United States Environmental Protection Agency
Region 7
Enforcement and Compliance Assurance Division

Air Branch

Air Branch Inspection Report
Partial Compliance Evaluation
Clarios, LLC
4722 Pear Street
St. Joseph, Missouri 64503
FRS# 110011105259

Inspection Date(s):
March 03, 2022

LUKE RODRIGUEZ Digitally signed by LUKE RODRIGUEZ Date: 2022.05.02 07:46:56 -05'00'
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INSPECTION OBJECTIVE

We conducted this partial compliance inspection to determine compliance with 40 CFR 63 Subpart PPPPPP - National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources, at the request of the Region 7 Environmental Justice Office, as part of an overall lead initiative in the community. This inspection is a Creating Cleaner Air for Communities National Compliance Initiative inspection.

Table 1 lists the inspection team members.

Table 1. PROJECT TEAM MEMBERS		
Team Member	**Organization**	**Project Role**
Luke Rodriguez	EPA, Region 7, ECAD	Lead Inspector
Avery Bowers	EPA, Region 7, ECAD	Field team member
Christina Kerr	MDNR, Air Pollution Control	Field team member

FACILITY CONTACT INFORMATION

Table 2 lists the primary facility contacts.

Table 2. FACILITY CONTACT INFORMATION		
Name, Title	**Phone No.**	**Email Address**
Lauren Williams Caudle, Environmental Engineer	816-627-5024	Lauren.williams.caudle@clarios.com
Melissa Bitters, Environmental Engineering Manager	414-339-3206	melissa.bitter@clarios.com
Arnoldo Tejeda, Plant Manager		

FACILITY OVERVIEW

Clarios, LLC (Clarios) operates a lead acid battery manufacturing plant in St. Joseph, Missouri under the authorization of various construction permits listed in Table 4. The facility is subject to the New Source Performance Standard in the code of federal regulations at 40 CFR 60 Subpart KK - *Standards of Performance for Lead-Acid Battery Manufacturing Plants* because it is a lead acid battery manufacturing plant that produces or has the design capacity to produce, in one day, batteries containing an amount of lead equal to or greater than 6.5 tons. The facility is also subject to 40 CFR 63, Subpart PPPPPP - *National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources* because the facility is a lead acid battery manufacturing plant as defined in 40 CFR § 60.371. 40 CFR 63 Subpart PPPPPP requires certain standards of maintenance for control equipment that control the regulated lead emitting processes (described in the Facility Operations Summary below). These requirements differ depending on the control equipment employed. 40 CFR 63 Subpart PPPPPP requires only an initial Performance Test to demonstrate compliance with the emission limits. Clarios conducts an internal performance test every five years in order to meet internal metric goals termed the "Boss Standard."

According to the information in the ECHO database, there have been no EPA or Missouri Department of Natural Resources (MDNR) Clean Air Act (CAA) inspections conducted at or enforcement actions against the facility in the past five years.

Table 3. APPLICABLE REGULATIONS AND STANDARDS	
Code of Federal Regulation	**Standard Name**
40 CFR Part 60	Subpart KK, Standards of Performance for Lead-Acid Battery Manufacturing Plants
40 CFR Part 63	Subpart A, General Provisions Subpart PPPPPP, National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources

Table 4. ISSUED PERMITS	
Permit No.	**Date Issued**
032003-030	March 4, 2003
032003-030A	February 23, 2004
062006-008	June 13, 2006
112006-002	November 2, 2006
102009-010	October 28, 2009
062010-010	June 23, 2010
052011-010	May 23, 2011
062017-005	June 14, 2017
062017-005A	April 9, 2018
092019-003	September 13, 2019
112020-007	November 10, 2020
112020-014	November 25, 2020
022022-006	February 28, 2022

The most recent permit, 022022-006, was issued in February 2022 and authorized an expansion of the plant. The REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE Document associated with the permit states that the facility does not require an operating permit.

FACILITY OPERATIONS SUMMARY

The Clarios facility manufactures starting, lighting, and ignition (SLI) batteries and absorbent glass mat (AGM) batteries. Lead compound emissions are generated from various processes at the facility including grid casting, lead reclamation, pasting, plating operations, and cast-on-strap lines. The processes regulated at Clarios under 40 CFR 63 Subpart PPPPPP, are grid casting facilities (2 production lines), paste mixing facilities (7 production lines), three-process operation facilities (15 assembly lines), lead oxide manufacturing facilities (10 ball mills), and lead reclamation facilities. The control equipment associated with each line is outlined in Appendix E. The results of testing to demonstrate compliance with the emission limitations in 40 CFR 63 Subpart PPPPPP conducted on July 26-30, 2021, are summarized in Table 5.

The battery manufacturing process begins with lead alloy ingots being fed into grid casting machines where the alloy is melted and poured into molds that form the battery grids. Clarios also receives grids from other Clarios facilities. Then, positive and negative grids are coated in lead oxide pastes in pasting machines. Each plate is sent to a drying oven to cure prior to entering the battery cell assembly area. In the battery assembly area, positive and negative plates are stacked in opposing order with insulators or spacers in between each plate. Upon completion, the plate assembly is placed into the battery case where a cast-on-strap is attached to form the internal electric connection. The battery is heat-sealed and sent to the final assembly area of post-production and charging. Final assembly sections are visible in Images 4, 5 and 15 of Appendix A.

The facility operates two strip caster melting pots. The strip caster emissions are controlled by a rotoclone and HEPA filter. Strip caster #1 is the subject of Images 8 and 9 of Appendix A.

The Lead Oxide Manufacturing Facility consists of ten Sovema ball mills. These mills prepare lead oxide for use in the pasting operation. In the mill, lead cylinders combine with air to form lead oxide. Ultimately, the lead oxide is collected in a baghouse then transferred through the cyclone conveyance system to a storage silo. A baghouse equipped with a HEPA filter controls emissions. Ball mills 7-9 are the subject of Image 10 of Appendix A.

The facility operates seven pasting lines. Pasting machines force a paste consisting of lead oxide powder, water, and sulfuric acid into the openings of the expanded grids. From hereafter in the process, the grids are referred to as plates. The plates are then flash dried and stacked. Each pasting line has a wet mixing area where the lead oxide is prepared for use. Emissions from the pasting lines are controlled by a baghouse equipped with a HEPA filter. Pasting Line 1 is the subject of Image 14 of Appendix A.

The facility operates eleven chemset rooms. In this process, pasted lead grids are chemically cured in an environment of controlled heat and humidity. Each room has a 48 – 72-hour cycle. The chemset rooms are vented uncontrolled through stacks on the roof of the building**.** The facility operates three trim dry ovens. In the trim drying process, trimmed pieces of lead from the expanding process are conveyed through a drying oven to remove excess cutting oil. The trim pieces are then recycled. Emissions from the trim dry ovens are vented, uncontrolled, to the atmosphere. Chemset ovens are visible in Images 6 and 7 of Appendix A.

The facility operates fifteen assembly or cast-on-strap (COS) lines. Plates are loaded in one of the fifteen COS machines where molten lead is poured around the plate lugs to form a strap. The elements are assembled into battery cases and the straps are welded to each other to connect the elements. A cover is heat sealed to the battery case. Emissions from COS Lines are vented to a baghouse equipped with a HEPA filter.

Table 5. PERFORMANCE TEST RESULTS
July 26-30, 2022

Process or Operation	Standard	7/21/21 Test Result
Pasting Line	0.000437 gr/dscf	3.75E-07 gr/dscf 7.41E-04 lb/hr
COS Line	0.000175 gr/dscf	0.0000298 gr/dscf 1.61E-03 lb/hr

Table 5. PERFORMANCE TEST RESULTS July 26-30, 2022		
Process or Operation	**Standard**	**7/21/21 Test Result**
Three-process operation	0.000437 gr/dscf	0.0000298 gr/dscf 1.04E-02 lb/hr
Lead oxide manufacturing	0.010 lb/ton	0.000021 gr/dscf 7.87E-04 lb/hr

FIELD ACTIVITIES SUMMARY

I arrived at the facility at approximately 9:00 am on March 3, 2022 and completed a drive by surveillance inspection. I made entry at the front gate at approximately 9:30 am introduced myself and members of the inspection team and presented my credentials to Lauren Williams Caudle. I explained that the purpose of the visit (described above in **Inspection Objective**) was to conduct an inspection to determine compliance with the CAA, specifically, to determine compliance with the conditions listed in Table 3. I explained that after asking for some general business information, I would observe work practices, process units, emission units, control equipment, and review associated records demonstrating compliance with 40 CFR 63 Subpart PPPPPP and certain permit conditions relating to control equipment associated with lead emitting activities.

I began the inspection by asking Ms. Williams Caudle and Mr. Tejeda to thoroughly outline the equipment, control equipment, processes, and products at the facility. We discussed the facility's operations as well as site safety and areas I wished to inspect. During this meeting, I requested and received information and diagrams relevant to the CAA (see appendices for more information). I notified Ms. Williams Caudle and Mr. Tejeda of their right to make a claim of confidential business information and asked them to indicate which records, photographs, or information they would like to claim as such; see Appendix B.

After I reviewed the requested records, we conducted a walkthrough with Ms. Williams Caudle and Mr. Tejeda to look at the equipment previously identified. During the walkthrough, Ms. Bowers collected images with a digital camera, at my direction. The photographs taken along with a description of each photo is attached to this report as Appendix A. I evaluated compliance with the maintenance requirements for all control equipment for each lead emitting processes with the regulations noted in Table 3 and permit conditions noted in Table 4. I obtained copies of the maintenance records as indicated in the Receipt for Documents (Appendix B). Observations from the walk through and records review are documented below in the Inspection Observations and Potential Findings section.

Following the walkthrough, I conducted a closing conference and discussed my findings with Ms. Williams Caudle, Ms. Bitters and Mr. Tejeda. At the closing conference, Mr. Tejeda indicated that none of the information or documents provided or photographs taken would be considered Confidential Business Information. He signed and we provided him a copy of the Confidentiality Notice (Appendix B). Mr. Tejeda also signed the Receipt for Documents and Samples form at this time (Appendix C). I did not collect samples for laboratory analysis or conduct measurements with handheld equipment during the inspection. I obtained background information and data pertaining to the facility from the Missouri Department of Natural Resources' (IDNR) and the EPA's files.

INSPECTION OBSERVATIONS AND POTENTIAL FINDINGS

Ambient weather, site conditions and activities were documented in field records. All photographs are attached as Appendix A. I made the following observations during the inspection. I discussed all observations with facility representatives during the closeout meeting unless otherwise noted in the observation description.

These observations are not final compliance determinations. EPA Region 7 Air Branch case review team will make the final compliance determinations based on its review of this report and other technical, regulatory, and facility information.

Fabric Filter Requirements

40 CFR 63 Subpart PPPPPP allows a facility using a fabric filter equipped with a HEPA filter to monitor according to the schedule in 40 CFR § 63.11423(b)(iv)(A) or (B). 40 CFR § 63.11423(b)(iv)(A) says that if the facility is using a pressure drop monitoring device to measure the differential pressure drop across the fabric filter, it must record the pressure drop at least once per week. 40 CFR § 63.11423(b)(iv)(B) says if the facility is conducting visible emissions observations, it must conduct the observations at least once per week and record the results. Clarios has elected to submit the results of both monitoring methods to demonstrate compliance with 40 CFR 63 Subpart PPPPPP in the monitoring system performance report mentioned later. 40 CFR 63 Subpart PPPPPP allows weekly monitoring of the differential pressure. Construction Permits authorizing the installation of this equipment required daily readings be recorded. Both Subpart PPPPPP and the Special Conditions of the construction permits require that a pressure drop observed outside of the normal operational ranges, must be recorded, and corrective action taken. The manufacturer establishes normal ranges and these are present on the log used to record the differential pressures daily. As explained by Ms. Williams Caudle, each fabric filter is equipped with a monitoring device to measure the differential pressure across the filter. Once per day, as required by special permit conditions, a technician records the differential pressure on a log that Ms. Williams Caudle reviews. By Clarios procedure if a reading is outside the normal range, the technician should log the incident in Maximo, a maintenance tracking software, and take corrective action. I reviewed several randomly selected logs. I observed instances where the incident was recorded in Maximo corresponding to a differential pressure reading outside of the normal range noted on the log. I also observed records entered on the log but could not find a corresponding record in Maximo. Ms. Williams Caudle believes that, in the cases of the observations with no Maximo entries, the technicians did take corrective action because the differential pressure returned to normal by the following reading, however, they failed to log the corrective action in Maximo.

Visible emission (opacity) readings of the stacks associated with the control equipment are also required weekly if complying with option (B); these readings are tracked on a separate document from the pressure drop records. I reviewed records from several randomly selected months. The facility has never observed any opacity during their recurring checks and therefore have not been required to conduct an opacity measurement in accordance with 40 CFR 60.374(b)(3). I was told by Ms. Williams Caudle, that one employee maintains a Method 9 testing certification in the event that a reading is required.

Per 63.11423(b)(2)(iv)(A), the facility is required to submit a monitoring system performance report. Clarios submits this report semi-annually as required with the most recent on January 27, 2022.

Written Maintenance Plan

There is a requirement in section Permit 032003-030A Baghouse Conditions (C)(3) for a written maintenance plan for specified control equipment. Mr. Tejeda told me that this written plan has not been drafted or finalized. Mr. Tejeda told me that the Maximo system is capable of a holistic preventative maintenance program but that they were in the process of implementing the program and had not yet reached the baghouses. There was no written record of regular maintenance inspection schedules, or the date, and results of all maintenance inspections including any actions or maintenance activities that resulted from the inspections available to review.

Scrubber Requirements

Facilities which use a scrubber to control an emission point from a lead emitting process, are required by 40 CFR §63.11423(b)(1) to install, calibrate, maintain, and operate a monitoring device that measures and records the pressure drop across the scrubbing system at least once every fifteen minutes. Per 40 CFR 60 Subpart KK 60.373, the monitoring device shall have an accuracy of ±5 percent over its operating range. I reviewed records of the monitoring device. Readings are recorded every fifteen minutes, as required. I requested documentation demonstrating the accuracy of the device, but they were not available at the time of the inspection. After the inspection, Ms. Bitter informed me by email on March 10, 2022, included as Appendix F, that she could not find documentation that the supplier could certify this requirement or had calibrated the equipment to ensure that this requirement was met. Following my visit to the facility, I was notified by Ms. Williams-Caudle that Clarios has set up an annual preventative maintenance schedule for that equipment so the calibrations will be completed annually going forward.

Fugitive Emissions

I informed Ms. Williams Caudle and Mr. Tejeda that during our drive-by surveillance, we observed, at the southeast corner of the building, as seen in Image 1 and 2 of Appendix A, that a rollup door stood open and there appeared to be no activity which would necessitate the open door. I asked Ms. Williams Caudle how the facility estimates fugitive emissions which are reported as part of the emission inventory and TRI. She explained that the facility uses filters which are spread around the production area quarterly to determine a lead concentration in the air. There are 8 fans in the roof that run at a constant speed. The lead concentration of the air is multiplied by the fan throughput and the total operating time for the year. Additionally, there are uncontrolled sources which vent to the atmosphere, such as the chemset ovens. These are tested as part of the "Boss Standards Test" every five years, the most recent occurring in July 2021. Emissions from the uncontrolled sources use the emission factor from the most recent test and the total operation of each oven annually. I asked Ms. Williams Caudle if the fugitive emission calculations assumed that the doors and loading zones always remained closed except when loading occurred and she said yes. Mr. Tejeda thought that there might be some explanation, such as a malfunction, but that it was a known expectation at the facility that doors should always remain closed when not in use. Upon leaving the facility at approximately 2:20 pm, we noted that the door was still open, see Image 16 in Appendix A.

Potential Finding 1: Maintenance Recordkeeping
Observation Summary: There are missing records of corrective actions taken when the differential pressure exceeded the normal operating range.
Citation: 40 CFR 63 §63.11423(b)(2)(iv)(A)
Evidence: Attachment D – Maintenance Record

Potential Finding 1: Maintenance Recordkeeping
Description of Observation: On 10/10/21, Radco 3 and Radco 4 baghouses exceeded the pressure differential of the normal operating range. There is no record of the corrective action taken. On 2/5/22 and 2/6/22, BH-1 baghouse exceeded the pressure differential of the normal operating range. There is no record of the corrective action taken I requested to review the record of the corrective actions taken. The facility could not produce these records.

Potential Finding 2: Written operation and maintenance plan lacking components.
Observation Summary: The facility is required to maintain an operation and maintenance log for the control equipment. The log reviewed during the inspection did not have all of the required information.
Citation: Permit 032003-030A Control Device Requirements (C)(3)
Evidence: The facility could not produce a maintenance schedule for control equipment.
Description of Observation: I asked to view the written record of regular inspection schedule, the date, and results of all inspections including any actions or maintenance activities that result from that inspection. Mr. Tejeda told me that they were working to get the preventative maintenance schedules into Maximo but had not yet completed this work. The facility could not provide a list of the inspection, repair, and replacement schedules for the control equipment.

Potential Finding 3: Scrubber Monitoring Device Accuracy
Observation Summary: A scrubbing system installed to comply with 40 CFR 63 Subpart PPPPPP shall have an accuracy of ±5 percent over its operating range. I asked the facility to demonstrate compliance with this requirement and they could not.
Citation: *40 CFR 63 Subpart § 63.11423(b)(1) & 40 CFR 63 Subpart §63.373*
Evidence: email stating that the Facility could not produce records ensuring monitoring device accuracy. **Appendix F**
Description of Observation: In an email on 3/10/22, Ms. Bitter indicated that the facility could not find or produce documentation of calibration to demonstrate the required accuracy of the equipment. Her email indicated that she requested that the manufacturer return to complete the calibration.