

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

N632763132

<b>FACILITY:</b> FEDERAL-MOGUL POWERTRAIN, LLC		<b>SRN / ID:</b> N6327
<b>LOCATION:</b> 47001 PORT ST, PLYMOUTH		<b>DISTRICT:</b> Detroit
<b>CITY:</b> PLYMOUTH		<b>COUNTY:</b> WAYNE
<b>CONTACT:</b> Troy Kantola , Technical Services Manager		<b>ACTIVITY DATE:</b> 04/07/2022
<b>STAFF:</b> C. Nazaret Sandoval	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b> FY 2022 Targeted Inspection		
<b>RESOLVED COMPLAINTS:</b>		

**Source:** SRN N6327 – Federal-Mogul (AKA Tenneco, Inc.)

**Location:** 47001 Port Street, Plymouth, MI 48170

**Inspection Dates:** 4/7/2022

**Reason for Inspection:** Targeted Inspection

**Inspector:** Nazaret Sandoval, AQD

**Main Contact Person:** Troy Kantola, Technical Services Manager

**Facility Phone Number:** (734) 254-8350

### **FACILITY BACKGROUND**

Federal-Mogul Corporation was founded in Detroit in 1899. The corporation operated with two business divisions: Federal-Mogul Powertrain and Federal-Mogul Motorparts. Federal-Mogul Powertrain focuses on original equipment powertrain products for automotive, heavy-duty and industrial applications. Federal-Mogul Motorparts sells and distributes a broad portfolio of products in the global vehicle aftermarket, while also serving original equipment manufacturers with vehicle products including brake friction, chassis, wipers and other components.

Federal-Mogul Corporation at Plymouth (Technical Center PT R&D – herein PTC) is part of the Powertrain Division. The facility is located in a light industrial area near M-14 and Beck Road. The business organization and the ownership at this location have changed over the years to become what it is today. In 1997, T&N Industries built the T&N Technical Center in Plymouth. In 1998, two engine testing facilities (McCord Payen and AE Goetze) moved their operations into the T&N Technical Center. Federal-Mogul bought out T&N Industries and took over all facility operations. In 2010, Federal-Mogul Ignition Products (under the name Champion Spark Plugs) moved their developmental and testing operations from their Toledo facility to the Plymouth site.

Federal Mogul's laboratory facilities, originally operating in Ann Arbor, were relocated to Plymouth at a building area constructed west of the old Federal Mogul building. The completion of the Plymouth Technical Center expansion project and the negotiations and business operations were completed around November 2019.

The total area of the building after the expansion is about 142,000 sq. ft, which includes 59,000 sq. ft for offices and 83,000 sq. ft for the labs. As indicated earlier, the new area is mostly occupied by the equipment from the Ann Arbor facility for material development work and testing (i.e., rubber-oil seals, bench testing, etc.). For building and labs identification details refer to the illustrations included in the last inspection report.

In 2018, Federal-Mogul Corporation was acquired by Tenneco, Inc., headquartered in Lake Forest, Illinois. The acquisition was completed on October 1, 2018. The two business divisions of Federal-Mogul – Powertrain and Motorparts – are being operated as separate divisions. The Plymouth Technical Center remains within the Powertrain division, and part of the Federal-Mogul Powertrain LLC legal entity. All internal and external signage have however been changed to the new Tenneco company identification. Tenneco currently operates four business segments: Clean Air, Motorparts, Performance Solutions, and Powertrain.

Tenneco announced on February 23, 2022, that it has entered into an agreement to be acquired by Apollo, one of the world's leading alternative investment managers. The deal is expected to close in the second half of 2022. However, this change in ownership does not affect the current business operations at the Federal Mogul Technical Center in Plymouth. Tenneco will continue to operate under the Tenneco name brand and will maintain a global presence.

The operations regulated by the AQD at Federal-Mogul Plymouth Technical Center (hereinafter Federal-Mogul) are those related to the testing of engines and engine components in dynamometer cells. The test cells are located in the south side of the building, opposite to the entrance lobby. Federal-Mogul does engine testing for the Big 3 automakers as well as some small-engine manufacturers.

As of the day of the inspection, on 4/7/2022, the facility had approximately 224 employees and one shift operations from Monday to Friday, from 6:30 A.M. to 3:00 P.M. Some tests run only during day shift, but there are others that can run unattended overnight and sometimes over weekends.

### **EQUIPMENT/PROCESS DESCRIPTION**

Federal-Mogul is permitted to operate a total of sixteen dynamometer cells. Cells 1 to 8 are in the west wing and Cells 9 to 16 are in the east wing. Each of the test cells is equipped with fuel lines that can accommodate gasoline, diesel and E-85. E-85 (a gasoline/ethanol blend) is tracked as gasoline for calculation of emission and material throughput. A variety of engine types and sizes, ranging from 250 to 600 brake-horsepower (bhp) are tested. During testing, the engine is connected to a dynamometer that simulates a vehicle load on the engine. Testing can last for a few hours up to several days in duration. The type of testing is specified by the clients and could include Developmental, Deep Thermal Shock, and Durability.

Deep Thermal Shock or DTS testing is that in which engines alternate between idle and peak power.

During Durability Testing the engines are usually tested for a period ranging from two weeks to three months. There are four cycles in which engines can be tested for durability:

Durability Cycles A, B, C, and D (refer to records in AQD file for illustrative graphs showing the variables involved in the different cycles).

Developmental testing consists of a variety of tests where engines typically operate at low and intermediate loads. The engines are operated in rich burn conditions (O<sub>2</sub> concentrations of less than 15%) and the tests are usually of shorter durations than the Durability tests.

Engines are fueled directly from underground storage tanks through a “fuel bank”, which meters various fuels into each test cell through flexible hoses.

Except for Cell 2, Cells 1 through 12 are generally used for testing gasoline engines; Cells 14, 15 and 16 are generally used for diesel engines. However, if necessary, all cells except Cell 13 may be used for either gasoline or diesel engines testing. Cell 13 is used exclusively for small engine testing (max engine rating 40 HP) and the cell has stands for testing small (2-cylinder) gasoline engines and ignition testing.

Cell 13 is divided into two cells with a partition wall. The alteration occurred in March 2016. The cells are identified as Cell 13.1 (with two testing stands) and 13.2 (with one testing stand). The wall was built to allow safer working conditions for the technicians, who might have to do mechanical work on one engine while the other engine is running. Also, the control room was isolated from the wing hallway to keep noise down when the one engine requires the operator to listen to its operation while running. In addition, the exhaust pipe was split to eliminate pressure pulses from one engine from affecting the other engine due to the nature of the testing. Emissions are vented out the back wall through two individual exhaust pipes. The engines tested in Cell 13 are small single-cylinder engines, for testing spark plug and to measure piston/ring/liner friction. Also, other types of small twin-cylinder and single-cylinder engines can be tested in Cell 13.

Cell 2, which was once an engine testing cell with dynamometers and ancillary equipment, has been converted to a cell with motorized cylinders heads for valve-rotator testing or GVT (Global Value Train) Spin Rigs Testing. This type of testing does not generate air emissions from the connected stack. Natural gas is used to heat the valves and rotate them. The GVT testing was explained to me during the 11/14/2019 inspection, when Cell 2 was still used as a storage room. The pictures illustrating the proposed equipment were submitted with the records sent to AQD via email on 11/20/2019. NTH prepared an exemption letter to reflect the test lab equipment. The letter claimed the permit to install exemption cited in Rule 283 – “Permit to install exemption; testing and inspection equipment”. See AQD file. The facility will conduct the testing of valve seats (seals) in cylinder heads engines at high temperatures using heated compressed natural gas (CNG). Mr. Kantola indicated that they were planning to start operations on 5/16/2022.

Federal-Mogul installed an Air Injection Control System (AICS) in 2004 to control CO and VOC emissions from the test cells' exhaust stacks. The AICS works by injecting a measured stream of air into the exhaust gas, which is hotter than the CO's auto ignition point, causing the CO to oxidize in the exhaust pipe. The exhaust temperature is monitored before and after air injection to assure sufficient destruction efficiency. The exhaust temperature must reach 1100 F to oxidize CO; exhaust temperatures using the AICS usually exceeds 1400 F. The AICS does, however, cause a minor increase in NOx emissions. The air injection rate (scfm) is dependent on the type of test being performed. According to permit conditions, the AICS is required when gasoline is used as fuel and

during Durability and Deep Thermal Shock testing. No controls are required when using diesel fuel, or when testing small engines (Briggs & Stratton), or when Developmental Testing is conducted.

The test cells are supported by multi-compartment underground storage tanks (USTs) located at the east wing of the building. To follow this description, refer to the tank-layout drawing received via email on 2/13/15 during the ROP renewal. One of the tanks has two compartments, UST 1 and UST 2, with 6,000 gallons each, storing iso-octane and premium unleaded gasoline. The other tank is a 6,000-gallon UST with three (3) 2,000-gallon compartments: UST 10, UST 3 and UST 4 for storage of Ethanol E-100, Racing Fuel and Ethanol E-85, respectively.

There are two (2) additional multi-compartment USTs with capacities of 8,000 gallons and 6,000 gallons. The 8,000-gallon tank is divided in two compartments: UST 5 (a 2,000-gallon blow-off tank) and UST 6 (6,000-gallon diesel tank). The 6,000-gallon tank has three 2,000-gallon compartments identified as UST 7, UST 8 and UST 9 used for storage of lab blow off, used oil and used anti-freeze respectively.

Additional minor exempt equipment include: three (3) parts washers (cold cleaners) that use a petroleum-based solvent with 100 % VOC content; a thrust ring electric driven bearing tester, where oil mist emissions are expected from the use of bearing coolants; seal-shaft testing equipment using oil and the roof-top space heaters.

### **COMPLIANCE HISTORY**

The last inspection to the facility was on November 14, 2019, and the facility was found to be in compliance with the ROP requirements and all the air quality applicable regulations.

There have been no complaints associated with the operations at the facility, no pending administrative consent orders, and no violation notices issued since the last inspection.

### **INSPECTION NARRATIVE**

The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451 and the Michigan Department of Environment, Great Lakes, and Energy - Air Quality Division (EGLE-AQD) rules.

On April 7, 2022 I arrived at the facility at approximately 1:30 PM and I was greeted by Troy Kantola, Product Director & Plant Manager at the Plymouth Technical Center (PTC). We gathered at the conference room with Karly St. Aubin, EHS Coordinator, and Chris Cummings, Engineering Instrumentation Associate, both employees of Federal-Mogul PTC. Chloe M. Palajac, from NTH consultants, was also in the meeting.

After the introductions I explained the purpose of my visit and I asked if there have been any changes in the facility operations, equipment additions, and/or modifications on the type of testing that is conducted at the test cells, since the last Air Quality Division (AQD) inspection conducted in 2019.

Mr. Kantola provided an update of the business operations and explained the negotiations with Apollo in 2022. This information was cited earlier in this report under "Facility

Background". Despite the negotiations with Apollo, it appears as if the business operations at Federal-Mogul PTC will continue as usual. The company does not expect major changes in the operations and/or type of testing conducted at the engine testing cells.

I was informed that no additional equipment or emission units regulated by AQD have been incorporated into the facility since the last inspection. As of 4/7/2022, the facility continues conducting most of its operations utilizing diesel engines and gasoline engines during developmental testing, whereas durability tests and DTS testing are less common.

Mr. Kantola reported a few updates and upcoming projects. The Non-AICS control system in Cell 14 was upgraded, with no changes in max power (HP). Three HVAC units will be replaced but with no changes in the BTUs. There is a project for the replacement of the dyno in Cell 14; NTH will evaluate the permit requirements. The tritium system that was discussed during the 2019 inspection, which is used as a radiotracer for tracking oil consumption in the engines, has been installed. The system was licensed on 3/31/2021, audited on 3/28/2022, and it became operational on 3/28/2022. This system is exempt from permitting, pursuant to Rule 285(2)(s) "Emissions or airborne radioactive materials specifically authorized pursuant to a United States nuclear regulatory commission license". For additional details, see the exemption analysis dated April 8, 2021, in the facility files.

I briefly described the sections of the Renewable Operating Permit (ROP) No. MI-ROP-N6327-2015; with emphasis in the regulated pollutant emission rates, material limits and the monitoring/recordkeeping and reporting conditions for the main emission units grouped under FG-ALLCELLS. As I read through the permit conditions, I asked for the pertinent records.

Some of the records (which are included in the appendix) were requested by AQD via email dated 4/5/2022. The rest of them were requested at the meeting. The facility provided most of the records via email in the following weeks after the inspection.

After the ROP discussion we proceeded to walkthrough the facility. During the first portion of the plant tour, I observed each one of the cells and the dynos, checking them against the flow diagram and the description we have in-file. I took pictures of the dynos that are currently installed at each cell to verify their maximum capacities and I compared them information obtained during the last inspection; they all matched. There were no modifications in the cells, except for the ones I already mentioned earlier in this report. At the time of the walkthrough there were no testing activities going on. The facility provided an updated cells description and layout with the ROP renewal application which reflects the minor changes described earlier.

At the end of walkthrough, we observed the operations located in the new area of the building. I verified that the work has been completed and the new testing equipment from the Ann Arbor Sealing System Technical Center was up and running. The labs are identified on a layout provided to me during the last inspection. The west machine shop and the sealing test labs identified in the plot plan with No. 1 and No. 2 respectively, were observed from the outside window. Then, we visited other labs (No. 5 to No. 8) which included the mill room, the press room, the material testing lab, the oven room and the coating lab. I did not have the opportunity to inspect the cited labs during my visit in 2019 because they were not fully operating. The operations taking place at each lab had been described in a preliminary evaluation prepared by NTH consultants dated May 13, 2016, after NTH visited the Sealing

System Technical Center in Ann Arbor on April 6, 2016. The summary table included with the evaluation described the emission sources, the estimated potential emissions and the applicability of permit to install exemptions. The analysis indicated that the lab activities for the sealing system operations corresponded to research and development activities with minimal potential emissions and demonstrated the applicability of Rule 283 exemption. Based on the equipment inspection and the description given by the lab specialist during our walkthrough on 4/7/2022, it seems like the demonstration submitted by NTH in 2016, which was updated on 1/16/2020, is accurate.

The parts washers installed on 2/1/2016 are still in the same locations. They are parts-washers maintained by "Safety Clean". Two are identified as Model 81 (max fill volume 80 gal) and one is Model 30 (max fill volume 15 gallons).

Model 81 washers are in the mechanical room, east test wing. Per information dated 6/26/2018, the dimensions of the openings on top of the units are: 45" W x 27" D, for a surface area of approximately 8.5 sq. ft. Model 30, located in the high dB laboratory near the bearing test rig, is 34" W x 22.5" D, for a surface area of 5.3 sq. ft. The equipment identification and written operating procedures are posted on each one of the cold cleaners.

At the closure meeting I went over the requested records and said that AQD's final compliance determination will be assessed once the records are received and evaluated. A written report will contain a detailed evaluation of the permit conditions.

Here is the list of the records received for this inspection:

- 1) Facility updates and acquisition infographic.
- 2) Material throughput and emission reports for the period from 3/1/2021 to 2/28/2022.
- 3) Stack test results for most recent testing.
- 4) Ultra Low Sulfur Diesel Fuel #2 – certificate of analysis and recent purchases.
- 5) Thermocouple and flow meter certificates of calibration.
- 6) Safety Kleen Part Washers - in/out reports and Safety Data Sheet for solvent.
- 7) Bearing Thrust Rig – Rule 290 lubricating oil usage records.
- 8) Space Heaters – Natural Gas Usage and estimated emissions.
- 9) Sealing system equipment exemption evaluation.
- 10) New Testing Equipment GVT– equipment pictures and description.
- 11) FG NESHAP CCCCCC - Fuel underground storage tanks and excerpt from fuel delivery procedures.

I left the facility at about 4:30 PM.

### **REGULATORY APPLICABILITY AND PERMIT UPDATES**

The regulatory analysis for this source was described in the ROP Staff Report dated May 18, 2015. Here is a summary of the applicable requirements:

This stationary source is subject to Title 40 of the Code of Federal Regulations (CFR), Part 70, because the potential to emit carbon monoxide (CO) exceeds 100 tons per year.

The stationary source is considered to be a minor source of HAP emissions because the potential to emit of any single HAP regulated by the federal Clean Air Act, Section 112, is less than 10 tons per year and the potential to emit of all HAPs combined are less than 25 tons per year.

The source is considered a synthetic minor source in regards to the Prevention of Significant Deterioration regulations of 40 CFR, Part 52.21 because the stationary source accepted legally enforceable permit conditions limiting the potential to emit of carbon monoxide to less than 250 tons per year.

FG-ALLCELLS at the stationary source is subject to the federal Compliance Assurance Monitoring (CAM) rule under 40 CFR, Part 64. These emission units have a control device and potential pre-control emissions of CO greater than the Title V major source threshold level. An air injection control system (AICS) is used in all gasoline engine test cells to control CO and VOC emissions. The pre-control device potential VOC emissions from each emission unit are less than 100 tons per year.

Rule 201 exemptions:

- The Thrust Ring Electric Driven Bearing Tester is exempt from state permitting. The facility submitted a Rule 290 exemption analysis for this process when the equipment was installed, and it was determined that an air permit was not required. During the inspection on 4/7/2022, AQD staff determined that there have been no changes to the equipment and/or its process operations. Therefore, the exemption analysis (on-file) is still valid. The facility keeps monthly records of the lubricant usage at this machine.
- The part washers are exempt from permitting via Rule 281(2)(h). According to the dimensions of the openings (W x D), all part washers have an air/vapor interface of not more than 10 square feet. The solvent usage is monitored and recorded.
- The facility has space heaters burning natural gas which are exempt from permitting via Rule 282(2)(b)(i). Each space heater has a rated heat input capacity of not more than 50,000,000 Btu per hour. AQD reminded the facility to update the PTE calculations for the space heaters whenever they add new heating units.

During the ROP renewal process, in February 2015, the facility submitted a demonstration validating that the requirements of Rule 201(1) to obtain a permit to install do not apply to the underground storage tanks used for the storage of the following waste products: used oil, used anti-freeze, engine coolant and diesel fuel. The tanks are exempt pursuant to the rules cited below:

UST 6 (Diesel Fuel Storage Tank): R 336.1284(2)(d).

EU-UST 7 and UST 8 (Used Hydraulic Oil and Engine Coolant Storage Tanks): R 336.1284(2)(c).

EU-UST 9 (Used Antifreeze Storage): R 336.1284(2)(i).

The gasoline tanks associated with the dynamometer cells for the engine testing facilities (EU-GASOLINE\_TANKS) are exempt from permitting under Rule 201 pursuant to exemption Rule 284(2)(g)(iii) which exempt equipment exclusively serving dynamometer cells facilities for gasoline and/or gasoline/ethanol blends storage and handling.

ROP Updates:

Federal-Mogul operates under a Renewable Operating Permit (ROP) first issued in 2003 and renewed under No. MI-ROP-N6327-2015 on 8/21/2015.

MI-ROP-N6327-2015 expired on 8/21/2020. An ROP Renewal Application was timely submitted to AQD with a cover letter dated 2/4/2020. The AQD staff reviewed the application and determined the application was administrative complete. AQD issued an administrative completeness determination letter, dated 2/14/2020. The ROP is currently under the renewal process.

### **APPLICABLE RULES/ PERMIT CONDITIONS**

For the purposes of determining compliance with MI-ROP-N6327-2015 issued on August 21, 2015, the fuel usage and emission records for the period 3/1/2021 to 2/28/2022 were reviewed. When determining compliance with 12-month rolling time-period limits, the most recent month with the highest fuel usage/emissions is cited in parentheses.

### **ROP No. MI-ROP-N6327-2015 –FLEXIBLE GROUP CONDITIONS:**

#### **FG-ALLCELLS includes EU-TESTCELL1 through EU-TESTCELL16**

#### **I. Emission Limits:**

<b>Pollutant</b>	<b>Emission Limit</b>	<b>Highest 12-Month Rolling Emission Total</b>	<b>Compliance Status</b>
VOC	5.6 tons per 12-month rolling time period	2.1 tons (Sept 2021)	In compliance
CO	223.3 tons per 12-month rolling time period	91.5 tons (Sept 2021)	In compliance
NOx	62.1 tons per 12-month rolling time period	10.4 tons (Sept 2021)	In compliance

#### **II. Material Limits:**

<b>Material</b>	<b>Limit</b>	<b>Highest Fuel Usage</b>	<b>Compliance Status</b>
Gasoline/E85	2,630,750 lbs. per 12-month rolling time period	486,871 lbs. (January 2022)	In compliance
Gasoline/E85	16,713 lbs. per day	2,657.2 lbs. per day (July 2021)	In compliance
Gasoline/E85	2,327 lbs. per hour	123.7 lbs. per hour (March 2021)	In compliance
Diesel	1,418,000 lbs. per 12-month rolling time period	192,551 lbs. (July 2021)	In compliance
Diesel	19,143 lbs. per day	2,278.5 lbs. per day (September 2021)	In compliance
Diesel	0.30% sulfur content in fuel	0.00084% sulfur*	In compliance

\*Federal-Mogul uses an “ultra-low sulfur premium diesel fuel” which has a specification of less than 15 ppm (0.0015%) sulfur content. The analytical result in the table is for a fuel sample collected on 04/21/2022 and analyzed on 04/22/2022.



#### IV. Design/Equipment Parameters- In Compliance

Test	Minimum Air Injection Rate (scfm)	Compliance Status
Durability Cycle A	45	In compliance
Durability Cycle B	50	In compliance
Durability Cycle C	72	In compliance
Durability Cycle D	50	In compliance
Deep Thermal Shock	45	In compliance

AICS injection rate is monitored during engine testing. Monthly engine test records for the cited period were reviewed to verify that the AICS was reaching the minimum air injection rate during each test cycle. It appears that for all instances the AICS has been used as required by the ROP conditions.

As it has been indicated in previous inspections reports, the facility has safeguards programmed into the test code that require the minimum parameters to be met (as part of their CAM). If they are not met, the test shuts down.

#### V.1 Testing/Sampling – In Compliance

Federal-Mogul is required to verify NOx and CO emission rates from a representative number of cells by testing once during the term of the ROP. A test protocol shall be submitted and approved by AQD staff before testing. To comply with this requirement for the term period from 2015 to 2020, a test protocol to determine the CO and NOx emission rates at the exhaust pipe was received by AQD-Detroit Office on April 30, 2019, with a cover letter dated April 25, 2019. AQD field staff concurred with the proposed test protocol and approved the test conditions in a letter dated April 19, 2019.

The test was performed on May 7, 2019, with the attendance of AQD district staff, the facility's consultants, testing company personnel and facility representatives. The test was conducted using a large 6.2-liter gasoline powered engine. The engine was tested on Cell 12 under two different testing conditions: Uncontrolled Developmental Testing (without AICS) and Durability Cycle-B Test (with AICS). In general, the tests ran smoothly, and all the operational parameters remained within the expected ranges specified in the ROP. A separate record has been created in the Michigan Air Compliance and Enforcement System (MACES) database for the stack test observations. The record reports the details about test performance and the preliminary results. Please refer to "Field Observation Report: Stack Testing" report in the AQD files.

A complete report with the details about the stack test procedures, recorded parameters, number of runs and the emission test results was prepared and timely submitted by the testing company. The report was received by the AQD Detroit Office on July 8, 2019. A summary table containing the test results has been included in the appendix of this inspection report. The stack test results were used to calculate emission factors (EFs) for NOx and CO for both conditions, with and without AICS. For the Developmental Testing scenario (without AICS), the average EFs were 0.010 lb. of NOx / lb. fuel and 0.32 lb. of CO / lb. fuel. Likewise, the EFs obtained from Durability Testing showed average values of 0.0065 lb. of NOx / lb. fuel and 0.16 lb. of CO / lb. fuel.

The NO<sub>x</sub> and CO emission factors measured as a result of the stack test conducted on May 7, 2019, showed values below the EFs specified in the Appendix 7 of the ROP for the Developmental Testing conducted on the large size (6.2 Liter) engine powered by gasoline. Likewise, the NO<sub>x</sub> EF measured during the Durability Testing – Cycle B showed a value below the one cited on Appendix 7. However, that was not the case for the EF measured for CO emissions during Durability Testing – Cycle B. According to ROP Tables 1 and 2 of Appendix 7, the maximum estimated EF for controlled CO emissions is 0.12 lb CO /lb. fuel ( i.e.  $0.693 * (1-0.83) = 0.12 \text{ lb CO /lb. fuel}$ ). The stack test result reported an EF value of 0.16 lb CO / lb. of fuel, which is above the maximum estimated EF from Appendix 7.

This issue was discussed with Federal Mogul representatives and their consultants in a meeting that took place at the AQD Detroit District Office on January 27, 2020. As a result of the discussion, we all agreed on adjusting the current uncontrolled CO emission factor cited on Table 1, Appendix 7 of the ROP for the 6.0 L engine to match the results of the stack test. This modification will be proposed during the ROP renewal process. This type of modification is allowed by the ROP special condition VI.18 for FG-ALLCELLS.

#### VI. Monitoring/Recordkeeping

Records are computerized/ maintained on file for a period of 5 years.

##### **VI.1 to VI.5 – In Compliance**

The permittee calibrates, maintains and operates the Automatic Data Acquisition System (DAS) in a satisfactory manner to monitor and record on a continuous basis the following parameters: the gasoline and diesel flow for each engine tested; the exhaust gas temperature just upstream of the air injection point and downstream of the air injection point (when the AICS is operating); the air injection rate (in scfm) when the AICS is operating.

Calibration calendar and records are contained in Gage Trak, a program that notifies when calibrations are due. The program also stores the results of the completed calibrations. The interval for calibration is flagged by Gage Trak. Examples of the calibration procedures used at the facility were requested by AQD at the inspection. The examples were provided via email and are in the appendix with the rest of the records collected during this inspection.

Certification and maintenance of the testing equipment is scheduled on a regular basis. Air flow meters are sent to the manufacturer at the time flagged by Gage Trak (usually every 2-3 years). Fuel totalizers are verified on-site, and thermocouples are calibrated when flagged by Gage Trak (generally every 6 months internally).

Necessary parts for routine repair for some of the monitoring equipment are available on-site. Spare thermocouples and air flow meters are kept on-site. Fuel flow meters have never failed and therefore they do not keep spares. However, if a fuel flow meter should fail, the facility would swap one in from an idle test cell until repairs could be made. The DAS must be functional to operate the test cell; therefore, no test can be run unmonitored.

##### **VI. 6 to VI. 8 – In Compliance**

The permittee keeps in a satisfactory manner, monthly and previous 12-month NO<sub>x</sub>, CO and VOC emission calculation records for FG-ALLCELLS. The emissions are calculated according to the procedure explained in Appendix 7 of the ROP.

The permittee calculates the hourly gasoline usage rate for FG-ALLCELLS based upon calendar monthly recordkeeping prorated to an hourly rate using actual operating hours. The permittee calculates the daily diesel and gasoline usage rate for FG-ALLCELLS based upon calendar monthly recordkeeping prorated to a daily rate using actual operating days.

During the inspection of 01/11/2016 AQD discussed the time periods and the calculation procedures used by the permittee to estimate the gasoline and diesel usages in lbs./hr. AQD agreed with the procedure. The procedures have not changed. The discussion is summarized under section VI.9 to VI.15 of this inspection report.

The gasoline and diesel usage in pounds per hour, as well as the operating hours are reported with the monthly records at the end of each month.

#### **VI.9 to VI.15 – In Compliance**

Records detailing fuel rate, hours of operation, and AICS operational parameters are recorded and maintained as required by the permit.

For this inspection, records from March 2021 to February 2022 were examined to determine compliance. Copies of the cited records can be found in the Appendix.

The permit limits gasoline usage per day and per hour. It also limits diesel usage per day. However, Federal Mogul is not required by the permit to track fuel usage on an hourly or daily basis to determine compliance with these usage limitations. Rather, per the methodology stated within SCs VI.9 and VI.10, the facility tracks fuel usage on a monthly basis and prorates the usage to a daily usage and an hourly usage based upon the total operating days and operating hours within the calendar month. Because the permit's material limits, "usage", is understood to reflect the time when fuel is actually being combusted and because the material limits are written for the flexible group FG-ALLCELLS and not for any individual engine test cell, the term operating hours is understood to mean any hour within the calendar month when one or more engine test cells is combusting the fuel in question and similarly so for the term operating day. Thus, any hour when gasoline is combusted within FG-ALLCELLS is counted as a single operating hour for the purpose of permit tracking, no matter how many of the individual cells (one to sixteen) within the flexible group are actually operating at that time.

The days of the month when diesel engines are tested are tallied separately from the gasoline testing days. Therefore, in a particular month, there will be "diesel operating days" and "gasoline operating days". The duration of a test depends upon the type of testing. Some tests only run on the day shift (6:30 AM – 3:00 PM) M-F. Other tests, mainly the Durability Tests, can run unattended overnight and sometimes over weekends.

#### **VI.16 – In Compliance**

The facility follows the procedure highlighted in Appendix 7 of the ROP to calculate the annual average destruction efficiency for CO and VOC.

#### **VI.17 – In Compliance**

The facility maintains records of fuel specifications and/or fuel analysis for each delivery, or storage tank, of fuel oil or diesel fuel. The records include purchase records for ASTM specification for fuel oil, analyses provided by the vendor at the time of delivery, analytical results from laboratory testing. Examples of the records were collected during the inspection. The information collected includes copies of the "bill of lading" – detailed receipt

given by the carrier Corrigan Oil Co. to Federal Mogul for gasoline and diesel purchases – the invoice was dated 3/15/2022. The information includes the volumes and the product specifications for each shipment received. In addition, the records demonstrate adequate compliance with the percent sulfur limit in fuel oil. ROP specifies a maximum sulfur content of 0.30 % (3,000 ppm). The product is identified as Ultra Low Sulfur Diesel # 2 (ULSD 15 ppm max). Certificate of analysis for diesel samples taken on 4/21/2022 were provided. The lab results dated 4/22/2022 showed ULSD with sulfur content 8.4 ppm

#### **VI. 18 - In Compliance**

Air injection control system (AICS) is always used when Durability and Deep Thermal Shock testing of gasoline engines is conducted. The AICS is maintained satisfactorily and the cycle average exhaust temperature just upstream of the air injection point and downstream of the air injection point is maintained at a minimum of 1300 °F. Records for March 2021 through February 2022 were reviewed and they showed temperatures above 1300 °F whenever AICS is used for either Durability or Deep Thermal Shock testing. Operating below 1300 °F for more than 30 minutes is an excursion. No excursions were detected or reported during the analyzed period.

#### **VI.19 - In Compliance**

N/A -No excursions were reported during the analyzed period.

#### **VI. 20 – In Compliance**

As the permittee has indicated in the semiannual and annual ROP compliance reports, there have been no situations of monitor malfunction/downtime. All monitoring is done with the DAS. If DAS is not functioning the test cell cannot be operated, thus no operation is possible unless it is being monitored.

#### **VI. 21 – N/A**

A Quality Improvement Plan (QIP) is required under 40 CFR 64.8 for sources that experience excessive excursion/exceedances during a reporting period. Federal Mogul has not experienced any excursions or exceedances during the last two years, as reported in the semiannual ROP compliance reports and as such, AQD has not required a QIP.

#### **VII. Reporting - In Compliance**

Annual and Semiannual ROP Certification Reports and Deviation Reports are submitted in a timely manner, as required. Since the last inspection the technical center building has been expanded and additional space heaters have been added (-refer to exempt equipment earlier in this report).

No changes in equipment have occurred in FG-ALLCELLS and no deviations have been reported. There has not been a change in land use.

#### **VIII. Stack/Vent Restrictions- In Compliance**

The exhaust gases from the stacks are discharged vertically upwards to the ambient air. I did not climb to the roof of the building to take a close look at the stacks; however, no visible emissions were observed at the time of the inspection.

In March 2016, when a dividing wall was added to Cell No. 13, two stacks with diameter of 4 inches and height of 32 feet were installed, replacing one (1) stack with diameter of 6 inches and height of 32 feet. For details, refer to the notification letter dated June 15,

2018. Except for the modifications of the exhaust stack from Cell 13, which were necessary to add operational flexibility, there have been no changes to the rest of the stacks.

#### IX. Other requirements – N/A

Failures to achieve compliance have not been identified. No modifications to the CAM have been required.

#### **FG-NESHAP CCCCCC (EPA is the delegated authority)**

The specific measures for a gasoline dispensing facility (GDF) with monthly throughput less than 10,000 gallons are cited under 40 CFR 63.11116(a)(1) to (4) and are listed under the special conditions cited for the flexible group FG-NESHAP CCCCCC, emission unit EU-GASOLINE\_TANKS.

This Area Source MACT has not been adopted into the State of Michigan, Air Quality Division, Part 9 rules. The State of Michigan has not accepted delegation from the EPA to implement and enforce the provisions of 40 CFR Part 63, Subpart CCCCCC. Consequently, the EPA is the authority responsible for the enforcement and implementation of the special condition included in this section of the ROP.

For this inspection Federal Mogul provided some records to show compliance with the special conditions cited for FG-NESHAP CCCCCC. The records were collected and will be placed in the facility files for reference purposes, but they will not be reviewed or evaluated by AQD for compliance determination.

#### **FG-COLD CLEANERS**

The cold cleaners are considered “new” cold cleaners because they were put into service after July 1, 1979. They are exempt from Rule 201 pursuant Rule 281 (2)(h).

#### **EU-SAFETYKLEEN**

##### II. Material Limits – N/A

The permittee doesn't use cleaning solvents containing halogenated compounds. For the physical and chemical properties of the cleaning solvent refer to the SDS collected during the inspection.

##### III. Process/Operational Restrictions

1. Cleaned parts shall be drained for no less than 15 seconds or until dripping ceases. The cold cleaners were not in operation at the time of the visit. **Not Evaluated**
2. The permittee performs routine maintenance on each cold cleaner as recommended by the manufacturer. **In Compliance**

##### IV. Design /Equipment Parameters – In Compliance

The cold cleaners at Federal-Mogul meet the following design requirements:

- 1a. The air/vapor interface of each cold cleaner is 8.5 square feet, which is not more than ten square feet.
- 1b. The cold cleaners are used for cleaning metal parts and the emissions are released to the general in-plant environment.
2. The cold cleaners were equipped with a device for draining cleaned parts.
3. All the cold cleaners were equipped with a cover and the covers are closed when they are not in use.

4. The Reid Vapor Pressure (RVP) of the cleaning solvent used at Federal-Mogul is less than 0.1 psia. The solvent is not agitated, nor heated. Therefore, the requirement of having a mechanically assisted cover does not apply.
5. This condition is not applicable to Federal-Mogul's cold cleaners. (RVP < 0.6psia)

#### V. Testing/Sampling – **N/A**

#### VI. Monitoring/Recordkeeping – **In Compliance**

Records are maintained on file for a period of five years

##### 1 – **N/A**

2. The following information (required by section VI. 2) was provided to AQD on 6/27/2018. The information written on stickers labels was posted on the cleaners and are still in-place:
  - a. A serial number, model number, or another unique identifier for each cold cleaner.
  - b. The date the unit was installed, manufactured or that it commenced operation.
  - c. According to the dimensions of the openings (W x D), all part washers have an air/vapor interface of not more than 10 square feet.
  - d. The applicable Rule 201 exemption is cited
  - e. The Reid vapor pressure of each solvent used. This information is listed on the MSDS.

##### f. **N/A**

For details about the capacities and dates of installation of the cold cleaners, please refer to the "Inspection Narrative" section in this report

3. The permittee shall maintain written operating procedures for each cold cleaner. These written procedures shall be posted in an accessible, conspicuous location near each cold cleaner.

The manufacturer operating procedures, as well as the AQD orange-stickers are posted near each one of the cold cleaners

4. The solvent is not a safety hazard. Records of solvent usage and solvent lost are kept in a monthly basis. Closed containers are used for the storage of solvent cleaner.

#### **FG-RULE 290 – In Compliance**

As indicated earlier in this report the Thrust Ring Electric Driven Bearing Tester (EU-BEARINGTESTER) is exempt from the requirements of Rule 201 pursuant to Rules 278 and 290. The facility submitted a Rule 290 exemption analysis for this process when the equipment was installed, and it was determined that an air permit was not required. The facility keeps monthly records of the lubricant usage at this machine. The permittee is in compliance with all the special conditions listed in the ROP for this flexible group.

#### **MAERS REPORT**

The facility is required to report to the Michigan Air Emission Reporting System (MAERS). The 2021 MAERS report was timely submitted on 3/10/2022 with no errors detected. The ROP certification was received on 3/15/2022. AQD audited the report and observed that there was an increase in the total emissions reported for 2021, from 61.84 tons in 2020 to 100 tons in 2021, with CO representing 81% of the total emissions. This increase in emission correlates with the fuel throughput increase, from 66,800 gals in 2020 to 101,900 gals in 2021. The figures represent an increase of 73% in gasoline usage and

13% increase in diesel compared to 2020. For details refer to MACES report CA N632762450

**FINAL COMPLIANCE DETERMINATION**

Federal-Mogul Corporation appears to be in compliance with the MI-ROP-N6327-20015 requirements and the evaluated state and federal air emissions standards, rules and regulations.

The ROP is in the renewal process. The ROP renewal presents an opportunity to adjust the current uncontrolled CO emission factor cited on Table 1, Appendix 7 of the ROP for the 6.0 L engine to match the results of the stack test conducted on May 7, 2019.

NAME NAZARET SANDOVAL

DATE 9/19/2022

SUPERVISOR JK