

SRN: N6327

Manila

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

N632744953

FACILITY: FEDERAL-MOGUL CORPORATION		SRN / ID: N6327
LOCATION: 47001 PORT ST, PLYMOUTH		DISTRICT: Detroit
CITY: PLYMOUTH		COUNTY: WAYNE
CONTACT: Terry Walter, Manager of Technical Services		ACTIVITY DATE: 05/23/2018
STAFF: C. Nazaret Sandoval	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: FY 2018 - Scheduled Inspection		
RESOLVED COMPLAINTS:		

Source: SRN N6327 – Federal-Mogul (PTC)

Location: 47001 Port Street, Plymouth, MI 48170

Date of Inspection: May 23, 2018

Date of Report: June 28, 2018

Reason for Inspection: Targeted Inspection

Inspector: Nazaret Sandoval, AQD

Personnel Present: Terry Walter, Manager of Technical Services, Federal-Mogul

Facility Phone Number: (734) 254-0100 (main); (734) 254-8291 (direct line)

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FACILITY BACKGROUND

Federal-Mogul Corporation was founded in Detroit in 1899 and maintains its worldwide headquarters in Southfield, Michigan. The corporation operates 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), 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 Corporation expanded its technical center in Plymouth as part of the growth of its powertrain division. Most of the laboratory facilities at the Sealing System Technical Center operating in Ann Arbor, MI have been relocated to Plymouth. During the site visit of May 23, 2018, it was observed that the building expansion project which started around the Spring of

2016, is almost completed, waiting for the hook-up of the equipment that has been being relocated.

The operations regulated by the Air Quality Division at Federal-Mogul Plymouth Technical Center (hereinafter Federal-Mogul) are those related to the testing of engines and engine components in dynamometer cells. Federal-Mogul does testing for the Big 3 automakers as well as some small-engine manufacturers. Some tests run only during day shift, but there are others that can run unattended overnight and sometimes over weekends.

The facility currently operates one shift, Monday through Friday (6:30 A.M. to 3:00 P.M.). The number of employees will increase from about 160 employees (in 2016) to 320 employees when the relocations is completed.

EQUIPMENT/PROCESS DESCRIPTION:

Federal-Mogul is permitted to operate a total of sixteen dynamometer cells. Cells 1 to 8 are located 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 engines types and sizes, ranging from 250 to 600 brake horse power (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. Engines are fueled directly from underground storage tanks through a "fuel bank", which meters various fuels into each test cell through flexible hoses.

Cells 1 through 12 are generally used for testing gasoline engines; Cells 14, 15 and 16 are generally used for diesel engines; and Cell 13 has various stands for testing small (2-cylinder) gasoline engines and ignition testing. If necessary, all cells except Cell No.13, may be used for either gasoline or diesel engines testing. Cell No.13 is used "exclusively" for small engine testing (max engine rating 40 HP).

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.

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_2 concentrations of less than 15 %) and the tests are usually of shorter durations than the durability tests.

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 auto ignition point of CO, 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 exceed 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. AICS is required to be operated 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, please refer to the "Tank Layout" drawing received via email on 2/13/15 during the ROP renewal filed with the records and documents gathered during the 2016 facility inspection.

One of the tanks has two compartments, UST 1 and UST 2 storing motor fuels. The volume of each compartment is 6,000 gallons. 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 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.

The cold room chassis dynamometer was added in 2011. The chassis-dynamometer is a fully enclosed unit, equipped with an exhaust stack, into which motor vehicles are placed for emissions testing under various use conditions. When a vehicle is tested, it is mounted on the chassis dynamometer and the dynamometer measures the horse power and torque produced by the vehicle. The tested vehicles are EPA emission compliant vehicles that are equipped with a catalytic converter and fueled by diesel, E-85, or gasoline. This equipment has not been used much since its installation.

The facility has three (3) parts washers that use a petroleum-based solvent with 100 % VOC content.

Federal-Mogul also performs thrust bearing testing in a "Thrust Ring Electric Driven Bearing Tester". The expected emissions from this equipment are oil mist from the use of bearing coolants.

COMPLIANCE HISTORY

The last inspection to this facility was conducted on January 11, 2016. 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 Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) rules.

On May 23, 2018 I arrived at the facility at approximately 9:20 AM and met with Mr. Terry Walter, Manager – Technical Services at Federal Mogul. I discussed the purpose of my visit. I asked Mr. Walter if there have been any changes during the last couple of years in the facility operations, equipment additions, and/or modifications of the type of testing they generally conduct in the testing cells. He indicated that 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. He added that no additional

equipment or emission units regulated by AQD have been incorporated into the facility since the last inspection. However, Mr. Walter provided the following updates:

- The dynamometers and the ancillary equipment for engine testing/monitoring have been removed from the Cell No. 2. Motorized cylinders heads have been placed in Cell No. 2 for valve-rotator testing. This type of testing does not generate air emissions from the connected stack.
- Cell No. 13 has been altered with a partition wall. This alteration occurred in March 2016. 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. These engines are small single-cylinder engines, one used for spark plug testing and the other to measure piston/ring/liner friction. Also, other type of small twin-cylinder and single-cylinder engines can be tested in this cell.
- As indicated earlier, the relocation of the equipment from the Ann Arbor facility has been occurring since the building extension was completed. The new space is occupied with equipment for material development work and testing (i.e. rubber-oil seals), bench testing, etc.

After the initial meeting, we proceeded to walk-thru the facility. We stopped at Cell No. 14, where a test identified as "Diesel Temperature Piston Test" was occurring. According to the information on the console screen, the test would have a duration of 10 hour and it had started at 7 AM. I took note of the diesel consumption by reading the fuel-metering totalizer. Mr. Walter showed me on the computer screen that when the test started the value in the totalizer was recorded as 77,661 pounds and when we stopped at the cell, at about 11 AM, the reading was 78,149 pounds. This indicated that in approximately 4 hours the diesel fuel consumption was around 488 lbs.

We also stopped at Cell No 2 where a "Rotocoil Durability Test" was running. A graph posted outside of the cell showed that this type of testing has durations ranging from 1000 hours to 4000 hours. Several thousand hours of durability testing are completed prior to the start of series production. New applications for valve rotators are initially proven through test rig development like this one before prototype tests by customers on firing engines are developed.

I asked Mr. Walter to show me Cell No.13. There was a partition wall dividing the room and two individual exhaust pipes coming out the back walls. At the time of the visit there were three stands for small-engine testing. We walked outside to observe the modifications of the stack for Cell No.13. I noticed an inverted "Y" that connects the two individual 4-inch exhaust pipes to the original 6-inch stack pipe.

I noticed that the total height of the stack and the diameter of the end pipe were not modified. The dimensions matched those permitted by the current ROP. Therefore, excess emissions above the permit limits are not expected to occur as a result of the work done in Cell No. 13. Revisions to the existing ROP might not be required at this time. We discussed the issue briefly and I told Mr. Walter I would get back to him with additional information about the required forms/procedures for the notification of the change.

On May 24, 2018, I sent an email to Mr. Walter requesting additional information about Cell No 13 operations. Based on his answers, and after having a conference call on June 1, 2018 with participation of Rhiana Dornbos (NTH Consultants), we all agreed that the cell alteration falls into what it is described in Rule 215 (1)(a) as an "operational flexibility within a stationary source". The change is not a major modification, the actual emissions do not exceed the

emissions allowed under the ROP and the change does not violate any applicable requirement. As indicated earlier, the partition wall was built to allow safer working condition for technicians performing mechanical work on one engine while the other engine is running. The exhaust split was needed to eliminate transmitting pressure pulses from one engine to another when two engines are tested. In fact, according to Mr. Walter, the operations in Cell No. 13 are no different from what they were before the partition wall was built. Cell No.13 was originally permitted for up to six-small engine testing stands, but the current ROP is not clear in identifying Cell No.13 as a “dedicated cell” for that type of testing.

After the conference call of June 1, 2018, I provided a link to the procedure per Rule 215 - Change Notification, and the M-001 instruction form. The facility agreed to provide the requested notification. This issue has been addressed by Federal Mogul before the completion of this report. A cover letter dated June 15, 2018 was received by the Detroit District Office on June 26, 2018. The letter explained the modification of Cell No. 13 and included the requested forms, M-001 and C-001, as attachments. It is Federal Mogul responsibility to demonstrate that the alteration of the exhaust stack connected to Cell No. 13 will not have an impact on the potential emissions an/or the modeling results conducted under the original stack conditions.

During the last portion of the plant tour Mr. Walter showed me the new area of the building. I noticed that most of the new testing equipment from the Ann Arbor - Sealing System Technical Center has arrived but most of them were still in boxes and not connected yet. I asked Mr. Walter to provide additional information about the specific operations that will be taking place in those areas to evaluate potential air pollutants and permit to install applicability. He handed out to me a preliminary evaluation prepared by NTH consultants. The document, dated May 13, 2016, was prepared after NTH visited the Sealing System Technical Center in Ann Arbor on April 6, 2016. A summary table includes the description of the emission sources and a summary of the emissions estimate potential emissions. Based on the analysis, it appears as if the relocated operations will fall within research and development activities since the potential emissions are minimal. However, we will wait until the relocation and connection of the equipment at the Plymouth Center is completed to verify if the permit to install exemption Rule 283 applies to the operations relocated to that building. If there are changes to the operations or to the assumptions used in the development of the cited evaluation of April 6, 2016, the permit exemption applicability should be re-evaluated.

The parts washers have been removed and new ones have been installed on 2/1/2016. 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 Mr. Walter’s email, 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.

Toward the end of the inspection, I took a quick look of the Bearing Testing machine and returned to Mr. Walter's office to conclude the inspection. During the closure meeting I collected some of the records and provided general comments.

Mr. Walter handed out the facility monthly and the 12-month rolling records for the periods of January to December (2017) and from January to April (2018).

I requested the following records: natural gas usage, SDS for the solvent used at the part washers, excerpt from their fuel delivery procedures pertaining the underground storage tanks

(USTs), and the lubricating oil usage records for the Bearing Testing equipment. The requested information was promptly provided by Federal-Mogul via email on 5/29/2018, except for the diesel fuel specs records, which was provided on 6/11/2018.

I left the facility at about 1:30 PM.

REGULATORY APPLICABILITY AND PERMIT UPDATES

The regulatory analysis for this source was described on 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 has the potential to emit carbon monoxide over 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 carbon monoxide (CO) greater than the 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 05/23/2018, 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 records collected for year 2017 showed no emissions.
- 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 and solvent losses are monitored and recorded. VOC emissions are minimal.
- Federal-Mogul submitted a demonstration on December 22, 2010 validating that the cold room chassis dynamometer is exempt from state permitting per Rule 285 (2)(g). This exemption does not require recordkeeping. The demonstration (on file) includes the analysis required by Rule 278a validating the applicability of the cited exemption. There have been no changes to the chassis and/or its operations; therefore, the demonstration is still current.

- 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. Eighteen (18) space heaters were added during the building expansion (see backup data submitted via email on 5/29/2018). Per AQD request (6/26/2018), an updated summary table with the accurate number of existing "roof-top- units "(RTU) was provided by Federal Mogul via email on 6/28/2018. The table shows that there were 28 existing RTUs previous to the building expansion. All RTUs listed have a rated heat input capacity below 50 MMBTU per hour. The highest rated units (RTU 45 and 46) have an input capacity of 450,000 BTU per hour. AQD reminded the facility to update the Potential to Emit (PTE) calculations for the Space Heaters whenever they add new heating units. An estimated PTE calculation was done by AQD using the heat input capacities provided by the facility and the EFs listed in MAERS for SCC 10500106 (external combustion using natural gas in space heaters). The results showed a PTE increase in the NOx emissions from 0.615 tons per year to 3.210 tons per year and for CO from 0.1230 tons per year to 0.6419 tons per year.

The actual NOx and CO emissions from the space heaters were calculated by AQD using the annual natural gas usage records for year 2017, which were provided by the facility via email on 5/29/2018. The actual emissions are very low. The facility reported an annual natural gas usage of 4,887.7 thousand cubic feet per year. The highest emissions are shown for NOx (0.244 TPY).

The results of PTE calculations indicate that in the worst-case scenario (operating 24 hrs. / 7 days a week, in a year) an increase in combustion of natural gas for the usage of additional space heaters would not result in an increase in emissions greater than the significance levels for CO (100 TPY) or NOx (40 TPY). The rest of pollutants (PM, SO2 and VOC) have even lower contributions.

- 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 Oil and Coolant Storage): R 336.1284 (2)(c)

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

The gasoline tanks associated with the dynamometers 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 August 21, 2015. The ROP expires on August 21, 2020. The following is a summary of the changes that were incorporated into the ROP during the ROP renewal process that took place in 2015:

- EU-GASOLINE_TANKS was added to the ROP. This emission unit is subject to a MACT

standard under the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Source Category: Gasoline Dispensing Facilities promulgated in 40 CFR, Part 63, Subparts A and CCCCCC.

The gasoline tanks at Federal Mogul were installed in 1996 and they were fully in service in 1998. Therefore, they are considered existing emission sources because the commenced construction date for the tanks preceded November 9, 2006, the date specified on §63.11112 (d) for new affected sources. According to the MACT, the compliance date for the standards of Subpart CCCCCC was January 10, 2011, with recordkeeping to document monthly throughput starting no later than January 24, 2011. The facility has always maintained records of fuel usage. The records for the last four years, since 2011, show that the maximum monthly gasoline throughput has been below 10,000 gallons. Consequently, the applicable requirements for the gasoline tanks are those specified under §63.11116.

- Special Condition V.1 –Testing/Sampling, for FG-ALLCELLS was revised. The new approved language specifies that the “representative” number of test cells for stack testing shall be defined in the test plan and it is subject to AQD approval. This modification was approved pursuant to R 336.1216(2) throughout a Minor Modification to MI-ROP-N6327-2009 which incorporated PTI No. 368-97E into the ROP.
- Terms and conditions for EU-SAFETYKLEEN and EU-BEARINGTESTER were incorporated into Section D of the ROP using the specific ROP templates for Flexible Groups (i.e. FG-COLD CLEANERS and FG-RULE 290). These exempt emission units were not included in the previous ROP.

For more details about this regulatory analysis and the applicable requirements, please refer to the permit to install database and the ROP staff report. The ROP staff report and technical notes are kept with the ROP development folder in the facility files at the AQD district office.

APPLICABLE RULES/ PERMIT CONDITIONS:

As it was indicated earlier, the facility operates under MI-ROP-N6327-2015 issued on August 21, 2015.

For the purposes of determining compliance with the ROP, the fuel usage and emission records for the year 2017 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: Evaluating period from January 2017 to December 2017

Pollutant	Emission Limit	Highest 12-Month Rolling Emission Total	Compliance Status
VOC	5.6 tons per 12-month rolling time period	2.7 tons (April)	In compliance
CO	223.3 tons per 12-month rolling time period	84.3 tons (January)	In compliance

NOx	62.1 tons per 12-month rolling time period	15.6 tons (Jan. and Feb.)	In compliance
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II. Material Limits

Material	Limit	Highest Fuel Usage	Compliance Status
Gasoline/E85	2,630,750 lbs. per 12-month rolling time period	395,528 lbs. (April)	In compliance
Gasoline/E85	16,713 lbs. per day	3,009 lbs. per day (January)	In compliance
Gasoline/E85	2,327 lbs. per hour	151.6 lbs. per hour (Jan)	In compliance
Diesel	1,418,000 lbs. per 12-month rolling time period	327,284 lbs. (January)	In compliance
Diesel	19,143 lbs. per day	3,111.6 lbs. per day (November)	In compliance
Diesel	0.30% sulfur content in fuel	<0.0015% 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.

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 testing. Monthly test records for year 2017 were reviewed to verify that the AICS was reaching the minimum air injection rate during each test cycle. It appears as if for all instances the AICS has been used as required by the ROP conditions.

Mr. Walter has indicated in previous inspections that 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 previous to testing. To comply with this requirement for the term period from 2010 to 2015, Federal-Mogul submitted a test protocol on March 27, 2014. AQD field staff concurred with the proposed test protocol and approved the test conditions. NOx and CO emission testing was performed on May 13, 2014 with the attendance of AQD district

staff, the facility's consultants, testing company personnel and facility representatives. The test was conducted on a medium size 3.6-liter engine, rated at 250 hp, using gasoline. The engine was tested on Cell 2 under two different testing conditions: Durability Cycle-D Test (with AICS) and Developmental Testing (without AICS). All 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) for this activity, for details refer to report N632725151. A complete report (dated June 27, 2014) with the testing results was timely submitted to DEQ. For details about the stack test procedures and test results evaluation refer to the submitted report in file. The emission summary table containing the May 13, 2014 test results has been filed with the 2016 backup inspection records.

The stack test results were used to calculate emission factors (EF) for NO_x and CO for both conditions, with and without AICS. For the worst-case scenario (without AICS), the EF for NO_x was 0.0244 lb. /lb. fuel) and 0.11 lb. / lb. fuel for CO. These results were below the EFs specified in Appendix 7 of the ROP when gasoline is used for Developmental Testing in a mid-range size engine; demonstrating compliance.

During the inspection of May 23, 2018 Mr. Walter, for the current ROP term cycle (2015 to 2020) they are planning to submit the stack test protocol in the spring of 2019.

VI. Monitoring/Recordkeeping

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

VI.1 to 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 filed 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 8 – In Compliance

The permittee keeps in a satisfactory manner, monthly and previous 12-month NO_x, 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 last inspection (01/11/2016) AQD discussed (via email) 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 January 2017 through December 2017 were examined to determine compliance. Copies of the cited records can be found in the District Office facility file –Orange Folder.

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 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 purposes 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.

For illustrative purposes, the details about an "actual" diesel testing conducted at Federal-Mogul on February 2014, is saved and filed with the rest of the records for the 2016 inspection in the District Office facility file –Orange Folder.

In 2017 the total hour run for FGCELLS under gasoline testing totaled 5,827 hours whereas for diesel testing totaled 2,123 hours.

VI.16 – In Compliance

The permittee keeps in a satisfactory manner, annual average CO and VOC destruction

efficiency calculation records. The facility follows the procedure highlighted in Appendix 7. Records for the years 2017 were provided on the day of the inspection. The annual average destruction efficiency for CO and VOC were within the permit requirements. For year 2017 the values were: 94% for CO and 95 % for VOC.

VI.17 – In Compliance

ROP specifies a maximum sulfur content of 0.30 % (3,000 ppm). To demonstrate compliance with the percent sulfur limit in fuel oil the permittee adequately maintains fuel purchased records. The information collected includes fuel specs from BP Amoco and the carrier is Corrigan Oil Co. Three sample-records were provided via email on 5/29/2018. The records show the fuel specs and the purchase receipts for three fuel deliveries in 2018, dated: 01/24, 03/16, and 05/04. All records demonstrate that an Ultra-Low Sulfur (ULS) fuel with a sulfur content (15 ppm max.) is used.

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 year 2017 were reviewed and they showed temperatures above 1300 °F whenever AICS is used. Operating below 1300 °F for more than 30 minutes is an excursion. No excursions were detected or reported during the analyzed period.

The records show that the comment presented by AQD in the last inspection (2016), regarding AICS being used during diesel testing, has been addressed. The facility is being proactive switching the test cell configuration to diesel testing when gasoline tests are finished, so that AICS is not used. AICS is not needed nor is it intended for use with diesel tests. It has no effect on diesel emissions.

It was also noticed that the facility is applying the 50 % destruction efficiency suggested in Appendix 7 of ROP for Developmental Testing when the temperature upstream the air injection point was higher than 1400F and the air flow is higher than 50 CFM. The implementation of the adjustment (using exhaust upstream temperature instead of the downstream temperature) started with the March 2015 report and continued.

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. However, we were informed in 2016 and in 2018 that they have conducted various improvements at their

facility. Test cell data acquisition system software and hardware upgrades are ongoing. They installed improved ventilation systems in (6) test cells during the summer of 2015. The central lab process cooling water system was reworked to improve reliability and function while reducing operating costs.

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).

Except for the modification of Cell No. 13 (for operation flexibility) 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 high of 32 inches 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 No. 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:

- 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 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

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 cold cleaners had been replaced since the time we inspected them during the last inspection on 1/11/2016. The following information (required by section VI. 2) was not available at the time of the inspection but it was provided to AQD via email on 6/27/2018. The information was written on stickers labels and posted on the cleaners:

- a. A serial number, model number, or other unique identifier for each cold cleaner.
- b. The date the unit was installed, manufactured or that it commenced operation.
- c. **N/A**
- 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 2018 inspection backup data.

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 DEQ 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 REVIEW

The facility is required to report to the Michigan Air Emission Reporting System (MAERS). Facility submitted MAERS for reporting year 2017 in a timely manner. AQD audited the report and observed that the facility decreased the total fuel throughput from 103,400 gals in 2016 to 85,500 gals in 2017. The total emissions showed a decreased of about 8% with respect to 2016; from 101 tons in 2016 to 93 tons in 2017 (77 tons are CO emissions). There was an increase of 13.9 % in gasoline usage and a 46 % decrease in diesel usage with respect to 2016. For details refer to MACES report CA N632744438

FINAL COMPLIANCE DETERMINATION

Federal-Mogul Corporation appears to be in compliance with the evaluated ROP No. MI-ROP-N6327-20015 requirements and the evaluated state and federal air emissions standards, rules and regulations.

NAME CA AndoralDATE 7/3/2018 SUPERVISOR JK