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

B264730138

FACILITY: LBWL, Eckert, Moores Park & REO Cogeneration		**SRN / ID:** B2647
LOCATION: 601 Island Ave, LANSING		**DISTRICT:** Lansing
CITY: LANSING		**COUNTY:** INGHAM
CONTACT: Shannon Whiton , Senior Environmental Engineer		**ACTIVITY DATE:** 07/09/2015
STAFF: Brad Myott	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Perform inspection to determine compliance with MI-ROP-B2647-2012b		
RESOLVED COMPLAINTS:		

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Install/ Modify Date/ Operating status	Flexible Group ID
EUBOILER1	509 MMBtu/hr Coal fired boiler. 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 operating Typically provides winter backup for REO.	FGECKERT
EUBOILER2	522 MMBtu/hr Coal fired boiler. Controlled with Electrostatic Precipitator (ESP). Production of steam is used for electric power generation and for providing backup steam for sale to customers.	January 1958, January 1986 Not operating Retired in 2013	FGECKERT
EUBOILER3	Coal-fired boiler with No. 2 fuel oil for start up and flame stabilization. 522 MMBtu/hr. Controlled with LNB, OFA, and ESP. Production of steam is used for electric power generation and for backup steam for sale to customers.	January 1961, January 1986 Not operating Typically provides winter backup for REO.	FGECKERT
EUBOILER4	Babcock and Wilcox pulverized coal-fired boiler with No. 2 fuel oil for start up 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 Operating	FGECKERT
EUBOILER5	Babcock and Wilcox pulverized coal-fired boiler with No. 2 fuel oil for start up 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 Operating	FGECKERT
EUBOILER6	Babcock and Wilcox	January 1970,	FGECKERT

	pulverized coal-fired boiler with No. 2 fuel oil for start up and flame stabilization. Rated at 807 MMBtu/hr. Controlled with LNB, OFA and ESP. Production of steam for electric power generation.	January 1982 Not Operating	
EUBOILER11	Wickes Boiler Company spreader stoker, travelling grate coal-fired boiler rated at 180,000 lbs/hr of steam. Boiler is used to provide steam only. Controlled with an ESP.	January 1956, January 1982 Shutdown	FGMOORESPARK FG-PROJECT
EUBOILER12	Wickes Boiler Company spreader stoker, travelling grate coal-fired boiler rated at 180,000 lbs/hr of steam. Boiler is used to provide steam only. Controlled with an ESP.	January 1956, January 1982 Shutdown	FGMOORESPARK FG-PROJECT
EUBOILER13	Wickes Boiler Company spreader stoker, travelling grate coal-fired boiler rated at 180,000 lbs/hr of steam. Boiler is used to provide steam only. Controlled with an ESP.	January 1956, January 1982 Shutdown	FGMOORESPARK FG-PROJECT
EUBOILER14	Wickes Boiler Company spreader stoker, travelling grate coal-fired boiler unit rated at 220,000 lbs/hr of steam. Boiler is used to provide steam only. Controlled with an ESP.	January 1968, January 1982 Shutdown	FGMOORESPARK FG-PROJECT
EUASHECKERT	Two fly ash handling systems for Eckert Boiler Units 1-6 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. Used for Sales Ash	April 1981 Operating	FGASH
EUASHMP	Two (2) ash handling systems for Moores Park Boiler Units 11-14 with bottom and fly ash silos, including two (2) fabric filter control systems and wetted ash rotary unloaders for both silos. "Reject ash"	April 1981 Operating	FGASH
EUCOAL	Coal handling system servicing both Eckert and Moores Park Stations. Includes coal conveyors, bucket elevators, coal bunkers, and equipment to apply dust suppressant to the coal.	July 1979 Operating	NA
EUENGINE1	A 4 Stroke Lean Burn (4SLB) compression	June 2006 Shutdown	FGENGINES

	ignition diesel fuel fired 2628hp engine. Engine drives a standby 1,825 kW electric generator.		FG-PROJECT
EUENGINE2	A 4SLB compression ignition diesel fuel fired 2628hp engine. Engine drives a standby 1,825 kW electric generator.	June 2006 Shutdown	FGENGINES FG-PROJECT
EUENGINE3	A 4SLB compression ignition diesel fuel fired 2628hp engine. Engine drives a standby 1,825 kW electric generator.	June 2006 Shutdown	FGENGINES FG-PROJECT
EUENGINE4	A 4SLB compression ignition diesel fuel fired 2628hp engine. Engine drives a standby 1,825 kW electric generator.	June 2006 Shutdown	FGENGINES FG-PROJECT
EUCOOLTWR	A four-cell, mechanical draft cooling tower. REO	4/11/2013	FG-PROJECT
EUNGENGINE	A nominally rated 11.3 MMBtu/hr (1,040 kW) natural gas-fired spark ignition internal combustion engine for emergency use. REO	5/8/2013	FG-PROJECT
EUAUXBOILER	A nominally rated 245 MMBtu/hr natural gas-fired auxiliary boiler. REO	4/25/2013	FG-PROJECT
EUTURBINE1	A nominally rated 385.3 MMBtu/hr natural gas-fired turbine with an electrical generator. REO	4/12/2013	FGTURB/HRSG1, FG-PROJECT
EUTURBINE2	A nominally rated 385.3 MMBtu/hr natural gas-fired turbine with an electrical generator. REO	4/13/2013	FGTURB/HRSG2, FG-PROJECT
EUHRSG1	A heat recovery steam generator (HRSG) with a nominally rated 66.4 MMBtu/hr natural gas-fired duct burner. REO	4/12/2013	FGTURB/HRSG1, FG-PROJECT
EUHRSG2	A heat recovery steam generator (HRSG) with a nominally rated 66.4 MMBtu/hr natural gas-fired duct burner. REO	4/13/2013	FGTURB/HRSG2, FG-PROJECT

Shannon Whiton (smw@LBWL.COM),

This partial compliance evaluation consisted of a scheduled inspection and is part of a Full Compliance Evaluation of the facility. It contains summaries and values extracted from other submitted materials and reports. The further use of any values in this document that were obtained from other documents should be verified using the original.

The Lansing Board of Water and Light (LBWL) Eckert Station and REO Plant are considered to be one Major Source. REO Town is located diagonally to the northeast of Eckert Station. The source is located in central Lansing on the north bank of the Grand River. The south bank of the river is a public park with residences and schools around it. North of LBWL is an industrial area, with commercial establishments to the east.

The source is major for the Criteria Pollutants; NOx, SOx, Particulate Matter, and Carbon Monoxide, and the HAPs; Hydrogen Chloride and Hydrogen Fluoride. The source operates under the requirements contained in Renewable Operating Permit (ROP), MI-ROP-B2647-2012, which also includes additional permits and plans. The ROP was renewed May 17, 2012 and expires May 17, 2017. A complete application is due between 11/17/15 and 11/17/16.

Attachments to the ROP include an Acid Rain Permit, 40 CFR 72; a CAIR SO2 Permit, 40 CFR 97; a CAIR NOX Annual Permit, 40 CFR 97; and a CAIR NOX Ozone Permit, 40 CFR 97.

Eckert boiler units #1, and #3- #6 are subject to federal Acid Rain Permit requirements.

The Clean Air Interstate Rules (CAIR), 40 CFR 97, have been incorporated into APC Rules 420 and Rules 821 through 834. Eckert Station Boiler Units #1-#6 and Moores Park Unit #14 are subject to these requirements and have obtained the required CAIR permits. CAIR is going away and CASPR will apply in the future and will be incorporated into the ROP at a later time.

Eckert Boiler Units #1 through #6 are subject to APC Part 8 rule requirements. NOx Budget Permits were issued to boiler units #1 through #6 on May 24, 2004. Because Eckert Units #1 through #6 were issued federally enforceable (CAIR Ozone Nitrogen Oxides Budget) permits they are no longer considered oxides of nitrogen budget units in accordance with Rule 802(2). The NOx Budget Permits were voided.

NSPS subparts D apply to coal fired electrical generating units (EGU's) with an installation date after 08/17/1971. The installation dates for the 6 EGU's at Eckert station are prior to that date; therefore the NSPS subpart D does not apply.

Older sources that avoided the NSPS subparts D requirements may be included in the States Regional Haze SIP. Michigan must require major sources that cause or contribute to the impairment of the visibility in Class 1 areas to install Best Available Retrofit Technology (BART). Michigan's SIP addresses the reasonable progress portion of the Haze requirement in Rules 970 and 971. Rule 971(3) states that EGU's subject to CAIR do not need to complete a BART analysis.

The final Mercury and Air Toxics Standards (MATS) were published February 16, 2012. Eckert Station operates existing coal fired EGU's which are subject 40 CFR 63 Subpart UUUUU—National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units, also know as MATS. Initial Notification report was received on 8/15/2012. Compliance is required by April 16, 2015, except that an extension was granted to LBWL until 4/16/2016 due to the need to stagger installation schedules so that reliable power can be provided during outage periods. Recently, the Supreme Court ruled against EPA concerning MATS. However, MATS was not vacated but remanded back to the Court of Appeals for the DC Circuit. Because it was remanded, MATS is still in effect and Michigan's coal and oil-fired power plants still have to comply with MATS by April 16, 2016.

These mercury requirements may be subsumed by Air Pollution Control (APC) Part 15 requirements promulgated on October 16, 2009. Part 15 will require a 90% reduction in mercury emissions by January 1, 2015 (APC Rule 1503). Rule 1512 required a Mercury Permit application be submitted by June 20, 2012. On June 1, 2012 a variance was granted to Eckert Station, by Vince Hellwig of AQD, extending the submittal date of the Mercury Permit application until June 1, 2013 and has then was extended to June 1, 2014.

Since Eckert units 1-6 are subject to 40 CFR 63 Subpart UUUUU, these units are not subject to The Industrial, Commercial, and Institutional (ICI) Boiler MACT subpart DDDDD as stated in 63.7491.

The cooling towers do not utilize any chromium based water treatments so are not subject to MACT NESHAP subpart Q. The cooling towers do not utilize any phosphate based water treatments either.

A Continuous Assurance Monitoring (CAM) plan, 40 CFR 64, is required for particulate matter emissions on FGECKERT because there is a standard for particulate of 0.20lb./1000lb of exhaust gas and an ESP is used to control the particulate. The potential pre-control emission of particulate matter from each of the boilers is greater than major source threshold.

Quarterly reports are being received as required by the ROP and include COM/CEM EERs and Summaries, SO2/Sulfur emissions, deviation reports, and the required certifications. CAM Excursion and Monitoring reports are submitted every 6 months. The attached list of Partial Compliance Evaluations within the FCE document contains comments on some of these reports as reviewed.

An electronic MAERs report was received on March 11, 2015, reviewed, and passed an audit review on 5/18/2015. A paper certification was received for the electronic submittal. The facility is categorized as a municipal utility. Air use fees are capped as per section 324.5522 of Act 451. Source wide annual emissions were estimated and reported by LBWL for 2014 as:

Pollutant	Pounds	Tons
Carbon Monoxide	677,835	339
Oxides of Nitrogen	2,853,421	1,427
Particulate Matter < 10 microns	103,816	52
Oxides of Sulfur	4,626,417	2,313
Total Non-Methane Organic Compounds	22,459	11

The AQD calculated the following from the reported 2014 data:

Pollutant	Pounds	Tons
Hydrogen Chloride	449,177	225
Hydrogen Fluoride	56,147	28

I arrived at 9:15 am at the REO Town plant as scheduled the evening prior. I met with Shannon Whiton and an intern, Ben. Julie Brunner from the AQD was also present on the inspection. Other LBWL staff was in attendance periodically throughout the inspection. I surveyed for odors as visible emissions as we approached the REO Plant. It was partly cloudy and 68° F. I did not experience any odors nor did I identify any opacity from the stacks.

REO Town Inspection

This is a cogeneration plant with the capability of producing electricity and steam. The plant officially commenced commercial operation on July 1, 2013. Actual installation dates are listed above in the emission unit table. We met with the plant manager Robb and we discussed the current ROP and any changes or updates to the plant. Robb then agreed to show us the control room and give us a tour of the facility.

EUTURBINE1 & 2/HRSG 1 & 2
On the day of the inspection only EUTURBINE2 & HRSG2 were operating. EUTURBINE2 is a natural gas-fired turbine and electrical generator that can produce upwards of 40 MW depending on the ambient temperature. During the summer the unit achieves less output than during the cooler winter months. Today the outside temp was approx.. 63F and the EUTURBINE2 load was around 37 MW and HRSG2 was producing about 6-7MW. From the control room on a separate monitor we were also able to see the NOx values of 9.4 lbs/hr (limit 39.6 pph) on a 24 hr average and 7 ppmv (limit 25 ppmv) on a 30-day rolling average from the . I also noted O2 was 14.4% and 361.5 MMBTU/hr heat input and.

We then proceeded to walk through the plant. We looked at EUENGINE which is a natural gas emergency engine for the fire pump and lights. It ran for 30 mins last winter during an emergency and goes through weekly and monthly tests. The hours meter indicated 96 hours total since it has been installed in 2013. Testing is required every 3 years for a non-certified engine.

We then proceeded to look at CTG1 (EUTURBINE1) which was not operating. Robb was able to get clearance to open the engine room doors to give us an overview of the engine. Robb explained that it is essentially a "jet engine in a box" that on cold weather days can produce 50—55 MW. CTG1 has about 13K hrs and CTG2 has about 11K hrs of operation. Engine overalls are typically done around 30-60K hrs. These will be performed by GE and most likely will require a temporary engine swap out. The back end of the engine exhausts to the HRSG for steam production which can be sold to customers or used to generate additional MW.

We then went to the CEMs room to view emissions data, see attached. CEMs are installed on TURB1/HRSG1, Turb2/HRSG2 and the aux. boiler. The CEMs indicated that only FGTURB/HRSG 2 was operating. There is little demand for steam this time of year. All values of NOx emissions being recorded for FGTurb/HRSG2 were in compliance with permit limits (see attached). The Aux boiler was not operating. The aux boiler will typically only operate in the winter months to provide back up steam.

FGECKERT

Boiler Operational Data for July 9, 2015							
Boiler ID	Design Cap. MW	Oper. Load MW	% Load	SO2 lb/mmbtu.	NOx lb/mmbtu	% O_2	% Opacity
Unit 1	35	Not operating					

Unit 2	40	Retired					
Unit 3	40	Not operating					
Unit 4	70	70	98	0.435	0.238		5.3
Unit 5	70	58	88	0.459	0.196		6.6
Unit 6	70	Not operating					

Above is data I recorded during the inspection at Eckert. See attached for additional NOx and SO2 CEM data as well as opacity data from the day of the inspection.

The five EGU's at Eckert Station are pulverized coal-fired boilers controlled with Electrostatic Precipitators (ESP), Low NOx Burners (LNB) and Over fire Air (OFA). The steam being produced is primarily used for electric power generation; however Units #1 & #3 also provide backup steam for sale to customers. Boiler Units #1, and #3 exhaust through flues in the west stack. Boiler Units #4, #5, and #6 exhaust through flues in the center stack. The stacks have been unaltered and remain at the appropriate dimensions. Note temperatures on the top floor of Eckert Station can reach 150 deg F during the summer. It was approximately 95 F during my inspection.

Units 1, 3 and 6 were not operating during the inspection. Units 4,and 5 were being fired on western coal from the Thunder Basin Coal Company during the inspection. It is my understanding that the coal is characterized as subbituminous coal. The boiler units may also burn No.2 fuel oil for start-up and spent boiler cleaning solutions not designated as hazardous waste. Several limited term permits have been issued to LBWL in the last five years allowing for the testing of alternative fuels. All of these permits have either elapsed or been voided. According to LBWL the only alternative fuel that was ever actually combusted was a torrified virgin wood product (charcoal). Because of the limited availability and high cost per BTU, there is no urgency to pursue the use of this product.

Continuous Emissions Monitoring (CEMs) is required to satisfy Acid Rain and CAIR requirements. Continuous Opacity Monitoring satisfies both new source review and CAM requirements. The parameters being monitored are flow, oxides of nitrogen, carbon dioxide, sulfur dioxide, and opacity. Some of the analyzers have been switched to newer models, however; funding has not been available for all of them.

Relative Accuracy Test Audits (RATAs) for CEMs on Unit 5 was conducted in June 2015. Relative accuracy results for high and low flow rates, carbon dioxide, sulfur dioxide, and nitrogen oxides parameters were all within the allowable limits. Units 4 & 6 are scheduled for RATAs in the 3rd quarter of 2015.

The SO_2 CEMs data is also used by LBWL to show compliance with the APC Rule 301 sulfur limit. A "Daily SO_2 Compliance" report is submitted quarterly. The report for the 1st quarter 2015 indicated that the highest monitored 24-hour SO2 emission rate was 0.93 pounds/mmbtu on Unit #1, on 6/14/2013. The SO_2 limit is 1.67 lbs/mmbtu for coal fired emissions and 1.11 lbs/mmbtu when fired on No.2 fuel.

The Excess Emission Reports and Summary Reports for opacity are also being submitted quarterly. The 1st quarter 2015 report indicated that the percent of boiler operational time in excess of the opacity standard averaged 0.30% for all monitors. The 1st quarter 2015 reports indicated that Unit #3 operated at 0.41% of the boiler operational time in excess of the opacity standard. This was the highest reported value for that quarter and was mostly due to startup/shutdown and soot blowing. The longest single opacity event on Unit #1 lasted 24 minutes on 2/24/2015.

Both CAM Exceedence and Monitor Downtime reports are being submitted. The attached list of Partial Compliance Evaluations contains some comments specific to CAM reports.

I inspected the ESP control rooms. New control panels have been installed on all the units as part of a recent upgrade. Primary voltage and amperage, secondary power and amperage, and sparking rate are all being metered as per permit requirement. The automatic controllers all work in a spark limited mode. I did notice that Units 5 and 4 had power except for unit 5 had 2 T-R Sets that were down for repairs but it did not appear to affect the opacity. Unit 4 did not have any T-R sets down. Units 1, and 3 have four T-R sets and Units 4, 5, and 6 have 8 T-R sets. The following data has been recorded at previous inspections but is not required to be recorded by the ROP:

T-R Set No.	Pri. Volt	Pri. Amp	Sec. kW	Sec. milliamps	Spark/min.	SCR

The ESP's appeared to be operating properly as indicated by the very low opacity during my inspection. Opacity was consistently between 5-6% during my inspection. ESP's are typically shutdown for repair when more than 2 T-R sets are down. Inside the control room we discussed the ESP Upgrade that occurred over a year ago. The operators believe that the upgrade which included computer upgrades for controlling power to the ESP units has improved automatic rapping and has thus improved their cleaning ability, making the units cleaner.

Stack testing for PM was completed in July 2013 on EUBOILERS4-6 and on 2/6/14 for EUBOILER1 and 5/13/14 for EUBOILER3 as required by the ROP. All boilers tested were in compliance with PM limits in the ROP. Particulate

emissions were calculated as pounds per thousand pounds of exhaust gas corrected to 50% excess air.

Shannon emailed me the most recent coal train shipment received in July (see attached). The SO_2 limit in the permit equates to a 1.0% Sulfur in coal value.

Coal Analytical Data				
Date	%Moisture	%Ash	%Sulfur	BTU/lb.
7/12/2015	26.57	5.58	0.47	8914

FGMOORESPARK

Lansing Board of Water and Light (LBWL) Moores Park Station contains four coal fired boilers previously used for steam generation only. The four Boiler Units #11, #12, #13, and #14 each exhausted through the eastern most of the three tall stacks.

On July 11, 2013 AQD received written notification that BWL had effective July 1, 2013 ceased operation of the four Boiler Units 11-14 at Moores Park due to the commencement of the new REO Town Units.

EUCOAL and FGASH

Fly ash is handled by a pneumatic conveyance system located on the east side of the plant. This is a closed loop material handling system. Silos hold the ash and are used to fill enclosed hopper bottom trucks. Fabric filters located on top of the silos are used to control the system. No trucks were being loaded during my inspection. I could not identify any ash leaks or spills in the area of the equipment. We examined the baghouses for the fly ash and noted that both units identified as Units A and B has a reading of 1" H2O each. The units are interchangeable and are considered out of range when the pressure drop is above 8" H2O.

No fugitive dust complaints have been received in many years. A fugitive dust plan in accordance with Rule 371 is required by the current version of the ROP. A fugitive dust plan was submitted by LBWL in December, 2009 and updated in June 2010. The fugitive dust plan is presently being implemented.

The fugitive dust control plan states that pavement around loadout areas are to be cleaned weekly by a mechanical sweeper. The area around the east flyash silo loadout and the roadway exiting the plant property exhibited minimal track out or spillage. The roadway south of the pile appeared free of track out. Fugitive dust entrained from vehicles as they entered or exited the plant was unnoticeable.

Coal is being delivered by rail and is a low sulfur subbituminous coal from the Powder River Basin (PRB). An enclosed conveyor moves coal from the receiving pits under the hopper railcars to the overhead bunkers in the main plant. A trip-conveyor is used to fill the coal bunkers from above. No rail cars were unloading coal during the inspection. LBWL does not maintain much of a coal pile at this time as they prefer to keep the coal moving into the plant as they receive it. Coal is unloaded from rail cars into underground bunkers and then it is transferred to the main plant bunkers. I did not notice any visible emissions or odors.

Dust suppression is achieved by liquid applications to the coal. Some dust suppression products are applied at the coal mine prior to transport. An additional spray is applied at every conveyor transfer point at LBWL.

I did not witness any fugitive opacity from the small coal pile at the east end of the plant, nor did I notice any odors. A stacker with a telescoping drop chute is used to build the pile when they have one.

Training for Fugitive Dust Management has been conducted in the past for LBWL staff.

FGENGINES

Four 2593 BHP caterpillar reciprocating internal combustion engines (RICE) for power to four 2000 kW black start generators. These units were for use in black/brown out (emergency) situations. In the past they would typically only operate one hour per week for preventative maintenance reasons.

On July 11, 2013 AQD received written notification that BWL had effective July 1, 2013 ceased operation of the four Engines identified as EUEngines 1-4.

On May 4,2015, PTI 132-05C was issued for these units to operate again as emergency units. Plans are not final at this time on when they will become operational. An application to update their ROP should be submitted to the AQD prior to operation of these units.

FGPROJECT

The REO Town Project was constructed to replace the Moores Park Station. It utilizes natural gas fired equipment. As part of the NSR process for this installation, a netting demonstration was submitted by LBWL. The demonstration indicated that the changes would not be subject to PSD requirements. A NSR permit was issued accordingly.

The new REO plant is diagonally northeast of the Eckert and Moores Park source. A decision during new source review determined that the new construction should be one stationary source with Eckert and Moores Park. On June 9, 2011 AQD received notification that the REO Town Project had started construction.

The new units at REO Town and Boilers 11-14 and FGEngines at Moores Park comprise the units of FGPROJECT. On July 11, 2013 AQD received written notification that BWL had effective July 1, 2013 ceased operation of FGEngines and EUBoilers 11-14 as required in FGPROJECT of MI-ROP-B2647-2012.

Summary
It appears that after performing the inspections and reviewing LBWL records that the LBWL Eckert Station & REO Cogeneration is in compliance with the requirements of MI-ROP-B2647-2012.

NAME _____ DATE 8/4/15 SUPERVISOR _____