

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

N291563990

<b>FACILITY:</b> TOYOTA MOTOR NORTH AMERICA R&D		<b>SRN / ID:</b> N2915
<b>LOCATION:</b> 1555 WOODRIDGE, ANN ARBOR		<b>DISTRICT:</b> Jackson
<b>CITY:</b> ANN ARBOR		<b>COUNTY:</b> WASHTENAW
<b>CONTACT:</b> Rosario Martinez Halberstadt , Engineering Manager		<b>ACTIVITY DATE:</b> 08/11/2022
<b>STAFF:</b> Diane Kavanaugh Vetort	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b> Major Source FCE Inspection and records review. Also with Contact: John Krocke, EE		
<b>RESOLVED COMPLAINTS:</b>		

**FULL COMPLIANCE EVALUATION (FCE) COMPLETE SCHEDULED COMPLIANCE INSPECTION.**  
**FACILITY: N2915 Toyota Motor North America (TMNA) 1555 and 1588 Woodridge, Ann Arbor referred to as " Ann Arbor Campus".**

**TMNA contacts present:**

**Rosario M. Halberstadt, Manager - Environmental Operations D: 734-995-0182 | C: 662-790-3164 Email: rosario.halberstadt@toyota.com**

**John Krocke, Environmental Engineer, Desk: (734) 695-4992 Mobile: (734) 389-5834 Email: john.krocke@toyota.com**

On August 11, 2022, Michigan Department of Environment, Great Lakes, and Energy (EGLE) Air Quality Division (AQD) conducted a complete scheduled compliance inspection at the Toyota Motor North America (TMNA) facility located at 1555 and 1588 Woodridge, Ann Arbor, MI. The purpose of the inspection is to determine TMNA's compliance status with applicable federal and state Air Pollution Control Regulations, particularly Michigan Act 451, Part 55 Air Pollution Control, the administrative rules, and the conditions of their Title V Renewable Operating Permit (ROP) MI-ROP-N2915-2017c. The ROP Renewal is currently in-house under Technical Review.

Prior to the inspection on August 8, 2022, I sent email communication to TMNA contacts in order to schedule the inspection and request the required records.

This facility also has an installed permit exempt natural gas fired Emergency Generator subject to federal National Emission Standard for Hazardous Air Pollutant (HAP) for Reciprocating Internal Combustion Engines (RICE) 40 CFR Part 63, Subpart ZZZZ also referred to as Maximum Achievable Control Technology (MACT) standard or RICE MACT. The facility is also subject to the Gasoline Dispensing Facilities MACT Subpart CCCCC (GDFMACT) for dispensing fuel to engine testing dynamometers and fleet vehicles.

TMNA operates what they call two "campuses". The Ann Arbor site is a Major Stationary Source ROP subject facility (N2915) and the York Twp site on Platt Rd. has a HAP Opt Out Permit (P0615). TMNA facilities are Minor (Area) Sources of HAPs. During this review period ROP Certifications and Deviation Reports were all received timely and reviewed. TMNA does not have any outstanding non-compliance issues. TMNA's 2021 Michigan Air Emissions Report System reported 4 tons of VOC, 34 tons CO, and 19 tons NOx emissions during the calendar year.

TMNA operates vehicle and engine research and developmental testing for their automobile manufacturing company at the Ann Arbor location. The site contains two buildings referred to as Evaluation (1555) and Powertrain (1588). TMNA contacts Rosario and John, accompanied me during the inspection and fully responded to all questions and requests for information.

### **PRE-INSPECTION CONFERENCE**

AQD explained the purpose of the inspection and requested general facility information and updates. TMNA representatives provided the following general information. Facility has approximately 1000

employees in hybrid work 20/80 split office/home. Current operation is 2 shifts depending on testing. There has been one notable change impacting process equipment or permits since the last inspection. Rosario and John informed me that they removed an underground storage tank (UST) and it was replaced with an above ground storage tank (AST). They said this is in their Renewal Application and they have notified AQD's Samuel Liveson, ROP Permit processor. In addition, they added an exempt Cold Cleaner and replaced an existing one. They are also requesting a CAM Plan change to allow for CCS Thermocouple replacement as needed.

During the inspection we discussed two other items that are being discussed at TMNA and may require AQD input and possibly permit changes.

1. Installing and operating Battery testing capabilities – very preliminary no details but they are questioning whether permit revision will be required.
2. The existing RTO controls 3 Engine test cells and is oversized. There is fuel inefficiency and Cell operations issues. It is very rare if ever that all 3 Test Cells run at the same time. Usually, the RTO is controlling 1 or 2. With very low VOC loading this seems wasteful. TMNA would like to consider other options. This may be possible through permit modification.

## **FACILITY SITE INSPECTION and ROP MI-ROP-N2915-2017c REVIEW**

The last PTI revision reorganized the EU/FG significantly and added a Source-Wide Table for operational flexibility and for the facility to restrict Carbon Monoxide (CO) emissions to below Prevention of Significant Deterioration (PSD) major source level. Source-Wide Conditions include all process equipment, including equipment covered by other permits, grand-fathered, and exempt equipment.

### **SOURCE-WIDE:**

Carbon Monoxide (CO) emission limit is 249.0 tons per year based on a 12 month rolling time period as determined at the end of each calendar month.

SC II. 1. Total Fuel Limit: 618,709 gallons / year 12 month rolling, Source-wide.

SC II. 1a. FGLEV, FGCONTROLLED and FGUNCONTROLLED Total Fuel Limit: 516,830 gal /yr. (of SC II.1) 12 month rolling.

SC II. 1b. FGCONTROLLED AND FGUNCONTROLLED Total Fuel Limit: 448,718 gal /yr. (of SC II.1a) 12 month rolling.

SC II. 1c. FGUNCONTROLLED Total Fuel Limit: 23,500 gallons/yr. (of SC II.1b) 12 month rolling.

Natural Gas FUEL Limit: 525.40 MMscf/yr. (Source wide) 12 month rolling time period. NOTE: I was told during the inspection this facility is not conducting Natural Gas testing.

### **The current ROP contains the following FG Tables with applicable requirements for EU:**

FG-CAM, FGULEV, FGLEV, FGCONTROLLED, FGUNCONTROLLED, FGTANKS, FGGENSETS, FGGDFMACT, FGRICEMACT, FGRULE287(2)(c), FGCOLDCLEANERS.

Specifically for this inspection AQD physically walked through all Engine testing areas and reviewed some controlled versus uncontrolled Dynamometers.

**FGUNCONTROLLED:** EU-COLD, EU-EG3, EU-EG4, EU-CHDY6, EU-CHDY7

**FGCONTROLLED:** EU-EG6, EU-EG1, EU-EG2, EU-EG5, EU-TM1, EU-TM4, EU-TM5, EU-EG7, EU-EG8, EU-EG9.

Engine emission control refers to the type of catalyst. Control is with catalytic converters primarily **FGULEV and FGLEV**. Chassis Dynamometers (CHDY), whole vehicle with incorporated catalytic converters, are tested to meet these standards of catalytic control. Dyno cells with individual catalyst (CCS) are EU-EG1, EU-EG2, EU-EG5, EU-TM1, EU-TM4, EU-TM5. Dyno cells with production catalyst: EU-UPDOWN, EU-EG3, EU-EG4, EU-EG6, Following the inspection John provided a photo of each type. All records received are attached to this report to file.

Today's inspection included both the Evaluation Building (EV, 1555) and Powertrain Building (PT, 1588). Emission Units and Flexible Groups (EU/FG) are in both buildings and are identified mostly by EV or PT. TMNA operates both CHDY and Engine Test Stands/Cells dynamometers (EG). Gasoline is the primary fuel used and the facility has multiple above ground storage tanks (FG-TANKS, FG-GDFMACT). Again, today I learned that they removed EUTANK2 (UST) and have now removed all UST on site.

I observed the Regenerative Thermal Oxidizer (RTO) air pollution control equipment and Engine Dynamometer flexible group FG-EG789. The RTO was observed to be operating without any associated EGs in operation; however, we spoke to an Operator at Cell EU-EG8, and he said it had a gasoline 4 cylinder Turbo with live catalyst in it that had been and/or would be operating.

Until recently the RTO was always kept at temperature due to the time and energy it takes to start up and shut down and to get it to the required operating temperature. Rosario said they are now shutting it off on the weekends when not operating Test Cells. This was reflected in the Temperature records I received and reviewed.

I observed the control panel, and the temperature was being recorded; required minimum is 1425 degrees F. TMNA has set a Temperature automatic shut-off at 1440 degrees F, interlock shuts off associated operating Dyno(s). I observed the current temperature readings: Thermocouple 2 read 1536 degrees F., and T3 read 1594 degrees F.

The RTO and FG-EG789 are also subject to the federal Compliance Assurance Monitoring (**FG-CAM**) requirements. The RTO appeared to be operating in compliance. AQD previously received and approved TMNA's RTO Malfunction Abatement Plan (MAP) on 4-19-18. Rosario showed me the redundant monitoring/recording now on the Unit for backup in case of lost data in the primary system.

The FGCONTROLLED and the FG-CAM conditions and CAM Plan are also applicable for EU: EG1, 2, 5, TM1, 4, 5 for Catalyst Control Systems (CCS). A Programmable Logic Controller (PLC) is used to monitor fuel throughput in lieu of reaching a minimum temperature in certain Engine Types and Testing scenarios. During the inspection I observed CCS installed on several of the subject Test Cells.

Compliance testing was conducted for FG-GENSETS on July 20, 2022 and was observed by AQD - TPU. IMPACT is the test consultant and AQD received and approved the test protocol prior to the testing.

Due to the recent testing, I did not inspect the FG-GENSETS, during this inspection. The two newer natural gas fired stationary generators are, 1,573 bhp (1,141 kW). The Units are run frequently and have appeared to be in excellent condition in the past and have tested in compliance to date. They are large units with individual exhaust stacks. Each Unit is equipped with a Catalyst and LEANOX air-to-fuel controllers. I have observed the catalyst section located in stack. Units are non-certified Generators subject to federal New Source Performance Standards (NSPS) Subpart JJJJ with NOx, CO and VOC limits and regular testing. In a prior inspection I observed two associated Above Ground Gasoline Storage Tanks (AST) were installed and operating properly. I did not inspect the tanks today. The tanks are fenced in together and are located next to the new FG-GENSETS.

FG-GDFMACT records require gasoline throughput of less than 100,000 gallons on an annual average determined monthly. TMNA stated they follow this. I requested these records be submitted. On September 1<sup>st</sup> I received the records indicating Compliance with the limit.

During the inspection I observed a mezzanine area, near the RTO, containing Fuel Day Tanks, labeled AG1-7. The Day Tanks are used to store/supply gasoline between the primary storage tanks outside and the Test Cells.

EUEMERGEN – TMNA confirmed they run weekly tests and do annual maintenance. The Unit was reviewed previously by AQD.

#### **POWERTRAIN BUILDING INSPECTION**

**CHASSIS DYNOS: EU-CHDY1 – CHDY6**

**ENGINE DYNOS (EG): EU-EG1, EG2, EG3, EG4, EG5, EG6**

**TRANSMISSION DYNOS (TM): EU-TM1, TM4, TM5,**

**EU-UPDOWN**

Rosaria, John, and I were assisted in the 1588 Powertrain the EG / TM dyno area by Tim Sprang Senior Technician Engine Evaluation/Calibration

#### **EVALUATION BUILDING INSPECTION**

**CHASSIS DYNOS: EU-CHDY7, CHDY8, CHDY9, CHDY10.**

**EUANECHOIC, EUENVIRON, EUCOLD,**

**EU-EG7, EG8, EG9 and associated RTO**

#### **TANKS /GDFs**

**EU-TANK1 (UST), EU-TANK5 (AST), EU-TANK6 AND EU-TANK7(combined)**

**CATALYSTS:** TMNA uses both inline catalytic converters of various materials/configuration and “add-on permanent” Catalytic Converter System (CCS) depending on the Cell and the test scenario. The CCS control is attached to the dynamometer, and they are all similar however different configurations. The Control Panel for each Cell monitors liters per hour fuel, and ambient temperature, Catalyst in/out temperatures, and Air to Fuel Ratio.

During the inspection I observed that EG-6 was not operating today. This Test Cell was the last to have been performance tested in 2017. We walked inside the Cell and saw a dual Catalytic Oxidizer setup. Rosario explained that one of these is the actual catalyst and the other is tested.

We observed an active alarm on EG5, it was open/not running with no operator present. We spoke to the EG4 Operator, and he went to find out what happened. This Cell has CCS with a different configuration.

EU-UPDOWN was observed to be not operating. It is “normal” up/down testing so does not need CCS. EG1 was not operating but Operator Tim was present, and he accompanied us inside several Cells (EG2) to observe and explain the CCS configurations. I requested some additional information on CCS from John and Rosario following the inspection.

EG3 was operating and testing with an “inline” Individual Catalyst.

I observed the fuel tanks located outside the building. In the current ROP, FG-TANKS contains TANK 1, TANK 2, and TANK 5. As previously noted, I verified EU-TANK2 has been removed and replaced with new AST yet to be officially named. This change will be reflected upon issuance of the renewal.

**RECORDKEEPING REVIEW**

TMNA recordkeeping submittal included the following documents for this Facility: Cover Letter.pdf; Appendix A.pdf through Appendix D. pdf; August 2021 to July 2022 RTO Temperature Records.pdf.

TMNA Reports TOTAL FUEL: 88,629.7 gallons (<LIMIT 618,709 gal / 12 month roll). COMPLIANT.

FGLEV, FGCONTROLLED & FGUNCONTROLLED Fuel Usage: 80,228.1 gal / 12 month roll ending July 2022. (<LIMIT 516,830 gal / 12 month roll). COMPLIANT

FGCONTROLLED & FGUNCONTROLLED Fuel Usage: 54,235.9 gal / 12 month roll ending July 2022. (<LIMIT 448,718 gal / 12 month roll). COMPLIANT.

FGUNCONTROLLED Fuel Usage: 696.3 gal / 12 month roll ending July 2022 (<LIMIT 23,500 gal /12 month roll). COMPLIANT.

CARBON MONOXIDE EMISSIONS: 37.8 tons per 12 month rolling period ending July 2022. Plus 7.8 tons /12 month roll from Natural Gas sources. (<LIMIT 249 tons / 12 month roll). COMPLIANT.

FG-CAM Record includes documentation of the required CCS Thermocouple replacement. TMNA shows replaced on EG1, TM4, EG2, TM1, TM5, EG5 during the applicable 12 month period. COMPLIANT.

The Regenerative Thermal Oxidizer (RTO) is part of FG-CAM. Records include RTO Off-Line and On-Line PM Inspection Checklists, and spare parts list, which are very detailed. There were no excursions per TMNA. Record includes a Maintenance Log, and Jan & Feb 2022 Service report from DURR (Manufacturer). COMPLIANT.

FGTANKS AND FGGDFMACT records indicated COMPLIANT. It is noted that the Renewal application references Tanks 1,5,6,7,8 new,9 new.

EGL E Leaking Underground Storage tank Closure Report was submitted for the removal of EUTANK2.

RTO Temperature Charts include one per month and demonstrate Temperature during Dyno operation is at or above the compliant temperature limit in the permit of 1425 degrees F. COMPLIANT.

**COMPLIANCE SUMMARY**

I received all required and requested recordkeeping following the inspection on or before August 19<sup>th</sup> and September 1, 2022. All record keeping is attached to this report for the files. Email communication with contacts included a request for follow up information.

AQD has determined that TMNA, Ann Arbor facility is in substantial compliance with the conditions of their ROP, MI-ROP-N2915-2017c and with the applicable federal and state administrative rules.

NAME *Diane Kavanaugh Vetter*DATE 9/8/22SUPERVISOR 