

N7648
MANILA

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

N764848321

FACILITY: AJF INC		SRN / ID: N7648
LOCATION: 37015 PENNSYLVANIA RD, NEW BOSTON		DISTRICT: Detroit
CITY: NEW BOSTON		COUNTY: WAYNE
CONTACT: Daniel Kleinow , Plant Manager		ACTIVITY DATE: 04/12/2019
STAFF: C. Nazaret Sandoval	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Targeted Inspection FY2019		
RESOLVED COMPLAINTS:		

Source: SRN N7648

Company Name: AJF Inc.

Location: 37015 Pennsylvania Road, New Boston, MI 48164

Date of Inspection: March 19, 2019 and April 12, 2019

Reason for Inspection: Targeted Inspection

Inspector: Nazaret Sandoval, EGLE - AQD

Personnel Present: Daniel Kleinow, General Manager
John Shaw, Safety Manager

Facility Phone Number: (734) 753-4410

FACILITY BACKGROUND

The primary business of AJF, Inc. (AJF) is the manufacture of nozzle fill sands or plugging sands, refractory precast shapes, refractory cement castable products and specialty products, for use in the metal working industry.

The primary raw materials used at AJF in the manufacture of their products are alumina, graphite, bauxite, cement, chromium oxide, magnesia, silica and zirconium oxide. The chromium oxide and zirconium oxide are delivered by tank trailers and into on-site silos controlled by bag houses. All other materials are delivered by bags, or super sacks. In general, the dry materials are transferred by screw conveyors, enclosed chutes or bucket elevators. There are no material storage piles either indoors or outside.

The company business schedule is as follows:

Office Hours: Monday through Friday, from 6:30 AM to 4:30 PM

Process Operations: Monday to Thursday from 6:30 AM to 3:00 PM, and from 6:30 AM to 2:00 PM, on Fridays.

COMPLAINT/COMPLIANCE HISTORY

The last inspection to this facility was conducted on August 1, 2014. There are no records of citizen complaints or violation notices registered against this facility since the last inspection.

REGULATORY BACKGROUND AND PREVIOUS EXEMPTION DEMONSTRATION

According to AQD records, in 2006, AJF hired a consultant engineering company - URS Corporation (URS) - to assist them in evaluating the facility requirements for a permit to install

(PTI). URS assessed the facility processes and equipment and identified the air emission sources and the applicable air regulations. The results of URS's evaluation were summarized in a report dated November 22, 2006 (with a supplement dated November 28, 2006). In the report, URS described AJF as a mineral processing facility where the primary pollutant emitted from its operations is particulate matter (PM). The report identified six (6) mineral processing lines all of which were sources of PM. The emission units are identified later in this report and are illustrated in Figures No. 1 to 6. PM is generated as a result of the different mixing, blending, material handling, and conveying operations.

URS quantified the facility's actual PM emissions based on the production records provided by AJF with the amount of material processed from January 2006 to October 2006 and prorated for the months of November and December. For the PM emission calculations URS used the EPA AP-42 emission factors for metallic processing - Table 11.24-2. Fugitive dust emissions from operations inside the building escape through open doors and wall fans in the manufacturing area; therefore, URS assumed a building capture efficiency of 70% and applied it to the fugitive PM calculations. Controlled and uncontrolled emissions were calculated for each emission unit. A baghouse captures and controls the PM emissions. URS used 80% capture and a 99.9 % control efficiency based on vendor performance specifications, to estimate the controlled emissions from the baghouse. The estimated also included the emissions from the "Plugging Sands" process which handles Chromium Oxide, a compound that has an initial threshold screening level (ITSL) of 0.5 ug/m³.

Based on the emissions results, the demonstration concluded that all of the facility's emission units for the mineral processing lines met the exemption criteria specified under R 336.1290 (a) (ii) (A) through (D). A note in AQD files dated November 29, 2006 indicates that AQD reviewed and accepted the demonstration and considered the facility to be in compliance and exempt from the requirements of R 336.1201(1) to obtain a permit to install. Other minor equipment and operations were also evaluated and demonstrated to be exempt under other exemption rules (see inspection narrative for details).

In conclusion, since 2006, this facility has been operating under the claimed exemptions that were demonstrated in the cited 2006 report. However, the facility must meet all the conditions specified in R 336.1290 (a)(ii) for the life of their operations to continue to be exempt from obtaining a PTI. One of the objectives of the inspection of 4/12/2019 is to determine if AJF remains in compliance with all the exemption provisions of the updated R 336.1290 (1) and R 336.1290 (2)(a)(ii).

INSPECTION NARRATIVE

Opening Meeting

On March 19, 2019 I arrived at AJF, Inc. at 9:30 AM and I met with Mr. John Shaw, Safety Manager and Mr. Daniel Kleinow, the General Manager of the facility. After the introductions, I stated the purpose of the inspection. The purpose of the inspection is to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; and the Air Quality Division (AQD) administrative rules.

I brought with me the Facility Process Flow Diagrams, (Figures No. 1 to 6) originally prepared by URS consultants in 2006. The diagrams identify the sources of air pollutants (emission units). According to the diagrams, AJF Inc. originally operated up to six (6) mineral processing lines, all of which were sources of particulate matter emissions. However, over the years, some of the lines have been decommissioned, as described below:

- Big Ball Mill (decommissioned-as indicated in the 2009 inspection report) – Fig. 1

- Small Ball Mill (decommissioned –confirmed during site visit of 2014) – Fig. 2
- Large Castable Operations – Fig. 3
- Small Castable Operations – Fig. 4
- Casting Blending – Fig. 5
- Plugging Sands Handling – Fig. 6

Other supporting emission units include:

- A painting booth
- Natural gas-fired dryers and ovens for drying and curing the castable products
- Testing and inspection equipment
- Welding and grinding operations
- Emergency Generator

I discussed the applicable air regulations and the permit to install exemption rules that the facility has been using after the evaluation conducted by URS in 2006. This information is discussed later in this report as part of the “Compliance Evaluation” section. I also asked for updates in the process operations. Mr. Shaw said that there have been no changes since the 2014 inspection.

I asked for the most recent production and emission records for each production line. The production records were handed out to me at the meeting.

After the first visit I followed up with the facility and requested additional records. After various phone discussions and email exchanges, I arranged a second visit.

In the second visit on April 12, 2019, I arrived at about 10:00 AM and brought with me the PTI Exemption handbook to discuss in detail the provisions of Rule 290 and Rule 278 and the monitoring and recordkeeping requirements. In addition, I showed them the summary table that had been prepared by URS in 2006 which included the calculations of the PM emissions. I indicated that the records provided in my visit on March 19, 2019 were not kept as required by the regulations. The facility is monitoring and recording the individual amounts of materials for each specific product in a particular production line, but they are not calculating the PM emissions per month from each production line. The total uncontrolled or controlled PM emissions in pounds per month must be calculated and recorded for each month so that AQD can evaluate compliance with the allowable pounds per month limit established by Rule 290 exemption.

The following records were collected and/or generated during the term of the inspection process. They are included in the appendices attached to this report:

A – Weekly production records for the cited periods. The labels identify the specific production line:

- Large Castables (from 11/19/2017 to 3/10/2019)
- Small Castables (from 11/12/2017 to 3/10/2019)
- Dry Blend (from 12/3/2017 to 3/10/2019)
- Dry Mix (from 1/28/2018 to 2/24/2019)

B – Production totals for each production line - Spread sheets developed by N. Sandoval (AQD) using the production records handed out by AJF on 3/19/2019. The tables summarize the total pounds of materials manufactured by AJF at each production line, in pounds per month and the total pounds for the year.

C - Technical Data Sheets for AJF's product line: Q-Ultra LC-80, QLC-80, QLC-85P, QSP 94, QLC-60P, QLC-70P, Q-Ultra LC 85C, QRam KN, QRam Z, QMAG 92, QMAG 95 Cleanflow CFLS-30 and 30CB, Zirflow 40S, Zirflow TMK-LS, Zirflow TMK2-LS.

D - Black paint purchase records with delivery dates: 10/26/2018, 1/9/2019, and 3/14/2019.

E – Natural Gas Tube Heaters Heat Input Capacity Information and Natural Gas Records
Natural Gas Records for period from 12/13/ 2018 to 1/11/2019 (30 days) and from 1/15/ 2019 to 2/11/ 2019 (28 days).

F – Emergency Generator – Scheduled Maintenance Checklists dated 11/7/2018 and 4/24/2018. SDS for diesel fuel.

G – References: Permit To Install Exemption Handbook Excerpts, EPA AP-42 EFs for Metallic Mineral Processing and Refractory Manufacturing.

H – Air Contaminant Data Sheet – MIOSHA records for TWA air sampling monitoring at AJF, Inc. on 4/8/2010 and 4/16/2010.

At the end of each opening meeting, Mr. John Shaw lead the walk-through the facility.

Facility Walk-through

Mr. Shaw led the tour and explained the activities and/or operations occurring at each section of the building. There are three main areas of operations in the building from East to West: Raw Material Storage and Welding Area, Mineral Processing Lines and Packaging /Shipping Area. Super-sacks of raw material for the Plugging Process are stored in the Packaging Area for “emergency” situations when trucks fail to deliver.

Mineral Processing Lines:

The processed depicted in figures 1 and 2 are no longer at the facility.

The attached figures 3 to 6 shows the product flows, transfer points, emission points, control devices (baghouses), and sources of fugitive emissions of PM for each process line.

- Castable Blending Operations – Dry Blend (Fig. 5)

In general, dry granular material is transferred by screw conveyors, enclosed chutes or bucket elevators to various vessels for the purpose of blending or mixing.

The transfer of bulk materials from super sacks or bulk bags to weigh hoppers or mixers accounts for much of the fugitive PM emitted by the facility. All of these transfers occur inside the AJF facility, although open doors and fans located near the roof of the facility cause a small amount of fugitive PM to be exhausted to the outside air. All point sources of PM emissions are controlled by a baghouse. The blended materials are bagged for shipment or are transferred within the facility to either the Small or the Large Castable Area.

- Small and Large Castable Operations– (Figs. 3 and 4)

There processes include the casting of formed structures weighing up to about 300 pounds

(small) and up to 12,000 pound or more, and the raw material comes from the Dry Blend Operations. Particulate emissions are rare in these two areas because the material handled is water wetted concrete-like paste. The castings are removed from the molds after setting and drying.

- Plugging Sands Handling (Fig. 6)

The other significant source of fugitive PM is the uploading of raw material for the “Ladle Nozzle Fill Sands” process from truck trailers to weigh hoppers and from the weigh hoppers to the bucket elevator and storage silos. Part of these activities take place outside the facility. PM emissions are controlled by a baghouse.

- Zirflow and Cleanflow Series Production Area

There are separate equipment at the plant located across the aisle from the Large Castable, with a smaller layout compared to the other operations. It includes two weight hoppers receiving material dumped manually from small bags. There were also screw conveyors, bucket elevators and a mixer for the purpose of blending or mixing sands to the proper specifications. The Zirflow and Cleanflow Series are produced here.

This equipment was installed around 2010 as a backup, because the main Plugging Sand Mixing System (depicted in Fig. 6) stopped working. From this system, the products are packed in 35 lbs and 50 lbs bags. The unit is connected to the baghouse.

As indicated earlier, all manufacturing operations are located inside the building. The only exterior operations are two silos for the receipt and storage of sand. The silos and bucket elevators are controlled by dust control socks. There are two baghouses, both located behind the building on the south side. The south-west baghouse collects most of the PM generated from the mineral operations. The exhaust fan is rated at 6000 cfm. The south-eastern baghouse, which is located behind the welding operations, controls the PM emissions from the welding and grinding activities and the exhaust fan is rated at 4000 cfm.

Miscellaneous Emission Units:

- Paint Booth

The paint booth is a source of VOC emissions where black paint is applied to metal rods approximately 3 feet in length. A numeric scale is stenciled on the rods. The rods are used to manufacture a specialty product developed by AJF Inc. which is used by the steel industry to measure steel bath depth in the tundish. The device is known as AVSM or “Anti-Vortexing Steel Measurement Device” (see attached drawing of the AVSM).

- Casting Curing Furnaces

There are two natural gas fired heaters that are used to dry and cure the casting products, depending upon the casting’s size. The heaters are not high heat input devices inasmuch as their function is just to hold controlled temperatures and/or remove moisture, within large enclosed insulated spaces. The burner associated with the large cast curing oven is a 5” Tube Burner with a heat input capacity of 1,500,000 BTU/ hr and the pre-heating oven (which looks like a “walking heating room” has a 4” Tube Burner with heat input capacity of 400,000 Btu /hr. The casting products in the small oven can reach up to 120 °F and they are hold in there for up to 24 hours. The bigger oven can reach up to 900 °F.

- Testing and inspection equipment and Welding and Grinding Operations

During the facility tour I asked a few questions about the final usage/applicability of their products. Mr. Shaw indicated that the steel making facilities are the main users of their products. He also showed me some of their castable products and talked about the nozzle fill sands series. He explained (with some detail) how the plugging sands, the well blocks and the AVSM are used in the steel making process.

Closure Meeting

After the facility tour, we came back to the office to continue with the discussion of the applicable regulations and the monitoring and recordkeeping requirements. I told AJF representatives that the main problem I found was that they are not reporting the actual PM emissions. Mr. Kleinow indicated that they did not receive an electronic version of the spreadsheet used by the consultants in 2006 for the recordkeeping, so they are unable to reproduce the PM emissions in the form presented in the summary table provided with the 2006 report. I explained how they could develop a spread sheet by using the consultant information and the references I have provided via email (i.e. Rule 290 provisions, AP-42 emission factors, etc.). I added that I could provide technical support in trying to replicate what the consultants have developed. However, they are ultimately responsible for resolving this issue and a reevaluation of the applicability of R 336.1290 (1) and R 336.1290 (2)(a)(ii) to their plant operations may be requested as a result of this inspection.

A final determination of compliance with the applicable requirements would be determined after a detailed review of the records and processing the information received in both visits.

Both days of the site visit I left the facility at about 2:00 PM.

APPLICABLE AIR REGULATIONS AND COMPLIANCE EVALUATION

According to AQD records, most of the unit operations at AJF have been exempt from the requirements of R 336.1201 (1) to obtain a permit to install (PTI) in accordance with R 336.1290 (a) (ii) - now updated under R 336.1290 (1) and R 336.1290 (2)(a)(ii).

The plant has other supporting units that have also been exempt from obtaining a PTI under other exemption rules which are identified in the subsequent paragraphs.

To be eligible for the specific exemption listed in R 336.1290 (2)(a)(ii), AJF must meet at all times, the criteria cited in Rule 290 (2)(a)(ii) [(A) through (D)] and the provisions and recordkeeping requirements cited in conditions (b) through (d) of the rule. Rule 290 excerpt are attached and have been extracted from the "Air Permit to Install Exemption Handbook". In addition, Rule 278 establishes requirements of eligibility for exemptions listed in Rules 280 through 291. To be eligible for a listed exemption, the owner or operator of an exempt process or exempt process equipment must be able to provide information demonstrating the applicability of the exemption pursuant to Rule 278a (Rule 278 and Rule 278a excerpts are also attached).

During this inspection I evaluated the production records for year 2018 for each one of the product lines. I verified (by requesting the technical data) that the products manufactured by AJF continue to be the same ones produced in 2006 so that there are no changes in the chemical composition of the compounds involved. I evaluated the process operations and the control devices, the source of air emissions and the type of pollutants. The objective was to verify if the requirements cited under the specific exemption rules that have been used by the facility are still applicable and the facility remains exempt from obtaining a PTI.

It appears as if the process operations and the products manufactured at AJF have not had major changes over the years.

Mineral Processing Lines (Fig. 3 to Fig. 6)

According to the production records and the technical data, AJF continues to manufacture the same line of products which are identified as: QLC (Low Cement castable) with percentages of Alumina of 60,70,80 and 85; the ultra-low cement castable (Q-Ultra LC 85C); and the refractory precast shape (QSP 94) with high purity (90 to 95% white fused alumina). In 2006, based on the toxic screening levels, the materials used in the manufacturing of the cited products were either identified as non-carcinogenic and non-toxics or showed initial threshold screening levels (ITSL) above 2 ug/m³. These products are associated with the operations occurring at the Dry-Blend, Small and Large Castable emission units.

In addition, AJF continues the production of the granular sand mixtures to fill the nozzle well area of steel ladles in the Dry-Blend emission unit (Fig. 6). Products include the Cleanflow Series - containing Chromium Oxide and Silica, and the Zirflow Series, containing Chromium Oxide, Zirconium Oxide, and Silica. These products were identified as toxics due to the presence of Chromium Oxide (Cr2O3), which has a ITSL of 0.5 ug/m³ in an annual average.

According to Rule 290(2)(a)(ii) the uncontrolled emissions of air contaminants for non-carcinogenic, non-toxic materials should be not more than 1,000 pounds per month or 500 pounds per month (controlled).

Since the records collected were presented as production records and not as particulate matter emissions, I compared the tons per year in 2018 with the tons per year reported in 2006, for each one of the production lines. If the annual production rate in 2018 is equal or below the one reported for year 2006, the emission unit is considered to be in compliance with the emission rate restrictions imposed by Rule 290(2)(a)(ii). I also assumed that the transfer points and the points of PM emissions for each emission unit are the same as those selected in 2006.

Here are the records for each product line in tons per year:

Emission Unit	Year 2006	Year 2018
Large Castables	618	281.26
Small Castables	988	190.19
Dry-Blend	1281	450.14
Plugging Sands	7376	10,602
Plugging Sands (Chromite Only)	5,313	5,449

According to analysis of the records, AQD concludes that AJF is likely to be in compliance with the cited emission restrictions. However, the recordkeeping procedures have to be modified in accordance with the provision of Rule 290.

Furthermore, it was noticed, that the submittal of 2006 seems to be missing the demonstration of the applicability of Rule 290 exemption pursuant to Rule 278. I did not find in AQD files the Potential To Emit (PTE) calculations for the operations at AJF, which are used to determine the eligibility to use the exemptions listed in Rules 280 through Rule 291.

The information in our files, on its face, appears to demonstrate compliance with Rule 290. However, AQD has not yet been able to replicate the calculation pathway for the emissions estimates given by the consultants. In addition, the demonstration of the applicability of the exemption pursuant to Rule 278a is not in AQD files and it appears as if that information was not requested in 2006. Nor was it requested the evaluation of Rule 278 (Exclusion from Exemption) which would have required the submittal of the Potential to Emit calculations.

Miscellaneous Emission Units

AJF operates other processes that are exempt from permit to install requirements under Michigan's air rules. The exemptions are listed here along with the relevant citation from the rules.

Paint Booth:

This is a source of VOC emissions. As indicated earlier in this report, the paint booth is only used to coat metal rods of about 3 feet in length, with black paint. Records of paint usage are kept by the facility. They use approximately 1 gallon of paint every five weeks. Therefore, since the volume of paint is less than 200 gallon of coating per month, this emission unit is exempt from permitting under R 336.1287(2)(c).

Natural gas-fired dryers and ovens:

The burners associated with the gas-fired heaters or Casting Curing Furnaces, have heat inputs of 1.5 MMBtu/hr and 400 MBtu/hr. Those values are below the limit of 10 MMBtu/hr, specified in R336.1282 (2)(a)(i).

Testing and inspection equipment - Exempt from permitting per R 336.1283(2)(b).

Welding and Grinding Operations - Exempt from permitting per R 336.1285(2)(i) and R 336.1285(2)(l)(vi)(C).

Emergency Generator – This equipment is exempt from permitting per R 336.1285(2)(g) which is used for internal combustion engines that have less than 10 MMBtu / hr maximum heat input. The diesel engine in the generator at AJF has a rated capacity of 250 KW, which is equivalent to 2.52 MMBtu/hr (estimated using 18 gal/hr fuel usage and 140,000 Btu / gal of diesel).

CONCLUSION

Overall, the inspection showed the facility is likely operating in compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; and the Air Quality Division (AQD) administrative rules.

The information in our files, on its face, appears to demonstrate compliance with Rule 290. However, AQD has not yet been able to replicate the calculation pathway for the emissions estimates given by the consultants in 2006. Therefore, to confirm the veracity of AQD's inspection conclusions and to have a better understanding of the overall operations at AJF and the sources of emissions; AQD will be asking AJF in the next couple of months to provide information demonstrating the applicability of the Rule 290 exemption pursuant to Rule 278a.

NAME Handover

DATE 10/17/2019 SUPERVISOR JK