GM LANSING GRAND RIVER ASSEMBLY (LGR)
COMPLIANCE ASSURANCE MONITORING PLAN
April 11th, 2022

I. Background

Compliance Assurance Monitoring (CAM) under 40 CFR Part 64 for major stationary sources applies to pollutant-specific emissions units at a major source that is required to obtain a part 70 or 71 permit if the unit satisfies all of the following criteria:

1.) The unit is subject to an emission limitation or standard for the applicable regulated air pollutant other than an emission limitation or standard that is exempt under 40 CFR Part 64, Section 64.2 (b)(1),

2.) The unit uses a control device to achieve compliance with any such emission limitation or standard; and

3.) The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

To provide reasonable assurance of compliance with emission limitations or standards for the anticipated range of operations at a pollutant-specific emissions unit, monitoring shall meet the following general criteria:

1.) The owner or operator shall design the monitoring to obtain data for one or more indicators of emission control performance,

2.) The owner or operator shall establish appropriate range(s) or designated conditions(s) for the selected indicators such that operation within the range provides reasonable assurance of ongoing compliance with emission limitations or standards over the anticipated range of operating conditions, and

3.) The design of indicator ranges or designated conditions may be based on a single maximum or minimum value, may be expressed as a function of process variables, may be expressed as a particular operational status or condition, or may be an inter dependence between more than one indicators.

The monitoring plan shall include a justification for the proposed elements of the monitoring plan and, if different from the manufacturer recommendations, an explanation of the reasons for the differences shall be discussed.

For Lansing Grand River (LGR), there are three sources that have prior to control potential volatile organic compounds (VOCs) emissions greater than 100 tons and are thus subject to CAM under 40 CFR Part 64. These sources are EU-ELECTROCOAT, EU-GUIDECOAT and FG-TOPCOAT.

II. Applicable Permit Requirements

Permit Number: MI-ROP-A1641-2017

A. Emission Unit Descriptions

EU-ELECTROCOAT: An electrocoat dip tank followed by an electrocoat curing oven followed by a dry filtered scuff booth.
EU-GUIDECOAT: A guidecoat spray booth followed by a curing oven. The solvent borne guidecoat is applied automatically with electrostatic bell applicators or equivalent.
EU-TOPCOAT1 and EU-TOPCOAT2: Two parallel topcoat spray systems which consist of a spray booth followed by a curing oven. There is a heated flash-off area located between the basecoat portion of the booth and the clearcoat portion of the booth. The waterborne basecoat is applied automatically with electrostatic bell and electrostatic robot applicators or equivalent. The solvent borne clearcoat is applied automatically with electrostatic bell and electrostatic robot applicators or equivalent.

B. Pollution Control Equipment

EU-ELECTROCOAT: VOC emissions from both the tank and oven are controlled by a thermal oxidizer (No. 1).
EU-GUIDECOAT: The guidecoat booth is equipped with a wet eliminator system to control particulate emissions from paint overspray. The spraybooth is comprised of two zones, both utilizing automatic applicators. VOC emissions from Zone 1 of the automatic electrostatic bell section of the guidecoat booth are controlled by thermal oxidizer No. 2. VOC emissions from Zone 2 are vented to the atmosphere. VOC emissions from the guidecoat curing oven are controlled by thermal oxidizer No. 1.
EU-TOPCOAT1 and EU-TOPCOAT2: The topcoat booths are equipped with a wet eliminator system to control particulate emissions from paint overspray. VOC emissions from the two automatic clearcoat sections of the topcoat booths and the flash-off area are controlled by thermal oxidizer No. 2. VOC emissions from the topcoat curing ovens are controlled by thermal oxidizer No. 1.

C. Emission Limits

Emission Unit	Flexible Group ID
EU-ELECTROCOAT	FG-Facility
EU-GUIDECOAT	FG-Facility
EU-TOPCOAT1 and EU-TOPCOAT2	FG-Facility, FG-Topcoat

Emission Limits

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. VOC	606 tons per year	12-month rolling time period as determined at the end of each calendar month.	FG-Facility	Special Condition VI.2	R 336.1225, R 336.1702(a), R 336.1901 and 40 CFR 52.21
2. VOC	264.3 tons per year	12-month rolling time period as determined at the end of each calendar month.	FG-Facility for production rates less than 60,000 jobs per year.	Special Condition VI.2	R 336.1225, R 336.1702(a), R 336.1901 and 40 CFR 52.21
3. VOC	5.73 pounds per job	12-month rolling time period as determined at the end of each calendar month.	FG-Facility for production rates 60,000 or more jobs per year.	Special Condition VI.2	R 336.1225, R 336.1702(a), R 336.1901 and 40 CFR 52.21

III. Control Devices

LGR uses the following control devices to control VOC emissions from the emissions units applicable to CAM: Thermal Oxidizer No. 1, Thermal Oxidizer No. 2, and two parallel rotary carbon concentrator (RCC) adsorption units upstream of Thermal Oxidizer No. 2.

A. Thermal Oxidizer No. 1

Regenerative thermal oxidizer (RTO) No. 1 (located on the south side of Paint Shop) is used to control emissions from the EU-ELECTROCOAT process emissions as well as the curing ovens for EU-GUIDECOAT, EU-TOPCOAT1 and EU-TOPCOAT2.

Monitoring Approach

	Compliance Indicator: RTO Temperature
A. Indicator	The RTO combustion temperature is measured with two thermocouples, one per combustion chamber. The average of the two readings is used for compliance with the minimum temperature required by the permit. The temperatures are monitored continuously and recorded at equally spaced intervals at least once every 15 minutes.
B. Indicator Range	The RTO temperature shall be a minimum temperature of 1400°F.
C. Bypass System Detection	The FG-Facility special condition no. VI.3 requires bypass monitoring such that each valve or closure mechanism cannot be opened without creating an alarm condition for which a record shall be made.

Performance Criteria, as required by 40 CFR §63.3(b)

	Compliance Indicator: RTO Temperature
A. Data Representativeness	There is a thermocouple located in each combustion chamber.
B. Verification of Operational Status	N/A - The system is not new and has not been modified
C. QA/QC Practices and Criteria	Validation of thermocouple accuracy or recalibration of each thermocouple will occur at minimum annually. The thermocouple may be replaced in lieu of validation.
D. Monitoring Frequency	Continuous, and recorded at equally spaced intervals at least once every 15 minutes.

E. Data Collection Procedures and Averaging Period; and excursion determination	GM collects the temperature records on the Yokogawa data historian from the average of the two thermocouples at least every 15 minutes during coating operations. Compliance with the minimum combustion temperature is based upon the average combustion temperature recorded every 15 minutes. Further, GM calculates three-hour averages of the combustion temperature when any one data point falls below the minimum required temperature, per EU-ELECTROCOAT special condition no. IV.1, EU-GUIDECOAT special condition no. IV.1 and IV.2, and FG-TOPCOAT special condition no. IV.1 and IV.2. Excursions are defined by FG-Facility special condition no. IX.7 as the following: a. A temperature excursion is defined as a confirmed three-hour period during which the average fails to meet the specified temperature requirements in special conditions III.1, III.2, and III.3 b. A monitoring excursion is defined as a failure to properly monitor as required in special conditions VI.3 and VI.4 c. An inspection excursion is defined as failure to complete an inspection required in special conditions VI.5 and VI.6. Note: the averaging time for a temperature excursion is 3 hours. Upon confirming an excursion, the site will follow the requirements of FG-Facility, special condition no. VII.4.

B. Thermal Oxidizer No. 2 and Rotary Carbon Concentrator (RCC) Adsorption Units

Regenerative thermal oxidizer (RTO) No. 2 (located on the north side of Paint Shop) is used to control emissions from Zone 1 of the automatic bells section portion EU-GUIDECOAT and the automatic clearcoat sections of the topcoat booths and the flash-off area of EU-TOPCOAT1 and EU-TOPCOAT2. Two parallel rotating carbon concentrator (RCC) units uses carbon adsorption to capture the VOCs from the high volume, low VOC concentrated exhaust stream and then transfers these VOCs to a smaller volume, heavily concentrated air stream via desorption. The concentrated VOCs are transferred to the RTO No. 2 for destruction.

Monitoring Approach

	RCC Wheel Motion	**RCC Temperature**	**RTO Temperature**
A. Indicator	Continuous motion/ rotation of the adsorbent wheel	The RCC desorption gas inlet temperature is measured with one thermocouple which is used for compliance with the minimum temperature required by the permit. The temperatures are monitored continuously and recorded at equally spaced intervals at least once every 15 minutes.	RTO combustion temperature is measured with two thermocouples, one per combustion chamber. The average of the two readings is used for compliance with the minimum temperature required by the permit. The temperatures are monitored continuously and recorded at equally spaced intervals at least once every 15 minutes.

B. Indicator Range	The motion sensor output is monitored by the system PLC to determine system status. A system alarm occurs in the event that motion is not detected.	The RCC desorption gas inlet temperature shall be above the temperature from the most recent acceptable performance test minus 15°F. The temperature of the most recent test was 250°F.	The RTO temperature shall be a minimum temperature of 1400°F.
C. Bypass System Detection	The FG-Facility special condition no. VI.3 requires bypass monitoring such that each valve or closure mechanism cannot be opened without creating an alarm condition for which a record shall be made.		

Performance Criteria, as required by 40 CFR §63.3(b)

	RCC Wheel Motion	**RCC Temperature**	**RTO Temperature**
A. Data Representativeness	There are two carbon wheels, one per parallel RCC. Each has a Read Switch to sense motion.	There is one thermocouple located in the combined desorb air supply for the RCCs.	There is a thermocouple located in each combustion chamber.
B. Verification of Operational Status	N/A – The system is not new and has not been modified		
C. QA/QC Practices and Criteria	N/A Note: A system priority fault results if wheel movement is not detected.	Validation of thermocouple accuracy or recalibration of each thermocouple will occur at minimum annually. The thermocouple may be replaced in lieu of validation.	
D. Monitoring Frequency	Continuous, not recorded	Continuous, and recorded at equally spaced intervals at least once every 15 minutes.	
E. Data Collection Procedures and Averaging Period; and excursion determination	A system alarm occurs in the event that motion is not detected.	GM collects the temperature records on the Yokogawa data historian from the average of the two thermocouples at least every 15 minutes during coating operations. Compliance with the minimum combustion temperature is based upon the average combustion temperature recorded every 15 minutes. Further, GM calculates three-hour averages of the combustion temperature when any one data point falls below the minimum required temperature, per EU-GUIDECOAT special condition no. IV.1 and IV.2 and FG-TOPCOAT special condition no. IV.1 and IV.2. Excursions are defined by FG-Facility special condition no. IX.7 as the following: a. A temperature excursion is defined as a confirmed three-hour period during which the average fails to meet the specified temperature	

		requirements in special conditions III.1, III.2, and III.3 b. A monitoring excursion is defined as a failure to properly monitor as required in special conditions VI.3 and VI.4 c. An inspection excursion is defined as failure to complete an inspection required in special conditions VI.5 and VI.6. Note: the averaging time for a temperature excursion is 3 hours. Upon confirming an excursion, the site will follow the requirements of FG-Facility, special condition no. VII.4.

IV. Justification

A. Rational for Selection of Performance Indicators

The average RTO combustion chamber temperature and the RCC inlet desorption gas temperature were both selected because they are indicative of the VOC destruction occurring within the RTO and VOC removal occurring in the RCC and are both widely accepted methods of monitoring. If the chamber temperature decreases significantly, then complete combustion may not occur, reducing the destruction efficiency. Therefore, the requirement to monitor temperature and maintain appropriate records is a justification for assuring VOC destruction efficiency. If the RCC inlet desorption temperature decreases significantly, then proper VOC removal cannot take place, reducing removal efficiency. Therefore, the requirement to monitor temperature and maintain appropriate records is a justification for assuring VOC removal efficiency. Temperature monitoring is specifically identified in the monitoring/recordkeeping requirements under the identified Emission Units and Flexible Groups.

B. Rational for Selection of Indicator Ranges

The selected indicator for RTO No. 1 and No. 2 is the minimum average combustion chamber temperature of 1400°F. This minimum temperature is specified in the current ROP. The selected indicator of the RCC is maintaining the temperature above the temperature from the most recent acceptable performance test minus 15°F, as specified in 40 CFR § 63.3167.

C. Performance Test

The last VOC RTO Destruction Efficiency testing was performed on December 7 through 10, 2015. The destruction efficiency of RTO No. 1 was 94.02%. The destruction efficiency of RTO No. 2 was 97.9%.