B2169
MANUAL

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

B216930448

FACILITY: CARMEUSE LIME Inc, RIVER ROUGE OPERATION		**SRN / ID:** B2169
LOCATION: 25 MARION AVE, RIVER ROUGE		**DISTRICT:** Detroit
CITY: RIVER ROUGE		**COUNTY:** WAYNE
CONTACT: Andy Blake , Site Operations Manager		**ACTIVITY DATE:** 07/31/2015
STAFF: Stephen Weis	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Compliance inspection of Carmeuse Lime, Inc. River Rouge facility. The Carmeuse facility is scheduled for inspection in FY 2015.		
RESOLVED COMPLAINTS:		

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

Date of Activity:
Friday, July 31, 2015

Personnel Present:

Steve Weis, DEQ-AQD Detroit Office
Andy Blake, Site Operations Manager
Ryan Zavalney, Production Supervisor
Hugh Crosmun, Process Engineer
Jim Mosier, Maintenance Planner

Purpose of Activity

A self-initiated inspection of the Carmeuse Lime, Inc. facility (hereinafter "Carmeuse" or "the River Rouge facility") was conducted on Friday, July 31, 2015. Carmeuse was on my list of sources targeted for an inspection during FY 2015. 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 recently issued Permit to Install No. 193-14.

Facility 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 City of Detroit's Wastewater Treatment Plant 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/SE. BP's 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. 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.

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, for flue gas treatment, for water treatment, and in the construction industry.

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 fired by pulverized coal, with natural gas used during start-ups. 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.

The exhaust gases from the two kilns are sent to one of two baghouses, one for each kiln. Prior to venting to the baghouses, the exhaust air from the kilns is sent through a water spray to lower the exhaust air temperature to below 500°F. Each of the two baghouse units (which are positive pressure, reverse-air baghouse units) consists of 12 compartments that contain a high-temperature fabric filter. The primary purpose of the baghouse units is to control emissions of particulate matter, but due to the resultant coating of limestone-derived material on the fabric filters, the baghouse also provides some measure of control for other pollutants produced by the lime production process, namely sulfur dioxide and hydrogen chloride. Both baghouses currently exhaust to the ambient air via a monovent. Per the requirements of Permit to Install No. 193-14, which was drafted as part of Michigan's 1-hour SO_2 non-attainment SIP development, Carmeuse will be installing a new stack. The new stack will release emissions 100 feet above grade, have a maximum exhaust diameter of 108 inches, and be a single point discharge rather than a vent.

Facility Operations

The Carmeuse facility is a production facility at which limestone is converted to calcium oxide. The facility typically operates 7 days a week, 24 hours per day.

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. Exhaust from the kiln is vented through a positive pressure reverse air baghouse that currently vents to the ambient air via a monovent-type ambient discharge.
- 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 a positive pressure reverse air baghouse that currently vents to the ambient air via a monovent-type ambient discharge.
- 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 1:40pm. I checked in at Carmeuse's offices, and I was told that my contact person, Andy Blake, was currently away from the office. I waited in the reception area, and Andy came in just before 2pm.

Andy and I proceeded to the conference room. I communicated the purpose of the visit, specifying that I wanted to check how Carmeuse demonstrates compliance of the River Rouge facility with the applicable regulations and permits. Andy brought some other Carmeuse staff into the room – Ryan, Hugh and Jim – to assist in presenting information and answering questions . We proceeded to go over the conditions of the facility's ROP.

As we reviewed the ROP, Carmeuse staff referenced SAP, which is a software program used to track equipment maintenance. This software program is used to track maintenance activities for the kilns, as well as for other equipment at the facility including the various baghouses. There are monitors in the conference room that can access the kiln control room screens, which show the operating status and parameters for the kilns, as well as the SAP system. Carmeuse staff used a computer projector to display the information on a white board during the inspection so that we could all reference and review the information being tracked by the facility. I discussed compliance with the ROP conditions and reviewed information with the assembled Carmeuse staff for about 2 hours. A summary of the compliance status of the River Rouge facility with the ROP is found in the following section.

I left the facility at 4:20pm. As I was leaving, a water truck from Carmeuse was wetting Marion Avenue.

Permits/Orders/Regulations

1) Renewable Operating Permit

Renewable Operating Permit No. **MI-ROP-B2169-2013** was issued to the Carmeuse River Rouge facility with an effective date of January 15, 2013. This permit addresses all of the Emission Units and Flexible Groups referenced in the "Facility Operations" section of this report.

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. Special Conditions III.1, VI.1, and all of the conditions under the "IX. Other Requirements" directly list the Consent Order as the applicable requirement. Special Condition VI.2 requires that Carmeuse River Rouge staff perform visible emissions and opacity readings of various locations around the facility on a weekly basis.

Carmeuse staff told me that calcium chloride is applied to any surface on the River Rouge property that is unpaved, and that a vehicle might drive on, at least every 6 weeks. This is **in compliance** with 3.D.2 of Exhibit A of the Consent Order.

Carmeuse staff showed me a log book titled "Weekly Environmental Compliance Requirements". This log book 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. For air, this includes the maintenance of all of the identified fugitive dust sources on site, required equipment inspections, visible emission and opacity readings, and parametric monitoring. I reviewed several entries in the log book, and I was provided with a copy of the weekly log for the week of July 20, 2015. This log indicates that all of the visible emission and opacity observations required by Special Condition VI.2 are being performed. It should be noted that Carmeuse staff performs the visible emission/opacity readings during the week, and staff from 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 provided indicate that Carmeuse is **in compliance** with the requirements in the Source-Wide Conditions section.

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

All of these Emission Units have been grouped together for the purposes of this compliance discussion because they all have, essentially, the same permit requirements. In addition, the compliance demonstrations for these Emission Units are grouped together.

All of the Emission Units has a particulate matter emission limit with Michigan Administrative Rule 331 as the applicable requirement. The emission limits all have the same monitoring/testing method – the requirement that a particulate matter emission test may be required (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. Weekly monitoring and recording of the pressure drop across the baghouses;

3. Daily visible emission 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 accomplished via the aforementioned Weekly Environmental Compliance Requirements log sheet. Referencing the attached example (for the week of July 20) will show the visible emission readings, and the various pressure drops, which are taken on Fridays. 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 staff showed me some outputs from the system, and I was provided with a copy of a report associated with a Kiln 2 baghouse inspection that took place on June 3, 2015 that resulted in some preventative maintenance. This information is attached to this report for reference.

Carmeuse is **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"). This Flexible Group is meant to present the applicable requirements of 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 operations located at a lime manufacturing plant that is a major source."

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, performed on November 13, 2012, indicate **compliance**. The test results showed:

- A PM lbs/ton of stone feed emission rate of 0.029 for Kiln 1, and 0.019 for Kiln 2. The permit limit is 0.12. The permit limit of 0.05 grams per dry standard cubic meter has not been checked, as yet. This limit was promulgated by the Lime MACT, which was not yet in effect when the stack test took place. The next testing event will check this emission limit.
- A sulfur dioxide emission rate of 240 ppm for Kiln 1, and 213.3 ppm for Kiln 2. The permit limit is 300 ppm @ 50% excess air.
- A sulfur dioxide emission rate of 0.56 lbs/MMBTU for Kiln 1, and 0.49 lbs/MMBTU for Kiln 2. The permit limit is 2.4 lbs/MMBTU.

Carmeuse's visible emission/opacity logs show that opacity is **in compliance**. The facility appears to be **in compliance** with the Emission Limits.

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 by Carmeuse staff that the facility has not used either of these fuels for some time, and there are no immediate plans to use them. Glycerin is hard to come by, as the product is in demand for animal feed, which limited the available supplies and raised the price. According to Carmeuse, syngas has not proven to be a viable commodity. Carmeuse has not had any throughputs of these materials, so the facility is **in compliance** with these permit conditions.

III. Process/Operational Restrictions

Special Condition:

III.1 – **in compliance** with applicable emission limits and operating limits put forth in the Lime MACT.

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

III.3 – **in compliance**. Carmeuse checks compliance with the 15% opacity limit. During the inspection, I was shown log sheets titled "Visible Emission Observation Evaluation" through which Carmeuse keeps track of the visible emission/opacity observations of the lime kiln baghouse. I was provided with copies of the entries for July 26 and 28, which are attached to this report for reference.

III.4 – **in compliance**. Carmeuse demonstrated compliance with the Lime MACT opacity limits associated with EUPSHFUGITIVE.

III.5 – **in compliance**. Carmeuse submitted an Operations, Maintenance and Monitoring (OM&M) Plan to the AQD-Detroit office for the River Rouge facility dated September 14, 2007. Carmeuse staff presented their copy of the OM&M Plan during the inspection.

III.6 – **in 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 – **in compliance**. Carmeuse complies with Special Condition III.7.b. by operating the lime kiln baghouse is accordance with the OM&M Plan referenced in Special Condition III.5.

III.8 – **in 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.

IV. Design/Equipment Parameters

There are no permit conditions in this section.

V. Testing/Sampling

Special Condition:

V.1 – **in compliance**. Carmeuse has conducted an approved particulate matter emission test. The test indicated compliance (see discussion under "I. Emission Limits").

V.2 – **in compliance**. Carmeuse has conducted an approved sulfur dioxide emission test. The test indicated compliance (see discussion under "I. Emission Limits").

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

V.6 – **in compliance**. Carmeuse performs analysis on the coal used at the River Rouge facility. The analyses are tracked via the aforementioned SAP software system. Carmeuse described their coal sampling procedure to me. Coal is sampled for both BTU analysis and monthly Greenhouse Gas (GHG) sampling. The GHG sampling involves sampling coal from the feed belt every other day, and sending in a 5 gallon pail of these samples once per month. Carmeuse also collects a grab sample in another 5 gallon pail once per month, and they 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 the records of the coal analyses using the SAP system, and they provided me with a couple of printouts which are attached to this report for reference.

VI. Monitoring/Recordkeeping

Special Condition:

VI.1 – **in compliance**. The air pollution control devices (capture/collection and closed vent system) are inspected at least once each year. Carmeuse staff told me that this task is performed during the annual outage for each kiln. Kiln 1 had its scheduled outage in April 2015, and Kiln 2's scheduled outage in September 6, 2015, during which time the required inspections will be performed. The inspections are tracked in the SAP software system. Carmeuse provided me with a printout of the inspections and maintenance from the SAP system that includes some of the tasks that are scheduled for 9/7/2015 during the outage. The printout is attached to this report for reference.

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

VI.3 – **in compliance**. According to Carmeuse staff, they are operating and maintaining the continuous parameter monitoring system (CPMS) in accordance with the OM&M Plan.

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

VI.6 – **in compliance**. Carmeuse is performing the required visible emission/opacity readings associated with the processes in EUPSHFUGITIVE.

VI.7 – **in compliance**. The daily limestone feed rate is continuously monitored and recorded. This is also recorded in the SAP system. Carmeuse was able to demonstrate these records during the inspection.

VI.8 and VI.9– **in 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 SAP system, which shows the coal usage in each kiln. As described by Carmeuse staff, a daily inventory of production and fuel usage is compiled each night at 11pm. Via the SAP system, Carmeuse can determine the BTU's used to produce lime.

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 Condition:

VII.1 through VII.4 – **in 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

Carmeuse is maintaining the exhaust stack/vent parameters as described in this section. However, Carmeuse will be changing their method of venting their baghouse to the ambient air in accordance with the requirements of Permit to Install No. 193-15. The facility is currently **in compliance**.

IX. Other Requirements

Special Condition:

IX.1 – **in compliance**. Carmeuse is demonstrating compliance with the applicable provisions of 40 CFR Part 63, Subpart AAAAA (the Lime MACT).

IX.2 – **in compliance**. 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. 193-14

This Permit to Install was issued on January 27, 2015. The Permit was issued in support of the 1-hour SO_2 National Ambient Air Quality Standards, and as part of Michigan's SO_2 Non-attainment SIP Plan. As previously mentioned, 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 SO_2 emission rate for the combined exhaust of Kilns 1 and 2. The requirements of this Permit do not begin to apply until October 1, 2018, when Carmeuse is required to begin compiling hourly SO_2 emission rate calculations, and continuously monitor and record the total hourly limestone feed rates to each kiln. Carmeuse will be required to perform a SO2 emission test to determine the SO_2 emission rate no later than April 1, 2019.

3) Federal Regulations

The Carmeuse River Rouge facility is subject to the requirements of **40 CFR Part 63, Subpart AAAAA.** 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.

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 are more stringent than the emission limits in Subpart HH. Thus, the requirements of Subpart HH are not included in Carmeuse's ROP,

Compliance Determination

Based upon the results of the July 31, 2015 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, as well as applicable State and Federal regulations.

Attachments to this report: a printout of the "Weekly Environmental Compliance Requirements" log sheet for the week of July 20, 2015; a printout from Carmeuse's central data system of a Kiln 2 baghouse inspection; copies of the company's "Visible Emission Observation Form" for two days; printouts of coal analysis data; a printout from Carmeuse's SAP software system showing some of the tasks that will take place during outage of Kiln 2.

NAME Steve Weiss DATE 9/15/15 SUPERVISOR JK