

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

B287362052

FACILITY: Michigan Sugar Company - Sebewaing Factory		SRN / ID: B2873
LOCATION: 763 N Beck St, SEBEWAING		DISTRICT: Bay City
CITY: SEBEWAING		COUNTY: HURON
CONTACT: Meaghan Martuch , Air Compliance Manager		ACTIVITY DATE: 02/10/2022
STAFF: Benjamin Witkopp	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MAJOR
SUBJECT: Facility inspection and subsequent information review		
RESOLVED COMPLAINTS:		

On February 10, 2022, Ben Witkopp of the Michigan Department of Environment, Great Lakes, and Energy - Air Quality Division (AQD) went to Michigan Sugar Company's (MSC) factory located in Sebewaing Michigan. Factory Manager Kevin Romzek, Plant Superintendent Adam Ginnrich, and MSC Air Compliance Manager Meaghan Martuch were present for MSC. The facility is covered by renewable operating permit (ROP) MI-ROP-B2873-2019. The facility extracts sugar produced by sugar beets. Molasses and beet pulp are additional products. The beet pulp is sold as pressed or in pelletized form. Spent lime from the process is sold as a soil enhancement.

MSC operations are seasonal as the processing is conducted during "campaigns" which typically run from mid August through mid March. The final step is the "juice campaign" after the slicing and beet processing is done. The unprocessed juice which remains is processed into sugar. The sugar itself can be handled, packaged, etc. at any point during the year. The record harvest of beets during the past growing season has caused the slicing campaign to be completed at the end of April.

The facility was inspected less than one year ago. Normally sources with a ROP are inspected on an every other year time frame. However, since the company had all four of its factories inspected during the previous year, AQD intends to get the cycle back to two factories per year unless problems are identified. This inspection and subsequent regulatory investigation was instructed to be more narrowly focused based on the previous findings and short interval between inspections.

### **LIME KILN**

The kiln uses coke or anthracite coal for fuel to heat limestone rock. Anthracite was the fuel in use. Carbon dioxide and calcium oxide are produced by the kiln to be used in beet processing. The anthracite is reportedly sampled at the coal docks in Saginaw and periodically at the factory site.

There is a fuel sulfur limit of 0.7% by weight. A usage limit is also present in the ROP. It is 5,000 tons per 12 month rolling time period and not an average nor per campaign basis. The highest sulfur content was found to be 0.67 % as received and 0.70% on a dry basis as determined by Mineral Labs, Inc. of Sayersville Kentucky. The sample was taken at the factory location by MSC staff. The highest 12 month rolling time period for usage occurred in January 2021 at 2,972 tons.

AQD had MSC staff collect an anthracite sample for independent analysis. Results from Hazen Research, Inc of Golden Colorado indicated the sulfur content was 0.589 % both as received and on a dry basis.

Visible emissions readings (non-certified) are to be taken when the kiln is directly venting to the atmosphere. Logs also indicate east or west stack and the operational state. The highest reading found was 12.7% in comparison to the 20% allowed under AQD Part 3 rule 301. When asked about the logistics of certified reader availability should a situation arise, Adam said their goal is to have 4 certified readers for the facility. That would dramatically lessen the need to get someone from another factory or from corporate.

## **PULP DRYERS**

The factory has three pulp dryers. Pulp dryer one and two are contained in a flexible group. Dryer three has its own separate conditions. The use of the dryers is purely demand driven. If area cattle operations can utilize wet pulp for feed then the demand for dried and pelletized pulp is lessened.

Pulp dryer three has a hourly limit per campaign year, not calendar year. The campaign year restriction is 6,240 hours. Records for the start of the 2021 / 22 campaign were checked. For the first four months of the campaign only 1,966 hours of operation were logged. The dryer also has a limit of 1,032 hours during ozone season which is defined as May 1 through September 30. Only 458 hours of operation were logged during ozone season, all of which occurred in September. There are limits on volatile organic compound (VOC) and carbon monoxide (CO) emissions. The limits are 245 and 442 tons per year (tpy) respectively based on a 12 month rolling time period. The values for 2021 were checked for convenience and found to be 31 and 123 tons for VOC and CO respectively. The values are well below permitted levels.

The dryer also has a particulate (PM) limit in terms of pounds per thousand pounds of stack gas. Compliance is sought through proper operation of control devices and periodic stack testing. A multicyclonic collector is used to control particulate emissions. The pressure drop across the collector is to be maintained between one to nine inches of water per the Malfunction Abatement Plan (MAP) and the Compliance Assurance Monitoring (CAM) plan. Pulp dryer three is also equipped with a flue gas recirculation system which is to be maintained between 5,000 and 19,000 cubic feet per minute per the plans. The pressure drop was typically five inches while the flue gas recirculation rate was 9,000 cfm. Lastly, dryer three has a sulfur dioxide (SO<sub>2</sub>) limit. However, the SO<sub>2</sub> would result when / if the unit is burning fuel oil. Fuel oil is not being used.

Dryers one and two are contained in a separate flexible group in the ROP. There is a particulate limit in terms of pounds per thousand pounds of stack gas. They also have a SO<sub>2</sub> limit that only applies when burning fuel oil. Fuel oil is not being used. Compliance is sought through proper operation of control devices and periodic stack testing. Like dryer three, each unit is equipped with a multicyclonic collector to control particulate emissions. The pressure drop across the collector is to be

maintained between one to nine inches of water per the MAP and CAM plan. The dryers are also equipped with a flue gas recirculation system which is to be maintained between 5,000 and 19,000 cubic feet per minute per the plans. The pressure drop was typically over seven inches while the flue gas recirculation rate for unit one was a minimum of 5,900 cfm while unit two's was 7,000 cfm.

The time period stated in the ROP for the SO<sub>2</sub> limits for all of the dryers is not found in AQD rule 402 and would require a means of verification to occur hourly. There is also a requirement to calculate the acceptable sulfur content as a means of demonstrating compliance. The requirement in the permit states the basis is to be on a pounds per million btu heat input basis and appendix 7 is referenced for the calculation. However, appendix 7 then presents the calculation resulting in the sulfur as % sulfur. Records were not requested given the existence of the conflict. The various conflicts between what is stated within the ROP itself, as well as versus rule 402, warrants close examination and correction.

### **PULP DRYERS (stack testing)**

Pulp dryers one, two, and three have stack testing requirements. The time frame in which to conduct the testing is within five years of the most recent performance test. Pulp dryers one and two were last tested on February 1, 2017. Dryer three was tested the next day, February 2, 2017. Five years has passed from those dates and the required stack testing has not been conducted. Violation of ROP condition EU DRYER#3 V 2 results from the lack of stack testing dryer three. Likewise, exceeding the time frame to conduct stack testing for dryers one and two results in violation of ROP condition FG PULPDRYERS V 2.

### **FGBOILERS**

The flexible group consists of the east (2) and west (3) Wickes boilers. The boilers are coal fired spreader stoker units. Emissions from each boiler are controlled by multiclones. Each boiler has two sets of multiclones. Subsequent to the multiclones the exhaust is combined and controlled by a high efficiency venturi scrubber and a wet electrostatic precipitator (WESP). The venturi and WESP were installed to meet the requirements of the Boiler National Emission Standards for Hazardous Air Pollutants (NESHAP) Maximum Achievable Control Technology (MACT) regulations found in 40 CFR part 63 subpart DDDDD, hereinafter Boiler MACT.

The boilers have two emission limits on them as a result of having obtained an air use permit that is contained in the ROP. Compliance with the PM limit is sought by monitoring proper operation of control equipment. Compliance with the sulfur dioxide (SO<sub>2</sub>) limit is based upon fuel sampling.

Readings of various control device parameters have been included in the boiler operational logs. The acceptable pressure drop range across the multiclone units is specified as one to six inches of water column in the ROP. Review of records into February 2022 found pressure drops within range. The values for boiler two east multiclones typically hung on the very low end of the range at one to two inches. Boiler two's west units typically were in the four to five inches range.

Similarly the east and west units for boiler three had a range of four to five inches. It is unclear why the values for boiler two's east units were lower in comparison to all others, but the values were still acceptable.

The boilers have emission limits of 0.45 pounds of particulate per 1,000 pounds of stack gas and 2.50 pounds of sulfur dioxide (SO<sub>2</sub>) per million btu's heat input (based on a 24-hour period). The 24-hour time period is questionable as it would necessitate hourly sampling, calculations, etc. AQD rule 401, table 41 footnote (e) speaks to a calendar day. Additionally, the footnote requires daily fuel sampling, analysis, calculations etc. whereas the ROP says "for each delivery" of coal. The ROP and rule 401 requirements conflict. The current ROP requirement to collect a representative coal sample once per campaign for independent analysis was being met. The sulfur content was found to be 0.54 % as received and 0.57% on a dry basis as determined by Mineral Labs, Inc of Sayersville Kentucky. AQD had MSC staff collect a coal sample for its own independent analysis. Results from Hazen Research, Inc of Golden Colorado indicated the sulfur content was 0.494 % as received and 0.514 % on a dry basis. There is a requirement to calculate the acceptable sulfur content. The requirement in the permit states the basis is to be on a pounds per million btu heat input basis and appendix 7 is referenced for the calculation. However, appendix 7 then presents the calculation resulting in the sulfur as % sulfur. Records were not requested given the existence of the conflict. Either way, an adjustment must be made based on compliant coal having a btu content of 12,000 btu per pound and a sulfur content of 1.5 %. Taking the higher "as received" value of 0.54 % sulfur, the heat value listed for that coal was 13,088 btu/lb. This equates to an acceptable sulfur content of 1.64 % (equivalent to 2.73 pounds of SO<sub>2</sub> per million btu's heat input). The % sulfur was found to comply with rule 401 limits as the adjusted limit was 1.64 % and the higher received value was only 0.54 %. This indicates the actual pounds of SO<sub>2</sub> per million btu's heat input is less than the adjusted limit previously stated. Much time was spent examining requirements in the ROP and rules. The various conflicts between what is stated within the ROP itself, as well as versus rule 401, warrants close examination and correction. This is true wherever rule 401 is involved in the ROP, including appendices.

### **FGSTOKERBLRS-5D**

Control devices were added to the existing multiclones to meet the Boiler MACT requirements for coal fired boilers two and three. The Boiler MACT is found in 40 CFR Part 63 subpart DDDDD. A venturi scrubber and WESP were installed in series after the multiclones exhaust was combined. The multiclone performance was previously discussed under FGBOILERS. A significant amount of time was spent reviewing the federal requirements in relation to MSC practices.

### **FGSTOKERBLRS-5D (operational limits / parameters / continuous compliance)**

Pressure drop across the venturi scrubber was typically 30 inches of water. Water flow in the center was usually in excess of 400 gallons per minute (gpm). Water flow in the venturi ring was commonly 65 gpm. The WESP instantaneous total power

ranged from 8 to 30 kilowatts (KW). These values are above the lowest of those found in the most recent performance testing for PM, e.g. 15.3 inches of water for scrubber pressure drop, 360 gpm for scrubber flow, and 4.29 KW for total power.

For reference purposes, the Boiler MACT Appendix Table 4 presents operating limits while Table 7 specifies how to establish them. Boiler MACT Appendix Table 8 then directs the means to demonstrate continuous compliance.

The company states that performance testing (a.k.a. stack testing) is the means used to demonstrate compliance with the Boiler MACT emission limits. Therefore, a significant amount of effort was expended in this area. Keep in mind the stack testing occurs in a single stack since the emissions from the boilers are combined and routed through a series of control equipment. If the emissions limits are met, then Table 7 of the Boiler MACT provides the mean for establishing an operating limit resulting from the testing. Operating limits are intended to provide one of the means of ongoing compliance between tests. One must determine the operations highest hourly average of the three run averages during the stack test multiply it by 1.1 (110 percent) as the operating limit for the combined boiler loads. It is felt the steam load operating limit should be on a combined basis as the direct result of the pollutant measurement being taken at a point after which the boiler exhausts have been combined. The boilers have boiler MACT limits for filterable PM, carbon monoxide (CO), hydrogen chloride (HCl), and mercury (Hg).

Testing for filterable PM and carbon monoxide (CO) last occurred in January of 2019. The latest testing for HCl and Hg was conducted in February of 2020. Review of stack test results and using the method in table 7 of the Boiler MACT results in the following boilers total operating limits:

Filterable PM 153,471 pounds of steam per hour

CO 154,562 pounds of steam per hour

HCl 139,781 pounds of steam per hour

Hg 143,516 pounds of steam per hour

Therefore, to ensure compliance with all of the pollutants, the boilers should not operate at a steam load greater than the smallest operating limit. The smallest operating limit shown above is 139,781 pounds of steam per hour. In checking boiler operational records, boiler two typically operated in a range of 30 to 50 thousand pounds of steam per hour. Boiler 3 usually operated at a higher level of 60 to 70 thousand pounds of steam per hour. That indicates the highest amount of actual combined operation (production) was commonly 120,000 pounds of steam per hour. However, it does not appear that boiler operators are made aware of the operating limits based upon the combined steam load not being tracked on the boiler records. Also, the load data is required to be on a 30-day rolling average per Tables 4 and 8 of the Boiler MACT. It could not be established that 30-day rolling averages were used for boiler load operating parameters. This is a violation of 40 CFR 63.7530(b) and Table 8 of the subpart.

The prior discussion was an example of just one operating parameter required by the Boiler MACT. 40 CFR 63.7500 (a)(2) requires a source to meet each (emphasis

added) operating limit in Table 4 of the subpart that applies to a boiler or process heater. Individual operating parameters for PM, CO, HCl, and Hg will now be discussed. When using a wet scrubber for PM and Hg control, Table 4, item 1, requires maintaining the 30-day rolling average pressure drop and the 30-day rolling average liquid flow rate at or above the lowest one-hour average pressure drop and the lowest one-hour average liquid flow rate, respectively, measured during the performance test demonstrating compliance with the PM and Hg emission limitation according to 40 CFR 63.7530(b) and Table 7 of the subpart. Because wet electrostatic precipitator technology is employed after the venturi scrubber, Table 4, item 4 b, requires maintaining the 30-day rolling average total secondary electric power input of the electrostatic precipitator at or above the operating limits established during performance testing according to 40 CFR 63.7530(b) and Table 7 of the subpart. As previously stated, the levels recorded on boiler operator logs appeared to be above minimums. It could not be established that 30-day rolling averages were employed for either the scrubber or the WESP operating parameters. This is a violation of 40 CFR 63.7530(b) and Table 8 of the subpart.

Though the boilers have an HCl limit, the scrubber is not considered a wet acid gas scrubber, by definition as stated in a footnote for Table 4 of the subpart, because no alkaline slurry or solution is used. Therefore, pH measurement and monitoring is irrelevant. The scrubber parameters established for PM and Hg as stated above would also be those that apply to HCl.

The boilers do not have a control device for CO emissions, therefore, control requirements are not listed in Table 4 of the subpart. Rather it discusses oxygen analyzer systems. Table 4 does discuss units equipped with oxygen trim and refers to 40 CFR 63.7525(a). Since MSC has chosen to equip the boilers with an oxygen trim system rather than install a continuous emission monitoring system, 63.7525(a) becomes relevant. 40 CR 63.7525(a) (7) requires the oxygen trim system be operated with the oxygen level set no lower than the lowest hourly average oxygen concentration measured during the most recent CO performance test as the operating limit for oxygen according to Table 7. The presence of oxygen in the flue gases from boilers 2 and 3 was being tracked during CO testing however, it's subsequent use as an operating parameter via the oxygen trim system could not be confirmed. This is a violation of 40 CR 63.7525(a) (7)

Lastly, it should be noted the operational limits / parameters are subject to change based on the results and operational parameters achieved during periodic performance testing.

#### **FGSTOKERBLRS-5D (tune-ups)**

For boilers having a heat input capacity greater than 10 MMBTU/hr, the Boiler MACT 40 CFR 63.7540 (a) (10) also requires an annual tune-up (13 months) while burning the type of fuel that routinely provided the majority of the heat input over the 12 months prior to the tune-up. The tune-ups were indeed performed with the boiler burning coal. However, it should be noted that tune-ups prior to those conducted in February 2021 were conducted using screened coal as opposed to the day to day use of coal "as received." 40 CFR 63.7540 (a) (12) allows units with an oxygen trim system to have a tune-up once every five years. Boiler two was tuned February 1,

2021 while boiler three was tuned the following day. Previous tune-ups of the boilers were performed on February 12, 2020. The most recent tune-ups occurred the week of February 12, 2022 during which screened coal was used again rather than "as received" which is fired during typical operation. The intervals between tune-ups required by the Boiler MACT were met.

#### **FGSTOKERBLRS-5D (stack testing)**

MSC has chosen to use stack / performance testing of its coal fired boilers as its means to demonstrate compliance with the Boiler MACT. Stack testing under the boiler MACT allows a variation in time frames depending upon the results of prior testing. If testing is performed and is below limits, but is above 75 % of the limit, then testing must occur again within one year. However, if test results are below 75% of limits, for two consecutive years of testing, then additional testing can be postponed up to 37 months from the date of the last test.

Hg and HCl testing resulted in two consecutive years where results were less than 75 % of limits. The second successful test occurred February 8 and 9, 2017. This allowed the next testing to occur within 37 months. The next test was performed on February 18, 2020 for HCl and February 19 and 20, 2020 for Hg. Test results were below 75 % of limits once again. The next testing would be required within the following 37 months of the last testing.

PM and CO testing experienced more difficulty achieving results below 75 % of limits over the years. However, two consecutive years of successful testing were completed as of January 17, 2019. This allowed the next testing to occur within 37 months. No testing was conducted in either 2020 or 2021. Testing had still not happened as of February 17, 2022 which would have been the end of the 37 month period in which to test. This is a violation of stack testing requirements found in 40 CFR 63.7515 (b). The site must now conduct annual testing. When / if two consecutive years have results less than 75 % of limits, only at that point would the 37 month interval between tests be allowed again.

#### **FGSTOKERBLRS-5D (reporting)**

Specific compliance reports must be submitted on a schedule. The items to be reported are specified per 40 CFR 63.7550. At the time of the inspection Meaghan and I discussed the reports that had been submitted in the past by MSC. She asked if they should go by the conditions listed in the ROP or the Boiler MACT requirements. She was told to go by the actual Boiler MACT requirements as ultimately that is what is required by the Federal regulations.

The reports are deficient. Examples include, but are not limited to, the lack of operating parameter limitations, instances of startup or shutdown, etc. This is a violation of 40 CFR 63.7550.

MSC has not met the requirements to provide notification of compliance status reports within 60 days after the completion of a relevant compliance demonstration activity. Examples include completion of performance tests and establishment of new operating limits. This is a violation of 40 CFR 63.9(h).

Deficient reporting by MSC substantially interferes with enforcement of requirements and a determination of the source's compliance.

### **FGSTOKERBLRS-5D (initial compliance)**

No official establishment of initial operating parameters could be found due to the apparent lack of meeting initial compliance requirements found in 40 CFR 63.7510. In addition to performance testing, the citation requires establishing operating limits, etc. to demonstrate continuous compliance. This is a violation of 40 CFR 63.7510 (a) (2).

### **FG-NATGASBOILERS-5D**

Two natural gas fired boilers are contained in the ROP flexible group for Boiler MACT requirements. The CE package boiler is a 100 MMBTU/hr unit while the summer boiler is only a 7 MMBTU/hr unit. The Boiler MACT is found in 40 CFR Part 63 subpart DDDDD.

The basic requirements for gas fired boilers consist of conducting periodic tune-ups. Boilers greater than 5 and less than 10 MMBTU/hr are to have a tune-up every two years (25 months). An annual tune-up (13 months) is required for boilers greater than 10 MMBTU/hr. Per reports submitted by the company to the US Environmental Protection Agency (EPA), the summer boiler was last tuned on March 17, 2020. The next tune-up would be required within 25 months. Multiple attempts were made to get documentation of the date of the latest tune-up. MSC eventually provided a copy of the tune-up that was performed March 17, 2020. The boiler was due for the next tune-up to occur by April 17, 2022 but it was not conducted. The lack of a timely tune-up results in a violation of 40 CFR 63.7515(d). The CE boiler was also tuned on March 17, 2020 with the next tune-up required within 13 months. However, the CE boiler was last tuned August 19, 2021 which is 18 months and results in a violation of 40 CFR 63.7515(d).

### **OTHER PROCESSES**

Pellet production via pellet mills and pellet cooling, was discussed in the prior inspection report. Likewise, a discussion of process equipment MSC has determined to be exempt from permitting via rule 285 (2) (DD) occurred in the previous inspection. The facility does have a fugitive dust plan in place the implementation of which was checked during the last inspection.

One change should be noted. The sugar cooler used to use air as a means to cool. A new Solex sugar cooler has been installed and air is not the cooling agent. The Solex uses plate to fluid technology to cool, much like a radiator in an automobile. Therefore, emissions are not created by the new unit. However, the old unit was not removed, but by-passed, when the new one was installed. Adam confirmed the old unit was actually used when they had a difficulty with the new unit. When asked if there was any plan to remove the old unit, Kevin confirmed there wasn't. He stated if there was a crunch for floor space in the area then it would be removed. Kevin added, at this point, it isn't hurting anything and actually was beneficial to have as a backup.



**SUMMARY**

The facility was found to be in non-compliance based primarily on extensive investigative work conducted after the inspection. A violation notice will be sent for the violations mentioned above and summarized as follows.

Pulp dryers 1 and 2	FG-PULPDRYERS V. 2	Stack testing not conducted on dryers 1 and 2. Supposed to be done within 5 years from last test
Pulp dryer 3	EU-DRYER#3 V. 2	Stack testing not conducted. Supposed to be done within 5 years from last test
Coal fired boilers 2 and 3	FG-STOKERBLRS-5D V. 8  40 CFR63.7515 (b)	Stack testing for filterable PM and CO not conducted. Supposed to be done within 37 months from last test
Coal fired boilers 2 and 3	40 CFR 63.17510 (a)(2)	Operating limits were not established for initial compliance purposes
Coal fired boilers 2 and 3	40 CFR 63.7520 and Subpart DDDDD Appendix Table 7	Operating limits for oxygen level (for O2 trim system), boiler operating load, wet scrubber, and electrostatic precipitator were not established in conjunction with stack testing
Coal fired boilers 2 and 3	40 CFR 63.7520 and Subpart DDDDD Appendix Table 8	Operating limits not used for boiler operating load, wet scrubber, and electrostatic precipitator

Coal fired boilers 2 and 3	40 CFR 63.7525 (a)(7)	Oxygen level not used as an operating parameter for O2 trim system
Coal fired boilers 2 and 3	FG-STOKERBLRS-5D VII 19. C.  40 CFR 63.7550 (c) (3)	Operating parameter limitations, startups shutdowns etc. not included in compliance reports
Coal fired boilers 2 and 3	40 CFR 63.9 (h)	Notification of compliance status not provided
Summer boiler	FG-NATGASBOILERS-5D III. 4. b.  40 CFR 63.7515 (d)	Tune-up not conducted. Supposed to be within 25 months of last one
CE package boiler	FG-NATGASBOILERS-5D III. 4. c.  40 CFR 63.7515 (d)	Tune-up conducted past 13 months of last one

NAME B. ZittkappDATE 9-9-22SUPERVISOR C. Hare