

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

A145356050

<b>FACILITY:</b> BERNE ENTERPRISES INC		<b>SRN / ID:</b> A1453
<b>LOCATION:</b> 7190 BERNE RD, PIGEON		<b>DISTRICT:</b> Bay City
<b>CITY:</b> PIGEON		<b>COUNTY:</b> HURON
<b>CONTACT:</b> Kathleen Kurk ,		<b>ACTIVITY DATE:</b> 11/05/2020
<b>STAFF:</b> Gina McCann	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MINOR
<b>SUBJECT:</b> PTI 129-19A and ACO inspection		
<b>RESOLVED COMPLAINTS:</b>		

**Mid-March 2020 the State of Michigan was placed under quarantine and shelter-in-place restrictions were required. State of Michigan residents have since been required to adhere to social distancing guidelines in response to the Covid-19 pandemic crisis. This inspection was conducted in two parts, an electronic records review with facility staff in teleconference and an onsite portion to review operation of control devices and process equipment.**

**On October 26<sup>th</sup>, 2020, EGLE-AQD staff sent a records request to Berne Enterprises. Attached is the request sent on October 26<sup>th</sup>, 2020 and the response from Berne Enterprises staff received October 27<sup>th</sup> and October 28<sup>th</sup>, 2020. Ms. Kathleen Kern, Office Manager and Mr. Daryl Mendrick, Environmental Engineer**

**On November 5<sup>th</sup>, 2020 I (glm) met with Mr. Daryl Mendrick, Huron Castings and Kurt Kern, Plant Superintendent. Mr. Keith Wurst, Owner, passed away over the summer and the facility is currently awaiting final acquisition from Mr. Leroy Wurst, Keith's brother, and owner of Huron Castings (B7013).**

**The facility has one active PTI 129-19A and an active Administrative Consent Order (ACO) 2019-10. The earliest the facility can request termination is 2022. At the time of the inspection the facility was in compliance with the PTI 129-19A and ACO 2019-10.**

**Berne Enterprises, Inc. is predominantly a steel foundry, though they also cast aluminum and austenitic manganese parts. Their websites list castings varying in sizes from 2 pounds (lbs.) to 23 lbs.**

### **FGFOUNDRY**

**The facility has one shell mold line that uses (4) four induction furnaces with the following capacities:**

- Furnace A- 4,000 pounds
- Furnace B- 4,000 pounds
- Furnace C- 2,000 pounds
- Furnace D- 1,000 pounds-designated for aluminum melt

The furnaces operate in two separate banks. Furnaces A and B on one bank and furnaces C and D on another bank. Electric set up restricts operation of only one furnace from each bank at a time. Further process restriction of each furnace is determined by the ability to use cooling water in only one bank at a time. Therefore, the facility can only operate one furnace

at a time. Special condition (SC) III.1. restricts operation to only one melt furnace at a time. SC VI.2. requires the hours of operation for each furnace, in order to demonstrate compliance with SC III.1. The facility does not track hourly operation of the furnace but could back calculate hours of operation through heats. The facility is currently preparing a PTI application and plans to request removal of this condition. Subsequent discussions with the permit sections determined it is possible to remove and the request should be able to be approved. A violation notice was not sent for this, because the facility physically cannot operate more than one furnace at a time, and this was verified while on-site. Hours of operation are not directly being tracked; however they can be verified through some massaging of data.

PTI 129-19A lists 22 emission limits for varying metals charged. Three main factors contribute to the PTI being built this way: 1) lack of good dispersion due to vents instead of stacks and 2) proximity of property boundary and 3) toxicity of metals/alloys being charged. The facility is exploring options to help with dispersion and plans to submit a PTI revision. The facility maintains the appropriate records to comply with these limits. The facility recorded the use of material 47/A747A, stainless steel in March 2020. The facility is not permitted to process this material and ceased operation upon issuance of the permit in June 2020.

Below is a table that compares actual material usage with permitted values. The facility was in compliance with the emission limits at the time of the inspection.

<b>Material</b>	<b>Material Limits Based on a 12-month rolling time period (tpy)</b>	<b>Material Usage (tpy)</b>
<b>8630</b>	<b>216</b>	<b>2.37</b>
<b>AusMn</b>	<b>90</b>	<b>14.06</b>
<b>1045</b>	<b>207</b>	<b>34.19</b>
<b>090</b>	<b>130.5</b>	<b>0</b>
<b>8640</b>	<b>65.25</b>	<b>5.71</b>
<b>WCB</b>	<b>162</b>	<b>15.02</b>
<b>CuMn</b>	<b>9</b>	<b>8.25</b>

<b>D.I.</b>	<b>22.5</b>	<b>0.30</b>
<b>8635</b>	<b>40.5</b>	<b>7.36</b>
<b>0030</b>	<b>81</b>	<b>0</b>
<b>4140</b>	<b>252</b>	<b>0</b>
<b>8635/40</b>	<b>40.5</b>	<b>0</b>
<b>C.I.</b>	<b>135</b>	<b>3.97</b>
<b>1524</b>	<b>126</b>	<b>8.68</b>
<b>AlMag 35</b>	<b>2.45</b>	<b>0.69</b>
<b>1025</b>	<b>36</b>	<b>0</b>
<b>Total metal charged to furnaces</b>	<b>1675</b>	<b>100.6</b>

**\*Actual material usage is based on the 12-month rolling time period ending October 2020.**

**SC III.2-5. restricts charge sizes for each furnace. Each furnace is sized as follows and have not changed: 1) Furnace A- 4,000 pounds 2) Furnace B- 4,000 pounds 3) Furnace C- 2,000 pounds 4) Furnace D- 1,000 pounds-designated for aluminum melt.**

**SC III.3. requires all operations of FGFOUNDRY to take place inside an enclosed building on and after July 31<sup>st</sup>, 2021. The facility is currently in the design phases of the building project. During the onsite portion of the inspection we discussed location of the new building and ideas of how additional exhaust would be introduced, which will be included in a subsequent PTI revision.**

#### **FGMOLDCORE**

**There are several natural gas molding and core machines that handle premixed sand that is coated with a resin to make molds. The molds consist of two parts, the outer molds and inner cores, both of which are made of sand pre-mixed with a chemical binder. Emissions occur in the mold making and core making processes and later when the molds and cores are removed from the cooled castings.**

**The mold line is a conveyor system which starts in the mold/pouring area. Individual baskets hold the molds. Melted material is poured from a tilt induction furnace into a ladle. The operator moves the ladle from basket to basket, pouring each part. When the baskets have been**

filled, the conveyor is advanced to the next set of baskets. This continues until the conveyor is full. The conveyor exits the north side of the building as it is advanced. Cooling takes place outside on the north and east sides of the building. When the conveyor has made its way around to the east side of the building the castings have cooled enough to remove the sand molds and cores.

SC II.1. restricts the amount of resin coated sand, or RCS, to 1,508 tons per year based on a 12-month rolling time period as determined at the end of the calendar month. SC VI.1. is the associated monitoring and recordkeeping requirement to maintain on a monthly and 12-month rolling time period the amount of RCS used in FGMOLDCORE. For the 12-month rolling time period ending September 2020 the facility used 90 tons.

### FGHEATTREAT

Once the castings have cooled enough to remove the sand molds and cores the mold line conveyor system makes its way around to the east side of the building. "Shakeout" is a manual process, which currently occurs outside on the east of the main building. The new building will enclose this activity. The operator breaks the spent sand mold from the part and shovels spent sand from the ground into a waste drum. The empty conveyor then reenters the building to begin the process again. After "shakeout" the parts are then either quenched with water or oil and heated in one of four (4) heat treat ovens for varying lengths of time. This determines the strength of the parts. Two (2) heat treat furnaces are in the main building, near the southwest corner. A small baghouse is associated with these units. Two additional heat treat furnaces are in the pole building north of the main building. This building was erected in the late 1990's, between 1995 and 1997.

After heat treat the parts are then sent to finishing, which occurs predominantly in the main building, though there are areas for finishing in the pole building. Finishing of the parts includes cutting with saws or torches and grinding. The facility utilizes an electric compressor, circa 1940's, to supply pneumatic air to the finishing equipment. There is an associated stack in the southwest area of the main building. During previous inspections it was explained that it was for air intake for the compressor. Additional metal particulate emissions are generated in the casting cleaning and finishing processes which include cutting with saws or torches and grinding. A Torit baghouse is associated with a wheelabrator located on the east side of the facility. The current PTI associates this baghouse with the heat treat furnaces, which should be corrected during the next PTI revision. Finished parts are stored outside, in large metal bins.

At the time inspection this baghouse was not in operation.

SC II.1. restricts the amount of quench oil used to 55 gallons per year based on a 12-month rolling time period as determined at the end of each calendar month. The quench oil usage is defined as the amount of quench oil added to bring the quench oil levels up to starting levels less any amount of quench oil reclaimed, disposed of, or spilled and cleaned up. SC VI.2 is the associated recordkeeping condition that requires the facility to maintain the amount of quench oil used in FGHEATTREAT on a monthly and 12-month rolling time period as determined at the end of each calendar month. For the 12-month rolling time period ending September 2020 the facility did not add quench oil to bring levels up to starting levels.

SC III.1. requires the facility to maintain and implement a malfunction abatement plan (MAP). The facility's MAP was approved on August 17, 2020. Maintenance records were requested and the facility was in compliance with this condition at the time of the inspection.

#### EUFINISHING

Various finishing and cleaning processes in the Main Building and Metal Building, including grinding and cutting. Emissions from the east side of the Main Building are controlled by Baghouse #1. At the time of the inspection the pressure differential was 3.5 inches of water column and within the appropriate range.

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#### MACT ZZZZZ

The facility submitted a site-specific scarp metal management plan as part of the ACO. The facility purchases stampings from D&W Salvage a scrap metal recycler, in Bad Axe. The MACT requires the facility to maintain records of binder chemical formulation and that it does not contain methanol as a specific ingredient of the catalyst formulation. The facility was able to produce records to validate they do not use auto scrap. At the time of the inspection, it appeared that Berne was in compliance with this requirement. The MACT also requires the facility to maintain records of annual quantity and composition of each HAP-containing chemical binder or coating material used to make molds and cores, 63.10892(e)(5). Purchase records were available for the coated sand that is used to make molds and cores. At the time of the inspection, it appeared that Berne was in compliance with this requirement.

The facility submitted an initial notification in 2009 to comply with the area source MACT for iron and steel foundries. Subsequent annual reports have not been submitted per 63.10890(f). The facility submitted the first 2020 semi-annual report on February 18, 2020. At the time of the inspection the facility was in compliance with the requirements of the MACT ZZZZZ.

  
NAME \_\_\_\_\_

DATE 11/16/2020

SUPERVISOR Chris Hare