Michigan Department of Environment, Great Lakes, and Energy
Air Quality Division

State Registration Number		ROP Number
A1641	**RENEWABLE OPERATING PERMIT STAFF REPORT**	MI-ROP-A1641-2024

General Motors LLC - Lansing Grand River Assembly

State Registration Number (SRN): A1641

Located at

920 Townsend Street, Lansing, Ingham County, Michigan 48933

Permit Number: MI-ROP-A1641-2024

Staff Report Date: February 12, 2024

This Staff Report is published in accordance with Sections 5506 and 5511 of Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). Specifically, Rule 214(1) of the administrative rules promulgated under Act 451, requires that the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD), prepare a report that sets forth the factual basis for the terms and conditions of the Renewable Operating Permit (ROP).

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RENEWABLE OPERATING PERMIT

February 12, 2024- STAFF REPORT

ROP Number

MI-ROP-A1641-2024

Purpose

Major stationary sources of air pollutants, and some non-major sources, are required to obtain and operate in compliance with an ROP pursuant to Title V of the federal Clean Air Act; and Michigan's Administrative Rules for Air Pollution Control promulgated under Section 5506(1) of Act 451. Sources subject to the ROP program are defined by criteria in Rule 211(1). The ROP is intended to simplify and clarify a stationary source's applicable requirements and compliance with them by consolidating all state and federal air quality requirements into one document.

This Staff Report, as required by Rule 214(1), sets forth the applicable requirements and factual basis for the draft ROP terms and conditions including citations of the underlying applicable requirements, an explanation of any equivalent requirements included in the draft ROP pursuant to Rule 212(5), and any determination made pursuant to Rule 213(6)(a)(ii) regarding requirements that are not applicable to the stationary source.

General Information

Stationary Source Mailing Address:	General Motors LLC - Lansing Grand River Assembly 920 Townsend Street Lansing, Michigan 48933
Source Registration Number (SRN):	A1641
North American Industry Classification System (NAICS) Code:	336111 - Automobile Manufacturing
Number of Stationary Source Sections:	1
Is Application for a Renewal or Initial Issuance?	Renewal
Application Number:	202200093
Responsible Official:	Jennifer Bigelow, Plant Director 313-407-2513
AQD Contact:	Matt Karl, Senior Environmental Quality Analyst 517-282-2126
Date Application Received:	April 13, 2022
Date Application Was Administratively Complete:	April 13, 2022
Is Application Shield in Effect?	Yes
Date Public Comment Begins:	February 12, 2024
Deadline for Public Comment:	March 13, 2024

Source Description

The General Motors LLC Lansing Grand River Assembly facility is an automobile painting and assembly plant. The facility is located at 920 Townsend Street, Lansing, Michigan, which is bordered to the north by West Malcolm X Street and I-496, to the west by South Martin Luther King Jr. Boulevard, and to the east and south by the Grand River. Downtown Lansing is located to the north, Westside is to the northwest, Sagamore Hills is to the southwest, Moores Park is to the south and REO Town is to the east.

The facility consists of multiple buildings including General Assembly, the Paint Shop, Stamping, the Body Shop, Logistics and Administration.

The most significant criteria air pollutant emitted is Volatile Organic Compounds (VOCs) that result from the automobile painting operations in the Paint Shop building. The VOC emissions are controlled by a regenerative thermal oxidizer (RTO), a rotary carbon concentrator (RCC) system and a second RTO. The RTOs control the VOC emissions by combusting them, breaking down more complicated organic compounds into carbon dioxide (CO_2) and water vapor. The RTOs typically have a VOC destruction efficiency (DE) of 95% or greater. The RCC system uses carbon adsorption to concentrate VOCs in the exhaust gas stream prior to combusting them in the second RTO.

The following table lists stationary source emission information as reported to the Michigan Air Emissions Reporting System (MAERS) for the year **2022**.

TOTAL STATIONARY SOURCE EMISSIONS

Pollutant	Tons per Year
Carbon Monoxide (CO)	4.08
Nitrogen Oxides (NO_x)	20.36
PM10*	15.35
Sulfur Dioxide (SO_2)	0.15
Volatile Organic Compounds (VOCs)	144.50

* Particulate matter (PM) that has an aerodynamic diameter less than or equal to a nominal 10 micrometers.

The following table lists Hazardous Air Pollutant emissions as calculated for the year 2022 by the AQD:

Individual Hazardous Air Pollutants (HAPs) **	Tons per Year
Total Hazardous Air Pollutants (HAPs)	**49.53**

**As listed pursuant to Section 112(b) of the federal Clean Air Act.

See Parts C and D in the ROP for summary tables of all processes at the stationary source that are subject to process-specific emission limits or standards.

Regulatory Analysis

The following is a general description and history of the source. Any determinations of regulatory non-applicability for this source are explained below in the Non-Applicable Requirement part of the Staff Report and identified in Part E of the ROP.

The stationary source is in Ingham County, which is currently designated by the United States Environmental Protection Agency (USEPA) as attainment/unclassified for all criteria pollutants.

The stationary source is subject to Title 40 of the Code of Federal Regulations (CFR) Part 70 because the potential to emit of Volatile Organic Compounds (VOCs) exceeds 100 tons per year. Also, the potential to emit of any single HAP regulated by Section 112 of the federal Clean Air Act is equal to or more than 10 tons per year and/or the potential to emit of all HAPs combined is equal to or more than 25 tons per year.

The emission units associated with PTI No. 134-99F, consisting of EUGASTANK#1, EUGASTANK#2, EUGASTANK#3, EUDIESELTANK, EUAFTANK#1, EUAFTANK#2, EUMETHTANK (renamed EUWWFTANK#1), EUTFTANK, EUPSFTANK, EUWOTANK, EUWGASTANK, EUWSOLVENTTANK, EUELECTROCOAT, EUSEALERS&ADHES, EUGLASSINSTALL, EUGUIDECOAT, EUTOPCOAT1, EUTOPCOAT2, EUDEADENER, EUFOAM, EUPURGE, EUOTHERSOLVENTS, EUVEHFUELFILL, EUNATURALGAS, EUSPOTREPAIR1, EUSPOTREPAIR2, EUSPOTREPAIR3, EUELPOMETALRPR, EUFINALREPAIR1, EUFINALREPAIR2, EUFINALREPAIR3, EUFINALREPAIR4, and EUSTARTUP/ROLLTEST at the stationary source were subject to review under the Prevention of Significant Deterioration regulations of 40 CFR 52.21 because at the time of New Source Review permitting, the potential to emit of Volatile Organic Compounds (VOCs) was greater than 250 tons per year.

EUELECTROCOAT, EUGUIDECOAT, and FGTOPCOAT (EUTOPCOAT1, and EUTOPCOAT2) at the stationary source are subject to the Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations promulgated in 40 CFR Part 60, Subparts A and MM.

FGSTORAGETANKS (EUGASTANK#1, EUGASTANK#2, EUGASTANK#3, EUGASTANK#4, and EUWWFTANK#1) at the stationary source are subject to the Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction or Modification Commenced After July 23, 1984, promulgated in 40 CFR Part 60, Subparts A and Kb.

FGNSPSJJJJ (EUEMERGENCYGENERATORLOC, EUEMERGENCYGENERATORSTAMPING) at the stationary source are subject to the Standards of Performance for Stationary Spark Ignition Internal Combustion Engines promulgated in 40 CFR Part 60, Subparts A and JJJJ.

FGMACTIIIIAUTOASSEMBLY (EUELECTROCOAT, EUGUIDECOAT, EUTOPCOAT1, EUTOPCOAT2, EUSEALERS&ADHES, EUGLASSINSTALL, EUDEADENER, EUFOAM, EUFINALREPAIR1, EUFINALREPAIR2, EUFINALREPAIR3, EUFINALREPAIR4, EUSPOTREPAIR1, EUSPOTREPAIR2, EUSPOTREPAIR3) at the stationary source are subject to the National Emission Standard for Hazardous Air Pollutants for Surface Coating of Automobiles and Light-Duty Trucks promulgated in 40 CFR Part 63, Subparts A and IIII.

FGMACTZZZZCI≤500HP (EUEMERGENCYGENERATORGA, EUEMERGENCYGENERATORPAINT, EUEMERGENCYDIESELFIREPUMPLGR, EUEMERGENCYDIESELFIREPUMPBLDG23) and FGMACTZZZZCI>500HP (EUEMERGENCYGENERATORBUILDING66, EUEMERGENCYGENERATORELPO) at the stationary source are subject to the National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subparts A and ZZZZ.

The monitoring conditions contained in the ROP are necessary to demonstrate compliance with all applicable requirements and are consistent with the "Procedure for Evaluating Periodic Monitoring Submittals."

The following Emission Units/Flexible Groups are subject to CAM:

Emission Unit/Flexible group ID	Pollutant/ Emission Limit	UAR(s)	Control Equipment	Monitoring (Include Monitoring Range)	Emission Unit/Flexible Group for CAM	PAM? *
EUELECTROCOAT, EUGUIDECOAT, EUTOPCOAT1, EUTOPCOAT2/ SOURCE-WIDE	VOC/ 606 tpy	R 336.1225, R 336.1702(a), R 336.1901, 40 CFR 52.21	RTO No.1, RCC and RTO No.2	Continuous Temperature Monitoring: RTO No.1 & 2 ≥1400°F, RCC ≥235°F	SOURCE-WIDE	No
EUELECTROCOAT, EUGUIDECOAT, EUTOPCOAT1, EUTOPCOAT2/ SOURCE-WIDE	VOC/ 264.3 tpy	R 336.1225, R 336.1702(a), R 336.1901, 40 CFR 52.21	RTO No.1, RCC and RTO No.2	Continuous Temperature Monitoring: RTO No.1 & 2 ≥1400°F, RCC ≥235°F	SOURCE-WIDE	No
EUELECTROCOAT, EUGUIDECOAT, EUTOPCOAT1, EUTOPCOAT2/ SOURCE-WIDE	VOC/ 5.73 lb/job	R 336.1225, R 336.1702(a), R 336.1901, 40 CFR 52.21	RTO No.1, RCC and RTO No.2	Continuous Temperature Monitoring: RTO No.1 & 2 ≥1400°F, RCC ≥235°F	SOURCE-WIDE	No

*Presumptively Acceptable Monitoring (PAM)

Regenerative thermal oxidizers (RTOs) are combustion systems that control Volatile Organic Compounds (VOCs) by combusting them to carbon dioxide (CO_2) and water. The rate at which VOC compounds are oxidized is greatly affected by temperature, the higher the temperature, the faster the oxidation reaction proceeds. Low temperature indicates the potential for insufficient destruction of the VOC. Thermal destruction of most organics occurs at combustion temperatures between 800°F and 2000°F. Normal operation of an RTO should include monitoring the combustion chamber temperature and maintaining the temperature above a minimum level.

A rotating carbon concentrator (RCC) uses carbon adsorption to capture VOCs from a high volume, low VOC concentration exhaust stream and then transfers these VOCs to a smaller volume, heavily concentrated air stream via desorption. The adsorbent material, activated carbon, is able to strip VOCs from the exhaust stream. The system rotates from an adsorption zone to a desorption zone. A desorption air heater heats moves heated air over the adsorbent material, which releases the VOCs into a highly concentrated exhaust stream. The desorption zone inlet temperature should be maintained above a minimum level to ensure that the VOCs are thermally released. A highly concentrated VOC exhaust stream is desirable, because it allows the RTO to achieve a higher destruction efficiency (DE).

Inspections of the accuracy of the thermocouples and recalibration or replacement can ensure proper operation of the control devices. Inspections of the rotary concentrators includes checking on the desorption fan, the concentrator wheel rotation, the pressure drop across the concentrator and checking the adsorbent materials for any contamination or erosion. Inspections of the RTOs includes checking on the condition of the heat exchanger and/or heat transfer media and checking the valve seals.

The CAM plan covers RTO No. 1, which is located on the south side of the Paint Shop building and is used to control VOC emissions from the EUELECTROCOAT process as well as the curing ovens for EUGUIDECOAT, EUTOPCOAT1 and EUTOPCOAT2. The CAM plan also covers the two parallel RCC and RTO No. 2, which are located on the north side of Paint Shop building and are used to control emissions from Zone 1 of the automatic bells section portion of EUGUIDECOAT and the automatic

clearcoat sections of the topcoat booths and the flash-off area of EUTOPCOAT1 and EUTOPCOAT2. The CAM conditions are contained under the Source-Wide conditions. The performance of the RCC system and the RTOs are determined by continuously monitoring temperature. Three (3) thermocouples, 1 located at the RCC desorption gas inlet and 1 located in the combustion chamber of each RTOs are used to obtain temperature data. During coating operations, the temperature is sampled at least every 15 minutes by a computerized data acquisition and handling system, and the data is averaged over three (3) hour periods. The minimum 3-hour average RTO combustion chamber temperature required by the permit is 1400°F. The minimum RCC inlet desorption temperature is the temperature from the most recent performance test minus 15°F. When the thermocouples detect a temperature below the minimum requirement, a temperature excursion investigation and corrective actions are required to be undertaken. A semi-annual report is required to be submitted to the AQD detailing information on the number, duration and cause of excursions/exceedances and the corrective actions taken.

Please refer to Parts B, C and D in the draft ROP for detailed regulatory citations for the stationary source. Part A contains regulatory citations for general conditions.

Source-Wide Permit to Install (PTI)

Rule 214a requires the issuance of a Source-Wide PTI within the ROP for conditions established pursuant to Rule 201. All terms and conditions that were initially established in a PTI are identified with a footnote designation in the integrated ROP/PTI document.

The following table lists all individual PTIs that were incorporated into previous ROPs. PTIs issued after the effective date of ROP No. MI-ROP-A1641-2017 are identified in Appendix 6 of the ROP.

PTI Number			
69-84A	69-84B	134-99	134-99A
134-99B	134-99C	134-99D	134-99E
134-99	314-99G	74-11	

Streamlined/Subsumed Requirements

The following table lists explanations of any streamlined/subsumed requirements included in the ROP pursuant to Rules 213(2) and 213(6). All subsumed requirements are enforceable under the streamlined requirement that subsumes them.

Emission Unit/Flexible Group ID	Condition Number	Streamlined Limit/ Requirement	Subsumed Limit/ Requirement	Stringency Analysis
SOURCE-WIDE	SC I.3	5.3 pounds of VOC per job.	0.17 kg VOC/LACS equivalent to 1.42 lbs VOC/GACS. Standards for volatile organic compounds under 40 CFR 60.392(a).	The streamlined requirement of 5.3 pounds VOC per job is more stringent than 1.42 pounds VOC per GACS.
SOURCE-WIDE	SC I.3	5.3 pounds of VOC per job.	1.40 kg VOC/LACS equivalent to 11.68 lbs VOC/GACS. Standards for volatile organic	The streamlined requirement of 5.3 pounds VOC per job is more stringent than 11.68 pounds VOC per GACS.

Emission Unit/Flexible Group ID	Condition Number	Streamlined Limit/ Requirement	Subsumed Limit/ Requirement	Stringency Analysis
			compounds under 40 CFR 60.392(b).	
SOURCE-WIDE	SC I.3	5.3 pounds of VOC per job.	1.47 kg VOC/LACS equivalent to 12.27 lbs VOC/GACS. Standards for volatile organic compounds under 40 CFR 60.392(c).	The streamlined requirement of 5.3 pounds VOC per job is more stringent than 12.27 pounds VOC per GACS.
SOURCE-WIDE	SC VI.2	Required records to calculate VOC emissions monthly.	Performance test and compliance provisions under 40 CFR 60.393.	The streamlined recordkeeping requirement is equivalent to keeping a monthly record of VOC emissions under 40 CFR 60.393.
SOURCE-WIDE	SC III.2, SC III.3, SC VI.4	Process/ Operational Restrictions conditions for RTO Nos. 1 & 2 and Monitoring/ Recordkeeping condition for RCC requiring continuous temperature monitoring.	Monitoring of emissions and operations under 40 CFR 60.394.	The continuous temperature monitoring requirements for the control equipment is equivalent to the continuous temperature monitoring requirements of 40 CFR 60.394.
SOURCE-WIDE	SC VI.2, SC VII.4	Required records to calculate VOC emissions monthly and requirement for semi-annual reporting of deviations.	Reporting and recordkeeping requirements under 40 CFR 60.395.	The streamlined recordkeeping and reporting requirements are equivalent to the reporting and recordkeeping requirements under 40 CFR 60.395.

LACS = liter of applied coating solids.
GACS = gallon of applied coating solids.

The following table demonstrates how GM conducted the equivalency analysis for the emission limits. Mass solids applied were calculated using the worst-case minimum paint thickness for a vehicle. The apportioned VOC for each operation (e-coat, guidecoat and topcoat) was then divided by the worst-case mass solids applied and compared to the NSPS MM standard as follows:

Operation	Lb VOC/job (contribution portion of 4.8)	Solids/job (GACS)	Stringency/Equivalent Limit (lb/GACS)	NSPS MM Limit (lb/GACS)
E-coat	0.08	0.61	0.13	1.42
Guidecoat	0.86	0.15	5.73	11.68
Topcoat (basecoat+clearcoat)	2.07	0.45	4.6	12.3

The equivalent limit is lower than the NSPS MM limit and therefore is more stringent.
Streamlined/subsumed conditions have been added to the SOURCE-WIDE special conditions (SC) I.3, III.2, III.3, VI.2, VI.4, VII.2, and VII.4.

Non-applicable Requirements

Part E of the ROP lists requirements that are not applicable to this source as determined by the AQD, if any were proposed in the ROP Application. These determinations are incorporated into the permit shield provision set forth in Part A (General Conditions 26 through 29) of the ROP pursuant to Rule 213(6)(a)(ii).

Processes Not in the Draft ROP

The following table lists PTI exempt processes that were not included in the Draft ROP pursuant to Rule 212(4). These processes are not subject to any process-specific emission limits or standards.

Emission Unit ID	Description of Emission Unit	Rule 212(4) Citation	PTI Exemption Rule Citation
Argon Tank	Argon storage tank located outside of the Body Shop.	R 336.1212(4)(d)	R 336.1284(2)(j)
Portable Torches	Non-production portable torches used for maintenance and repair.	R 336.1212(4)(e)	R 336.1285(2)(j)(i)

Draft ROP Terms/Conditions Not Agreed to by Applicant

This draft ROP does not contain any terms and/or conditions that the AQD and the applicant did not agree upon pursuant to Rule 214(2).

Compliance Status

The AQD finds that the stationary source is expected to be in compliance with all applicable requirements as of the effective date of this ROP.

Action taken by EGLE, AQD

The AQD proposes to approve this ROP. A final decision on the ROP will not be made until the public and affected states have had an opportunity to comment on the AQD's proposed action and draft permit. In addition, the USEPA is allowed up to 45 days to review the draft ROP and related material. The AQD is not required to accept recommendations that are not based on applicable requirements. The delegated decision maker for the AQD is Robert Byrnes, Lansing District Supervisor. The final determination for ROP approval/disapproval will be based on the contents of the ROP Application, a judgment that the stationary source will be able to comply with applicable emission limits and other terms and conditions, and resolution of any objections by the USEPA.

Purpose

A Staff Report dated February 12, 2024, was developed to set forth the applicable requirements and factual basis for the draft Renewable Operating Permit (ROP) terms and conditions as required by Rule 214(1) of the administrative rules promulgated under Act 451. The purpose of this Staff Report Addendum is to summarize any significant comments received on the draft ROP during the 30-day public comment period as described in Rule 214(3). In addition, this addendum describes any changes to the draft ROP resulting from these pertinent comments.

General Information

Responsible Official:	Jennifer Bigelow, Plant Director 313-407-2513
AQD Contact:	Matt Karl, Senior Environmental Quality Analyst 517-282-2126

Summary of Pertinent Comments

The following comments were received during the 30-day public comment period:

FGSTORAGETANKS SC VI.1.b – The reference to Subpart MM 40 CFR 60.390 should be Subpart Kb 40 CFR 60.110b.

FGMACTZZZZCI>500HP SC VI.3 – The reference to 40 CFR 80.510(b) should be 40 CFR 1090.305.

Source-Wide SC III.1, III.2, III.3, VI.4, VI.5, VI.6. typos, add “40 CFR” 64.6

Changes to the February 12, 2024 Draft ROP

The following changes were made in response to the comments received:

FGSTORAGETANKS SC VI.1.b. updated UAR to 40 CFR 60.110b.

FGMACTZZZZCI>500HP SC VI.3 updated UAR to 40 CFR 1090.305.

Source-Wide SC III.1, III.2, III.3, VI.4, VI.5 and VI.6 had UAR for “64.6” corrected to read “40 CFR 64.6”.