Saginaw Metal Casting Operation (SMCO)
CAM / MAP PLAN DESCRIPTION – SCRUBBERS
Date: March 24, 2021

The information provided in this document fulfills Federal Compliance Assurance Monitoring (CAM) requirements pursuant to 40 CFR Part 64 and the State of Michigan Malfunction Abatement Plan (MAP) requirements pursuant to Rule 911 (2).

The CAM Plan can be found in Sections 1 – IV and the MAP plan can be found in Section V. This plan is applicable to the two scrubbers.

I. Background

A. Emissions Unit

Description: SMCO uses two scrubbers to control emissions from precision sand and semi-permanent mold coremaking processes. These processes, identified as EU-PSANDCOREROOM and EU-SPMCOREROOM, are summarized in Appendix A.

Facility: General Motors LLC – Saginaw Metal Casting Operations
1629 N. Washington
Saginaw, MI 48601

B. Applicable Regulation, Emissions Limit, and Monitoring Requirements

Renewable Operating Permit No. MI-ROP-B1991-2015c and pending renewal
Permit to Install No. 36-12J

A summary of the CAM applicable emissions limits for each process can be found in Appendix A.

Control Technology: This CAM/MAP plan covers scrubbers.

Monitoring Requirements:
Scrubber flow, pH, and pressure drop

Potential Pre-Control Emissions: See Appendix A for the estimated potential pre-control emissions for each scrubber.

II. Monitoring Parameters and Frequency; Inspection Activities; Corrective Actions

	Scrubber Flow	pH	Pressure drop
A. Indicator	Scrubber flow is measured with a flow meter.	pH of the scrubber liquid is measured with a pH meter.	Pressure drop across the scrubber is measured with a differential pressure gauge.
B. Indicator Range	See Appendix A for the Indicator Range for each scrubber. An excursion is a departure from the indicator range shown in Appendix A based on a three hour average. If outside the indicator range, malfunction abatement activities will commence		
C. ByPass System Detection	There is no bypass of the scrubbers.		

III. PERFORMANCE CRITERIA

	Scrubber Flow	pH	Pressure drop
A. Data Representativeness	The flow rate of scrubbing solution circulated through the scrubber is measured after the circulation pump.	The pH of the scrubbing solution is measured in the scrubber reservoir.	Pressure taps are located at the gas phase inlet and outlet of the scrubber
B. Verification of Operational Status	Not Applicable	Not Applicable	Not Applicable
C. QA/QC Practices & Criteria	Flow meter is calibrated annually	pH monitoring equipment are calibrated monthly	Pressure gauge is calibrated annually
D. Monitoring Frequency	Flow is monitored continuously	pH is monitored continuously	Pressure drop is monitored continuously
E. Data Collection Procedure	Flow is recorded every 15 minutes	pH is recorded every 15 minutes	Pressure drop is recorded every 15 minutes
F. Averaging Period	3-hour average to determine an excursion	3-hour average to determine an excursion	3-hour average to determine an excursion

IV. Justification

A. Rationale for Selection of Performance Indicators

Scrubber efficiency is dependent on ensuring sufficient reactivity between the scrubbing fluid and the gaseous air contaminant. This liquid to gas ratio is a key operating parameter for the scrubber. The scrubbing fluid needs to be in a certain pH range and with sufficient flow for the reaction to occur.

B. Rational for Selection of Indicator Ranges

GM selected the indicator ranges based on the scrubber manufacturer's recommendation and site operating experience. Additionally, compliance stack testing results support the ranges. (See Appendix B for summary of stack testing results and the pressure drop ranges during the test.)

An excursion from an indicator range, based on a three hour average, triggers an inspection, corrective action, and reporting, according to applicable special conditions in the permit. Corrective actions are further outlined below under the MAP section.

C. Performance Test

During 2015 and 2016, performance tests were performed on the portions of EU-SPMCOREROOM and EU-PSCOREROOM which are controlled by the associated scrubber. A summary of the performance test results and indicator monitoring ranges during each test can be found in Appendix B. All results showed compliance with applicable emission limits. Copies of test reports have been previously submitted AQD's Technical Programs Unit and the Bay City District Office. This testing confirms that the chosen indicator ranges correlates with

compliance with limits. There have been no significant changes to the processes or scrubbers that would affect scrubber performance since the testing occurred.

V. Malfunction Abatement Plan (Michigan Rule 911)

A. Preventive Maintenance Program (Rule 911(2)(a))

In general, GM will follow the preventative maintenance program recommended by the equipment manufacturer. Maintenance will be performed by SMCO maintenance personnel or outside contractors. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded.

A semi-annual scrubber inspection will be conducted, and the scrubber will be cleaned, as necessary, based upon the inspection. In addition, the scrubber media will be replaced based upon the results of the inspection.

Some replacement parts will be available in order to conduct rapid repairs, if needed. Typical spare parts include pH probes, pumps, and valves. If a serious problem is discovered, parts suppliers shall be contacted, and equipment will be obtained as quickly as possible.

B. Air Cleaning operating variables (Rule 911(2)(b))

The identification of the source and air-cleaning device operating variables that will be monitored to detect a malfunction or failure, their normal operating range, and monitoring method are described in Section II above and Appendix A.

C. Corrective procedures or operational changes (Rule 911(2)(c))

Emissions in excess of a permit limit can result from a malfunction of the process or associated scrubber. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant's Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Engineer shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant's Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the scrubber or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant's Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant's Environmental Engineer, or designee, will contact EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

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3-24-2020

SMCO CAM/MAP Plan for Scrubbers and RTO

Appendix A

Collector Id	Emission unit/process step	Annual controlled emission - permit basis TPY	Potential uncontrolled emission based on control efficiency TPY	CAM, MAP or Both	MAP subject emission limit	CAM subject emission limit	Emission limit value (lb/hr), unless otherwise noted	Indicator Justification	Indicator	Indicator Range
Z03-ISO-01	**EU-PSANDCOREROOM/ coremaking processes ducted to acid scrubber**	PM 1.53 PM10 1.53 PM2.5 1.53 VOC 22.00	PM 30.6 PM10 30.6 PM2.5 30.6 VOC 440.00 based on 95 % control	Both	PM/PM10/PM2.5	VOC	PM 0.56 PM10 0.56 PM2.5 0.56 VOC 8.10	Supplier recommendation and operating experience	Pressure drop	0.1 - 6 inches water column
									scrubber flow	> 190 gallons per minute
									pH	< 4.5
Z05-ISO-02	**EU-SPMCOREROOM/ coremaking processes ducted to caustic scrubber**	PM 1.36 PM10 1.36 PM2.5 1.36 VOC 3.72 SO2 16.55	PM 27.2 PM10 27.2 PM2.5 27.2 VOC 74.4 SO2 331.0 based on 95 % control	Both	PM/PM10/PM2.5 VOC	SO2	PM 0.45 PM10 0.45 PM2.5 0.45 VOC 1.23 SO2 5.49	Supplier recommendation and operating experience	Pressure drop	0.1 - 12 inches water column
									scrubber flow	> 390 gallons per minute
									pH	> 7.5
Z02-RTO-03 (see note 1)	**EU-PSANDCASTLINE/ pouring, cooling and shakeout ducted to RTO**	VOC emissions only pouring/cooling 2.19 shakeout 8.31	VOC emissions only pouring/cooling 43.8 shakeout 166.2 total 210.0	Both	VOC	VOC	VOC 4.07	Operating Experience	RTO combustion temperature	> 1400 degrees F

Note 1: For particuate control, the RTO is preceded by a cartridge collector for pouring and cooling and a baghouse for shakeout. Both the cartridge collector and baghouse are CAM subject for PM/PM10/PM2.5. See the CAM/MAP plan for the fabric filter collectors.

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SMCO CAM/MAP Plan for Scrubbers and RTO

Appendix B - Stack Testing Summary

Emission Unit	CAM Subject (Y/N)	Pollutants	Emission Limits (Lbs/Hr)	Test Result	Percent of Limit	Monitoring Range during test	Report date
EU-PSANDCOREROOM	Yes	DMIPA	1.77	0.022	1.24%	Pressure drop: 2 - 2.29 inches water Flow: 207 - 209 gal/min pH: 2.77 - 2.89	3/7/2016
EU- PSANDCASTLINE	Yes	PM	2.85	0.37	12.98%	Baghouse pressure drop: 0.4 - 0.50 inches water Cartridge collector pressure drop: 0.73 - 1.02 inches water RTO combustion temp: 1420 - 1463 F	1/4/2016
		PM10	5.55	0.37	6.67%		
		PM2.5	5.55	0.37	6.67%		
		NOx	4.46	1.17	26.23%		
		VOC	4.07	1.62	39.80%		
EU-SPMCOREROOM	Yes	SO2	4.82	0.07	1.45%	Pressure drop: 2.07 - 2.6 inches water Flow: 393 - 397 gal/min pH: 8.6 -12.6	2/16/2015