

B2169
MARION

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

B216947951

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| FACILITY: CARMEUSE LIME Inc, RIVER ROUGE OPERATION | | SRN / ID: B2169 |
| LOCATION: 25 MARION AVE, RIVER ROUGE | | DISTRICT: Detroit |
| CITY: RIVER ROUGE | | COUNTY: WAYNE |
| CONTACT: Matt Gower , Site Operations Manager | | ACTIVITY DATE: 02/13/2019 |
| STAFF: Stephen Weis | COMPLIANCE STATUS: Compliance | SOURCE CLASS: MAJOR |
| SUBJECT: Compliance inspection of the Carmeuse Lime and Stone facility in River Rouge. The Carmeuse facility is scheduled for inspection in FY 2019. | | |
| RESOLVED COMPLAINTS: | | |

Location:

Carmeuse Lime, Inc. (SRN B2169)
25 Marion Avenue
River Rouge

Date of Activity:

Wednesday, February 13, 2019

Personnel Present:

Steve Weis, DEQ-AQD Detroit Office
Kris Milner, Environmental Area Manager, Carmeuse
Matt Gower, Site Operations Manager, Carmeuse River Rouge
Hugh Crosmun, Process Engineer, Carmeuse River Rouge

Purpose of Activity

A self-initiated inspection of the Carmeuse Lime, Inc. facility (hereinafter "Carmeuse" or "the River Rouge facility") was conducted on Wednesday, February 13, 2019. Carmeuse was on my list of sources targeted for an inspection during FY 2019. The purpose of this inspection was to determine compliance of operations at the Carmeuse facility with applicable rules, regulations and standards as promulgated by Public Act 451 of 1994 (NREPA, Part 55 Air Pollution Control) and Federal standards. The facility is also subject to the terms and conditions of Renewable Operating Permit No. MI-ROP-B2169-2013 and Permit to Install Nos. 193-14A and 128-17.

Facility Site Description

The Carmeuse River Rouge facility is located on the north side of Marion Street, just east of Jefferson Avenue. The facility is bounded on the north by the Rouge River, along which Carmeuse has docking and off-loading infrastructure in place to allow for raw material delivery (limestone, coal) via ship. The areas to the north and east of Carmeuse contain some of the area's notable heavy industrial facilities - the Great Lakes Water Authority's Water Resource Recovery Facility lies across the Rouge River to the north of Carmeuse; Zug Island, which contains some of U.S. Steel's operations (blast furnaces) and other activities associated with steelmaking, such as EES Coke's coke oven, lies about ¾ mile to the east and northeast; DTE Energy's River Rouge Power Plant is about ¾ mile to the east; and US Steel's facility in Ecorse is about one mile to the south/southeast. Buckeye Terminals, LLC River Rouge Terminal is located directly to the east of Carmeuse along Marion Ave., and U.S. Gypsum is located on the west side of Jefferson Ave. opposite from the Carmeuse property.

The area directly to the south of Carmeuse is a residential area. The closest residential properties are located along Anchor Street, backing up to Marion Ave., and are approximately 100 yards from Carmeuse's lime kilns.

Facility Operations

Carmeuse is a Belgian company with North American operations based in Pittsburgh, PA. The company produces lime, high calcium limestone and dolomitic stone. The River Rouge facility is one of 28 production facilities that are currently operating in the eastern U.S. and eastern Canada. The River Rouge facility produces calcium oxide, also known as quicklime, lime, and high calcium lime. According to Carmeuse's website, this product is used in the steel making process, in pulp and paper production, in glass manufacturing, for flue gas treatment, for water and wastewater treatment, and in the construction industry. The facility typically operates 7 days a week, 24 hours per day.

The lime product is produced at the River Rouge facility in two counter-flow horizontal rotary kilns, in which limestone is heated in a process referred to as calcining. Each kiln is 300 feet long, with a drum diameter of 10.6 feet. The kilns are primarily fired by pulverized coal, with natural gas used during start-ups. Carmeuse has also recently been permitted, per the requirements put forth in Permit to Install No. 128-17, to fire used oil in the kilns on a permanent basis and biosolids material on a temporary basis. Coal is received via ship and stored on site. The coal is transferred from the storage piles to feed bins, from which it is conveyed to a rolling mill for pulverizing/sizing, after which it is fed to the kilns. Limestone also arrives at the facility via ship, and it is offloaded to storage piles in the northern portion of the Carmeuse property. The limestone comes from various Carmeuse quarries in Michigan and Canada, including Rogers City, Drummond Island and Port Calcite (near Gulliver), MI and Manitoulin Island, Ontario. The limestone is conveyed from the storage piles via feeders under the piles to transfer stations, where the limestone is screened and sized prior to being conveyed to the kilns.

The kilns are counter-flow kilns – with this configuration, the limestone is fed on the opposite end of the kiln that the coal is fed, and it “flows” towards the firing end. The kilns are heated to temperatures ranging from 1100 to 1300°F at the end in which the limestone is fed, and up to 2375°F at the fuel end. The heating of the limestone constitutes the calcining process, through which the limestone (calcium carbonate, CaCO_3) is thermally broken down into high calcium lime (CaO) and carbon dioxide. Each kiln has a maximum production capacity of approximately 500 tons of lime product per day. The lime product is conveyed from the kilns to lime product storage silos. The lime product is pneumatically loaded from the storage tanks to trucks and rail cars for delivery to customers.

Under the current lime kiln-exhaust configuration, the exhaust gases from the two kilns are sent to a pulse-jet baghouse, which vents to a single stack that releases emissions 120 feet above grade. The baghouse and stack are new; the construction of the baghouse and the stack were completed, and they commenced operation as the ambient discharge system for the kilns, during the third quarter of 2018. The stack was constructed per the requirements of Permit to Install No. 193-14A, which was drafted as part of the development of Michigan's 1-hour SO_2 non-attainment state implementation plan (SIP). The two kilns used to vent to their own separate baghouse units, which in turn vented to the ambient air via a monovent, one associated with each baghouse. The old baghouse and monovent structures have been taken down and removed. The primary purpose of the baghouse unit is to control emissions of particulate matter, but due to the resultant coating of limestone-derived material on the filtering media in the baghouse, it also provides some measure of control for other pollutants produced by the lime production process, namely sulfur dioxide and hydrogen chloride.

Carmeuse's Renewable Operating Permit defines Emission Units and Flexible Groups that represent the various processes that occur at the River Rouge facility. These Emission Units and Flexible Groups are described below.

- EUKILNNUMBER1 – a horizontal rotary lime kiln identified as Kiln No. 1. The kiln is 300 feet long with a 10.6-foot diameter. As described previously, exhaust from the kiln is vented through an exhaust system that is shared with that of Kiln No.2, which consists of a pulse-jet baghouse that vents to the ambient air via a single stack.
- EUKILNNUMBER2 – a horizontal rotary lime kiln identified as Kiln No. 2. The kiln is 300 feet long with a 10.6-foot diameter. Exhaust from the kiln is vented through an exhaust system that is shared with that of Kiln No.1, which consists of a pulse-jet baghouse that vents to the ambient air via a single stack.
- EUCONVEYOR/ELEV – the conveyors, elevators and rescreening operations for the finished lime product. There are three baghouse units associated with this equipment to control potential particulate emissions.
- EULIMELOADOUT – lime load out equipment for transferring finished lime product from storage silos to truck and rail vehicles. There are two baghouse units associated with this equipment to control potential

particulate emissions.

- EUFLUEDUSTTANK - a storage tank for lime kiln dust (LKD). There is a baghouse unit associated with this equipment to control potential particulate emissions.
- EUFUGITIVE – this Emission Unit covers potential fugitive dust associated with open storage piles of materials (limestone, coal) and facility roadways. These potential fugitive emissions are controlled by water sprays, dust suppressant, and/or sweeping.
- EUNO6BINVENT – a lime fines handling operation that is vented through a baghouse.
- EUFDLOADOUT – flue dust load out equipment that vents through the same baghouse as EUFLUEDUSTTANK to control potential particulate emissions.
- EUPSHFUGITIVE – equipment used for handling limestone after the limestone bin, and prior to the lime kilns. The processed stone handling (PSH) equipment includes all conveyors prior to the lime kilns for which the only emissions are fugitive dust emissions.
- FG-MACT-AAAAA-LIME MANUFACTURING PLANTS – this Flexible Group consists of the Emission Units that are subject to the Federal NESHAP (National Emission Standards for Hazardous Air Pollutants) for Lime Manufacturing Plants, 40 CFR Part 63 Subpart AAAAA. This Flexible Group consists of EUKILNNUMBER1, EUKILNNUMBER2 and EUPSHFUGITIVE.

Inspection Narrative

I arrived at the facility at about 11:05am. Carmeuse was in the midst of compliance emissions testing, which was scheduled to take place on February 12 and 13, 2019 in order to meet the testing requirements put forth in Special Condition V.1 of PTI No. 128-17. My visit on this day was scheduled to both perform a compliance evaluation/site visit, as well as to observe a portion of the compliance emissions test. I checked in at Carmeuse's offices, and I was met by the River Rouge facility's Site Operations Manager, Matt Gower. Matt and I proceeded to his office where we were met by Kris Milner. I communicated the purpose of the visit, specifying that along with observing a portion of the compliance emissions test, I wanted to discuss with them how Carmeuse demonstrates compliance of the River Rouge facility with the applicable regulations and permits.

We began by discussing the current operations at the facility. Kris and Matt discussed the new baghouse and stack. They told me that the baghouse, heat exchanger and stack have been in operation since August of 2018, and that they have been operating well. They told me that they plan to remove the old baghouse structure from the facility. I advised them to ensure that any asbestos that may be present in the baghouse/monovent structure and related ducting is addressed, and I offered that they can contact AQD's Technical Programs Unit Asbestos staff.

We discussed the new fuels that have been permitted for use at the facility. The facility has been using used oil, and the compliance emissions testing that was taking place during the time of my site visit was to measure emissions resulting from firing the lime kilns on a mixture of used oil and coal. Kris and Matt discussed the permitted use of processed biosolids from the Great Lake Water Authority Biosolids Drying Facility (GLWA-BDF), which is located along West Jefferson just to the north of Carmeuse. They told me that they have commenced the 90-day trial burn of the material that is allowed by PTI No. 128-17. They have found the biosolids material to be lighter than the coal. They are working with a consultant (Trinity Consultants) to research using pyrolysis to produce char from the biosolids. They told me that the ash content of processed biosolids is 25-30%, but that the char produced by the pyrolysis process has a lower ash content while maintaining the BTU content of the original material. I was told that Carmeuse is working with Trinity to classify the char material to see if it still considered a biosolids material. Kris and Matt told me that they would contact AQD as more information is found regarding a potential change in the way that biosolids is used as a fuel.

On a side note to update the discussion regarding biosolids, on April 25, 2019, I participated in a conference call with representatives from Carmeuse's consultant, Trinity, and AQD's Permit Unit to discuss a proposed pyrolysis project. AQD was told that Carmeuse is looking at raising the limit on the amount of syngas (synthetic gas) that is allowed to be fired in the kilns; they are planning to offset the amount of coal and/or used oil fired in the kilns with the increased amount of syngas, with the assertion that syngas is a cleaner fuel emissions-wise than the other fuels. We were told that proposal is for the syngas to be produced onsite by a pyrolysis unit that will process biosolids to produce a syngas to be fired in the kiln. The pyrolysis unit would leave a biogenic carbon

(similar to the char material that was discussed during the site visit), and Carmeuse and their consultant were planning meetings with DEQ/EGLE's Waste Division to discuss a beneficial use approval for the material. Their initial meeting with the Waste Division was scheduled for May 7, 2019. We discussed potential AQD permitting requirements based on presented scenarios. AQD was told that there would be further discussion about the project and potential air permitting once details, such as the beneficial use approval, have been worked out. As of the writing of this report, there have been no further discussions with AQD involving the proposed pyrolysis process and usage of syngas to be produced on site.

We then proceeded to go over the conditions of the facility's ROP and PTIs. As we reviewed the ROP, Carmeuse staff referenced facility records to demonstrate compliance. I was provided with fugitive dust and visible emissions reading records. We discussed the facility's fugitive dust plan, and Kris mentioned that he would be sending me proposed updates to the plan. The fugitive dust plan will be discussed in more detail in the next section of this report.

We were joined by Hugh Crosmun. His office is across the hall from Matt's, and he was monitoring the operating parameters of the kilns and the baghouse from his office as he has monitors that access the kiln control room screens. During the compliance emissions testing, the baghouse inlet temperature and pressure drop, the limestone feed and production rates, the fuel feed rate and the kiln revolutions per hour were being monitored and recorded. Hugh described the operation of the baghouse. He said that the baghouse is a pulse-jet unit with two compartments. There are 5 headers in each compartment, and 10 valves per header. I was told that the bags are 6-inch diameter, 15 feet long. Hugh showed me the data trend from 9:33am – 1:33p; this showed a line graph of the readings of the monitored parameters during this timeframe. Hugh also showed me historical data trends to illustrate that the production rate during the time of the test is consistent with recent, typical production rates at the facility. I took some instantaneous readings from the screen, reading the following – a baghouse inlet temperature of 400° F; a compartment 1 pressure drop of 1.5 inches water; a compartment 2 pressure drop of 3 inches water; a limestone feed rate to kiln 1 of 44 tons per hour (tph); a limestone feed rate to kiln 2 of 31 tph; a fuel feed rate to kiln 1 of 6.4 tph; a fuel feed rate to kiln 2 of 4 tph. On February 13, the kilns were firing only coal as fuel for the compliance emissions test.

Kris and I visited the test consultant's trailer. We met with Chris and Craig. They recapped the test to that point, telling me that on Tuesday the 12th, testing was performed with the kilns firing used oil and coal, and that today's test involved only coal as the fuel. They told me that they performed method 201A, 5 and 202 tests, and that the filters looked clean ("like new") at the conclusion of the tests to that point. Kris and I walked up to take a look at the sampling point on the baghouse.

We returned to Matt's office, and we had some conversation to summarize and conclude my site visit. Matt mentioned that with the new configuration of the exhaust – going from discharging to the ambient air via monovent structures to now discharging via a single stack – the requirements for the type of monitoring has changed from visible emissions readings to monitoring (via a bag leak detection system). We agreed that the conditions in the Flexible Group for the kilns will need to be checked and updated.

I left the facility at 3:45pm.

Permits/Orders/Regulations

Permits

The Carmeuse River Rouge facility is currently subject to the requirements of three permits – Renewable Operating Permit No. MI-ROP-B2169-2013, which became effective on January 15, 2013, Permit to Install (PTI), No. 193-14A, which was issued via correspondence from DEQ-AQD to Carmeuse dated March 24, 2016, and PTI No. 128-17, which was issued via correspondence from DEQ-AQD to Carmeuse dated April 25, 2018. The facility's ROP expired on January 15, 2018, and Carmeuse submitted an administratively complete ROP renewal application before the July 15, 2017 submittal deadline. Thus, they are operating under the ROP Permit Shield provisions.

The following subsections address the Carmeuse facility's compliance with the three permits that are currently effective at the facility.

1) ROP No. MI-ROP-B2169-2013

The following paragraphs provide a description of Carmeuse's compliance with the terms and conditions put

forth by the ROP, with the headings representing the sections of the ROP.

Source-Wide Conditions

The Source-Wide Conditions table in the ROP addresses fugitive dust at the Carmeuse facility. The requirements in this section of the ROP cite **Consent Order SIP No. 22-1993** as an applicable requirement.

This Consent Order is part of the State of Michigan's State Implementation Plan (SIP); this part of the SIP was submitted by the State of Michigan as part of the attainment demonstration for PM-10. The Michigan Department of Natural Resources submitted the PM-10 SIP to EPA on June 11, 1993, and, after a couple of revisions, the nonattainment area PM SIP for Wayne County, Michigan was approved and became effective on February 16, 1995. One element of the SIP was the requirement that facilities with designated standard industrial classifications that are located in the area designated in Table 36 of Michigan Administrative Rule 371 "... develop and implement an approved fugitive dust control operating program and to have the program embodied in a legally enforceable order..." (this quote was taken from the preamble to the Consent Order). Many of the larger facilities in the portion of Wayne County designated in Table 36 were issued Orders as part of the SIP. Carmeuse was issued the Consent Order referred to as SIP No. 22-1993.

In the Source-Wide Conditions section of the ROP, the Emission Limits table contains a couple of opacity limits – 20 percent for sources of fugitive dust other than storage piles, and 5 percent for material storage piles. The compliance method for the opacity limits is put forth in Special Condition VI.2, which requires that Carmeuse River Rouge staff do the following:

- 1) Perform visible emission (VE) readings from roads, lots and storage piles on a weekly basis (method 9 readings should be taken when VEs are observed).
- 2) Perform VE readings from fugitive dust sources other than roads, lots or storage piles on a weekly basis (method 9 readings should be taken when VEs are observed).

Matt showed me the log book that contains records of the required visible emission readings during my site visit. A form referred to as the "Visible Emission Observation Evaluation" form is kept for each week.

Special Conditions III.1, VI.1, and all of the conditions under the "IX. Other Requirements" all require that the facility comply with the SIP Consent Order, and they list the Consent Order as the applicable requirement. Kris said that he was working on drafting revisions to the SIP fugitive dust plan in accordance with the allowance and requirements presented in Special Condition IX.3. Kris submitted a draft revised plan to me via an e-mail dated March 25, 2019. I sent Kris and Matt a response on May 28, 2019 that included my comments and suggested changes to their revised plan, as well as some guidance. As of the writing of this report, there have been no updates regarding the SIP fugitive dust plan. When Carmeuse staff and I agree on a revised plan, it will be sent to EGLE-AQD's SIP Unit staff to commence the procedure for officially revising the plan in the SIP.

Carmeuse staff showed me a log book titled "Weekly Environmental Compliance Requirements" that contains sheets for each week that serves as a checklist for the various tasks required to be performed in accordance with applicable air and water regulations. There are sections titled "Air" and "Nuisance Dust Collectors" that include checklists for tasks related to the maintenance of all of the identified fugitive dust sources on site, and visible emission/opacity readings taken on weekdays and parametric monitoring for the dust collectors. I was provided with a copy of the weekly log for the week of February 4, 2019, which is attached to this report for reference. I was also shown a record referred to as the "Front Endloader Shift Report". This report shows the condition of the coal pile, and also summarizes visible emissions readings, including those that have been performed on the weekend, recording observations of the material stockpiles, the dust collectors, and the baghouse stack. I was provided with a copy of this report from February 11, 2019, and it is attached to this report for reference. These records indicate that all of the visible emission and opacity observations required by Special Condition VI.2 are being performed, and that the fugitive dust control measures that are required by the SIP Order are being adhered to. It should be noted that Carmeuse staff performs the visible emission/opacity readings during the week, and staff from Impact (formerly Derenzo and Associates, Inc.), an environmental consulting company that provides visible emissions monitoring, perform the readings on the weekends.

The information and records that I was shown and provided indicate that Carmeuse is **in compliance** with the requirements in the Source-Wide Conditions section.

EUCONVEYOR/ELEV, EULIMELOADOUT, EUFLUEDUSTTANK, EUNO6BINVENT, and EUFDLOADOUT

These five Emission Units have been grouped together for the purposes of this compliance discussion because they all have, essentially, the same permit requirements – the Special Conditions in the Testing/Sampling and

Monitoring/Recordkeeping sections are identical for all five Emission Units. EUCONVEYOR/ELEVATOR represents lime product conveyors, elevators and rescreening equipment. EULIMELOADOUT represents the loading of lime product to trucks. EUFLUEDUSTTANK represents the flue dust bin. EUNO6BINVENT represents #6 bin vent, which handles lime fines. EUFDLOADOUT represents flue dust rail loadout or flue dust rescreening. Carmeuse staff provided that the rail loadout portion (EUFDLOADOUT) of this grouping of Emission Units is no longer in operation.

These Emission Units have a particulate matter emission limit with Michigan Administrative Rule 331 as the underlying applicable requirement. The emission limits all have the same Monitoring/Testing Method – the requirement that a particulate matter emission test may be required per Department (DEQ/EGLE) request (Special Condition V.1 in all five Emission Unit tables), and identical requirements under section “VI. Monitoring/Recordkeeping” to:

1. Conduct regular inspections of the operating condition of the baghouses associated with the Emission Units;
2. Perform weekly monitoring and recording of the pressure drop across the baghouses;
3. Perform daily VE readings to determine the presence or absence of visible emissions (i.e. an EPA Method 22 reading).

The weekly monitoring of the pressure drop, as required by Special Condition VI.2, and the daily visible emission readings, as required by Special Condition VI.3, are recorded via the aforementioned Weekly Environmental Compliance Requirements log sheet, and visible emission readings taken on weekend days are recorded on the Front Endloader Shift Report. The examples from the facility log sheets that are attached to this report show the visible emission readings, and the various pressure drops. I was told that the baghouse inspections are logged in a Carmeuse’s central maintenance data system. This system allows Carmeuse staff to log the results of equipment inspections, and to request and log any repairs and maintenance that is performed.

Carmeuse appears to be **in compliance** with the permit conditions associated with EUCONVEYOR/ELEV, EULIMELOADOUT, EUFLUEDUSTTANK, EUNO6BINVENT, and EUFDLOADOUT.

FG-MACT-AAAAA-LIME MANUFACTURING PLANTS

This Flexible Group includes the permit requirements for EUKILNNUMBER1, EUKILNNUMBER2, and EUPSHFUGITIVE. The equipment covered by these Emission Units is subject to the requirements of 40 CFR Part 63, Subpart AAAAA, the National Emission Standards for Hazardous Air Pollutants for Lime Manufacturing Plants (hereinafter “the Lime MACT”). The Flexible Group description in the ROP states, in part, that the Lime MACT “...covers the existing lime kilns and their associated coolers, and PSH (processed stone handling) operations located at a lime manufacturing plant that is a major source.” This conditions in this Flexible Group address the applicable requirements of the Lime MACT.

The paragraphs that follow provide a summary of Carmeuse’s compliance with the Special Conditions in this Flexible Group.

I. Emission Limits

The Emission Limits table contains emission limits for PM, opacity and sulfur dioxide. The Monitoring/Testing Method for the PM and sulfur dioxide emission limits is the stack testing requirements put forth in Special Conditions V.1 and V.2 for PM and sulfur dioxide, respectively. The most recent stack tests were performed on December 4, 2018, and for PM, PM10 and PM2.5 on February 12-13, 2019 as required by PTI No. 128-17. The test results showed the following:

- The December testing showed measured PM from the single stack of 0.0056 lb/ton of stone feed (tsf), versus the permitted limit of 0.12 lb/tsf. SO₂ was measured at 0.45 lb/MMBTU (vs. the permitted limit of 2.4 lb/MMBTU), and 198.20 ppm corrected to 50% excess oxygen (vs. the permitted limit of 300 ppm corrected to 50% excess air).
- The testing performed on February 13, when the kilns were fired with only coal, showed measured PM of 0.02 lb/tsf, versus the permitted limit of 0.12 lb/tsf.

The results of these most recent compliance emissions stack testing events show compliance with the permitted

emission limits. Compliance with the PSH opacity limits is discussed in the write-up for Section VI.

II. Material Limits

The conditions in the Material Limits table address the usage of alternative fuels to fire the kilns. The use of glycerin and syngas was analyzed and allowed by Permit to Install No. 330-07D, which was incorporated into the ROP.

During the inspection, I was told that Carmeuse has not used glycerin or syngas for some time; I was told this during my last site visit in July of 2017, and Carmeuse staff told me that there has been no use of these materials since that time. Carmeuse has not had any throughputs of these materials, so the facility is **in compliance** with these permit conditions. Recall that Carmeuse is researching an on-site pyrolysis process that would generate a synthetic gas from biosolids; this project is still at the research phase at the time of the writing of this report.

III. Process/Operational Restrictions

Special Condition:

III.1 – The Carmeuse facility's compliance with the emission limits in this Flexible Group is described under the Emission Limits heading.

III.2 – The facility maintains and operates the kiln baghouses when the kilns are operating. Compliance.

III.3 – Carmeuse performs visible emissions readings to check compliance with the 15% opacity limit. During the inspection, I was shown the log sheet titled "Visible Emission Observation Evaluation" through which Carmeuse keeps track of the visible emission/opacity observations of the lime kiln baghouse. However, the requirements of this Special Condition are specific to the former baghouse configuration associated with the kilns; the language references "...the positive pressure reverse air baghouse...". The new baghouse, which exhausts to a single stack, is equipped with a bag leak detection system. The PTI that addresses the installation and use of the single stack does not include baghouse monitoring requirements. Per discussions with Carmeuse staff during the site visit, the requirements associated with this type of permit condition will be updated during the ROP renewal review process.

III.4 – Carmeuse maintains records of visible emissions readings that demonstrate compliance with the Lime MACT opacity limits associated with EUPSHFUGITIVE.

III.5 – Carmeuse submitted an Operations, Maintenance and Monitoring (OM&M) Plan to the AQD-Detroit Office for the River Rouge facility dated September 14, 2007. This OM&M Plan needs to be updated to reflect the operating and maintenance procedures associated with the new baghouse. Kris told me that he has an updated, red-lined version that is undergoing internal review. He will submit it to the AQD-Detroit Office when it is completed and approved.

III.6 – Compliance. Carmeuse has developed a written startup, shutdown and malfunction plan for the River Rouge facility. It was available for review during the inspection.

III.7 – Compliance. Carmeuse has been complying with Special Condition III.7.b. by operating the lime kiln baghouse in accordance with the OM&M Plan referenced in Special Condition III.5. As referenced in the discussion for Special Condition III.5, an updated OM&M Plan is being drafted to address the new baghouse configuration. Captured emissions are vented to a closed system, in compliance with III.7.a.

III.8 – Compliance. The River Rouge facility is currently firing coal in the kiln, with natural gas used during startup. Glycerin and syngas are not currently in use. In addition, per the issuance of PTI No. 128-17, the facility is able to fire used oil in the kilns, and processed biosolids for a trial burn period of up to 90 days.

IV. Design/Equipment Parameters

There are no permit conditions in this section.

V. Testing/Sampling

Special Condition:

V.1 – Carmeuse has conducted approved particulate matter emission tests in December of 2017 and February of 2018 (see the related discussion under “I. Emission Limits”). Compliance.

V.2 – Carmeuse conducted an approved sulfur dioxide emission test in December 2018. The test indicated compliance (see the related discussion under “I. Emission Limits”). Compliance.

V.3-5 – These Special Conditions address testing, monitoring and sample analysis associated with the use of glycerin and syngas. These fuels are not currently being used as fuel to fire the kilns, so these conditions are not currently applicable.

V.6 – Carmeuse staff confirmed that the procedure detailed during my last site visit is still valid. Per facility procedures, Carmeuse staff samples the coal used at the River Rouge facility for analysis. Coal is sampled for both BTU analysis and monthly Greenhouse Gas (GHG) sampling. Carmeuse staff collect a composite sample of coal from around the coal piles after each coal delivery by ship, from which an ultimate analysis is performed, as well as a determination of the ash fusion temperature. Carmeuse showed me an example record of a coal analysis.

VI. Monitoring/Recordkeeping

Special Condition:

VI.1 – Carmeuse inspects the air pollution control devices (capture/collection and closed vent system) at least once each year. Carmeuse staff told me that this task is performed during the annual outage for each kiln. The OM&M Plan for the new baghouse will put forth the maintenance and inspection schedule and procedures for the new baghouse.

VI.2 – **Compliance.** Carmeuse is keeping records of all of the deviations, notifications and records required by the Lime MACT.

VI.3 – **Compliance.** According to Carmeuse staff, they are operating and maintaining the continuous parameter monitoring system (CPMS) in accordance with the existing OM&M Plan. The OM&M Plan is being updated to reflect any changes resulting from the installation and use of the new baghouse.

VI.4 and VI.5 – **Compliance.** According to Carmeuse staff, the flow measurement devices and pressure measurement devices are compliant with the Lime MACT.

VI.6 – **Compliance.** Carmeuse staff communicated that they are performing the required visible emission/opacity readings associated with the processes in EUPSHFUGITIVE. The readings are kept on the Weekly Environmental Compliance Requirements form, and also tracked via the facility's Visible Emission Observation Evaluation forms. An example of VE reading of the processed stone handling process (aka PSH) is shown on the attached Weekly Environmental Compliance Requirements log sheet from February 4.

VI.7 – **Compliance.** The daily limestone feed rate is continuously monitored and recorded. During the site visit when looking at production data as part of the compliance emissions stack test observation, I was shown the trend data for the time period from the weeks of February 3 and 10. A reading of the feed rate is logged every 1/10th of a minute.

VI.8 and VI.9– **Compliance.** Carmeuse tracks and records the BTU/hour heat input rate of coal to the lime kilns, as well as the coal consumption rate. This information is also tracked by the facility's internal system, which shows the coal usage in each kiln. Carmeuse uses the fuel data to determine the BTUs used to produce lime. A copy of a coal analysis taken during the February stack test is attached for reference.

VI.10, VI.11, VI.12, and VI.13 – these ROP Special Conditions address monitoring and recordkeeping requirements associated with glycerin and syngas usage. These conditions are not currently applicable.

VII. Reporting

Special Conditions (SCs) VII.1 through VII.4 – **Compliance.** Carmeuse is complying with the reporting requirements in this section. These reports are required by either the ROP (VII.1, 2 and 3) or the Lime MACT (VII.4).

VIII. Stack/Vent Restrictions

The exhaust stack/vent parameters, as put forth in this section, are no longer valid. The physical parameters for the single stack that vents the baghouse put forth in SC VIII.1 of PTI No. 193-14A are the valid stack/vent restrictions. This information will be updated when the ROP renewal is drafted.

IX. Other Requirements

Special Condition:

IX.1 – Carmeuse is demonstrating compliance with the applicable provisions of 40 CFR Part 63, Subpart AAAAA.

IX.2 – Carmeuse is demonstrating compliance with the applicable provisions of 40 CFR Part 60, Subpart Y (Standards of Performance for Coal Preparation and Processing Plants). Subpart Y applies to the coal processing and conveying equipment, coal storage system, or coal transfer and loading systems at the facility.

In summary, based on the information presented during my inspection of Carmeuse River Rouge, the facility is **in compliance** with the terms and conditions of MI-ROP-B2169-2013.

2) Permit to Install No. 193-14A

This Permit to Install was issued on March 18, 2016. PTI No. 193-14 was initially issued in support of the 1-hour SO₂ National Ambient Air Quality Standards, and as part of Michigan's SO₂ Non-attainment SIP Plan. Permit 193-14 requires that Carmeuse construct a new stack. The Permit also requires that, upon completion of the new stack configuration, Carmeuse establish a new SO₂ emission rate for the combined exhaust of Kiln Nos. 1 and 2. Additional modeling for SO₂ revealed that the stack height required in PTI No. 193-14 would not result in attainment of the SO₂ standard. Carmeuse and DEQ-AQD determined, via air dispersion modeling, that a stack height of 120 feet would result in compliant SO₂ emissions. PTI No. 193-14A was issued to put forth this updated stack height requirement. The requirements of this Permit became effective on October 1, 2018, when Carmeuse was required to begin compiling hourly SO₂ emission rate calculations, and continuously monitor and record the total hourly limestone feed rates to each kiln. Per the requirements of this PTI, Carmeuse was required to perform a SO₂ emission test to determine the SO₂ emission rate no later than April 1, 2019; this was done on December 4, 2018.

I. Emission Limits

SC I.1 puts forth a SO₂ emission limits of 470 pounds per hour (pph). Carmeuse submitted their initial Excess Emissions Report Summary for SO₂ via correspondence dated March 28, 2019 (received by AQD-Detroit on April 1, 2019). Carmeuse reported that for the period from September 1, 2018 through February 28, 2019, there were no exceedances of the 470 pph limit over a total source reported operating time of 4,329 hours.

II. Material Limits

There are no material limits presented in this PTI.

III. Process/Operational Restrictions

There are no conditions addressing process/operational restrictions in this PTI.

IV. Design/Equipment Parameters

There are no conditions addressing design/equipment parameters in this PTI.

V. Testing/Sampling

Special Condition:

V.1 – Carmeuse conducted an approved compliance emissions test for SO₂ on December 4, 2018. A report summarizing the results of the test were submitted to AQD via correspondence dated January 15, 2019. The three-run average SO₂ emissions that were measured during the test was 164.61 lb/hr. Compliance.

VI. Monitoring/Recordkeeping

Special Condition:

VI.1 – Based on the initial Excess Emissions Report Summary that was submitted by Carmeuse, they have been calculating SO₂ emissions and comparing them against the SO₂ emission limit in the PTI since September 1, 2018 in compliance with this condition.

VI.2 – The correspondence submitted on March 28, 2019 also includes a Limestone Feed Rate Monitoring Downtime Summaries report, which indicate that Carmeuse is adequately monitoring the limestone feed rate.

VII. Reporting

Special Condition:

VII.1 – The correspondence that was submitted on March 28, 2019 includes the required SO₂ excess emissions summary and the limestone feed rate monitoring system downtime and corrective action summary. Compliance.

VII.2 – Carmeuse completed the installation of the new stack and notified AQD. Compliance.

VIII. Stack/Vent Restrictions

Carmeuse stated that they installed the new stack in compliance with the requirements of the PTI.

IX. Other Requirements

There are no conditions in this section of the ROP.

In summary, based on the information presented during my inspection of Carmeuse River Rouge, the facility is **in compliance** with the terms and conditions of PTI No. 93-14A.

3) Permit to Install No. 128-17

This Permit to Install was issued on April 25, 2018 to allow Carmeuse the ability to burn used oil in the kilns, as well as processed biosolids on a temporary basis.

I. Emission Limits

The Emission Limits table contains emission limits for PM, PM₁₀, PM_{2.5}, opacity and sulfur dioxide. The Monitoring/Testing Method for the PM, PM₁₀, PM_{2.5} and sulfur dioxide emission limits is the stack testing requirements put forth in Special Condition V.1, to be performed within 180 days of commencement of the initial use of use oil as a fuel for the kilns. SC V.2 requires testing for PM, PM₁₀, PM_{2.5}, SO₂, NO_x, CO and VOC emissions during the trial burn period for processed biosolids, which has not yet commenced. The stack test on the kilns when firing used oil was performed on February 12-13, 2019. The test results showed the following:

- The measured PM (as filterable particulate matter) was 0.02 lb/tsf, versus the permitted limit of 0.12 lb/tsf. PM₁₀ was measured at 4.07 lb/hr, versus the permitted limit of 23.45 lb/hr. PM_{2.5} was measured at 3.56 lb/hr, versus the permitted limit of 23.45 lb/hr. SO₂ was measured at 0.6 lb/MMBTU (vs. the permitted limit of 2.4 lb/MMBTU), 193 lb/hr (vs. the permitted limit of 470 lb/hr), and 254 ppm corrected to 50% excess oxygen (vs. the permitted limit of 300 ppm corrected to 50% excess air).
- Visible Emissions readings were performed during the stack test. The report summarizing the test reports zero exceedances of the 15% visible emission limit in SC I.10.

The results of the most recent compliance emissions stack testing event show compliance with the permitted emission limits. Compliance with the opacity limits for PSH is discussed in the write-up for Section VI.

II. Material Limits

The first seven conditions (SCs II.1 through 7) in the Material Limits table address the usage of glycerin and syngas, placing limits on the amount that can be used, as well as limits on specific properties of these two

fuels. As mentioned previously in this report, these two fuels are not currently being used at the facility, and have not been used for some time. As such, Carmeuse has not had any throughputs of these materials, so the facility is **in compliance** with these permit conditions.

The facility is firing used oil in the kilns. The amount of used oil being fired is continuously monitored. During the February 12 stack test during which used oil was fired, the highest reported used oil usage rate during a test run was 2.4 tons per hour. Using a typical used oil density of 7.6 lb/gallon, the 2.4 tons per hour equates to 631.58 gallons per hour (vs. the permitted limit of 1,838 gallons per hour).

In accordance with SC II.9, no waste material or waste fuel is being fired in the kilns.

Regarding SC II.10, the facility has not yet fired processed biosolids in the kilns.

III. Process/Operational Restrictions

Special Condition:

III.1 – The Carmeuse facility's compliance with the emission limits in this Flexible Group is described under the Emission Limits heading.

III.2 – Carmeuse maintains records of visible emissions readings that demonstrate compliance with the Lime MACT opacity limits associated with EUPSHFUGITIVE.

III.3 – As discussed earlier in this report, Carmeuse submitted an Operations, Maintenance and Monitoring (OM&M) Plan to the AQD-Detroit Office for the River Rouge facility dated September 14, 2007. This OM&M Plan needs to be updated to reflect the operating and maintenance procedures associated with the new baghouse. The company has a draft version that is undergoing internal review.

III.4 – Carmeuse has developed a written startup, shutdown and malfunction plan for the River Rouge facility. Compliance.

III.5 – This condition limits the facility to firing coal, natural gas, syngas, glycerin and/or non-waste used oil as fuels in the kilns. The facility is currently using coal, natural gas and non-waste used oil.

III.6 – This condition addresses the trial burn period for processed biosolids, which has not yet commenced.

IV. Design/Equipment Parameters

Special Condition:

IV.1 – The facility maintains and operates the baghouse in a satisfactory manner when the kilns are operating.

IV.2 - Captured emissions are vented to a closed system, in compliance with IV.2.a. For IV.2.b, an updated OM&M Plan is being drafted to address the new baghouse configuration.

V. Testing/Sampling

Special Condition:

V.1 – Carmeuse has conducted an approved compliance emissions test that meets the requirements of this condition within 180 days of commencement of the use of used oil in firing the kilns (see the related discussion under "I. Emission Limits"). Compliance.

V.2 – This condition puts forth the testing requirements associated with the temporary used of biosolids to fire the kilns. Carmeuse has not yet commenced the trial burn of processed biosolids.

VI. Monitoring/Recordkeeping

Special Condition:

VI.1 – Carmeuse inspects the air pollution control devices (capture/collection and closed vent system) at least once each year. Carmeuse staff told me that this task is performed during the annual outage for each kiln. The OM&M Plan for the new baghouse will put forth the maintenance and inspection schedule and procedures for

the new baghouse.

VI.2 – Carmeuse is keeping records of all of the deviations, notifications and records required by the Lime MACT. Compliance.

VI.3 – According to Carmeuse staff, they are operating and maintaining the continuous parameter monitoring system (CPMS) in accordance with the existing OM&M Plan. The OM&M Plan is being updated to reflect any changes resulting from the installation and use of the new baghouse. Compliance.

VI.4 and VI.5 – According to Carmeuse staff, the flow measurement devices and pressure measurement devices are compliant with the Lime MACT. Compliance.

VI.6 – Carmeuse staff communicated that they are performing the required visible emission/opacity readings associated with the processes in EUPSHFUGITIVE. The readings are kept on the Weekly Environmental Compliance Requirements form, and also tracked via the facility's Visible Emission Observation Evaluation forms. An example of VE reading of the processed stone handling process (aka PSH) is shown on the attached Weekly Environmental Compliance Requirements log sheet from February 4. Compliance.

VI.7 – The daily limestone feed rate is continuously monitored and recorded. During the site visit when looking at production data as part of the compliance emissions stack test observation, I was shown the trend data for the time period from the weeks of February 3 and 10. A reading of the feed rate is logged every 1/10th of a minute. Compliance.

VI.8 and VI.9 – Carmeuse tracks and records the BTU/hour heat input rate of coal to the lime kilns, as well as the coal consumption rate. This information is also tracked by the facility's internal system, which shows the coal usage in each kiln. Carmeuse uses the fuel data to determine the BTU's used to produce lime. A copy of a coal analysis taken during the February stack test is attached for reference. Compliance.

VI.10, VI.11, VI.12, and VI.13 – these ROP Special Conditions address monitoring and recordkeeping requirements associated with glycerin and syngas usage. These conditions are not currently applicable.

VI.14 – Carmeuse keeps records of the amount of natural gas the is used by the kilns. Compliance.

VI.15 – Carmeuse has been tracking the amount of used oil fired in the kilns via fuel flow meters. Compliance.

VI.16 – Carmeuse is maintaining analytical reports of the composition of the used oil that is used to fire the kilns. This information includes the sulfur content of the used oil. Compliance.

VI.17 – This condition requires that the amount of biosolids fired in the kilns be monitored. The facility has not yet begun using biosolids.

VII. Reporting

Carmeuse is complying with the reporting requirements in this section. The facility has not yet begun using biosolids, so they have not had to send the notification required in SC VII.2.

VIII. Stack/Vent Restrictions

The exhaust stack/vent parameters, as put forth in this section, are no longer valid. The physical parameters for the single stack that vents the baghouse put forth in SC VIII.1 of PTI No. 193-14A are the valid stack/vent restrictions.

IX. Other Requirements

Special Condition:

IX.1 – Carmeuse is demonstrating compliance with the applicable provisions of 40 CFR Part 63, Subpart AAAAA.

IX.2 – Carmeuse is demonstrating compliance with the applicable provisions of 40 CFR Part 60, Subpart Y (Standards of Performance for Coal Preparation and Processing Plants). Subpart Y applies to the coal processing and conveying equipment, coal storage system, or coal transfer and loading systems at the facility.

IX.3 – This condition limits the use of processed biosolids to 90 days after the date of initial startup of using this material as a fuel in the kilns. The facility has not yet triggered initial startup.

In summary, based on the information presented during my inspection of Carmeuse River Rouge, the facility is **in compliance** with the terms and conditions of MI-ROP-B2169-2013.

Federal Regulations

The Carmeuse River Rouge facility is subject to the requirements of **40 CFR Part 63, Subpart AAAAA**. The requirements of Subpart AAAAA are included in the facility's ROP. The facility is also subject to **40 CFR Part 60, Subpart Y**, as the facility has the potential to process more than 200 tons of coal per day. The requirements associated with this regulation are put forth in Special Condition IX.2 in FG-MACT AAAAA-LIME MANUFACTURING PLANTS of the facility's ROP.

In addition, the two lime kilns are subject to **40 CFR Part 60, Subpart HH**. The particulate matter emission standards put forth by the Lime MACT (Subpart AAAAA) are more stringent than the emission limits in Subpart HH. Thus, the requirements of Subpart HH are not included in Carmeuse's ROP.

AQD Consent Order

The Carmeuse River Rouge facility is subject to Consent Order AQD No. 10-2017, which became effective on September 11, 2017. The Order was entered as a result of a measured exceedance of particulate matter emissions during compliance emissions tests that were conducted in 2016. The Compliance Program and Implementation Schedule in section 9 of the Order requires that the facility comply with the PM emissions limits in the ROP on and after the effective date of the Order, and that the facility conduct compliance emissions tests by specified deadlines. All of the requirements of the Compliance Program have been completed by Carmeuse.

Paragraph 18 of the Order puts forth the length of effect and termination provisions of the Order. It is stated that the Order shall remain in full force and effect for a period of at least two years, and thereafter shall terminate only upon written notice of termination by the AQD Director. The Order was discussed during the site visit. Carmeuse staff mentioned that they had successfully completed the requirements in the Compliance Program and Implementation Schedule, and that they planned to submit a request to have the Order terminated, presumably after September 11, 2019, which would mark two years since the Order's effective date.

Compliance Determination

Based upon the results of the February 13, 2019 site visit and subsequent records review, the Carmeuse River Rouge facility appears to be in compliance with all of the terms and conditions of the facility's Renewable Operating Permit and Permits to Install, as well as applicable State and Federal regulations.

Attachments to this report: a copy of the "Weekly Environmental Compliance Requirements" log sheets for the weeks of February 4, 2019; a copy of the "Front Endloader Shift Report" for February 11, 2019; a copy of coal analysis data from samples taken in February 2019.

NAME Steve Welch DATE 8/13/19 SUPERVISOR JK