EXECUTIVE SUMMARY

RWDI AIR Inc. (RWDI) was retained by FCA US LLC to complete destruction efficiency (DE) for volatile organic compounds (VOCs) on three (3) thermal oxidizers (TOs) serving the EU-TOPCOAT 1, 2, and 3 Ovens and removal efficiency (RE) on three (3) Zeolite Concentrators from the EU-TOPCOAT 1, 2 and 3 Color Lines at Jefferson North Assembly Plant (JNAP) located in Detroit, Michigan. JNAP operates under Renewable Operating Permit No. MI-ROP-N2155-2017. The testing followed United States Environmental Protection Agency (USEPA) reference method 25A. Discussions of Modifications are provided in the report ***(Section 5)*** that further outline the details of the testing completed.

A minimum of three 1-hour tests concurrently at the inlet and outlet of each source were conducted in order to determine the average destruction/removal efficiency of the TOs/concentrators. Stack gas velocity, gas composition and moisture were also taken once during each 1-hour test for the exhaust of each of the TOs. Initial testing for all equipment was completed by November 30, 2020, with additional testing performed between December 1 to 8, 2020. The sampling was conducted from November 17, 2020 to December 8th, 2020. Sampling was witnessed by Ms. Regina Angellotti and Mr. Matthew Karl from the Michigan Air Quality Division (AQD) of the State of Michigan Department of Environment, Great Lakes and Energy (EGLE).

Coatings are applied to vehicles automatically and manually in booths. Vehicles proceed through a curing oven. This line consists of three basecoat robot zones, basecoat electrostatic bells, basecoat automatic conventional zone, heated flash zone, two clearcoat robot zones, clearcoat electrostatic bells, and a cure oven. Emissions from the basecoat bell zones, basecoat automatic conventional zone, heated flash and clearcoat bell zones are ducted to a filter house, concentrator, and a thermal oxidizer. Emissions from the ovens are controlled by separate thermal oxidizers. To clarify, Color 1, 2, and 3 each have one dedicated concentrator system, one dedicated TO to treat concentrator emissions, and one dedicated TO to treat oven emissions. There is a total of 3 concentrator systems, 3 concentrator TOs, and 3 oven TOs.

The sampling train for VOC's consisted of a flame ionization analyzer as described in USEPA Method 25a. VOC concentrations were continuously collected via heated sample lines from both the inlet and outlet for each of the sources noted above, simultaneously.

Results of the sampling program are outlined in the following tables. Results of individual tests are presented in the **Appendices**.

Source: EU-TOPCOAT 1 – Concentrator (November 30, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Removal Efficiency [1] (as THC)
1	2020-11-30	07:02	08:01	19	116.9	30.21	74.2%
2	2020-11-30	08:45	09:44	15	101.3	28.95	71.4%
3	2020-11-30	09:58	10:57	17	110.3	28.32	74.3%
4	2020-11-30	11:05	12:04	15	107.7	28.64	73.4%
				Average	**109.1**	**29.03**	**73.3%**

Notes:
[1] Removal efficiency was calculated based on Total Hydrocarbon (THC).
THC – Total Hydrocarbon

Source: EU-TOPCOAT 1 – Concentrator (December 1, 2020) – Engineering Study with EGLE

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Inlet Methane [2] [3] (ppm) (as propane)	Inlet NMOC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Outlet Methane [2] (ppm) (as propane)	Inlet NMOC (ppm) (as propane)	Removal Efficiency [1] (as NMOC)
1a	2020-12-01	09:30	09:39	18	88.4	9.83	78.6	N/A	N/A	N/A	N/A
1b	2020-12-01	09:46	09:56	18	N/A	N/A	N/A	20.7	10.0	10.6	N/A
2	2020-12-01	10:27	11:26	13	81.4	8.96	72.4	18.8	8.96	9.88	86.4%
3	2020-12-01	12:38	13:50	17	95.8	7.50	88.3	15.3	7.50	7.81	91.2%
				Average	**88.5**	**8.76**	**79.8**	**18.3**	**8.82**	**9.44**	**88.8%**

Notes:
[1] Removal efficiency was calculated based on total non-methane concentrations (NMOC).
[2] Methane to Propane conversion determined per test (see **Appendix D**)
[3] Methane concentration was measured at the Outlet per Method 25A. Outlet methane concentration was applied to the Inlet for Removal Efficiency calculations.
NMOC – Non-methane organic compound

Source: EU-TOPCOAT 1 – Concentrator (December 8, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Inlet Methane [2] (ppm) (as propane)	Inlet NMOC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Outlet Methane [2] (ppm) (as propane)	Inlet NMOC (ppm) (as propane)	Removal Efficiency [1] (as NMOC)
1	2020-12-08	07:21	08:20	16	103.7	5.89	97.8	14.8	6.23	8.57	91.2%
2	2020-12-08	09:23	10:22	17	100.8	7.45	93.4	17.0	7.43	9.59	89.7%
3	2020-12-08	11:00	12:21	15	88.3	8.55	79.8	18.4	8.52	9.84	87.7%
4	2020-12-08	13:10	14:09	15	113.1	10.6	102.5	21.2	10.8	10.4	89.9%
				Average	**101.5**	**8.12**	**93.4**	**17.8**	**8.25**	**9.59**	**89.6%**

Notes:
[1] Removal efficiency was calculated based on total non-methane concentrations (NMOC).
[2] Methane to Propane conversion determined per test (see **Appendix D**)
NMOC – Non-methane organic compound

Source: EU-TOPCOAT 2 – Concentrator (November 18, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Removal Efficiency [1] (as THC)
1	2020-11-18	08:00	08:59	15	89.2	6.94	92.2%
2	2020-11-18	09:45	10:44	19	86.3	2.03	97.6%
3	2020-11-18	10:57	11:56	18	117.3	2.09	98.2%
4	2020-11-18	12:30	13:29	17	91.5	2.11	97.7%
				Average	**96.1**	**3.29**	**96.4%**

Notes:
[1] Removal efficiency was calculated based on Total Hydrocarbon (THC).
THC – Total Hydrocarbon

Source: EU-TOPCOAT 3 – Concentrator (November 17, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Removal Efficiency [1] (as THC)
1	2020-11-17	08:30	09:29	19	96.5	10.91	88.7%
2	2020-11-17	09:48	11:25	16	49.8	8.61	82.7%
3	2020-11-17	12:16	13:15	18	67.5	10.16	84.9%
4	2020-11-17	13:29	14:44	18	54.5	8.98	83.5%
				Average	**67.1**	**9.66**	**85.0%**

Notes:
[1] Removal efficiency was calculated based on Total Hydrocarbon (THC).
THC – Total Hydrocarbon

Source: EU-TOPCOAT1 – Color 1 Oven TO (Concentration) (November 20, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Outlet Methane (ppm) [2] (as Propane)	Outlet Total NMOC (ppm) (as Propane)	Destruction Efficiency (ppm) [1]
1	2020-11-20	08:47	09:46	22	219.9	0.87	0.71	0.16	99.9%
2	2020-11-20	10:00	10:59	16	170.3	0.94	0.76	0.17	99.9%
3	2020-11-20	11:39	12:38	22	218.0	0.76	0.60	0.17	99.9%
				Average	**202.7**	**0.86**	**0.69**	**0.17**	**99.9%**

Notes:
[1] Destruction efficiency was calculated based on total non-methane concentrations (NMOC).
[2] Methane to Propane conversion determined per test (see **Appendix E**)
NMOC – Non-methane organic compound

Source: EU-TOPCOAT1 – Color 1 Oven TO (Emission Rate) (November 20, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (lb/hr) (as propane)	Outlet THC (lb/hr) (as Propane)	Outlet Methane (lb/hr) [2] (as Propane)	Outlet NMVOC (lb/hr) (as Propane)	Destruction Efficiency (lb/hr) [1]
1	2020-11-20	08:47	09:46	22	10.4	0.04	0.03	0.01	99.9%
2	2020-11-20	10:00	10:59	16	8.3	0.05	0.04	0.01	99.9%
3	2020-11-20	11:39	12:38	22	10.6	0.04	0.03	0.01	99.9%
				Average	**9.7**	**0.04**	**0.03**	**0.01**	**99.9%**

Notes:
[1] Destruction efficiency was calculated based on total non-methane concentrations (NMOC).
[2] Methane to Propane conversion determined per test (see **Appendix E**)
NMOC – Non-methane organic compound

Source: EU-TOPCOAT1 – Color 1 Oven TO (Stack Parameters and Residence Time) (November 20, 2020)

Test ID	Date	TO Outlet Flow Rate (dscfm)	TO Outlet Stack Temperature (°F)	Residence Time (sec)
1	2020-11-20	6,672	672	0.81
2	2020-11-20	6,806	665	0.78
3	2020-11-20	6,834	664	0.78
	Average	**6,771**	**667**	**0.79**

Source: EU-TOPCOAT2 – Color 2 Oven TO (Concentration) (November 18, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Outlet Methane (ppm) [2] (as Propane)	Outlet Total NMVOC (ppm) (as Propane)	Destruction Efficiency (ppm) [1]
1	2020-11-18	08:15	09:14	20	291.8	7.32	4.04	3.28	98.9%
2	2020-11-18	10:00	10:59	24	351.7	7.24	3.54	3.71	98.9%
3	2020-11-18	11:15	12:14	28	367.3	7.42	3.53	3.88	98.9%
				Average	**336.9**	**7.33**	**3.71**	**3.62**	**98.9%**

Notes:
[1] Destruction efficiency was calculated based on total non-methane concentrations (NMOC).
[2] Methane to Propane conversion determined per test (see **Appendix E**)
NMOC – Non-methane organic compound

Source: EU-TOPCOAT2 – Color 2 Oven TO (Emission Rate) (November 18, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (lb/hr) (as propane)	Outlet THC (lb/hr) (as Propane)	Outlet Methane (lb/hr) [2] (as Propane)	Outlet Total NMVOC (lb/hr) (as Propane)	Destruction Efficiency (lb/hr) [1]
1	2020-11-18	08:15	09:14	20	13.8	0.35	0.19	0.15	98.9%
2	2020-11-18	10:00	10:59	24	16.0	0.33	0.16	0.17	98.9%
3	2020-11-18	11:15	12:14	28	16.8	0.34	0.18	0.18	98.9%
				Average	**15.5**	**0.34**	**0.17**	**0.17**	**98.9%**

Notes:
[1] Destruction efficiency was calculated based on total non-methane concentrations (NMOC).
[2] Methane to Propane conversion determined per test (see **Appendix E**)
NMOC – Non-methane organic compound

Source: EU-TOPCOAT2 – Color 2 Oven TO (Stack Parameters and Residence Time) (November 18, 2020)

Test ID	Date	TO Outlet Flow Rate (dscfm)	TO Outlet Stack Temperature (°F)	Residence Time (sec)
1	2020-11-18	6,613	698	0.79
2	2020-11-18	6,357	698	0.82
3	2020-11-18	6,421	698	0.81
	Average	**6,464**	**698**	**0.81**

Source: EU-TOPCOAT3 – Color 3 Oven TO (Concentration) (November 17, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Outlet Methane (ppm) [2] (as Propane)	Outlet Total NMVOC (ppm) (as Propane)	Destruction Efficiency (ppm) [1]
1	2020-11-17	09:15	10:14	22	257.9	18.3	6.96	11.3	95.6%
2	2020-11-17	10:26	11:25	19	200.3	16.8	7.23	9.60	95.2%
3	2020-11-17	11:38	12:49	16	209.9	17.4	7.14	10.2	95.1%
				Average	**222.7**	**17.5**	**7.11**	**10.4**	**95.3%**

Notes:
[1] Destruction efficiency was calculated based on total non-methane concentrations (NMOC).
[2] Methane to Propane conversion determined per test (see **Appendix E**)
NMOC – Non-methane organic compound

Source: EU-TOPCOAT Oven 3 – TO (Emission Rate) (November 17, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (lb/hr) (as propane)	Outlet THC (lb/hr) (as Propane)	Outlet Methane (lb/hr) [2] (as Propane)	Outlet Total NMVOC (lb/hr) (as Propane)	Destruction Efficiency (lb/hr) [1]
1	2020-11-17	09:15	10:14	22	14.0	0.99	0.38	0.61	95.6%
2	2020-11-17	10:26	11:25	19	10.6	0.89	0.38	0.51	95.2%
3	2020-11-17	11:38	12:49	16	11.0	0.91	0.37	0.54	95.1%
				Average	**11.9**	**0.93**	**0.38**	**0.55**	**95.3%**

Notes:
[1] Destruction efficiency was calculated based on total non-methane concentrations (NMOC).
[2] Methane to Propane conversion determined per test (see **Appendix E**)
NMOC – Non-methane organic compound

Source: EU-TOPCOAT3 – Color 3 Oven TO (Stack Parameters and Residence Time) (November 17, 2020)

Test ID	Date	TO Outlet Flow Rate (dscfm)	TO Outlet Stack Temperature (°F)	Residence Time (sec)
1	2020-11-17	7,828	680	0.68
2	2020-11-17	7,478	679	0.70
3	2020-11-17	7,380	679	0.71
	Average	**7,562**	**679**	**0.70**

TABLE OF CONTENTS

LIST OF TABLES

(Found within the Report Text)

LIST OF FIGURES

(Found within the Report Text)

LIST OF APPENDICES

1 INTRODUCTION

RWDI AIR Inc. (RWDI) was retained by FCA US LLC to complete destruction efficiency (DE) for volatile organic compounds (VOCs) on three (3) thermal oxidizers (TOs) serving the EU-TOPCOAT 1, 2, and 3 Ovens and removal efficiency (RE) on three (3) Zeolite Concentrators from the EU-TOPCOAT 1, 2 and 3 Color Lines at Jefferson North Assembly Plant (JNAP) located in Detroit, Michigan. JNAP operates under Renewable Operating Permit No. MI-ROP-N2155-2010. The testing followed United States Environmental Protection Agency (USEPA) reference method 25A.

A minimum of three 1-hour tests concurrently at the inlet and outlet of each source were conducted in order to determine the average destruction/removal efficiency of the TOs/concentrators. Stack gas velocity, gas composition and moisture were also taken once during the three (3) 1-hour tests for the exhaust of each of the TOs. The sampling was conducted from November 17th, 2020 to December 8th, 2020. Initial testing for all equipment was completed by November 30, 2020, with additional testing performed between December 1 to 8, 2020. Sampling was witnessed by Ms. Regina Angellotti and Mr. Matthew Karl from the Michigan Air Quality Division (AQD) of the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE).

The notification of intent to conduct the air compliance testing was submitted to the EGLE on September 15th, 2020. The quality assurance review of the test plan was completed on October 5th, 2020. A copy of the Source Testing Plan and ROP is located in **Appendix A** of this report. A copy of the quality assurance review letter is provided in **Appendix B**.

2 SOURCE DESCRIPTION

2.1 Facility Description

JNAP is located at 2101 Connor Avenue in Detroit, Michigan. The facility completes assembly and paint operations for the Dodge Durango and Jeep Grand Cherokee. Coatings are applied to vehicles automatically and manually in booths. Vehicles proceed through a curing oven. Each line consists of three basecoat robot zones, basecoat electrostatic bells, basecoat automatic conventional zone, heated flash zone, two clearcoat robot zones, clearcoat electrostatic bells, and a cure oven. Emissions from the basecoat bell zones, basecoat automatic conventional zone, heated flash and clearcoat bell zones are ducted to a filter house, concentrator, and a thermal oxidizer. Emissions from the oven are controlled by separate thermal oxidizers. To clarify, Color 1, 2, and 3 each have one dedicated concentrator system, one dedicated TO to treat concentrator emissions, and one dedicated TO to treat oven emissions. There is a total of 3 concentrator systems, 3 concentrator TOs, and 3 oven TOs.

3 SAMPLE LOCATION

Figures 1 through **12** below depict the sources sampled, sampling ports and traverse point locations. Photographs of each sampling location are presented below. **Appendix A** contains detailed Schematics of all sampling locations.

Figure 1: EU-TOPCOAT 1 Concentrator Inlet

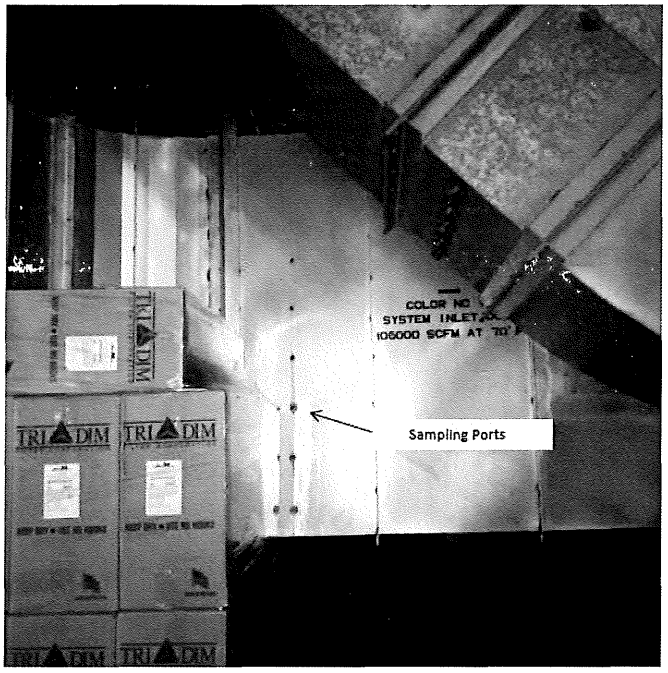


Figure 2: EU-TOPCOAT 1 Concentrator 1 Outlet

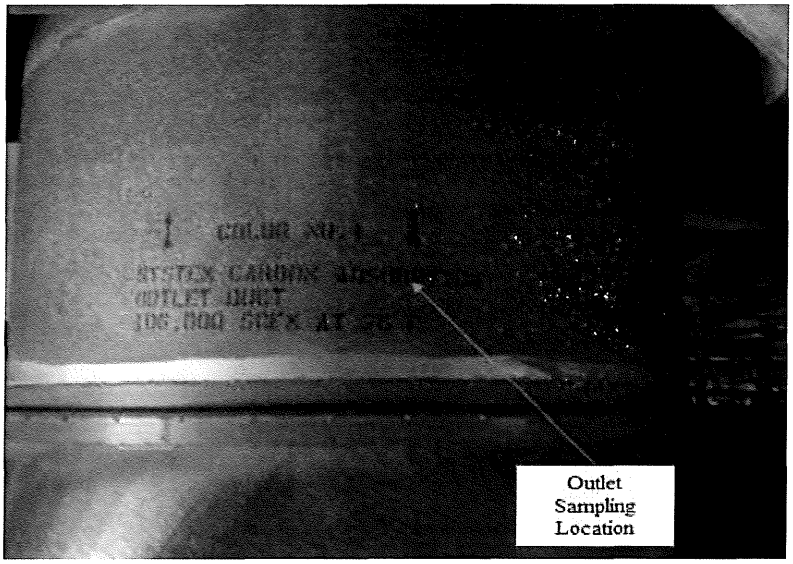


Figure 3: EU-TOPCOAT 2 Concentrator Inlet

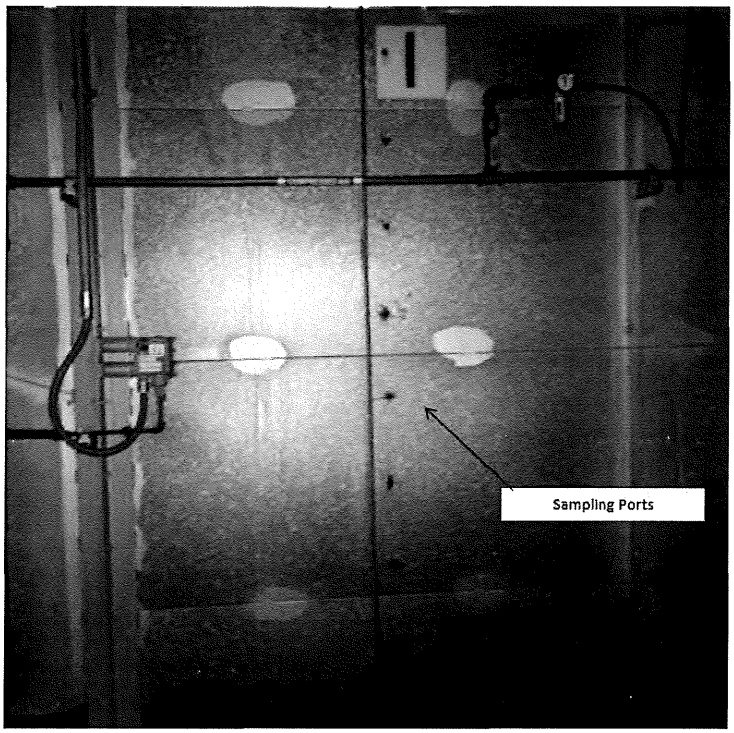


Figure: 4: EU-TOPCOAT 2 Concentrator Outlet

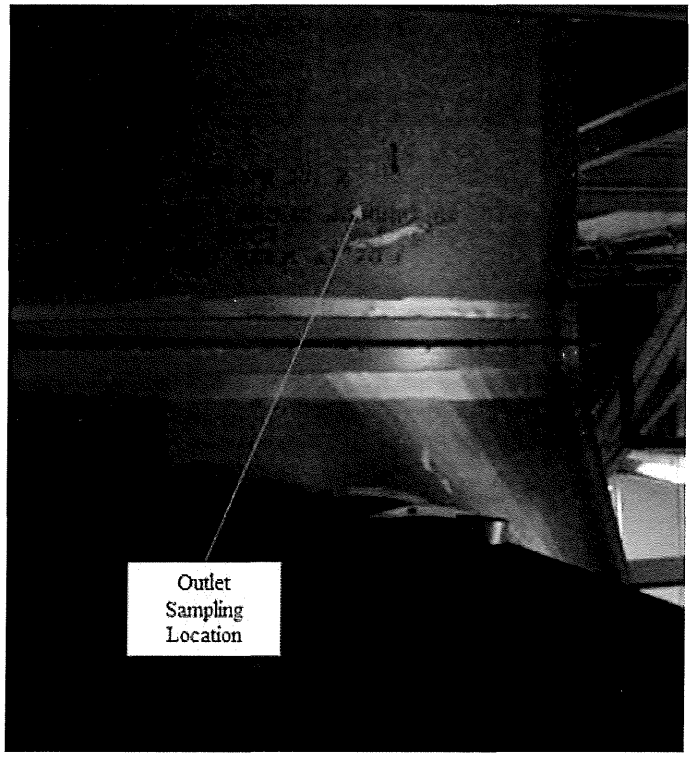


Figure 5: EU-TOPCOAT 3 Concentrator Inlet

Figure 6: EU-TOPCOAT 3 Concentrator Outlet

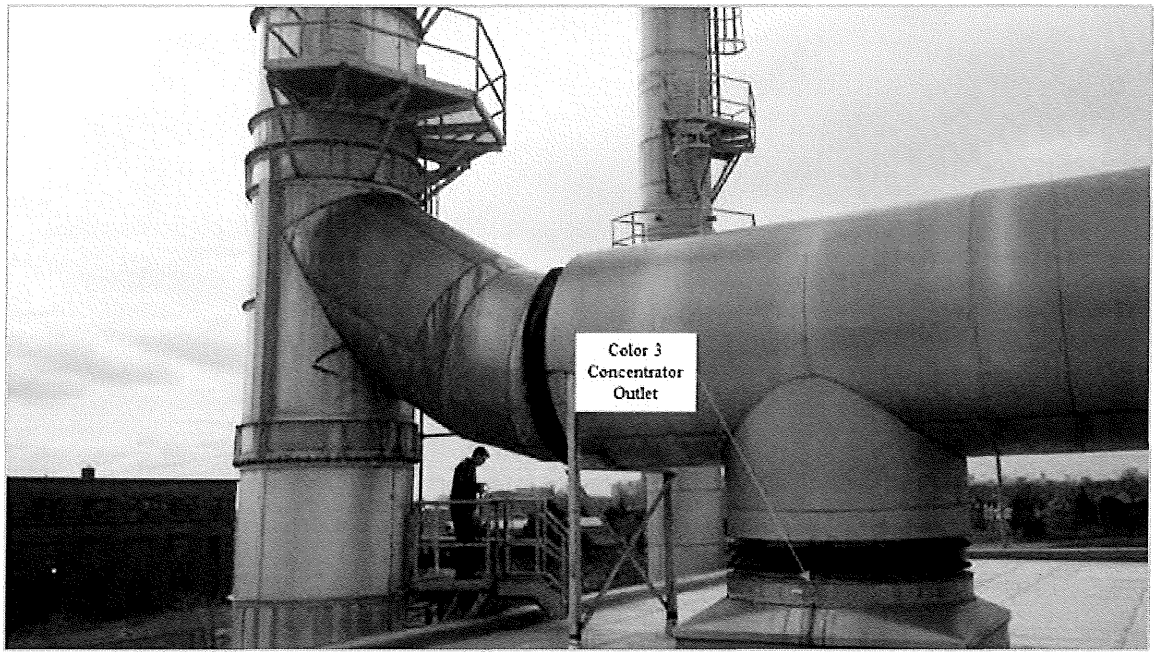


Figure 7: EU-TOPCOAT Oven 1 TO Inlet

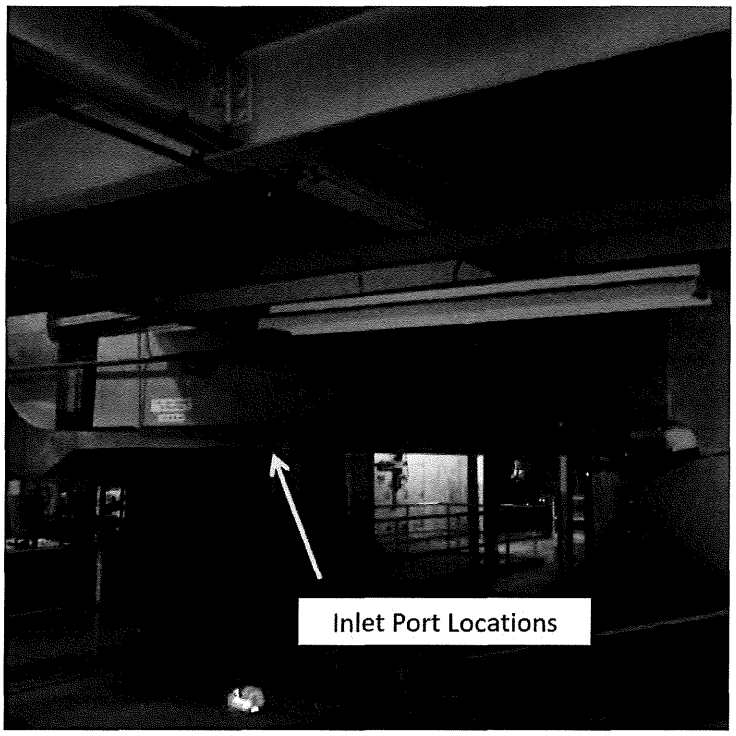


Figure 8: EU-TOPCOAT Oven 1 TO Outlet (THC Measurement Location)

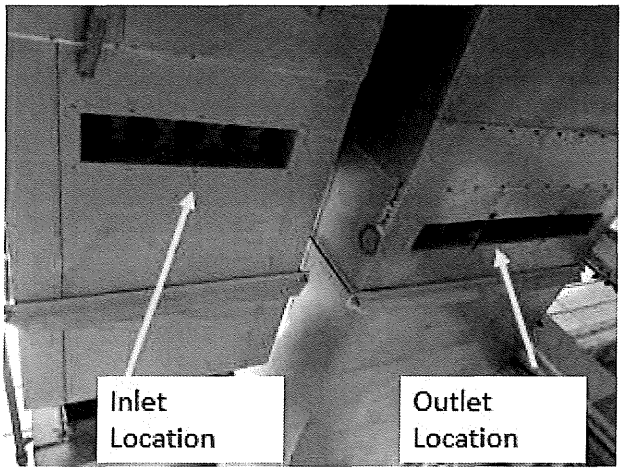


Figure 9: EU-TOPCOAT Oven 1 TO Outlet (Flow and Moisture Sampling Location)

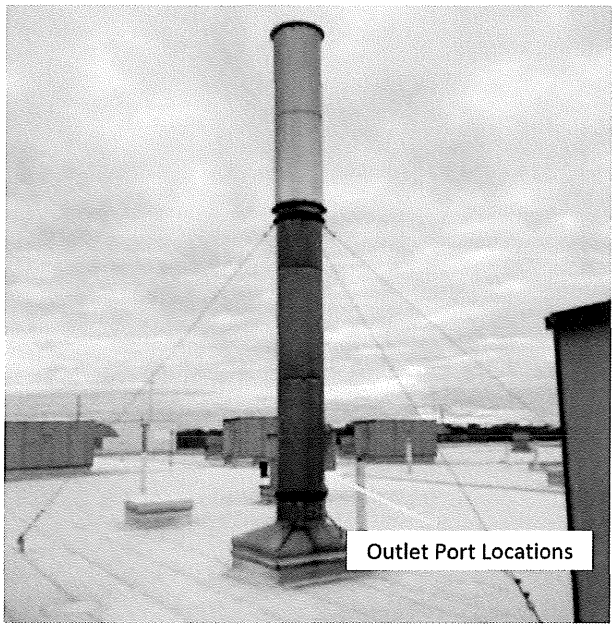


Figure 10: EU-TOPCOAT Oven 2 TO Inlet

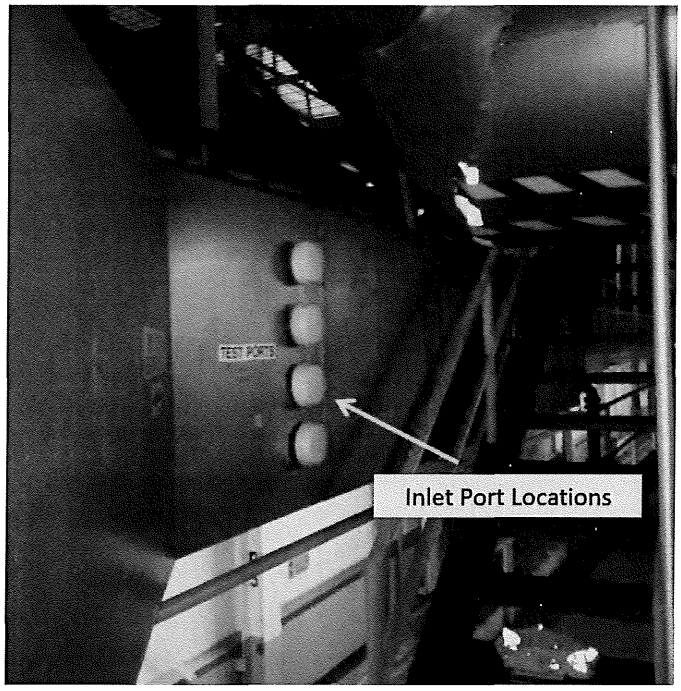


Figure 11: EU-TOPCOAT Oven 2 TO Outlet (THC Sampling Location)

Figure 12: EU-TOPCOAT Oven 2 TO Outlet (Flow and Moisture Sampling Location)

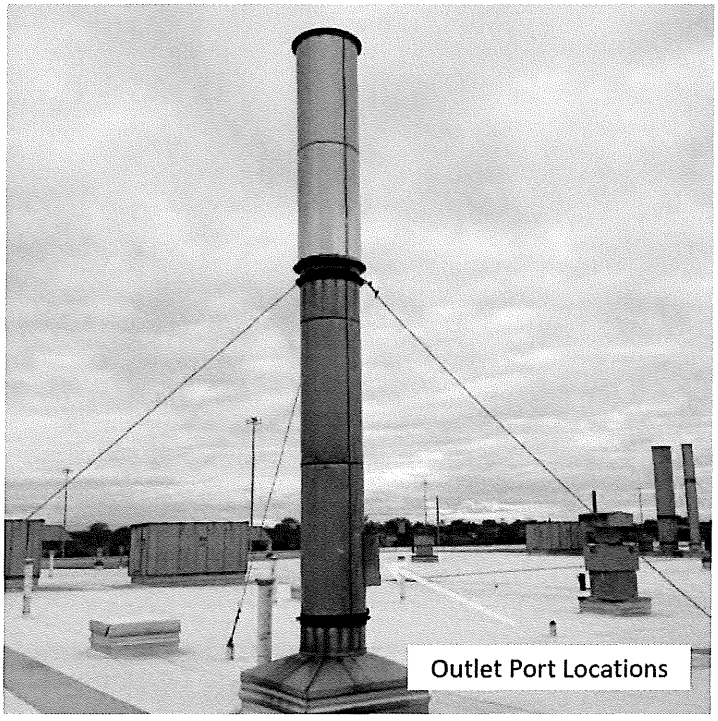


Figure 13: EU-TOPCOAT Oven 3 TO Inlet

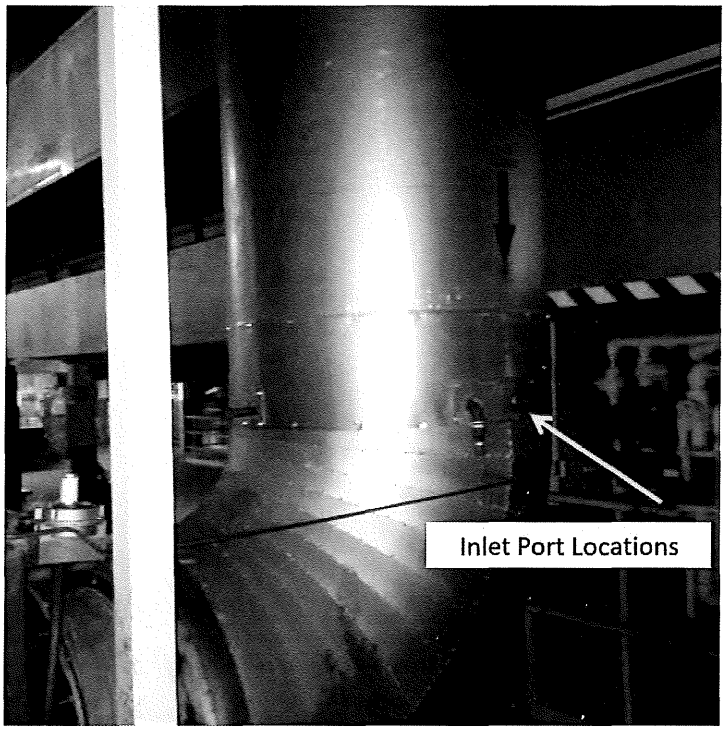


Figure 14: EU-TOPCOAT Oven 3 TO Outlet (THC Sampling Location)

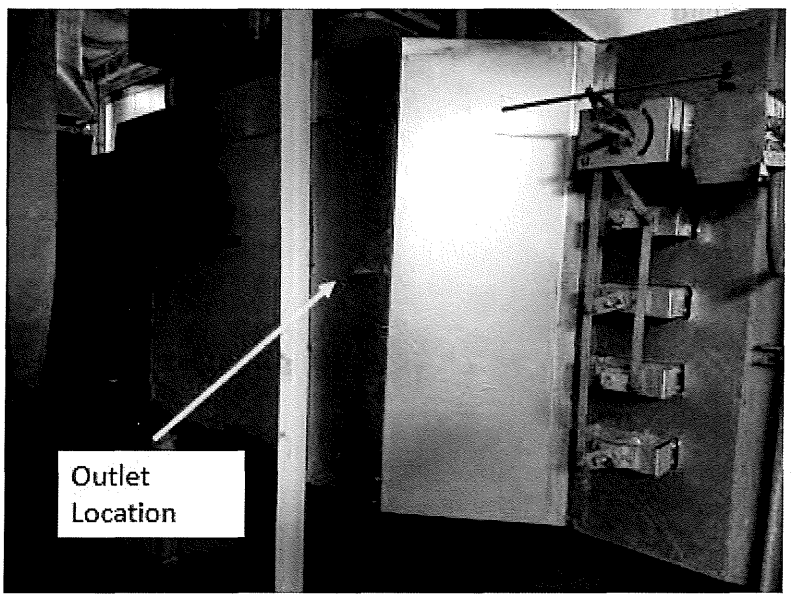
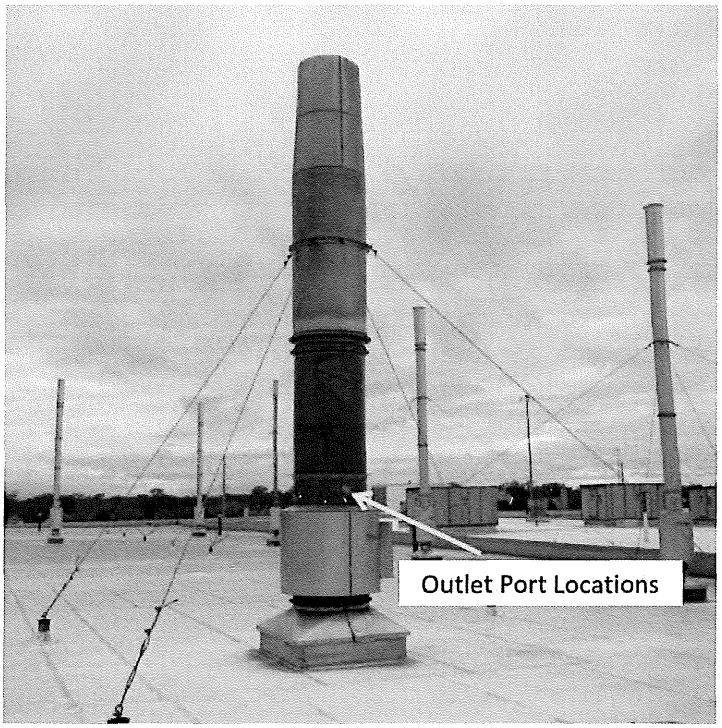


Figure 15: EU-TOPCOAT Oven 3 TO Outlet (Flow and Moisture Sampling Location)



The inlet and outlet of each of the EU-TOPCOAT 1, 2, and 3 Concentrators were tested simultaneously to evaluate the VOC removal efficiency. These sampling locations did not meet USEPA Method 1 criteria and therefore flow rates could not be measured according to the Method. The flue gas was extracted from a probe located near the center of the duct and continuously introduced into the flame ionization analyzer to measure VOC concentrations. VOC RE was computed based on inlet and outlet VOC concentrations (ppmv).

The inlet and outlet of each of the EU-TOPCOAT Oven 1, 2 and 3 TOs were tested simultaneously to evaluate the VOC destruction efficiency. The inlet sampling location did not meet the USEPA Method 1 criteria and therefore flow rates although measured were not used for the DE emission rate calculation. The outlet sampling locations were considered ideal and flow, temperature and moisture were measured at these locations. The flow was assumed to be the same on the Inlet as was measured at the Outlet. VOC DE was computed based on inlet and outlet emissions rates (lb/hr) and concentration basis (ppmv). The VOC measurements for the outlet of the TOs were taken from the outlet ducts at a location adjacent to the inlet for each of the TOs. Flow, temperature, and moisture were taken at the locations shown above for each of the TO outlets

4 SAMPLING METHODOLOGY

4.1 Testing Methodology

The following table summarizes the test methodologies that were followed during this program.

Table 4.1: Summary of Test Methodology

Parameter	Proposed Method
Velocity, Temperature, Flow rate	USEPA Method 1 to 4
Total VOCs	USEPA[1] Method 25A (CEM)
Total Methane and Total Non-Methane Organic Compounds (NMOC)	USEPA[1] Method 25A (CEM)

Notes: [1] USEPA = United States Environmental Protection Agency

4.2 Description of Testing Methodology

The following section provides brief descriptions of the sampling methods.

4.2.1 Stack Velocity, Temperature, and Volumetric Flow Rate Determination

The exhaust velocities and flow rates were determined following the USEPA Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rate". Velocity measurements were taken with a pre-calibrated S-Type pitot tube on the inlet and a pre-calibrated standard pitot on the outlet. All pressure readings were taken with an incline manometer. Volumetric flow rates were determined following the equal area method as outlined in USEPA Method 2. Temperature measurements were made simultaneously with the velocity measurements and were conducted using a Type K chromel-alumel thermocouple in conjunction with a digital temperature indicator. As noted in the Notification for testing, flow measurements were only completed once during the testing at the inlet and outlet of the TOs. Due to the non-ideal location of the TO inlets, the inlet flow was considered to be the same as the outlet for DE calculations. No flows were measured on the Concentrators due to the non-ideal sampling locations. Flow information can be found in **Appendix F**.

The dry molecular weight of the stack gas was determined following calculations outlined in USEPA Method 3, "Determination of Molecular Weight of Dry Stack Gas". Oxygen and carbon monoxide were monitored using an electrochemical cell and a non-dispersive infrared sensor. Stack moisture content was determined through direct condensation and according to USEPA Method 4, "Determination of Moisture Content of Stack Gas". As noted in the Notification for Testing, moisture test was only completed at the outlet of the exhaust stacks for the TOs. Moisture tests were not conducted on the Concentrators.

4.2.2 Continuous Emissions Monitoring for VOCs

Testing for VOCs was accomplished simultaneously at the inlet and outlet using continuous emission monitors (CEM). VOC testing followed USEPA Method 25A "Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer" In order to compare inlet and outlet concentrations, the outlet concentrations of total VOCs, methane, and non-methane VOCs were converted to parts per million (ppmv) as propane for the TOs. The methane response factor was 2.6. For the Concentrators a direct comparison of VOCs (as propane) was used to determine the RE. The exhaust gas sample was withdrawn from a single point at the center of the duct/stack using a stainless steel probe. The sample proceeded through a heated filter where particulate matter was removed. The sample was then transferred via a heated Teflon® line and introduced to the analyzers (hot/wet) for measurement.

Prior to testing, instrument linearity checks and calibration error checks were conducted. USEPA protocol gases were used for all span values. The FIDs were calibrated using zero (>1% of span value) and high (80-90% of span value) sent though the system to the sample tip and returned to the analyzers. Low Span gas and mid ranges were then introduced. In addition, the analyzers were calibrated (zeroed and span checked) at the completion of each test using the Zero and Mid span gases.

Appendix C contains a schematic of a typical Method 25A sampling apparatus. **Appendix D** contains detailed data for the Concentrator sampling program including summary of results, the span value data and 1 minute averages. **Appendix E** contains detailed data for the TO sampling program including summary of results, the span value data and 1 minute averages. All field notes are provided in **Appendix G**.

Data acquisition was provided using a data logger system programmed to collect and record data at one second intervals. Average one minute concentrations were calculated from the one second measurements.

4.3 Process Data

JNAP representatives provided production information during testing of the concentrators and TOs including the following:

- Concentrator Desorb Temperature during each test for the Color 1, 2 and 3 concentrators;
- Color Booth production rates during each Color 1, 2, and 3 concentrator testing periods;
- TO combustion chamber temperature during each Oven TO testing period; and
- Color Oven production rate during each Color 1, 2 and 3 Oven TO testing period.

Mr. Thomas Caltrider and Mr. Steven Szura from FCA US LLC recorded and monitored the process during the testing to ensure the production rate was within typical normal production rates. Prior to commencing with the testing, Mr. Caltrider and/or Mr. Szura confirmed that the process was operating normally. Prior to commencing with the testing, Mr. Caltrider and/or Mr. Szura confirmed that the process was operating normally. During times of lower than representative throughput rates, tests were delayed or paused until representative production levels occurred. Further details are provided in **Appendix I**.

5 MODIFICATIONS

There were several modifications that occurred during the testing:

- Due to lower production periods during testing both Concentrator 2 and 3 included four (4) tests instead of the minimum of three (3), in addition, for some tests, the time was extended beyond the minimum 60 minute duration.
- Due to lower production periods during testing, Color 3 Oven TO Test 3 testing time was extended beyond the minimum 60 minute duration for some of the test.
- For Concentrator 1 (EU-TOPCOAT1), it was determined that a higher than normal amount of natural gas was passing through from an Air Supply House and was elevating THC concentrations at both the inlet and outlet Total Hydrocarbon Analyzers. On November 30, 2020, testing was completed in order to satisfy the five (5) year requirement to complete the testing prior to December 3, 2020. On December 1, Ms. Regina Angellotti was on-site at JNAP to witness the engineering study being completed to evaluate the inlet and outlet methane readings in addition to the THC readings. On this date, it was agreed to by EGLE that FCA could monitor methane on the outlet (in addition to THC) and apply the values to the inlet in order to estimate the non-methane organic compound (NMOC) fraction from both the inlet and outlet. A test was originally completed that proved that the inlet and outlet methane concentrations were comparable. At the completion of the engineering study, Ms. Regina Angellotti agreed that JNAP should proceed to try to correct the problem identified with the Air Supply House and that the final compliance test should be completed with real-time inlet and outlet readings of THC and methane in order to calculate the resultant NMOC fraction to be used for determining the removal efficiency. This was completed on December 8, 2020. For Concentrator 1, results are provided for November 30, 2020 (THC inlet/outlet only), December 1, 2020 (engineering study with inlet THC only and outlet with THC and methane and outlet methane was applied to the inlet THC to calculate resultant NNOC) and December 8, 2020 (inlet and outlet with real-time THC and methane).

6 RESULTS

The average emission results for this study are presented in the following tables. Detailed information regarding each test run can be found in the **Appendix D** for Concentrators testing and **Appendix E** for Oven TOs testing.

Table 6.1.1: EU-TOPCOAT 1 – Concentrator (November 30, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Removal Efficiency [1] (as THC)
1	2020-11-30	07:02	08:01	19	116.9	30.21	74.2%
2	2020-11-30	08:45	09:44	15	101.3	28.95	71.4%
3	2020-11-30	09:58	10:57	17	110.3	28.32	74.3%
4	2020-11-30	11:05	12:04	15	107.7	28.64	73.4%
				Average	**109.1**	**29.03**	**73.3%**

Notes:
[1] Removal efficiency was calculated based on Total Hydrocarbon (THC).
THC – Total Hydrocarbon

Table 6.1.2: EU-TOPCOAT 1 – Concentrator (December 1, 2020) – Engineering Study with EGLE

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Inlet Methane [2] [3] (ppm) (as propane)	Inlet NMOC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Outlet Methane [2] (ppm) (as propane)	Inlet NMOC (ppm) (as propane)	Removal Efficiency [1] (as NMOC)
1a	2020-12-01	09:30	09:39	18	88.4	9.83	78.6	N/A	N/A	N/A	N/A
1b	2020-12-01	09:46	09:56	18	N/A	N/A	N/A	20.7	10.0	10.6	N/A
2	2020-12-01	10:27	11:26	13	81.4	8.96	72.4	18.8	8.96	9.88	86.4%
3	2020-12-01	12:38	13:50	17	95.8	7.50	88.3	15.3	7.50	7.81	91.2%
				Average	**88.5**	**8.76**	**79.8**	**18.3**	**8.82**	**9.44**	**88.8%**

Notes:
[1] Removal efficiency was calculated based on total non-methane concentrations (NMOC).
[2] Methane to Propane conversion determined per test (see **Appendix C**)
[3] Methane concentration was measured at the Outlet per Method 25A. Outlet methane concentration was applied to the Inlet for Removal Efficiency calculations.
NMOC – Non-methane organic compound

Table 6.1.3: EU-TOPCOAT 1 – Concentrator (December 8, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Inlet Methane [2] (ppm) (as propane)	Inlet NMOC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Outlet Methane [2] (ppm) (as propane)	Inlet NMOC (ppm) (as propane)	Removal Efficiency [1] (as NMOC)
1	2020-12-08	07:21	08:20	16	103.7	5.89	97.8	14.8	6.23	8.57	91.2%
2	2020-12-08	09:23	10:22	17	100.8	7.45	93.4	17.0	7.43	9.59	89.7%
3	2020-12-08	11:00	12:21	15	88.3	8.55	79.8	18.4	8.52	9.84	87.7%
4	2020-12-08	13:10	14:09	15	113.1	10.6	102.5	21.2	10.8	10.4	89.9%
				Average	**101.5**	**8.12**	**93.4**	**17.8**	**8.25**	**9.59**	**89.6%**

Notes:
[1] Removal efficiency was calculated based on total non-methane concentrations (NMOC).
[2] Methane to Propane conversion determined per test (see **Appendix C**)
NMOC – Non-methane organic compound

Table 6.1.4: EU-TOPCOAT 2 – Concentrator (November 18, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Removal Efficiency [1] (as THC)
1	2020-11-18	08:00	08:59	15	89.2	6.94	92.2%
2	2020-11-18	09:45	10:44	19	86.3	2.03	97.6%
3	2020-11-18	10:57	11:56	18	117.3	2.09	98.2%
4	2020-11-18	12:30	13:29	17	91.5	2.11	97.7%
				Average	**96.1**	**3.29**	**96.4%**

Notes:
[1] Removal efficiency was calculated based on Total Hydrocarbon (THC).
THC – Total Hydrocarbon

Table 6.1.5: EU-TOPCOAT 3 – Concentrator (November 17, 2020)

Test ID	Date	Start	End	Vehicles per hour	Inlet THC (ppm) (as propane)	Outlet THC (ppm) (as Propane)	Removal Efficiency [1] (as THC)
1	2020-11-17	08:30	09:29	19	96.5	10.91	88.7%
2	2020-11-17	09:48	11:25	16	49.8	8.61	82.7%
3	2020-11-17	12:16	13:15	18	67.5	10.16	84.9%
4	2020-11-17	13:29	14:44	18	54.5	8.98	83.5%
				Average	**67.1**	**9.66**	**85.0%**

Notes:
[1] Removal efficiency was calculated based on Total Hydrocarbon (THC).
THC – Total Hydrocarbon