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

A393470602

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| **FACILITY:** Great Lakes Castings LLC | | **SRN / ID:** A3934 |
| **LOCATION:** 800 N. Washington Ave., LUDINGTON | | **DISTRICT:** Cadillac |
| **CITY:** LUDINGTON | | **COUNTY:** MASON |
| **CONTACT:** Gordon (Gordy) Anderson , EHS Supervisor | | **ACTIVITY DATE:** 11/29/2023 |
| **STAFF:** Caryn Owens | **COMPLIANCE STATUS:** Non Compliance | **SOURCE CLASS:** MAJOR |
| **SUBJECT:** On-site Inspection and Records Review | | |
| **RESOLVED COMPLAINTS:** | | |

On Wednesday, November 29, 2023, Caryn Owens and Linsey Wells of the Department of Environment, Great Lakes, and Energy (EGLE) – Air Quality Division (AQD) conducted an on-site, unannounced field inspection and records review of Great Lakes Castings LLC (GLC) (SRN: A3934) located at 800 North Washington Avenue, Ludington, Mason County, Michigan. The site is located on the east side of North Washington Avenue, approximately 1/10 mile north of East Tinkham Avenue and consists of one main building in the central portion of the site. The surrounding area to the facility consists of a school adjacent to the facility to the south, and some commercial facilities and residential housing north of the facility. The remainder of the surrounding area is residential or vacant land.

The field inspection and records review were to determine compliance with the Renewable Operating Permit (ROP) MI-ROP-A3934-2015. The site is currently an area (a synthetic minor) source for hazardous air pollutants (HAPs) and is subject to the following National Emission Standard for Hazardous Air Pollutants (NESHAP): for Iron and Steel Foundries in Area Sources 40 CFR Part 63, Subpart ZZZZZ; and for Stationary Reciprocating Internal Combustion Engines in 40 CFR, Part 63, Subpart ZZZZ (RICE MACT). Additionally, the following emission units are subject to federal Compliance Assurance Monitoring (CAM) Rule in 40 CFR Part 64: EUCUPOLA, EUHUNTERSAND, EUDISAEWETDC, EUHUNTERDUSTAR, EUDISADUSTAR, EUOTHERDUSTAR, EUCLEANING, and EUFINISH. GLC submitted a ROP Renewal Application to AQD and was received by the Cadillac District Office on March 10, 2020.

**Summary:**

The activities covered during the field inspection and records review for the facility indicates the facility was in violation with ROP MI-ROP-A3934-2015 due to:

- installing a new engine at the facility;
- modification of EUHUNTERSAND to include emissions from EUHUNTERDUSTAR; and
- non-reporting of 1st Semi-annual Compliance Report for NESHAP 40 CFR Part 63, Subpart ZZZZZ.

Specific permit conditions that were reviewed are discussed below.

**On-site Inspection:**

At the time of the inspection, I met with Mr. Gordon Anderson, the EHS Supervisor, and Christy McNamee, the Safety Manager who escorted AQD throughout the facility. When AQD first entered, we signed in and contacted Mr. Anderson. AQD had general personal protection equipment (PPE) on, which included hard hat, safety glasses, hearing protection, steel toe shoes, and a flame-resistant (FR) jackets. Additionally, a N-95 respirator mask or better is required to access some parts of the plant due to silica dust exposure.

GLC is a gray iron foundry that produces cast iron products. The major production operations are raw material handling and preparation, mold and core production, metal melting, pouring and cooling, and casting finishing/heat treating. Molten iron is produced in a cupola controlled with an afterburner, wet cap, quencher, venturi scrubber and demister. The molten metal is stored in a holding furnace. Green sand molds are produced on two separate mold lines, a Hunter and a DISA line which are controlled by baghouses and scrubbers. The molten metal is poured in the Hunter and DISA lines from portable ladles. The molds utilize shell and cold box cores which are also produced on-site. Finishing operations at the facility primarily consist of three Rotoblast (shot blasting) units.

Prior to entering the facility, I observed the vapor plume from the cupola which was in operation during the inspection. The weather conditions were cloudy, with winds from the west-southwest about 10-15 miles per hour, and approximately 36 degrees Fahrenheit. I observed the all the emission units listed in the ROP, which are discussed in more detail below in each section of this inspection report.

During the inspection I observed the raw data from the monitoring systems for the cupola, and the pressure drops of each baghouse. The area of the foundry that is not accessible for inspection unless a N-95 respirator mask is used, contains a

wet scrubber and baghouse. The data recorded from the Cupola, baghouses/scrubbers, and pH monitor is addressed below in each section.

Additionally, Mr. Anderson indicated that they have a new diesel engine located outside on the east side Property and recently began operating. I mentioned that the ROP Renewal Application should be updated to include this engine, and they need to submit a Notification to AQD to notify the details of this engine, and that this engine has begun operating. As of the date of this inspection report, AQD has not received information on the new engine at the facility.

Additionally, Mr. Anderson showed Ms. Owens where the emission unit EUHUNTERDUSTAR system was modified, being closed off from the Dustar baghouse and redirected to the emission unit EUHUNTERSAND system which exhausts to the CSI Baghouse.

The facility is claiming the following exemptions at the facility:

- Three metal natural gas-fired heat ovens with less than 10,000,000 Btu/hr input through exemption Rule 336.1282 (2)(b)(i).
- One 1,000-gallon propane storage tank through exemption 336.1284(2)(b).
- Gas fired air make-up and Heating, Ventilation, and Air Conditioning (HVAC) Units with less than 10,000,000 heat input through exemption Rule 336.1282(2)(b)(i).
- An existing Spark Ignition emergency generator engine with less than 500 horsepower through exemption 336.1285(2)(g), this emission unit is covered in the ROP.
- One small cold cleaner through exemption Rules 336.1281(h) and 336.1285(r)(iv), but this exemption has reporting requirements and contains a small paragraph discussed below.
- The pattern making process, the shell core machines, and core wash area through exemption Rule 336.1290, but this exemption has recordkeeping requirements, and is discussed in a short paragraph below.

**Source Wide Conditions:** These Conditions include all process equipment at the stationary source including equipment covered by other permits, grandfathered equipment, and exempt equipment.

**I. Emission Limits:**
HAPS emissions are limited to 10 tons per individual HAP and 25 tons aggregate HAPS. Compliance with these limits is demonstrated through calculation of emissions based on emission factors associated with iron and sand binder usage rates. Records of HAPS emission over the last 12 months are attached. The most prominent individual HAP emitted by the facility is Benzene. Emissions of Benzene over the last 12 months total 2.3 tons per 12-month rolling time period. Total HAPS for the facility total 9.6 tons per 12-month rolling time period.

Opacity is also limited to 20% from any building. Testing for this is required once every six months and was completed October 30, 2023 and demonstrated compliance.

**II. Material Limits:**
There are no material limits associated with Source-Wide Conditions.

**III. Process/Operational Restrictions:**
The facility has a written scrap procurement plan that follows the mercury scrap management option of not accepting scrap that contains motor vehicle scrap. Compliance with this plan is required to be certified and reported semi-annually. The most recent reporting was received by AQD for the period July 1, 2022 through December 31, 2022. AQD did not receive the 1st semi-annual Compliance Report for in the calendar year 2023, the 2nd semi-annual Compliance Report is due to AQD by March 15, 2024.

**IV. Design/Equipment Parameters:**
There are no design limits associated with Source-Wide Conditions.

**V. Testing/Sampling:**
Testing for fugitive emissions (opacity) from all buildings is required once every six months. Testing for this is required once every six months, and was performed on October 30, 2023, which demonstrated compliance.

**VI. Monitoring/Recordkeeping**
Records regarding HAP emission calculations and scrap procurement and segregation are being kept by the facility and demonstrate compliance with applicable standards. A report regarding the scrap procurement and segregation

should be submitted every six months per the Iron and Steel Foundry Area Source MACT (40 CFR Part 63, Subpart ZZZZZ).

**VII. Reporting:**
Semi-annual deviation reports, annual certifications of compliance reports were reviewed and documented as they were received. The facility did not report the visible emissions testing to AQD timely, and this will be reported as a deviation on the next semi-annual and annual report to AQD. Additionally, AQD did not receive the 1st semi-annual Compliance Report as required to show compliance with the Iron and Steel Foundry Area Source MACT under 40 CFR Part 63, Subpart ZZZZZ. This is a violation of the ROP.

**VIII. Stack/Vent Restrictions:**
There are no specific stack parameters for Source-Wide Conditions.

**IX. Other Requirements:**
Malfunction Abatement Plans (MAP) are required for EUCUPOLA, EUCOLDBOXCORE, EUHUNTERSAND, EUDISASORM, FGDUSTAR, and FGCLEAN&FINISH. Plans for each have been developed and copies are on file with the AQD Cadillac District Office. These plans have been recently updated and submitted with the ROP Renewal. AQD reviewed and approved the plans May 12, 2020.

**EUCUPOLA:** Cupola and associated demister, afterburner, quencher, and venturi scrubber, metallic scrap storage area, coke storage area, and electric holding melting furnace. During the initial inspection of EUCUPOLA, the Cupola was on operating on blast.

**I. Emission Limits:**
The emission unit currently has the following emission limits:

| Pollutant | Limit | Highest Reported Record |
|---|---|---|
| **Particulate Matter (PM)** | 50.8 tons per year (tpy) | 38.8 tpy |
| **PM** | 1.4 pounds/ Ton of metal charged | 0.79 pounds/ Ton of metal charged |
| **PM** | 28 pounds per hour | 12.50 pounds per hour |
| **PM** | 0.25 pounds per 1,000 pounds of exhaust gases, calculated on a dry gas basis | 0.145 pounds per 1,000 pounds of exhaust gases, calculated on a dry gas basis |
| **PM-10** | 39.2 tpy | 22.1 tpy |
| **PM-10** | 1.08 pounds/ Ton of metal charged | 0.925 pounds/ Ton of metal charged |
| **PM-10** | 21.6 pounds per hour | 14.39 pounds per hour |
| **Sulfur Dioxide (SO2)** | 54.4 tpy | 0.1 tpy |
| **SO2** | 1.5 pounds/ Ton of metal charged | 0.0032 pounds/ Ton of metal charged |
| **SO2** | 30.0 pounds per hour | 0.191 pounds per hour |
| **Carbon Monoxide (CO)** | 408.0 tpy | 171.40 tpy |
| **CO** | 11.25 pounds/ Ton of metal charged | 7.16 pounds/ Ton of metal charged |
| **CO** | 225.0 pounds per hour | 122.26 pounds per hour |
| **Volatile Organic Compounds (VOCs)** | 13.6 tpy | 1.41 tpy |
| **VOC** | 0.42 pounds/ Ton of metal charged | 0.055 pounds/ Ton of metal charged |
| **VOC** | 8.4 pounds per hour | 0.81 pounds per hour |
| **Lead (Pb)** | 0.76 tpy | 0.25 tpy |
| **Pb** | 0.02 pounds/ Ton of metal charged | 0.0055 pounds/ Ton of metal charged |
| **Pb** | 0.4 pounds per hour | 0.0865 pounds per hour |
| **Arsenic (As)** | 0.0036 pounds per hour | 0.0002 pounds per hour |
| **Manganese (Mn)** | 0.87 pounds per hour | 0.455 pounds per hour |
| **PM or Total Metal HAP** | 0.8 or 0.06 pounds per ton of metal charged | 0.035 pounds of Total Metal HAPs per ton of metal charged |

Compliance with the emission limits is demonstrated through stack testing and calculations based on emission factors developed during stack testing. Stack testing was completed November 9 - 11, 2021 for the above pollutant emissions. Records of annual emissions indicate compliance with each of the limits.

**II. Material Limits:**

The sulfur content of the coke is limited to 2.5%, by weight. I collected a sample of coke from the fuel bunker during the inspection and submitted it to Merit Laboratories for analysis, and the analytical results indicated the sulfur content of the coke was 0.56%, which is compliance with the sulfur content of the coke.

The facility is restricted to melting no more than 20 tons of metal per hour and 6,050 tons per month. Records maintained by GLC indicate that the highest melt rate observed was 18.0 tons per hour and 4,313.81 tons per month between November 1, 2022 through October 31, 2023, which demonstrates compliance with the limit.

**III. Process/Operational Restrictions:**

Emission control device operating parameters are specified in the ROP. At the time of the inspection, I recorded the following operational parameters during the field inspection.

| Parameter | Permit Limit | Actual (on Blast) |
|---|---|---|
| **Venturi Delta P** | > 33 inches wc | 46.0" wc |
| **Venturi Flow** | > 200 gallons per minute (gpm) | 265.8 gpm |
| **Demister Delta P** | < 1.0 inches wc | 0.26" wc |
| **Demister Flow** | > 40 gpm | 46.9 gpm |
| **Quencher Flow** | > 200 gpm | 240.9 gpm |
| **Cupola Upper Stack Temp** | > 1150 degrees F | 1548 degrees F |

The facility follows an Operations and Maintenance Plan, for the cupola venturi scrubber and the plan has daily, monthly and annual maintenance checks, and are recorded and kept onsite.

**IV. Design/Equipment Parameters:**

Devices to measure flow rate, pressure drop, and temperature across the various pieces of equipment were all installed and appeared to be operating properly.

**V. Testing/Sampling:**

The ROP requires testing for each of the pollutant limits every 5 years. The most recent test performed was to show compliance with the emission limits and the total metal HAP limits under 40 CFR Part 63, Subpart ZZZZZ, and was completed on November 9-11, 2021.

**VI. Monitoring/Recordkeeping:**

The facility records the charge weight and time and the ratio of iron to coke charged, which are recorded on a daily and monthly basis. Monitoring of these items is maintained electronically. The computer records the time and weight of each material charged to the cupola. The computer system is also set up so that the facility cannot exceed the 20 ton per hour melt rate limit. Records of monitored data were available at the time of the inspection. Inspection of the records demonstrates that the facility is maintaining the required records.

Additionally, the facility continuously monitors the flow rate of the quencher, the flow rate of the demister, and the upper stack temperature. They use the differential pressure and liquid flow rate data of the venturi scrubber and demister as well as the liquid flow rate of the quencher to determine continuous and proper operation of EUCUPOLA.

Records associated with CAM are also being kept and were available on request.

As previously stated, the facility monitors and records the sulfur content of each shipment of coke received.

The facility calculates monthly and 12-month rolling emissions for PM, PM-10, SO2, CO, VOC, and Pb using the most current stack test emission factors. As previously discussed above, the Cupola was operating within the permitted parameters. Any deviations to the operating established operating parameters are discussed below.

**VII. Reporting:**
The facility is required to report calendar year emissions to the AQD via the Michigan Air Emission Reporting System. The report was previously reviewed and documented. Semi-annual deviation reports and annual certifications of compliance were previously reviewed and documented. Reporting associated with CAM was previously reviewed and documented. Any excursions and monitoring downtime concerns were repaired in a timely and adequate basis. As previously stated, the 1st semi-annual reporting for 40 CFR Part 63, Subpart ZZZZZ has not been received for the 2023 calendar year, which is in violation with the ROP.

**VIII. Stack/Vent Restrictions:**
Stack parameters at the facility have not been modified and appear correct.

**IX. Other Requirements:**
There has been no need to modify the existing CAM plan.

**EUCOLDBOXCORE:** Cold box core machines with packed tower scrubber including ancillary core making equipment. This system is controlled by a sulfuric acid recirculating packed tower scrubber.

**I. Emission Limits:**
The facility is limited to 10 tons of VOC per year from this emission unit. Emissions are calculated using the resin manufacturer emission factor. The records indicated the 12-month rolling VOC emission rate was 1.7 tpy. The dimethylpropionic acid (DMPA) limit is 0.50 tpy. It should be noted that the facility no longer uses N, n-dimethylisopropanolamine (DIMPA). The records indicated 12-month rolling DMPA emissions were 0.02 tpy. The ROP indicates that there must be no visible emissions from the emission unit. Records of visible emissions readings are maintained and indicate that no visible emissions were observed. I observed no visible emissions during the inspection.

**II. Material Limits:**
The emission unit is limited to using only 23,000 pounds of resin per calendar month. Based on the records reviewed, the highest amount of resin used from November 1, 2022 through October 31, 2023 was 9,600 pounds of resin, which is below the permitted limit.

**III. Process/Operational Restrictions:**
EUCOLDBOXCORE was operating during the inspection. The scrubber was operating with a pH of the scrubber at 3.33. According to Mr. Anderson, when the pH is around 4, then they will replace the acid in the scrubber. The permit requires the scrubber liquid pH to be maintained below 4.5.

The facility follows MAP for EUCOLDBOXCORE and the plan has daily, weekly, monthly and annual maintenance checks, and are recorded and kept onsite.

**IV. Design/Equipment Parameters:**
The pH meter on the scrubber was installed and appeared to be operating properly.

**V. Testing/Sampling:**
Non-certified visible emissions observations are required on a weekly basis, when the equipment is operating. Records of visible emissions readings are maintained and indicate that no visible emissions were observed. Observations made during the inspection also confirmed no visible emissions were present.

**VI. Monitoring/Recordkeeping:**
Records indicate that GLC is monitoring and recording the pH of the scrubbing liquor, the VOC and DMPA emissions from the emission unit, and the presence of any visible emissions as required by the permit.

The facility records the differential pressure on a daily basis when the scrubber is operating. The scrubber differential pressure was 3.33 inches water column (wc) during the inspection. According to Mr. Anderson, the visible inspections of the packed bed scrubber are required on a quarterly basis but happen more frequently.

**VII. Reporting:**
Semi-annual deviation reports and annual certifications of compliance were previously reviewed and documented.

**VIII. Stack/Vent Restrictions:**
Stack parameters at the facility have not been modified and appear correct.

**IX. Other Requirements:**
There are no other requirements for EUCOLDBOXCORE.

**EUHUNTERPOURING:** Iron pouring process of the Hunter line. There are five pouring lines for EUHUNTERPOURING, but the facility typically uses one to three of the five lines.

**I. Emission Limits:**
PM emissions are limited to 0.10 pounds per 1000 pounds of exhaust gases. Stack testing on November 9-11, 2021 demonstrated emissions were 0.0175 pounds per thousand pounds exhaust gas. Furthermore, the absence of visible emissions during the testing and the absence of visible emissions based upon observations by facility personnel indicate continuous compliance with the emission limit. I observed no visible emissions during the inspection.

**II. Material Limits:**
There are no material limits associated with EUHUNTERPOURING.

**III. Process/Operational Restrictions:**
The Hunter line has a pouring rate limit of 20 tons per hour this is equivalent to the cupola melt rate limit. The highest Cupola melt rate was observed at 18.0 tons per hour between November 1, 2022 through October 31, 2023.

**IV. Design/Equipment Parameters:**
There are no design/equipment parameters for EUHUNTERPOURING.

**V. Testing/Sampling:**
As previously stated, the most recent stack test was completed between November 9-11, 2021, and the facility was in compliance with the emission limits. The facility is required to complete stack testing every five years. The facility is required to perform non-certified visible emissions observations on a weekly basis when the emission unit is operating. Records of visible emissions readings are maintained and indicate that no visible emissions were observed. I observed no visible emissions during the inspection.

**VI. Monitoring/Recordkeeping:**
Records of the amount of metal poured are being properly maintained.

**VII. Reporting:**
Semi-annual deviation reports and annual certifications of compliance were previously reviewed and documented. Test protocols were submitted to the AQD within required timeframes.

**VIII. Stack/Vent Restrictions:**
There are no Stack parameter restrictions for EUHUNTERPOURING.

**IX. Other Requirements:**
There are no other requirements for EUHUNTERPOURING.

**EUHUNTERSAND:** Hunter line sand system controlled by the CSI Baghouse. Additionally, according to Mr. Anderson, the EUHUNTERDUSTAR historically has been connected to the Dustar baghouse, however, a few years ago this line has been re-routed to the CSI baghouse. This Emission Unit now includes, the Hunter line mold cooling, shakeout, return mold sand, and sandmulling operations. This would be considered a modified emission unit, and is a violation with Rule 336.1201 violation due to:

"a person shall not install, construct, reconstruct, relocate, or modify any process or process equipment, including control equipment pertaining thereto, which may emit any of the following, unless a permit to install that authorizes such action is issued by the department.
(a) Any air pollutant regulated by title I of the clean air act and its associated rules, including 40 C.F.R. §51.165 and §51.166, adopted by reference in R 336.1902.
(b) Any air contaminant. A person who plans to install, construct, reconstruct, relocate, or modify any such process or process equipment shall apply to the department for a permit to install on an application form approved by the department and shall provide the information required in R 336.1203."

**I. Emission Limits:**
PM emissions from this emission unit are limited to 0.10 pounds per 1,000 pounds of exhaust gases, calculated on a dry gas basis. Stack testing on October 19-21, 2021, demonstrated emissions were 0.0025 pounds per thousand pounds exhaust gas. The facility demonstrates continuous compliance with this limit by maintaining the differential pressure across the CSI baghouse.

**II. Material Limits:**
There are no material limits associated with EUHUNTERSAND.

**III. Process/Operational Restrictions:**
The facility is not allowed to operate the emission unit unless the CSI baghouse differential pressure is within the range specified in the MAP. The facility demonstrates continuous compliance by maintaining the differential pressure across the CSI baghouse within the 0.2 to 7 inches wc range specified in the MAP, and 1 – 6 inches wc range specified in the CAM plan. Based upon a review of the records, the differential pressure ranged from 1.7 inches wc to 6.8 inches wc and was observed at 4.0 inches wc at the time of the inspection.

The facility follows MAP for EUHUNTERSAND and the plan has daily, monthly and semi-annual maintenance checks, and are recorded and kept onsite.

**IV. Design/Equipment Parameters:**
A device to measure differential pressure across the baghouse was installed and appeared to be operating properly.

**V. Testing/Sampling:**
PM testing is required every 5 years. As previously stated, stack testing was completed October 19-21, 2021, and testing demonstrated compliance with the PM emissions limit.

**VI. Monitoring/Recordkeeping:**
The facility is required to continuously monitor the differential pressure across the baghouse and record the parameter once per day during operation. At the time of the inspection, the monitor was operating, and the differential pressure was 4.0 inches wc. Based on the records reviewed, no malfunctions, excursions, or exceedances in the monitoring data were documented.

**VII. Reporting:**
Semi-annual deviation reports and annual certifications of compliance were previously reviewed and documented. Test protocols were submitted to the AQD within required timeframes.

**VIII. Stack/Vent Restrictions:**
There are no Stack parameter restrictions for EUHUNTERSAND

**IX. Other Requirements:**
There has been no need to modify the existing CAM plan.

**EUHUNTERMOLDCOOL:** Hunter line mold cooling. No control equipment is associated with this emission unit.

**I. Emission Limits:**
This emission unit is limited to 0.10 pounds of particulate per 1,000 pounds of exhaust gases. Compliance with this limit is based on non-certified visible emission readings. Records of these readings were reviewed and demonstrate zero visible emissions. No visible emissions were noted during the inspection.

**II. Material Limits:**
There are no material limits associated with EUHUNTERMOLDCOOL.

**III. Process/Operational Restrictions:**
There are no process restrictions for EUHUNTERMOLDCOOL.

**IV. Design/Equipment Parameters:**
There are no equipment restrictions for EUHUNTERMOLDCOOL.

**V. Testing/Sampling:**

The facility is required to perform non-certified visible emissions observations on a weekly basis when the emission unit is operating and conduct Method 9 readings if any visible emissions are observed. Records of visible emissions readings are maintained and indicate that no visible emissions were observed. I observed no visible emissions during the inspection.

**VI. Monitoring/Recordkeeping:**
Records of visible emissions readings are maintained and indicate that no visible emissions were observed. I observed no visible emissions during the inspection.

**VII. Reporting:**
Semi-annual deviation reports and annual certifications of compliance were previously reviewed and documented.

**VIII. Stack/Vent Restrictions:**
Stack parameters at the facility have not been modified and appear correct.

**IX. Other Requirements:**
There are no other requirements for EUHUNTERMOLDCOOL.

**EUEASTCOREOVEN:** East core oven and associated equipment. No pollution control is associated with this emission unit.

**I. Emission Limits:**
The ROP states that there shall be no visible emissions from the core oven. At the time of the inspection, I observed no visible emissions from the oven stack.

**II. Material Limits:**
There are no material limits associated with EUEASTCOREOVEN.

**III. Process/Operational Restrictions:**
There are no operational parameters associated with EUEASTCOREOVEN.

**IV. Design/Equipment Parameters:**
There are no design limits associated with EUEASTCOREOVEN.

**V. Testing/Sampling:**
The facility is required to perform non-certified visible emissions observations on a weekly basis when the emission unit is operating. I observed no visible emissions during the inspection.

**VI. Monitoring/Recordkeeping:**
As previously stated, records of visible emissions readings are maintained and indicate that no visible emissions were observed.

**VII. Reporting:**
Semi-annual deviation reports and annual certifications of compliance were previously reviewed and documented.

**VIII. Stack/Vent Restrictions:**
Stack parameters at the facility have not been modified and appear correct.

**IX. Other Requirements:**
There are no other requirements for EUEASTCOREOVEN.

**EUDISAEWETDC:** Disamatic line shakeout and return mold sand system operations controlled by the east wet dust collector.

**I. Emission Limits:**
The ROP emission limits for PM-10 are 0.10 pound per 1,000 pounds of exhaust gases, calculated on a dry gas basis, and 64.8 tpy. Demonstration of compliance is through stack testing and non-certified visible emissions readings. The facility performed stack testing October 19-21, 2021, which demonstrated PM-10 emissions were 0.030 pounds per 1000 pounds of exhaust gases, and records showed PM-10 was at 12.1 tons per year and within permitted limits.

The East Wet Dust Collector controls emissions from DISA line cooling, most of the shakeout, and sand reclaim. Opacity from the East Wet Dust Collector is limited to 5% during normal operation and 20% during cleaning of the dust collector. This is demonstrated though weekly non-certified VE's. Records of these are being kept and were reviewed.

**II. Material Limits:**
There are no material limits associated with EUDISAEWETDC.

**III. Process/Operational Restrictions:**
The wet dust collector was in operation at the time of the inspection with a flow rate of 186 gallons per minute (gpm). The MAP specifies a normal operating range of 100 – 300 gpm and the CAM Plan requires 150 – 275 gpm. According to the daily records reviewed from November 1, 2022 through October 31, 2023, the flow rates ranged between 150-240 gallons per minute.

Operation of the emission unit is also limited to 6,000 hours per year, and based on the records reviewed, the hours operated from November 1, 2022 through October 31, 2023 were 3,944 hours, and operates around 250 to 450 hours per month.

The facility follows MAP for EUDISAEWETDC and the plan has daily, monthly and semi-annual maintenance checks, and are recorded and kept onsite.

**IV. Design/Equipment Parameters:**
A device to measure flow through the collector was installed and was operating properly as demonstrated by compliant flow rate and no visible emissions present.

**V. Testing/Sampling:**
The facility performed stack testing October 19-21, 2021, which demonstrated PM-10 emissions were 0.030 pounds per 1000 pounds exhaust gases. As previously stated, the facility is required to complete stack testing every five years.

The facility is also required to perform non-certified visible emissions observations on a weekly basis when the emission unit is operating. I observed no visible emissions during the inspection.

**VI. Monitoring/Recordkeeping:**
The facility is required to continuously monitor and record the liquid flow rate once per day through the collector during operation. Inspection of EUDISAEWETDC, the monitor was installed and operating, and the flow rate was recorded on a daily basis. As previously stated, the flow rate through this collector during the inspection was at 186 gpm. Based on the records reviewed, no malfunctions, excursions or exceedances of the monitoring data were documented. Additionally, records of visible emissions readings are maintained and indicated that no visible emissions were observed.

**VII. Reporting:**
Semi-annual deviation reports and annual certifications of compliance were previously reviewed and documented. Reporting associated with CAM is being performed properly and was previously reviewed and documented. No monitor downtime, excursions or exceedances were reported to the AQD within the past year of this inspection report. Test protocols were submitted to the AQD within required timeframes.

**VIII. Stack/Vent Restrictions:**
Stack parameters at the facility have not been modified and appear correct.

**IX. Other Requirements:**
There has been no need to modify the existing CAM plan.

**EUEMER-GEN:** Existing Spark ignition (SI) emergency reciprocating internal combustion engine (RICE) less than 500 HP at an area source for HAPs, as identified within 40 CFR, Part 63, Subpart ZZZZ, 63.6590(a)(1). EUEMER-GEN is not connected to the public electrical grid and is only used to provide a backup to supply power internally. At the time when this Emission Unit was permitted, the facility supplied the Conditions in accordance with 40 CFR, Part 63, Subpart ZZZZ (RICE MACT) since AQD did not have delegation over the RICE MACT. Therefore, AQD did not review this portion of the ROP, but will be reviewed in the future once the ROP Renewal for GLC has been completed.

**FGDISALINE:** This Flexible Group includes the: Disamatic line pouring, mold cooling, and sand mulling operations (associated with EUDISADUSTAR); and sample shot blast unit (associated with EUOTHERDUSTAR). This flexible group is controlled by the Dustar Baghouse. This Flexible Group has been modified. Originally EUHUNTERDUSTAR was permitted to exhaust to the Dustar Baghouse, but this emission unit was re-routed to exhaust to the CSI Baghouse. As previously stated, AQD finds this as a Rule 336.1201 violation, due to modifying an Emission Unit.

**I. Emission Limits**

The ROP emission limits for PM-10 are: 0.0205 pound per 1,000 pounds of exhaust gases, calculated on a dry gas basis for FGDISALINE; 7.5 tpy for EUDISADUSTAR; 6.5 tons of PM-10 per year for EUHUNTERDUSTAR; and 3.6 tons of PM-10 per year for EUOTHERSTAR. The emission limits for VOCs are 14.0 pounds per hour and 42 tpy for EUDISADUSTAR. The emission limits for Formaldehyde were 2.0 milligrams per cubic meter. Demonstration of compliance is through stack testing, through calculations using emission factors derived from stack testing, and via non-certified visible emissions readings. The facility performed stack testing October 19-21, 2021, which demonstrated PM-10 emissions were 0.0028 pounds per 1000 pounds of exhaust gases. Formaldehyde emissions were 0.151 milligrams per cubic meter, and demonstrated the VOC emissions were 1.41 pounds per hour. Based on the records reviewed, emissions for FGDISALINE were 1.1 tons of PM-10 per year and 2.8 tons of VOC per year.

The Dustar Baghouse controls emissions from FGDISALINE. Visible Emissions from the Dustar Baghouse are limited to 5% opacity during normal operation. This is demonstrated though weekly non-certified visible emissions. Records of these are being kept and were reviewed.

**II. Material Limits:**

There are no material limits associated with FGDISALINE.

**III. Process/Operational Restrictions:**

The Dustar Baghouse was in operation at the time of the inspection with a differential pressure of 4.03 inches wc. The MAP specifies a normal operating range of 0.2 to 7.0 inches wc and the CAM Plan indicates proper function of the baghouse between 1.0 inches to 6.0 inches wc. Based on the daily records reviewed from November 1, 2022 through October 31, 2023, the Dustar Baghouse differential pressure ranged between 0.2 to 5.6 inches wc.

The facility follows MAP for FGDISALINE and the plan has daily, weekly and semi-annual maintenance checks, and are recorded and kept onsite.

**IV. Design/Equipment Parameters:**

A device to measure the differential pressure across the baghouse was installed and was operating properly as demonstrated by compliant differential pressure readings and no visible emissions during the inspection.

**V. Testing/Sampling:**

The facility performed stack testing October 19-21, 2021, which demonstrated PM-10 emissions were 0. 0028 pounds per 1000 pounds exhaust gases. As previously stated, the facility is required to complete stack testing every five years.

The facility is also required to perform non-certified visible emissions observations on a weekly basis when the emission unit is operating. I observed no visible emissions during the inspection.

**VI. Monitoring/Recordkeeping:**

The facility is required to continuously monitor and record the differential pressure once per day across the baghouse. Inspection of the emission unit concluded that the gauge was installed, operating, and records indicate that the differential pressure is recorded. Based on the records reviewed no malfunctions of the monitoring data were documented.

Records associated with PM-10, VOC and formaldehyde emission calculations are maintained and demonstrate compliance with the emission limits.

Records of visible emissions readings are maintained and indicate that no visible emissions were observed.

**VII. Reporting:**

Semi-annual deviation reports and annual certifications of compliance were previously reviewed and documented. Reporting associated with CAM needs to be looked at closer and documented properly. Test protocols were submitted to the AQD within required timeframes.

It should be noted that AQD received two deviations reported for May 19 and May 22, 2023 where the facility indicated the manometer was over 7.0 inches wc. The records do not show the facility in operation for May 15, 2023 and the recorded reading for the differential pressure for May 22, 2023 was 5.3 inches water column. The facility indicated they installed a transducer to signal to the operator's panel if the bags to the baghouse are getting full and minimize deviations in the future.

Additionally, the records reviewed indicated two CAM excursions on March 6 and March 8, 2023 where the differential pressure range was below 1.0 inches wc. AQD was not notified of these two CAM excursions, however, the records did not show a deviation, and appeared to go back to working order.

**VIII. Stack/Vent Restrictions:**
Stack parameters at the facility have not been modified and appear correct.

**IX. Other Requirements:**
There has been no need to modify the existing CAM plan.

**FGCLEAN&FINISH:** This Flexible Group includes Shot blast machine used to clean castings prior to finishing (associated with EUCLEANING) and casting finishing process using grinding wheels (associated with EUFINISH). This flexible Group is controlled by the AAF baghouse.

**I. Emission Limits:**
PM-10 emissions are limited to 0.10 pounds per 1,000 pounds of exhaust gases, calculated on a dry gas basis. Compliance with this emission limit is ensured by proper installation, operation and maintenance of the AAF baghouse.

**II. Material Limits:**
There are no material limits associated with FGCLEAN&FINISH.

**III. Process/Operational Restrictions:**
The ROP requires that the baghouse be installed and operating properly and that the differential pressure across the baghouse is within the normal operating range. At the time of the inspection, the differential pressure of the AAF baghouse was 4.2 inches wc, which is within the approved range specified in the MAP of 0.2 to 7.0 inches wc, and 1 to 6 inches wc as specified in the CAM plan.

The facility follows MAP for FGCLEAN&FINISH and the plan has daily, monthly, and semi-annual maintenance checks, and are recorded and kept onsite.

**IV. Design/Equipment Parameters:**
A device to measure pressure drop was installed and appeared to be operating properly.

**V. Testing/Sampling:**
The facility is required to perform non-certified visible emissions observations on a weekly basis when the emission unit is operating and conduct Method 9 readings if visible emissions are detected. I observed no visible emissions during the inspection.

**VI. Monitoring/Recordkeeping:**
The differential pressure gauge was installed and operating at the time of the inspection. Daily records reviewed from November 1, 2022 through October 13, 2023 demonstrated the differential pressure is recorded at least once per day during operation. Based on the records reviewed, the pressure drops ranges between 2.4 to 6.0 inches wc. At the time of the inspection the differential pressure was 4.2 inches wc.

Records of visible emissions readings are maintained and indicated no visible emissions were observed.

**VII. Reporting:**
Semi-annual deviation reports and annual certifications of compliance were previously reviewed and documented. Reporting associated with CAM is being performed properly and was previously reviewed and documented. Test protocols and completed test reports were submitted to the AQD within required timeframes.

**VIII. Stack/Vent Restrictions:**
There are no stack/vent restrictions associated with FGCLEAN&FINISH.

**IX. Other Requirements:**

There has been no need to modify the existing CAM plan.

**FGCOLDCLEANERS:**

This flexible group includes any cold cleaner that is grandfathered or exempt from Rule 201 pursuant to Rule 278 and Rule 281(2)(h) or Rule 285(2)(r)(iv), existing cold cleaners that were placed into operation prior to July 1, 1979, and new cold cleaners that were placed into operation on or after July 1, 1979. There is one small cold cleaner at the facility, EUCOLDCLEANERM, which is considered a small maintenance cold cleaner, and uses mineral spirits (petroleum distillates). The associated Safety Data Sheet (SDS) information was provided to AQD. The cold cleaner is serviced by the facility with disposal of spent solvents to an approved waste hauler. The cold cleaner appeared in good condition and was closed when not in use.

**FGRULE290:**

This flexible group covers EUPATTERNMAKING, EUSHELLCORE, EUCOREWASH. GLC maintains material VOC content and use records that demonstrate emissions for each emission unit are below the Rule 290 thresholds. Previously EURIAPPLICATION was included in this Flexible Group, however, Great Lakes Casting has removed this application from the facility. If they decide to use it again in the future, they can submit the proper documentation to show it meets Rule 290 and include the application in the next ROP Renewal.

NAME Cayce Owens DATE 2-1-24 SUPERVISOR Shane Nixon