

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

A649756789

FACILITY: Meridian Brick		SRN / ID: A6497
LOCATION: 3820 E. Serr Rd., CORUNNA		DISTRICT: Lansing
CITY: CORUNNA		COUNTY: SHIAWASSEE
CONTACT: Jerry Greger , Plant Manager		ACTIVITY DATE: 01/27/2021
STAFF: Michelle Luplow	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MAJOR
SUBJECT: Virtual, announced compliance inspection to determine compliance with MI-ROP-A6497-2015 and PTI 170-18		
RESOLVED COMPLAINTS:		

Inspected by: Michelle Luplow

Personnel Present: Jerry Greger (jerry.greger@meridianbrick.com), Plant Manager

Bill Stevens, Kiln Operator (bill.stevens@meridianbrick.com), Supervisor

Purpose: Conduct an announced, scheduled, virtual partial compliance evaluation (PCE) inspection by determining compliance with Meridian Brick's ROP, MI-ROP-A6497-2015 and recently issued PTI 170-18 (for the replacement of the whirl wet particulate control device with a baghouse) and issuance of HAPs opt-out conditions. This activity was conducted as part of a full compliance evaluation (FCE), and was also conducted virtually via approval from EPA, as the result of COVID-19.

Safety PPE: During in-person visits, high visibility vests, hard hats, and steel-toed boots are required to be worn. Meridian Brick employees wear respirators when working in the crushing building.

Facility Background/Regulatory Overview: Meridian Brick, according to J. Greger, is the only brick manufacturer in Michigan and is a supplier of exterior brick primarily for residential construction and primarily purchased by Detroit distributors. This facility does not produce refractory brick. Meridian Brick was formerly Forterra Brick up until May 2017, and prior to that, Hanson Brick. Bricks are manufactured from shale mined from Meridian's shale mining pit, located adjacent and northeast of Meridian Brick's plant operations. A primary crusher crushes the raw shale into an acceptable size at the grinding plant. The size is then further reduced by grinding the material down to an acceptable mesh size for the pug mixers and brick extruders. Extruded bricks are placed into a drying oven to remove moisture prior to being fired in the natural gas-fired kilns.

Meridian Brick is a major source of SO₂ and PM₁₀. Sulfur from the shale is released as SO₂ upon firing the brick in the kilns. The exhaust stream from the kilns is injected with hydrated lime to neutralize sulfuric acid, in addition to neutralizing hydrofluoric acid (HF) prior to being exhausted through a baghouse to control the lime particulate.

Meridian Brick applied for an opt-out permit for HAPs (PTI 170-18) which was issued in April 2019. In 2010, per request by the EPA, Meridian Brick conducted stack testing to determine HF emissions as part of the input process for developing the MACT Subpart JJJJJ for Brick and Structural Clay Products Manufacturing (BSCP), published on October 25, 2015 (prior to this date, the subpart was vacated). D. McKeown, Meridian's Regional Environmental Manager, provided me with the stack test results during a previous inspection which demonstrated that Meridian Brick was a major source of the HAP, HF (a potential to emit greater than 10 tons per year), and thus resulted in Meridian Brick becoming subject to the MACT Subpart JJJJJJ. In June 2018, a stack test was conducted on EUKILN01 (EUKILN02 was not able to be tested due to the roof collapsing) to determine compliance with the MACT Subpart JJJJJJ, in addition to gathering data that would demonstrate that HAP

potential emissions are below major source thresholds. Results contained emissions of the following elements and compounds: hydrochloric acid (HCl), chlorine (Cl₂), HF, mercury (Hg), antimony (Sb), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), lead (Pb), manganese (Mn), nickel (Ni), and selenium (Se). The data showed that neither the individual HAPs nor aggregate HAPs potential to emit exceeded the 10 tpy and 25 tpy major source thresholds, if operating at maximum routine conditions. The MACT Subpart JJJJJJ required testing to be conducted on EUKILN02 by December 26, 2018 or obtain an opt-out permit before June 25, 2019. By obtaining the opt-out permit for HAPs, Meridian Brick is no longer subject to the MACT Subpart JJJJJJ; however, they do so at their own risk of enforcement action, as the MACT "Once in, always in" policy recission is being challenged in court.

In addition to obtaining the HAPs opt-out, PTI 170-18 also allows for the replacement of the whirlwet particulate control device with a fabric filter baghouse, which is associated with FGPLANT1.

J. Greger said that EUKILN02's roof has spots that need to be replaced. There are currently no plans to fix EUKILN02's roof because there is not enough demand to justify the need to operate EUKILN02. During the 2017 inspection there was enough production to operate both kilns; EUKILN02 was operating during the 2017 inspection, and EUKILN01 had been brought back into production in February 2017 after its roof had been caved in. A reconstruction analysis will need to be submitted to demonstrate that rebuilding EUKILN02's roof is exempt when and if Meridian Brick decides to do so.

Meridian Brick's ROP renewal application is currently in-house and under technical review. The company is being in the process of being sold and expected date for the ownership change is April or May of 2021.

Inspection: Due to COVID-19 safety concerns and technological feasibility, the inspection was conducted virtually through the iPhone FaceTime app on January 27, 2021, with a phone conversation on January 20, 2021 to discuss other compliance-relevant information that was not necessary to address while conducting the virtual inspection.

After addressing technical difficulties with the FaceTime app, we began the inspection at approximately 11:00 a.m. on January 27, 2021. J. Greger and B. Stevens were both present onsite for the inspection.

J. Greger and B. Stevens provided me with a tour of the facility through FaceTime. J. Greger explained that many of the historic buildings that are no longer being used for production were torn down or reutilized as storage space.

The current shale mine that Meridian Brick uses for brick production is regulated under EGLE's Water Resources Division for water discharge. There are plans in place to start a new shale pit on the south side of Serr Road (with a life expectancy of 20 years). Meridian Brick had, at one point, considered rerouting plant traffic to Wren Road, which is east of the facility entrance. This would have included closing Serr Road access just west of the plant, and also would have included closing Tile Plant Road (to the north of the plant) just south of M-21/Corunna Road. J. Greger confirmed that these road closures are no longer scheduled to occur.

Mining in the spring, summer, and fall months is conducted 5 days per week, stockpiling as much as possible to have enough shale to process during the winter months. J. Greger said winter month mining would result in ice within the shale which causes processing issues. During this inspection, J. Greger confirmed that they were not

currently mining shale but did mine shale up through the end of December 2020. He said that mining is generally conducted between the spring and late fall but the dates mining occurs is largely weather-dependent. For example, they will not mine if there is a wet spring because they do not want to process wet shale. He also explained that they were not mining June - November 2020 due to loss of mining equipment. He explained that Meridian Brick now contracts the mining work out to Fusion.

Meridian Brick currently operates one shift (first shift), Monday – Friday, 6 a.m. – 2 p.m. During previous years, second shift was also operating Monday – Friday, 2 p.m. – 10 p.m.

EUCRUSHING

EUCRUSHING operations were occurring during the inspection. This emission unit is comprised of NSPS Subpart OOO-subject process equipment and includes crushing equipment used to decrease the size of the mined shale; the equipment used to handle and transport the crushed material; and control methods. The crushing equipment and the grinding plant feed belt were operating during the inspection.

The primary crusher is located underground and the grinding plant feed belt is an enclosed conveyor located on the outside of the building. The secondary crusher located within the grinding plant building is equipped with a baghouse which exhausts to the in-plant environment. All equipment except for the primary crusher and grinding plant feed belt are enclosed within the grinding plant building.

See Table 1 for a list of equipment, control devices, opacity limits, and visible emissions noted during the inspection. Visible emission observations for all equipment located within the grinding plant building were determined by viewing the outside of the grinding plant from all angles (per FaceTime) to ensure that opacity was not emitting from any portion of the building.

J. Greger said that they generally crush the mined shale 5 hours per day during first shift (6 a.m. – 11 a.m.), 5 days per week, all year long in order to provide the materials necessary to produce brick. He said as long as the kilns are operating they will need to produce and process shale. He said there have been no new installations to EUCRUSHING and there have also been no modifications or changes to the existing equipment.

J. Greger said that respirable silica dust is a hazard within this building and Meridian Brick employees are required to be fit-tested for respirators per MIOSHA. J. Greger said they've also installed a drop curtain, as well as water spray bars on the crushing equipment to further minimize exposure to Meridian Brick's employees.

There are currently no Testing/Sampling or Stack/Vent Restriction requirements for EUCRUSHING.

Emission Limits & Monitoring/Recordkeeping

Opacity is limited to 15% for the primary crusher and 10% for the grinding plant feed belt. The remaining equipment is located within the crushing plant building and has an opacity limit of 0% from the building (i.e. there should be no visible emissions (VEs) emanating from the crushing plant building). Meridian Brick is required to perform and record the results of a visible emission observation during routine operating conditions at least once per calendar month on the primary crusher, grinding plant feed belt and the grinding plant building. J. Greger did not go inside the crushing building, but I did ask that he show me from the door that the equipment was

operating, which we verified while on FaceTime. During the inspection, as noted in Table 1, I saw no signs of opacity from the crushing plant building, the grinding plant feed belt, nor the primary crusher.

As I requested, J. Greger provided me with January 2020 – December 2020 monthly VE records for these pieces of equipment. All records were provided and reviewed; records indicate that there were no VE's seen from the primary crusher, grinding plant feed belt, or the grinding plant building on the days that the VE observations were taken. J. Greger clarified that "Reading 1," designated at the bottom of the VE forms, is for the grinding plant feed belt, while readings 2 and 3 are for the grinding plant building. See attached for a snapshot from the provided records.

Table 1. EUCRUSHING equipment (Appendix 9 of ROP)

Equipment Description	ID Number	Opacity Limit (Percent)	Control Device	Visible Emissions during inspection
Primary Crusher	462-76	15	N/A - Located underground	None
Grinding Plant Feed Belt	No. 1	10	Equipment enclosure	None
Stedman Impact grinder	SGR-1	0	Enclosed in Building	None
Stedman Grinder exit belt	No. 7	0	Enclosed in Building	None
Elevator belt to screens	No. 8	0	Enclosed in Building	None
Screen feed/plow belt	No. 9	0	Enclosed in Building	None
Finished belt under screens	No. 10	0	Enclosed in Building	None
Finished short cross conveyor	No. 11	0	Enclosed in Building	None
First finished elevator conveyor	No. 12	0	Enclosed in Building	None
Second finished elevator conveyor	No. 13	0	Enclosed in Building	None
Finished shuttle car conveyor	No. 14	0	Enclosed in Building	None

Equipment Description	ID Number	Opacity Limit (Percent)	Control Device	Visible Emissions during inspection
Coarse return belt	No. 4	0	Enclosed in Building	None
Coarse return elevator belt	No. 5	0	Enclosed in Building	None
Coarse return short feed belt	No. 6	0	Enclosed in Building	None
Reclaimer system	REC-1	0	Enclosed in Building	None
Reclaimer conveyor belt	Belt A	0	Enclosed in Building	None
Belt to splitting tower	Belt B	0	Enclosed in Building	None
Leahy screen #1	Screen 1	0	Enclosed in Building	None
Leahy screen #2	Screen 2	0	Enclosed in Building	None
Leahy screen #3	Screen 3	0	Enclosed in Building	None
Leahy screen #4	Screen 4	0	Enclosed in Building	None
Simplicity Screen #5	Screen 5	0	Enclosed in Building	None
Simplicity Screen #6	Screen 6	0	Enclosed in Building	None

Material Limits & Monitoring/Recordkeeping

Meridian Brick has a material limit of 225,000 tons of material throughput in EUCRUSHING per 12-month rolling time period. As requested, J. Greger provided me with 12-month rolling records for January – December 2020. The total tons processed during this 12-month rolling period was 69,793 tons (see attached records), within the specific limits of the ROP.

Design/Equipment Parameters

Meridian is required to label all equipment using company ID numbers according to the ID numbers in Appendix 9 in the ROP and within Table 1. The equipment was verified that it was ID'ed during a previous inspection, the ID's are located on the belt guards.

Process/Operational Restrictions

Meridian Brick must not operate EUCRUSHING, EUSTORAGE, or EUTRUCKTRAFFIC unless the Fugitive Dust Control Plan in Appendix 10 is implemented and maintained:

Fugitive Dust Control Plan:

Site Roadways/Plant Yard

Dust on the site roadways and the plant yard are required to be controlled by water, calcium chloride, or other acceptable and approved fugitive dust control compounds. Records of all dust suppression activities are required to be kept.

During the inspection, B. Stevens virtually showed me the roads throughout the plant yard and the road down to the shale mine via J. Greger driving the truck down through these areas. Because of the recent snow events, the roads were snow-covered and therefore, no fugitive dust was observed on paved or unpaved roadways. J. Greger said that the snowpack stays on the unpaved roads until it melts and will generally keep the dust down to a minimum during the winter.

The Fugitive Dust Control Plan also requires that all paved roadways and paved plant yards be swept between dust control applications, as needed, and any spillage on roads shall be cleaned up immediately. During past inspections I noted many piles of finely crushed shale pushed off to the sides of the plant yard near the buildings and other process equipment. Since that time (2017 onward), J. Greger has ensured that all piles were removed and the paved portions of the plant yard were swept. During this inspection, we noted that Meridian Brick has kept the paved portions of their roads and yards well-maintained: there were no piles of material; paved portions of the road were snow-covered. J. Greger said that any piles created from the outdoor conveyors are cleaned up every other day and that these sweepings are put back into the material stock piles. Additionally, J. Greger said they installed new scrapers on the belts. He explained that the material being conveyed is wet and likes to stick to the belt, so the scrapers ensure that the wet material is removed to reduce the amount of material that falls off the conveyors to the ground.

As of December 2018, J. Greger said they have in their possession 3 vacuum sweeper trucks to continue to maintain these paved portions of their facility. He showed me one of the units onsite. The vacuum sweepers are used once per week on paved portions of the plant yard and paved plant roads, depending on the weather. J. Greger said they will not use the vacuum sweeper when it's raining.

During the non-winter months J. Greger said Meridian Brick uses calcium chloride on the unpaved roads and unpaved plant yard twice per year at a minimum, and that it is working so well they don't need to use their 3,000-gallon water truck to keep the dust down in these areas (although they still maintain this truck onsite).

Although not required by the fugitive dust control plan, 10 mph speed limits signs are posted.

Plant

Drop distances between transfer points must be kept at a minimum to reduce fugitive dust from transfer operations. There were not transfer operations being conducted during the virtual site visit to verify drop distances were being minimized.

Storage Piles (includes verification of compliance with EUSTORAGE conditions for open area storage piles)

Stockpiling of all shale is to be performed to minimize drop distance and control potential dust problems and the storage piles shall be watered as needed to meet the opacity limit of 5%. Stockpiling of the nonmetallic minerals occurs behind the facility. I did not witness the process of stockpiling during the virtual site visit and therefore could not determine compliance with the requirement to conduct stockpiling with a minimum drop distance; however, the storage piles were covered with snow, and those piles being harvested for crushing appeared to be saturated with moisture; I saw no signs of fugitive dust from any of the storage piles during the inspection. **See attached photo.**

J. Greger said that they've never had to water the storage piles because there is enough water in the material to keep the piles from releasing fugitive dust.

Truck Traffic

Vehicles are required to be loaded to prevent their contents from dropping, leaking, blowing or otherwise escaping. We observed no truck loading during the inspection.

Based on the condition of the unpaved and paved roads and yard during the inspection, it appears that Meridian Brick is maintaining these areas according to their Fugitive Dust Control Plan, and it is my professional judgment that a review of their dust suppressant application records was not necessary.

EUTRUCKTRAFFIC

This emission unit addresses all truck traffic related to delivery of material products to customers, traffic from the quarry pit to the processing area, loader traffic, storage pile handling and loading delivery trucks.

There are currently no Material Limits, Design/Equipment Parameters, Testing/Sampling, or Stack/Vent Restrictions for EUTRUCKTRAFFIC.

Emission Limits & Monitoring/Recordkeeping

Opacity from EUTRUCKTRAFFIC operations is limited to 5% opacity, based on a 6-minute average. Records of monthly uncertified visible emission readings are required to be kept. At any time that visible emissions are observed, certified Method 9 readings are required to be taken. J. Greger keeps records of "Monthly Truck Traffic Visible Emissions" readings, and provided me with these records for January – December 2020 (see attached), as requested. These records include the required VE readings from the Pit Road, Plant road/yard, and storage piles. All monthly recorded readings were 0% opacity.

During the inspection I saw no signs of opacity from any of the processes covered under EUTRUCKTRAFFIC.

Process/Operational Restrictions

The fugitive dust plan in Appendix 10 is required to be implemented in maintained in order to operate EUTRUCKTRAFFIC. Evaluation that Meridian Brick is meeting this requirement is found under the EUCRUSHING discussion.

EUSTORAGE

This emission unit covers open area storage piles of various material sizes and product types.

There are currently no Material Limits, Design/Equipment Parameters, Testing/Sampling, or Stack/Vent Restrictions for EUSTORAGE.

Emission Limits & Monitoring/Recordkeeping

Opacity from EUSTORAGE operations is limited to 5% opacity, based on a 6-minute average. Records of monthly uncertified visible emission readings are required to be kept. At any time that visible emissions are observed, certified Method 9 readings are required to be taken. J. Greger keeps records of "Monthly Truck Traffic Visible Emissions" readings, and provided me with these records for January – December 2020 (see attached), as requested. These records include the required VE readings from the storage piles. All monthly recorded readings were 0% opacity.

During the inspection I saw no signs of opacity from any of the storage piles.

Process/Operational Restrictions

The fugitive dust plan in Appendix 10 is required to be implemented in maintained in order to operate EUSTORAGE. Evaluation that Meridian Brick is meeting this requirement is found under the EUCRUSHING discussion.

Meridian Brick is in compliance with all conditions under EUCRUSHING, EUTRUCKTRAFFIC and EUSTORAGE at this time.

EUPUG-90

The EUPUG-90 is equipment used for brick extrusion and to add color and texture to the brick. A pulse-jet baghouse is equipped to the mixer/extruder: 4 baghouse compartments with 4 collection bins. The exhaust stack from the dust collector is a downward sloping gooseneck, exhausting approximately 5' above ground level. J. Greger pointed out that they have welded down the tops of the canisters collecting the EUPUG-90 particulate.

This unit was operating during the inspection.

There are currently no Material Limits, Design/Equipment Parameters, Testing/Sampling, or Stack/Vent Restrictions for EUPUG-90.

Emission Limits, Process/Operational Restrictions & Monitoring/Recordkeeping

Particulate matter is limited to 0.10 lbs/1,000 lbs exhaust gases from the baghouse. There are no visible emission limits, but there is a requirement to perform 6-minute uncertified visible emission observations at least once per calendar month and to record these observations. If visible emissions are seen, certified visible emission readings are required to be taken. If there are visible emissions present, this is an indication that the 0.10 lbs/1,000 lbs exhaust gases limit is not being met, as well as the baghouse not being operated properly.

J. Greger showed me the dust collector for EUPUG-90. I did not observe any VE's emitting from the gooseneck exhaust stack during the inspection.

I requested monthly records for January – December 2020 (see attached). All records indicate that there were no visible emissions seen during any of the months during this period.

Semi-annual records of repairs and maintenance on the EUPUG-90 baghouse collector are required based on Meridian Brick's Preventative Maintenance Plan (PMP) (version 4-10-20). Although the ROP for EUPUG-90 does not require that records of the inspections of the baghouse itself be kept, only maintenance and repairs, J. Greger showed me that they do document their semi-annual maintenance inspections on EUPUG-90's baghouse. The most recent semi-annual inspection was conducted in August 2020 (see attached). The record indicates that the baghouse was in proper operating order: grease was added to the motor, the bags were checked for leaks, and the side wall integrity had moderate rust (which may need to be noted in a future inspection to ensure there is no leakage of particulate from the baghouse, if the unit becomes rusted out.

Meridian Brick is in compliance with all conditions for EUPUG-90 at this time.

FGKILNS (KILN01, KILN02): MI-ROP-A6497-2015 and PTI 170-18

FGKILNS is comprised of two parallel natural gas-fired tunnel kilns. Kiln 1 (EUKILN01) was operating during the inspection. Kiln 1 was brought back into production in February 2017. Prior to this, only Kiln 2 (EUKILN02) had been operating because Kiln 1 had to be repaired (its ceiling had caved in) and after repairs there wasn't enough demand to operate the second kiln. Kiln 2 is currently not operational, as described in the Facility Background section of this report.

Bricks are first sent through a 610°F dryer to remove moisture, which prevents the bricks from exploding in the kiln. After being dried, they are called "dry bricks," while bricks post-kiln are called "fired bricks" (as referenced in Appendices 5 and 7 of the ROP).

Each kiln is equipped with a baghouse (Goretex bags) and dry lime injection. The lime injection neutralizes the acids from the process before it is collected in the baghouse. The gases are diverted from the kilns to a tower where the hydrated lime is injected into the gas stream, from here it is sent to a cooling tower where the gas is cooled via air infiltration to 450F, a temperature at which the Goretex bags can withstand.

During the June 2018 stack test, Tom Gasloli (TPU) and I observed that the small door on the side of the cooling tower tunnel was open halfway, which allows ambient air to flow through the cooling tower, into the baghouse, and out the stack. T. Gasloli and I discussed that this door should never be open greater than halfway at any time, as this would allow more air to flow through the stack and change emission rates. Maximum routine operations would therefore include keeping the door a maximum of halfway open. During the inspection the door was completely closed (I observed B. Stevens taking a photo of this for me during the virtual inspection and is attached), and therefore would be considered part of maximum routine conditions.

J. Greger said that the cooling tower used to use water to cool the gas stream, but not any longer, because the Goretex bags can withstand a higher heat. He said that Meridian Brick only has to bleed ambient air into the tower to cool down the process air to an acceptable temperature before it enters the baghouse. J. Greger said that the cooling water would erode the inside of the tower, which then required more inspections and maintenance to be done. Without the water there is less of a need for quarterly inspections of the tower. It is AQD's position, therefore, that semi-annual inspections of the cooling tower are acceptable.

Sulfur Dioxide Emission Limits, Process/Operational Restrictions, Testing/Sampling & Monitoring/Recordkeeping

SO₂ Emissions/Calculations

To calculate SO₂ emissions, Meridian Brick is required to sample one dry brick and one fired brick on a monthly basis and send to a lab to be analyzed for sulfur content (Appendix 5 of the ROP). The difference in the sulfur content from the dry brick and the fired brick is used to determine the percent sulfur released. The percent sulfur released is then used in the calculations contained in Appendix 7 for monthly SO₂ emission calculations.

Meridian Brick keeps an electronic spreadsheet that is used to perform all calculations outlined in Appendix 7. D. McKeown said that Meridian Brick produces standard-sized bricks and larger. Because of the variance in brick size, Meridian uses "brick equivalents" to calculate the brick tonnage using the brick weight determined during the monthly brick sulfur content test, which is then used in the Appendix 7 SO₂ emissions formula.

J. Greger enters the number of days per month the kilns were run; the average number of cars sent through the kiln; the monthly brick equivalents sent through the kiln; the weight of each dry and burnt brick that is tested; and the % sulfur from each dry and burnt brick tested into the spreadsheet. From there the spreadsheet calculates the SO₂ emissions on an hourly and calendar year basis and the appropriate lime feed rates necessary for control. The lime feed rate will also depend on the number of cars sent through the kiln per day (the push rate). It is important to note that the equation in the ROP to calculate daily SO₂ emissions will calculate tons per day, without a conversion to pounds per day. Meridian Brick's spreadsheet addresses this issue in their calculations.

Permitted SO₂ emission limits from both kilns combined is 241 lb/hr (averaged over a calendar month) and 650 tons/calendar year. SO₂ emissions are required to be determined by the methods and calculations outlined in Appendix 5 and Appendix 7 of the ROP (which Meridian Brick does, as described above), in addition to stack testing within 5 years of the previous stack test.

Average hourly SO₂ emissions and ton/calendar year SO₂ emissions records were obtained and reviewed for calendar year 2020 (see attached). The highest hourly SO₂ emissions from both kilns combined was 53 lb/hr in January 2020, with the second highest at 51 lb/hr in February 2020.

Annual SO₂ emissions from both kilns combined were reviewed for calendar years 2017 – 2020 to determine compliance with the 650 tons per calendar year limit. The highest calendar year SO₂ tonnage was 456 tons in 2017. The 2020 records show a calendar year SO₂ emission rate of 126 tons. Meridian Brick appears to be in compliance with their calendar year SO₂ limits at this time.

The last stack test was conducted on June 21, 2018. Stack Test results from the 2018 test showed that Kiln 1 produced an SO₂ emission rate of 92.9 lb/hr. Extrapolating this data to 2 kilns, total SO₂ hourly emission rate would be 185.8 lbs/hr, demonstrating compliance with the 241 lb/hr emission limit.

Additionally, PM emission rates were also tested. Each kiln is limited to 0.10 lbs PM/1,000 lbs exhaust gas. Stack test results show an emission rate of 0.0038 lbs PM/1,000 lbs exhaust gas, demonstrating compliance with the limit.

Dry hydrated lime feed rate calculations

The dry hydrated lime is used to control an assumed 11% of SO₂ emissions. Dry hydrated lime injection rates are determined using Appendix 7 calculations, and the lime feed rate is required to be monitored and recorded on a continuous basis. Meridian Brick's spreadsheets calculate lime feed rate on a monthly basis. The lime feed rate calculated in a particular month is the lime feed rate that is used for the following month's lime feed control. For example, the calculated December 2020 hydrated lime feed rate is 37.63 lbs/hr. This rate will be used for the January 2021 operations for controlling SO₂. During the inspection, B. Stevens showed me Meridian Brick's process for determining the lime feed rate: B. Stevens zeros out a tray on a scale, then uses the tray to capture lime for 30 seconds. The tray is then placed back on the scale to gather a grams per 30-second rate. During the inspection a total of 0.222 g lime was collected. B. Stevens said he then multiplies this number by 2 (to get an amount for 1 minute) and then by 60 (to get an amount for one hour) and then divides by 453.6 (to convert from grams to pounds). The lime feed rate that Meridian Brick was running at during the inspection was 58.7 lbs/hour, which is more than what was required based on the lime feed rate calculation of 37.63 lb/hr.

The lb/hr lime feed rate is typically correlated with a dial number on the lime feed rate monitoring system. For example, "40" on the lime feed rate monitor during the inspection would equate to 66 lb/hr. The feed rate is therefore monitored continuously; however it is not monitored in any type of units nor is it recorded continuously (every 15 minutes). To address these issues, I asked Meridian Brick to check the lime feed rate once every charge (approximately every 2 hours) and record this rate. By doing this, Meridian Brick ensures that the lime feed is maintained at the level that is required.

Process/Operational Restrictions & Monitoring/Recordkeeping

Preventative Maintenance Plan

The kilns can only be operated if a Preventative Maintenance Program (PMP) has been implemented and is maintained. Meridian Brick's Preventative Maintenance Plan was originally drafted May 1, 2003. Within the 2020 ROP renewal application, Meridian Brick included an updated version of their PMP in the ROP renewal application. The new PMP is dated April 10, 2020. I will be reviewing this plan and have follow-up conversations

with the company regarding the clarity and content of the PMP/MAP as there are deficiencies that need to be addressed.

The PMP contains items to be monitored, corrective actions that can be taken in the event of abnormal operation, and what should be inspected and how often it should be inspected (daily, weekly, quarterly, semi-annually and bi-annually).

Baghouse Temperature and Pressure Drop

Kilns must also not be operated unless the temperature in each fabric filter collector is maintained 15°F below the bag degradation temperature, and an alarm must sound if the temperature in the baghouse gets within 25°F of the bag degradation temperature, or the set point if it is lower than this range. Baghouse temperature is required to be continuously monitored and recorded. The Goretex bag degradation temperature is 500°F, therefore the temperature must be maintained below 485°F, and an alarm must sound if the temperature reaches 475°F. B. Stevens said the exhaust from the kiln is sent through the gas cooling tower to drop the temperature of the gas before the gas enters the fabric filters. He said the cooling tower alarm is set at 450°F and that if the cooling tower temperature reaches 450°F the kiln operator has 30 minutes to bring the temperature down before the baghouse alarm sounds. B. Stevens said that if the temperature in the fabric filter collectors reaches 475°F, another alarm sounds, and the kiln exhaust and kiln shut down automatically, thus Meridian Brick is operating the kilns more than 15°F below the bag degradation temperature and is in compliance with this condition. Temperature is continuously monitored and recorded digitally. J. Greger provided me with these records for January 1-11, 2020, and June 1-11, 2020. These records (see attached) indicate that the baghouse temperature was maintained at or below 400°F, which is considered an acceptable operating temperature based on the degradation temperature of the bags.

The kilns must not be operated if the pressure drop across the kiln fabric filter is less than 2 inches H₂O or greater than 6 inches H₂O and the pressure drop should be continuously monitored and recorded. A digital display (Meridian Brick refers to it as the “Pollution Control Device”) continuously digitally monitors the pressure drop across the fabric filter, with the acceptable operating range labeled (per request by B. Culham, previous AQD inspector). B. Stevens said an alarm should sound if the pressure drop exceeds 6 inches H₂O. According to records provided by the company, the pressure drop is recorded by hand once every charge. It is also continuously digitally recorded. I reviewed the hand-written pressure drop records for January 1-11, 2020, and June 1-11, 2020, and verified that all readings were within the 2-6” H₂O operating range (see attached).

Table 2 contains kiln parameters recorded during the virtual inspection. All parameters during the inspection were within the permitted operating ranges.

Table 2. Operating parameter values during inspection

	2-6” H ₂ O ?P	Temperature (°F)	Lime feed rate	Cooling Tower Temp (°F)	Bag Degradation Temp (°F)
Kiln 1	5.23	367	58.7 lb/hr (controller speed at 7.56)	390	475 (alarm), 500 (bag deg temp)
Kiln 2	NA	NA	NA	NA	

					475 (alarm), 500 (bag deg temp)
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Based on the limit of 0.10 lb/1000 lbs exhaust gas PM limit, there should be no signs of opacity from FGKILNS operations. Records of monthly uncertified visible emission readings are required to be kept. At any time that visible emissions are observed, certified Method 9 readings are required to be taken. J. Greger keeps records of "Monthly Kiln Stacks Visible Emissions" readings, and provided me with these records for January – December, 2020 (see attached). All monthly recorded readings were 0% opacity.

During the inspection, J. Greger showed me the kiln stacks. I saw no signs of opacity from FGKILNS.

FGPLANT1 (EUPUG-30, EUPUG-50, EUSMALLDRYER, EUSMALLMIXER)

The FGPLANT1 is a plant used to make "thin" bricks and consists of EUPUG-30 (an extruder that creates straight bricks), EUPUG-50 (an extruder that makes corner bricks), EUSMALLMIXER (a paddle mixer), and EUSMALLDRYER (a sand dryer system). EUSMALLMIXER is used to mix sand and chemicals, including brick colorant, to be used in the EUPUG-30 and EUPUG50 lines.

All 4 units are vented via local ventilation to the same control device, a Donaldson Torit dust collector with dry filter, permitted under PTI 170-18, to replace the "whirl wet" wet cyclone separator, which controls particulate from these 4 emission units. A notification of installation for the new dust collector was received on September 4, 2020, informing AQD that the new baghouse was installed on August 10, 2020. During the inspection J. Greger showed me the location where the whirl wet used to be, and we verified that the unit has been removed.

EUPUG-30 was operating during the inspection.

Emission Limits, Process/Operational Restrictions, & Monitoring/Recordkeeping

The new dust collector is installed in the center of FGPLANT1 and is vented to the in-plant environment, which is the way that this unit was permitted. The permit requires that Meridian Brick maintain PM emission rates at 0.05 lb/1000 lb exhaust gases by maintaining the dust collector according to the manufacturer's specifications, and, although the unit is vented to the in-plant environment, Meridian Brick is required to monitor and record the pressure drop across the dust collector on a weekly basis. Additionally, Meridian Brick is required to operate the dust collector within a pressure drop range as established by the manufacturer.

J. Greger said that the appropriate pressure drop range for this unit is 2 – 7 "H₂O. During the inspection, the pressure drop on the unit was reading at 1.6 "H₂O, below the appropriate operating range; however, there were no visible emissions in the plant that I could see while conducting the virtual inspection. Additionally, while Meridian Brick has observed the unit on a weekly basis, to ensure there is no dust in the in-plant environment (dust is one indicator that the unit is malfunctioning) they have not recorded weekly pressure drop readings on this unit. After notifying J. Greger of this deficiency he informed me that Meridian Brick has created a sheet that they will use to record the pressure drops on a weekly basis. **A violation notice will be sent to address the pressure drop and the recordkeeping deficiencies.**

There are no Material Limits, Design/Equipment Parameters, Testing/Sampling, Reporting, or Stack/Vent Restrictions for FGPLANT1 at this time.

FGFACILITY (PTI 170-18)

FGFACILITY was added to the permitted requirements under PTI 170-18 and is used to put legally enforceable restrictions on individual and aggregate HAPs, a facility-wide (HAPs opt-out).

There are currently no Material Limits, Process/Operational Restrictions, Design/Equipment Parameters, or Reporting requirements for FGFACILITY.

Emission Limits & Monitoring/Recordkeeping

Each individual HAP is limited to 8.9 tpy on a 12-month rolling period and aggregate HAPs are limited to 22.4 tpy per 12-month rolling period. Meridian Brick is required to calculate the quantity of HAP materials used, the HAP emission factor of each HAP-containing material used or emitted (emission factors are required to be based on testing at the facility); and individual and aggregate monthly and 12-month rolling emission rates are required to be calculated.

J. Greger provided me with excel spreadsheets containing individual and aggregate HAPs calculations (attached) on a monthly and 12-month rolling basis for calendar years 2019 and 2020. All emission factors are included in the HAPS calculations spreadsheet and are based on the June 2018 stack test results. D. McKeown explained that all non-mercury metal HAP lb/ton-product-fired emission rates were calculated based on the emission rate provided in the stack test report (lb/hr), divided by 8.04 tons of fired product per hour (the production rate during the test). The highest individual HAP 12-month rolling emissions was 3.9 tons from October 2019 – September 2020. The highest total aggregate HAPs 12-month rolling emissions was 5.4 tons for the same 12-month rolling period. Based on the data submitted, HCl is the largest contributor of aggregate HAPS emissions, and the highest emitted individual HAP. Meridian Brick is meeting their HAP opt-out limits at this time.

Testing/Sampling

Meridian Brick is required to verify HAP emission rates from either Kiln 1 or Kiln 2 to determine compliance with individual and aggregate HAP limits, and includes the testing for HCl, HF, chlorine, Hg and non-Hg metal HAPs. Another test is therefore required to be conducted before June 19, 2023.

FGPARTSWASHER

There are 2 (never heated) parts washers located in their garage and in the new maintenance building. J. Greger said Meridian Brick owns these units now (previously they were renting the units from Vesco Oil), but Vesco oil still services and maintains these units. Each of them holds approximately 40 gallons. Each parts washer tub is attached to a drum where the solvent is stored through a drain at the bottom of the wash tub (no chemicals are stored in the washer itself), which meets the design requirement of equipping the washer with a draining device.

Mineral spirits is still the cleaning solvent used in the parts washers; according to the MSDS submitted to me by J. Greger, the only halogenated compound present is trace amounts (<0.1%) of tetrachloroethylene

(perchloroethylene) (see attachment). According to the ROP, the cleaning solvents must not exceed 5% by weight of this compound. Meridian Brick is therefore in compliance with the material limits condition of the ROP for this emission unit.

J. Greger said that the approximate dimensions of the parts washers each have an air/vapor interface of approximately 10 ft² (4 ft x 2.5 ft) and therefore meets the design requirement of not exceeding 10 ft² of air/vapor interface.

Both parts washers are equipped with lids. During the inspection, I verified that the lids were closed on these units.

Condition 3 of Monitoring/Recordkeeping in the ROP says that written operating procedures must be posted in an accessible, conspicuous location near each cold cleaner. During the inspection I verified that operating procedures were in place for each of the units. Meridian Brick is in compliance with the operating procedure requirement.

Conditions 4 & 5 of the FGPARTSWASHER design/equipment parameters requires certain conditions be met depending on the Reid vapor pressure of the cleaning solvents. The Reid vapor pressures for trimethylbenzene and mineral spirits are 0.095 psia and 0.13 psia, respectively, according to Cameo Chemicals MSDS. Condition 4 requires mechanical assistance of the cover if the Reid vapor pressures are more than 0.3 psia. Meridian Brick is not required to have mechanical assistance based on the psia's.

Condition 5 requires certain conditions be met if the Reid vapor pressures are greater than 0.6 psia; the Reid vapor pressures are not, and therefore the conditions are not applicable.

Compliance Statement: Meridian Brick is currently in compliance with MI-ROP-A6497-2015 and currently in non-compliance with PTI 170-18 at this time. A violation notice will be sent to address the deficiencies noted for FGPLANT1 monitoring and recordkeeping.



Image 1(Active Storage Pile) : Storage Pile that is being actively harvested during the inspection. No opacity/fugitive dust. Photo Credit: Bill Stevens, Meridian Brick



Image 2(Lime Feed) : Location where lime is collected from the process to determine lime feed rate. Photo Credit: Bill Stevens, Meridian Brick.

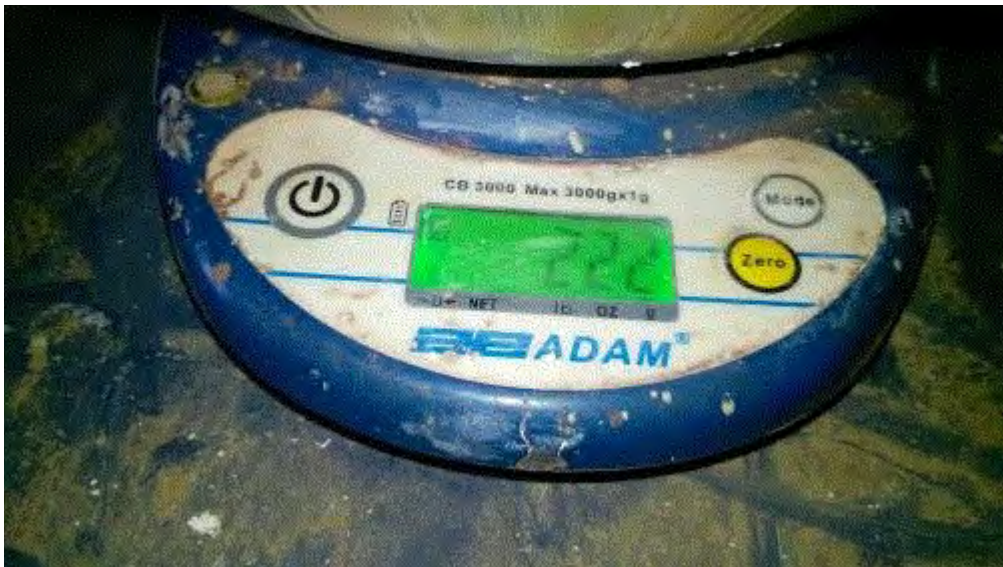


Image 3(30-sec Lime Weight) : After lime is collected, it is weighed. During the inspection, a 30-second collection of lime yielded 0.222 g. Photo Credit: Bill Stevens, Meridian Brick.



Image 4(Cooling Tower Door) : Cooling tower door (where ambient air is let into cooling tower to maintain a safe temperature for the baghouse). Closed during inspection. Photo Credit: Bill Stevens, Meridian Brick

NAME Michelle Luplow

DATE 2/24/21

SUPERVISOR B. M.