permit limit of 25 ppmv dry at 15% oxygen is on a 4-hour rolling average basis per 40 CFR 60.4350(g). This is currently not in the ROP, but the turbines actually never operate in simple cycle. Based on data from 11/1/2018 to 12/11/2018 reviewed during the inspection, EUTURBINE1 (OSTG1) and EUTURBINE2 are operated in compliance with the 40 CFR 60, Subpart KKKK and ROP No. MI-ROP-B2647-2018.

3. REO CEMS NO<sub>x</sub> hourly data in pph, ppmv, and lb/MMBtu for 12/5-11/2018 as summarized below.

NOx (ppm) = max 20 ppm  
NOx (lb/hr) = max 1.3 pph  
NOx (lb/MMBtu) = 0.029 lb/MMBtu

The permit limits for NOx are 30 ppmv dry at 3% oxygen (excluding startup and shutdown) and 0.20 lb/MMBtu on a 30-day rolling average, and 10.2 lb/hr on a 24-hour average. EUAUXBOILER is operating in compliance with the permitted emission limits.

4. Cooling Tower (EUCOOLTWR) – Records in hourly per month for 2017 and 2018, and Monthly Average TDS for 2013 to 2018 with maintenance notes. The highest hourly emission of particulate matter for 2017 was 0.023 pph in Aug-2017 and for 2018 it was 0.022 pph in Jan-2018. EUCOOLTWR is in compliance with the PM/PM10/PM2.5 emission limits of 0.77 pph.

Inspection – Eckert Station:

I inspected the Eckert Power Plant on December 14, 2018. There were no odors from operations and no visible emissions from the stacks. Upon arrival, the weather was 41°F, wind WNW@5 MPH, fog, and UV Index 0 Low.

In the boiler control room, EUBOILER5 was operating at 55 MW output. EUBOILER4 and EUBOILER6 were off line. The last time EUBOILER4 operated was 12/5/2018 when a tube leak occurred, and the last time EUBOILER6 operated was 11/15/2018. EUBOILER1 and EUBOILER3 are not operational. And, while not officially retired, they will not be operated again. They went off line when MATS became effective. These boilers have been cleaned out, and the control panel for them is dark (and taped off). Eckert Station is now at what LBWL staff describe as “zero generation”. The last of the coal was burned out of the bunkers on 12/18/2018.

The mercury (Hg) sorbent trap mercury monitoring system is located in a shed on the roof. LBWL staff used to process the sorbent traps in the on-site Lumex monitor and now all traps are sent off to APEX for analysis. Sorbent traps collect Hg for seven (7) days during normal operation and 3 to 4 days for startup. There are two traps – one for the A Train and one for the B Train. Pictures of the Sorbent Trap Chain of Custody Forms and the sorbent traps used in the stack for EUBOILER5 that were inserted 12/12/2018 and removed 12/14/2018 are attached to this report. The technician was changing traps, leak testing them and getting ready to put them in the stack. Relative Accuracy Test Audits (RATAs) for the Hg monitoring systems were completed in October 2018 for EUBOILER5, and in September and August 2018 for EUBOILER4 and EUBOILER6.

An activated carbon injection (ACI) system is used to control emissions of Hg. The ACI is injected at a rate to keep below the limit in 40 CFR 63, Subpart UUUUU of 1.2 lb/TBtu. Carbon injection logs for 11/30/2018, 12/1/2018, and 12/2/2018 are attached to this report. The carbon injection system is computer controlled but an operator checks the system every two hours and notes system operation, silo levels, and other operating parameters to assure that the system is operating properly.

The shed for the continuous emission monitoring systems (CEMS) is also on the roof of the facility. Opacity is monitored per 40 CFR Part 60 and for Compliance Assurance Monitoring (CAM) per 40 CFR Part 64 for PM. NOx, CO<sub>2</sub> and SO<sub>2</sub> are monitored per 40 CFR Part 75 for the Acid Rain Program and CSAPR. The RATA for the NOx, SO<sub>2</sub>, and CO<sub>2</sub> CEMS on EUBOILER5 was completed on 12/4/2018, and in September and August 2018 for EUBOILER4 and EUBOILER6. The following information was collected from the CEMS readout for EUBOILER5:

Opacity – 6.17%  
CO<sub>2</sub> uncorrected – 1210.465 ppm  
NO uncorrected – 1.133 ppm  
NO<sub>2</sub> uncorrected – 0.020 ppm  
NOx uncorrected – 1.153 ppm  
SO<sub>2</sub> uncorrected – 2.152 ppm

We inspected the ESP control rooms. The readout for each transformer-rectifier (T-R) set or rather each field of the ESP for EUBOILER5 was as follows:

T-R Set No. 5-1 – 8 amps, 132 volts, 34 sparks/minute  
T-R Set No. 5-2 – 59 amps, 262 volts, 27 sparks/minute  
T-R Set No. 5-3 – 23 amps, 201 volts, 23 sparks/minute  
T-R Set No. 5-4 – This field has been out for some time. (Tagged out.)  
T-R Set No. 5-5 – 28 amps, 175 volts, 33 sparks/minute



T-R Set No. 5-6 – 57 amps, 263 volts, 27 sparks/minute  
T-R Set No. 5-7 – 32 amps, 198 volts, 22 sparks/minute  
T-R Set No. 5-8 – 111 amps, 274 volts, 11 sparks/minute

Even with a field out, the opacity from EUBOILER5 was approximately 6% (and at 7.5% when soot blowing at 3:07 pm) indicating proper operation. The limit on visible emissions is 20% opacity except for one 6-minute average of not more than 27% per SC 1.4. The control operating systems for the ESPs were upgraded more than a few years ago, and opacity from the boilers at Eckert have shown a decrease in opacity. The opacity monitors send a signal to the ESP controls and if the opacity is higher, the rapping will not occur. If the computerized system is down, then a backup default system will continue to operate the ESPs. The system operating parameters, rapping history, and power is collected and automatically controlled by the system. Also, a burner management system is installed on the boilers. It was installed on the boilers in the 1980s for safety reasons and the boiler operator cannot override it.

Stack testing for compliance with PM emission limitations is required every 3 years for EUBOILER4, EUBOILER5, and EUBOILER6 to show compliance with the PM limit of 0.20 lb/1000 lb (corrected to 50% excess air). EUBOILER4 (tested 7/21/16) results were 0.0042 lb/1000 lb (corrected to 50% excess air). EUBOILER5 (tested 6/9/16) results were 0.0097 lb/1000 lb (corrected to 50% excess air). EUBOILER6 (tested 7/28/16) results were 0.0059 lb/1000 lb (corrected to 50% excess air). Test results were not received within 60 days after the date of the test per Rule 1001(5). The missed stack testing was discovered during the processing of the ROP renewal. Since PM emission testing is required for MATS, emission information collected within the 3 year period was used, and a revised testing report was submitted to demonstrate that the PM testing was actually completed within 3 years of the last test.

CAM - Opacity is monitored continuously as a surrogate for PM per 40 CFR 64. The COM system is used to indicate proper operation of the ESPs. While multiple deviations of the opacity limits get reported each quarter, an excursion which is defined as any 2 or more consecutive 1-hour blocks of greater than 20% opacity has not been reported.

MATS (40 CFR 63, Subpart UUUUU) - EUBOILER4, EUBOILER5, and EUBOILER6 are subject to MATS as existing coal-fired electric utility steam generating units (EGUs) designed to burn not low rank coal. Mercury (Hg) control (ACI injection) was added to comply with the regulation. The most recent boiler tune-ups were conducted on September 11-12, 2015 for EUBOILER4, and September 17&18, 2015 for EUBOILER5 and EUBOILER6 per the MATS requirements. These boilers rely on paragraph 1 of the definition of startup in 40 CFR 63.10042. Compliance is demonstrated by quarterly testing PM and hydrogen chloride (HCl), and Hg emission monitoring is done using sorbent traps. Testing of PM and HCl emissions have demonstrated compliance with MATS. There have been problems with Hg monitor downtime and this was referred to EPA as Michigan doesn't have delegation for this MACT. EPA issued a Finding of Violation (FOV) on September 28, 2018. LBWL has taken steps to address the monitor downtime by sending the sorbent traps to a qualified lab for analysis and discontinuing on-site analysis.

#### Cooling Towers:

Eckert has a bank of five cooling towers along the Grand River. The cooling towers are exempt from permitting per Rule 280(2)(d). There have been no changes in the operation of the cooling towers since the last inspection. No chromium compounds to treat the water are used in the cooling towers, therefore, they are not subject to 40 CFR 63, Subpart Q. Phosphate compounds are not used in the cooling tower either.

#### EUCOAL and Coal Handling:

The boilers were originally designed to combust bituminous coal. In 1998 to 1999, a switch was made to low sulfur subbituminous coal from the Power River Basin (PRB) in Wyoming. This coal can be dusty and can accidentally heat up and combust even when containing greater than 22% moisture. Liquid dust suppression is used (RAM3) which contains succinic acid, sulfo-1,4-Bis(2-ethylhexyl)ester, sodium salt (CAS No. 577-11-7), diethylene glycol monobutyl ether (CAS No. 112-34-5), and propylene glycol (CAS No. 57-55-6).

The coal comes via railcar and is unloaded out of the bottom of the railcar into receiving pits to a conveyor. The conveyor, which is covered, transports the coal into the plant to the coal bunkers dedicated to each boiler. Dust suppression is sprayed on the coal while it is being unloaded and conveyed. Per 40 CFR 60, Subpart Y, visible emissions testing was completed on 6/26/2018. There was 0% opacity observed during the test.

There is a very small coal pile on the east side of the plant which is mainly for emergency purposes. A stacker with a telescoping drop chute is used to build the pile. Coal that arrives at the plant via rail is moved immediately

into the plant bunkers. Each bunker holds 4 railcars of coal. EUBOILER4 has 4 bunkers, EUBOILER5 has 6 bunkers, and EUBOILER6 has 6 bunkers. If coal has to be unloaded from the bunkers, it is unloaded to the east side coal pile.

Normal operation was only one boiler is operated at a time. Eckert was using about 7 to 8 railcars of coal per day. Each railcar holds about 120 tons of coal so roughly 960 tons per day of coal was combusted at Eckert prior to zero generation. It was 50 railcars when Eckert Station and Moores Park Steam Station consisted of 10 coal-fired boilers.

#### Ash Handling:

Fly ash from the ESPs is pneumatically conveyed to a 1000 ton silo located on the east side of the plant. There are two redundant fly ash handling systems with two (2) pulse jet fabric filter baghouses, two (2) mechanical vacuum producers, one (1) wetted ash rotary unloader, and two (2) telescopic discharge chutes. A two bay load out is used. One side for unloading dry ash for concrete has loadout control (it vents back into the ash silo) and, one side for unloading wetted ash which is not acceptable for market. No trucks were currently being loaded during the inspection. There was some evidence of fly ash on the ground and track out in the loading bay but none that was air borne. One area that may have been a small pile of spilled fly ash (or just dirt) was wet.

The pressure drop on the baghouses was checked during the inspection. The east baghouse was operating, and the gauge was measuring between 0" to 1" water column (wc). If the pressure differential reaches 2.5" wc shift supervisors are notified. The west baghouse was not operating. The baghouses are inspected every three weeks. There are two pump vents on the south side of the ash handling system and one vent on the north side for the bag separators. No evidence of visible emissions from the pneumatic system and controls were observed. No fugitive dust complaints have been received in a number of years.

The fugitive dust plan (Version 1.3, October 2015) is implemented. Copies of the baghouse log sheets 11/30/2018, 12/1/2018, and 12/2/2018 were obtained. The Nuvatrol bag diff. and silo vent bag diff. are monitored on a daily basis. If the silo vent bag diff reaches 2.5" wc. (set point) the station shift supervisor (SSS) is to be notified. None of the diff readings on the log sheets were close to 2.5" wc. The filter discharge gas is monitored for dust loading which will automatically shut down the vacuum pump when dust exceeds 40 pico amperes. The boiler stack gas temperature is also monitored. If the stack temperature is less than 260°F, station supervisors are notified in order to take appropriate action.

Also, a small building and silo for the activated carbon injection (ACI) system is located just east of the ash handling system. No evidence of ACI spillage was seen.

#### Bottom Ash Handling:

Bottom ash from the boilers is sent to Hydrobins where water is decanted. The dewatered ash is dropped into trucks with open top roll off boxes in a covered bay located on the west side of the plant. The bottom ash is sent to a landfill for disposal.

#### Emergency Engines:

Four diesel fuel-fired RICE were re-permitted on PTI 132-05C which was issued October 13, 2015. The engines are CAT 3516 (V16) with 2 MW generators, and were manufactured in the 1990s. EUENGINE1 and EUENGINE2 are located at the bottom of the combined stack housing for EUBOILER1, 2 and 3. EUENGINE3 and EUENGINE4 are located at the bottom of the combined stack housing for EUBOILER4, 5 and 6. They were installed for black start purposes but decommissioned as part of the project to build REO Town. The engines had been re-permitted as emergency engines and for voltage support. The engines are still not connected, there is no power and therefore, no lights in the engine rooms. An 18-month extension on construction was granted, but has expired. The permit for the engines is effectively null and void.

A preventative maintenance program and malfunction abatement plan for specified emission units at Eckert Station is implemented per Rule 911 and in compliance with the requirements in the special conditions of ROP No. MI-ROP-B2647-2018.

#### Zero Generation Status:

As of 12/18/2019, Eckert is not operating and has been taken off the grid as a baseload plant. No coal will be on-site, and coal bunkers are empty. All fly ash and bottom ash will be removed, and fugitive dust monitoring will be maintained until the coal combustion by-products are off-site. LBWL is still maintaining it in readiness mode / status in the event power is needed for any reason, such as high demand. In order to do this, minimal staff will be on-site and doing rounds/inspections every 4-hours.

- CEMS will be maintained and daily calibrations completed. There will be no linearity testing because the boilers have to be operating for linearity testing.
- Maintenance and monitoring plans will be maintained. The steam turbines will be rotated every once in a while. For the coal handling equipment, belts will be lubed and equipment maintained.
- In July, LBWL plans to run a capacity test to prove that the boilers can be started if called upon. Only EUBOILER5 was operating at the time of zero generation. EUBOILER6 will not be operated again due to safety concerns. EUBOILER4 had a maintenance issue and LBWL staff were unsure of whether it would be repaired for the test.

Records Review:

The following records were received for the inspection:

1. Baghouse and Carbon Injection Log Sheets
2. Eckert COMS and CEMS data for EUBOILER4 dated 11/4 – 12/5, EUBOILER5 dated 11/30 – 12/16, and EUBOILER6 dated 11/12 – 11/16.

The permit limits for visible emissions are 20% opacity except for one 6-minute average per hour of not more than 27%, and for SO<sub>2</sub> the limits are 1.67 lb/MMBtu for coal combustion and 1.11 lb/MMBtu for oil combustion. The boilers have been operating in compliance with the permitted emission limits with some deviations reported for visible emissions quarterly.

All records obtained in the course of this compliance inspection are attached to the file copy of the report.

ROP and MACT Reporting and Testing:

LBWL submits quarterly, semi-annual and annual ROP reports as required by ROP No. MI-ROP-B2647-2018. Semi-annual 40 CFR 63, Subpart UUUUU (MATS) reports are submitted to EPA and AQD. Quarterly testing of CI and PM shows that all three units are meeting the standard, but some PM testing is not below the LEE emission limits (50% of the standard) as hoped so testing could be reduced. Hg emissions have been monitored continuously using sorbent tubes as below the standard, but monitor downtime has been an issue. Compliance with MATS has been an issue for Hg monitoring and EPA enforcement action is pending.

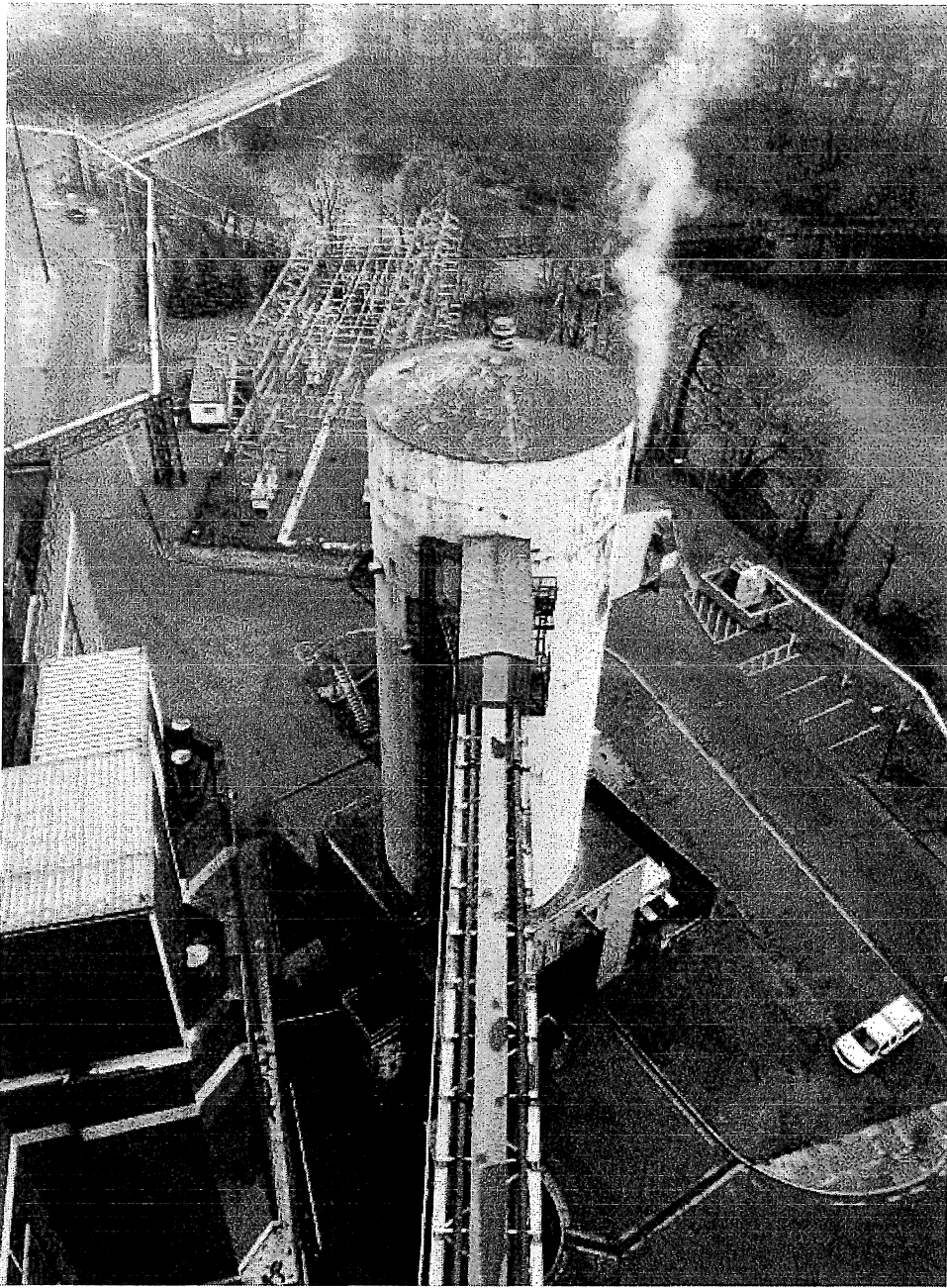
Summary:

Instances of noncompliance as noted above with ROP No. MI-ROP-B2647-2018, and state and federal regulations have been identified since the last FCE.

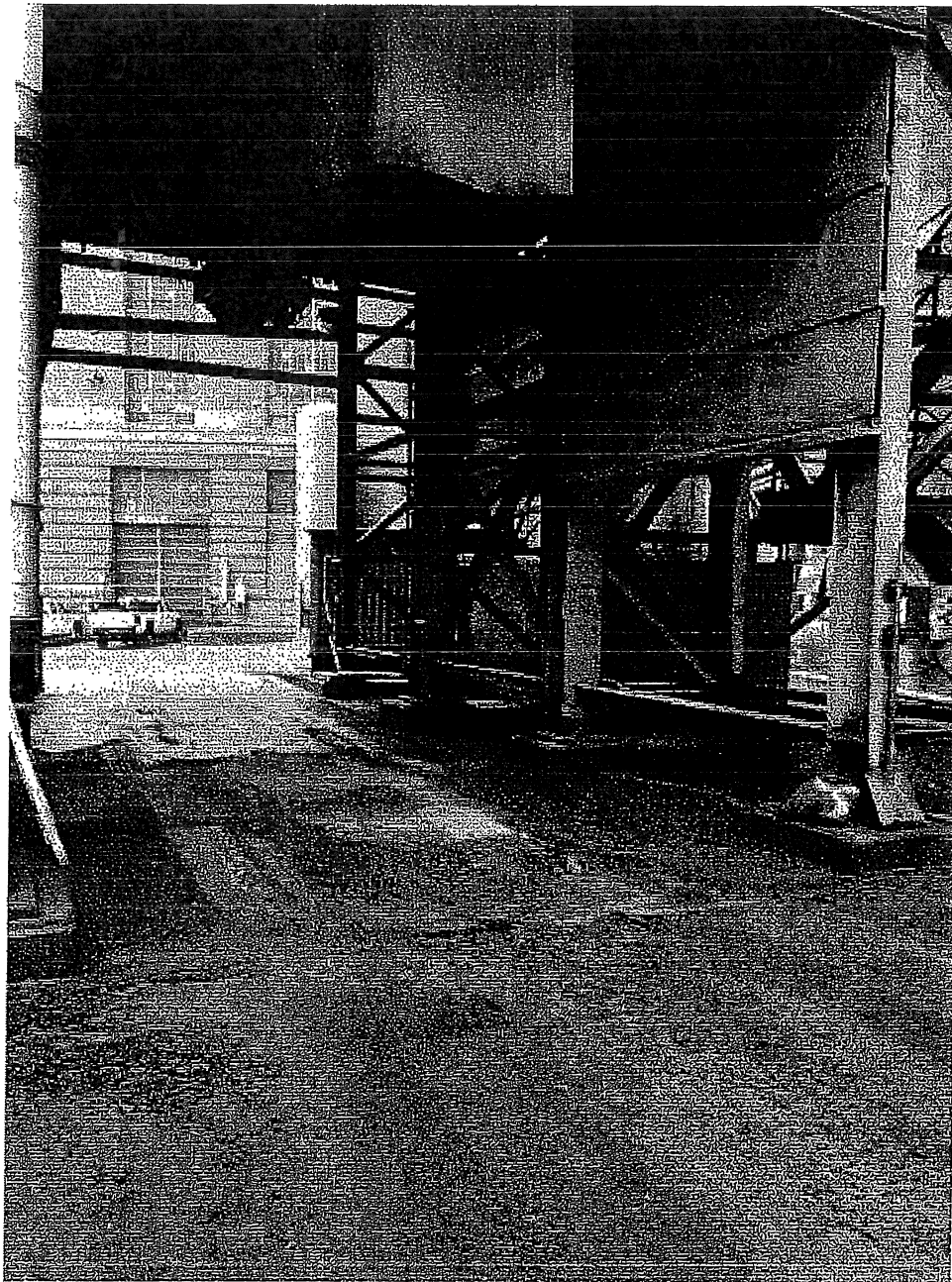
- A VN for EUNGINE was issued 10/12/2018. The engine was retested on 12/12&13 as part of the resolution.
- An EPA issued an FOV for MATS violations is pending resolution.



**Image 1(021)** : Sorbent tube ready for insertion into stack for EUBOILER5



**Image 2(020) :** Fly ash silo



**Image 3(028) : Fly ash loading bay**

NAME Justin T. Bunker DATE 1/23/19 SUPERVISOR [Signature]