

M4199  
MANILA

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: On-site Inspection

M419963997

FACILITY: GENERAL MOTORS LLC DETROIT-HAMTRAMCK ASSEMBLY		SRN / ID: M4199
LOCATION: 2500 E GENERAL MOTORS BLVD, DETROIT		DISTRICT: Detroit
CITY: DETROIT		COUNTY: WAYNE
CONTACT: Meghan Kennedy , Environmental Engineer		ACTIVITY DATE: 08/08/2022
STAFF: C. Nazaret Sandoval	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Targeted Inspection FY 2022		
RESOLVED COMPLAINTS:		

**Source:** General Motors LLC, Detroit-Hamtramck Assembly Center

**SRN:** M4199

**Address:** 2500 E. General Motors Blvd., Detroit, Michigan 48211-2002

**Subject:** Targeted Inspection FY 2022

**Inspection Date:** 8/8/2022

**Author:** Nazaret Sandoval, Air Quality Division (AQD), Detroit Office

**1 - SAFETY EQUIPMENT/SAFETY TRAINING/SECURITY**

Shoes or boots are required in all areas of the facility. Coveralls and hair mesh (provided by the plant) are required in the paint shop. A hard hat or a baseball cap could be used to cover the hair, instead of the mesh. Safety glasses with side shields and cut-resistant arm sleeves (provided by the plant) are required in the body shop.

The main entrance to the plant is off the I-94 service drive just east of Chene Road. Visitors should enter the parking lot via Electric Avenue and at the barrier gate arm request access to the site using the intercom to talk to the security guard who is at the main building entrance. There is also a dome camera that captures the visitors IDs (badge or driver license). Once in the building, visitors must sign in with the security guard, show ID, and call your GM contact who will escort you inside. Make sure you know the GM contact person's phone number because the guards do not have a GM directory available. A safety video must be viewed once per calendar year, after which time a Safety Protocol Program sticker will be issued for that calendar year.

**2 - FACILITY HISTORY AND PROCESS DESCRIPTION**

The General Motors Detroit-Hamtramck Assembly Center is a stationary source that has historically produced automobiles from vehicle parts shipped to the site using processes typical of an automotive assembly line, including a body shop, paint shop, and a general assembly area. The General Motors Assembly Center at Detroit-Hamtramck opened in 1985 and almost 35 years after that opening, in 2019, GM announced an investment to fully renovate the old plant and to build a variety of all-electric trucks and SUVs. A permit application was submitted to AQD for a project to install the new automotive assembly line to replace the one at the existing location. Permit to Install (PTI) 209-19, issued on June 17, 2020, allowed the construction and operation of the new plant, which is currently identified as GM Factory ZERO. The old plant ceased operations on February 28, 2020. The new plant commence construction on June 17, 2020, with initial startup of the operations on July 21, 2021, and vehicle production for saleable units on August 26, 2021.

Factory ZERO will be home to the 2022 GMC HUMMER EV Pickup, 2024 GMC HUMMER EV SUV, Chevrolet Silverado EV and the Cruise Origin (an all-electric, self-driving, shared vehicle); among other yet to be announced EVs. When fully operational, Factory ZERO will employ more than 2,200 employees with a typical production shift running from 6 AM to

4:30 PM, Monday through Friday, and maintenance shifts on off-production hours. However, during the low production stage the facility has approximately 750-1000 employees and the current operations are from 6 AM to 2:30 PM Monday through Friday.

GM retooled Factory ZERO for EV production. To accommodate the new battery assembly operation, an extension to the existing East E-LOC building was added. In addition, two building extensions were built on the north side of the existing body shop building to accommodate the newly assembled vehicles. All the vehicle manufacturing equipment and processes in the body shop, paint shop and general assembly were replaced. A diagram in AQD files shows the existing areas of the plant and the additions.

The new assembly line also has supporting equipment, which includes: six (6) 8 MMBTU/hr rated natural gas-fired hot water generators, air supply housing units to support the body shop and battery building, fourteen (14) natural gas-fired dock heaters, and a 346-kW diesel-fired emergency engine.

Here is a description of the major areas of the plant:

### BODY SHOP

Vehicle bodies are first welded, and some light grinding occurs during various steps in the body shop. Some of the grinding and welding booths are equipped with add-on fabric filters that vent back into the plant; otherwise, these operations vent uncontrolled to the in-plant atmosphere, which itself is filtered and returned. As part of the metal body assembly, sealers and adhesives are used to hold the body together and/or to provide waterproofing to the vehicle. Sealers and adhesives applied in the body shop are air-dried and emissions are emitted to the general in-plant environment.

### PAINT SHOP

After the metal body of the vehicle is assembled, it is shipped from body shop to paint shop. Within the paint shop, pretreatment is the first stop.

#### - Pretreatment

At pretreatment, the vehicle surface is prepared for coating. The pretreatment process consists of a series of dip tanks and rinse stages, followed by a deionized water rinse. Metal vehicle bodies are submerged in a tank and passed through a series (stages) of washes in the pretreatment system. The pretreatment begins with a deluge of water to remove any loose metal, dust, welding slag, etc. on the vehicle, followed by detergent washes, water rinses, and finally a solution wash to enhance paint adhesion and corrosion resistance. Minimal volatile organic compounds (VOCs) are used in these washes and the pretreatment system vents uncontrolled to ambient air.

#### - ELPO

After pretreatment, vehicle bodies are dip-coated with a water-based prime coat, called the electrocoat or ELPO. One electrocoat line serves all the vehicles at the plant. The electrodeposition coating process (ELPO) consists of a coating dip tank, followed by a series of rinse tanks, and two curing ovens, each with a cooling zone. Repairs will take place in an ELPO sand booth to correct minor imperfections. Emissions from the coating tank and the curing oven are controlled by a bank of regenerative thermal oxidizers (RTOs).

After curing in the ELPO ovens, the vehicle bodies move into the sealer application process, where there are various manual and robotic sealer, adhesive, and sound deadener material application stations/booths. Prior to primer application the materials applied in the paint shop (sealers, fillers, and liquid applied sound deadener) will be air-dried before

further curing in the primer curing ovens. VOC emissions released in the primer curing ovens will be controlled by the appropriate RTO(s). Various sealers and adhesives are applied to vehicle bodies throughout the body shop and paint shop to improve structural stability and reduce noise. Robotic hands apply the sealers and adhesives from wands as a paste or putty, therefore, 100% transfer is achieved, and the application is performed open-air in the plant.

#### - Primer

After the sealer process, vehicles are painted with a solvent-based prime coat, called the guide coat or primer surfacer, and dried in a curing oven. The vehicles pass to a prep area, an automatic primer booth for application of solvent borne main primer and solvent borne two-tone primer, a primer observation zone, an ambient flash-off area, two (2) natural gas-fired primer curing ovens, each with a cooling tunnel, and a booth for manual wet sanding repair to correct surface blemishes. One primer surfacer line serves all the vehicles at the plant; two parallel curing ovens (north and south) serve the primer surfacer line. The primer surfacer is colored white or gray (gray will be introduced later) depending on the topcoat to follow. After the primer surfacer, a black solvent-based monocoat is applied to the top of the vehicles that will receive the two-tone black roof (all of the first Hummer EVs will receive the black monocoat). The primer surfacer is applied robotically with electrostatic spray applicators in an enclosed booth with a downdraft "waterwash" system wherein the flow of air in the booth is blown down from the ceiling through a grated floor and into a water stream flowing belowground. The spray applicators are purged internally to a collection tank.

#### - Topcoat

After the primer surfacer, the vehicles are coated with a colored, water-based basecoat and then a transparent, solvent-based clearcoat, followed by drying in a curing oven; this coating combination is termed the topcoat. Six topcoat lines serve the vehicles at the plant; each topcoat line has its own dedicated curing oven. As with the primer surfacer, both the basecoat and clearcoat are applied robotically with electrostatic spray applicators in enclosed booths equipped with downdraft waterwash systems; the spray applicators purge basecoat into the waterwash and clearcoat into a collection tank.

### GENERAL ASSEMBLY and BATTERY PACK ASSEMBLY

After leaving the paint shop, the coated vehicle shell is merged with the vehicle's undercarriage, interior, etc. in the final assembly area. The vehicle is filled with windshield washer fluid, brake fluid, and other necessary liquids, tested to ensure that it will start, inspected, and then parked prior to shipping. Minor emissions expected from the general assembly, such as those from glass bonding and fluid fill, are released to in-plant air. If imperfections or scratches are observed in the surface coat during the final inspection the vehicle is driven into stand-alone enclosures, called the final repair booths, for the manual application of touch-up paint. The booths are equipped with fabric filters for particulate control. Solvent wipedowns and booth-cleaning operations throughout the plant are a source of volatile organic compound emissions.

Minor emissions released to the ambient air are expected from the sealers at the battery packs assembly area. The uncontrolled emissions in both the general and the battery pack assembly areas are justified by the usage of very low VOC sealers.

### SUPPORTING EQUIPMENT, EMERGENCY GENERATORS AND FIRE PROTECTION

Steam for the assembly plant operations was formerly provided by four spreader stoker coal-fired boilers (Boilers #1 to #4), located at the northern end of the plant at the boiler house.

However, in December 2015, Boilers #2, #3, and #4 were shut down and disconnected from the system and the coal-firing capabilities for Boiler #1 (rated at 84.0 MMBtu/hr.) were removed. Boiler #1 was permitted to burn natural gas only. Since 2003 (PTI 8-03), GM was permitted to temporarily install and operate up to two, 92 MMBtu/hr natural gas-fired rental boilers during the heating season. Steam was generated on-site through the two temporary boilers, and Boiler #1 was used as a back-up.

GM had a long-term contract to receive steam from a third party, which was used directly, and indirectly through hot water heat exchangers, to heat manufacturing and office spaces at various locations at the facility. Boiler #1 was used as a back-up to supplement steam to the plant during the heating season. However, around the end of 2019, the operations of the third-party steam provider shut down and could not meet the steam demand on the GM system. GM had since used the temporary boilers on site to supplement the steam needs. The temporary boilers, initially installed on October 19, 2020, with a startup around November 2020, operated from December 2020 to April 2021 and again from October 2021 to April 2022. Between April and October 2021, the units were put into a dry layup and could not be operated. The last time GM used a temporary boiler was on April 20, 2022, when temporary Boiler #1 was removed from the site. Temporary Boiler #2 was removed on April 7, 2022.

With the plant expansion, the demand for comfort heating increased as building sizes increased to accommodate the battery assembly and the expanded body shop. To satisfy the demand in a permanent basis, GM proposed a "Steam Elimination Project" which include the installation of additional supporting equipment. The project was permitted under PTI 209-19A issued on April 15, 2022, as a modification to the previously permitted automotive assembly line (PTI 209-19). With the modifications to the original permitted project the plant supporting equipment includes: six natural gas-fired hot water generators, various natural gas-fired space dock heaters, air handling units and air supply houses to support the body shop and the battery building; two new diesel-fired emergency engines for a total of three (the plant had an existing emergency generator) and one new diesel-fired fire pump. In addition, the modification includes adhesives application in the battery area.

With the installation of the equipment proposed by the Steam Elimination Project, Boiler #1 and the temporary boilers were no longer needed. A formal ROP notification from GM was received on June 3, 2022, indicating that EUBOILER1, EUTEMPBOILER1 and EUTEMPBOILER2 will be removed from service effective 6/30/2022.

At the time of the inspection the Steam Elimination Project was still under construction but almost completed.

### **3 - PAINT SHOP WALKTHROUGH**

I arrived at GM Factory Zero (herein, GM or "the facility") the morning of 8/8/2022 at about 11:30 a.m. After signing in at the security guard entrance I met with Meghan Kennedy, Environmental Engineer at GM.

The purpose of the inspection was to verify the facility's compliance with the requirements of Article II, Air Pollution Control, Part 55 of Act 451 of 1994 and the conditions of the active permit, PTI 209-19A. In addition, I wanted to verify the status of the installation/startup for the permitted equipment at the newly constructed paint shop, which is currently operating at low production. In general terms, I verified if all the equipment and unit operations permitted by PTI 209-19A were installed and/or ready to operate.

We proceeded to the plant inspection by walking through the assembly area towards the paint shop which is located at the far northeast side of the building. At the assembly line Ms. Kennedy showed me the modules. Out of the six modules that will be in place for full vehicle production, only modules 1, 2 have been completed and are producing vehicles, the rest of the modules were still under construction. As we walked through the assembly line, we stopped at the location of one of the glass installation sealer pumps. Ms. Kennedy indicated that with the modular design each individual assembly job (i.e. glass installation) is located at the same geographical meridian within the north-south plant line. Sealers applied in the assembly area are air-dried and emissions are emitted to the general in-plant environment.

We then walked to the east to enter the paint shop and followed the direction in which the vehicles travel inside the process operations. Ms. Kennedy indicated that the vehicles in the paint shop travel from west to east when entering from the body shop and then when they reach the end wall the vehicles are turned to follow an east to west direction for pretreatment. Then, the ELPO process is west to east, the sealers east-west, and so on. Please refer to the AQD report in file for the approximate GM paint shop layout flow diagram.

I inspected the operations that were described in section 2 of this report, which are identified in PTI 209-19A as:

EUPRETREATMENT  
EUELPO  
EUSEALERS  
EUPRIMER  
EUTOPCOAT

The plants runs automatically and there were only a few operators in the visited areas, mainly in the robotic section of EUTOPCOAT

There is a unique aspect of this paint shop, and it has to do with the design of the control equipment and the process. The topcoat application process will use six “modules” for application of basecoat and clearcoat. This allows operation flexibility dependent on the demand for the vehicles being produced. During periods of high demand, more modules will be required to operate. Since there is such potential variability in the usage of the various topcoat modules, the design has also incorporated multiple RTOs for control of VOCs from the coating process. The RTOs are installed in two banks, one bank is identified as the “oven RTOs” (RTO 210 and RTO 220) with a common stack controlling the VOC emissions from the ELPO tank, the ELPO oven, the prime curing ovens, all basecoat heated flash-off areas, and all topcoat curing ovens. The other bank or “booth RTO” has three RTOs (RTO 110, 120, and 130) with a common stack used for control of the primer spray booth, all basecoat spray booths, all clearcoat spray booths, and all topcoat observation zones. As the number of topcoat modules being used for production increases, the more RTOs are brought into service to control emissions. Although the permit requires only the appropriate RTO portions to be operating for corresponding operations to continue, the facility typically runs all five RTOs.

The facility monitors the RTO combustion chamber temperatures continuously during operation for each RTO through the Programmable Logic Controller (PLC). The RTO temperatures can be checked locally on the floor and at the general control panel screens.

RTO temperature records were requested during the inspection on 8/8/2022. The records for 8/8/2022 were provided via email on 8/9/2022 in a graph chart format for various hours during the day. However, since the temperature scale in the graph was too broad to read the values accurately, AQD requested additional records in a tabulated form for the time-period from 12 to 1 PM, which were also provided on 8/9/2022. The values will be discussed later in this report.

As required by the PTI, within 365 days after the beginning of saleable vehicle production, RTO performance tests are being conducted at the facility during the first week of August. Due to low production, only a single sample run on one RTO per bank will be completed per day. On 8/2/2022, RTOs 110 and 210 were tested. Testing will continue through the week. The PTI also requires the RTOs to be inspected annually, Ms. Kennedy stated that the inspection has just been completed before the RTO testing.

At the time of the visit Ms. Kennedy commented that the average production has been around 5 vehicles per day since the starting date of saleable vehicle production on August 24, 2021. Only two vehicles were in the paint shop at the time of inspection, and these were observed at the basecoat booth in module 1. The first was a Hummer primed with a white coat, and when it approached the basecoat robots, it was sprayed with black topcoat. The next vehicle in the line for coating was the Cruise Origin Driverless Car. I observed, through the glass-enclosed spray booths, the downdraft water wash systems operating under grates on the floor. Ms. Kennedy indicated that water flow is inspected visually on a weekly basis. If the water flow is too low, the paint booths automatically shut-off. The spray booths are also controlled via downdraft and dry filters located on the sides of the booths, which are also inspected weekly. AQD requested sample records for to verify compliance with the cited inspection requirements. Records were provided via email on 8/15/2022 and will be discussed later in this report.

The primer, monocoat, and clear coat are solvent-based paints; the basecoat is waterborne-based paint. The primer and clearcoat spray booths also have purge solvent collection systems to control HAP emissions, as required by the Auto MACT. The recovered solvent goes into a tank, is treated as hazardous secondary material, and is sent back to the supplier for recycling/repurposing.

I requested the monthly emission records and the natural gas throughput for the period from July 2021 to June 2022 to evaluate the emission and material limits for FGAUTOASSEMBLY, which is the flexible group that covers the equipment used for the automotive assembly and painting operations for the entire Detroit-Hamtramck Assembly Plant. Records were provided via email on 8/9/2022 and will be analyzed later in this report.

During this inspection I visited the powerhouse and the location of the old emergency generator. I confirmed that all the old boilers were disconnected from the system but were still in the boiler room. Ms. Kennedy said that they were abandoned on-site because removing them is very costly. The new water heaters were in the building but were not installed yet.

In the last inspection, in 2021, I requested the Safety Data Sheets (SDS) for all the chemicals that are used in each unit operation at the new paint shop. Ms. Kennedy provided them via email on July 31, 2021. The SDS are saved in AQD files for this facility.

After we finished the tour of the plant, I thanked Ms. Kennedy for her time, and I told her that an inspection report will be prepared with the information collected during the site visit after I completed the evaluation of the records and the reports received by the AQD Detroit

District during the 12-month period previous to the inspection date. I signed out of the plant and left the property at about 3:30 PM.

#### **4 – PERMIT BACKGROUND AND APPLICABLE FEDERAL REGULATIONS**

GM is located in a portion of Wayne County that is currently meeting all of the National Ambient Air Quality Standards (NAAQS) set by the United States Environmental Protection Agency (USEPA), except for ozone. The area is in attainment for PM10, PM2.5, CO, NOx, SO2, and lead. A portion of Wayne County has been designated by the USEPA as nonattainment for SO2, but GM is not located within the SO2 nonattainment area.

The source is permitted to emit greater than 100 tons VOC and is therefore subject to the Title V program, known as the Renewable Operating Permit (ROP) program in Michigan. The source is also a Clean Air Act Section 112 major source for Hazardous Air Pollutants (HAPs). Paint shop operations are subject to both the New Source Performance Standards (NSPS) at 40 CFR 60, Subpart MM and the National Emissions Standards for Hazardous Air Pollutants for Surface Coating of Automobiles and Light Duty Trucks (or MACT) at 40 CFR 63, Subpart IIII.

GM provided a demonstration that the performance levels required in the NSPS will be met prior to applying abatement credits. The post-control emission performance levels for the ELPO, primer, and topcoat have been subsumed into the flexible permit limit of 3.0 lbs of VOC / vehicle. Compliance with the flexible permit limit will also show compliance with Subpart MM requirements.

Subpart IIII includes Hazardous Air Pollutant (HAP) emission limits in lb/gallons of applied coating solids (lb/GACs), as well as work standard practices for subject facilities. The proposed surface coating operations will comply with the standards for new sources without the use of add-on control devices.

The three diesel-fired emergency engines and one fire pump associated with the new assembly line are subject to 40 CFR Part 60, Subpart IIII. For equipment utilized in an emergency capacity, the NSPS limits the hours of operation to less than 100 hours or less for non-emergency readiness testing. If the emergency engines and/or fire pump are non-certified or not maintained or operated according to the manufacturer's emission-related written instructions, the NSPS considers the engine non-certified and requires testing to demonstrate compliance with NMHC+NOx, CO, and PM limits. This equipment is also subject to the NESHAP at 40 CFR 63, Subpart ZZZZ; per the NESHAP, compliance with the NSPS equates to compliance with the NESHAP.

The six proposed hot water generators associated with the automotive assembly line are subject to the NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters, 40 CFR Part 63, Subpart DDDDD; however, there are no emission standards for small, natural gas-fired units, only work practice standards that are included in the permit.

GM is operating under MI-ROP-M4199-2010 (ROP) issued on 2/17/2010 with an expiration date on 2/17/2015. GM timely submitted an ROP renewal application to the AQD Detroit Office on June 27, 2014 (via email). A hard copy of the ROP renewal application was received by AQD on June 30, 2014. An application shield letter was issued by AQD to GM on July 2, 2014, to acknowledge that the renewal application was administrative complete, and that the existing ROP shall not expire until the renewal permit is issued or denied.

After the initial ROP review there were numerous discussions with GM in 2015, 2017 and 2018. Various project proposals and permitting options (e.g. PTI 196-14 and PTI application No. 69-18) were sought but were later withdrawn or discontinued due to changing business requirements. Lastly, in 2019, GM submitted a permit application for a project to install a new automotive assembly line to replace the one at the existing location. Permit to Install PTI 209-19, issued on June 17, 2020, allowed the construction and operation of the new plant, which is currently identified as GM Factory ZERO. The old plant ceased operations on February 28, 2020. After issuance of PTI No. 209-19, GM proposed to install new natural gas fired equipment such as hot water heaters, space heaters, door heaters and other miscellaneous heating equipment under a project called the Steam Elimination EPC Project (the EPC Project). AQD issued PTI 209-19A on April 15, 2022.

PTI 91-15, issued on July 14, 2015, was for the elimination of coal capabilities at the powerhouse and permanently shut down Boilers #2, #3 and #4 along with their associated coal/ash handling equipment. Boiler #1, also regulated by the cited permit, used to run natural gas only, but as indicated earlier, Boiler #1 was decommissioned on June 30, 2022, though PTI 91-15 has not yet been voided.

In summary, there are two permits to install (PTI) that remain active and have been issued to the facility since the 2010 ROP renewal: PTI 91-15 and PTI 209-19A. The facility's compliance status with the terms and conditions of the cited permits will be evaluated in this report.

In general, unless otherwise stated, this inspection report evaluates the compliance activities that have occurred during a 12-month period previous to the inspection date. For the ROP, only the General Conditions will be evaluated because the rest of the requirements are not applicable to GM Factory ZERO.

## **5 – COMPLIANCE EVALUATION**

### **PTI 209-19A**

- Not all the terms and conditions included in PTI 209-19A were evaluated during the inspection of 8/8/2022 because the plant was still in its initial low production period which started on 8/24/2021 with the beginning of the first saleable vehicle production.
- Emission records were collected for the period from July 2021 to June 2022 and since the start of saleable vehicles the average production has only been five vehicles per day. Therefore, the permit evaluation will be limited to the conditions that can be addressed with the available records.
- Common requirements, applicable to various EUs have been grouped and evaluated together.

### **EUPRETREAT, EUELPO, EUPRIMER, EUMISCSOLVENTS, EUSEALERS, EUFLUIDFILL, EUFNLRPR2020, EUGLASSBOND, FGTOPCOAT**

#### **V.1, VI.1 - In Compliance**

GM will be using manufacturer's formulation data and the information in the Safety Data Sheets (SDS) to determine the VOC content, water content and density of any coating or material applied or used in the above cited unit operations. GM will maintain a current listing from the manufacturer of the chemical composition of each material, including the weight percent of each component. GM keeps the SDS on file and they were provided to the AQD upon request.

## EUELPO, EUPRIMER, EUMISCSOLVENTS, EUSEALERS, FGTOPCOAT

### IV.1 – In Compliance.

GM does not operate the above cited emission units unless the appropriate RTO portions of FGCONTROLS are installed, maintained and operated in a satisfactory manner. For a satisfactory operation of the RTOs the facility shall maintain a minimum retention time of 0.5 seconds and maintain the RTO combustion chamber temperature at the manufacturer's recommended temperature until an acceptable performance test has been performed (which had not been completed yet at the time of the inspection).

According to the records provided, it appears that the manufacturers recommended the operation of the RTO combustion chamber at temperatures around 1525 °F, with a low temperature alert at 1400 °F. The sample records obtained for 8/8/2022 showed combustion chamber temperatures above and below 1524 °F for all the RTOs (i.e., 110, 120, 130 and 210 and 220) during the evaluated time period. The more discrete information (from 12 to 1 PM) showed that the lowest recorded RTO temperature was 1493.6 °F (at 12:02 PM and at 12:04 PM for RTO AB130). All the other RTOs reported values that were above 1500 °F.

In addition, per condition IV.1.c, a satisfactory operation of each respective RTO also includes that after the acceptable performance test has been performed, the facility has to maintain the RTO combustion chamber temperature, based upon a three-hour average, at the temperature during the most recent control device performance test which demonstrated compliance with either:

- i. a VOC outlet concentration of less than or equal to 7 ppm as propane (during the initial low production period as specified in FGAUTOASSEMBLY SC III.1); or
- ii. a minimum 95 percent destruction efficiency (after the initial low production period ends).

The RTO testing that is being conducted in August 2022 will evaluate if the controls can achieve VOC outlet concentrations below 7 ppm as propane.

During periods of low production, an RTO may not have enough VOC loading on the front end to establish 95% Destruction Efficiency (DE) as required in the permit, and therefore a 7 ppm as propane outlet is established as an alternative during this period. The permit requires the DE testing to be conducted within 180 days after the end of the initial low production period (FGAUTOASSEMBLY, SC V.5) to show that the individual banks of RTOs are achieving 95% DE.

### EUPHFPENG – In Compliance

GM notified AQD in a letter dated 3/15/2022 that a certified fire pump engine began operations at the site. The EPA certificate of conformity for a John Deere, 315 kW diesel-fueled fire pump engine was attached to the letter. This satisfies the permit reporting condition VII.1

The other permit conditions for EUPHFPENG were not evaluated during the inspection of 8/8/2022 and will be covered in future inspections.

### FGAUTOASSEMBLY

This flexible group covers equipment used for the automotive assembly and painting operations for the entire Detroit-Hamtramck Assembly Plant, excepting existing natural gas equipment, the existing boilerhouse, the Steam Elimination (EPC) Project equipment, emergency engines and the fire pump.

Emission Unit: EUPRETREAT, EUELPO, EUPRIMER, EUTOPCOAT1, EUTOPCOAT2, EUTOPCOAT3, EUTOPCOAT4, EUTOPCOAT5, EUTOPCOAT6, EUMISCSOLVENTS, EUSEALERS, EUFLUIDFILL, EUFNLRPR2020, EUGLASSBOND, EUHWG1, EUHWG2, EUHWG3, EUHWG4, EUHWG5, EUHWG6, EUNGHEAT

I.1 to I.10, II.1– In Compliance

Emission records provided for the period July 2021 to June 2022 were evaluated and compared with the permit limits cited in SC I.1, for each pollutant. The results of the evaluation are summarized below.

Pollutant	Limit	Time Period / Operating Scenario	Facility Emissions	Units	Within Compliance
VOC	39.0 tpy	12-month rolling time period as determined at the end of each calendar month	17.2	tons/year 12-month rolling	YES
VOC	330.3 tpy	12-month rolling time period as determined at the end of each calendar month		Not applicable until the end of the low production period	
VOC	3.0 pounds per job	12-month rolling time period as determined at the end of each calendar month		Not applicable until the end of the low production period	
PM	21.5 tpy	12-month rolling time period as determined at the end of each calendar month	3.5	tons/year 12-month rolling	YES
PM10	21.5 tpy	12-month rolling time period as determined at the end of each calendar month	3.5	tons/year 12-month rolling	YES
PM2.5	21.5 tpy	12-month rolling time period as determined at the end of each calendar month	3.5	tons/year 12-month rolling	YES
NOx	44.6 tpy	12-month rolling time period as determined at the end of each calendar month	14.1	tons/year 12-month rolling	YES
CO	52.1 tpy		16.4		YES

		12-month rolling time period as determined at the end of each calendar month		tons/year 12-month rolling	
SO2	0.4 tpy	12-month rolling time period as determined at the end of each calendar month	0.1	tons/year 12-month rolling	YES
GHGs as CO2e	74,054 tpy	12-month rolling time period as determined at the end of each calendar month	23,374.2	tons/year 12-month rolling	YES

I.1, VI.1.b – In Compliance

As with the emission limits, the natural gas limit within PTI 209-19A is not applicable to the entire facility. Existing natural gas equipment (including the boilerhouse) and new equipment addressed elsewhere in the permit (e.g. the steam elimination project) are not included in this natural gas limit.

Material	Limit	Time Period / Operating Scenario	Facility Emissions	Units	Within Compliance
1. Natural Gas	1,240 Million standard cubic feet per year	12-month rolling time period as determined at the end of each calendar month	391.4	MMCF/year 12-month rolling	Yes

III.1- Compliance

The facility shall not produce more than 10,000 vehicles (or “jobs”) per 12-month rolling time period as determined at the end of each calendar month during the initial low production period. The initial low production period started with the initial production of saleable vehicles (August 24, 2021) and lasting until either:

1. A maximum of 36 months after the beginning of saleable vehicle production, or
2. Production of saleable vehicles exceeds 10,000 vehicles per 12-month rolling time period.

During the initial low production period the permit limits the annual VOC to 39.0 tpy (SC I.1). After either 36-months have passed or the production of saleable vehicles exceeds 10,000, the permit requirements of 330.3 tpy of VOCs (SC I.2) and 3.0 lbs VOC/job (SC 3.0) become applicable and replace SC I.1.

According to the records, 922 vehicles were produced as of June 2022.

Beginning on the startup of production, and continuing for the first 12 calendar months, the 39.0 tpy VOC limit applies to the cumulative total VOC emissions. Thereafter, the limit shall

become a 12-month rolling limit. So far, the reported total is a cumulative total VOC emission.

#### IV.1, VI.2 - In Compliance.

Note: This condition is also applicable to EUPRIMER (IV.2), EUTOPCOAT (IV.2), EUFNLPR2020 (IV.1)

The facility installed, maintains, and operates each spray coating booth with a waterwash particulate control system. Satisfactory operation of the control system is achieved by monitoring the conditions of each waterwash particulate control system through weekly visual inspections (except during weeks with no production) of each primer, basecoat, and clearcoat spray booth and by monitoring the dry filter particulate system on all final repair booths. The records are kept on file and they are available to the AQD upon request. Two different documents were provided to show compliance with the cited conditions. The filter report dated 8/12/2022 contained various columns with data reporting the location of the filters, a minor description, and other columns where the operator can enter the frequency of the inspections, record filter replacements, etc. There is a color code to alert change out. Red indicates critical level/change out is past due; yellow is caution level or recommended change out, and green means the filter is in working conditions. The report showed instances where change out was past due, but a note indicated "some gauges are not working properly, so recommendations for change out should be confirmed based on visual inspections".

For the waterwash, a weekly booth assessment sheet dated 8/8/2022 was provided for the primer booth as an example. The figure showed the downdraft average air flow and the water flow. The waterwash is the portion of the report near the robots. Same as before, red means no water flow, yellow indicates low water flow and green good water flow.

#### V.1 and V.2 – Not Yet Applicable

These two conditions are not applicable yet. They refer to the initial testing for PM, PM10 and PM2.5 emission rates from each RTO and from the final repair booths stacks and NOX emission rates from RTO, all required after 180 days of the end of the initial low production period. As an alternative, for NOx, GM could provide emission factor guarantees from natural gas equipment if found to be acceptable by the AQD District Office.

#### V.3 – In Compliance

During the week of August 1, 2022, within 365 days after the beginning of saleable vehicle production, GM conducted the initial testing to verify the overall transfer efficiency for each booth in EUPRIMER and EUTOPCOAT(1 to 6) in accordance with the U.S. EPA "Protocol for Determining the Daily Volatile Organic Compound Emission Rate of Automobile and Light-Duty Truck Topcoat Operations," September 2008, EPA-453/R-08-002, as amended. The vehicle tested was the Hummer EV Truck. The test was conducted in accordance with the approved test plan which had been submitted on 5/3/2022 (no less than 30 days prior to testing) to the AQD Technical Programs Unit (TPU) and to the Detroit District Office. TPU approved the final plan prior to testing and sent a letter of approval, dated 5/26/2022. Solids transfer efficiency (TE) values were determined for representative coatings, including prime, white solid basecoat, nimbus metallic basecoat and clearcoat. The facility indicated that the transfer efficiencies from the tested booth(s) are representative of the other booth (s). Vehicles weights were determined before and after the coating application. Calibrated volumetric flow meters, located on each applicator, were used to measure paint usage. A complete report with the test results was submitted to the AQD Technical Programs Unit and to the Detroit District Office on 9/8/2022 (within 60 days following the last date of the test). A summary table showed the following TE values for each tested coating: Prime (83.6

%), White Solid Basecoat (73.9 %), Nimbus Metallic Basecoat (74.3%) and Clearcoat (78.2 %).

#### V.4 – In Compliance

Within 365 days after the beginning of saleable vehicle production GM measured the capture efficiency through panel testing for each spray booth, flash-off area, observation zone, and oven portion of FGAUTOASSEMBLY to the respective VOC control device(s), in accordance with the U. S. EPA "Protocol for Determining the Daily Volatile Organic Compound Emission Rate of Automobile and Light-Duty Truck Topcoat Operations," September 2008, EPA 453/R-08-002, as amended.

This capture efficiency testing includes materials (sealers, et al) applied after EUDELPO and prior to EUPRIMER that are cured in primer curing oven.

#### V.5 – In Compliance

The facility shall verify the destruction efficiency of each RTO in FGAUTOASSEMBLY by testing at the owner's expense, in accordance with Department requirements and according to the following schedule:

- a) Within 365 days after the beginning of saleable vehicle production.
- b) Within 180 days of the end of the initial low production period as specified in SC III.1.
- c) Within 2 years of the testing required in SC V.5(b).
- d) Within 2.5 years of the testing required in SC V.5(c).
- e) At least once every five years thereafter.

As indicated earlier in this report the facility has been conducting RTO testing during the first week of August 2022, in accordance with the condition V.5a.

#### VI.1 to VI.3 – In Compliance

GM keeps records and calculations as required by these permit conditions. AQD requested the monthly emission records for the permit regulated pollutants, hours of operation, natural gas usage and number of vehicles made within the period from July 2021 to June 2022. The records were provided. AQD did not ask for a sample calculation to verify the assumed process parameters (e.g., transfer, capture and control efficiencies, booth splits, etc.) and VOC emissions due to natural gas combustion. Prior to the initial testing, for each controlled section, the design combined capture and control efficiency may be used. Thereafter, values no greater than the most recently tested values may be used. This information will be requested in future inspections.

#### VII.1 – In Compliance

For each emission unit (EU) and flexible group (FG) included in this permit, the facility submitted to AQD in an acceptable format, the actual VOC, PM10, PM2.5, NOx, CO, SO2, and GHGs as CO2e emission rates for each limit included in the permit. The quarterly reports were timely submitted within 30 days following the end of the quarter in which the data was collected. AQD reviewed the quarterly reports, and the emission rates were in compliance with the permit limits.

#### VII.3 and FGAUTOMACT VII.2 - In Compliance

GM submitted a written notification dated September 2, 2021, received/postmarked by AQD on September 9, 2021, indicating that the production of saleable units began on August 24, 2021. This notification was submitted within 30 days of the start of producing saleable vehicles to satisfy the reporting requirements cited on SC VII.3 for FGAUTOASSEMBLY and those cited on SC VII.2 for FGAUTOMACT per 40 CFR 63, Subpart A, under 63.9(b)(4)

(v). The notification also included information to satisfy the Initial Notification required in 63.9(b)(2)(i) to (v) of 40 CFR 63, Subpart A.

### FGCONTROLS

#### Description:

Two banks of RTOs used for control of VOC emissions from the ELPO tank, primer spray booth, all basecoat and clearcoat spray booths, all heated flash-off areas, all observation zones, and all curing ovens. Waterwash on all paint spray booths and dry filter particulate control on all final repair booths.

The emission units associated with FGCONTROLS are:

EUELPO, EUPRIMER, EUTOPCOAT1 to EUTOPCOAT6, EUMISCSOLVENTS, EUSEALERS, EUFNLRPR2020

#### III.1 – In Compliance

A malfunction abatement plan (MAP) has been submitted within 90 days following the beginning of saleable vehicle production and is implemented and maintained as described in Rule 911(2), for the RTO add on control devices. The MAP, submitted to the AQD Detroit District for review and approval, was received on 11/23/2021. The MAP was reviewed and was found to be adequate in addressing the minimum requirements cited under conditions III.1.a to III.1.c. A paper copy of the MAP is in the facility files.

#### VI.1 – In Compliance

The facility monitors and records the RTOs temperature on a continuous basis during operation. Temperature data recording consist of measurements made at equally spaced intervals at least once every 15 minutes. All records are kept on file and were available upon request. During the visit I checked the actual screens where the RTO temperatures are monitored and collected by the PLC system. Also, as indicated in previous paragraphs, sample records were provided and demonstrated compliance with this condition.

#### VI.2 to VI.4 - Not Evaluated

These conditions refer to the maintenance records and repair activities for the RTOs and the associated equipment, records of RTO bypass, and RTO inspections required to demonstrate compliance with VOC emissions.

I was informed that in preparation for the upcoming stack test, the annual inspection of RTO 110 and RTO 210 was recently complete, but I did not request records. These conditions will be evaluated in future inspections.

### FGAUTOMACT

The permit conditions and applicable requirements for FGAUTOMACT were not evaluated during this inspection cycle and will be covered in the next inspection.

The following comments, applicable to AUTOMACT, are related to reports received within the evaluated period.

As cited earlier, the Initial Notification required by 40 CFR Part 63, Subpart A, Section 63.9 (b)(2)(i) to (v), was received on 9/9/2021. The Notice of Compliance Status (NOCS) required by 40 CFR 63.3110(c) was received/postmarked by AQD on 9/8/2022. As it was received after the date of inspection, a full evaluation of the NOCS will occur during the next inspection cycle. However, it is noted the NOCS was timely submitted no later than 60 days after the first day of the first full month following completion of all applicable compliance tests. The transfer efficiency test, which is the only required test, was performed on August

1-5, 2022. The information within the NOCS covers all the requirements cited on 40 CFR 63.3110(c)(1) to (c)(12). It is also noted that GM has chosen the compliance method specified in 40 CFR 63.3090(b) and 40 CFR 63.3092(a), wherein the ELPO is evaluated on its own and not included within the emission limit applied to the remaining surface coating operations.

#### MI-ROP-M4199-2010, General Conditions

9, 10 – In Compliance – Collected air contaminants shall be removed to maintain controls at required collection efficiency; air cleaning devices installed and operated in a satisfactory manner – It appears as if the controls were installed and operating as directed by the ROP.

11 – In Compliance – Visible emissions limited to 20% over a six-minute average, with the exception of one 27% six-minute period per hour, unless otherwise specified in the ROP or in a federal new source performance standard. This limit applies to point source (non-fugitive) emission units at the plant – No visible emissions were noted from facility operations during the 8/8/2022 inspection.

12 – In Compliance – Nuisance emissions prohibited – No citizen complaints have been received by the AQD's Detroit Office for GM in the period since the last inspection.

19 through 23, 25 (and under individual EU/FG tables at SCs VII.1 through 3) – In Compliance – Semiannual deviation reports, Rule 912 reports, compliance certifications and report certifications – Semiannual deviation reports and annual certifications for year 2021, and for the first semester of year 2022 were timely submitted and reviewed by AQD. Please see AQD review comments on the FCE FY 2022 under ROP SEMI 1 CERT and ROP SEMI 2 CERT compliance activities.

24 – In Compliance – Submissions to the emissions inventory. The 2021 MAERS report was submitted online by GM on 3/25/2022 and the ROP certification was received by AQD via email on 3/25/2022. A hard copy of the ROP MAERS Certification report was received on 3/28/2022. The supplemental control information was submitted via email to infoMAERS@michigan.gov on 3/25/2022. Please see report CA\_M419963068 for MAERS audit comments.

#### MI-ROP-M4199-2010 - SECTION 2 and PTI 91-15

In compliance with SC. VII.1 of PTI 91-15, GM provided written notification of the removal of the coal-firing capability for Boiler #1 and permanent shutdown of Boilers #2, #3 and #4 in a letter dated December 11, 2015.

During the inspection of 9/19/2017 AQD verified the decommissioning required under PTI 91-15 and confirmed the completion of the shut-down activities of EUBOILER2, EUBOILER3, EUBOILER4, EUASHCONVEYOR, EUASHSILO and EUHOPPER, which were regulated under MI-ROP-M4199-2010 - SECTION 2.

After 2017, the only active emission sources regulated under PTI 91-15 were EUBOILER1, EUTEMPBOILER1, and EUTEMPBOILER2. The two temporary boilers were brought to the plant as need it to supply steam for comfort heat during the heating season. GM complied with all the applicable requirements cited in PTI 91-15, for the emission units identified

above. Refer to the previous inspection report (year 2021) and the FCE 2022 for the evaluation of the permit conditions.

On 6/3/2022 GM submitted form M-001 (Rule 215(1) Notification of a change) and the certification form C-001 for the decommissioning of EUBOILER1, EUTEMPBOILER1 and EUTEMPBOILER2. The notification indicated that the cited emission units were going to be removed from service effective 6/30/2022.

During the inspection of 8/8/2022 it was confirmed that the temporary boilers were no longer at the site and Boiler #1 was disconnected from the system.

Since all the emission units regulated under ROP SECTION 2 and PTI 91-15 have been permanently shut down, no further evaluation will be conducted.

**6 - CONCLUSION**

At the time of completion of the investigation the facility appears to be in substantial compliance with the requirements of Article II, Air Pollution Control, Part 55 of Act 451 of 1994, and with the conditions of permit MI-ROP-M4199-2010, PTI 91-15 and PTI 209-19A.

NAME Offandoral

DATE 12/27/2022 SUPERVISOR JK