Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)

Plant Management Document

VX Projectile Final Non-Agent Air Emissions Report

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prepared by
Bechtel Parsons Blue Grass Team (BPBGT)

prepared for
Program Executive Office –
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Concurrence

JTG Review Concurrence on 24915-SYS-5RP-00-00013 R0 has successfully completed. All participants have completed their tasks.

24915-SYS-5RP-00-00013 R0 VX Projectile Final Non-Agent Air Emissions Report
URGENT: Please close this concurrence task as soon as you can to provide your signature approval. Thank you.

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1.0 EXECUTIVE SUMMARY

1.1 Purpose

This report provides the final non-agent air emissions results for the Integrated Facility Demonstration (IFD) and non-agent air emissions testing conducted in accordance with (IAW) Block 5B of 24915-00-G01-GGSP-00003, *Pilot Test Demonstration Plan, Volume III* (PTDP), and 24915-GEN-5PL-00-00011, *Quality Project Plan for Main Plant Non-Agent Air Emissions Sampling and Analysis* (QAPjP), to satisfy applicable permit and regulatory requirements.

1.2 Overview

The BGCAPP executed pilot testing of equipment and processes for demilitarization of the 155-mm VX projectile stockpile IAW the PTDP. Pilot testing verifies effective destruction of stockpile munitions in compliance with applicable contractual and permit requirements. This pilot testing was organized into blocks IAW the projectile process flow through the facility. Each block underwent ramp-up and demonstration activities IAW system requirements. Success of these activities is documented in the corresponding letter reports:

Block 1: Munitions Receipt and Processing, incorporating the Munitions Washout System (MWS), 24915-SYS-5RP-00-00006, *Pilot Test Demonstration Block 1 Report for VX Projectiles*

Block 2: Munitions Bodies and Secondary Waste Treatment, incorporating the Metal Parts Treater (MPT), 24915-SYS-5RP-00-00007, *Pilot Test Demonstration Block 2 Report for VX Projectiles*

Block 3: Agent Collection and Neutralization, incorporating the Agent Collection System (ACS) and Agent Neutralization System (ANS), 24915 SYS-5RP-00-00008, *Pilot Test Demonstration Block 3 Report for VX Projectiles*

Block 4: Off-Gas Treatment, incorporating the Off-Gas Treatment System for MPT and ANS (OTM), 24915-SYS-5RP-00-00009, *Pilot Test Demonstration Block 4 Report for VX Projectiles*

The final block for pilot testing was Block 5, IFD. The IFD represented the culmination of pilot testing in which process systems were operated under the conditions defined and/or validated through testing, ramp-up, and demonstration at full rate. The IFD for VX projectile processing incorporated three distinct activities:

- Demonstration of agent destruction and removal efficiency IAW Kentucky Revised Statutes (KRS) 224.50-130
- Collection of representative emissions samples during periods of full facility operation
- Demonstration of integrated facility operations (performed in parallel with collection of representative emissions samples)

Operational data that demonstrates BGCAPP compliance with KRS 224.50-130 are provided in 24915-SYS-5RP-00-00010, *Pilot Test Demonstration Block 5A Report for VX Projectiles*. Operational data collected during integrated operations and emissions sampling are provided in 24915-SYS-5RP-00-00011, *Pilot Test Demonstration Block 5B Report for VX Projectiles*. This report summarizes the non-agent air emissions sampling and analysis performed and provides tables containing emission rates and/or concentrations for each applicable analyte during the IFD demonstration period.

This final report has been prepared IAW the QAPjP requirements. As further discussed in 24915-SYS-5RP-00-00011, *Pilot Test Demonstration Block 5B Report for VX Projectiles,* the plant was operated IAW PTDP requirements during each sampling period. The three primary agent process systems for VX projectiles, the MWS, ANS, and MPT, were actively processing waste throughout the sampling period, and the OTM was within normal operating ranges. Furthermore, the peak and average throughput achieved during each sampling period met PTDP requirements to support the operating schedule.

1.3 Summary of Testing Performed

Non-agent air emissions testing commenced on March 16, 2021, and completed on March 20, 2021, with preliminary activities such as mobilization, absence of cyclonic flow, and preliminary flow and moisture for nozzle selection conducted March 13 through 15, 2021.

Non-agent air emissions samples were collected at three locations IAW the PTDP and QAPjP. The sampling locations included the east and west Munitions Demilitarization Building (MDB) filtration area duct and stacks and the OTM duct. As further discussed in Appendix III of 24915-8H4-V14-H000-00006, *Screening-Level Human Health Risk Assessment [HHRA] Results for Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)*, the OTM sampling location reduces dilution air to support quantifying potential emissions of products of incomplete combustion (PIC); however, the one significant drawback is that it does not account for downstream filtration of contaminants provided by the MDB Heating, Ventilation, and Air Conditioning (HVAC) Filtration System.

Four sampling runs were completed at each location, and samples from all four runs were submitted for analysis. As summarized in Table 1–1, all testing and system/analytical data collection planned for the IFD was completed. A detailed test chronology with the sampling times for each sampling train at each sampling location for each run is provided in Appendix A.

The data have been reviewed to assess usability and were determined to be usable for their intended purpose. The Bechtel Parsons Blue Grass Team (BPBGT) has determined that each of the objectives specified in Block 5B of 24915-00-G01-GGSP-00003, *Pilot Test Demonstration Plan, Volume III (PTDP),* and 24915-GEN-5PL-00-00011, *Quality Project Plan for Main Plant Non-Agent Air Emissions Sampling and Analysis (QAPjP),* was achieved.

1.4 Non-Agent Air Emissions Results

Non-agent air emissions for the select criteria pollutants and constituents of potential concern (COPC) identified in Appendix G of the PTDP have been determined. Based on the achieved peak MWS throughput, the Pilot Test Director determined that Runs 2, 3, and 4 were to be used to determine the three-run averages presented in this report.

Table 1–2 summarizes the select criteria pollutant emissions measured by Temporary Reference Method (TRM) Continuous Emissions Monitoring System (CEMS) for carbon monoxide (CO), sulfur dioxide (SO_2), oxides of nitrogen (NO_x), and total hydrocarbons (THC), as propane, for Runs 2, 3, and 4 and provides the three-run average. Table 1–3 summarizes the three-run average COPC emissions rates and provides the estimated COPC emission rates that were used in 24915-8H4-V14-H000-00006, *Screening-Level Human Health Risk Assessment (HHRA) Results for Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)*. Measured emission rates that are greater than the modeled emission rate are shown in Table 1–3 in ***italicized bold*** font.

For the continuously monitored emission results, any negative values reported by the sampling subcontractor were presented as zero (0). For the COPC, in instances where non-detects (ND) were incurred, the reporting limit (RL), estimated detection limit (EDL) or method detection limit (MDL), depending on the analysis type, was generally used to calculate the emission rate unless otherwise indicated.

The average COPC emissions are presented using a format that allows the user to determine whether the reported result reflects all non-detect results as indicated by a < before the reported value and an ND after the reported value, e.g., < 8.12E-13 ND, a combination of detected and non-detected results as indicated by the presence of the "<" before the results and the absence of an ND after the result, e.g., < 1.31E-12, or all detected values when the result is reported without a < or ND qualifier, e.g., 1.00E-11 grams/second (g/s).

No blank corrections have been made to the volatile organics, semivolatile organics, dioxins/furans, acid gases, ammonia, particulate, or metals data presented in this report.

1.5 Project Participants

The BPBGT conducted the non-agent emissions test while processing VX-filled projectiles IAW the PTDP. The BGCAPP Test Director was the point of contact for any concerns associated with the emissions test. The non-agent air emissions sampling and on-site analysis were performed by a subcontractor, AECOM Technical Services of Austin, Texas (AECOM). Off-site laboratory analysis was performed by AECOM's subcontract laboratories, Eurofins TestAmerica in Knoxville, Tennessee and Savannah, Georgia (TestAmerica).

1.6 Summary

Required non-agent air emission sampling was completed during the IFD demonstration period as specified in Appendix G of the PTDP. The required sample analyses were completed, and non-agent air emissions results have been prepared and reported in this final report.

Specific contaminants were observed at higher emission rates than estimated in the preoperational HHRA. In most instances, the greater emission rates were observed at the OTM sampling location, which takes no credit for the downstream MDB HVAC Filtration System (i.e., two stages of high-efficiency particulate air [HEPA] filters for removal of particulate phase contaminants and six stages of carbon filters for removal of organic contaminants). The potential impacts to calculated risk/hazard using the conservative assumption of the HHRA will be submitted in a separate submittal to the Kentucky Department for Environmental Protection (KDEP).

Table 1–1: Sampling Matrix for Exhaust Gas

Analyte	Sampling Method	Planned	Performed
Traverse Points	EPA Method 1	Yes	Yes
Off-Gas Velocity	EPA Method 2	Yes	Yes
Oxygen and Carbon Dioxide	EPA Methods 3A	Yes	Yes
Moisture	EPA Method 4	Yes	Yes
Sulfur Dioxide	EPA Method 6C	Yes	Yes
Nitrogen Oxides	EPA Method 7E	Yes	Yes
Carbon Monoxide	EPA Method 10	Yes	Yes
Total Hydrocarbons	EPA Method 25A	Yes	Yes
Semivolatile Organics	SW-846 Method 0010	Yes	Yes
Total Organics	SW-846 Methods 0010 and 0040	Yes	Yes
Dioxins/Furans, Polychlorinated Biphenyls, and Polycyclic Aromatic Hydrocarbons	SW-846 Method 0023A	Yes	Yes
Volatile Organics	SW-846 Method 0031	Yes	Yes
Acid Gases, Ammonia, and Particulates	EPA Method 26A and 5	Yes	Yes
Trace Metals	EPA Method 29	Yes	Yes

Table 1–2: Criteria Pollutant Emissions

Constituent	CASRN	Run 2/3/4 Average Emission Rate (lb/hr)	
		East Duct	West Duct
Sulfur Dioxide	7446-09-5	0	0.19
Nitrogen Oxides	10102-43-9 10102-44-0	0	0.38
Total Hydrocarbons, as propane	N/A	0.42	0.44
Carbon Monoxide	630-08-0	0.01	0

Table 1–3: COPC Emission Rate Comparison

COPC	CASRN	Run 2/3/4 Average Emission Rate (g/s) [a,b]			Modeled MDB HVAC Each Stack Emission Rate (g/s) [c]
		MDB HVAC Duct and Stack		OTM Duct Between Exhaust and HVAC Filter Duct	
		East	West		
Volatile Organic Compounds					
Acetone	67-64-1	< 1.16E-03 ND	< 1.17E-03 ND	---	4.97E-03
Benzene	71-43-2	< 6.31E-05	< 5.93E-05 ND	---	4.97E-04
Chloroethane	75-00-3	< 2.32E-04 ND	< 2.35E-04 ND	---	2.48E-03
Chloroform	67-66-3	< 5.87E-05 ND	< 5.93E-05 ND	---	4.97E-04
Methylene chloride	75-09-2	< 4.23E-04	< 4.25E-04	---	1.23E-03
Toluene	108-88-3	< 1.10E-04	< 1.17E-04 ND	---	4.97E-04
m & p-Xylene	136777-61-2	< 1.17E-04 ND	< 1.19E-04 ND	---	4.97E-04
o-Xylene	95-47-6	< 5.87E-05 ND	< 5.93E-05 ND	---	9.93E-04
Xylenes (total)	1330-20-7	< 1.76E-04 ND	< 1.78E-04 ND	---	9.93E-04
Styrene	100-42-5	< 4.84E-05	< 5.25E-05	---	4.97E-04
Tetrachloroethene	127-184	< 5.50E-05	< 5.93E-05 ND	---	4.97E-04
Semivolatile Organic Compounds					
Dimethyl phthalate	131-11-3	< 6.46E-04 ND	< 6.55E-04 ND	---	4.72E-03
Bis(2-Ethylhexyl)phthalate [d]	117-81-7	***< 1.28E-03 ND***	***< 1.03E-03 ND***	---	6.30E-04
Butyl benzyl phthalate	85-68-7	< 6.46E-04 ND	< 6.55E-04 ND	---	4.72E-03
1,4-Dichlorobenzene	106-46-7	< 6.46E-04 ND	< 6.55E-04 ND	---	4.72E-03
Diethyl phthalate	84-66-2	< 6.46E-04 ND	< 5.97E-04	---	4.72E-03
Di-n-butyl phthalate	84-74-2	< 6.46E-04 ND	< 6.55E-04 ND	---	6.30E-03
Naphthalene	91-20-3	< 6.46E-04 ND	< 6.55E-04 ND	---	4.72E-03
Benzo(a)pyrene	50-32-8	---	---	< 6.55E-09 ND	8.02E-09
Perylene	198-55-0	---	---	< 2.54E-08 ND	8.02E-08
Phenanthrene	85-01-8	---	---	< 5.70E-08	1.87E-07
Dioxins/Furans					
2,3,7,8-TetraCDD	1746-01-6	---	---	< 1.31E-12	5.35E-12
Total TetraCDD	41903-57-5	---	---	1.00E-11	5.35E-12
2,3,7,8-TetraCDF	51207-31-9	---	---	< 8.12E-13 ND	5.35E-12
Total TetraCDF	55722-27-5	---	---	< 1.72E-12	2.67E-11
1,2,3,7,8-PentaCDD	40321-76-4	---	---	< 1.29E-13 ND	2.67E-11
Total PentaCDD	36088-22-9	---	---	3.42E-12	2.67E-11
1,2,3,7,8-PentaCDF	57117-41-6	---	---	< 1.20E-12 ND	2.67E-11
2,3,4,7,8--PentaCDF	57117-31-4	---	---	< 1.18E-12 ND	2.67E-11

Table 1–3: COPC Emission Rate Comparison (continued)

COPC	CASRN	Run 2/3/4 Average Emission Rate (g/s) [a,b]			Modeled MDB HVAC Each Stack Emission Rate (g/s) [c]
		MDB HVAC Duct and Stack		OTM Duct Between Exhaust and HVAC Filter Duct	
		East	West		
Dioxins/Furans (continued)					
Total PentaCDF	30402-15-4	---	---	< 1.20E-12 ND	2.67E-11
1,2,3,6,7,8- HexaCDD	57653-85-7	---	---	< 7.61E-13 ND	2.67E-11
1,2,3,4,7,8- HexaCDD	39227-28-6	---	---	< 7.74E-13 ND	2.67E-11
1,2,3,7,8,9-HexaCDD	19408-74-3	---	---	< 7.56E-13 ND	2.67E-11
Total HexaCDD	34464-46-8	---	---	5.79E-12	2.67E-11
1,2,3,6,7,8- HexaCDF	57117-44-9	---	---	< 6.39E-13 ND	2.67E-11
1,2,3,4,7,8- HexaCDF	70648-26-9	---	---	< 6.89E-13 ND	2.67E-11
1,2,3,7,8,9-HexaCDF	72918-21-9	---	---	< 7.46E-13 ND	2.67E-11
2,3,4,6,7,8-HexaCDF	60851-34-5	---	---	< 6.72E-13 ND	2.67E-11
Total HexaCDF	55684-94-1	---	---	2.43E-12	2.67E-11
1,2,3,4,6,7,8-HeptaCDD	35822-46-9	---	---	< 1.49E-12 ND	2.67E-11
Total HeptaCDD	37871-004	---	---	< 1.49E-12 ND	2.67E-11
1,2,3,4,6,7,8-HeptaCDF	67562-39-4	---	---	< 1.09E-12	2.67E-11
1,2,3,4,7,8,9-HeptaCDF	55673-89-7	---	---	< 6.56E-13 ND	2.67E-11
Total HeptaCDF	38998-75-3	---	---	< 1.14E-12	2.67E-11
Total OctaCDD	3268-87-9	---	---	3.45E-12	5.35E-12
Total OctaCDF	39001-02-0	---	---	1.54E-12	5.35E-12
Polychlorinated Biphenyls					
3,3',4,4'-TetraCB (PCB 77)	32598-13-3	---	---	< 9.17E-12	8.02E-11
3,4,4',5-TetraCB (PCB 81)	70362-50-4	---	---	< 8.79E-12 ND	8.02E-11
2,3,3',4,4'-PentaCB (PCB 105)	32598-14-4	---	---	< 9.51E-12	8.02E-11
2,3,4,4',5-PentaCB (PCB 114)	74472-37-0	---	---	< 8.48E-12 ND	8.02E-11
2,3',4,4',5-PentaCB (PCB 118)	31508-00-6	---	---	< 3.68E-11	8.02E-11
2',3,4,4',5-PentaCB (PCB 123)	65510-44-3	---	---	< 9.24E-12 ND	8.02E-11
3,3',4,4',5-PentaCB (PCB 126)	57465-28-8	---	---	< 9.82E-12 ND	8.02E-11
2,3,3',4,4',5-HexaCB (PCB 156)	38380-08-4	---	---	< 3.30E-11	8.02E-11
2,3,3',4,4',5'-HexaCB (PCB 157)	69782-90-7	---	---	< 3.30E-11	8.02E-11
2,3',4,4',5,5'-HexaCB (PCB 167)	52663-72-6	---	---	< 3.35E-12 ND	8.02E-11
3,3',4,4',5,5'-HexaCB (PCB 169)	32774-16-6	---	---	< 3.20E-12 ND	8.02E-11
2,3,3',4,4',5,5'-HeptaCB (PCB 189)	39635-31-9	---	---	< 5.80E-12 ND	8.02E-11
Total MonoCB	27323-18-8	---	---	< 6.89E-11	8.02E-10
Total DiCB	25512-42-9	---	---	9.37E-10	8.02E-10

Table 1–3: COPC Emission Rate Comparison (continued)

COPC	CASRN	Run 2/3/4 Average Emission Rate (g/s) [a,b]			Modeled MDB HVAC Each Stack Emission Rate (g/s) [c]
		MDB HVAC Duct and Stack		OTM Duct Between Exhaust and HVAC Filter Duct	
		East	West		
Polychlorinated Biphenyls (continued)					
Total TriCB	25323-68-6	---	---	2.88E-10	8.02E-10
Total TetraCB	26914-33-0	---	---	2.24E-10	8.02E-10
Total PentaCB	25429-29-2	---	---	1.87E-10	8.02E-10
Total HexaCB	26601-64-9	---	---	1.70E-10	8.02E-10
Total HeptaCB	28655-71-2	---	---	< 6.03E-11	8.02E-10
Total OctaCB	55722-26-4	---	---	4.34E-11	8.02E-10
Total NonaCB	53742-07-7	---	---	< 3.44E-11 ND	8.02E-10
Total DecaCB	2051-24-3	---	---	< 2.94E-12	8.02E-11
Total PCB	1336-36-3	---	---	1.97E-09	7.30E-09
Metals					
Antimony	7440-36-0	---	---	< 3.36E-06 ND	3.21E-06
Arsenic	7440-38-2	---	---	***< 1.68E-06 ND***	5.35E-07
Barium	7440-39-3	---	---	***2.30E-06***	5.35E-07
Beryllium	7440-41-7	---	---	< 1.45E-07	2.67E-07
Boron	7440-42-8	---	---	< 2.09E-05	2.67E-05
Cadmium	7440-43-9	---	---	***< 1.57E-05***	2.67E-07
Chromium	7440-47-3	---	---	***6.59E-06***	2.67E-06
Cobalt	7440-48-4	---	---	< 2.28E-06	2.67E-06
Copper	7440-50-8	---	---	***1.57E-05***	6.69E-06
Lead	7439-92-1	---	---	***< 7.69E-05***	5.35E-07
Manganese	7439-96-5	---	---	***2.14E-06***	8.02R-07
Nickel	7440-02-0	---	---	***2.40E-06***	5.35E-07
Phosphorus	7723-14-0	---	---	3.45E-05	8.02E-05
Selenium	7782-49-2	---	---	< 1.68E-06 ND	2.67E-06
Silver	7440-22-4	---	---	< 5.09E-07	2.67E-06
Thallium	7440-28-0	---	---	***< 1.68E-06 ND***	5.35E-07
Tin	7440-31-5	---	---	< 8.04E-06	2.94E-05
Vanadium	7440-62-2	---	---	< 8.79E-07	1.34E-06
Zinc	7440-66-6	---	---	***5.47E-05***	5.35E-07
Mercury					
Mercury	7439-97-6	---	---	< 3.30E-07	2.67E-06

Table 1–3: COPC Emission Rate Comparison (continued)

COPC	CASRN	Run 2/3/4 Average Emission Rate (g/s) [a,b]			Modeled MDB HVAC Each Stack Emission Rate (g/s) [c]
		MDB HVAC Duct and Stack		OTM Duct Between Exhaust and HVAC Filter Duct	
		East	West		
Inorganics					
Hydrogen chloride	7647-01-0	9.43E-04	< 1.02E-03	---	1.18E-02
Hydrogen fluoride	7664-39-3	< 1.31E-03 ND	< 1.26E-03 ND	---	1.18E-02
Chlorine	7782-50-5	1.45E-03	1.19E-03	---	4.72E-03
Ammonia	7664-41-7	***< 8.66E-04***	***1.09E-03***	---	5.90E-04

[a] Measured emission rates that are greater than the modeled emission rate are shown with ***italicized bold*** font.

[b] Measured emission rates from the OTM location are compared to the modeled MDB HVAC stack emission rate using one-half the measured emission rate shown in this table. Measured emissions at the OTM sampling location take no credit for removal afforded by the downstream MDB HVAC Filtration System (i.e., two stages of HEPA filter for removal of particulate phase contaminants and six stages of carbon filters for removal of organic contaminants).

[c] See 24915-8H4-V14-H000-00006, *Screening-Level Human Health Risk Assessment [HHRA] Results for Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)*.

[d] The train total for this analyte was calculated using the MDL in lieu of the RL.

2.0 EXHAUST GAS SAMPLING

2.1 Non-Agent Air Emissions Sampling Locations

Non-agent air emissions samples were collected at the locations specified in the PTDP and QAPjP. The sampling locations included the east and west MDB filtration area duct and stacks and the OTM duct. The United States Environmental Protection Agency (EPA) Method 1 (M1) was used to establish the required traverse for sampling points at each non-agent air emissions sampling location where isokinetic sampling was performed.

2.1.1 MDB Filtration Area Duct and Stack Sampling Locations

The horizontal duct leading to each stack and the stacks themselves have permanently installed sampling ports that were used for non-agent air emissions sampling to determine the parameters specific to the PTDP. On each stack, there are two sets of four orthogonal 4-inch sampling ports approximately 78.5 and 80.5 feet above ground level. Scaffolding provided access and a working area to stage necessary personnel and equipment. Only the upper port set was used during testing. This port set meets the minimum distances from downstream and upstream flow disturbances for isokinetic sampling. The inner diameter of the stack is 86 inches, and 24-point sampling was performed, 12 points per traverse. All four ports were used during sampling such that six points of each 12-point traverse were sampled from each port.

The horizontal duct sampling ports were used to perform non-isokinetic sampling and for the TRM CEMS. These ports were accessed from permanently installed grating. The inner diameter of the duct is 84 inches and single-point sampling was performed.

Appendix A details the sampling ports that were used for isokinetic and non-isokinetic sampling and provides a figure depicting the non-agent sampling ports for the MDB filtration area duct and stacks.

2.1.2 OTM Duct

At the OTM duct location, exhaust gas samples were collected from flanged ports in a horizontal run of duct between the MPT blowers and the HVAC filter duct. This location has three orthogonal sets of sampling ports located sequentially along the duct for a total of six ports. Each set of orthogonal ports includes two 3-inch ports located 90 degrees apart, in the same plane of the duct. One of these two ports is oriented for horizontal sampling, and the other is oriented for vertical sampling. Each port set meets the minimum distances from downstream and upstream flow disturbances. Port sets 2 and 3 were used during testing. Before testing, the inner diameter of the OTM duct was measured at 17 inches. Eight-point sampling was performed, four points per traverse.

Appendix A details the sampling ports that were used for isokinetic sampling and provides a figure depicting the non-agent sampling ports for the OTM duct.

2.2 Summary of Non-Agent Air Emissions Sampling

This section describes the procedures that were followed during the emissions test. Throughout the overall program, the EPA-authored sampling methods identified in the PTDP and QAPjP were used.

2.2.1 Field Program Description

Non-agent air emissions samples were collected as specified in Appendix G of the PTDP using the following methods IAW the QAPjP:

- EPA Method 1 (M1), *Sample and Velocity Traverses for Stationary Sources*
- EPA Method 2 (M2), *Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)*
- EPA Method 3A (M3A), *Determination of Oxygen and Carbon Dioxide in Emissions from Stationary Sources*
- EPA Method 4 (M4), *Determination of Moisture Concentration in Stack Gases*
- EPA Method 6C (M6C), *Determination of Sulfur Dioxide Emissions from Stationary Sources (by TRM CEMS)*
- EPA Method 7E (M7E), *Determination of Nitrogen Oxides Emissions from Stationary Sources (by TRM CEMS)*
- EPA Method 10 (M10), *Determination of Carbon Monoxide Emissions from Stationary Sources (by TRM CEMS)*
- EPA Method 25A, *Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer (by TRM CEMS)*
- SW-846 Method 0010 (M0010), *Semivolatile Organics Using Modified Method 5 Sampling Train*
- SW-846 Method 0023A (M0023A), *Sampling Method for Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofuran Emissions from Stationary Sources*
- SW-846 Method 0031 (M0031), *Sampling Method for Volatile Organic Compounds*
- EPA Method 26A (M26A), *Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources Isokinetic Method*
- EPA Method 5 (M5), *Determination of Particulate Matter Emissions from Stationary Sources* (operated in conjunction with the M26A sampling train)
- EPA Method 29 (M29), *Determination of Metals Emissions from Stationary Sources*

In addition, sampling for total unspeciated organics was conducted using the M0010 and SW-846 Method 0040 (M0040), *Sampling of Principal Organic Hazardous Constituents from Combustion Sources Using Tedlar® Bags*, as described in *Guidance for Total Organics, Final Report* (EPA/600/R-96/033). The total organics data are intended to support future risk assessment activities, as necessary.

2.2.2 Presampling Activities

Pre-sampling activities included equipment calibration, sample media preparation, and precleaning of the sample train glassware. Each of these activities are described or referenced in the following subsections. Other pre-sampling activities included team meetings and conferences, equipment packing and setup, and finalization of all details leading up to the coordinated initiation of the sampling program.

2.2.2.1 Equipment Calibration

To prevent the failure of equipment or instruments during use, maintenance and calibration were performed to ensure accurate measurements from the field and laboratory instruments.

Equipment scheduled for field use was cleaned and checked before calibration, as required. General readiness of equipment entailed a visual inspection of the meter boxes, sample hot boxes, probes, and umbilical lines for: dust, oil, and dirt in lines; and loose fittings and connections. An adequate supply of spare parts was taken to the field to minimize downtime due to equipment failure.

Equipment calibration was conducted IAW the QAPjP, the EPA methods, and the procedures outlined in the EPA document entitled, "*Quality Assurance Handbook for Air Pollution Measurement Systems; Volume III – Stationary Source Specific Methods*" (EPA 600/4-77-0276). All required calibrations were performed before the test program, with post-test calibrations conducted as required. Documentation of pre-test calibrations was kept in the project file during the field effort, and copies were included in a pre-test package distributed to the KDEP observers during the emissions test. A copy of the KDEP pre-test distribution is provided as Appendix D. Copies of the exhaust gas sampling equipment calibrations are provided in Appendix A.

2.2.2.2 Glassware Preparation

Before field use, sample train glassware was subjected to method-specific cleaning procedures to minimize sample contamination. Cleaning and storage procedures for sampling train glassware were IAW the procedures summarized in the QAPjP*,* or subcontractor procedures that have been demonstrated to produce sufficiently clean glassware. After glassware is used in the field, the sample recovery procedures are considered sufficient to allow glassware reuse for the duration of the test event.

Sample bottles were purchased pre-cleaned and certified to meet or exceed the requirements of the EPA guidance document "*Specifications and Guidance for Contaminant-Free Sample Containers"* (EPA/540/R-93/051). Only new, unused containers with non-adhesive polytetrafluoroethylene (PTFE)-lined closures were used as applicable.

2.2.2.3 Sample Media Preparation

Reagents used for the testing program were of sufficient grade or quality to meet or exceed method requirements. This included the use of spectro-grade solvents from the same lot, when possible, and the collection and analysis of the appropriate blanks. Deionized (DI) reagent water used in all organic sampling trains was of a grade and quality demonstrated to be "organic-free" as per SW-846 requirements.

Resin used in the M0010 and M0023A sampling trains was prepared and certified clean by the laboratory supplying the resin. The sorbent traps for these sampling trains were loaded with resin at the laboratories with the openings packed with clean glass wool to ensure no resin would be lost. Field surrogates were added by the laboratory before shipping, as required. The M0031 traps were purchased preloaded with resin and then conditioned by the laboratory IAW methods-specific procedures.

2.2.3 Sampling Methods

On-site sampling activities included the equipment staging in the field, sampling operations, data logging (except where noted below), and sample recovery. Copies of the non-agent air emissions sampling data sheets are in Appendix A. The following subsections identify and describe the sampling methods employed.

2.2.3.1 EPA Methods 1 and 2

Velocity traverses were conducted at each isokinetic sampling location with a Type S pitot assembly IAW M1 and M2. A Type S pitot tube with an attached inclined manometer was used to measure the gas velocities. An attached Type K thermocouple with remote digital display was used to determine the exhaust gas temperature.

Before sampling commenced, preliminary determinations of exhaust gas velocity and volumetric flow rate were performed to assist in selecting the correct nozzle size to ensure isokinetic testing requirements were met, and minimum sample volumes were obtained. During the actual sampling, exhaust gas velocity and volumetric flow rate measurements were conducted with each isokinetic sampling train. The required number of sampling traverse points for each sampling location was determined following M1. Pitot tubes were leak-checked before and after each run. In addition, the attached thermocouple was verified after each run.

At each isokinetic sampling location, static pressure measurements were recorded manually once per run. These static pressure readings were used to calculate stack gas volumetric flow rate for each isokinetic sampling train at each sampling location.

A cyclonic flow check was conducted at each sampling location before testing IAW Section 11.4 of M1. This procedure was used to ensure the flow was not “swirling” at the sampling location. The equipment used consisted of a Type S pitot tube connected to an inclined manometer to measure the duct differential pressure and an angle finding device (i.e., leveled angle finder for the horizontal ports and a digital protractor for the vertical port at the OTM location). The pitot tube was positioned at each traverse point so that the face openings of the pitot tube were perpendicular to the exhaust duct cross-sectional plane. This position is called the zero reference.

If the velocity pressure reading was zero, the cyclonic angle was recorded as 0º. If the velocity pressure reading was not zero, the pitot tube was rotated clockwise or counterclockwise until the velocity pressure reading became zero. This angle was then measured and reported. After this technique was applied at each traverse point, the average of the absolute values of the cyclonic angles was calculated. This average was less than (<) 20 degrees (allowed maximum) at each location, and the flow conditions were deemed acceptable to test.

2.2.3.2 EPA Method 3A

As described in the QAPjP, oxygen (O_2 and carbon dioxide (CO_2) concentrations at the east and west MDB filtration area ducts were measured prior to Run 1, and these measurements confirmed that the use of the default dry gas molecular weight of 29.0 was appropriate for these locations (see M2, Section 8.6).

At the OTM location, O_2 and CO_2 concentrations were determined during each run by collecting a bag sample that was analyzed using a TRM CEMS IAW M3A. This approach was expressly permitted by the QAPjP and is consistent with the EPA approved alternative test method ALT-123.

Calibrations, quality assurance (QA)/quality control (QC) activities, routine maintenance, and repair activities were documented for the O_2 and CO_2 testing. Activities related to the pretest checks were also recorded. All data related to O_2 and CO_2 sampling and the pretest activities were logged using a data acquisition system (DAS).

The TRM CEMS was calibrated IAW M3A. In general, the QA/QC measures included the use of EPA protocol calibration gases, pre-run calibrations, calibration error, and bias tests, as applicable. Copies of the certifications for the gas standards, documentation of all TRM CEMS QA/QC procedures, and results summaries of the TRM CEMS QC are in Appendix A.

2.2.3.3 EPA Method 4

During preliminary measurements, an initial exhaust gas moisture measurement was performed IAW M4. This method is applicable for the determination of the moisture content of stack gas. A gas sample was extracted at a constant rate from the duct, and the moisture removed from the gas stream by a series of chilled impingers. The amount of collected moisture was then determined gravimetrically and used in the calculation of percent moisture. During each run, M4 was used in conjunction with M29, M0023A, M26A, and M0010, for the determination of moisture at the respective sampling locations. The weight gain for each sample train impinger configuration was recorded and used in the exhaust gas moisture determination calculation.

2.2.3.4 EPA Method 6C

The SO_2 emissions were measured during each run at the east and west MDB filtration area duct sampling locations using TRM CEMS.

Calibrations, QA/QC activities, routine maintenance, and repair activities were documented for the SO_2 testing. Activities related to the pretest checks (calibration drift/error and response time tests) were also recorded. All data related to SO_2 sampling and the pretest activities were logged using a DAS.

The TRM CEMS were calibrated IAW method requirements. In general, the QA/QC measures included the use of EPA protocol calibration gases, pre-run calibration, calibration error, and bias tests. Copies of the certifications for the gas standards, documentation of all TRM CEMS QA/QC procedures, and results summaries of the TRM CEMS QC are in Appendix A.

2.2.3.5 EPA Method 7E

The NO_X emissions were measured during each run at the east and west MDB filtration area duct sampling locations using TRM CEMS.

Calibrations, QA/QC activities, routine maintenance, and repair activities were documented for the NO_X testing. Activities related to the pretest checks (calibration drift/error and response time tests) were also recorded. All data related to NO_X sampling and the pretest activities were logged using a DAS.

The TRM CEMS were calibrated IAW method requirements. In general, the QA/QC measures included the use of EPA protocol calibration gases, pre-run calibration, calibration error, and bias tests. Copies of the certifications for the gas standards, documentation of all TRM CEMS QA/QC procedures, and results summaries of the TRM CEMS QC are in Appendix A.

2.2.3.6 EPA Method 10

The CO emissions were measured during each run at the east and west MDB filtration area duct sampling locations using TRM CEMS.

Calibrations, QA/QC activities, routine maintenance, and repair activities were documented for the CO testing. Activities related to the pretest checks (calibration drift/error and response time tests) were also recorded. All data related to CO sampling and the pretest activities were logged using a DAS.

The TRM CEMS were calibrated IAW method requirements. In general, the QA/QC measures included the use of EPA protocol calibration gases, pre-run calibration, calibration error, and bias tests. Copies of the certifications for the gas standards, documentation of all TRM CEMS QA/QC procedures, and results summaries of the TRM CEMS QC are in Appendix A.

2.2.3.7 EPA Method 25A

The THC, as propane, emissions were measured during each run at the east and west MDB filtration area duct sampling locations using TRM CEMS.

Calibrations, QA/QC activities, routine maintenance, and repair activities were documented for the THC testing. Activities related to the pretest checks (calibration drift/error and response time tests) were also recorded. All data related to THC sampling and the pretest activities were logged using a DAS.

The TRM CEMS were calibrated IAW method requirements. In general, the QA/QC measures included the use of EPA protocol calibration gases, pre-run calibration, and hourly system drift checks. Copies of the certifications for the gas standards, documentation of all TRM CEMS QA/QC procedures, and results summaries of the TRM CEMS QC are in Appendix A.

2.2.3.8 SW-846 Method 0010

A sampling train was used to determine the emission rate of select semivolatile organic compounds and unspeciated semivolatile and nonvolatile organic compounds IAW M0010, *Modified EPA Method 5 Sampling Train,* and the EPA *Guidance for Total Organics - Final Report, March 1996* at the east and west stack sampling locations. In addition to the target semivolatile organic compounds, tentatively identified compounds (TIC), including unknowns, were identified and reported via forward library search. Table 2–1 summarizes the exhaust gas characteristics measured by the M0010 sampling trains operated at the east and west stack sampling locations for Runs 2, 3, and 4.

The sampling train consisted of a heated, glass-lined probe with a glass button-hook nozzle and a heated Teflon® transfer line. The sample gas passed through the probe to a heated, glass-fiber filter. The probe and the filter holder were maintained at 248, plus or minus (±) 25 degrees Fahrenheit (ºF) throughout each run with one exception (see Section 4.4). Downstream of the heated filter, the gas passed through a heated Teflon® transfer line to a water-cooled condenser module, then through a sorbent module containing resin. The heated Teflon® transfer line was maintained at 248ºF ± 25ºF throughout each run. The temperature of the exhaust gas entering the resin module was kept below 68ºF. The gas then passed through a series of ice-cooled impingers kept below 68ºF to enable condensation and collection of entrained moisture.

The first impinger, acting as a condensate reservoir (knockout) connected to the outlet of the resin module, was modified with a short stem IAW method requirements. The next two impingers each contained 100-milliliters (mL) of DI water with the second DI water-filled impinger fitted with a Greenburg-Smith impinger stem. The fourth impinger was empty, and the fifth impinger was charged with silica gel. All connections within the train were glass or Teflon®. No sealant greases were used. A dry gas meter, pump, and calibrated orifice meter were downstream from the impingers. The M0010 sampling train configuration is depicted in Appendix A:.

At the east and west stack sampling locations, a M0010 sample was collected over a 240-minute sampling period for each run. Sampling was isokinetic (90 to 110 percent [%]) with readings of exhaust gas and necessary sampling parameters recorded every 5 minutes, so two sets of readings were taken at each traverse point.

For each run at each location, leak checks of the entire sampling train were performed before the start of sampling, during port changes, and at the completion of sampling. The initial and final leakage rates were documented on the relevant field test data sheets. The acceptance standard for the sampling train was a leak rate of less than or equal to (≤) 0.02 cubic feet per minute (cfm) performed at the highest vacuum reached during the period since the previous leak check.

Following the completion of each run (including final leak check), the sampling trains were disassembled at the sampling location and transported to the designated recovery areas. The sample recovery sequence is detailed on the field sampling log for the sampling train found in Appendix A:. Each M0010 train resulted in the following sample fractions:

- Front-half (probe, heated Teflon® transfer line, nozzle, front-half glassware) recovery rinse
- Filter
- Back-half (back-half filter holder and condenser) recovery rinse
- Resin module
- Condensate
- Condensate impinger rinse

2.2.3.9 SW-846 Method 0023A

A sampling train was used to measure and determine the emission rate of dioxins/furans, polychlorinated biphenyls (PCBs), and select polycyclic aromatic hydrocarbons (PAHs) IAW M0023A at the OTM sampling location. Table 2–1 summarizes the exhaust gas characteristics measured by the M0023A sampling train for Runs 2, 3, and 4.

The sampling train consisted of a heated, glass-lined probe with a glass button-hook nozzle and a heated Teflon® transfer line. The sample gas passed through the probe to a heated, glass-fiber filter. The probe and the filter holder were maintained at 248ºF ± 25ºF throughout each run. Downstream of the heated filter, the gas passed through a heated Teflon® transfer line to a water-cooled condenser module, then through a sorbent module containing resin. The heated Teflon® transfer line was maintained at 248 ºF ± 25ºF throughout each run. The temperature of the exhaust gas entering the resin module was kept below 68ºF. The gas then passed through a series of ice-cooled impingers kept below 68ºF to enable condensation and collection of entrained moisture.

The first impinger, acting as a condensate reservoir (knockout) connected to the outlet of the resin module, was modified with a short stem IAW method requirements. The next two impingers each contained 100-mL of DI water with the first of these two impingers equipped with a Greenburg-Smith impinger stem. The fourth impinger was charged with silica gel. All connections within the train were glass or Teflon®. No sealant greases were used. A dry gas meter, pump, and calibrated orifice meter followed the impingers. The M0023A sampling train configuration is in Appendix A:.

An M0023A sample was collected over a 280-minute sampling period for Run 1 and over a 240-minute period for Runs 2, 3, and 4. Sampling was isokinetic (90 to 110%) with readings of exhaust gas and necessary sampling parameters recorded every 5 minutes with a minimum of six 5-minute readings taken at each traverse point (Run 1 had seven 5-minute readings per traverse point).

For each run, leak checks of the entire sampling train were performed before the start of sampling, during port changes, and at the completion of sampling. All leak checks and leakage rates were documented on the relevant field test data sheet. The acceptance standard for the sampling train was a leak rate of $\leq$ 0.02 cfm performed at the highest vacuum reached during the period since the previous leak check.

Following the completion of each run (including final leak check), the sampling train was disassembled at the sampling location and transported to the designated recovery areas. The sample recovery sequence is detailed on the field sampling log for the sampling train found in Appendix A:. Each M0023A train resulted in the following sample fractions:

- Front-half (probe, heated Teflon® transfer line, nozzle, front-half glassware) recovery acetone and methylene chloride rinse
- Front-half (probe, heated Teflon® transfer line, nozzle, front-half glassware) recovery toluene rinse
- Filter
- Back-half acetone and methylene chloride rinse (back-half of the filter holder, coil condenser, and connecting glassware
- Back-half toluene rinse (back-half of the filter holder, coil condenser, and connecting glassware
- Resin module
- Condensate
- Condensate impinger acetone and methylene chloride rinse

2.2.3.10 SW-846 Method 0031

An M0031 sampling train was used to measure and determine emission rates of select volatile organics in the exhaust gas. In addition to the target volatile organic compounds, TICs, including unknowns, were identified and reported via forward library search. Table 2–2 and Table 2–3 summarize the exhaust gas characteristics measured by the M0031 sampling trains operated at the east and west duct sampling locations, respectively, for Runs 2, 3, and 4.

The sampling trains consisted of a heated, glass-lined probe maintained at 130 ± 5 degrees Celsius (°C). The sample gas passed through the probe to a water-cooled condenser, then through the first of two Tenax® tubes. The temperature of the gas exiting the condenser was maintained at < 20°C. Immediately after passing through the first Tenax® tube, the chilled gas passed through the second Tenax® tube where any uncollected condensate fell out into a knockout flask. The gas stream was then chilled further by a second water-chilled coil condenser before passing through a Tenax®/charcoal tube that was used in lieu of an Anasorb-747® tube as allowed by the QAPjP. After passing through the Tenax®/charcoal tube, the gas passed through a silica gel trap, and the volume was measured by a dry gas meter. A diagram of the sampling train is in Appendix A:.

For each run, an initial leak check of the entire sampling train was performed from the probe nozzle before the start of sampling for the first tube set. All subsequent leak checks were performed from the three-way valve as the probe remained in the exhaust duct. All leak checks and leakage rates were documented on the relevant field test data sheet. The acceptance standard for the M0031 sampling train was a leak rate of < 0.1 inches of mercury (inHg) at a vacuum that was above normal operating pressure for the initial leak check and at least at the highest vacuum encountered during the run for the final leak check. In several instances, the final leak check was lower than the highest vacuum encountered but within one inch of the highest vacuum. This circumstance is not believed to impact the usability of the affected tube sets.

Samples were collected at a rate of approximately 0.5 liters per minute (L/min) per tube set for 40 minutes per set, resulting in a sample volume of approximately 20 liters (L) per set. In several instances the sampling duration was less than 40 minutes following weather delays. In all instances the actual volume of exhaust gas for each tube set was recorded for use in determining total volume and emissions rates. Each tube set included two Tenax® tubes and one Tenax®/charcoal tube. Four tube sets (1, 2, 3, and 4) were collected for each run.

Recovery of each tube involved removing the tube from the sampling train, capping the ends of each tube, and returning the tube to the original vial in which it was received. Along with the

recovery of each tube set, a single recovery of the collected condensate was made at the completion of the sampling period. After the last tube set was recovered, condensate present in the knockout flask was transferred to a 40-mL volatile organics analysis (VOA) vial. The knockout flask was rinsed three times with high-performance liquid chromatography (HPLC)-grade water, and each rinse was transferred to the same 40-mL VOA vial. At the conclusion of the rinse sequence, the vial was topped off with HPLC-grade water to create a positive meniscus to ensure the absence of air space when the septum-equipped cap was affixed to the VOA vial. Each tube of the tube set and the VOA vial were labeled with a unique sample ID.

One field blank tube set was collected during each run. The M0031 field blank sample tubes were handled in the field similarly to the sample tubes. The field blank tubes were placed into the M0031 sampling train, leak-checked, and removed from the train using the same procedure as the actual samples.

Each run produced the following samples at each location:

- Four pairs of Tenax® tubes (1A/1B, 2A/2B, 3A/3B, and 4A/4B)
- Four Tenax®/charcoal tubes (1C, 2C, 3C, and 4C)
- One condensate sample
- One set of field blank tubes (A, B, and C)

Trip blanks consisting of one complete tube set and one set of VOA vials filled with organic free water were placed in a cooler containing the M0031 samples before delivery of the samples to the laboratory.

2.2.3.11 SW-846 Method 0040

An M0040 sampling train was used to measure and determine the emission rates of unspeciated volatile organics IAW M0040. Table 2–2 summarizes the exhaust gas characteristics measured by the M0040 sampling trains operated at the east and west duct sampling locations for Runs 2, 3, and 4.

The total organics method provides for the sampling and analysis of total organics from stack gas emissions, combining the organics from three specific boiling point/vapor pressure ranges: light hydrocarbons and volatile organics, semivolatile organics, and nonvolatile organics. Two sampling procedures and four analytical techniques were combined to generate a value for total organics. According to the EPA, the mass of organics that remains after correction for the identified organics is called residual organic carbon and this mass can be used to estimate risk from unidentified organic emissions.

The M0040 sampling train consisted of a glass-lined probe and heated, quartz-fiber filter with Teflon® filter support attached to one of two inlets of a glass and Teflon® 3-way isolation valve. The second valve inlet was connected to a charcoal trap to filter incoming air when releasing system pressure after leak checks. The outlet of the isolation valve was connected to a glass, water-cooled, coil condenser; and a glass condensate trap for the removal and collection of condensable liquids present in the gas stream. A Teflon® transfer line connected the condensate trap to a second three-way isolation valve and the isolation valve to a Tedlar® bag contained in a rigid, air-tight container for sampling, storage, and transport. The bag container was connected to a control console with a Teflon® vacuum line between the bag container and the control console without use of silica gel or a charcoal trap. The M0040 sampling train configuration is depicted in Appendix A:.

Leak checks of the entire M0040 train were performed before and after each sampling run. In the event any portion of the train was disassembled and reassembled, leak checks were performed before disassembling the train and again upon reassembly. All leak checks and leakage rates were documented on the relevant field test data sheets.

One Tedlar® bag gas sample was collected at each sampling location per run. Sample volumes were in the range of 17 to 27 L with collection rates in the range of 0.30 to 0.45 L/min. A daily field blank was also collected at each location. Each run produced the following samples at each location:

- Tedlar® bag sample
- Condensate sample
- Tedlar® bag field blank
- Condensate field blank

A field control spike was conducted during Run 2 using the sample collected at the east duct sampling location. The field control spike was performed by spiking a known amount of propane into the sample bag after collection and analysis.

2.2.3.12 EPA Method 26A

A sampling train was used to measure and determine the emission rate of the hydrogen chloride, hydrogen fluoride, chlorine, particulate matter, and ammonia IAW M26A at the east and west stack sampling locations. Table 2–1 summarizes the exhaust gas characteristics measured by the M26A sampling trains operated at the east and west stack sampling locations for Runs 2, 3, and 4.

The sampling train consisted of a heated, glass-lined probe with a glass button-hook nozzle and a Teflon® transfer line. The sample gas passed through the probe to a heated filter. The probe and the filter holder were maintained in the range of 248 to 273ºF throughout each run. The gas then passed through a series of six ice-cooled impingers kept below 68°F to enable condensation and collection of entrained moisture.

The first impinger served as a moisture knockout and contained 50 mL of 0.1 normal (N) sulfuric acid (H_2SO_4). The next 2 impingers contained 100 mL of 0.1N H_2SO_4. The fourth and fifth impingers contained 100 mL of 0.1N sodium hydroxide (NaOH). The sixth impinger was charged with silica gel. A dry gas meter, pump, and calibrated orifice meter were downstream from the impingers. The M26A sampling train configuration is depicted in Appendix A:.

At the east and west stack sampling locations, an M26A sample was collected over a 240-minute sampling period for each run. Sampling was isokinetic (90 to 110%) with readings of exhaust gas and necessary sampling parameters recorded every 5 minutes, so two sets of readings were taken at each traverse point.

For each run at each location, leak checks of the entire sampling train were performed before the start of sampling, during port changes, and at the completion of sampling. All leak checks and leakage rates were documented on the relevant field test data sheet. The acceptance standard for the sampling train was a leak rate of $\leq$ 0.02 cfm performed at the highest vacuum reached during the period since the previous leak check.

Following the completion of each run (including the final leak check), the filter and filter housing were visually inspected to verify no moisture was present, and a purge with filtered air was not required. The sampling trains were disassembled at the sampling location and transported to the designated recovery areas. The sample recovery sequence is detailed on the field sampling log for the sampling train found in Appendix A:. Each M26A train resulted in the following sample fractions:

- Filter
- Front-half solvent rinse
- 0.1N H_2SO_4 impinger catch and rinse
- 0.1N NaOH impinger catch with rinse

2.2.3.13 EPA Method 29

A sampling train was used to measure and determine the emission rate of the trace metals IAW M29 at the OTM sampling location. Table 2–1 summarizes the exhaust gas characteristics measured by the M29 sampling train for Runs 2, 3, and 4.

The sampling train consisted of a heated glass-lined probe with a glass button-hook nozzle and a Teflon® transfer line. The sample gas passed through the probe to a heated filter. The probe and the filter holder were maintained at 248 ± 25ºF throughout each run. Downstream of the heated filter, the gas passed through a series of seven ice-cooled impingers kept below 68ºF to enable condensation and collection of entrained moisture.

The first impinger was empty and served as a moisture knockout. The second and third impingers contained 100 mL of a 5% nitric acid (HNO_3)/10% hydrogen peroxide (H_2O_2) solution. The fourth impinger was empty. The fifth and sixth impingers contained 100 mL of a 4% potassium permanganate ($KMnO_4$)/10% H_2SO_4 solution. The seventh impinger was charged with silica gel. A dry gas meter, pump, and calibrated orifice meter were downstream from the impingers. The M29 sampling train configuration is depicted in Appendix A.

An M29 sample was collected over a 240-minute sampling period for each run. Sampling was isokinetic (90 to 110%) with readings of exhaust gas and necessary sampling parameters recorded every 5 minutes, so six sets of readings were taken at each traverse point.

For each run, leak checks of the entire sampling train were performed before the start of sampling, during port changes, and at the completion of sampling. All leak checks and leakage rates were documented on the relevant field test data sheet. The acceptance standard sampling train was a leak rate of $\leq$ 0.02 cfm performed at the highest vacuum reached during the period since the previous leak check.

Following the completion of each run (including final leak check), the sampling train was disassembled at the sampling location and transported to the designated recovery areas. The sample recovery sequence is detailed on the field sampling log for the sampling train found in Appendix A:. Each M29 train resulted in the following sample fractions:

- Probe, nozzle, and front-half filter housing 0.1N HNO_3 rinse
- Filter
- Impinger 1,2, and 3 catch and 0.1N HNO_3 rinse of impingers 1, 2, and 3, connecting glassware, back-half filter housing, and transfer line
- Impinger 4 catch and 0.1N HNO_3 rinse
- Impingers 5 and 6 catch with water and 4% $KMnO_4$/10%H_2SO_4 rinses
- Impingers 5 and 6 hydrogen chloride (HCl) and water rinses

Table 2–1: Isokinetic Sampling Train Summary

Parameter	Units	Run 2	Run 3	Run 4
M0010: SVOC/TO (East Stack)				
Sample Volume	dscf	119.682	117.936	121.059
Exhaust Gas Flow Rate	dscfm	76,496	76,369	78,812
Exhaust Gas Temperature	°F	77.0	75.9	73.5
Exhaust Gas Moisture	%	0.88	0.97	0.49
Isokinetics	%	99.62	99.23	98.70
M0010: SVOC/TO (West Stack)				
Sample Volume	dscf	114.630	119.017	114.440
Exhaust Gas Flow Rate	dscfm	74,752	77,440	75,901
Exhaust Gas Temperature	°F	76.5	73.7	71.3
Exhaust Gas Moisture	%	0.94	1.33	0.65
Isokinetics	%	97.64	97.75	96.00
M26A/M5: Acid Gases/Ammonia/Particulates (East Stack)				
Sample Volume	dscf	114.432	117.842	118.525
Exhaust Gas Flow Rate	dscfm	72,793	74,925	76,323
Exhaust Gas Temperature	°F	75.4	74.7	72.8
Exhaust Gas Moisture	%	1.33	1.41	0.45
Isokinetics	%	100.09	100.14	98.88
M26A/M5: Acid Gases/Ammonia/Particulates (West Stack)				
Sample Volume	dscf	133.372	134.557	132.448
Exhaust Gas Flow Rate	dscfm	76,333	76,239	76,830
Exhaust Gas Temperature	°F	73.8	71.2	69.7
Exhaust Gas Moisture	%	1.33	1.46	0.61
Isokinetics	%	99.18	100.18	97.86
M0023A: Dioxins/Furans, PAH, and PCB (OTM Duct)				
Sample Volume	dscf	112.693	112.692	108.117
Exhaust Gas Flow Rate	dscfm	2,167	2,153	2,043
Exhaust Gas Temperature	°F	173.7	171.2	170.9
Exhaust Gas Moisture	%	2.77	2.74	2.56
Isokinetics	%	99.40	98.48	99.57
M29: Trace Metals (OTM Duct)				
Sample Volume	dscf	108.367	132.639	128.138
Exhaust Gas Flow Rate	dscfm	2,077	2,087	1,982
Exhaust Gas Temperature	°F	174.3	170.5	171.2
Exhaust Gas Moisture	%	3.39	3.48	3.26
Isokinetics	%	100.53	99.04	100.75

Table 2–2: Non-Isokinetic Sampling Train Summary for East Duct

Parameter	Run 2			Run 3			Run 4		
Barometric Pressure (inHg)	29.06			28.67			29.51		
Meter Calibration Factor	1.009			1.009			1.009		
Collection Time (hr)	Set 1: 1228-1308			Set 1: 1115-1150			Set 1: 1030-1139		
	Set 2: 1322-1402			Set 2: 1249-1329			Set 2: 1151-1231		
	Set 3: 1416-1456			Set 3: 1417-1627			Set 3: 1244-1324		
	Set 4: 1516-1556			Set 4: 1724-1804			Set 4: 1336-1416		
M0031 Tube Pairs	**Sample Volume (L, dry)**	**Temperature (°F)**	**Corrected Volume (dry standard liters [dsL])**	**Sample Volume (L, dry)**	**Temp. (°F)**	**Corrected Volume (dsL)**	**Sample Volume (L, dry)**	**Temperature (°F)**	**Corrected Volume (dsL)**
Set 1	20.041	79.3	19.230	17.515	82.3	16.489	20.229	88.00	19.397
Set 2	20.015	85.8	18.977	19.913	87.8	18.559	19.979	96.75	18.856
Set 3	19.845	86.3	18.798	19.296	89.3	17.934	19.980	97.75	18.823
Set 4	20.024	85.0	19.011	20.050	75.8	19.105	19.897	97.25	18.762
Totals	---	---	76.017	---	---	72.087	---	---	75.837
Barometric Pressure (inHg)	Bag: 29.06			Bag: 28.67			Bag: 29.52		
	Field Blank: 28.97			Field Blank: 28.66			Field Blank: 29.50		
Meter Calibration Factor	1.002			1.002			1.002		
Collection Time (hr)	Bag: 1225-1345			Bag: 1115-1305			Bag: 1030-1159		
	Field Blank: 1500-1650			Field Blank: 1355-1625			Field Blank: 1252-1352		
M0040 Sample Bags	**Sample Volume (L, dry)**	**Temperature (°F)**	**Corrected Volume (dsL)**	**Sample Volume (L, dry)**	**Temp. (°F)**	**Corrected Volume (dsL)**	**Sample Volume (L, dry)**	**Temperature (°F)**	**Corrected Volume (dsL)**
Bag	25.9	74.1	24.919	25.340	83.6	23.632	26.680	59.4	26.812
Field Blank	25.520	86.7	23.914	25.260	82.8	23.586	27.900	70.7	27.425

Table 2–3: Non-Isokinetic Sampling Train Summary for West Duct

Parameter	Run 2			Run 3			Run 4		
Barometric Pressure (inHg)	28.93			28.98			29.18		
Meter Calibration Factor	1.009			1.009			1.009		
Collection Time (hr)	Set 1: 1226-1306			Set 1: 1115-1150			Set 1: 1030-1152		
	Set 2: 1327-1407			Set 2: 1254-1334			Set 2: 1206-1246		
	Set 3: 1449-1529			Set 3: 1350-1428			Set 3: 1301-1341		
	Set 4: 1545-1625			Set 4: 1556-1714			Set 4: 1356-1436		
M0031 Tube Pairs	**Sample Volume (L, dry)**	**Temperature (°F)**	**Corrected Volume (dry standard liters [dsL])**	**Sample Volume (L, dry)**	**Temperature (°F)**	**Corrected Volume (dsL)**	**Sample Volume (L, dry)**	**Temperature (°F)**	**Corrected Volume (dsL)**
Set 1	19.705	88.2	18.498	17.189	76.4	16.519	20.037	66.4	19.758
Set 2	19.415	87.4	18.252	19.852	77.0	19.057	19.514	77.4	18.848
Set 3	19.616	81.8	18.632	19.183	79.0	18.347	19.751	81.6	18.929
Set 4	19.858	81.4	18.876	19.874	78.8	19.015	19.498	85.6	18.550
Totals	---	---	74.257	---	---	72.938	---	---	76.084
Barometric Pressure (inHg)	Bag: 28.93			Bag: 28.93			Bag: 29.18		
	Field Blank:			Field Blank: 28.90			Field Blank: 29.28		
Meter Calibration Factor	0.992			0.992			0.992		
Collection Time (hr)	Bag: 1225-1325			Bag: 1115-1300			Bag: 1030-1207		
	Field Blank: 1704-1804			Field Blank: 1425-1722			Field Blank: 1332-1427		
M0040 Sample Bags	**Sample Volume (L, dry)**	**Temperature (°F)**	**Corrected Volume (dsL)**	**Sample Volume (L, dry)**	**Temperature (°F)**	**Corrected Volume (dsL)**	**Sample Volume (L, dry)**	**Temperature (°F)**	**Corrected Volume (dsL)**
Bag	20.450	74.0	19.395	18.400	72.9	17.528	21.820	58.1	21.514
Field Blank	23.300	74.6	22.051	23.300	74.6	22.051	21.490	75.6	20.567

3.0 ANALYTICAL PROCEDURES

The analytical program performed in support of the VX projectiles IFD non-agent air emissions test consisted of the analysis of non-agent exhaust gas samples. The program used EPA analytical methods and laboratory-specific procedures as specified in the QAPjP. Analyses were performed by the sampling subcontractor and the sampling subcontractor's laboratories. The on-site non-agent analyses performed by AECOM are provided in Appendix A:, and the non-agent analytical reports for the analyses performed by TestAmerica are provided in 0.

3.1 Summary of On-Site Analytical Procedures

3.1.1 TRM CEMS

Sampling to determine SO_2, NO_X, CO, and THC, as propane, was performed during each run at the east and west MDB filtration area duct sampling locations using TRM CEMS as described in Sections 2.2.3.4, 2.2.3.5, 2.2.3.6, and 2.2.3.7, respectively.

Sampling to determine O_2 and CO_2 concentrations was performed during each run at the OTM duct sampling location by collecting an integrated bag sample and analyzing it using a TRM CEMS as described in Section 2.2.3.2.

3.1.2 Unspeciated Volatile Organics

The total organics (TO) sampling and analysis was accomplished by following the procedures identified and referenced in *Guidance for Total Organics, Final Report* (EPA/600/R-96/033). Two separate sampling trains were employed at the east and west sampling locations to collect the samples necessary to make the TO determination. An M0040 sampling train was used to collect exhaust gas samples for the determination of total volatile unspeciated organics and an M0010 sampling train was used to collect exhaust gas samples for total unspeciated semivolatile and nonvolatile organics.

For the unspeciated volatile organics, one bag sample per run from the east and west duct sampling locations were collected and analyzed on-site for C_1 through C_7 compounds via gas chromatography (GC)/flame ionization detector (FID). The associated condensate samples were analyzed at an off-site laboratory for C_4 through C_7 compounds as described in Section 3.2.6.

The exhaust gas samples collected into the Tedlar® bags were analyzed in the field by GC/FID. The GC was set up in the field with column and conditions appropriate for the analysis of C_1 through C_7 n-alkanes. Retention times (RT) were determined, and a calibration was performed with certified gas standards of C_1 through C_7 alkanes in nitrogen. The GC oven is temperature-programmed to allow separation of the analytes, which are then detected by an FID. Uniform FID response for varying compound classes is assumed in this methodology. Compounds were quantitated against a multipoint calibration curve prepared using C_1 through C_7 standards. Results of the Tedlar® bag analyses were added to the volatile organics from the condensate to yield the total unspeciated volatile organics fraction of the TO.

3.2 Summary of Off-Site Analytical Procedures

In addition to the on-site analyses described in the prior section, off-site analyses of the non-agent air emission samples were performed. The off-site analytical methods employed for the non-agent air emission samples are listed below.

Parameter	Analysis Method
Semivolatile Organics	SW-846 Method 8270C (M8270)
Polycyclic Aromatic Hydrocarbons	M8270 with selected ion monitoring (SIM)/isotope dilution
Polychlorinated Biphenyls	EPA Method 1668A (M1668)
Dioxins/Furans	SW-846 Methods 8290A (M8290)
Volatile Organics	SW-846 Method 8260B (M8260)
Total Volatile, Semivolatile, and Nonvolatile Unspeciated Organics	*Guidance for Total Organics* EPA/600/R-96/033
Acid Gases	EPA Method 26A (M26A)
Particulate Matter	EPA Method 5 (M5)
Ammonia	Standard Methods for the Examination of Water and Wastewater Method 4500NH3-G (SM4500NH3G)
Metals	SW-846 Methods 6010C (M6010), 7470A (M7470A), and 7471A (M7471A)

3.2.1 Semivolatile Organics

Sampling for semivolatile organics was accomplished by M0010 as described in Section 2.2.3.8. Preparation of the sampling train was performed IAW SW-846 Method 3542 (M3542). Analysis of the three analytical fractions of the M0010 sampling train was performed IAW M8270 by GC/mass spectrometry (MS).

Sample fractions were prepared for analysis IAW M3542. This method provides procedures by which the samples generated by the M0010 sampling train are separated and solvent extracted IAW SW-846 Method 3540C (M3540) (filter and XAD®/back-half rinse fractions) and SW-846 Method 3510C (M3510) (front-half rinse and condensate/condensate rinse fractions) with method exceptions as noted in M3542. Extracts are concentrated to final volume IAW M3540. In total, the sample fractions recovered from the M0010 sampling train prepared for analysis by M3542 yielded three extracts for analysis by M8270. Note that a portion of each extract was split and combined to facilitate unspeciated semivolatile and nonvolatile organics analysis as described in Section 3.2.6

M8270 is a GC/MS method where samples (prepared for analysis using one or more of the aforementioned sample preparation procedures) are introduced into a GC by injecting an aliquot of the concentrated sample extract. The GC is equipped with a fused-silica capillary column. The GC oven is temperature-programmed to allow separation of the analytes, which are then detected by an MS interfaced to the GC. Analytes eluted from the capillary column are introduced into the MS whereby identification of most target analytes is accomplished by comparing their mass spectra with the electron impact spectra of authentic standards.

Quantitation is accomplished by comparing the response of a major (quantitation) ion relative to an internal standard using a multipoint calibration curve.

In addition to the target analytes, the laboratory identified, or attempted to identify, up to 20 of the largest non-target analyte responses that were greater than (>) 10% of the nearest internal standard. These analytes are referred to as TICs. All TICs are qualitative tentative identifications and should not be interpreted to be definitive evidence of the presence of the identified compound. Quantitation of each TIC is based on a theoretical response factor of one in lieu of response factors generated from a multipoint calibration curve and reported values should be considered estimated.

3.2.2 Dioxins/Furans

Sampling for dioxins/furans was accomplished by M0023A as described in Section 2.2.3.9. Samples were extracted and concentrated as described in the method with necessary modifications to provide extracts for PCB and PAH analysis. Analysis of the sample extracts was performed by high-resolution gas chromatography (HRGC)/high resolution mass spectrometry (HRMS) IAW M8290.

Samples were solvent extracted IAW the matrix-specific technique described in M8290 after the addition of internal standards and surrogates, as required (surrogate standards are added to the sorbent/back-half before sampling). Sample extracts are solvent exchanged and concentrated using a nitrogen evaporative concentrator to reduce the volume of the extract. After the concentrated samples are subject to a cleanup step, fractionated, and subject to additional cleanup steps, they are ready for analysis by M8290.

M8290 employs an HRGC column coupled to an HRMS. An aliquot of each concentrated sample extract is injected into the HRGC/HRMS system. The system is capable of performing selected ion monitoring at resolving powers of at least 10,000 (10% valley definition). The target-analyte identification for which a C_{13}-labeled standard is available in the sample fortification and recovery standard solutions (added before sample analysis) is based on: their elution at exact RT (minus 1 to plus 3 seconds from the respective internal or recovery standard signal); and simultaneous detection of the two most abundant ions in the molecular ion region. All other target analytes are identified when their relative RT fall within their respective dioxin/furan retention-time windows, as established using a column performance evaluation solution and the simultaneous detection of the two most abundant ions in the molecular ion region.

The identification of octachlorodibenzofuran is based on its RT relative to $^{13}C_{12}$- octachlorinated dibenzo-p-dioxin (CDD) and the simultaneous detection of the two most abundant ions in the molecular ion region. Confirmation is based on a comparison of the ratio of the integrated ion abundance of the molecular ion species to their theoretical abundance ratio. Quantitation of the individual congeners, total dioxins, and total furans is achieved in conjunction with the establishment of a multipoint calibration curve for each homologue.

3.2.3 Polychlorinated Biphenyls

Sampling for PCB was accomplished by M0023A as described in Section 2.2.3.9. Samples were extracted and concentrated as described in the method with appropriate modifications made to accommodate dioxin/furan, PCB, and PAH analysis. Analysis of the sample extracts was performed by HRGC/HRMS IAW M1668.

Samples were solvent extracted IAW matrix specific techniques after the addition of internal standards and surrogates, as required (a surrogate standard was added to the sorbent/back half prior to sampling). Sample extracts were solvent exchanged and concentrated using a nitrogen evaporative concentrator to reduce the volume of the extract. After the concentrated samples were subjected to a cleanup step, fractionated, and subject to additional cleanup steps, they were ready for analysis by M1668.

M1668 employs an HRGC column coupled to an HRMS. An aliquot of each concentrated sample extract is injected into the analytical system. The system is capable of performing selected ion monitoring at resolving powers of at least 10,000 (10% valley definition). Two exact ions are monitored at each level of chlorination throughout a pre-determined RT window. An individual chlorinated biphenyl congener is identified by comparing the RT and the ion-abundance ratio of two exact ions with the corresponding RT of an authentic standard and the theoretical or acquired ion-abundance ratio of the two exact ions. The analytical system is multi-point calibrated and quantitative analysis is performed using selected ion current profile areas using the internal standard technique.

3.2.4 Polycyclic Aromatic Hydrocarbons

Sampling for PAH was accomplished by M0023A as described in Section 2.2.3.9. Samples were extracted and concentrated as described in the method with appropriate modifications made to accommodate dioxin/furan, PCB, and PAH analysis. Analysis of the sample extracts was performed by GC/MS IAW M8270 modified using selected ion monitoring (SIM) with isotope dilution.

Samples were solvent extracted IAW matrix specific techniques after the addition of isotopically labeled internal standards (a “sampling surrogate” was added to the sorbent/back half prior to sampling). Sample extracts were solvent exchanged and concentrated using a nitrogen evaporative concentrator to reduce the volume of the extract. After the concentrated samples were subjected to matrix-specific cleanup, the final extract was prepared by adding a known amount of the labeled recovery standard and concentrating to the final volume.

The analytical method uses capillary column GC/MS with the MS operated in SIM mode. An aliquot of each concentrated sample extract is injected into the analytical system. The analytes are separated by the GC and detected by the MS. The identification of the target compounds is based on their RT relative to the labeled internal standards as established during routine calibration and the simultaneous detection of a quantitation and confirmation ion. Quantitation of the target compounds is based on their relative response to the internal standards. A multipoint calibration is performed to establish mean response factors for the target analytes. Alkylated homologues are quantitated on the basis of response factors of the parent PAH.

3.2.5 Volatile Organics

Sampling for selected volatile organics was accomplished by M0031 as described in Section 2.2.3.10. Analysis of the M0031 samples was performed IAW SW-846 Methods 5041A (M5041) and M8260. The sample fractions analyzed included the paired Tenax® tubes from each set, the Tenax®/charcoal tubes from each set, and the condensate collected from each run at the east and west MDB filtration area duct sampling locations.

M5041, modified IAW M0031, is a method in which the sorbent tubes are thermally desorbed by heating and purging with organic-free helium. The gaseous effluent from the tubes is bubbled through pre-purged organic-free reagent water and trapped on an analytical sorbent trap in a purge-and-trap unit. For condensate samples, a sample aliquot is placed directly into the purging chamber of the purge-and-trap unit where volatile organic constituents are purged onto the analytical sorbent trap. After desorption, the analytical sorbent trap is heated rapidly, and the gas flow from the analytical trap is directed to the head of a fused-silica capillary column. The volatile organic compounds desorbed from the analytical trap are determined by M8260.

M8260 is a GC/MS method where volatile compounds are introduced into a GC using appropriate purge-and-trap methods. The GC is equipped with a fused-silica capillary column. The GC oven is temperature-programmed to allow separation of the analytes, which are then detected by an MS interfaced with the GC. Analytes eluted from the capillary column are introduced into the MS; identification of most target analytes is accomplished by comparing their mass spectra with the electron impact spectra of authentic standards.

Quantitation is accomplished by comparing the response of a major (quantitation) ion relative to an internal standard using a multipoint calibration curve.

In addition to the target analytes, the laboratory identified, or attempted to identify, up to 10 of the largest non-target analyte responses that were > 10% of the nearest internal standard. These analytes are referred to as TICs. All TICs are qualitative tentative identifications and should not be interpreted to be definitive evidence of the presence of the identified compound. Quantitation of TICs is based on a theoretical response factor of one in lieu of response factors generated from a multipoint calibration curve and reported values should be considered estimated.

3.2.6 Total Volatile, Semivolatile, and Nonvolatile Organics

The TO sampling and analysis was accomplished by following the procedures identified and referenced in *Guidance for Total Organics, Final Report* (EPA/600/R-96/033). Two separate sampling trains were employed at the east and west sampling locations to collect the samples necessary to make the TO determination. An M0040 sampling train was used to collect exhaust gas samples for the determination of total volatile unspeciated organics, and an M0010 sampling train was used to collect exhaust gas samples for total unspeciated semivolatile and nonvolatile organics.

For the unspeciated volatile organics, one bag sample per run from the east and west MDB filtration area duct sampling locations was collected and analyzed on site for C_1 through C_7 compounds via the on-site GC/FID as described in Section 0. The condensate collected ahead of the Tedlar® bag during each run was analyzed for C_4 through C_7 compounds by an off-site laboratory IAW the method described in *Guidance for Total Organics, Final Report* (EPA/600/R-96/033). This is a GC/FID method where samples are purged onto a sorbent trap, and the sorbent trap is then desorbed into a GC. The GC is equipped with a fused-silica capillary column. The GC oven is temperature programmed to allow separation of the analytes, which are then detected by an FID. Uniform FID response for varying compound classes is assumed in this methodology. Compounds found with RT before the C_4 RT are quantified with an appropriate response factor and reported as C_4 with the other results quantitated against a multipoint calibration curve prepared using C_5 through C_7 standards. Results of the condensate are added to the field-determined volatile organics values to yield the total unspeciated volatile organic fraction of the TO.

For the total unspeciated semivolatile and nonvolatile organic fractions of the TO, the samples were extracted as described in Section 3 with a split of each fraction reserved for TO analysis. As described in the QAPjP, two standards were added to each sample before extraction to bracket the quantitation range. One of the standards serves as a surrogate to provide an additional QC measure for the analysis. For this testing, the three extract splits from each sampling train were combined after extraction, split to allow separate analysis for the unspeciated semivolatile and nonvolatile organics, and the results are combined after analysis.

The total chromatographic organic (TCO) method is a capillary GC/FID method quantifying chromatographic material in the 100 to 300°C boiling point range. An aliquot of the prepared extract is injected onto a capillary GC column with an FID detector, and the peak areas are summed over the RT window that encompasses the TCO boiling-point range. The TCO value is determined from the multipoint calibration curve, generated with hydrocarbon standards that fall within the TCO range, specifically decane, dodecane, and tetradecane. The organics identified in the prescribed boiling-point range are quantified and summed (totaled) to obtain the TCO portion of the TO. M8270 surrogates added to the extracts and a peak known to be toluene are not included in the TCO total.

The gravimetric (GRAV) method quantifies nonvolatile organic material with a boiling point > 300°C. A measured aliquot of the prepared extract is placed in a pre-cleaned weighing pan to air dry at room temperature; then, drying completes in a room temperature desiccator, while exposure to dust and contaminants are minimized. The residue in the pan is weighed, and the mass is recorded to determine the GRAV value.

The TO value is reported as the sum of the unspeciated volatile, semivolatile, and nonvolatile organics results.

3.2.7 Acid Gases

Acid gas sampling and analysis was accomplished by M26A as described in Section 2.2.3.12. A small volume of each M26A sample is injected into an ion chromatograph to flush and fill a constant volume sample loop. The sample is then injected into a stream of carbonate-bicarbonate eluent of the same strength as the impinger solutions. The sample is pumped through three different ion exchange columns and into a conductivity detector.

The first two columns, a precolumn or guard column and a separator column, are packed with low-capacity, strongly basic anion exchanger. Ions are separated into discrete bands based on their affinity for the exchange sites of the resin. The last column is a suppressor column that reduces the background conductivity of the eluent to a low or negligible level and converts the anions in the sample to their corresponding acids. The separated anions in their acid form are measured using an electrical-conductivity cell. Anions are identified based on their RT compared to known standards. Quantitation is accomplished by measuring the peak height or area and comparing it to a calibration curve generated from known standards.

3.2.8 Ammonia

Ammonia sampling was accomplished in conjunction with acid gases collected IAW M26A, and analysis was accomplished using automated spectrophotometry IAW SM45000NH3G using an aliquot of the recovered sulfuric acid impinger contents as described in the QAPjP. With SM4500NH3G, alkaline phenol and hypochlorite react with ammonia to form indophenol blue that is proportional to the ammonia concentration. The blue color formed is intensified with sodium nitroprusside. Concentration is determined based on measured sample response versus a calibration curve generated from known standards.

3.2.9 Particulate Matter

Particulate matter analyses were accomplished following the procedures in M5. The sampling for particulate matter emissions was accomplished in conjunction with the M26A isokinetic sampling train as described in Section 2.2.3.12.

Before field use, each filter was desiccated to a constant weight, placed in glass petri dishes, and sealed with Teflon® tape. An identification label was placed on each dish, and the weight of each filter was recorded. The beakers used for the dry-down of the acetone rinse were cleaned and dried in a drying oven. The beakers were desiccated to a constant weight.

Analysis of the particulate matter samples was accomplished by drying the front-half acetone rinses in a tared beaker, desiccating, and weighing to a constant weight. The filters were desiccated and weighed to a constant weight. The net weight for the front-half acetone rinse and filter were determined by calculating the difference in weight. The sum of the net weights for the probe wash and filter catch was used to calculate the particulate matter concentrations in the exhaust gas.

3.2.10 Metals

Metals sampling and preparation of the sampling trains for analysis were accomplished by M29 as described in Section 2.2.3.13. The M29 sample preparation procedures employ acid digestion using acid/reagent combinations specified in the method for each sample fraction collected from the sampling train.

As the laboratory uses boric acid with the front-half fraction digestate, the M29 front-half sample preparation procedure was modified, as described in the QAPjP, to incorporate a two-step digestion to facilitate the reporting of boron for the front-half fraction (no changes are required for the back-half fraction). With the two-step digestion, the laboratory performs an initial digestion using HNO_3 and HCl that does not include the addition of hydrofluoric acid (HF) and subsequent addition of boric acid (H_3BO_3). This initial digestion is brought to a known final volume and then split into two equal aliquots. The first aliquot is analyzed for boron only. The second aliquot is reduced in volume and re-digested with HF and the addition of H_3BO_3 before analysis. This digestate is analyzed for all M6010 metals except boron.

Analysis of the digested sample fractions was conducted by cold vapor atomic absorption spectroscopy (CVAAS) for mercury, M7470, and by inductively coupled plasma (ICP)/atomic emission spectrometry (AES), M6010, for the remaining metals.

In the CVAAS technique used for mercury analysis (M7470), analysis is based on the absorption of radiation at 253.7-nanometers by mercury vapor. The mercury is reduced to the elemental state and aerated from solution in a closed system. The mercury vapor passes through a cell positioned in the light path of an atomic absorption spectrophotometer. Absorbance is measured as a function of mercury concentration.

M6010, used to analyze M29 samples for all target metal concentrations except mercury, is a multi-element procedure that uses ICP/AES. The method measures characteristic emission spectra by optical spectrometry. Samples are nebulized, and the resulting aerosol is transported to the plasma torch. Element-specific emission spectra are produced by radio-frequency inductively coupled plasma. The spectra are dispersed by a grating spectrometer, and the intensities of the emission lines are monitored by photosensitive devices. Appropriate background corrections are applied to account for spectral interferences.

4.0 QUALITY ASSURANCE/QUALITY CONTROL RESULTS

The QA/QC measures for this program were based on the sampling requirements outlined in the PTDP and the QAPjP. Results of the QA/QC activities employed during the testing program are summarized in this section. Calculations were performed using standardized equations.

Field data for the non-agent air emissions sampling were reduced by the sampling subcontractor using a personal computer with software containing validated equations. Isokinetic ratios were determined after each test run. Reduced data shown in Appendix A: were generated using the data recorded in the field after each run was completed, with the exception of pollutant concentrations and emission rates, which were determined after sample analyses were completed. All isokinetic sampling trains were leak checked before, and immediately after, sampling in each port.

The non-agent air emissions samples were collected by AECOM with sample collection, documentation, and management procedures performed IAW the PTDP and the QAPjP. Table 4–1 provides a summary of laboratory and field samples collected and analyzed in support of the emissions tests.

4.1 Laboratory Qualifications and Analytical Standards

The off-site analytical laboratories used to perform sample analysis were TestAmerica in Knoxville, Tennessee, and Savannah, Georgia. Both laboratories are accredited by the National Environmental Laboratory Accreditation Program and/or American Association for Laboratory Accreditation and have been audited by BGCAPP Laboratory Quality personnel. In addition, these two laboratories hold multiple state certifications, including Kentucky, and the Knoxville laboratory has supported emissions testing in support of chemical agent demilitarization facilities for more than 20 years.

4.1.1 Data Verification and Validation

The sampling activities were subject to on-site surveillances by designated BGCAPP personnel. The non-agent air emissions sampling data were initially verified by the sampling subcontractor and then subject to independent verification by BGCAPP-designated personnel.

The non-agent air emissions analytical data were initially verified by the subcontractor laboratory QC and/or supervisory personnel and then subjected to independent verification and validation by BGCAPP-designated personnel. The validation involved verification and validation based on compliance of sample receipt, completeness of the data set, holding times, and sample-related QC results. Each non-agent air emissions laboratory report was subjected to a Stage 2A validation IAW the QAPjP. Data were validated according to the criteria specified in the QAPjP and the referenced EPA guidelines, with appropriate considerations made for source emissions sampling and analysis in lieu of soil and water samples analyzed IAW EPA Contract Laboratory Program (CLP) requirements.

4.1.2 Data Reporting

All data were reported IAW the QAPjP requirements and results are expressed in standard units depending on the measurement and the ultimate use.

4.2 Field Quality Control Summary

4.2.1 Calibration Procedures

Before the field sampling effort, the field sampling equipment was calibrated. Copies of the calibration documentation were on site during the emissions test and are included in Appendix A:. The BGCAPP provided the KDEP observers copies of the pretest calibrations and other relevant pre-test information prior to testing. A copy of the pre-test information provided to KDEP is included as Appendix D: of this report. Calibrations were performed as described in the EPA *Quality Assurance Handbook for Air Pollution Measurement Systems; Volume III - Stationary Source Specific Methods* (EPA-600/4-77-027b), and EPA 40 CFR Part 60, Appendix A. Field analysis equipment was calibrated in the field before use. Field sampling and analysis equipment that required calibration included the dry gas meters, probe nozzles, thermocouples, pitot tubes, field barometers, field balances, field GC, and TRM CEMS.

4.2.2 Equipment Leak Checks

Before sampling, each isokinetic sampling train was leak checked IAW the procedures outlined in M5 and/or the applicable sampling method. During the course of each run, a leak check was conducted before and after sampling in each port. Leakage rates for each isokinetic sampling train were recorded on the respective field data sheets (see Appendix A:). Table 4–2 summarizes the leak check results recorded for each isokinetic sampling train.

The M0031 sampling train leak checks were performed initially from the end of the probe with all subsequent leak checks performed between the three-way valve downstream of the probe and the pump. Acceptable M0031 leak checks in terms of leakage rate were recorded in all instances and were recorded on the respective field data sheets (see Appendix A:). It is noted that for the east duct, two Run 1 and one Run 3 final leak checks were performed at a vacuum that was not at the highest vacuum encountered during the sampling run (see below). Results from all tube sets should be usable considering the actual vacuums encountered. Run 1 results, where two of the low-vacuum leak checks were performed, have not been used to determine the three-run average emissions.

Run/Set	Leak Check Vacuum, Initial (inHg)	Leak Check Vacuum, Final (inHg)	Sample Run Vacuum, Highest (inHg)	Sample Run Vacuum, Lowest (inHg)
1 / 1	21	2	3	2
1 / 3	3	1.5	3	2
3 / 1	18	3	3.5	2

The M0040 sampling train was leak checked before and after each sample was collected. All M0040 leak checks for each bag sample submitted for analysis from each run met acceptance criteria and were recorded on the respective field data sheets (see Appendix A).

4.2.3 Reagent Blanks

Reagent blanks are defined as samples of the reagent source water (ASTM Type II water, organic-free DI water), solvents, solutions, and other media used for sample collection. All required reagent blanks were collected in the field and submitted for analysis. Reagent blank results are discussed with the respective analysis, as required.

4.2.4 Field Blanks

Field blanks for non-agent air emissions sampling methods were collected during the field sampling program IAW the QAPjP requirements. For the non-isokinetic sampling trains, one field blank (blank train) was collected for each sampling method employed. For the M0031 sampling trains, a field blank was collected during each run for each train operated. For the M0040 sampling trains, a daily field blank was collected for each train operated. Field blank results are discussed with the respective analysis, as required.

4.2.5 Trip Blanks

Trip blanks for this sampling program consisted of a set of M0031 Tenax® and Tenax®/charcoal tubes, XAD-2 traps for the M0010 and M0023A sampling trains, a M0040 Tedlar® bag filled with a "zero" gas, and volatile organic analysis vials filled with ASTM Type II DI water for the M0031 and M0040 sampling trains. With the exception of the M0040 Tedlar® bag, which was analyzed on site, these trip blank samples were transported from the field to the laboratory for storage and analysis with the non-agent air emissions samples. All required trip blank samples were provided and analyzed for the same analytical parameters as the actual test samples. Trip blank results are discussed with the respective analysis, as required.

4.2.6 Temperature Indicator (Blank)

Temperature indicators, also called temperature blanks, are small sample bottles filled with reagent water that were placed in each cooler containing samples with a temperature preservation requirement prior to shipment to TestAmerica. Upon arrival at the laboratory, the temperature of this container was measured in lieu of measuring the temperature over every container in the cooler. As the temperature indicator is not analyzed and does not measure introduced contamination, it is not a true "blank" sample. Temperature indicators were placed in each cooler containing samples with a temperature preservation requirement prior to sealing the container for sample transport.

4.3 Sample Management

This section presents the sample preservation, transportation and receiving, holding times, traceability, and chain-of-custody (COC) documentation for the non-agent air emissions samples.

4.3.1 Sample Preservation

The non-agent air emissions samples were preserved by storing them in a refrigerator or on ice, as required, until packaged for transport to the off-site laboratories. Samples requiring cooling were packed with ice to maintain temperatures within the required range for transport to the laboratory. All samples arrived at the off-site laboratories within the required temperature ranges, as applicable.

4.3.2 Sample Traceability

Sample traceability for the non-agent air emissions samples procedures were employed IAW the QAPjP requirements to document the identity of each sample and its handling, from its first existence as a sample until analysis and data reduction were completed. Custody records traced a sample from its collection until it was transferred to the analytical laboratory. Internal laboratory records then documented the custody of the sample through its final disposition.

Sample integrity was maintained throughout all sampling and analysis programs. In accordance with SW-846 guidance, a sample was considered under a person's custody if the sample met the following criteria:

- In that person's physical possession
- In view of that person after acquiring possession
- Secured by that person so no one could tamper with the sample or secured by that person in an area restricted to authorized personnel

These criteria were used to define the meaning of "custody" and to ensure the integrity of the test program samples from collection to data reporting. Restricted access to the samples was an integral part of the COC procedure. Samples were held within sight of the samplers or sample custodian or kept in secured containers at all times. Custody seals were applied to each shipping container used to transport the samples to the off-site laboratory.

4.3.3 Sample Transportation and Receiving

The non-agent air emissions samples were stored on site until they were packaged and transferred directly to a TestAmerica laboratory courier by the AECOM sample custodian who accompanied the samples, with the appropriate COC form, to the designated meeting area. For each sample, the COC form listed the parameters for analysis by the laboratory and the total number and type of samples shipped for analysis. The AECOM sample custodian signed and dated the COC upon custody transfer to the TestAmerica courier, who acknowledged receipt of the samples shipment by signing and dating the COC form. Upon receipt at the laboratories, the sample condition and temperature were recorded, and the samples were logged into the laboratory sample tracking system with unique laboratory sample number.

4.3.4 Sample Shipping

TestAmerica-Knoxville shipped samples for ammonia analysis to the TestAmerica-Savanah laboratory. These samples were packaged, transported, and shipped IAW applicable Department of Transportation, International Air Transportation Authority, and EPA regulations. A COC accompanied the samples whereby custody was relinquished and accepted by the shipping and receiving laboratories.

4.3.5 Sample Preservation and Holding Times

The sample preservation requirements and holding times are presented in Table 13 of the QAPjP. The sampling personnel preserved the samples requiring temperature preservation by keeping them in a refrigerator or cooler packed with ice until they were packed for transport to the laboratory and transferred to the laboratory courier. A temperature blank was placed in each cooler to provide a means by which the laboratory could monitor the temperature of each cooler upon receipt at the laboratory. Holding times were monitored by keeping track of the day(s) from the time the samples were collected to the time that they were prepared, extracted, and/or analyzed. All samples met the temperature preservation and holding time requirements as specified in the QAPjP.

4.3.6 Chain-of-Custody Documentation

4.3.6.1 Labeling

For each non-agent air emissions sample, sample identification labels were used to ensure the required information was entered in the field. The non-agent air emissions sample labels were affixed to the appropriate container at the time of sample recovery. All samples collected were labeled with a preprinted sample label. No unresolved discrepancies between the sample name listed on the label and the name listed on the COC were identified, and the required analyses were performed.

4.3.6.2 Field Data Sheets

Information relevant to the non-agent air emissions sampling and analysis was recorded using sampling logs and/or field data sheets. Entries were made in indelible ink, and corrections generally followed the error correction protocol of one line through the error, initial of the person performing the correction, and the date of the correction. Appendix A contains a test chronology for each run summarizing the events recorded in the sampling log and copies of the field data sheets.

4.3.6.3 Chain-of-Custody Forms

For the non-agent air emissions samples, a COC form was filled out and accompanied every sample or group of individually identified samples to establish the documentation necessary to trace sample possession from the time of collection. The person relinquishing sample custody and the person receiving sample custody signed and dated each COC form at the time of custody transfer. Copies of the COC forms for the non-agent air emissions samples are provided in each laboratory report.

4.4 Sample Collection

The non-agent air emissions sampling was performed using the methods listed in Section 2.2.3. Isokinetic samples (M0010, M0023A, M26A, and M29), non-isokinetic samples (M0031 and M0040), and TRM CEMS samples were collected from the locations identified in the PTDP and QAPjP and described in Section 2.1. The number and location of the non-agent air emissions sampling points were determined IAW the procedures specified in M1, and all traverse points met the minimum distance from the inner wall of the duct or stack.

Verification of the absence of cyclonic flow at the west MDB filtration area stack and OTM duct sampling locations was performed on March 12, 2021, and at the east MDB filtration area stack on March 13, 2021, with no cyclonic flow present. The cyclonic flow data sheets are provided in Appendix A:. Calibration of the Type S pitot tube used for the cyclonic flow check and velocity measurements was performed IAW 40 CFR 60, Appendix A, Method 2. The Type S pitot tubes used for velocity measurements with each isokinetic sampling train conformed to the specification of M2, and a coefficient of 0.84 was assigned. Calibration data are provided in Appendix A:.

Before sampling, all non-agent air emissions sampling train glassware was cleaned as required by the QAPjP. Reagents used during sampling met the specifications of each respective sampling method. Sample containers were received in sealed boxes from the vendor with certificates of QA compliance IAW EPA specifications.

Each non-agent air emissions sampling train was operated IAW the applicable method and QAPjP requirements. For the isokinetic sampling trains, readings were recorded every 5 minutes at each traverse point for the following:

- Velocity pressure
- Exhaust gas temperature
- Orifice pressure
- Probe temperature
- Transfer line temperature (as applicable)
- Sorbent trap inlet temperature (as applicable)
- Silica gel impinger outlet temperature
- Dry gas meter outlet temperature
- Dry gas meter volume

4.4.1 Isokinetic Sampling

For each isokinetic sampling train (i.e., M0010, M0023A, M26A, and M29), the following sampling procedures were performed to comply with the QAPjP requirements:

- A minimum of 3 dry standard cubic meters (DSCM) total sample volume was collected over a 240-minute sampling period for each completed sampling train during each run with the exception of the Run 1 M0023A train. This train was operated for a total of 280 minutes and the sample volume was 2.94 DSCM. Though the minimum volume of 3 DSCM was not attained, the resulting samples are considered usable, though only results from Runs 2, 3, and 4 are used for three-run averages. The sample volume collected for each run is presented in Table 2–1 and Appendix A:.
- One field blank (blank train) sample was collected by assembling a complete sampling train at the sampling area. The filter housing and probe on the blank train were heated to the appropriate temperature, and the train was leak checked the same number of times as an actual sample train. The sample was then recovered in the same manner as an actual sample.
- Sample recovery was conducted both at designated areas outside the recovery (laboratory) trailer as well as inside the recovery trailer in a controlled laboratory setting IAW the procedures specified in the reference method.

- For M0010 and M0023A, the resin was packed in air-tight glass traps. The resin was purchased pre-cleaned and packed by the laboratory IAW the procedures specified in the reference method.
- For M0010 and M0023A, the temperature of the sample gas stream between the outlet of the condenser and the inlet to the resin trap was maintained below 68°F.
- The following temperatures were maintained during each run; these temperatures were monitored and recorded on field data sheets, which are in Appendix A:.
  - For M0010, M0023A, and M29, the probe, transfer line, and filter were maintained between 223 and 273°F with one excursion for the east stack M0010. This excursion was brief and brought back to within the acceptable range by the Operator without requiring sampling to be suspended and is not considered to have impacted the validity of the collected sample.
  - For the M26A, the temperatures of the probe and filter were maintained between 248 and 273°F.
- An initial and final leak check was conducted on each sampling train for each traverse with a maximum allowable leak rate of 0.02 cfm for 1-minute. The initial leak check for each run was conducted at a minimum vacuum of approximately 10 to 15 inHg. The leak checks performed during the sampling run, at each port change, and at the completion of the test were conducted at a vacuum greater than or equal to the maximum value reached during the sampling of each port. Passing leak check results were obtained for all completed sampling trains. The leak check results are presented in Table 4–2 and Appendix A:.
- An initial and final leak check was conducted for each test run on each Type S pitot assembly at a minimum velocity pressure reading of 3.0 inches water column (in. w.c.). Both the pitot impact opening and the static pressure openings passed each leak check.
- A successful posttest check of the stack thermocouple for each Type S pitot assembly was conducted.
- Isokinetic sampling rates were maintained during each of the sampling runs for all completed sampling trains. Percent isokinetic data for each run are presented in Appendix A:.

4.4.2 Non-Isokinetic Sampling

4.4.2.1 Volatile Organics

The following sampling procedures were performed to comply with EPA and QAPjP requirements for M0031 sampling:

- Four sets of sorbent traps and one condensate sample were collected at each location for each run. Each sorbent trap set consisted of two Tenax® tubes and one Tenax®/charcoal tube (used in lieu of Anasorb® as expressly permitted by the QAPjP).
- A field blank sample was collected during each run at each sampling location. The field blank traps were loaded into the sampling train, leak checked, and recovered in the same manner as a field sample. After collection, the field blank sample was handled and analyzed the same as the actual sample.

- A trip blank sample set was included with the actual sample traps during shipment to the site, sampling, and shipment to the laboratory. The end caps were not removed from the trip blank.
- A trip blank consisting of organic-free water was included with the actual sample condensates during shipment to the laboratory.
- The samples were delivered to the laboratory in a sealed cooler packed with ice. Documentation of analysis and a COC form relinquishing custody of the samples accompanied the samples.
- The Tenax® and Tenax®/charcoal traps were stored on ice before use, and the Tenax® and Tenax®/charcoal traps and condensate samples were received by the laboratory at a temperature ≤ 10°C.
- Each sample was collected by drawing the exhaust gas through the train at a rate of approximately 0.5 L/min for up to 40 minutes (there were several instances where the sampling time was less than 40 minutes). Approximately 20 dry standard liters (dsL) of exhaust gas sample volume were pulled through each set of traps. The sample volume collected and field data sheets for each run are in Appendix A:.
- The cooling water used for circulating through the condensers came from an ice water bath. The temperature of the sample gas stream between the outlet of the first condenser and the paired Tenax® sorbent traps, and between the outlet of the second condenser and the Tenax®/charcoal trap, was maintained below 68°F.
- An initial leak check was conducted for each sample collected for 1 minute while pulling a vacuum greater than the expected maximum vacuum during collection. A final leak check was conducted for each sample collected for 1 minute while pulling a vacuum greater than or equal to the highest vacuum recorded during collection of the sample with the exceptions described in Section 4.2.2. The M0031 sampling trains passed all leak checks. The leak check results are in Appendix A:.

4.4.2.2 Unspeciated Volatile Organics

The following sampling procedures were performed to comply with EPA and QAPjP requirements for M0040 sampling:

- Sample volumes between 17 and 28 L were collected for each bag sample. The sample volume collected and field data sheets for each run are in Appendix A:.
- One bag sample was collected in a Tedlar® bag at each location during each run.
- One condensate sample was collected per bag sample collected using amber glass septum cap vials.
- A daily field blank sample was collected.
- A field spike was performed after Run 2 by injecting a known quantity of propane into a sample aliquot after collection and analysis of the unspiked bag from the east MDB filtration area duct sampling location.
- The temperatures of the probe, filter, and valve were maintained between 266 and 284°F during collection of each sample.
- The condenser temperature was maintained at a temperature of < 68°F. Temperatures were recorded every 5 minutes, and field data sheets documenting the temperatures are in Appendix A:.

- An initial leak check was conducted for each sample collected for 1 minute while pulling a vacuum greater than the expected maximum vacuum during collection. A final leak check was conducted for each sample collected for 1 minute while pulling a vacuum greater than or equal to the highest vacuum recorded during collection of the sample. The M0040 sampling train passed all leak checks, and the results are in Appendix A:.
- The condensate samples were delivered to the laboratory in a sealed cooler packed with ice. Documentation of analysis and a COC form relinquishing custody of the samples accompanied the samples. The condensate samples were received by the laboratory at a temperature in the range of 0 to 6°C.

4.4.2.3 Oxygen and Carbon Dioxide

The O_2 and CO_2 concentrations were determined at the OTM duct location for each run by collecting a sample into a Tedlar® bag and analyzing the bag IAW M3A. For the east and west MDB filtration duct and stack locations, O_2 and CO_2 concentrations were measured prior to Run 1, and these measurements confirmed that the use of the default dry gas molecular weight of 29.0 was appropriate for these locations (see M2, Section 8.6).

Daily log sheets were maintained, and calibrations, QC activities, routine maintenance, and repair activities were documented for the M3A sampling. Activities related to the pretest checks (e.g., calibration drift/error) were also recorded. All data related to M3A sampling and the pretest activities were logged using a DAS.

The analyzer was calibrated IAW M3A. The QC measures included the use of EPA protocol calibration gases, pretest and posttest run calibrations, calibration error, and bias tests. Copies of the certifications for the gas standards are in Appendix A:.

4.4.2.4 Sulfur Dioxide

The SO_2 was determined at the east and west MDB filtration duct locations during each run IAW M6C. Results were continuously recorded for each run.

Daily log sheets were maintained, and calibrations, QC activities, routine maintenance, and repair activities were documented for the SO_2 testing. Activities related to the pretest checks (e.g., calibration drift/error) were also recorded. All data related to SO_2 sampling and the pretest activities were logged using a DAS.

The analyzers were calibrated IAW M6C (which references M7E). The QC measures included the use of EPA protocol calibration gases, pretest and posttest run calibrations, calibration error, and bias tests. Copies of the certifications for the gas standards are in Appendix A:.

4.4.2.5 Oxides of Nitrogen

The NO_X was determined at the east and west MDB filtration duct locations during each run IAW M7E. Results were continuously recorded for each run.

Daily log sheets were maintained, and calibrations, QC activities, routine maintenance, and repair activities were documented for the NO_X testing. Activities related to the pretest checks (e.g., calibration drift/error) were also recorded. All data related to NO_X sampling and the pretest activities were logged using a DAS.

The analyzers were calibrated IAW M7E. The QC measures included the use of EPA protocol calibration gases, pretest and posttest run calibrations, calibration error, and bias tests. Copies of the certifications for the gas standards are in Appendix A:.

4.4.2.6 Carbon Monoxide

The CO was determined at the east and west MDB filtration duct locations during each run IAW M10. Results were continuously recorded for each run.

Daily log sheets were maintained, and calibrations, QC activities, routine maintenance, and repair activities were documented for the CO testing. Activities related to the pretest checks (e.g., calibration drift/error) were also recorded. All data related to CO sampling and the pretest activities were logged using a DAS.

The analyzers were calibrated IAW M10 (which references M7E). The QC measures included the use of EPA protocol calibration gases, pretest and posttest run calibrations, calibration error, and bias tests. Copies of the certifications for the gas standards are in Appendix A:.

4.4.2.7 Total Hydrocarbons

The THC was determined at the east and west MDB filtration duct locations during each run IAW M25A. Results were continuously recorded for each run.

Daily log sheets were maintained, and calibrations, QC activities, routine maintenance, and repair activities were documented for the THC testing. Activities related to the pretest checks were also recorded. All data related to THC sampling and the pretest activities were logged using a DAS.

The analyzers were calibrated IAW M25A. The QC measures included the use of EPA protocol calibration gases, pretest calibration, and hourly system drift checks. Copies of the certifications for the gas standards are in Appendix A:.

4.5 Verification and Validation of Laboratory Results

Blank and spiked samples were analyzed IAW the QA/QC requirements specified in the QAPjP. Blank samples included the following items: reagent blanks, field blanks, trip blanks, and method blanks.

- Method blanks, which were used to measure any contaminants that may have been introduced to the sample during sample preparation and analysis in the laboratory
- Reagent blanks, which were used to assess the cleanliness of the reagents used in the field
- Field blanks, which were used to measure any contaminants that may have been introduced to the samples from the sampling equipment and sampling technique
- Trip blanks, which provided a measure of any sample contamination that may have been introduced during shipping of the samples from the site to the laboratory

The spike samples were used to assess method performance and the recovery efficiency of the various analytical methods used in this work; they consisted of the following:

- Matrix spike and matrix spike duplicates (MS/MSD)
- Laboratory control sample and duplicate (LCS/LCSD)
- Postdigestion spike and postdigestion duplicates (PDS/PDSD)
- Blank spikes
- Surrogate spikes

Exhaust gas samples are generally consumed in their entirety during the initial preparation and analysis of each sample. In instances where re-extraction and/or analysis are indicated in response to poor spike recovery, such action cannot be taken, as there is no additional sample aliquot available.

Analytical precision was assessed by performing spikes and spike duplicates with the analytes of interest and measuring the relative percent difference (RPD) between the duplicate analyses. The recovery of the spiked samples was used to assess the bias (accuracy) of the analysis. The surrogate spikes, which are authentic standards (not likely to be found in the matrix), added to every organic sample before preparation and/or analysis were used to provide an additional measure of QC for each sample. Surrogate spikes provide data that allow assessment of items such as matrix effects, gross sample-processing errors, and extraction efficiency.

The following subsections summarize the QA/QC assessment for the exhaust gas samples collected and analyzed.

4.1.3 Semivolatile Organics

During each run, an M0010 sampling train was used to collect samples for the determination of emission levels of the semivolatile target analytes and TICs at the east and west MDB filtration area stack as specified in the PTDP and QAPjP. M0010 samples from a minimum of three runs were collected and analyzed. For this project, M0010 samples were extracted IAW M3542 to yield three fractions per run for analysis by M8270. These extracts were split to support total unspeciated semivolatile and nonvolatile organics as described in Section 4.1.4.

The QC measures included the collection and analysis of reagent blanks, a field blank (blank train), and a trip blank; use of a field surrogate, which was spiked onto the XAD trap before sampling; additional surrogates added to the samples in the laboratory before extraction; internal standards added before analysis; and the preparation and analysis of method blanks and LCS/LCSD.

The results were reported, reviewed, and validated IAW QAPjP requirements. The complete laboratory reports are provided in Appendix B-1 and B-2. Table 4–3 provides a summary of the dates each sample was prepared and analyzed and demonstrates all holding time requirements were satisfied.

Sample-related QC results were generally within acceptance limits and Table 4–4 and Table 4–5 provide a summary of the surrogate recoveries and the LCS/LCSD recoveries and RPD, respectively, with any results that are outside the control limits clearly identified. Though some results were qualified as estimated, in no instance were results rejected based on surrogate or LCS/LCSD recovery. It is noted that Table 6 of the QAPjP identifies nine M8270 spiking compounds for this program. Three of the nine compounds are PAHs; these were analyzed by M8270SIM and are not included with the M8270 results. Additional spiking compounds were employed as allowed by the QAPjP. For the additional spiking compounds, only those compounds with laboratory-established recovery limits were assessed and only the QAPjP-required spiking compounds are summarized in Table 4–5.

For the reagent, field, trip, and laboratory blanks, there were no target analytes detected that would have biased the reported results, and qualification is not indicated.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the M0010 exhaust gas sample results for semivolatile organics usable for demonstrating the test objectives.

4.1.4 Unspeciated Semivolatile and Nonvolatile Total Organics

During each run, an M0010 sampling train was used to collect samples for the determination of emission levels of unspeciated semivolatile and nonvolatile organics at the east and west MDB filtration area stack as specified in the PTDP and QAPjP. M0010 samples from a minimum of three runs, as specified in the test plan, were collected and analyzed. For this project, M0010 samples were extracted IAW M3542 yielding three fractions per run that were split for semivolatile organic analysis by M8270 and unspeciated semivolatile organics and unspeciated nonvolatile organics analysis IAW the EPA *Guidance for Total Organics* (EPA 600/R-96-033).

The QC measures included the collection and analysis of reagent blanks, a field blank (blank train), and a trip blank; a surrogate added to the samples in the laboratory before extraction; and preparation and analysis of method blanks, LCS/LCSD, and standard reference materials.

The results were reported, reviewed, and validated IAW QAPjP requirements. The complete laboratory reports are provided in Appendix B-1 and B-2 (Appendix B:). Table 4–6 provides a summary of the dates each sample was prepared and analyzed and demonstrates all holding time requirements were satisfied.

Sample-related QC results were within acceptance limits with Table 4–6 and Table 4–7 providing a summary of the surrogate recoveries for the unspeciated semivolatile organics analysis, and the LCS/LCSD recoveries and RPD, respectively. For the field, trip, and laboratory blanks, there was no unspeciated semivolatile and nonvolatile organic mass reported that would have biased the reported results, and qualification is not indicated.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the M0010 exhaust gas sample results for unspeciated semivolatile and nonvolatile organics usable for demonstrating the test objectives.

4.1.5 Dioxins/Furans

During each run, an M0023A sampling train was used to collect samples for the determination of emission levels of dioxins/furans at the OTM duct as specified in the PTDP and QAPjP. M0023A samples from a minimum of three runs, as specified in the test plan, were collected and analyzed. For this project, M0023A samples were extracted to yield two fractions per run for analysis of dioxins/furans by M8290 and three fractions per run for analysis of PCBs by M1668 and PAHs by M8270SIM.

The QC measures included the collection and analysis of reagent blanks, a field blank (blank train) and a trip blank, use of field surrogates, which were spiked onto the XAD trap before sampling, additional surrogates and internal standards added to the samples in the laboratory before extraction and analysis, and the preparation and analysis of method blanks and LCS/LCSD.

The results were reported, reviewed, and validated IAW the test plan requirements. The complete laboratory report is provided as Appendix B-3 (Appendix B:). Table 4–8 provides a summary of the dates each sample was prepared and analyzed and demonstrates all holding time requirements were satisfied.

Sample-related QC results were generally within acceptance limits and Table 4–9 and Table 4–10 provide a summary of the surrogate and internal standard recoveries and the LCS/LCSD recoveries and RPD, respectively, with any results that are outside the control limits clearly identified. The laboratory attributes the out-of-limit 1,2,3,7,8-PeCDD LCS/LCSD recoveries and ^{13}C-1,2,3,7,8-PeCDD recovery to interference from the PCB spike added to the

samples for the combined train. Though some results were qualified as estimated, in no instance were results rejected based on surrogate, internal standard, or LCS/LCSD recovery or RPD.

For the reagent, field, trip, and laboratory blanks, there were target analytes found between the RL and EDL that may have biased the reported results and the associated results should be considered estimated. Though some dioxin/furan results were flagged as estimated, in no instance was any result found to be unusable.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the M0023A exhaust gas sample results for dioxins/furans to be usable for demonstrating the test objectives.

4.1.6 Polychlorinated Biphenyls

During each run, an M0023A sampling train was used to collect samples for the determination of emission levels of PCB at the OTM duct as specified in the PTDP and QAPjP. M0023A samples from a minimum of three runs, as specified in the test plan, were collected and analyzed. For this project, M0023A samples were extracted to yield two fractions per run for analysis of dioxins/furans by M8290 and three fractions per run for analysis of PCB by M1668 and PAH by M8270SIM.

QC measures included the collection and analysis of reagent blanks, a field blank (blank train), and a trip blank, use of field surrogates, which were spiked onto the XAD trap before sampling, additional surrogates and internal standards added to the samples in the laboratory before extraction and analysis, and the preparation and analysis of method blanks and LCS/LCSD.

The results were reported, reviewed, and validated IAW the test plan requirements. The complete laboratory report is provided as Appendix B-3.

Table 4–11provides a summary of the dates each sample was prepared and analyzed and demonstrates all holding time requirements were satisfied. Sample-related QC results were within acceptance limits and Table 4–12 and Table 4–13 provide a summary of the surrogate and internal standard recoveries and the LCS/LCSD recoveries and RPD, respectively.

For the reagent, field, trip, and laboratory blanks, there were target analytes found between the RL and EDL that may have biased the reported results and the associated results should be considered estimated. Though some PCB results were flagged as estimated, in no instance was any result found to be unusable.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the M0023A exhaust gas sample results for PCB to be usable for demonstrating the test objectives.

4.1.7 Polycyclic Aromatic Hydrocarbons

During each run, an M0023A sampling train was used to collect samples for the determination of emission levels of PAHs at the OTM duct as specified in the PTDP and QAPjP. M0023A samples from a minimum of three runs, as specified in the test plan, were collected and analyzed. For this project, M0023A samples were extracted to yield two fractions per run for analysis of dioxins/furans by M8290 and three fractions per run for analysis of PCBs by M1668 and PAHs by M8270SIM.

The QC measures included the collection and analysis of reagent blanks; a field blank (blank train) and a trip blank; use of a field surrogate, which was spiked onto the XAD trap before sampling; isotopically labelled internal standards added to the samples in the laboratory before extraction and analysis; and the preparation and analysis of method blanks and LCS/LCSD.

The results were reported, reviewed, and validated IAW the test plan requirements. The complete laboratory report is provided as Appendix B-3 (see Appendix B). Table 4–14 provides a summary of the dates each sample was prepared and analyzed and demonstrates all holding time requirements were satisfied. Sample-related QC results were within acceptance limits and

Table 4–15 and Table 4–16 provide a summary of the surrogate and internal standard recoveries and the LCS/LCSD recoveries and RPD, respectively.

For the reagent, trip, and laboratory blanks, there were no target analytes found between the RL and MDL that would have biased the reported results. For the field blank, there were target analytes found between the RL and MDL that may have biased the reported results, and the associated results should be considered estimated. Though some PAH results were flagged as estimated, in no instance was any result found to be unusable.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the M0023A exhaust gas sample results for PAH to be usable for demonstrating the test objectives.

4.1.8 Volatile Organics

During each run, an M0031 sampling train was used to collect samples for the determination of emission levels of volatile organic target analytes and TICs at the east and west MDB filtration area duct as specified in the PTDP and QAPjP. M0031 samples from a minimum of three runs, as specified in the test plan, were collected and analyzed. For this project, M0031 samples were analyzed IAW M5041 and M8260 with the Tenax® tubes paired for analysis, and the Tenax®/charcoal tubes and condensate analyzed separately. The separate analysis of the paired Tenax® tubes and Tenax®/charcoal tubes allowed breakthrough to be assessed.

The QC measures included the collection and analysis of field blanks with each run consisting of a complete tube set; trip blanks consisting of a complete tube set; and reagent water, surrogates, and internal standards added to the samples in the laboratory before analysis; and the analysis of method blanks and LCS/LCSD.

The results were reported, reviewed, and validated IAW QAPjP requirements. The complete laboratory report is provided as Appendices B-4 and B-5 (Appendix B:).

Table 4–17 provides a summary of the dates each sample was analyzed and demonstrates all holding time requirements were satisfied.

Sample-related QC results were generally within acceptance limits, and Table 4–17 and Table 4–18 provide a summary of the surrogate recoveries and the LCS/LCSD recoveries and RPD, respectively, with any results that are outside the control limits clearly identified. It is noted that Table 7 of the QAPjP identifies 7 spiking compounds for this program. Additional spiking compounds were employed as allowed by the QAPjP. For these additional spiking compounds, only those compounds with laboratory-established recovery limits were assessed and only the QAPjP-required spiking compounds are summarized in Table 4–18.

For the field, trip, and/or laboratory blanks, there were target analytes detected that may have biased the reported results and the associated results should be considered estimated. Though some volatile organic results were flagged as estimated, in no instance was any result found to be unusable.

For some samples, the dichlorodifluoromethane (Freon 12) results met the technical definition for breakthrough. In no instance was it reported that the absorptive capacity of the Tenax®/charcoal tube was exceeded, and at the reported concentrations, it is unlikely that breakthrough occurred. However, all detected dichlorodifluoromethane (Freon 12) results should be considered estimated.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the M0031 exhaust gas sample results for volatile organics usable for demonstrating the test objectives.

4.1.9 Unspeciated Volatile Organics

During each run, an M0040 sampling train was used to collect samples for the determination of emission levels of unspeciated volatile organics at the east and west MDB filtration area duct as specified in the PTDP and QAPjP. Exhaust gases were sampled for unspeciated volatile organics IAW M0040. The M0040 samples from a minimum of three runs, as specified in the test plan, were collected and analyzed. For this project, each bag sample was analyzed on site while the associated condensate samples were analyzed by an off-site laboratory. The on-site and off-site analyses are performed IAW the EPA *Guidance for Total Organics* (EPA 600/R-96-033) and laboratory procedures.

The QC measures included the following:

- Collection and analysis of a field blank with each run at the east and west MDB filtration area duct consisting of a bag sample and a condensate sample
- Trip blanks consisting of a bag sample and a condensate (reagent water) sample
- Field spike (performed after collection and analysis of the Run 2 bag collected from the east MDB filtration area duct)
- Surrogate added to the condensate samples in the laboratory before analysis
- Analysis of method blanks and LCS/LCSD; for the bag sample analysis, the continuing calibration verification conducted at the beginning of each analytical sequence served as the LCS

The results were reported, reviewed, and validated IAW the test plan requirements. The bag samples are reported as part of the subcontractor sampling report (see Appendix A:), and the complete laboratory reports for the condensate samples are provided as Appendices B-6 and B-7 (Appendix B:). Table 4–19 provides a summary of the dates each sample was analyzed and demonstrates all holding time requirements were satisfied.

Sample-related QC results were within acceptance limits, and Table 4–20,

Table 4–21, and Table 4–22 provide a summary of the condensate surrogate recoveries, field spike recovery, bag sample LCS recoveries, and condensate LCS/LCSD recoveries and RPD, respectively.

For the field, trip, and/or laboratory blanks, there was no unspeciated total organic mass detected that would have biased the reported results.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the M0040 exhaust gas sample results for unspeciated volatile organics usable for demonstrating the test objectives.

4.1.10 Acid Gases

During each run, an M26A sampling train was used to collect samples for the determination of emission levels of hydrogen chloride, hydrogen fluoride, and chlorine at the east and west MDB filtration area stacks as specified in the PTDP and QAPjP. M26A samples from a minimum of three runs were collected and analyzed.

The QC measures included the collection and analysis of reagent and field samples and the analysis of method blanks, LCS/LCSD, and MS/MSD.

The results were reported, reviewed, and validated IAW the test plan requirements. The complete laboratory reports are provided as Appendices B-8 and B-9 (see Appendix B). Table 4–23 provides a summary of the dates each sample was analyzed and demonstrates all holding time requirements were satisfied.

Sample-related QC results were within acceptance limits and Table 4–24 and Table 4–25 provide a summary of the LCS/LCSD and MS/MSD recoveries and RPD, respectively. For the reagent and field blanks, there was hydrogen chloride and chlorine found that would have biased the reported results and all associated hydrogen chloride, and chlorine results should be considered estimated. Though some hydrogen chloride and chlorine results were flagged as estimated, in no instance was any result found to be unusable.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the M26A exhaust gas sample results for hydrogen chloride, hydrogen fluoride, and chlorine usable for demonstrating the test objectives.

4.1.11 Ammonia

During each run, an M26A sampling train was used to collect samples for the determination of emissions levels of ammonia at the east and west MDB filtration area stacks as specified in the PTDP and QAPjP. M26A samples from a minimum of three runs were collected and analyzed.

The QC measures included the collection and analysis of reagent and field blanks, and the analysis of method blanks, LCS/LCSD, and MS/MSD.

The results were reported, reviewed, and validated IAW the test plan requirements. The complete laboratory reports are provided as Appendices B-8 and B-9 (Appendix B:). Table 4–23 provides a summary of the dates each sample was analyzed and demonstrates all holding time requirements were satisfied.

Sample-related QC results were within acceptance limits and Table 4–24 and Table 4–25 provide a summary of the LCS/LCSD and MS/MSD recoveries and RPD, respectively. For the reagent, field, and laboratory blanks, there was ammonia found in the field blank that would have biased the reported results, and all associated ammonia results should be considered estimated. Though some ammonia results were flagged as estimated, in no instance was any result found to be unusable.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the M26A exhaust gas sample results for ammonia usable for demonstrating the test objectives.

4.1.12 Particulate Matter

During each run, an M26A sampling train was used to collect samples for the determination of emission levels of particulate matter emissions at the east and west MDB filtration area stacks as specified in the PTDP and QAPjP. M26A samples from a minimum of three runs were collected and analyzed IAW M5.

The QC measures included the use of appropriate class weights to verify the accuracy of the analytical balance, the collection and analysis of reagent and field blank samples, and replicate weighings of each sample collected.

The results were reported, reviewed, and validated IAW the test plan requirements. The complete laboratory reports are provided as Appendices B-8 and B-9 (Appendix B:). The particulate matter analysis has no holding time requirement. The LCS/LCSD, standard reference material, and standard reference material duplicate analyses were within control limits. For the reagent and field blanks, particulate matter was found in the front-half rinse fraction that may have biased the reported results, and the associated results should be considered estimated. Though some particulate matter results were flagged as estimated, in no instance was any result found to be unusable.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the exhaust gas sample results for particulate matter usable for demonstrating the test objectives.

4.1.13 Metals

During each run, an M29 sampling train was used to collect samples for the determination of emission levels of select metals at the OTM duct as specified in the PTDP and QAPjP. M29 samples from a minimum of three runs were collected and analyzed.

As described in Section 3.2.10, the preparation of the front-half fraction included a two-step digestion to facilitate the reporting of boron in addition to the other metals of interest. The laboratory narrative included in the final report (see Appendix B-10 in Appendix B:) provides a detailed description of how the results from each digestate were determined.

The QC measures included the collection and analysis of reagent and field blanks, preparation and analysis of method blanks, LCS/LCSD, and MS/MSD or PDS/PDSD.

The results were reported, reviewed, and validated IAW the test plan requirements. The complete laboratory report is provided as Appendix B-10 (see Appendix B:). All sample analyses were completed within the holding times specified in the QAPjP.

With the exception of the cobalt recovery in the front-half sample post-digestion spike and post-digestion spike duplicate samples, all sample-related QC results were within acceptance limits, and Table 4–26 and Table 4–27 provide a summary of the LCS/LCSD, MS/MSD, and PDS/PDSD recoveries and RPD, respectively.

For the reagent, field, and laboratory blanks, metals were found that may have biased the reported results, and the associated results should be considered estimated. Table 4–28 provides a summary of the method blank, field blank, and reagent blank results. Though some metals results were flagged as estimated, in no instance was any result found unusable.

Based on the review of the sampling data, the analytical results, and the validation report, BGCAPP considers the M29 exhaust gas sample results for metals usable for demonstrating the test objectives.

4.6 Audit Sample Results

The QAPjP indicated audit samples would be acquired IAW the restructured stationary source audit program requirements, provided audit samples were available. At the time of testing, no audit samples were available due to an insufficient number of accredited audit sample providers. As such, no audit samples were required or obtained for this testing program. The following is an excerpt from the EPA website https://www.epa.gov/emc/emc-technical-support#audit describing this circumstance:

> *"The general provisions to 40 CFR Parts 60 and 63 (see §60.8(g)(1) and §63.7(c)(2)(iii)(A)) require that the owner or operator obtain audit samples if the audit samples are "commercially available" and have defined "commercially available" as two or more independent accredited audit sample providers (AASP) to have blind audit samples available for purchase. Since there are no longer two providers, the requirement to obtain these audit samples is no longer in effect until such time as another independent AASP has audit samples available for purchase.*
>
> *When there are two or more AASP with audit samples available for purchase, we will update this webpage with the name or names of the providers and audit sample(s) available for purchase. At that time, this information must be listed on the EMC website for 60 days before audits are required again."*

4.7 Overall QA/QC Assessment

4.1.14 Comparability of Analytical Data

Standardized EPA sampling and analytical methodologies were employed to collect samples and generate data in common units. Samples were analyzed using the procedures specified in the PTDP and QAPjP. As such, the results generated during this test are expected to be comparable to other results collected using the same methodologies and procedures.

4.1.15 Representativeness of Analytical Data

Based on a review of the sampling and analysis methods employed, as well as the reported results, the non-agent air emissions sample results are considered representative, although reagent and field blank results do indicate a potential high bias in some instances as described in Section 4.5. The non-agent air emissions sampling port locations and the number and location of the traverse points were IAW EPA method requirements. Absence of cyclonic flow was demonstrated at each isokinetic sampling location prior to testing. EPA-authored sampling methods were used to collect and analyze all non-agent air emissions samples.

4.1.16 Completeness of Analytical Data

The PTDP identified obtaining a minimum of three complete non-agent air emissions sample sets as the critical measurement. Based on a review of the sampling and analysis results, the non-agent air emissions sample results are considered 100% complete. Non-agent air emissions samples from four runs were collected and analyzed. Though some field sample results should be considered estimated, no results were rejected or deemed unusable.

On an individual analyte basis, a total of 7,382 individual analytes were planned to be reported for the field samples from three runs and the associated field QC samples. In no instance was any result found to be unusable. With 7,382 of the 7,382 individual analytes found to be usable, a completeness of 100% was obtained for the non-agent air emissions testing conducted during the IFD.

For determining the total number of individual analytes, each required field and field QC sample analyzed in the field was considered with the exception of the M0040 field spike and each required TRM CEMS parameter was counted as one analyte per run per location. Only field and field QC samples from Runs 2, 3, and 4 were considered. Run 1 sampling and analyses were not considered when determining the total number of analytes. The required library search for each volatile and semivolatile organic analysis was counted as a single analyte, even though more than one TIC may have been returned. For co-eluting analytes for volatile and semivolatile organics, such as m&p-xylenes, each analyte was counted individually, as well as the total, when a total was reported, e.g., xylenes, total.

4.1.17 Analytical Data Usability

Without exception, the analytical data generated from the non-agent air emissions testing conducted during the IFD IAW the PTDP and QAPjP are valid and considered usable for demonstrating the test objectives. Results qualified as estimated can be used as long as the limitations of the results are understood.

4.8 Deviations and Anomalies

With few exceptions, the sampling and analysis performed during the IFD was consistent with the planned sampling and analysis as described in the PTDP and QAPjP. Table 4–29 summarizes the recognized deviations and anomalies that occurred and discusses the basis and impact of each deviation and/or anomaly. The BGCAPP has determined that these occurrences do not have a significant impact with respect to the validity and usability of the reported data for its intended purpose.

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22377-1	BGCAPP T5-WS-VXP1-M0031-TA-1/TB-1	1	03/16/21	X												
140-22377-2	BGCAPP T5-WS-VXP1-M0031-TC-1	1	03/16/21	X												
140-22377-3	BGCAPP T5-WS-VXP1-M0031-TA-2/TB-2	1	03/16/21	X												
140-22377-4	BGCAPP T5-WS-VXP1-M0031-TC-2	1	03/16/21	X												
140-22377-5	BGCAPP T5-WS-VXP1-M0031-TA-3/TB-3	1	03/16/21	X												
140-22377-6	BGCAPP T5-WS-VXP1-M0031-TC-3	1	03/16/21	X												
140-22377-7	BGCAPP T5-WS-VXP1-M0031-TA-4/TB-4	1	03/16/21	X												
140-22377-8	BGCAPP T5-WS-VXP1-M0031-TC-4	1	03/16/21	X												
140-22377-9	BGCAPP T5-WS-VXP1-M0031-TA-BK/TB-BK	1	03/16/21	X												
140-22377-10	BGCAPP T5-WS-VXP1-M0031-TC-BK	1	03/16/21	X												
140-22377-11	BGCAPP T5-WS-VXP1-M0031-COND	1	03/16/21	X												
140-22377-12	BGCAPP T5-WS-VXP2-M0031-TA-1/TB-1	2	03/17/21	X												
140-22377-13	BGCAPP T5-WS-VXP2-M0031-TC-1	2	03/17/21	X												
140-22377-14	BGCAPP T5-WS-VXP2-M0031-TA-2/TB-2	2	03/17/21	X												
140-22377-15	BGCAPP T5-WS-VXP2-M0031-TC-2	2	03/17/21	X												
140-22377-16	BGCAPP T5-WS-VXP2-M0031-TA-3/TB-3	2	03/17/21	X												
140-22377-17	BGCAPP T5-WS-VXP2-M0031-TC-3	2	03/17/21	X												
140-22377-18	BGCAPP T5-WS-VXP2-M0031-TA-4/TB-4	2	03/17/21	X												
140-22377-19	BGCAPP T5-WS-VXP2-M0031-TC-4	2	03/17/21	X												
140-22377-20	BGCAPP T5-WS-VXP2-M0031-TA-BK/TB-BK	2	03/17/21	X												

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22377-21	BGCAPP T5-WS-VXP2-M0031-TC-BK	2	03/17/21	X												
140-22377-22	BGCAPP T5-WS-VXP2-M0031-COND	2	03/17/21	X												
140-22377-23	BGCAPP T5-WS-VXP3-M0031-TA-1/TB-1	3	03/18/21	X												
140-22377-24	BGCAPP T5-WS-VXP3-M0031-TC-1	3	03/18/21	X												
140-22377-25	BGCAPP T5-WS-VXP3-M0031-TA-2/TB-2	3	03/18/21	X												
140-22377-26	BGCAPP T5-WS-VXP3-M0031-TC-2	3	03/18/21	X												
140-22377-27	BGCAPP T5-WS-VXP3-M0031-TA-3/TB-3	3	03/18/21	X												
140-22377-28	BGCAPP T5-WS-VXP3-M0031-TC-3	3	03/18/21	X												
140-22377-29	BGCAPP T5-WS-VXP3-M0031-TA-4/TB-4	3	03/18/21	X												
140-22377-30	BGCAPP T5-WS-VXP3-M0031-TC-4	3	03/18/21	X												
140-22377-31	BGCAPP T5-WS-VXP3-M0031-TA-BK/TB-BK	3	03/18/21	X												
140-22377-32	BGCAPP T5-WS-VXP3-M0031-TC-BK	3	03/18/21	X												
140-22377-33	BGCAPP T5-WS-VXP3-M0031-COND	3	03/18/21	X												
140-22377-34	BGCAPP T5-WS-VXP4-M0031-TA-1/TB-1	4	03/20/21	X												
140-22377-35	BGCAPP T5-WS-VXP4-M0031-TC-1	4	03/20/21	X												
140-22377-36	BGCAPP T5-WS-VXP4-M0031-TA-2/TB-2	4	03/20/21	X												
140-22377-37	BGCAPP T5-WS-VXP4-M0031-TC-2	4	03/20/21	X												
140-22377-38	BGCAPP T5-WS-VXP4-M0031-TA-3/TB-3	4	03/20/21	X												
140-22377-39	BGCAPP T5-WS-VXP4-M0031-TC-3	4	03/20/21	X												
140-22377-40	BGCAPP T5-WS-VXP4-M0031-TA-4/TB-4	4	03/20/21	X												

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22377-41	BGCAPP T5-WS-VXP4-M0031-TC-4	4	03/20/21	X												
140-22377-42	BGCAPP T5-WS-VXP4-M0031-TA-BK/TB-BK	4	03/20/21	X												
140-22377-43	BGCAPP T5-WS-VXP4-M0031-TC-BK	4	03/20/21	X												
140-22377-44	BGCAPP T5-WS-VXP4-M0031-COND	4	03/20/21	X												
140-22383-1	BGCAPP T5-ES-VXP1-M0031-TA-1/TB-1	1	03/16/21	X												
140-22383-2	BGCAPP T5-ES-VXP1-M0031-TC-1	1	03/16/21	X												
140-22383-3	BGCAPP T5-ES-VXP1-M0031-TA-2/TB-2	1	03/16/21	X												
140-22383-4	BGCAPP T5-ES-VXP1-M0031-TC-2	1	03/16/21	X												
140-22383-5	BGCAPP T5-ES-VXP1-M0031-TA-3/TB-3	1	03/16/21	X												
140-22383-6	BGCAPP T5-ES-VXP1-M0031-TC-3	1	03/16/21	X												
140-22383-7	BGCAPP T5-ES-VXP1-M0031-TA-4/TB-4	1	03/16/21	X												
140-22383-8	BGCAPP T5-ES-VXP1-M0031-TC-4	1	03/16/21	X												
140-22383-9	BGCAPP T5-ES-VXP1-M0031-TA-BK/TB-BK	1	03/16/21	X												
140-22383-10	BGCAPP T5-ES-VXP1-M0031-TC-BK	1	03/16/21	X												
140-22383-11	BGCAPP T5-ES-VXP1-M0031-COND	1	03/16/21	X												
140-22383-12	BGCAPP T5-VXPTB1-M0031-COND	---	03/21/21	X												
140-22383-13	BGCAPP T5-ES-VXP2-M0031-TA-1/TB-1	2	03/17/21	X												
140-22383-14	BGCAPP T5-ES-VXP2-M0031-TC-1	2	03/17/21	X												
140-22383-15	BGCAPP T5-ES-VXP2-M0031-TA-2/TB-2	2	03/17/21	X												
140-22383-16	BGCAPP T5-ES-VXP2-M0031-TC-2	2	03/17/21	X												

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22383-17	BGCAPP T5-ES-VXP2-M0031-TA-3/TB-3	2	03/17/21	X												
140-22383-18	BGCAPP T5-ES-VXP2-M0031-TC-3	2	03/17/21	X												
140-22383-19	BGCAPP T5-ES-VXP2-M0031-TA-4/TB-4	2	03/17/21	X												
140-22383-20	BGCAPP T5-ES-VXP2-M0031-TC-4	2	03/17/21	X												
140-22383-21	BGCAPP T5-ES-VXP2-M0031-TA-BK/TB-BK	2	03/17/21	X												
140-22383-22	BGCAPP T5-ES-VXP2-M0031-TC-BK	2	03/17/21	X												
140-22383-23	BGCAPP T5-ES-VXP2-M0031-COND	2	03/17/21	X												
140-22383-24	BGCAPP T5-ES-VXP3-M0031-TA-1/TB-1	3	03/18/21	X												
140-22383-25	BGCAPP T5-ES-VXP3-M0031-TC-1	3	03/18/21	X												
140-22383-26	BGCAPP T5-ES-VXP3-M0031-TA-2/TB-2	3	03/18/21	X												
140-22383-27	BGCAPP T5-ES-VXP3-M0031-TC-2	3	03/18/21	X												
140-22383-28	BGCAPP T5-ES-VXP3-M0031-TA-3/TB-3	3	03/18/21	X												
140-22383-29	BGCAPP T5-ES-VXP3-M0031-TC-3	3	03/18/21	X												
140-22383-30	BGCAPP T5-ES-VXP3-M0031-TA-4/TB-4	3	03/18/21	X												
140-22383-31	BGCAPP T5-ES-VXP3-M0031-TC-4	3	03/18/21	X												
140-22383-32	BGCAPP T5-ES-VXP3-M0031-TA-BK/TB-BK	3	03/18/21	X												
140-22383-33	BGCAPP T5-ES-VXP3-M0031-TC-BK	3	03/18/21	X												
140-22383-34	BGCAPP T5-ES-VXP3-M0031-COND	3	03/18/21	X												
140-22383-35	BGCAPP T5-ES-VXP4-M0031-TA-1/TB-1	4	03/20/21	X												
140-22383-36	BGCAPP T5-ES-VXP4-M0031-TC-1	4	03/20/21	X												

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22383-37	BGCAPP T5-ES-VXP4-M0031-TA-2/TB-2	4	03/20/21	X												
140-22383-38	BGCAPP T5-ES-VXP4-M0031-TC-2	4	03/20/21	X												
140-22383-39	BGCAPP T5-ES-VXP4-M0031-TA-3/TB-3	4	03/20/21	X												
140-22383-40	BGCAPP T5-ES-VXP4-M0031-TC-3	4	03/20/21	X												
140-22383-41	BGCAPP T5-ES-VXP4-M0031-TA-4/TB-4	4	03/20/21	X												
140-22383-42	BGCAPP T5-ES-VXP4-M0031-TC-4	4	03/20/21	X												
140-22383-43	BGCAPP T5-ES-VXP4-M0031-TA-BK/TB-BK	4	03/20/21	X												
140-22383-44	BGCAPP T5-ES-VXP4-M0031-TC-BK	4	03/20/21	X												
140-22383-45	BGCAPP T5-ES-VXP4-M0031-COND	4	03/20/21	X												
140-22383-46	BGCAPP T5-ES-VXPTB1-M0031-TA-BK/TB-BK	---	03/20/21	X												
140-22383-47	BGCAPP T5-ES-VXPTB1-M0031-TC-BK	---	03/20/21	X												
140-22384-1	BGCAPP T5-ES-VXP1A-TOE-COND	1	03/16/21		X											
140-22384-2	BGCAPP T5-ES-VXP1FB-TOE-COND	1	03/16/21		X											
140-22384-3	BGCAPP T5-ES-VXP2A-TOE-COND	2	03/17/21		X											
140-22384-4	BGCAPP T5-ES-VXP2FB-TOE-COND	2	03/17/21		X											
140-22384-5	BGCAPP T5-ES-VXP3A-TOE-COND	3	03/18/21		X											
140-22384-6	BGCAPP T5-ES-VXP3FB-TOE-COND	3	03/18/21		X											
140-22384-7	BGCAPP T5-ES-VXP4A-TOE-COND	4	03/20/21		X											
140-22384-8	BGCAPP T5-ES-VXP4FB-TOE-COND	4	03/20/21		X											
140-22385-1	BGCAPP T5-WS-VXP1A-M0040-TOE-COND	1	03/16/21		X											

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22385-2	BGCAPP T5-WS-VXP1FB-M0040-TOE-COND	1	03/16/21		X											
140-22385-3	BGCAPP T5-WS-VXP2A-M0040-TOE-COND	2	03/17/21		X											
140-22385-4	BGCAPP T5-WS-VXP2FB-M0040-TOE-COND	2	03/17/21		X											
140-22385-5	BGCAPP T5-WS-VXP3A-M0040-TOE-COND	3	03/18/21		X											
140-22385-6	BGCAPP T5-WS-VXP3FB-M0040-TOE-COND	3	03/18/21		X											
140-22385-7	BGCAPP T5-WS-VXP4A-M0040-TOE-COND	4	03/20/21		X											
140-22385-8	BGCAPP T5-WS-VXP4FB-M0040-TOE-COND	4	03/20/21		X											
140-22385-9	BGCAPP-TB-VXPTB1-M0040-TOE-COND	---	03/20/21		X											
140-22385-10	BGCAPP-TB-VXPTB2-M0040-TOE-COND	---	03/20/21		X											
140-22386-1	BGCAPP T5-WS-VXP1-M0010-TOE.SV-PNR/FILT	1	03/16/21			X										
140-22386-2	BGCAPP T5-WS-VXP1-M0010-TOE.SV-CR/XAD	1	03/16/21			X										
140-22386-3	BGCAPP T5-WS-VXP1-M0010-TOE.SV-COND/IR	1	03/16/21			X										
140-22386-4	BGCAPP T5-WS-VXP1-M0010-TOE.SV-COMBINED	1	03/16/21				X									
140-22386-5	BGCAPP T5-WS-VXP2-M0010-TOE.SV-PNR/FILT	2	03/17/21			X										
140-22386-6	BGCAPP T5-WS-VXP2-M0010-TOE.SV-CR/XAD	2	03/17/21			X										
140-22386-7	BGCAPP T5-WS-VXP2-M0010-TOE.SV-COND/IR	2	03/17/21			X										
140-22386-8	BGCAPP T5-WS-VXP2-M0010-TOE.SV-COMBINED	2	03/17/21				X									
140-22386-9	BGCAPP T5-WS-VXP3-M0010-TOE.SV-PNR/FILT	3	03/18/21			X										
140-22386-10	BGCAPP T5-WS-VXP3-M0010-TOE.SV-CR/XAD	3	03/18/21			X										
140-22386-11	BGCAPP T5-WS-VXP3-M0010-TOE.SV-COND/IR	3	03/18/21			X										

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22386-12	BGCAPP T5-WS-VXP3-M0010-TOE.SV-COMBINED	3	03/18/21				X									
140-22386-13	BGCAPP T5-WS-VXP4-M0010-TOE.SV-PNR/FILT	4	03/20/21			X										
140-22386-14	BGCAPP T5-WS-VXP4-M0010-TOE.SV-CR/XAD	4	03/20/21			X										
140-22386-15	BGCAPP T5-WS-VXP4-M0010-TOE.SV-COND/IR	4	03/20/21			X										
140-22386-16	BGCAPP T5-WS-VXP4-M0010-TOE.SV-COMBINED	4	03/20/21				X									
140-22386-17	BGCAPP T5-WS-VXPFB-M0010-TOE.SV-PNR/FILT	---	03/15/21			X										
140-22386-18	BGCAPP T5-WS-VXPFB-M0010-TOE.SV-CR/XAD	---	03/15/21			X										
140-22386-19	BGCAPP T5-WS-VXPFB-M0010-TOE.SV-COND/IR	---	03/15/21			X										
140-22386-20	BGCAPP T5-WS-VXPFB-M0010-TOE.SV-COMBINED	---	03/15/21				X									
140-22386-21	BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-FILTER	---	03/16/21			X										
140-22386-22	BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-XAD	---	03/16/21			X										
140-22386-23	BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-DCM/MEOH	---	03/16/21			X										
140-22386-24	BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-COMBINED	---	03/16/21				X									
140-22387-1	BGCAPP T5-ES-VXP1-M0010-TOE.SV-PNR/FILT	1	03/16/21			X										
140-22387-2	BGCAPP T5-ES-VXP1-M0010-TOE.SV-CR/XAD	1	03/16/21			X										
140-22387-3	BGCAPP T5-ES-VXP1-M0010-TOE.SV-COND/IR	1	03/16/21			X										
140-22387-4	BGCAPP T5-ES-VXP1-M0010-TOE.SV-COMBINED	1	03/16/21				X									
140-22387-5	BGCAPP T5-ES-VXP2-M0010-TOE.SV-PNR/FILT	2	03/17/21			X										
140-22387-6	BGCAPP T5-ES-VXP2-M0010-TOE.SV-CR/XAD	2	03/17/21			X										
140-22387-7	BGCAPP T5-ES-VXP2-M0010-TOE.SV-COND/IR	2	03/17/21			X										

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22387-8	BGCAPP T5-ES-VXP2-M0010-TOE.SV-COMBINED	2	03/17/21				X									
140-22387-9	BGCAPP T5-ES-VXP3-M0010-TOE.SV-PNR/FILT	3	03/18/21			X										
140-22387-10	BGCAPP T5-ES-VXP3-M0010-TOE.SV-CR/XAD	3	03/18/21			X										
140-22387-11	BGCAPP T5-ES-VXP3-M0010-TOE.SV-COND/IR	3	03/18/21			X										
140-22387-12	BGCAPP T5-ES-VXP3-M0010-TOE.SV-COMBINED	3	03/18/21				X									
140-22387-13	BGCAPP T5-ES-VXP4-M0010-TOE.SV-PNR/FILT	4	03/20/21			X										
140-22387-14	BGCAPP T5-ES-VXP4-M0010-TOE.SV-CR/XAD	4	03/20/21			X										
140-22387-15	BGCAPP T5-ES-VXP4-M0010-TOE.SV-COND/IR	4	03/20/21			X										
140-22387-16	BGCAPP T5-ES-VXP4-M0010-TOE.SV-COMBINED	4	03/20/21				X									
140-22388-1	BGCAPP T5-MPT-VXP1-M0023A-PNR-AD/PNR-TOL/FILT	1	03/16/21					X	X	X						
140-22388-2	BGCAPP T5-MPT-VXP1-M0023A-CR-AD/CR-TOL/XAD	1	03/16/21					X	X	X						
140-22388-3	BGCAPP T5-MPT-VXP1-M0023A-COND/IR-AD	1	03/16/21						X	X						
140-22388-4	BGCAPP T5-MPT-VXP2-M0023A-PNR-AD/PNR-TOL/FILT	2	03/17/21					X	X	X						
140-22388-5	BGCAPP T5-MPT-VXP2-M0023A-CR-AD/CR-TOL/XAD	2	03/17/21					X	X	X						
140-22388-6	BGCAPP T5-MPT-VXP2-M0023A-COND/IR-AD	2	03/17/21						X	X						
140-22388-7	BGCAPP T5-MPT-VXP3-M0023A-PNR-AD/PNR-TOL/FILT	3	03/18/21					X	X	X						
140-22388-8	BGCAPP T5-MPT-VXP3-M0023A-CR-AD/CR-TOL/XAD	3	03/18/21					X	X	X						
140-22388-9	BGCAPP T5-MPT-VXP3-M0023A-COND/IR-AD	3	03/18/21						X	X						
140-22388-10	BGCAPP T5-MPT-VXP4-M0023A-PNR-AD/PNR-TOL/FILT	4	03/20/21					X	X	X						
140-22388-11	BGCAPP T5-MPT-VXP4-M0023A-CR-AD/CR-TOL/XAD	4	03/20/21					X	X	X						

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22388-12	BGCAPP T5-MPT-VXP4-M0023A-COND/IR-AD	4	03/20/21						X	X						
140-22388-13	BGCAPP T5-MPT-VXPFB-M0023A-PNR-AD/PNR-TOL/FILT	---	03/15/21					X	X	X						
140-22388-14	BGCAPP T5-MPT-VXPFB-M0023A-CR-AD/CR-TOL/XAD	---	03/15/21					X	X	X						
140-22388-15	BGCAPP T5-MPT-VXPFB-M0023A-COND/IR-AD	---	03/15/21						X	X						
140-22388-16	BGCAPP T5-MPT-VXPRB1-M0023A-FILT	---	03/16/21					X	X	X						
140-22388-17	BGCAPP T5-MPT-VXPRB1-M0023A-XAD	---	03/16/21					X	X	X						
140-22388-18	BGCAPP T5-MPT-VXPRB1-M0023A-ACE	---	03/16/21					X	X	X						
140-22388-19	BGCAPP T5-MPT-VXPRB1-M0023A-DCM	---	03/16/21					X	X	X						
140-22388-20	BGCAPP T5-MPT-VXPRB1-M0023A-TOL	---	03/16/21					X								
140-22389-1	BGCAPP T5-MPT-VXP1-M29-PNR/FILT	1	03/16/21								X	X				
140-22389-2	BGCAPP T5-MPT-VXP1-M29-NPI	1	03/16/21								X	X				
140-22389-3	BGCAPP T5-MPT-VXP1-M29-EIR	1	03/16/21									X				
140-22389-4	BGCAPP T5-MPT-VXP1-M29-PERM	1	03/16/21									X				
140-22389-5	BGCAPP T5-MPT-VXP1-M29-HCLRNS	1	03/16/21									X				
140-22389-6	BGCAPP T5-MPT-VXP2-M29-PNR/FILT	2	03/17/21								X	X				
140-22389-7	BGCAPP T5-MPT-VXP2-M29-NPI	2	03/17/21								X	X				
140-22389-8	BGCAPP T5-MPT-VXP2-M29-EIR	2	03/17/21									X				
140-22389-9	BGCAPP T5-MPT-VXP2-M29-PERM	2	03/17/21									X				
140-22389-10	BGCAPP T5-MPT-VXP2-M29-HCLRNS	2	03/17/21									X				
140-22389-11	BGCAPP T5-MPT-VXP3-M29-PNR/FILT	3	03/18/21								X	X				

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22389-12	BGCAPP T5-MPT-VXP3-M29-NPI	3	03/18/21								X	X				
140-22389-13	BGCAPP T5-MPT-VXP3-M29-EIR	3	03/18/21									X				
140-22389-14	BGCAPP T5-MPT-VXP3-M29-PERM	3	03/18/21									X				
140-22389-15	BGCAPP T5-MPT-VXP3-M29-HCLRNS	3	03/18/21									X				
140-22389-16	BGCAPP T5-MPT-VXP4-M29-PNR/FILT	4	03/20/21								X	X				
140-22389-17	BGCAPP T5-MPT-VXP4-M29-NPI	4	03/20/21								X	X				
140-22389-18	BGCAPP T5-MPT-VXP4-M29-EIR	4	03/20/21									X				
140-22389-19	BGCAPP T5-MPT-VXP4-M29-PERM	4	03/20/21									X				
140-22389-20	BGCAPP T5-MPT-VXP4-M29-HCLRNS	4	03/20/21									X				
140-22389-21	BGCAPP T5-MPT-VXPFB-M29-PNR/FILT	---	03/15/21								X	X				
140-22389-22	BGCAPP T5-MPT-VXPFB-M29-NPI	---	03/15/21								X	X				
140-22389-23	BGCAPP T5-MPT-VXPFB-M29-EIR	---	03/15/21									X				
140-22389-24	BGCAPP T5-MPT-VXPFB-M29-PERM	---	03/15/21									X				
140-22389-25	BGCAPP T5-MPT-VXPFB-M29-HCLRNS	---	03/15/21									X				
140-22389-26	BGCAPP T5-MPT-VXPRB1-M29-FILT	---	03/15/21								X	X				
140-22389-27	BGCAPP T5-MPT-VXPRB1-M29-NA RNS SOLN	---	03/15/21								X	X				
140-22389-28	BGCAPP T5-MPT-VXPRB1-M29-NP SOLN	---	03/15/21								X	X				
140-22389-29	BGCAPP T5-MPT-VXPRB1-M29-PERM SOLN	---	03/15/21									X				
140-22389-30	BGCAPP T5-MPT-VXPRB1-M29-HCL SOLN	---	03/15/21									X				
140-22390-1	BGCAPP T5-ES-VXP1-M5/26A-PNR	1	03/16/21													X

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22390-2	BGCAPP T5-ES-VXP1-M5/26A-FILT	1	03/16/21													X
140-22390-3	BGCAPP T5-ES-VXP1-M5/26A-ACDIMP	1	03/16/21										X			
140-22390-4	BGCAPP T5-ES-VXP1-M5/26A-ACDIMP/AMMONIA	1	03/16/21												X	
140-22390-5	BGCAPP T5-ES-VXP1-M5/26A-ALKIMP	1	03/16/21											X		
140-22390-6	BGCAPP T5-ES-VXP2-M5/26A-PNR	2	03/17/21													X
140-22390-7	BGCAPP T5-ES-VXP2-M5/26A-FILT	2	03/17/21													X
140-22390-8	BGCAPP T5-ES-VXP2-M5/26A-ACDIMP	2	03/17/21										X			
140-22390-9	BGCAPP T5-ES-VXP2-M5/26A-ACDIMP/AMMONIA	2	03/17/21												X	
140-22390-10	BGCAPP T5-ES-VXP2-M5/26A-ALKIMP	2	03/17/21											X		
140-22390-11	BGCAPP T5-ES-VXP3-M5/26A-PNR	3	03/18/21													X
140-22390-12	BGCAPP T5-ES-VXP3-M5/26A-FILT	3	03/18/21													X
140-22390-13	BGCAPP T5-ES-VXP3-M5/26A-ACDIMP	3	03/18/21										X			
140-22390-14	BGCAPP T5-ES-VXP3-M5/26A-ACDIMP/AMMONIA	3	03/18/21												X	
140-22390-15	BGCAPP T5-ES-VXP3-M5/26A-ALKIMP	3	03/18/21											X		
140-22390-16	BGCAPP T5-ES-VXP4-M5/26A-PNR	4	03/20/21													X
140-22390-17	BGCAPP T5-ES-VXP4-M5/26A-FILT	4	03/20/21													X
140-22390-18	BGCAPP T5-ES-VXP4-M5/26A-ACDIMP	4	03/20/21										X			
140-22390-19	BGCAPP T5-ES-VXP4-M5/26A-ACDIMP/AMMONIA	4	03/20/21												X	
140-22390-20	BGCAPP T5-ES-VXP4-M5/26A-ALKIMP	4	03/20/21											X		
140-22390-21	BGCAPP T5-VXPFB-M5/26A-PNR	---	03/15/21													X

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22390-22	BGCAPP T5-VXPFB-M5/26A-FILT	---	03/15/21													X
140-22390-23	BGCAPP T5-VXPFB-M5/26A-ACDIMP	---	03/15/21										X			
140-22390-24	BGCAPP T5-VXPFB-M5/26A-ACDIMP/AMMONIA	---	03/15/21												X	
140-22390-25	BGCAPP T5-VXPFB-M5/26A-ALKIMP	---	03/15/21											X		
140-22390-26	BGCAPP T5-VXPRB1-M5/26A-FILT	---	03/15/21													X
140-22390-27	BGCAPP T5-VXPRB1-M5/26A-ACE	---	03/15/21													X
140-22390-28	BGCAPP T5-VXPRB1-M5/26A-H2SO4 SOLN	---	03/15/21										X			
140-22390-29	BGCAPP T5-VXPRB1-M5/26A-H2SO4 SOLN/AMMONIA	---	03/15/21												X	
140-22390-30	BGCAPP T5-VXPRB1-M5/26A-NAOH SOLN	---	03/15/21											X		
140-22391-1	BGCAPP T5-WS-VXP1-M5/26A-PNR	1	03/16/21													X
140-22391-2	BGCAPP T5-WS-VXP1-M5/26A-FILT	1	03/16/21													X
140-22391-3	BGCAPP T5-WS-VXP1-M5/26A-ACDIMP	1	03/16/21										X			
140-22391-4	BGCAPP T5-WS-VXP1-M5/26A-ACDIMP/AMMONIA	1	03/16/21												X	
140-22391-5	BGCAPP T5-WS-VXP1-M5/26A-ALKIMP	1	03/16/21											X		
140-22391-6	BGCAPP T5-WS-VXP2-M5/26A-PNR	2	03/17/21													X
140-22391-7	BGCAPP T5-WS-VXP2-M5/26A-FILT	2	03/17/21													X
140-22391-8	BGCAPP T5-WS-VXP2-M5/26A-ACDIMP	2	03/17/21										X			
140-22391-9	BGCAPP T5-WS-VXP2-M5/26A-ACDIMP/AMMONIA	2	03/17/21												X	
140-22391-10	BGCAPP T5-WS-VXP2-M5/26A-ALKIMP	2	03/17/21											X		
140-22391-11	BGCAPP T5-WS-VXP3-M5/26A-PNR	3	03/18/21													X

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
140-22391-12	BGCAPP T5-WS-VXP3-M5/26A-FILT	3	03/18/21													X
140-22391-13	BGCAPP T5-WS-VXP3-M5/26A-ACDIMP	3	03/18/21										X			
140-22391-14	BGCAPP T5-WS-VXP3-M5/26A-ACDIMP/AMMONIA	3	03/18/21												X	
140-22391-15	BGCAPP T5-WS-VXP3-M5/26A-ALKIMP	3	03/18/21											X		
140-22391-16	BGCAPP T5-WS-VXP4-M5/26A-PNR	4	03/20/21													X
140-22391-17	BGCAPP T5-WS-VXP4-M5/26A-FILT	4	03/20/21													X
140-22391-18	BGCAPP T5-WS-VXP4-M5/26A-ACDIMP	4	03/20/21										X			
140-22391-19	BGCAPP T5-WS-VXP4-M5/26A-ACDIMP/AMMONIA	4	03/20/21												X	
140-22391-20	BGCAPP T5-WS-VXP4-M5/26A-ALKIMP	4	03/20/21											X		
---	East Run 1 (Bag)	1	03/16/21		X											
---	East FB 1 (Bag)	1	03/16/21		X											
---	East Run 2 (Bag)	2	03/17/21		X											
---	East FB 2 (Bag)	2	03/17/21		X											
---	East Run 3 (Bag)	3	03/18/21		X											
---	East FB 3 (Bag)	3	03/18/21		X											
---	East Run 4 (Bag)	4	03/20/21		X											
---	East FB 4 (Bag)	4	03/20/21		X											
---	West Run 1 (Bag)	1	03/16/21		X											
---	West FB 1 (Bag)	1	03/16/21		X											
---	West Run 2 (Bag)	2	03/17/21		X											

Table 4–1: Field and Laboratory Sample Identification Cross Reference Guide (continued)

Laboratory Sample No.	Field Sample ID	Run No.	Sampling Date	Analytical Testing Parameter												
				Volatile Organics	Unspeciated Volatile Organics	Semivolatile Organics	Unspeciated Semivolatile and Nonvolatile Organics	Dioxins/Furans	PCB	PAH	Metals	Mercury	Hydrogen Chloride and Hydrogen Fluoride	Chlorine	Ammonia	Particulates
---	West FB 2 (Bag)	2	03/17/21		X											
---	West Run 3 (Bag)	3	03/18/21		X											
---	West FB 3 (Bag)	3	03/18/21		X											
---	West Run 4 (Bag)	4	03/20/21		X											
---	West FB 4 (Bag)	4	03/20/21		X											

Table 4–2: Isokinetic Train Leak Checks

Run	Location	Sample Train	Initial		First Port Change				Second Port Change				Third Port Change				Final	
			VAC (inHg)	Rate (cf)	VAC (inHg)	Rate (cf)	VAC (inHg)	Rate (cf)	VAC (inHg)	Rate (cf)	VAC (inHg)	Rate (cf)	VAC (inHg)	Rate (cf)	VAC (inHg)	Rate (cf)	VAC (inHg)	Rate (cf)
1	East Stack	M0010	15	0.015	10	0.008	10	0.015	10	0.013	10	0.015	10	0.018	10	0.012	11	0.007
		M26A	15	0.006	6	0.005	6	0.004	6.5	0.004	6.5	0.003	6	0.008	6	0.006	10	0.005
	West Stack	M0010	15	0.010	7	0.012	10	0.010	10	0.011	10	0.009	11	0.009	11	0.008	8	0.015
		M26A	16	0.010	10	0.005	15	0.005	10	0.005	10	0.005	10	0.005	10	0.004	9.5	0.005
	OTM Duct	M0023A	15	0.005	8	0.002	15	0.003	---	---	---	---	---	---	---	---	9	0.001
		M29	15	0.009	5	0.003	15	0.009	---	---	---	---	---	---	---	---	5	0.003
2	East Stack	M0010	15	0.010	12	0.013	12	0.008	12	0.008	12	0.015	12	0.015	12	0.007	12	0.017
		M26A	15	0.008	9	0.010	9	0.004	8	0.004	8	0.005	8	0.004	8	0.006	9	0.008
	West Stack	M0010	14	0.012	10	0.014	10	0.014	10	0.014	10	0.015	10	0.014	10	0.015	7	0.010
		M26A	13	0.004	8	0.004	9	0.004	8.5	0.003	8.5	0.003	9	0.004	9	0.004	10	0.005
	OTM Duct	M0023A	15	0.003	8	0.002	15	0.007	---	---	---	---	---	---	---	---	10	0.006
		M29	15	0.005	2.5	0.006	15	0.009	---	---	---	---	---	---	---	---	5.5	0.008
3	East Stack	M0010	15	0.009	9	0.011	9	0.007	9	0.015	9	0.010	9	0.011	9	0.007	9	0.011
		M26A	15	0.013	6.5	0.007	7	0.006	6	0.003	6	0.005	6.5	0.005	6.5	0.005	7	0.004
	West Stack	M0010	16	0.013	10	0.008	10	0.009	10	0.010	10	0.006	10	0.007	10	0.008	7.5	0.008
		M26A	16	0.004	9	0.004	9	0.004	9	0.005	9	0.005	9	0.005	9	0.005	10	0.003
	OTM Duct	M0023A	17	0.006	10.5	0.003	15.5	0.004	---	---	---	---	---	---	---	---	15	0.007
		M29	16	0.008	5.5	0.005	15.5	0.010	---	---	---	---	---	---	---	---	6	0.006
4	East Stack	M0010	15	0.014	11	0.016	11	0.012	11	0.011	11	0.011	11	0.014	11	0.015	11	0.008
		M26A	15	0.013	7	0.007	7	0.005	7	0.002	7	0.002	8	0.005	7	0.006	7.5	0.005
	West Stack	M0010	15	0.010	10	0.007	11	0.009	10	0.011	10	0.009	10	0.012	10	0.010	7	0.005
		M26A	15	0.005	9	0.007	9	0.008	8	0.014	8	0.005	9	0.005	9	0.005	7	0.004
	OTM Duct	M0023A	15	0.004	10	0.015	15	0.003	---	---	---	---	---	---	---	---	10	0.002
		M29	15	0.007	6	0.015	15	0.012	---	---	---	---	---	---	---	---	6	0.010

Table 4–3: Semivolatile Organic Sample Holding Time Summary

Sample Name	Sample Date	Preparation Date	Analysis Date	Collection to Extraction (Days)	Extraction to Analysis (Days)
BGCAPP T5-ES-VXP1-M0010-TOE.SV-PNR/FILT	03/16/21	03/23/21	03/25/21	7	2
BGCAPP T5-ES-VXP1-M0010-TOE.SV-CR/XAD	03/16/21	03/24/21	03/29/21	8	5
BGCAPP T5-ES-VXP1-M0010-TOE.SV-COND/IR	03/16/21	03/23/21	03/29/21	7	6
BGCAPP T5-ES-VXP2-M0010-TOE.SV-PNR/FILT	03/17/21	03/23/21	03/25/21	6	2
BGCAPP T5-ES-VXP2-M0010-TOE.SV-CR/XAD	03/17/21	03/24/21	03/29/21	7	5
BGCAPP T5-ES-VXP2-M0010-TOE.SV-COND/IR	03/17/21	03/23/21	03/29/21	6	6
BGCAPP T5-ES-VXP3-M0010-TOE.SV-PNR/FILT	03/18/21	03/23/21	03/25/21	5	2
BGCAPP T5-ES-VXP3-M0010-TOE.SV-CR/XAD	03/18/21	03/24/21	03/30/21	6	6
BGCAPP T5-ES-VXP3-M0010-TOE.SV-COND/IR	03/18/21	03/23/21	03/29/21	5	6
BGCAPP T5-ES-VXP4-M0010-TOE.SV-PNR/FILT	03/20/21	03/23/21	03/25/21	3	2
BGCAPP T5-ES-VXP4-M0010-TOE.SV-CR/XAD	03/20/21	03/24/21	03/30/21	4	6
BGCAPP T5-ES-VXP4-M0010-TOE.SV-COND/IR	03/20/21	03/23/21	03/29/21	3	6
BGCAPP T5-WS-VXP1-M0010-TOE.SV-PNR/FILT	03/16/21	03/23/21	03/25/21	7	2
BGCAPP T5-WS-VXP1-M0010-TOE.SV-CR/XAD	03/16/21	03/24/21	03/29/21	8	5
BGCAPP T5-WS-VXP1-M0010-TOE.SV-COND/IR	03/16/21	03/23/21	03/29/21	7	6
BGCAPP T5-WS-VXP2-M0010-TOE.SV-PNR/FILT	03/17/21	03/23/21	03/25/21	6	2
BGCAPP T5-WS-VXP2-M0010-TOE.SV-CR/XAD	03/17/21	03/24/21	03/29/21	7	5
BGCAPP T5-WS-VXP2-M0010-TOE.SV-COND/IR	03/17/21	03/23/21	03/29/21	6	6
BGCAPP T5-WS-VXP3-M0010-TOE.SV-PNR/FILT	03/18/21	03/23/21	03/25/21	5	2
BGCAPP T5-WS-VXP3-M0010-TOE.SV-CR/XAD	03/18/21	03/24/21	03/29/21	6	5
BGCAPP T5-WS-VXP3-M0010-TOE.SV-COND/IR	03/18/21	03/23/21	03/29/21	5	6
BGCAPP T5-WS-VXP4-M0010-TOE.SV-PNR/FILT	03/20/21	03/23/21	03/25/21	3	2
BGCAPP T5-WS-VXP4-M0010-TOE.SV-CR/XAD	03/20/21	03/24/21	03/29/21	4	5
BGCAPP T5-WS-VXP4-M0010-TOE.SV-COND/IR	03/20/21	03/23/21	03/29/21	3	6

Table 4–3: Semivolatile Organic Sample Holding Time Summary (continued)

Sample Name	Sample Date	Preparation Date	Analysis Date	Collection to Extraction (Days)	Extraction to Analysis (Days)
BGCAPP T5-WS-VXPFB-M0010-TOE.SV-PNR/FILT	03/15/21	03/23/21	03/25/21	8	2
BGCAPP T5-WS-VXPFB-M0010-TOE.SV-CR/XAD	03/15/21	03/24/21	03/29/21	9	5
BGCAPP T5-WS-VXPFB-M0010-TOE.SV-COND/IR	03/15/21	03/23/21	03/29/21	8	6
BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-FILTER	03/16/21	03/23/21	03/25/21	7	2
BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-DCM/MEOH	03/16/21	03/23/21	03/29/21	7	6
BGCAPP T5-WS-VXP1-M0010-TOE.SV-CR/XAD	03/16/21	03/24/21	03/30/21	8	6
BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-XAD	03/16/21	03/24/21	03/29/21	8	5
MB 140-47968/1-B (48253)	---	03/24/21	03/29/21	---	5
MB 140-47969/1-B (48253)	---	03/23/21	03/29/21	---	6
MB 140-47966/1-B (48131)	---	03/23/21	03/25/21	---	2
LCS 140-47968/2-B (48253)	---	03/24/21	03/29/21	---	5
LCSD 140-47968/3-B (48253)	---	03/24/21	03/29/21	---	5
LCS 140-47969/2-B (48253)	---	03/23/21	03/29/21	---	6
LCSD 140-47969/3-B (48253)	---	03/23/21	03/29/21	---	6
LCS 140-47966/2-B (48131)	---	03/23/21	03/25/21	---	2
LCSD 140-47966/3-B (48131)	---	03/23/21	03/25/21	---	2

Note:

QAPjP Limit: 14 days from collection to extraction and 40 days from extraction to analysis.

Table 4–4: Semivolatile Surrogate Standard Results

Sample Name	$^{13}C_6$-Naphthalene	2-Fluorobiphenyl	2-Fluorophenol	Nitrobenzene-d_5	Phenol-d_5	Terphenyl-d_{14}	2,4,6-Tribromophenol
Front-Half QAPjP Limits (%):	**---**	**48-110**	**37-105**	**43-107**	**48-114**	**67-112**	**34-121**
BGCAPP T5-ES-VXP1-M0010-TOE.SV-PNR/FILT	---	76	68	72	70	91	75
BGCAPP T5-ES-VXP2-M0010-TOE.SV-PNR/FILT	---	70	64	68	65	80	69
BGCAPP T5-ES-VXP3-M0010-TOE.SV-PNR/FILT	---	73	66	70	68	85	71
BGCAPP T5-ES-VXP4-M0010-TOE.SV-PNR/FILT	---	68	61	66	64	77	68
BGCAPP T5-WS-VXP1-M0010-TOE.SV-PNR/FILT	---	73	66	70	68	83	72
BGCAPP T5-WS-VXP2-M0010-TOE.SV-PNR/FILT	---	60	55	57	56	77	65
BGCAPP T5-WS-VXP3-M0010-TOE.SV-PNR/FILT	---	80	72	76	74	94	81
BGCAPP T5-WS-VXP4-M0010-TOE.SV-PNR/FILT	---	70	62	67	64	84	68
BGCAPP T5-WS-VXPFB-M0010-TOE.SV-PNR/FILT	---	74	68	72	71	81	72
BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-FILTER	---	77	73	76	75	84	70
BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-DCM/MEOH	---	88	77	85	82	85	66
MB 140-47968/1-B (48253)	---	80	76	80	79	88	84
LCS 140-47968/2-B (48253)	---	81	76	83	83	80	74
LCSD 140-47968/3-B (48253)	---	85	77	86	84	83	86

Table 4–4: Semivolatile Surrogate Standard Results (continued)

Sample Name	$^{13}C_6$-Naphthalene	2-Fluorobiphenyl	2-Fluorophenol	Nitrobenzene-d_5	Phenol-d_5	Terphenyl-d_{14}	2,4,6-Tribromophenol
Back-Half QAPjP Limits (%):	**50-150**	**48-111**	**42-104**	**45-110**	**50-118**	**73-108**	**51-125**
BGCAPP T5-ES-VXP1-M0010-TOE.SV-CR/XAD	75	76	67	69	74	79	80
BGCAPP T5-ES-VXP2-M0010-TOE.SV-CR/XAD	78	77	68	73	76	81	81
BGCAPP T5-ES-VXP3-M0010-TOE.SV-CR/XAD	79	76	71	72	77	78	81
BGCAPP T5-ES-VXP4-M0010-TOE.SV-CR/XAD	84	80	74	77	81	80	79
BGCAPP T5-WS-VXP1-M0010-TOE.SV-CR/XAD	82	82	74	78	81	84	82
BGCAPP T5-WS-VXP1-M0010-TOE.SV-CR/XAD	89	92	84	84	92	94	84
BGCAPP T5-WS-VXP2-M0010-TOE.SV-CR/XAD	76	74	68	70	73	78	74
BGCAPP T5-WS-VXP3-M0010-TOE.SV-CR/XAD	87	81	75	79	81	86	87
BGCAPP T5-WS-VXP4-M0010-TOE.SV-CR/XAD	71	67	64	66	66	***71***	69
BGCAPP T5-WS-VXPFB-M0010-TOE.SV-CR/XAD	75	73	69	69	71	76	73
BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-XAD	82	80	73	75	78	83	80
MB 140-47969/1-B (48253)	---	89	65	91	83	93	79
LCS 140-47969/2-B (48253)	---	84	57	87	79	83	82
LCSD 140-47969/3-B (48253)	---	81	53	81	74	81	78

Table 4–4: Semivolatile Surrogate Standard Results (continued)

Sample Name	$^{13}C_6$-Naphthalene	2-Fluorobiphenyl	2-Fluorophenol	Nitrobenzene-d_5	Phenol-d_5	Terphenyl-d_{14}	2,4,6-Tribromophenol
Condensate QAPjP Limits (%):	**---**	**56-109**	**29-90**	**52-109**	**19-134**	**55-115**	**40-127**
BGCAPP T5-ES-VXP1-M0010-TOE.SV-COND/IR	---	79	64	79	76	85	73
BGCAPP T5-ES-VXP2-M0010-TOE.SV-COND/IR	---	77	60	77	69	79	66
BGCAPP T5-ES-VXP3-M0010-TOE.SV-COND/IR	---	84	69	85	78	93	78
BGCAPP T5-ES-VXP4-M0010-TOE.SV-COND/IR	---	76	47	75	66	80	69
BGCAPP T5-WS-VXP1-M0010-TOE.SV-COND/IR	---	79	49	82	68	87	72
BGCAPP T5-WS-VXP2-M0010-TOE.SV-COND/IR	---	79	45	78	65	84	73
BGCAPP T5-WS-VXP3-M0010-TOE.SV-COND/IR	---	76	51	76	68	82	70
BGCAPP T5-WS-VXP4-M0010-TOE.SV-COND/IR	---	72	47	72	64	79	64
BGCAPP T5-WS-VXPFB-M0010-TOE.SV-COND/IR	---	73	50	73	65	80	66
MB 140-47966/1-B (48131)	---	88	78	86	81	91	74
LCS 140-47966/2-B (48131)	---	83	73	85	80	81	87
LCSD 140-47966/3-B (48131)	---	75	69	79	74	72	79

Note:

$^{13}C_6$-Naphthalene is a field surrogate that is only added to the resin trap. As such, only back-half sample fractions have a recovery reported for this surrogate.

Table 4–5: Semivolatile LCS Results

Laboratory ID:	LCS 140-47968/2-B / LCSD 140-47968/3-B
Date Extracted:	03/24/21
Date Analyzed:	03/29/21

Spiked Compound	Concentration (µg)			Recovery (%)		RPD	SAP/QAPP Limits (%)		
	True	LCS	LCSD	LCS	LCSD	(%)	Recovery		RPD
Bis(2-ethylhexyl) phthalate	100	87.77	113.4	88	113	25	84 to 125		34
Butyl benzyl phthalate	100	86.75	87.20	87	87	1	85 to 125		32
1,4-Dichlorobenzene	100	78.54	78.49	79	78	0	58 to 100		42
Diethyl phthalate	100	81.55	82.93	82	83	2	74 to 114		40
Di-n-butyl phthalate	100	85.22	89.08	85	89	4	75 to 120		32
Naphthalene	100	83.92	86.01	84	86	2	61 to 120		28

Laboratory ID:	LCS 140-47969/2-B / LCSD 140-47969/3-B
Date Extracted:	03/23/21
Date Analyzed:	03/29/21

Spiked Compound	Concentration (µg)			Recovery (%)		RPD	SAP/QAPP Limits (%)		
	True	LCS	LCSD	LCS	LCSD	(%)	Recovery		RPD
Bis(2-ethylhexyl) phthalate	100	96.40	90.09	96	90	7	80 to 123		20
Butyl benzyl phthalate	100	91.78	88.28	92	88	4	80 to 122		20
1,4-Dichlorobenzene	100	80.08	73.00	80	73	9	58 to 101		28
Diethyl phthalate	100	89.80	87.30	90	87	3	71 to 118		20
Di-n-butyl phthalate	100	94.03	88.92	94	89	6	74 to 128		20
Naphthalene	100	90.21	83.87	90	84	7	62 to 120		28

Table 4–5: Semivolatile LCS Results (continued)

Laboratory ID:	LCS 140-47966/2-B / LCSD 140-47966/3-B
Date Extracted:	03/23/21
Date Analyzed:	03/25/21

Spiked Compound	Concentration (µg)			Recovery (%)		RPD	SAP/QAPP Limits (%)	
	True	LCS	LCSD	LCS	LCSD	(%)	Recovery	RPD
Bis(2-ethylhexyl) phthalate	100	98.13	85.68	98	86	14	77 to 128	25
Butyl benzyl phthalate	100	91.68	83.82	92	84	9	76 to 127	25
1,4-Dichlorobenzene	100	75.12	72.33	75	72	4	50 to 104	25
Diethyl phthalate	100	91.27	80.05	91	80	13	69 to 116	25
Di-n-butyl phthalate	100	94.75	85.34	95	85	10	70 to 122	25
Naphthalene	100	88.25	81.53	88	82	8	59 to 120	25

Table 4–6: Unspeciated Semivolatile and Nonvolatile Organics Holding Time and Surrogate Standard Results

Sample	Sample Date	Preparation Date	Analysis Date	Collection to Extraction (Days)	Extraction to Analysis (Days)	n-Heptadecane (%)
Unspeciated Semivolatile Organics						
BGCAPP T5-ES-VXP1-M0010-TOE.SV-COMBINED	03/16/21	03/23/21	03/28/21	7	5	109
BGCAPP T5-ES-VXP2-M0010-TOE.SV-COMBINED	03/17/21	03/23/21	03/28/21	6	5	109
BGCAPP T5-ES-VXP3-M0010-TOE.SV-COMBINED	03/18/21	03/23/21	03/28/21	5	5	95
BGCAPP T5-ES-VXP4-M0010-TOE.SV-COMBINED	03/20/21	03/23/21	03/28/21	3	5	95
BGCAPP T5-WS-VXP1-M0010-TOE.SV-COMBINED	03/16/21	03/23/21	03/28/21	7	5	89
BGCAPP T5-WS-VXP2-M0010-TOE.SV-COMBINED	03/17/21	03/23/21	03/28/21	6	5	93
BGCAPP T5-WS-VXP3-M0010-TOE.SV-COMBINED	03/18/21	03/23/21	03/28/21	5	5	96
BGCAPP T5-WS-VXP4-M0010-TOE.SV-COMBINED	3/20/2021	03/23/21	03/28/21	3	5	100
BGCAPP T5-WS-VXPFB-M0010-TOE.SV-COMBINED	3/15/2021	03/23/21	03/28/21	8	5	104
BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-COMBINED	03/16/21	03/23/21	03/28/21	7	5	99
MB 140-47958/1-A	---	03/23/21	03/28/21	---	5	94
LCS 140-47958/2-A	---	03/23/21	03/28/21	---	5	98
LCSD 140-47958/3-A	---	03/23/21	03/28/21	---	5	96
Unspeciated Nonvolatile Organics						
BGCAPP T5-ES-VXP1-M0010-TOE.SV-COMBINED	03/16/21	03/23/21	03/30/21	7	7	---
BGCAPP T5-ES-VXP2-M0010-TOE.SV-COMBINED	03/17/21	03/23/21	03/30/21	6	7	---
BGCAPP T5-ES-VXP3-M0010-TOE.SV-COMBINED	03/18/21	03/23/21	03/30/21	5	7	---
BGCAPP T5-ES-VXP4-M0010-TOE.SV-COMBINED	03/20/21	03/23/21	03/30/21	3	7	---
BGCAPP T5-WS-VXP1-M0010-TOE.SV-COMBINED	03/16/21	03/23/21	03/28/21	7	5	---
BGCAPP T5-WS-VXP2-M0010-TOE.SV-COMBINED	03/17/21	03/23/21	03/28/21	6	5	---
BGCAPP T5-WS-VXP3-M0010-TOE.SV-COMBINED	03/18/21	03/23/21	03/28/21	5	5	---
BGCAPP T5-WS-VXP4-M0010-TOE.SV-COMBINED	03/20/21	03/23/21	03/28/21	3	5	---

Table 4–6: Unspeciated Semivolatile and Nonvolatile Organics Holding Time and Surrogate Standard Results (continued)

Sample	Sample Date	Preparation Date	Analysis Date	Collection to Extraction (Days)	Extraction to Analysis (Days)	n-Heptadecane (%)
BGCAPP T5-WS-VXPFB-M0010-TOE.SV-COMBINED	03/15/21	03/23/21	03/28/21	8	5	---
BGCAPP T5-WS-VXPRB1-M0010-TOE.SV-COMBINED	03/16/21	03/23/21	03/28/21	7	5	---
MB 140-47958/1-A	---	03/23/21	03/28/21	---	5	---
LCS 140-47958/2-A	---	03/23/21	03/28/21	---	5	---
LCSD 140-47958/3-A	---	03/23/21	03/28/21	---	5	---
LCSSRM 140-48274/16	---	---	03/30/21	---	---	---
LCDSRM 140-48274/17	---	---	03/30/21	---	---	---
LCSSRM 140-48274/18	---	---	03/30/21	---	---	---
LCDSRM 140-48274/19	---	---	03/30/21	---	---	---

Note:

QAPjP Limits: 14 days from collection to extraction
40 days from extraction to analysis
Recovery = 50 to 150%

Table 4–7: Unspeciated Semivolatile and Nonvolatile Organics LCS/LCSD Results

Sample ID	Concentration (mg)			Recovery (%)		RPD (%)
	True	LCS	LCSD	LCS	LCSD	
Total Chromatographable Organics						
LCS 140-47958/2-A / LCSD 140-47958/3-A	0.225	0.1556	0.1910	69	85	20
Gravimetric Organics						
LCS 140-47958/2-A LCSD 140-47958/3-A	2.51	2.533	2.667	101	106	5
LCSSRM 140-48274/16, LCDSRM 140-48274/17	108	95.80	99.47	89	93	4
LCSSRM 140-48274/18, LCDSRM 140-48274/19	206	190.8	203.7	93	99	7

Note:

QAPjP Limits: Recovery = TCO: 50 to 150%, GRAV: 50 to 150%
RPD = TCO: ≤ 35%, GRAV: ≤ 35%

Table 4–8: Dioxin/Furan Sample Holding Time Summary

Sample Name	Sample Date	Preparation Date	Analysis Date	Collection to Extraction (Days)	Extraction to Analysis (Days)
BGCAPP T5-MPT-VXP1-M0023A-PNR-AD/PNR-TOL/FILT	3/16/21	3/22/21	3/29/21	6	7
BGCAPP T5-MPT-VXP1-M0023A-CR-AD/CR-TOL/XAD	3/16/21	3/22/21	3/30/21	6	8
BGCAPP T5-MPT-VXP2-M0023A-PNR-AD/PNR-TOL/FILT	3/17/21	3/22/21	3/29/21	5	7
BGCAPP T5-MPT-VXP2-M0023A-CR-AD/CR-TOL/XAD	3/17/21	3/22/21	3/30/21	5	8
BGCAPP T5-MPT-VXP3-M0023A-PNR-AD/PNR-TOL/FILT	3/18/21	3/22/21	3/29/21	4	7
BGCAPP T5-MPT-VXP3-M0023A-CR-AD/CR-TOL/XAD	3/18/21	3/22/21	3/30/21	4	8
BGCAPP T5-MPT-VXP4-M0023A-PNR-AD/PNR-TOL/FILT	3/20/21	3/22/21	3/29/21	2	7
BGCAPP T5-MPT-VXP4-M0023A-CR-AD/CR-TOL/XAD	3/20/21	3/22/21	3/30/21	2	8
BGCAPP T5-MPT-VXPFB-M0023A-PNR-AD/PNR-TOL/FILT	3/15/21	3/22/21	3/29/21	7	7
BGCAPP T5-MPT-VXPRB1-M0023A-XAD	3/16/21	3/22/21	3/29/21	6	7
BGCAPP T5-MPT-VXPRB1-M0023A-ACE	3/16/21	3/22/21	3/27/21	6	5
BGCAPP T5-MPT-VXPRB1-M0023A-DCM	3/16/21	3/22/21	3/29/21	6	7
BGCAPP T5-MPT-VXPRB1-M0023A-TOL	3/16/21	3/22/21	3/29/21	6	7
MB 140-47957/12-B	---	3/22/21	3/27/21	---	5
MB 140-47960/9-B	---	3/22/21	3/29/21	---	7
LCS 140-47957/10-B	---	3/22/21	3/27/21	---	5
LCSD 140-47957/11-B	---	3/22/21	3/27/21	---	5
LCS 140-47960/7-B	---	3/22/21	3/29/21	---	7
LCSD 140-47960/8-B	---	3/22/21	3/29/21	---	7

Note:

QAPjP Limits: 30 days from collection to extraction
45 days from extraction to analysis

Table 4–9: Dioxin/Furan Internal and Surrogate Standard Results

	Internal Standards										Surrogates				
	^{13}C-2,3,7,8-TetraCDD	^{13}C-1,2,3,7,8-PentaCDD	^{13}C-1,2,3,6,7,8-HexaCDD	^{13}C-1,2,3,4,6,7,8-HeptaCDD	^{13}C-OctaCDD	^{13}C-2,3,7,8-TetraCDF	^{13}C-1,2,3,7,8-PentaCDF	^{13}C-1,2,3,6,7,8-HexaCDF	^{13}C-1,2,3,4,6,7,8-HeptaCDF	^{13}C-OctaCDF	$^{37}Cl_4$-2,3,7,8-TetraCDD	^{13}C-2,3,4,7,8-PentaCDF	^{13}C-1,2,3,4,7,8-HexaCDF	^{13}C-1,2,3,4,7,8-HexaCDD	^{13}C-1,2,3,4,7,8,9-HeptaCDF
Sample Name	**40 to 135%**										**70 to 130%**				
BGCAPP T5-MPT-VXP1-M0023A-PNR-AD/PNR-TOL/FILT	82	***279***	97	71	63	64	77	85	67	56	---	---	---	---	---
BGCAPP T5-MPT-VXP1-M0023A-CR-AD/CR-TOL/XAD	87	***269***	94	75	69	67	76	86	69	59	79	97	85	82	84
BGCAPP T5-MPT-VXP2-M0023A-PNR-AD/PNR-TOL/FILT	77	***285***	94	68	62	65	78	85	66	55	---	---	---	---	---
BGCAPP T5-MPT-VXP2-M0023A-CR-AD/CR-TOL/XAD	89	***307***	100	77	70	68	80	90	70	60	81	98	82	76	83
BGCAPP T5-MPT-VXP3-M0023A-PNR-AD/PNR-TOL/FILT	88	***309***	97	73	61	69	79	89	68	56	---	---	---	---	---
BGCAPP T5-MPT-VXP3-M0023A-CR-AD/CR-TOL/XAD	85	***277***	93	76	67	64	73	85	69	59	79	99	87	82	84
BGCAPP T5-MPT-VXP4-M0023A-PNR-AD/PNR-TOL/FILT	85	***287***	100	70	62	63	77	88	69	54	---	---	---	---	---
BGCAPP T5-MPT-VXP4-M0023A-CR-AD/CR-TOL/XAD	86	***287***	100	76	70	67	76	88	70	58	79	98	84	76	83

Table 4–9: Dioxin/Furan Internal and Surrogate Standard Results (continued)

	Internal Standards										Surrogates				
Sample Name	^{13}C-2,3,7,8-TetraCDD	^{13}C-1,2,3,7,8-PentaCDD	^{13}C-1,2,3,6,7,8-HexaCDD	^{13}C-1,2,3,4,6,7,8-HeptaCDD	^{13}C-OctaCDD	^{13}C-2,3,7,8-TetraCDF	^{13}C-1,2,3,7,8-PentaCDF	^{13}C-1,2,3,6,7,8-HexaCDF	^{13}C-1,2,3,4,6,7,8-HeptaCDF	^{13}C-OctaCDF	$^{37}Cl_4$-2,3,7,8-TetraCDD	^{13}C-2,3,4,7,8-PentaCDF	^{13}C-1,2,3,4,7,8-HexaCDF	^{13}C-1,2,3,4,7,8-HexaCDD	^{13}C-1,2,3,4,7,8,9-HeptaCDF
	40 to 135%										70 to 130%				
BGCAPP T5-MPT-VXPFB-M0023A-PNR-AD/PNR-TOL/FILT	87	***277***	94	79	74	67	81	93	72	65	---	---	---	---	---
BGCAPP T5-MPT-VXPRB1-M0023A-XAD	96	***309***	108	81	70	72	81	98	75	60	80	100	80	74	84
BGCAPP T5-MPT-VXPRB1-M0023A-ACE	78	***270***	80	79	72	61	70	75	75	61	---	---	---	---	---
BGCAPP T5-MPT-VXPRB1-M0023A-DCM	87	***291***	86	82	76	68	77	82	78	64	---	---	---	---	---
BGCAPP T5-MPT-VXPRB1-M0023A-TOL	87	***286***	83	76	73	68	75	77	77	63	---	---	---	---	---
MB 140-47957/12-B	84	***267***	89	77	78	69	73	81	79	64	---	---	---	---	---
MB 140-47960/9-B	81	***304***	81	75	68	65	72	79	74	59	---	---	---	---	---
LCS 140-47957/10-B	91	***302***	89	82	80	71	80	86	85	72	---	---	---	---	---
LCSD 140-47957/11-B	90	***301***	89	82	79	72	79	86	81	68	---	---	---	---	---
LCS 140-47960/7-B	84	***317***	86	74	69	67	76	87	79	64	---	---	---	---	---
LCSD 140-47960/8-B	75	***294***	89	73	65	62	71	79	74	59	---	---	---	---	---

Table 4–10: Dioxin/Furan LCS/LCSD Results

Spiked Compound	Concentration (picogram [pg])			Recovery (%)		RPD
	True	LCS	LCSD	LCS	LCSD	(%)
Laboratory ID:	LCS 140-47957/10-B / LCSD 140-47957/11-B					
Date Extracted:	03/22/21					
Date Analyzed:	03/27/21					
2,3,7,8-TCDD	600	480.2	495.6	80	83	3
1,2,3,7,8-PeCDD	3,000	1,775	1,865	***59***	***62***	5
1,2,3,4,7,8-HxCDD	3,000	2,511	2,551	84	85	2
1,2,3,6,7,8-HxCDD	3,000	3,082	3,235	103	108	5
1,2,3,7,8,9-HxCDD	3,000	3,089	3,120	103	104	1
1,2,3,4,6,7,8-HpCDD	3,000	2,645	2,700	88	90	2
OCDD	6,000	4,995	5,040	83	84	1
2,3,7,8-TCDF	600	581.4	574.5	97	96	1
1,2,3,7,8-PeCDF	3,000	2,593	2,646	86	88	2
2,3,4,7,8-PeCDF	3,000	2,570	2,660	86	89	3
1,2,3,4,7,8-HxCDF	3,000	2.745	2,715	91	90	1
1,2,3,6,7,8-HxCDF	3,000	3,143	3,114	105	104	1
2,3,4,6,7,8-HxCDF	3,000	2,948	2,955	98	99	0
1,2,3,7,8,9-HxCDF	3,000	2,777	2,784	93	93	0
1,2,3,4,6,7,8-HpCDF	3,000	2.553	2,739	85	91	7
1,2,3,4,7,8,9-HpCDF	3,000	2,365	2,493	79	83	5
OCDF	6,000	5,438	5,591	91	93	3
Laboratory ID:	LCS 140-47960/7-B / LCSD 140-47960/8-B					
Date Extracted:	03/22/21					
Date Analyzed:	03/29/21					
2,3,7,8-TCDD	600	486.3	507.5	81	85	4
1,2,3,7,8-PeCDD	3,000	1,762	1,779	***59***	***59***	1
1,2,3,4,7,8-HxCDD	3,000	2,459	2,300	82	77	7
1,2,3,6,7,8-HxCDD	3,000	3,293	3,066	110	102	7
1,2,3,7,8,9-HxCDD	3,000	3,131	2,796	104	93	11
1,2,3,4,6,7,8-HpCDD	3,000	2,672	2,655	89	88	1
OCDD	6,000	4,908	5,148	82	86	5
2,3,7,8-TCDF	600	553.1	551.4	92	92	0
1,2,3,7,8-PeCDF	3,000	2,641	2,676	88	89	1
2,3,4,7,8-PeCDF	3,000	2,611	2,653	87	88	2
1,2,3,4,7,8-HxCDF	3,000	2,488	2,661	83	89	7
1,2,3,6,7,8-HxCDF	3,000	3,213	3,237	107	108	1
2,3,4,6,7,8-HxCDF	3,000	2,754	2,881	92	96	5

Table 4–10: Dioxin/Furan LCS/LCSD Results (continued)

Spiked Compound	Concentration (pg)			Recovery (%)		RPD
	True	LCS	LCSD	LCS	LCSD	(%)
1,2,3,7,8,9-HxCDF	3,000	2,609	2,708	87	90	4
1,2,3,4,6,7,8-HpCDF	3,000	2,595	2,663	87	89	3
1,2,3,4,7,8,9-HpCDF	3,000	2,495	2,494	83	83	0
OCDF	6,000	5,389	5,671	90	95	5

QAPjP Limits: Recovery = 70 to 130%
RPD = ≤ 35%

Table 4–11: PCB Sample Holding Time Summary

Sample Name	Sample Date	Prep-aration Date	Analysis Date	Collection to Extraction (Days)	Extraction to Analysis (Days)
BGCAPP T5-MPT-VXP1-M0023A+-PNR-AD/PNR-TOL/FILT	03/16/21	03/22/21	03/30/21	6	8
BGCAPP T5-MPT-VXP1-M0023A+-CR-AD/CR-TOL/XAD	03/16/21	03/22/21	03/30/21	6	8
BGCAPP T5-MPT-VXP1-M0023A+-COND/IR-AD	03/16/21	03/23/21	03/26/21	7	3
BGCAPP T5-MPT-VXP2-M0023A+-PNR-AD/PNR-TOL/FILT	03/17/21	03/22/21	03/30/21	5	8
BGCAPP T5-MPT-VXP2-M0023A+-CR-AD/CR-TOL/XAD	03/17/21	03/22/21	03/30/21	5	8
BGCAPP T5-MPT-VXP2-M0023A+-COND/IR-AD	03/17/21	03/23/21	03/26/21	6	3
BGCAPP T5-MPT-VXP3-M0023A+-PNR-AD/PNR-TOL/FILT	03/18/21	03/22/21	03/30/21	4	8
BGCAPP T5-MPT-VXP3-M0023A+-CR-AD/CR-TOL/XAD	03/18/21	03/22/21	03/30/21	4	8
BGCAPP T5-MPT-VXP3-M0023A+-COND/IR-AD	03/18/21	03/23/21	03/26/21	5	3
BGCAPP T5-MPT-VXP4-M0023A+-PNR-AD/PNR-TOL/FILT	03/20/21	03/22/21	03/30/21	2	8
BGCAPP T5-MPT-VXP4-M0023A+-CR-AD/CR-TOL/XAD	03/20/21	03/22/21	03/30/21	2	8
BGCAPP T5-MPT-VXP4-M0023A+-COND/IR-AD	03/20/21	03/23/21	03/26/21	3	3
BGCAPP T5-MPT-VXPFB-M0023A+-PNR-AD/PNR-TOL/FILT	03/15/21	03/22/21	03/29/21	7	7
BGCAPP T5-MPT-VXPFB-M0023A+-CR-AD/CR-TOL/XAD	03/15/21	03/22/21	03/30/21	7	8
BGCAPP T5-MPT-VXPFB-M0023A+-COND/IR-AD	03/15/21	03/23/21	03/26/21	8	3
BGCAPP T5-MPT-VXPRB1-M0023A+-FILT	03/16/21	03/22/21	03/29/21	6	7
BGCAPP T5-MPT-VXPRB1-M0023A+-XAD	03/16/21	03/22/21	03/30/21	6	8
BGCAPP T5-MPT-VXPRB1-M0023A+-ACE	03/16/21	03/22/21	03/29/21	6	7
BGCAPP T5-MPT-VXPRB1-M0023A+-DCM	03/16/21	03/22/21	03/29/21	6	7
MB 140-47963/12-B	---	03/22/21	03/29/21	---	7
MB 140-47965/9-B	---	03/22/21	03/30/21	---	8
MB 140-48029/8-B	---	03/23/21	03/26/21	---	3
LCS 140-47963/10-B	---	03/22/21	03/29/21	---	7
LCSD 140-47963/11-B	---	03/22/21	03/29/21	---	7
LCS 140-47965/7-B	---	03/22/21	03/30/21	---	8
LCSD 140-47965/8-B	---	03/22/21	03/30/21	---	8
LCS 140-48029/6-B	---	03/23/21	03/25/21	---	2
LCSD 140-48029/7-B	---	03/23/21	03/26/21	---	3

Note:

QAPjP Limits: 30 days from collection to extraction
45 days from extraction to analysis

Table 4–12: PCB Internal and Surrogate Standard Results

	Internal Standards																								Surrogates		
Sample Name	PCB-1L	PCB-3L	PCB-4L	PCB-15L	PCB-19L	PCB-37L	PCB-54L	PCB-77L	PCB-81L	PCB-104L	PCB-105L	PCB-114L	PCB-118L	PCB-123L	PCB-126L	PCB-155L	PCB-156L	PCB-157L	PCB-167L	PCB-169L	PCB-170L	PCB-188L	PCB-189L	PCB-202L	PCB-209L	PCB-28L	PCB-111L	PCB-178L
	QC Limit (25-150%)																										
BGCAPP T5-MPT-VXP1-M0023A-PNR-AD/PNR-TOL/FILT	61	58	76	72	81	75	85	81	80	75	87	85	84	82	82	94	85	85	85	89	82	91	75	109	94	83	91	97
BGCAPP T5-MPT-VXP1-M0023A-CR-AD/CR-TOL/XAD	62	57	76	70	78	74	89	77	76	79	87	86	85	83	81	94	85	85	86	88	82	88	75	107	91	81	91	94
BGCAPP T5-MPT-VXP1-M0023A-COND/IR-AD	72	67	82	71	83	72	98	76	74	85	90	92	90	88	81	99	87	87	85	90	87	91	78	105	81	88	91	95
BGCAPP T5-MPT-VXP2-M0023A-PNR-AD/PNR-TOL/FILT	65	60	81	76	85	77	88	82	80	77	87	87	85	82	82	98	87	87	86	91	83	88	75	107	94	83	91	95
BGCAPP T5-MPT-VXP2-M0023A-CR-AD/CR-TOL/XAD	62	58	77	74	79	73	87	75	75	76	84	85	82	81	80	91	83	83	82	88	79	86	74	103	92	81	88	93
BGCAPP T5-MPT-VXP2-M0023A-COND/IR-AD	72	67	82	71	83	72	98	76	74	85	90	92	90	88	81	99	87	87	85	90	87	91	78	105	81	88	91	95
BGCAPP T5-MPT-VXP3-M0023A-PNR-AD/PNR-TOL/FILT	61	59	78	73	80	74	86	80	78	75	89	85	85	83	81	92	84	84	85	89	81	87	74	105	92	82	90	93
BGCAPP T5-MPT-VXP3-M0023A-CR-AD/CR-TOL/XAD	60	59	77	72	84	74	83	79	77	78	85	85	82	82	80	93	83	83	84	87	80	89	74	106	92	81	91	92
BGCAPP T5-MPT-VXP3-M0023A-COND/IR-AD	67	61	74	66	85	70	97	75	73	78	86	84	83	82	78	91	82	82	81	83	81	85	77	99	78	87	90	93
BGCAPP T5-MPT-VXP4-M0023A-PNR-AD/PNR-TOL/FILT	61	57	78	74	78	76	88	80	79	74	86	85	83	84	82	93	86	86	86	90	81	86	74	103	91	84	90	94
BGCAPP T5-MPT-VXP4-M0023A-CR-AD/CR-TOL/XAD	61	58	77	73	78	73	87	78	75	78	85	86	83	81	79	92	82	82	83	86	80	88	72	107	90	84	91	97
BGCAPP T5-MPT-VXP4-M0023A-COND/IR-AD	70	65	80	70	86	71	100	78	74	80	90	87	84	83	79	96	85	85	85	86	81	89	77	102	81	84	90	93
BGCAPP T5-MPT-VXPFB-M0023A-PNR-AD/PNR-TOL/FILT	65	59	76	72	81	74	79	76	75	75	85	83	84	82	78	88	84	84	85	86	81	83	74	98	90	85	89	94
BGCAPP T5-MPT-VXPFB-M0023A-CR-AD/CR-TOL/XAD	60	56	76	71	78	71	82	78	75	76	88	87	86	84	82	93	82	82	83	85	83	91	73	107	93	81	91	98
BGCAPP T5-MPT-VXPFB-M0023A-COND/IR-AD	74	68	82	76	83	74	97	77	76	84	93	92	91	89	85	98	90	90	89	92	89	93	83	112	84	87	92	98
BGCAPP T5-MPT-VXPRB1-M0023A-FILT	68	65	81	69	84	74	82	76	77	76	86	84	84	83	81	91	82	82	84	85	81	85	79	101	93	85	91	94
BGCAPP T5-MPT-VXPRB1-M0023A-XAD	60	56	76	68	80	72	90	76	72	75	84	82	81	80	78	91	82	82	82	86	80	87	71	105	88	83	88	95
BGCAPP T5-MPT-VXPRB1-M0023A-ACE	68	65	80	73	83	75	83	75	74	83	88	85	86	85	82	93	86	86	87	89	82	86	78	104	93	86	92	98
BGCAPP T5-MPT-VXPRB1-M0023A-DCM	69	64	79	72	87	76	89	81	78	76	83	83	82	79	76	92	83	83	82	88	83	87	76	103	92	84	93	97
MB 140-47963/12-B	69	65	78	73	91	78	87	83	84	80	85	85	83	83	83	98	85	85	84	89	83	86	76	103	91	90	95	99
MB 140-47965/9-B	64	61	80	74	84	76	92	79	78	77	87	87	85	83	81	92	86	86	85	90	81	87	73	105	94	86	90	92
MB 140-48029/8-B	71	67	80	72	83	74	98	74	74	78	88	85	86	85	80	93	85	85	83	87	86	88	78	106	79	88	90	97
LCS 140-47963/10-B	68	67	80	80	88	80	91	81	77	79	90	84	85	83	84	97	82	82	84	88	82	87	78	104	91	87	93	98
LCSD 140-47963/11-B	73	73	81	82	80	81	80	87	83	72	87	82	80	80	80	86	82	82	83	88	79	83	77	97	85	86	98	96
LCS 140-47965/7-B	71	66	79	75	84	74	76	76	75	79	85	85	84	82	80	87	83	83	82	86	82	90	76	102	87	84	91	97
LCSD 140-47965/8-B	64	63	75	74	81	75	79	75	75	77	84	83	83	82	77	88	82	82	82	84	78	87	74	99	86	83	89	93
LCS 140-48029/6-B	75	72	82	68	78	71	96	74	71	77	87	83	81	81	79	98	81	81	80	82	84	88	77	104	88	84	91	93
LCSD 140-48029/7-B	72	69	76	73	78	70	91	72	71	73	82	81	80	79	76	91	82	82	81	85	81	83	76	99	77	86	87	93

Table 4–13: PCB LCS/LCSD Results

Spiked Compound	Concentration (ng)			Recovery (%)		RPD
	True	LCS	LCSD	LCS	LCSD	(%)
Laboratory ID:	LCS 140-47963/10-B / LCSD 140-47963/11-B					
Date Extracted:	03/22/21					
Date Analyzed:	03/29/21					
3,3',4,4'-TetraCB (PCB-77)	15	14.41	14.65	96	98	2
3,4,4',5-TetraCB (PCB-81)	15	13.50	14.43	90	96	7
2,3,3',4,4'-PentaCB (PCB-105)	15	15.12	15.09	101	101	0
2,3,4,4',5-PentaCB (PCB-114)	15	15.89	16.68	106	111	5
2,3',4,4',5-PentaCB (PCB-118)	15	15.25	15.78	102	105	3
2',3,4,4',5-PentaCB (PCB-123)	15	16.76	16.13	112	108	4
3,3',4,4',5-PentaCB (PCB-126)	15	15.85	16.13	106	108	2
2,3,3',4,4',5-HexaCB (PCB-156)	30	31.41	31.60	105	105	1
2,3,3',4,4',5'-HexaCB (PCB-157)	30	31.41	31.60	105	105	1
2,3',4,4',5,5'-HexaCB (PCB-167)	15	16.07	16.16	107	108	1
3,3',4,4',5,5'-HexaCB (PCB-169)	15	14.42	15.17	96	101	5
2,3,3',4,4',5,5'-HeptaCB (PCB-189)	15	15.54	16.05	104	107	3
Laboratory ID:	LCS 140-47965/7-B / LCSD 140-47965/8-B					
Date Extracted:	03/22/21					
Date Analyzed:	03/30/21					
3,3',4,4'-TetraCB (PCB-77)	15	14.62	14.79	97	99	1
3,4,4',5-TetraCB (PCB-81)	15	14.33	13.90	96	93	3
2,3,3',4,4'-PentaCB (PCB-105)	15	14.94	15.17	100	101	2
2,3,4,4',5-PentaCB (PCB-114)	15	16.29	16.34	109	109	0
2,3',4,4',5-PentaCB (PCB-118)	15	14.86	14.91	99	99	0
2',3,4,4',5-PentaCB (PCB-123)	15	17.63	16.11	118	107	9
3,3',4,4',5-PentaCB (PCB-126)	15	15.97	15.48	106	103	3
2,3,3',4,4',5-HexaCB (PCB-156)	30	31.66	31.67	106	106	0
2,3,3',4,4',5'-HexaCB (PCB-157)	30	31.66	31.67	106	106	0
2,3',4,4',5,5'-HexaCB (PCB-167)	15	15.96	16.13	106	108	1
3,3',4,4',5,5'-HexaCB (PCB-169)	15	14.58	14.60	97	97	0
2,3,3',4,4',5,5'-HeptaCB (PCB-189)	15	15.81	15.73	105	105	1

Table 4–13: PCB LCS/LCSD Results (continued)

Spiked Compound	Concentration (ng)			Recovery (%)		RPD
	True	LCS	LCSD	LCS	LCSD	(%)
Laboratory ID:	LCS 140-48029/6-B / LCSD 140-48029/7-B					
Date Extracted:	03/23/21					
Date Analyzed:	03/25/21					
3,3',4,4'-TetraCB (PCB-77)	10	9.90	9.83	99	98	1
3,4,4',5-TetraCB (PCB-81)	10	9.10	9.01	91	90	1
2,3,3',4,4'-PentaCB (PCB-105)	10	10.47	10.46	105	105	0
2,3,4,4',5-PentaCB (PCB-114)	10	11.35	11.17	114	112	2
2,3',4,4',5-PentaCB (PCB-118)	10	11.07	10.90	111	109	1
2',3,4,4',5-PentaCB (PCB-123)	10	11.91	11.93	119	119	0
3,3',4,4',5-PentaCB (PCB-126)	10	11.24	11.20	112	112	0
2,3,3',4,4',5-HexaCB (PCB-156)	20	20.22	20.72	101	104	2
2,3,3',4,4',5'-HexaCB (PCB-157)	20	20.22	20.72	101	104	2
2,3',4,4',5,5'-HexaCB (PCB-167)	10	10.28	10.49	103	105	2
3,3',4,4',5,5'-HexaCB (PCB-169)	10	9.55	9.53	96	95	0
2,3,3',4,4',5,5'-HeptaCB (PCB-189)	10	10.53	10.32	105	103	2

Note:

QAPjP Limits: Recovery = 60 to 135%
RPD = ≤ 35%

Table 4–14: PAH Sample Holding Time Summary

Sample Name	Sample Date	Preparation Date	Analysis Date	Collection to Extraction (Days)	Extraction to Analysis (Days)
BGCAPP T5-MPT-VXP1-M0023A+-PNR-AD/PNR-TOL/FILT	03/16/21	03/22/21	03/26/21	6	4
BGCAPP T5-MPT-VXP1-M0023A+-CR-AD/CR-TOL/XAD	03/16/21	03/22/21	03/26/21	6	4
BGCAPP T5-MPT-VXP1-M0023A+-COND/IR-AD	03/16/21	03/23/21	03/25/21	7	2
BGCAPP T5-MPT-VXP2-M0023A+-PNR-AD/PNR-TOL/FILT	03/17/21	03/22/21	03/26/21	5	4
BGCAPP T5-MPT-VXP2-M0023A+-CR-AD/CR-TOL/XAD	03/17/21	03/22/21	03/26/21	5	4
BGCAPP T5-MPT-VXP2-M0023A+-COND/IR-AD	03/17/21	03/23/21	03/25/21	6	2
BGCAPP T5-MPT-VXP3-M0023A+-PNR-AD/PNR-TOL/FILT	03/18/21	03/22/21	03/26/21	4	4
BGCAPP T5-MPT-VXP3-M0023A+-CR-AD/CR-TOL/XAD	03/18/21	03/22/21	03/26/21	4	4
BGCAPP T5-MPT-VXP3-M0023A+-COND/IR-AD	03/18/21	03/23/21	03/25/21	5	2
BGCAPP T5-MPT-VXP4-M0023A+-PNR-AD/PNR-TOL/FILT	03/20/21	03/22/21	03/26/21	2	4
BGCAPP T5-MPT-VXP4-M0023A+-CR-AD/CR-TOL/XAD	03/20/21	03/22/21	03/26/21	2	4
BGCAPP T5-MPT-VXP4-M0023A+-COND/IR-AD	03/20/21	03/23/21	03/25/21	3	2
BGCAPP T5-MPT-VXPFB-M0023A+-PNR-AD/PNR-TOL/FILT	03/15/21	03/22/21	03/26/21	7	4
BGCAPP T5-MPT-VXPFB-M0023A+-CR-AD/CR-TOL/XAD	03/15/21	03/22/21	03/26/21	7	4
BGCAPP T5-MPT-VXPFB-M0023A+-COND/IR-AD	03/15/21	03/23/21	03/25/21	8	2
BGCAPP T5-MPT-VXPRB1-M0023A+-FILT	03/16/21	03/22/21	03/26/21	6	4
BGCAPP T5-MPT-VXPRB1-M0023A+-XAD	03/16/21	03/22/21	03/26/21	6	4
BGCAPP T5-MPT-VXPRB1-M0023A+-ACE	03/16/21	03/22/21	03/26/21	6	4
BGCAPP T5-MPT-VXPRB1-M0023A+-DCM	03/16/21	03/22/21	03/26/21	6	4
MB 140-47971/12-B	---	03/22/21	03/26/21	---	4
MB 140-47972/9-B	---	03/22/21	03/26/21	---	4
MB 140-48032/8-B	---	03/23/21	03/25/21	---	2

Table 4–14: PAH Sample Holding Time Summary (continued)

Sample Name	Sample Date	Preparation Date	Analysis Date	Collection to Extraction (Days)	Extraction to Analysis (Days)
LCS 140-47971/10-B	---	03/22/21	03/26/21	---	4
LCSD 140-47971/11-B	---	03/22/21	03/26/21	---	4
LCS 140-47972/7-B	---	03/22/21	03/26/21	---	4
LCSD 140-47972/8-B	---	03/22/21	03/26/21	---	4
LCS 140-48032/6-B	---	03/23/21	03/25/21	---	2
LCSD 140-48032/7-B	---	03/23/21	03/25/21	---	2

Note:

QAPjP Limit: 14 days from collection to extraction and 40 days from extraction to analysis

Table 4–15: PAH Internal Standard and Surrogate Results

	Internal Standard															Surrogate
	Naphthalene-d_8	2-methylnaphthalene-d_{10}	Acenaphthylene-d_8	Fluorene -d10	Phenanthrene-d10	Anthracene-d10	Fluoranthene-d10	Chrysene-d12	Benzo(b)fluoranthene-d12	Benzo(k)fluoranthene-d12	Benzo(a)pyrene-d12	Perylene-d12	Dibenz(a,h)anthracene-d14	Indeno[1,2,3-cd]pyrene-d12	Benzo(ghi)perylene-d12	$^{13}C_6$-Naphthalene
	QC Limit (%															
Sample Name	30-120															50-150
BGCAPP T5-MPT-VXP1-M0023A-PNR-AD/PNR-TOL/FILT	78	80	85	81	69	70	88	92	98	90	101	85	102	99	94	---
BGCAPP T5-MPT-VXP1-M0023A-CR-AD/CR-TOL/XAD	74	79	88	81	65	63	85	87	95	88	83	69	102	95	87	95
BGCAPP T5-MPT-VXP1-M0023A-COND/IR-AD	86	88	95	87	82	83	94	92	102	92	102	91	102	100	97	---
BGCAPP T5-MPT-VXP2-M0023A-PNR-AD/PNR-TOL/FILT	78	81	86	80	67	69	88	93	97	91	100	86	106	103	96	---
BGCAPP T5-MPT-VXP2-M0023A-CR-AD/CR-TOL/XAD	67	70	76	75	62	60	80	82	93	84	89	72	98	92	84	97
BGCAPP T5-MPT-VXP2-M0023A-COND/IR-AD	86	87	94	86	82	84	94	95	94	97	93	86	101	99	93	---
BGCAPP T5-MPT-VXP3-M0023A-PNR-AD/PNR-TOL/FILT	78	77	86	77	65	67	86	89	93	88	94	82	102	98	92	---
BGCAPP T5-MPT-VXP3-M0023A-CR-AD/CR-TOL/XAD	80	84	99	87	71	74	89	88	99	88	95	78	103	97	89	94
BGCAPP T5-MPT-VXP3-M0023A-COND/IR-AD	78	79	85	81	76	77	90	90	98	91	100	85	99	97	91	---
BGCAPP T5-MPT-VXP4-M0023A-PNR-AD/PNR-TOL/FILT	78	81	87	83	67	66	87	90	94	89	95	83	103	100	91	---
BGCAPP T5-MPT-VXP4-M0023A-CR-AD/CR-TOL/XAD	75	79	81	79	65	68	83	85	94	84	87	70	98	92	83	94
BGCAPP T5-MPT-VXP4-M0023A-COND/IR-AD	89	91	94	91	80	84	94	97	98	96	96	87	100	98	95	---
BGCAPP T5-MPT-VXPFB-M0023A-PNR-AD/PNR-TOL/FILT	69	72	81	73	62	64	81	87	91	87	95	80	98	96	88	---
BGCAPP T5-MPT-VXPFB-M0023A-CR-AD/CR-TOL/XAD	76	78	88	80	64	70	84	85	97	86	98	82	102	98	91	94
BGCAPP T5-MPT-VXPFB-M0023A-COND/IR-AD	82	84	89	85	80	84	94	95	100	94	98	88	100	99	94	---
BGCAPP T5-MPT-VXPRB1-M0023A-FILT	76	81	95	81	66	71	86	94	96	92	96	85	99	97	89	---
BGCAPP T5-MPT-VXPRB1-M0023A-XAD	76	81	98	81	66	73	84	89	98	86	97	81	100	97	90	95
BGCAPP T5-MPT-VXPRB1-M0023A-ACE	77	78	87	77	70	75	84	90	91	89	88	81	93	92	89	---
BGCAPP T5-MPT-VXPRB1-M0023A-DCM	82	84	92	82	75	77	87	91	91	89	88	81	93	92	88	---
MB 140-47971/12-B	83	84	87	83	75	75	86	92	92	89	89	81	89	88	83	---
MB 140-47972/9-B	84	86	95	85	76	79	88	94	92	92	92	83	95	94	88	---
MB 140-48032/8-B	84	84	95	89	83	85	95	95	102	93	96	87	97	96	92	---
LCS 140-47971/10-B	79	81	79	80	72	72	85	91	97	87	90	84	91	90	86	---
LCSD 140-47971/11-B	77	79	78	78	71	71	84	89	87	91	88	82	91	91	88	---
LCS 140-47972/7-B	80	83	90	84	74	76	87	87	94	89	96	85	97	94	89	---
LCSD 140-47972/8-B	82	84	91	83	74	76	87	89	91	94	95	84	96	94	89	---
LCS 140-48032/6-B	83	85	96	90	83	83	95	96	94	98	100	91	98	96	92	---
LCSD 140-48032/7-B	81	84	94	88	80	80	92	92	92	96	97	89	95	94	90	---

Note: 13C6-Naphthalene is a field surrogate that is only added to the resin trap. As such, only back-half sample fractions have a recovery reported for this surrogate.

Table 4–16: PAH LCS/LCSD Results

Laboratory ID:	LCS 140-47971/10-B / LCSD 140-47971/11-B
Date Extracted:	03/22/21
Date Analyzed:	03/26/21

Spiked Compound	Concentration (µg)			Recovery (%)		RPD	QC Limits (%)		
	True	LCS	LCSD	LCS	LCSD	(%)	Recovery		RPD
Acenaphthene	750	786.0	776.3	105	104	1	60 - 140		25
Acenaphthylene	750	726.7	724.6	97	97	0	60 - 140		25
Anthracene	750	749.3	764.5	100	102	2	60 - 140		25
Benzo[a]anthracene	750	783.0	768.5	104	102	2	60 - 140		25
Benzo[a]pyrene	750	726.4	724.7	97	97	0	60 - 140		25
Benzo[b]fluoranthene	750	672.9	740.3	90	99	10	60 - 140		25
Benzo[e]pyrene	750	743.8	746.6	99	100	0	60 - 140		25
Benzo[g,h,i]perylene	750	752.8	730.3	100	97	3	60 - 140		25
Benzo[k]fluoranthene	750	759.9	715.8	101	95	6	60 - 140		25
Chrysene	750	729.5	749.8	97	100	3	60 - 140		25
Dibenz(a,h)anthracene	750	705.0	697.6	94	93	1	60 - 140		25
Fluoranthene	750	732.0	732.9	98	98	0	60 - 140		25
Fluorene	750	764.4	758.2	102	101	1	60 - 140		25
2-Methylnaphthalene	750	774.7	783.7	103	104	1	60 - 140		25
Indeno[1,2,3-cd]pyrene	750	739.2	707.6	99	94	4	60 - 140		25
Perylene	750	876.8	876.3	117	117	0	60 - 140		25
Phenanthrene	750	751.0	754.0	100	101	0	60 - 140		25
Pyrene	750	744.6	744.7	99	99	0	60 - 140		25

Table 4–16: PAH LCS/LCSD Results (continued)

Laboratory ID:	LCS 140-47972/7-B / LCSD 140-47972/8-B
Date Extracted:	03/22/21
Date Analyzed:	03/26/21

Spiked Compound	Concentration (µg)			Recovery (%)		RPD	QC Limits (%)				
	True	LCS	LCSD	LCS	LCSD	(%)	Recovery				RPD
Acenaphthene	750	715.3	700.3	95	93	2	60	-	140		25
Acenaphthylene	750	731.1	723.7	97	96	1	60	-	140		25
Anthracene	750	741.7	737.8	99	98	1	60	-	140		25
Benzo[a]anthracene	750	823.6	802.4	110	107	3	60	-	140		25
Benzo[a]pyrene	750	713.2	703.8	95	94	1	60	-	140		25
Benzo[b]fluoranthene	750	739.5	716.7	99	96	3	60	-	140		25
Benzo[e]pyrene	750	681.1	697.7	91	93	2	60	-	140		25
Benzo[g,h,i]perylene	750	724.8	719.9	97	96	1	60	-	140		25
Benzo[k]fluoranthene	750	708.0	705.3	94	94	0	60	-	140		25
Chrysene	750	768.4	730.1	102	97	5	60	-	140		25
Dibenz(a,h)anthracene	750	677.7	672.4	90	90	1	60	-	140		25
Fluoranthene	750	722.7	715.9	96	95	1	60	-	140		25
Fluorene	750	760.4	757.5	101	101	0	60	-	140		25
2-Methylnaphthalene	750	780.9	785.6	104	105	1	60	-	140		25
Indeno[1,2,3-cd]pyrene	750	704.9	704.1	94	94	0	60	-	140		25
Perylene	750	761.1	838.8	101	112	10	60	-	140		25
Phenanthrene	750	758.5	752.5	101	100	1	60	-	140		25
Pyrene	750	732.9	729.2	98	97	1	60	-	140		25

Table 4–16: PAH LCS/LCSD Results (continued)

Laboratory ID:	LCS 140-48032/6-B / LCSD 140-48032/7-B
Date Extracted:	03/23/21
Date Analyzed:	03/25/21

Spiked Compound	Concentration (µg)			Recovery (%)		RPD	QC Limits (%)				
	True	LCS	LCSD	LCS	LCSD	(%)	Recovery				RPD
Acenaphthene	500	451.3	442.4	90	88	2	60	-	140		25
Acenaphthylene	500	451.7	439.3	90	88	3	60	-	140		25
Anthracene	500	476.9	471.2	95	94	1	60	-	140		25
Benzo[a]anthracene	500	510.6	499.0	102	100	2	60	-	140		25
Benzo[a]pyrene	500	449.0	443.4	90	89	1	60	-	140		25
Benzo[b]fluoranthene	500	466.7	455.6	93	91	2	60	-	140		25
Benzo[e]pyrene	500	437.2	429.9	87	86	2	60	-	140		25
Benzo[g,h,i]perylene	500	471.5	457.4	94	91	3	60	-	140		25
Benzo[k]fluoranthene	500	449.4	442.7	90	89	1	60	-	140		25
Chrysene	500	465.2	453.7	93	91	3	60	-	140		25
Dibenz(a,h)anthracene	500	434.1	429.3	87	86	1	60	-	140		25
Fluoranthene	500	457.9	447.3	92	89	2	60	-	140		25
Fluorene	500	484.3	472.2	97	94	3	60	-	140		25
2-Methylnaphthalene	500	504.6	489.5	101	98	3	60	-	140		25
Indeno[1,2,3-cd]pyrene	500	456.1	444.3	91	89	3	60	-	140		25
Perylene	500	480.6	473.2	96	95	2	60	-	140		25
Phenanthrene	500	474.8	468.2	95	94	1	60	-	140		25
Pyrene	500	463.0	454.1	93	91	2	60	-	140		25

Table 4–17: Volatile Holding Time Summary and Surrogate Results

Sample Name	Sample Date	Analysis Date	Collection to Analysis (Days)	Surrogate			
				Dibromofluoromethane	1,2-Dichloroethane-d_4	Toluene-d_8	4-Bromofluorobenzene
			Sorbent QC Limits (%):	50-134	50-127	57-134	50-122
BGCAPP T5-ES-VXP1-M0031-TA-1/TB-1	03/16/21	03/25/21	9	122	93	104	89
BGCAPP T5-ES-VXP1-M0031-TC-1	03/16/21	03/25/21	9	121	98	112	101
BGCAPP T5-ES-VXP1-M0031-TA-2/TB-2	03/16/21	03/25/21	9	112	92	102	87
BGCAPP T5-ES-VXP1-M0031-TC-2	03/16/21	03/25/21	9	109	91	105	91
BGCAPP T5-ES-VXP1-M0031-TA-3/TB-3	03/16/21	03/25/21	9	112	90	108	88
BGCAPP T5-ES-VXP1-M0031-TC-3	03/16/21	03/25/21	9	119	98	114	93
BGCAPP T5-ES-VXP1-M0031-TA-4/TB-4	03/16/21	03/25/21	9	111	90	108	91
BGCAPP T5-ES-VXP1-M0031-TC-4	03/16/21	03/25/21	9	110	92	106	92
BGCAPP T5-ES-VXP2-M0031-TA-1/TB-1	03/17/21	03/25/21	8	121	93	109	92
BGCAPP T5-ES-VXP2-M0031-TC-1	03/17/21	03/25/21	8	109	93	101	83
BGCAPP T5-ES-VXP2-M0031-TA-2/TB-2	03/17/21	03/25/21	8	113	91	106	90
BGCAPP T5-ES-VXP2-M0031-TC-2	03/17/21	03/25/21	8	110	94	102	91
BGCAPP T5-ES-VXP2-M0031-TA-3/TB-3	03/17/21	03/25/21	8	116	96	108	92
BGCAPP T5-ES-VXP2-M0031-TC-3	03/17/21	03/25/21	8	118	98	109	95
BGCAPP T5-ES-VXP2-M0031-TA-4/TB-4	03/17/21	03/25/21	8	111	91	107	89
BGCAPP T5-ES-VXP2-M0031-TC-4	03/17/21	03/25/21	8	113	96	107	92
BGCAPP T5-ES-VXP3-M0031-TA-1/TB-1	03/18/21	03/25/21	7	114	89	103	83
BGCAPP T5-ES-VXP3-M0031-TC-1	03/18/21	03/25/21	7	113	96	107	93
BGCAPP T5-ES-VXP3-M0031-TA-2/TB-2	03/18/21	03/25/21	7	114	100	105	92
BGCAPP T5-ES-VXP3-M0031-TC-2	03/18/21	03/25/21	7	109	95	103	87
BGCAPP T5-ES-VXP3-M0031-TA-3/TB-3	03/18/21	03/26/21	8	108	89	106	87
BGCAPP T5-ES-VXP3-M0031-TC-3	03/18/21	03/26/21	8	106	85	106	87
BGCAPP T5-ES-VXP3-M0031-TA-4/TB-4	03/18/21	03/26/21	8	105	83	106	83
BGCAPP T5-ES-VXP3-M0031-TC-4	03/18/21	03/26/21	8	105	88	106	90

Table 4–17: Volatile Holding Time Summary and Surrogate Results (continued)

Sample Name	Sample Date	Analysis Date	Collection to Analysis (Days)	Surrogate			
				Dibromofluoromethane	1,2-Dichloroethane-d_4	Toluene-d_8	4-Bromofluorobenzene
			Sorbent QC Limits (%):	50-134	50-127	57-134	50-122
BGCAPP T5-ES-VXP4-M0031-TA-1/TB-1	03/20/21	03/26/21	6	105	85	106	85
BGCAPP T5-ES-VXP4-M0031-TC-1	03/20/21	03/26/21	6	106	87	110	91
BGCAPP T5-ES-VXP4-M0031-TA-2/TB-2	03/20/21	03/26/21	6	102	83	105	83
BGCAPP T5-ES-VXP4-M0031-TC-2	03/20/21	03/26/21	6	102	84	102	82
BGCAPP T5-ES-VXP4-M0031-TA-3/TB-3	03/20/21	03/27/21	7	108	89	103	89
BGCAPP T5-ES-VXP4-M0031-TC-3	03/20/21	03/27/21	7	102	82	106	88
BGCAPP T5-ES-VXP4-M0031-TA-4/TB-4	03/20/21	03/27/21	7	109	88	107	90
BGCAPP T5-ES-VXP4-M0031-TC-4	03/20/21	03/27/21	7	106	88	107	90
BGCAPP T5-ES-VXP1-M0031-TA-BK/TB-BK	03/16/21	03/23/21	7	105	85	106	89
BGCAPP T5-ES-VXP1-M0031-TC-BK	03/16/21	03/23/21	7	106	88	106	92
BGCAPP T5-ES-VXP2-M0031-TA-BK/TB-BK	03/17/21	03/23/21	6	103	84	103	89
BGCAPP T5-ES-VXP2-M0031-TC-BK	03/17/21	03/23/21	6	104	86	104	90
BGCAPP T5-ES-VXP3-M0031-TA-BK/TB-BK	03/18/21	03/23/21	5	99	79	99	82
BGCAPP T5-ES-VXP3-M0031-TC-BK	03/18/21	03/23/21	5	104	83	104	83
BGCAPP T5-ES-VXP4-M0031-TA-BK/TB-BK	03/20/21	03/23/21	3	103	84	104	88
BGCAPP T5-ES-VXP4-M0031-TC-BK	03/20/21	03/23/21	3	108	88	106	94
BGCAPP T5-ES-VXPTB1-M0031-TA-BK/TB-BK	03/20/21	03/23/21	3	105	86	102	89
BGCAPP T5-ES-VXPTB1-M0031-TC-BK	03/20/21	03/23/21	3	104	86	102	91

Table 4–17: Volatile Holding Time Summary and Surrogate Results (continued)

Sample Name	Sample Date	Analysis Date	Collection to Analysis (Days)	Surrogate			
				Dibromofluoromethane	1,2-Dichloroethane-d_4	Toluene-d_8	4-Bromofluorobenzene
			Sorbent QC Limits (%):	50-134	50-127	57-134	50-122
BGCAPP T5-WS-VXP1-M0031-TA-1/TB-1	03/16/21	03/24/21	8	107	89	108	91
BGCAPP T5-WS-VXP1-M0031-TC-1	03/16/21	03/24/21	8	109	89	105	91
BGCAPP T5-WS-VXP1-M0031-TA-2/TB-2	03/16/21	03/24/21	8	108	88	107	93
BGCAPP T5-WS-VXP1-M0031-TC-2	03/16/21	03/24/21	8	112	95	107	92
BGCAPP T5-WS-VXP1-M0031-TA-3/TB-3	03/16/21	03/24/21	8	110	89	108	89
BGCAPP T5-WS-VXP1-M0031-TC-3	03/16/21	03/24/21	8	107	87	109	90
BGCAPP T5-WS-VXP1-M0031-TA-4/TB-4	03/16/21	03/24/21	8	108	90	105	90
BGCAPP T5-WS-VXP1-M0031-TC-4	03/16/21	03/24/21	8	110	91	107	92
BGCAPP T5-WS-VXP2-M0031-TA-1/TB-1	03/17/21	03/24/21	7	106	89	106	88
BGCAPP T5-WS-VXP2-M0031-TC-1	03/17/21	03/24/21	7	110	90	107	91
BGCAPP T5-WS-VXP2-M0031-TA-2/TB-2	03/17/21	03/24/21	7	105	87	104	87
BGCAPP T5-WS-VXP2-M0031-TC-2	03/17/21	03/24/21	7	107	87	107	90
BGCAPP T5-WS-VXP2-M0031-TA-3/TB-3	03/17/21	03/24/21	7	104	84	103	81
BGCAPP T5-WS-VXP2-M0031-TC-3	03/17/21	03/24/21	7	105	86	105	89
BGCAPP T5-WS-VXP2-M0031-TA-4/TB-4	03/17/21	03/24/21	7	107	90	107	90
BGCAPP T5-WS-VXP2-M0031-TC-4	03/17/21	03/24/21	7	90	67	108	84
BGCAPP T5-WS-VXP3-M0031-TA-1/TB-1	03/18/21	03/24/21	6	110	91	109	88
BGCAPP T5-WS-VXP3-M0031-TC-1	03/18/21	03/24/21	6	109	89	109	90
BGCAPP T5-WS-VXP3-M0031-TA-2/TB-2	03/18/21	03/24/21	6	107	91	105	89
BGCAPP T5-WS-VXP3-M0031-TC-2	03/18/21	03/24/21	6	104	87	105	86
BGCAPP T5-WS-VXP3-M0031-TA-3/TB-3	03/18/21	03/26/21	8	99	80	102	82
BGCAPP T5-WS-VXP3-M0031-TC-3	03/18/21	03/26/21	8	112	90	113	94
BGCAPP T5-WS-VXP3-M0031-TA-4/TB-4	03/18/21	03/26/21	8	98	80	103	86

Table 4–17: Volatile Holding Time Summary and Surrogate Results (continued)

Sample Name	Sample Date	Analysis Date	Collection to Analysis (Days)	Surrogate			
				Dibromofluoromethane	1,2-Dichloroethane-d_4	Toluene-d_8	4-Bromofluorobenzene
			Sorbent QC Limits (%):	50-134	50-127	57-134	50-122
BGCAPP T5-WS-VXP4-M0031-TA-1/TB-1	03/20/21	03/26/21	6	100	80	102	83
BGCAPP T5-WS-VXP4-M0031-TC-1	03/20/21	03/26/21	6	103	86	105	88
BGCAPP T5-WS-VXP4-M0031-TA-2/TB-2	03/20/21	03/26/21	6	107	88	109	92
BGCAPP T5-WS-VXP4-M0031-TC-2	03/20/21	03/26/21	6	106	88	106	90
BGCAPP T5-WS-VXP4-M0031-TA-3/TB-3	03/20/21	03/26/21	6	103	83	107	87
BGCAPP T5-WS-VXP4-M0031-TC-3	03/20/21	03/26/21	6	110	92	110	94
BGCAPP T5-WS-VXP4-M0031-TA-4/TB-4	03/20/21	03/26/21	6	107	88	107	92
BGCAPP T5-WS-VXP4-M0031-TC-4	03/20/21	03/26/21	6	106	89	108	89
BGCAPP T5-WS-VXP1-M0031-TA-BK/TB-BK	03/16/21	03/23/21	7	108	87	105	90
BGCAPP T5-WS-VXP1-M0031-TC-BK	03/16/21	03/23/21	7	112	94	108	92
BGCAPP T5-WS-VXP2-M0031-TA-BK/TB-BK	03/17/21	03/23/21	6	100	79	100	82
BGCAPP T5-WS-VXP2-M0031-TC-BK	03/17/21	03/23/21	6	106	84	106	90
BGCAPP T5-WS-VXP3-M0031-TA-BK/TB-BK	03/18/21	03/23/21	5	107	87	107	91
BGCAPP T5-WS-VXP3-M0031-TC-BK	03/18/21	03/23/21	5	107	89	109	92
BGCAPP T5-WS-VXP4-M0031-TA-BK/TB-BK	03/20/21	03/23/21	3	110	90	106	94
BGCAPP T5-WS-VXP4-M0031-TC-BK	03/20/21	03/23/21	3	113	95	111	96
MB 140-48012/7	---	03/23/21	---	105	87	103	91
MB 140-48054/6	---	03/24/21	---	111	93	106	93
MB 140-48107/6	---	03/25/21	---	113	98	106	93
MB 140-48144/6	---	03/26/21	---	103	86	102	86
MB 140-48167/6	---	03/27/21	---	106	90	102	89
MB 140-48225/1-A	---	03/28/21	---	106	98	99	98

Table 4–17: Volatile Holding Time Summary and Surrogate Results (continued)

Sample Name	Sample Date	Analysis Date	Collection to Analysis (Days)	Surrogate			
				Dibromofluoromethane	1,2-Dichloroethane-d_4	Toluene-d_8	4-Bromofluorobenzene
			Sorbent QC Limits (%):	50-134	50-127	57-134	50-122
LCS 140-48012/26	---	03/23/21	---	105	82	99	83
LCSD 140-48012/27	---	03/23/21	---	107	83	101	88
LCS 140-48012/4	---	03/23/21	---	111	89	102	87
LCSD 140-48012/5	---	03/23/21	---	107	83	103	87
LCS 140-48054/3	---	03/24/21	---	108	85	103	87
LCSD 140-48054/4	---	03/24/21	---	107	83	103	87
LCS 140-48107/3	---	03/25/21	---	113	90	104	90
LCSD 140-48107/4	---	03/25/21	---	109	84	102	88
LCS 140-48144/3	---	03/26/21	---	108	83	102	86
LCSD 140-48144/4	---	03/26/21	---	101	78	101	85
LCS 140-48167/3	---	03/27/21	---	109	87	103	87
LCSD 140-48167/4	---	03/27/21	---	103	80	101	85
LCS 140-48168/3	---	03/28/21	---	105	90	96	92
LCSD 140-48168/4	---	03/28/21	---	103	88	98	92
BGCAPP T5-ES-VXP1-M0031-COND	03/16/21	03/28/21	12	103	94	97	95
BGCAPP T5-ES-VXP2-M0031-COND	03/17/21	03/28/21	11	104	94	97	97
BGCAPP T5-ES-VXP3-M0031-COND	03/18/21	03/28/21	10	104	97	99	94
BGCAPP T5-ES-VXP4-M0031-COND	03/20/21	03/28/21	8	101	93	98	94
BGCAPP T5-VXPTB1-M0031-COND	03/21/21	03/28/21	7	103	91	98	98
BGCAPP T5-WS-VXP1-M0031-COND	03/16/21	03/28/21	12	103	94	100	95
BGCAPP T5-WS-VXP2-M0031-COND	03/17/21	03/28/21	11	100	92	101	105
BGCAPP T5-WS-VXP3-M0031-COND	03/18/21	03/28/21	10	105	97	99	94
BGCAPP T5-WS-VXP4-M0031-COND	03/20/21	03/28/21	8	102	95	99	97
MB 140-48012/7	---	03/23/21	---	105	87	103	91
LCS 140-48012/26	---	03/23/21	---	105	82	99	83
LCSD 140-48012/27	---	03/23/21	---	107	83	101	88

Note: QAPjP Limit: 14 days from sample collection to analysis

Table 4–18: Volatile LCS Results

Spiked Compound	Concentration (µg)			Recovery (%)		RPD (%)	QC Limits (%)	
	True	LCS	LCSD	LCS	LCSD		Recovery	RPD
Laboratory ID:	LCS 140-48012/26/LCSD 140-48012/27							
Date Analyzed:	03/23/21							
Acetone	1.000	0.2713	0.2675	27	27	1	20 - 191	50
Benzene	0.250	0.2815	0.2899	113	116	3	68 - 128	22
Chloroethane	0.250	0.2101	0.2157	84	86	3	43 - 163	32
Chloroform	0.250	0.2533	0.2633	101	105	4	63 - 123	27
Methylene Chloride	0.250	0.2221	0.2324	89	93	5	60 - 134	41
Toluene	0.250	0.2538	0.2570	102	103	1	70 - 120	22
m,p-Xylene	0.250	0.2400	0.2436	96	97	1	74 - 126	38
o-Xylene	0.250	0.2350	0.2401	94	96	2	64 - 120	37
Laboratory ID:	LCS 140-48054/3/LCSD 140-48054/4							
Date Analyzed:	03/24/21							
Acetone	0.9600	0.4994	0.4043	52	40	21	20 - 191	50
Benzene	0.2400	0.2881	0.3014	120	121	5	68 - 128	22
Chloroethane	0.2400	0.2103	0.2183	88	87	4	43 - 163	32
Chloroform	0.2400	0.2613	0.2714	109	109	4	63 - 123	27
Methylene Chloride	0.2400	0.2385	0.2548	99	102	7	60 - 134	41
Toluene	0.2400	0.2592	0.2727	108	109	5	70 - 120	22
m,p-Xylene	0.2400	0.2452	0.2590	102	104	5	74 - 126	38
o-Xylene	0.2400	0.2397	0.2532	100	101	5	64 - 120	37
Laboratory ID:	LCS 140-48107/3/LCSD 140-48107/4							
Date Analyzed:	03/25/21							
Acetone	1.040	0.4034	0.3735	39	37	8	20 - 191	50
Benzene	0.260	0.3138	0.2936	121	117	7	68 - 128	22
Chloroethane	0.260	0.2319	0.2119	89	85	9	43 - 163	32
Chloroform	0.260	0.2814	0.2660	108	106	6	63 - 123	27
Methylene Chloride	0.260	0.2626	0.2436	101	97	8	60 - 134	41
Toluene	0.260	0.2837	0.2615	109	105	8	70 - 120	22
m,p-Xylene	0.260	0.2652	0.2499	102	100	6	74 - 126	38
o-Xylene	0.260	0.2585	0.2438	99	98	6	64 - 120	37

Table 4–18: Volatile LCS Results (continued)

Spiked Compound	Concentration (µg)			Recovery (%)		RPD (%)	QC Limits (%)	
	True	LCS	LCSD	LCS	LCSD		Recovery	RPD
Laboratory ID:	LCS 140-48144/3/LCSD 140-48144/4							
Date Analyzed:	03/26/21							
Acetone	1.000	0.4178	0.3648	42	36	14	20 - 191	50
Benzene	0.250	0.2946	0.2817	118	113	4	68 - 128	22
Chloroethane	0.250	0.2164	0.2038	87	82	6	43 - 163	32
Chloroform	0.250	0.2659	0.2525	106	101	5	63 - 123	27
Methylene Chloride	0.250	0.2430	0.2267	97	91	7	60 - 134	41
Toluene	0.250	0.2670	0.2588	107	104	3	70 - 120	22
m,p-Xylene	0.250	0.2462	0.2468	98	99	0	74 - 126	38
o-Xylene	0.250	0.2442	0.2382	98	95	2	64 - 120	37
Laboratory ID:	LCS 140-48167/3/LCSD 140-48167/4							
Date Analyzed:	03/27/21							
Acetone	1.000	0.6679	0.4108	67	41	48	20 - 191	50
Benzene	0.250	0.2991	0.2828	120	113	6	68 - 128	22
Chloroethane	0.250	0.2158	0.1998	86	80	8	43 - 163	32
Chloroform	0.250	0.2664	0.2522	107	101	5	63 - 123	27
Methylene Chloride	0.250	0.2445	0.2241	98	90	9	60 - 134	41
Toluene	0.250	0.2734	0.2652	109	106	3	70 - 120	22
m,p-Xylene	0.250	0.2532	0.2459	101	98	3	74 - 126	38
o-Xylene	0.250	0.2463	0.2367	99	95	4	64 - 120	37
Laboratory ID:	LCS 140-48168/3/LCSD 140-48168/4							
Date Analyzed:	03/28/21							
Acetone	40.000	28.820	30.900	72	77	7	62 - 131	50
Benzene	10.000	10.680	11.140	107	111	4	75 - 120	20
Chloroethane	10.000	8.032	8.427	80	84	5	65 - 122	20
Chloroform	10.000	10.100	10.260	101	103	2	80 - 121	20
Methylene Chloride	10.000	9.331	10.040	93	100	7	67 - 120	20
Toluene	10.000	10.020	10.680	100	107	6	72 - 120	20
m,p-Xylene	10.000	9.083	9.733	91	97	7	76 - 120	20
o-Xylene	10.000	9.139	9.725	91	97	6	78 - 120	20

Table 4–19: Unspeciated Volatile Organics Condensate Holding Time Summary and Surrogate Results

Sample	Sample Date	Preparation Date	Analysis Date	Collection to Analysis (Days)	n-Octane Recovery (%)
BGCAPP T5-ES-VXP1A-TOE-COND	03/16/21	03/22/21	03/24/21	6	103
BGCAPP T5-ES-VXP1FB-TOE-COND	03/16/21	03/22/21	03/24/21	6	105
BGCAPP T5-ES-VXP2A-TOE-COND	03/17/21	03/22/21	03/24/21	5	103
BGCAPP T5-ES-VXP2FB-TOE-COND	03/17/21	03/22/21	03/24/21	5	96
BGCAPP T5-ES-VXP3A-TOE-COND	03/18/21	03/22/21	03/24/21	4	104
BGCAPP T5-ES-VXP3FB-TOE-COND	03/18/21	03/22/21	03/24/21	4	97
BGCAPP T5-ES-VXP4A-TOE-COND	03/20/21	03/22/21	03/24/21	2	97
BGCAPP T5-ES-VXP4FB-TOE-COND	03/20/21	03/22/21	03/24/21	2	102
BGCAPP T5-WS-VXP1A-M0040-TOE-COND	03/16/21	03/22/21	03/24/21	6	95
BGCAPP T5-WS-VXP1FB-M0040-TOE-COND	03/16/21	03/22/21	03/24/21	6	101
BGCAPP T5-WS-VXP2A-M0040-TOE-COND	03/17/21	03/22/21	03/24/21	5	99
BGCAPP T5-WS-VXP2FB-M0040-TOE-COND	03/17/21	03/22/21	03/24/21	5	100
BGCAPP T5-WS-VXP3A-M0040-TOE-COND	03/18/21	03/22/21	03/24/21	4	99
BGCAPP T5-WS-VXP3FB-M0040-TOE-COND	03/18/21	03/22/21	03/24/21	4	90
BGCAPP T5-WS-VXP4A-M0040-TOE-COND	03/20/21	03/22/21	03/24/21	2	100
BGCAPP T5-WS-VXP4FB-M0040-TOE-COND	03/20/21	03/22/21	03/24/21	2	99
BGCAPP-TB-VXPTB1-M0040-TOE-COND	03/20/21	03/22/21	03/24/21	2	88
BGCAPP-TB-VXPTB2-M0040-TOE-COND	03/20/21	03/22/21	03/24/21	2	94
MB 140-47996/1-A	---	03/22/21	03/24/21	---	90
LCS 140-47996/2-A	---	03/22/21	03/24/21	---	93
LCSD 140-47996/3-A	---	03/22/21	03/24/21	---	99

Note:

QAPjP Limits: 14 days to analysis
Recovery = 50 to 150%

Table 4–20: Unspeciated Volatile Organics Field Spike Results

Compounds	True (ppmv)	Sample Result (ppmv)	Field Spike Result (ppmv)	Recovery (%)
C_3-Propane	1.89	< 0.12	1.52	80.6

Notes:

The field spike was performed by spiking an aliquot of the sample after the initial analysis was complete.

QAPjP Limit: Recovery = 80 to 120%

Table 4–21: Unspeciated Volatile Organics LCS Results

Analyte	True (ppmv)	LCS (ppmv)	Recovery (%)	LCS (ppmv)	Recovery (%)	LCS (ppmv)	Recovery (%)	LCS (ppmv)	Recovery (%)
	Run Number:	1		2		3		4	
	Date:	03/16/21		03/17/21		03/18/21		03/20/21	
Methane (C_1)	1.250	1.283	102.6	1.333	106.7	1.262	100.9	1.369	109.5
Ethane (C_2)	1.646	1.697	103.1	1.761	107.0	1.662	101.0	1.831	111.2
Propane (C_3)	1.205	1.234	102.4	1.299	107.8	1.206	100.1	1.357	112.6
Butane (C_4)	1.183	1.213	102.5	1.264	106.8	1.195	101.0	1.327	112.2
Pentane (C_5)	1.159	1.202	103.7	1.246	107.5	1.165	100.5	1.300	112.2
Hexane (C_6)	1.258	1.281	101.8	1.344	106.9	1.249	99.3	1.370	108.9
Heptane (C_7)	1.213	1.244	102.6	1.261	104.0	1.204	99.2	1.313	108.2

Notes:

For this analysis, the continuing calibration verification serves as the LCS. The values presented in this table are taken from the field sampling report in which calculated recoveries used unrounded values such that recalculation of the recoveries from the values shown on this page may yield slightly different results.

QAPjP Limit: Recovery = 75 to 125%

Table 4–22: Unspeciated Volatile Organics Condensate LCS/LCSD Results

Element	Concentration (µg/sample)			Recovery (%)		RPD (%)
	True	LCS	LCSD	LCS	LCSD	
Sample ID:	LCS 01/26/2020, LCSD 01/26/2020					
Analysis Date:	01/26/20					
C_5-Pentane	1.00	1.042	0.9771	104	98	6
C_6-Hexane	0.999	0.9520	0.8961	95	90	6
C_7-Heptane	1.00	0.9897	0.9618	99	96	3

Notes:

QAPjP Limit: Recovery = 50 to 150%
RPD = 0 to 35%

Table 4–23: Acid Gas, Ammonia, and Particulate Matter Sample Holding Time Summary

Sample Name	Sample Date	Preparation Date	Analysis Date	Collection to Analysis (Days)
Hydrogen Chloride				
BGCAPP T5-ES-VXP1-M5/26A-ACDIMP	03/16/21	03/26/21	03/26/21	10
BGCAPP T5-ES-VXP2-M5/26A-ACDIMP	03/17/21	03/26/21	03/26/21	9
BGCAPP T5-ES-VXP3-M5/26A-ACDIMP	03/18/21	03/26/21	03/26/21	8
BGCAPP T5-ES-VXP4-M5/26A-ACDIMP	03/20/21	03/26/21	03/27/21	7
BGCAPP T5-VXPFB-M5/26A-ACDIMP	03/15/21	03/26/21	03/27/21	12
BGCAPP T5-VXPRB1-M5/26A-H2SO4 SOLN	03/15/21	03/26/21	03/27/21	12
BGCAPP T5-WS-VXP1-M5/26A-ACDIMP	03/16/21	03/26/21	03/27/21	11
BGCAPP T5-WS-VXP2-M5/26A-ACDIMP	03/17/21	03/26/21	03/27/21	10
BGCAPP T5-WS-VXP3-M5/26A-ACDIMP	03/18/21	03/26/21	03/27/21	9
BGCAPP T5-WS-VXP4-M5/26A-ACDIMP	03/20/21	03/26/21	03/27/21	7
LCS 140-48174/1-A	---	03/26/21	03/26/21	---
LCSD 140-48174/2-A	---	03/26/21	03/26/21	---
MB 140-48174/3-A	---	03/26/21	03/26/21	---
BGCAPP T5-ES-VXP2-M5/26A-ACDIMP	03/17/21	03/26/21	03/26/21	9
BGCAPP T5-ES-VXP2-M5/26A-ACDIMP	03/17/21	03/26/21	03/26/21	9
BGCAPP T5-WS-VXP3-M5/26A-ACDIMP	03/18/21	03/26/21	03/27/21	9
BGCAPP T5-WS-VXP3-M5/26A-ACDIMP	03/18/21	03/26/21	03/27/21	9
Chlorine				
BGCAPP T5-ES-VXP1-M5/26A-ALKIMP	03/16/21	03/30/21	03/30/21	14
BGCAPP T5-ES-VXP2-M5/26A-ALKIMP	03/17/21	03/30/21	03/30/21	13
BGCAPP T5-ES-VXP3-M5/26A-ALKIMP	03/18/21	03/30/21	03/31/21	13
BGCAPP T5-ES-VXP4-M5/26A-ALKIMP	03/20/21	03/30/21	03/31/21	11
BGCAPP T5-VXPFB-M5/26A-ALKIMP	03/15/21	03/30/21	03/31/21	16
BGCAPP T5-WS-VXP1-M5/26A-ALKIMP	03/16/21	03/30/21	03/31/21	15
BGCAPP T5-WS-VXP2-M5/26A-ALKIMP	03/17/21	03/30/21	03/31/21	14
BGCAPP T5-WS-VXP3-M5/26A-ALKIMP	03/18/21	03/30/21	03/31/21	13
BGCAPP T5-WS-VXP4-M5/26A-ALKIMP	03/20/21	03/30/21	03/31/21	11
LCS 140-48303/1-A	---	03/30/21	03/30/21	---
LCSD 140-48303/2-A	---	03/30/21	03/30/21	---
MB 140-48303/3-A	---	03/30/21	03/30/21	---
BGCAPP T5-ES-VXP2-M5/26A-ALKIMP	03/17/21	03/30/21	03/30/21	13
BGCAPP T5-ES-VXP2-M5/26A-ALKIMP	03/17/21	03/30/21	03/31/21	14
BGCAPP T5-WS-VXP3-M5/26A-ALKIMP	03/18/21	03/30/21	03/31/21	13
BGCAPP T5-WS-VXP3-M5/26A-ALKIMP	03/18/21	03/30/21	03/31/21	13

Table 4–23: Acid Gas, Ammonia, and Particulate Matter Sample Holding Time Summary (continued)

Sample Name	Sample Date	Preparation Date	Analysis Date	Collection to Analysis (Days)
Ammonia				
BGCAPP T5-ES-VXP1-M5/26A-ACDIMP/AMMONIA	03/16/21	03/24/21	03/24/21	8
BGCAPP T5-ES-VXP2-M5/26A-ACDIMP/AMMONIA	03/17/21	03/24/21	03/24/21	7
BGCAPP T5-ES-VXP3-M5/26A-ACDIMP/AMMONIA	03/18/21	03/24/21	03/24/21	6
BGCAPP T5-ES-VXP4-M5/26A-ACDIMP/AMMONIA	03/20/21	03/24/21	03/24/21	4
BGCAPP T5-VXPFB-M5/26A-ACDIMP/AMMONIA	03/15/21	03/24/21	03/24/21	9
BGCAPP T5-VXPRB1-M5/26A-H2SO4 SOLN/AMMONIA	03/15/21	03/24/21	03/24/21	9
BGCAPP T5-WS-VXP1-M5/26A-ACDIMP	03/16/21	03/24/21	03/24/21	8
BGCAPP T5-WS-VXP2-M5/26A-ACDIMP	03/17/21	03/24/21	03/24/21	7
BGCAPP T5-WS-VXP3-M5/26A-ACDIMP	03/18/21	03/24/21	03/24/21	6
BGCAPP T5-WS-VXP4-M5/26A-ACDIMP	03/20/21	03/24/21	03/24/21	4
LCS 680-661127/3-A	---	03/24/21	03/24/21	---
MB 680-661127/1-A	---	03/24/21	03/24/21	---
BGCAPP T5-ES-VXP1-M5/26A-ACDIMP/AMMONIAMS	03/16/21	03/24/21	03/24/21	8
BGCAPP T5-ES-VXP1-M5/26A-ACDIMP/AMMONIAMSD	03/16/21	03/24/21	03/24/21	8
BGCAPP T5-WS-VXP3-M5/26A-ACDIMP/AMMONIAMS	03/18/21	03/24/21	03/24/21	6
BGCAPP T5-WS-VXP3-M5/26A-ACDIMP/AMMONIAMSD	03/18/21	03/24/21	03/24/21	6
Particulate Matter				
BGCAPP-T5-ES-VXP1-M5/26A-PNR	03/16/21	---	03/26/21	10
BGCAPP-T5-ES-VXP1-M5/26A-FILT	03/16/21	---	03/26/21	10
BGCAPP-T5-ES-VXP2-M5/26A-PNR	03/17/21	---	03/26/21	9
BGCAPP-T5-ES-VXP2-M5/26A-FILT	03/17/21	---	03/26/21	9
BGCAPP-T5-ES-VXP3-M5/26A-PNR	03/18/21	---	03/26/21	8
BGCAPP-T5-ES-VXP3-M5/26A-FILT	03/18/21	---	03/26/21	8
BGCAPP-T5-ES-VXP4-M5/26A-PNR	03/20/21	---	03/26/21	6
BGCAPP-T5-ES-VXP4-M5/26A-FILT	03/20/21	---	03/26/21	6
BGCAPP-T5-VXPFB-M5/26A-PNR	03/15/21	---	03/26/21	11
BGCAPP-T5-VXPFB-M5/26A-FILT	03/15/21	---	03/26/21	11
BGCAPP-T5-VXPRB1-M5/26A-FILT	03/15/21	---	03/26/21	11
BGCAPP-T5-VXPRB1-M5/26A-ACE	03/15/21	---	03/26/21	11
BGCAPP-T5-WS-VXP1-M5/26A-PNR	03/16/21	---	03/26/21	10
BGCAPP-T5-WS-VXP1-M5/26A-FILT	03/16/21	---	03/26/21	10
BGCAPP-T5-WS-VXP2-M5/26A-PNR	03/17/21	---	03/26/21	9
BGCAPP-T5-WS-VXP2-M5/26A-FILT	03/17/21	---	03/26/21	9
BGCAPP-T5-WS-VXP3-M5/26A-PNR	03/18/21	---	03/26/21	8
BGCAPP-T5-WS-VXP3-M5/26A-FILT	03/18/21	---	03/26/21	8
BGCAPP-T5-WS-VXP4-M5/26A-PNR	03/20/21	---	03/26/21	6
BGCAPP-T5-WS-VXP4-M5/26A-FILT	03/20/21	---	03/26/21	6

Note:
QAPjP Limit: 28 days from collection to analysis for hydrogen chloride, chlorine, and ammonia; particulate matter has no holding time.

Table 4–24: Acid Gas and Ammonia LCS/LCSD Results

Sample ID	Analysis Date	Parameter	Units	Concentration				Recovery (%)		RPD (%)
				Spike	Sample	LCS	LCSD	LCS	LCSD	
LCS 140-48174/1-A / LCSD 140-48174/2-A	03/26/21	Hydrogen chloride	mg	77.1	---	77.15	77.28	100	100	0
LCS 140-48174/1-A / LCSD 140-48174/2-A	03/26/21	Hydrogen fluoride	mg	79.0	---	79.25	78.33	100	99	1
LCS 140-48303/1-A / LCSD 140-48303/2-A	03/30/21	Chlorine	mg	75.0	---	74.21	74.59	99	99	1
LCS 680-661127/3-A	03/24/21	Ammonia (as N)	mg/L	1.00	---	0.93	---	93	---	---

Note:

QAPjP Limits: Recovery = 90 to 110%
RPD = Not specified, 20% applied

Table 4–25: Acid Gas and Ammonia MS/MSD Results

Sample ID	Analysis Date	Parameter	Units	Concentration				Recovery (%)		RPD (%)
				Spike	Sample	MS	MSD	MS	MSD	
140-22390-13	03/26/21	Hydrogen chloride	mg	1,200	78.9	1,333	1,329	101	100	0
140-22391-13	03/27/21	Hydrogen chloride	mg	1,230	94.1	1,327	1,337	100	101	1
140-22390-13	03/26/21	Hydrogen fluoride	mg	1,230	ND	1,169	1,191	95	97	2
140-22391-13	03/27/21	Hydrogen fluoride	mg	1,260	ND	1,113	1,126	88	89	1
140-22390-15	03/31/21	Chlorine	mg	1,930	140	1,986	2,014	96	97	1
140-22391-15	03/31/21	Chlorine	mg	1,910	133	2,047	2,055	100	101	0
140-22390-14	03/24/21	Ammonia (as N)	mg/L	1.00	0.25	1.032	0.946	87	79	9
140-22391-14	03/24/21	Ammonia (as N)	mg/L	1.00	0.117	1.079	1.050	96	93	3

Note:

QAPjP Limits: Recovery = 85 to 125%
RPD = 0 to 25%

Table 4–26: Metals LCS/LCSD Results

Element	Concentration (µg)			Recovery (%)		RPD (%)
	True	LCS	LCSD	LCS	LCSD	
Sample ID:	LCS 140-48014/9-A / LCSD 140-48014/10-A					
Antimony	50.00	49.70	49.77	99	100	0
Arsenic	10.00	10.06	10.07	101	101	0
Barium	10.00	10.09	10.19	101	102	1
Beryllium	5.000	5.127	5.187	103	104	1
Boron	100.0	99.10	100.3	99	100	1
Cadmium	5.000	5.134	5.206	103	104	1
Chromium	20.00	20.57	20.92	103	105	2
Cobalt	10.00	10.27	10.33	103	103	1
Copper	25.00	25.53	25.92	102	104	2
Lead	10.00	10.36	10.49	104	105	1
Manganese	10.00	10.43	10.59	104	106	2
Nickel	50.00	50.70	51.37	101	103	1
Phosphorus	500.0	514.0	520.9	103	104	1
Selenium	15.00	14.45	14.63	96	98	1
Silver	5.000	4.828	4.924	97	98	2
Thallium	40.00	40.24	40.73	101	102	1
Tin	50.00	50.67	51.08	101	102	1
Vanadium	20.00	20.09	20.30	100	102	1
Zinc	50.00	50.38	50.64	101	101	0
Sample ID:	LCS 140-48013/8-A /LCSD 140-48013/9-A					
Antimony	50.00	47.07	47.01	94	94	0
Arsenic	10.00	9.300	9.139	93	91	2
Barium	10.00	9.600	9.671	96	97	1
Beryllium	5.000	5.171	5.187	103	104	0
Boron	100.0	95.9	94.8	96	95	1
Cadmium	5.000	5.011	5.011	100	100	0
Chromium	20.00	19.66	19.73	98	99	0
Cobalt	10.00	9.775	9.791	98	98	0
Copper	25.00	24.33	24.46	97	98	1
Lead	10.00	9.854	10.02	99	100	2
Manganese	10.00	9.987	10.02	100	100	0
Nickel	50.00	48.13	48.32	96	97	0
Phosphorus	500.0	478.0	478.7	96	96	0
Selenium	15.00	14.39	14.31	96	95	1
Silver	5.000	4.606	4.626	92	93	0

Table 4–26: Metals LCS/LCSD Results (continued)

Element	Concentration (µg)			Recovery (%)		RPD (%)
	True	LCS	LCSD	LCS	LCSD	
Thallium	40.00	38.62	38.61	97	97	0
Tin	50.00	49.59	49.63	99	99	0
Vanadium	20.00	19.62	19.76	98	99	1
Zinc	50.00	47.38	47.52	95	95	0
Sample ID:	LCS 140-48015/9-B / LCSD 140-48015/10-B, LCS 140-47987/10-B/, LCS 140-47986/9-B/, LCS 140-47985/10-B/, LCS 140-47983/10-B/					
Front-half	5.00	5.03	4.96	101	99	1
Back-half	10.00	10.38	---	104	---	---
Empty Impinger	5.00	5.15	---	103	---	---
HCl Rinse	1.25	1.26	---	101	---	---
$KMnO_4$ Imps.	0.500	0.501	---	100	---	---

Note:

QAPjP Limits: Recovery = 75 to 125%
RPD = Not specified, 20% applied

Table 4–27: Metals MS/MSD Results

Element	Concentration (µg)				Recovery (%)		RPD (%)
	True	Sample	MS	MSD	MS	MSD	
Sample ID:	140-22389-6 PDS, 140-22389-6 PDSD						
Antimony	50.0	ND	48.03	48.41	96	97	1
Barium	10.0	7.37	17.11	17.21	97	98	1
Beryllium	5.0	0.018	5.159	5.227	103	104	1
Boron	100	ND	104.5	106.0	105	106	1
Cadmium	5.0	50	53.21	54.00	NC	NC	1
Chromium	20.0	18.6	38.89	39.52	102	105	2
Cobalt	10.0	ND	6.52	6.56	65	66	1
Copper	25.0	49.2	74.20	75.12	100	104	1
Manganese	10.0	3.79	14.23	14.44	104	106	1
Phosphorus	500	80.9	579.2	584.2	100	101	1
Silver	5.00	0.30	5.349	5.422	101	102	1
Tin	50.0	ND	46.37	46.97	93	94	1
Vanadium	20.0	0.542	21.10	21.41	103	104	1
Zinc	50.0	151.0	194.6	197.1	88	93	1
Mercury	1.000	ND	0.922	1.040	92	104	12
Sample ID:	140-22389-11 PDS, 140-22389-11 PDSD						
Arsenic	50.0	ND	50.87	51.00	102	102	0
Lead	50.0	363.0	405.6	410.9	86	96	1
Nickel	250.0	8.81	262.7	261.1	102	101	1
Selenium	75.0	ND	72.17	71.65	96	96	1
Thallium	200.0	ND	201.1	200.7	101	100	0
Sample ID:	140-22389-7 PDS, 140-22389-7 PDSD						
Antimony	50.00	ND	48.78	48.43	98	97	1
Arsenic	10.00	ND	9.39	9.29	94	93	1
Barium	10.00	0.696	10.73	10.65	100	100	1
Beryllium	5.000	ND	5.357	5.347	107	107	0
Boron	100.0	31.0	123.9	124.1	93	93	0
Cadmium	5.000	0.018	5.181	5.163	103	103	0
Chromium	20.00	0.607	21.25	21.35	103	104	0
Cobalt	10.00	0.111	10.34	10.29	102	102	1
Copper	25.00	4.23	29.59	29.74	101	102	1
Lead	10.00	ND	10.45	10.41	104	104	0
Manganese	10.00	3.900	14.15	14.21	103	103	0
Nickel	50.00	0.601	51.07	50.87	101	101	0

Table 4–27: Metals MS/MSD Results (continued)

Element	Concentration (µg)				Recovery (%)		RPD (%)
	True	Sample	MS	MSD	MS	MSD	
Phosphorus	500.0	16.80	508.4	505.8	98	98	1
Selenium	15.00	ND	14.74	14.35	98	96	3
Silver	5.000	ND	4.758	4.697	95	94	1
Thallium	40.00	ND	40.02	39.54	100	99	1
Tin	50.00	17.00	67.08	67.01	100	100	0
Vanadium	20.00	ND	20.62	20.61	103	103	0
Zinc	50.00	10.00	58.47	58.79	97	98	1
Sample ID:	140-22389-7 MS/140-22389-7 MSD, 140-22389-8 MS/140-22389-8 MSD, 140-22389-9 MS/140-22389-9 MSD, 140-22389-10 MS/140-22389-10 MSD						
Back-half (HNO_3/H_2O_2)	2.000	0.140	2.100	2.140	98	100	2
$KMnO_4$ Impingers	1.900	ND	1.828	0.774	96	96	7
Empty Impinger	1.900	ND	1.828	0.774	96	96	7
HCl rinse	1.430	ND	1.408	1.439	99	101	2

Note:

QAPjP Limits: Recovery = 75 to 125%
RPD = Not specified, 20% applied

Table 4–28: Metals Laboratory, Field, and Reagent Blank Results

Constituent	Method Blanks (µg)		Field Blank (µg)		Reagent Blanks (µg)		
	Front-Half	Back-Half	Front-Half	Back-Half	Filter	Rinse Solutions	Impinger Solutions
Antimony	ND	ND	ND	ND	1.10	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND	ND
Barium	0.33	ND	7.16	0.328	7.12	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND	ND
Boron	ND	ND	ND	14.5	ND	ND	---
Cadmium	ND	ND	ND	ND	ND	ND	ND
Chromium	ND	ND	3.34	0.254	2.92	0.57	0.205
Cobalt	ND	ND	ND	ND	ND	ND	ND
Copper	ND	ND	0.871	1.39	0.404	ND	0.371
Lead	ND	ND	ND	ND	ND	ND	ND
Manganese	ND	ND	3.67	0.293	2.32	0.324	ND
Mercury (Front-Half)	ND	---	ND	---	ND	ND	ND
Mercury (HNO_3/H_2O_2)	---	0.15	---	ND	---	---	ND
Mercury ($KMnO_4$)	---	ND	---	ND	---	---	ND
Mercury (Empty Impinger)	---	ND	---	ND	---	---	---
Mercury (HCl)	---	ND	---	ND	---	ND	---
Nickel	ND	ND	5.64	0.310	4.11	0.284	ND
Phosphorus	ND	ND	ND	ND	ND	ND	---
Selenium	ND	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND	ND
Tin	ND	ND	ND	ND	ND	ND	---
Vanadium	ND	ND	ND	ND	ND	ND	---
Zinc	ND	ND	11.3	2.69	6.08	ND	ND

Table 4–29: Summary of Deviations and Anomalies

Test Element	Deviation/Anomaly	Basis and Impact
Sampling/On-Site Analysis		
PTDP Appendix G Table G-2	For the east and west stack M0031 sampling trains, the total sample collection time was under 40 minutes.	No impact. All reported data are usable and the actual volume sampled is used to determine the non-agent air emission concentrations and rates for the volatile organic target analytes. Section 9.4.9 of the QAPjP expressly permits the use of alternate sampling rates and times provided a sample volume of 20 L is not exceeded.
QAPjP Section 9.4.9	For the east stack M0031 sampling train, two Run 1 and one Run 3 final leak checks were performed at a vacuum that was less than the maximum vacuum recorded during the collection of these tube sets.	No significant impact. The results from all tube sets should be usable considering the actual vacuums recorded relative to the final leak check vacuum. Only Runs 2, 3, and 4 have been used to derive the reported 3-run averages.
QAPjP Section 5.2.2 Table 5	For some M0031 tube sets, the analysis of the Tenax®/charcoal tube showed > 30% of the dichlorodifluoromethane (Freon 12) concentration detected for the paired Tenax® tubes (with > 75 ng are detected on the Tenax®/charcoal tube).	No significant impact. Considering the actual concentrations detected on the paired Tenax® tubes and Tenax®/charcoal tubes, there is no indication that the absorptive capacity was exceeded in any instance and it is not believed that these results are indicative of actual breakthrough in which there was a loss of analyte. The reported dichlorodifluoromethane (Freon 12) emission rates are considered usable.
QAPjP Table 18	For the field analysis of the unspeciated volatile organic bag samples, the QAPjP-specified ending calibration verification was not performed.	No significant impact. All reported results are usable. The method-required daily calibration check was performed and met specifications. Failure to perform the QAPjP-specified ending calibration verification does not invalidate the data.
PTDP Appendix G Table G-2 QAPjP Section 9.4.7	For the Run 1 OTM duct M0023A sampling train, the total sample volume of 2.94 dscm was < 3 dscm target.	No impact. Runs 2, 3, and 4 have been used to derive the reported 3-run averages. Valid Run 1 emission concentrations and rates can be calculated using the actual sample volume collected.
QAPjP Section 9.4.8	For the Run 1 east stack M0010 sampling train, one 5-minute reading did not include the stack temperature.	No impact. Runs 2, 3, and 4 have been used to derive the reported 3-run averages. The stack temperature was stable and the absence of the single stack temperature does not invalidate the east stack Run 1 M0010 results.
QAPjP Section 9.4.8	For the Run 1 east stack M0010 sampling train, one of the 5-minute readings indicated a filter temperature of 275°F.	No impact. Runs 2, 3, and 4 have been used to derive the reported 3-run averages. The brief filter temperature excursion does not invalidate the east stack Run 1 east stack M0010 results.

Table 4–29: Summary of Deviations and Anomalies (continued)

Test Element	Deviation/Anomaly	Basis and Impact
QAPjP Section 9.4.8	For the Run 1 west stack M0010 sampling train, the 4th impinger was reported to be damaged during post-sampling recovery activity.	No impact. Runs 2, 3, and 4 have been used to derive the reported 3-run averages. The 4th impinger was intact and the contents are not recovered as a field sample and are only used in determining moisture content.
QAPjP Section 13.2.3.7	For the Run 1 west stack M25A, the final zero drift was > 3% maximum.	No impact. Runs 2, 3, and 4 have been used to derive the reported 3-run averages. For Run 1, there was 11 minutes of sampling time between the last passing hourly drift check and the final nonconforming drift check. Run 1 provided sufficient valid data for a reportable run and the subcontractor-reported west stack Run 1 M25A data does not include the 11 minutes of data.
Analytical		
QAPjP Section 5.2 Tables 5 through 10	Exhaust gas analyses were generally performed within all required QC criteria. However, there were some sample analyses where not all QAPjP QC criteria were met. Specific failures are addressed in Section 4.5.	No significant impact. The out of range occurrences include items such as surrogate, internal standard, and laboratory control sample recovery. No results were rejected and all results are considered usable for determining non-agent air emission concentrations and rates for the target analytes.

5.0 NON-AGENT EMISSIONS TEST RESULTS

The isokinetic and non-isokinetic sampling summary for all sampling trains required to demonstrate plan objectives are summarized in Table 2–1, Table 2–2, and Table 2–3. No blank corrections have been made to the volatile organics, semivolatile organics, dioxins/furans, acid gases, ammonia, particulate, or metals data. The laboratory made blank corrections to certain unspeciated total organic results IAW method guidance. In instances where nondetection (ND) were incurred, the RL or detection limit, depending on the analysis type, was used to calculate an emissions rate.

A less than (<) symbol is used on the report tables to indicate the analyte was not detected in one or more of the analytical fractions used to generate the emission rate. In some instances, an ND is reported to indicate the analyte was not found in any of the analytical fractions. Note that the ND is only used when the laboratory reports use an ND or U (for undetected) for non-detect results. For example, a result of 3.00E-06 g/s indicates the reported analyte was found in all fractions used to generate the result; a result of < 3.00E-06 g/s indicates the analyte was found in at least one of the analytical fractions but not all of them; and a result of < 3.00E-06 ND g/s indicates the analyte was not found in any of the analytical fractions used to generate the total. Non-agent emissions calculation examples are provided in Appendix C:, *Example Emission Rate Calculations*.

5.1 Semivolatile Organics

Table 5–1 and Table 5–2 summarize the semivolatile organic emissions results for the east and west stacks, respectively. In addition to the semivolatile organics on the target analyte list, these results include the TICs from the library searches that were performed for each sample fraction. Library search results for which a suitable match was not identified, i.e., unknown, are not included in the emissions summary table. As described in Section 3, all TICs are qualitative tentative identifications and should not be interpreted to be definitive evidence of the presence of the identified compound. The quantitation of each TIC is based on a theoretical response factor, and reported values should be considered estimated. The complete semivolatile organics analytical package can be found in Appendices B-1 and B-2 (Appendix B:).

5.2 Dioxins/Furans

Table 5–3 summarizes the dioxin/furan emissions results for the OTM duct. For the dioxins/furans train totals used in emission rate calculations, NDs were incorporated using the EDL. The complete dioxin/furan analytical package can be found in Appendix B-3 (see Appendix B:).

5.3 Polychlorinated Biphenyls

Table 5–4 summarizes the PCB emissions results for the OTM duct. For the PCB train totals used in emission rate calculations, NDs were incorporated using the EDL. The complete PCB analytical package can be found in Appendix B-3 (see Appendix B:).

5.4 Polycyclic Aromatic Hydrocarbons

Table 5–5 summarizes the PAH emissions results for the OTM duct. The complete PAH analytical package can be found in Appendix B-3 (see Appendix B:).

5.5 Volatile Organics

Table 5–6 and Table 5–7 summarize the volatile organic emissions results for the east and west stacks, respectively. In addition to the volatile organics on the target analyte list, these results include the TICs from the library searches that were performed for each sample fraction. Library search results for which a suitable match was not identified, i.e., unknown, are not included in the emissions summary table. As described in Section 3.2.5, all TIC are qualitative tentative identifications and should not be interpreted to be definitive evidence of the presence of the identified compound. The quantitation of each TIC is based on a theoretical response factor and reported values should be considered estimated. The complete volatile organics analytical package can be found in Appendices B-6 and B-7 (see Appendix B:).

5.6 Total Organics

Total organic emissions, as determined IAW the EPA *Guidance for Total Organics* (EPA 600/R 96 033), represent the sum of the total unspeciated volatile organic emissions, the total unspeciated semivolatile organic emissions, and the total nonvolatile organic emissions. Table 5–8 and Table 5–11 provide the total organic emission results for the east and west stacks. Table 5–9 and Table 5–12 summarize the total unspeciated semivolatile and nonvolatile organic emissions, and Table 5–10 and Table 5–13 summarize the total unspeciated volatile organic emissions results. The results for the bag fraction of the total unspeciated volatile organic analyses performed in the field are provided in Appendix A:. The complete analytical packages for the total unspeciated semivolatile and nonvolatile organics and the condensate fraction of the total unspeciated volatile organics can be found in Appendices B-1, B-2, B-6, and B-7 (see Appendix B:).

5.7 Acid Gases, Ammonia, and Particulates

Table 5–14 and Table 5–15 summarize the acid gases, ammonia, and particulate emissions results for the east and west stacks. The complete acid gas, ammonia, and particulate analytical package can be found in Appendices B-8 and B-9 (Appendix B:).

As previously indicated, all M26A/5 results are reported without blank correction even where such correction is expressly permitted by the EPA method. Reagent blank samples were collected in the field at the method-specified volume to permit blank correction of the particulate matter results IAW M5.

For the hydrogen chloride and chlorine results, the end user is alerted that the reagent blanks and field blank (blank train) results have total hydrogen chloride and chlorine catches that are comparable to the total mass observed for the field samples. This circumstance suggests that the reported emission rates for hydrogen chloride and chlorine may not be indicative of the actual hydrogen chloride and chlorine emissions from the MDB filtration area stacks.

For the ammonia results, the end user is alerted that the field blank (blank train) result has an ammonia catch (total mass) that is comparable to the total mass observed for the field samples. This circumstance suggests that the reported emission rates for ammonia may not be indicative of the actual ammonia emissions from the MDB filtration area stacks.

5.8 Trace Metals

Table 5–16 summarizes the trace metals emissions results for the OTM duct. The complete trace metal analytical package can be found in Appendix B-10 (see Appendix B:).

As previously indicated, metals results are reported without blank correction even where such correction is expressly permitted by the EPA method. All filter and reagent blank samples were collected in the field at the method-specified volume to permit blank correction of the results IAW M29.

5.9 Criteria Pollutants

Table 5–17 summarizes the CO, NOx, SO_2, and THC results using TRM CEMS in the east and west stacks. A summary of the monitoring results can be found in Appendix A:.

Table 5–1: Summary of Semivolatile Organic Emissions for East Stack

Constituent	Units	Run 2	Run 3	Run 4	Average
		119.682 dscf	117.936 dscf	121.059 dscf	119.559 dscf
		76,496 dscfm	76,369 dscfm	78,812 dscfm	77,226 dscfm
a,a-Dimethyl phenethylamine 122-09-8	µg	< 80 ND	< 80 ND	< 80 ND	< 80 ND
	µg/dscm	< 23.60 ND	< 23.95 ND	< 23.33 ND	< 23.62 ND
	lb/hr	< 6.76E-03 ND	< 6.85E-03 ND	< 6.89E-03 ND	< 6.83E-03 ND
	g/s	< 8.52E-04 ND	< 8.63E-04 ND	< 8.68E-04 ND	< 8.61E-04 ND
Acetophenone 98-86-2	µg	< 60 ND	< 60 ND	< 60 ND	< 60 ND
	µg/dscm	< 17.70 ND	< 17.96 ND	< 17.50 ND	< 17.72 ND
	lb/hr	< 5.07E-03 ND	< 5.14E-03 ND	< 5.17E-03 ND	< 5.13E-03 ND
	g/s	< 6.39E-04 ND	< 6.48E-04 ND	< 6.51E-04 ND	< 6.46E-04 ND
2-Acetylaminofuorene 53-96-3	µg	< 240 ND	< 240 ND	< 240 ND	< 240 ND
	µg/dscm	< 70.81 ND	< 71.86 ND	< 70.00 ND	< 70.87 ND
	lb/hr	< 2.03E-02 ND	< 2.06E-02 ND	< 2.07E-02 ND	< 2.05E-02 ND
	g/s	< 2.56E-03 ND	< 2.59E-03 ND	< 2.60E-03 ND	< 2.58E-03 ND
a-Naphthylamine 134-32-7	µg	< 60 ND	< 60 ND	< 60 ND	< 60 ND
	µg/dscm	< 17.70 ND	< 17.96 ND	< 17.50 ND	< 17.72 ND
	lb/hr	< 5.07E-03 ND	< 5.14E-03 ND	< 5.17E-03 ND	< 5.13E-03 ND
	g/s	< 6.39E-04 ND	< 6.48E-04 ND	< 6.51E-04 ND	< 6.46E-04 ND
4-Aminobiphenyl 92-67-1	µg	< 140 ND	< 140 ND	< 140 ND	< 140 ND
	µg/dscm	< 41.30 ND	< 41.92 ND	< 40.83 ND	< 41.34 ND
	lb/hr	< 1.18E-02 ND	< 1.20E-02 ND	< 1.21E-02 ND	< 1.20E-02 ND
	g/s	< 1.49E-03 ND	< 1.51E-03 ND	< 1.52E-03 ND	< 1.51E-03 ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Aniline 62-53-3	µg	< 100	ND	< 100	ND	< 100	ND	< 100	ND
	µg/dscm	< 29.50	ND	< 29.94	ND	< 29.17	ND	< 29.53	ND
	lb/hr	< 8.45E-03	ND	< 8.57E-03	ND	< 8.61E-03	ND	< 8.54E-03	ND
	g/s	< 1.07E-03	ND	< 1.08E-03	ND	< 1.09E-03	ND	< 1.08E-03	ND
Aramite, total 140-57-8	µg	< 120	ND	< 120	ND	< 120	ND	< 120	ND
	µg/dscm	< 35.40	ND	< 35.93	ND	< 35.00	ND	< 35.44	ND
	lb/hr	< 1.01E-02	ND	< 1.03E-02	ND	< 1.03E-02	ND	< 1.03E-02	ND
	g/s	< 1.28E-03	ND	< 1.30E-03	ND	< 1.30E-03	ND	< 1.29E-03	ND
Benzaldehyde 100-52-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Benzidine 92-87-5	µg	< 600	ND	< 600	ND	< 600	ND	< 600	ND
	µg/dscm	< 177.02	ND	< 179.64	ND	< 175.01	ND	< 177.18	ND
	lb/hr	< 5.07E-02	ND	< 5.14E-02	ND	< 5.17E-02	ND	< 5.13E-02	ND
	g/s	< 6.39E-03	ND	< 6.48E-03	ND	< 6.51E-03	ND	< 6.46E-03	ND
Benzoic acid 65-85-0	µg	< 500	ND	< 500	ND	< 500	ND	< 500	ND
	µg/dscm	< 147.52	ND	< 149.70	ND	< 145.84	ND	< 147.65	ND
	lb/hr	< 4.23E-02	ND	< 4.28E-02	ND	< 4.31E-02	ND	< 4.27E-02	ND
	g/s	< 5.33E-03	ND	< 5.40E-03	ND	< 5.43E-03	ND	< 5.38E-03	ND
Benzyl alcohol 100-51-6	µg	< 420	ND	< 420	ND	< 420	ND	< 420	ND
	µg/dscm	< 123.91	ND	< 125.75	ND	< 122.50	ND	< 124.02	ND
	lb/hr	< 3.55E-02	ND	< 3.60E-02	ND	< 3.62E-02	ND	< 3.59E-02	ND
	g/s	< 4.47E-03	ND	< 4.53E-03	ND	< 4.56E-03	ND	< 4.52E-03	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
1,1'-Biphenyl 92-52-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
bis(2-Chloroethoxy)methane 111-91-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
bis(2-Chloroethyl)ether 111-44-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
bis(2-Ethylhexyl)phthalate 117-81-7 (total catch uses MDL)	µg	< 119.2	ND	< 119.2	ND	< 119.2	ND	< 119.2	ND
	µg/dscm	< 35.17	ND	< 35.69	ND	< 34.77	ND	< 35.20	ND
	lb/hr	< 1.01E-02	ND	< 1.02E-02	ND	< 1.03E-02	ND	< 1.02E-02	ND
	g/s	< 1.27E-03	ND	< 1.29E-03	ND	< 1.29E-03	ND	< 1.28E-03	ND
4-Bromophenyl-phenylether 101-55-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Butyl benzyl phthalate 85-68-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
4-Chloroaniline 106-47-8	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND
Chlorobenzilate 510-15-6	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
4-Chloro-3-methylphenol 59-50-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
1-Chloronapthalene 90-13-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
2-Chloronaphthalene 91-58-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
2-Chlorophenol 95-57-8	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
4-Chlorophenyl-phenylether 7005-72-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Diallate 2303-16-4	µg	< 120	ND	< 120	ND	< 120	ND	< 120	ND
	µg/dscm	< 35.40	ND	< 35.93	ND	< 35.00	ND	< 35.44	ND
	lb/hr	< 1.01E-02	ND	< 1.03E-02	ND	< 1.03E-02	ND	< 1.03E-02	ND
	g/s	< 1.28E-03	ND	< 1.30E-03	ND	< 1.30E-03	ND	< 1.29E-03	ND
Dibenz(a,j)acridine 224-42-0	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Dibenzofuran 132-64-9	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
1,2-Dichlorobenzene 95-50-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
1,3-Dichlorobenzene 541-73-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
1,4-Dichlorobenzene 106-46-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
3,3'-Dichlorobenzidine 91-94-1	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND
2,4-Dichlorophenol 120-83-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
2,6-Dichlorophenol 87-65-0	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Diethyl phthalate 84-66-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Dimethyl aminoazobenzene 60-11-7	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
7,12-Dimethylbenz(a)-anthracene 57-97-6	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND
3,3'-Dimethylbenzidine 119-93-7	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND
2,4-Dimethylphenol 105-67-9	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND
Dimethyl phthalate 131-11-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Di-n-butyl phthalate 84-74-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
1,3-Dinitrobenzene 99-65-0	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
4,6-Dinitro-2-methylphenol 534-52-1	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND
2,4-Dinitrophenol 51-28-5	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND
2,4-Dinitrotoluene 121-14-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
2,6-Dinitrotoluene 606-20-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Di-n-octylphthalate 117-84-0	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Dinoseb 88-85-7	µg	< 140	ND	< 140	ND	< 140	ND	< 140	ND
	µg/dscm	< 41.30	ND	< 41.92	ND	< 40.83	ND	< 41.34	ND
	lb/hr	< 1.18E-02	ND	< 1.20E-02	ND	< 1.21E-02	ND	< 1.20E-02	ND
	g/s	< 1.49E-03	ND	< 1.51E-03	ND	< 1.52E-03	ND	< 1.51E-03	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
1,4-Dioxane 123-91-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Diphenylamine 122-39-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
1,2-Diphenylhydrazine (as Azobenzene) 122-66-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Ethyl methanesulfonate 62-50-0	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Ethyl parathion 56-38-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Hexachlorobenzene 118-74-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Hexachlorobutadiene 87-68-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Hexachlorocyclopentadiene 77-47-7	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND
Hexachloroethane 67-72-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Hexachloropropene 1888-71-7	µg	< 240	ND	< 240	ND	< 240	ND	< 240	ND
	µg/dscm	< 70.81	ND	< 71.86	ND	< 70.00	ND	< 70.87	ND
	lb/hr	< 2.03E-02	ND	< 2.06E-02	ND	< 2.07E-02	ND	< 2.05E-02	ND
	g/s	< 2.56E-03	ND	< 2.59E-03	ND	< 2.60E-03	ND	< 2.58E-03	ND
Isophorone 78-59-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Isosafrole 120-58-1	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Methapyrilene 91-80-5	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
3-Methylcholanthrene 56-49-5	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND
Methyl methanesulfonate 66-27-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
2-Methyl-5-nitroaniline 99-55-8	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND
2-Methylphenol 95-48-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
3/4-Methylphenol 65794-96-9	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Naphthalene 91-20-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
1,4-Naphthoquinone 130-15-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
2-Naphthylamine 91-59-8	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND
2-Nitroaniline 88-74-4	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND
3-Nitroaniline 99-09-2	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND
4-Nitroaniline 100-01-6	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Nitrobenzene 98-95-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
2-Nitrophenol 88-75-5	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
4-Nitrophenol 100-02-7	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND
4-Nitroquinoline-l-oxide 56-57-5	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND
N-Nitrosodiethylamine 55-18-5	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
N-Nitrosodimethylamine 62-75-9	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
N-Nitroso-di-n-butylamine 924-16-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
N-Nitroso-di-n-propylamine 621-64-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
N-Nitrosodiphenylamine 86-30-6	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
N-Nitrosomethylethylamine 10595-95-6	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
N-Nitrosomorpholine 59-89-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
N-Nitrosopiperidine 100-75-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
N-Nitrosopyrrolidine 930-55-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
o-Toluidine 95-53-4	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND
2,2'-oxybis[1-chloropropane] 108-60-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Pentachlorobenzene 608-93-5	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Pentachloroethane 76-01-7	µg	< 140	ND	< 140	ND	< 140	ND	< 140	ND
	µg/dscm	< 41.30	ND	< 41.92	ND	< 40.83	ND	< 41.34	ND
	lb/hr	< 1.18E-02	ND	< 1.20E-02	ND	< 1.21E-02	ND	< 1.20E-02	ND
	g/s	< 1.49E-03	ND	< 1.51E-03	ND	< 1.52E-03	ND	< 1.51E-03	ND
Pentachloronitrobenzene 82-68-8	µg	< 240	ND	< 240	ND	< 240	ND	< 240	ND
	µg/dscm	< 70.81	ND	< 71.86	ND	< 70.00	ND	< 70.87	ND
	lb/hr	< 2.03E-02	ND	< 2.06E-02	ND	< 2.07E-02	ND	< 2.05E-02	ND
	g/s	< 2.56E-03	ND	< 2.59E-03	ND	< 2.60E-03	ND	< 2.58E-03	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Pentachlorophenol 87-86-5	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 88.51	ND	< 89.82	ND	< 87.50	ND	< 88.59	ND
	lb/hr	< 2.54E-02	ND	< 2.57E-02	ND	< 2.58E-02	ND	< 2.56E-02	ND
	g/s	< 3.20E-03	ND	< 3.24E-03	ND	< 3.26E-03	ND	< 3.23E-03	ND
Phenacetin 62-44-2	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND
Phenol 108-95-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
1,4-Phenylenediamine 106-50-3	µg	< 280	ND	< 280	ND	< 280	ND	< 280	ND
	µg/dscm	< 82.61	ND	< 83.83	ND	< 81.67	ND	< 82.68	ND
	lb/hr	< 2.37E-02	ND	< 2.40E-02	ND	< 2.41E-02	ND	< 2.39E-02	ND
	g/s	< 2.98E-03	ND	< 3.02E-03	ND	< 3.04E-03	ND	< 3.01E-03	ND
2-Picoline 109-06-8	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
Pronamide 23950-58-5	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Pyridine 110-86-1	µg	< 120	ND	< 120	ND	< 120	ND	< 120	ND
	µg/dscm	< 35.40	ND	< 35.93	ND	< 35.00	ND	< 35.44	ND
	lb/hr	< 1.01E-02	ND	< 1.03E-02	ND	< 1.03E-02	ND	< 1.03E-02	ND
	g/s	< 1.28E-03	ND	< 1.30E-03	ND	< 1.30E-03	ND	< 1.29E-03	ND
Safrole 94-59-7	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 23.60	ND	< 23.95	ND	< 23.33	ND	< 23.62	ND
	lb/hr	< 6.76E-03	ND	< 6.85E-03	ND	< 6.89E-03	ND	< 6.83E-03	ND
	g/s	< 8.52E-04	ND	< 8.63E-04	ND	< 8.68E-04	ND	< 8.61E-04	ND
1,2,4,5-Tetrachlorobenzene 95-94-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
2,3,4,6-Tetrachlorophenol 58-90-2	µg	< 140	ND	< 140	ND	< 140	ND	< 140	ND
	µg/dscm	< 41.30	ND	< 41.92	ND	< 40.83	ND	< 41.34	ND
	lb/hr	< 1.18E-02	ND	< 1.20E-02	ND	< 1.21E-02	ND	< 1.20E-02	ND
	g/s	< 1.49E-03	ND	< 1.51E-03	ND	< 1.52E-03	ND	< 1.51E-03	ND
1,2,4-Trichlorobenzene 120-82-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND
2,4,5-Trichlorophenol 95-95-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 17.70	ND	< 17.96	ND	< 17.50	ND	< 17.72	ND
	lb/hr	< 5.07E-03	ND	< 5.14E-03	ND	< 5.17E-03	ND	< 5.13E-03	ND
	g/s	< 6.39E-04	ND	< 6.48E-04	ND	< 6.51E-04	ND	< 6.46E-04	ND

Table 5-1: Summary of Semivolatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2	Run 3	Run 4	Average
2,4,6-Trichlorophenol 88-06-2	µg	< 60 ND	< 60 ND	< 60 ND	< 60 ND
	µg/dscm	< 17.70 ND	< 17.96 ND	< 17.50 ND	< 17.72 ND
	lb/hr	< 5.07E-03 ND	< 5.14E-03 ND	< 5.17E-03 ND	< 5.13E-03 ND
	g/s	< 6.39E-04 ND	< 6.48E-04 ND	< 6.51E-04 ND	< 6.46E-04 ND
1,3,5-Trinitrobenzene 99-35-4	µg	< 60 ND	< 60 ND	< 60 ND	< 60 ND
	µg/dscm	< 17.70 ND	< 17.96 ND	< 17.50 ND	< 17.72 ND
	lb/hr	< 5.07E-03 ND	< 5.14E-03 ND	< 5.17E-03 ND	< 5.13E-03 ND
	g/s	< 6.39E-04 ND	< 6.48E-04 ND	< 6.51E-04 ND	< 6.46E-04 ND
Cyclohexane 110-82-7 TIC	µg	153.6	194.5	172.9	173.67
	µg/dscm	45.32	58.23	50.43	50.65
	lb/hr	1.30E-02	1.67E-02	1.49E-02	1.47E-02
	g/s	1.64E-03	2.10E-03	1.88E-03	1.85E-03
Butane, 2-methoxy-2-methyl 994-05-8 TIC	µg	282.6	NOT FOUND	208.8	245.70
	µg/dscm	83.38		60.90	72.49
	lb/hr	2.39E-02		1.80E-02	2.10E-02
	g/s	3.01E-03		2.27E-03	2.65E-03
Decane 124-18-5 TIC	µg	52.1	48.2	43.8	48.03
	µg/dscm	15.37	14.43	12.78	13.79
	lb/hr	4.40E-03	4.13E-03	3.77E-03	3.99E-03
	g/s	5.55E-04	5.20E-04	4.75E-04	5.02E-04

Note:
All analytes identified as "TIC" in the emission table are qualitative tentative identifications and should not be interpreted to be definitive evidence of the presence of the identified compound. The quantitation of each TIC is based on a theoretical response factor, and reported values should be considered estimated due to the high uncertainty with the identification and quantitation of these compounds.

Table 5–2: Summary of Semivolatile Organic Emissions for West Stack

Constituent	Units	Run 2	Run 3	Run 4	Average
		114.630	119.017	114.440	116.029
		74,752	77,440	75,901	76,031
a,a-Dimethyl phenethylamine 122-09-8	µg	< 80 ND	< 80 ND	< 80 ND	< 80 ND
	µg/dscm	< 24.64 ND	< 23.73 ND	< 24.68 ND	< 24.35 ND
	lb/hr	< 6.90E-03 ND	< 6.89E-03 ND	< 7.02E-03 ND	< 6.93E-03 ND
	g/s	< 8.69E-04 ND	< 8.68E-04 ND	< 8.84E-04 ND	< 8.74E-04 ND
Acetophenone 98-86-2	µg	< 60 ND	< 60 ND	< 60 ND	< 60 ND
	µg/dscm	< 18.48 ND	< 17.80 ND	< 18.51 ND	< 18.27 ND
	lb/hr	< 5.18E-03 ND	< 5.16E-03 ND	< 5.26E-03 ND	< 5.20E-03 ND
	g/s	< 6.52E-04 ND	< 6.51E-04 ND	< 6.63E-04 ND	< 6.55E-04 ND
2-Acetylaminofuorene 53-96-3	µg	< 240 ND	< 240 ND	< 240 ND	< 240 ND
	µg/dscm	< 73.93 ND	< 71.20 ND	< 74.05 ND	< 73.06 ND
	lb/hr	< 2.07E-02 ND	< 2.07E-02 ND	< 2.11E-02 ND	< 2.08E-02 ND
	g/s	< 2.61E-03 ND	< 2.60E-03 ND	< 2.65E-03 ND	< 2.62E-03 ND
a-Naphthylamine 134-32-7	µg	< 60 ND	< 60 ND	< 60 ND	< 60 ND
	µg/dscm	< 18.48 ND	< 17.80 ND	< 18.51 ND	< 18.27 ND
	lb/hr	< 5.18E-03 ND	< 5.16E-03 ND	< 5.26E-03 ND	< 5.20E-03 ND
	g/s	< 6.52E-04 ND	< 6.51E-04 ND	< 6.63E-04 ND	< 6.55E-04 ND
4-Aminobiphenyl 92-67-1	µg	< 140 ND	< 140 ND	< 140 ND	< 140 ND
	µg/dscm	< 43.12 ND	< 41.54 ND	< 43.20 ND	< 42.62 ND
	lb/hr	< 1.21E-02 ND	< 1.20E-02 ND	< 1.23E-02 ND	< 1.21E-02 ND
	g/s	< 1.52E-03 ND	< 1.52E-03 ND	< 1.55E-03 ND	< 1.53E-03 ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Aniline 62-53-3	µg	< 100	ND	< 100	ND	< 100	ND	< 100	ND
	µg/dscm	< 30.80	ND	< 29.67	ND	< 30.85	ND	< 30.44	ND
	lb/hr	< 8.63E-03	ND	< 8.61E-03	ND	< 8.77E-03	ND	< 8.67E-03	ND
	g/s	< 1.09E-03	ND	< 1.08E-03	ND	< 1.11E-03	ND	< 1.09E-03	ND
Aramite, total 140-57-8	µg	< 120	ND	< 120	ND	< 120	ND	< 120	ND
	µg/dscm	< 36.96	ND	< 35.60	ND	< 37.03	ND	< 36.53	ND
	lb/hr	< 1.04E-02	ND	< 1.03E-02	ND	< 1.05E-02	ND	< 1.04E-02	ND
	g/s	< 1.30E-03	ND	< 1.30E-03	ND	< 1.33E-03	ND	< 1.31E-03	ND
Benzaldehyde 100-52-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Benzidine 92-87-5	µg	< 600	ND	< 600	ND	< 600	ND	< 600	ND
	µg/dscm	< 184.82	ND	< 178.01	ND	< 185.13	ND	< 182.65	ND
	lb/hr	< 5.18E-02	ND	< 5.16E-02	ND	< 5.26E-02	ND	< 5.20E-02	ND
	g/s	< 6.52E-03	ND	< 6.51E-03	ND	< 6.63E-03	ND	< 6.55E-03	ND
Benzoic acid 65-85-0	µg	< 500	ND	< 500	ND	< 500	ND	< 500	ND
	µg/dscm	< 154.02	ND	< 148.34	ND	< 154.27	ND	< 152.21	ND
	lb/hr	< 4.31E-02	ND	< 4.30E-02	ND	< 4.39E-02	ND	< 4.33E-02	ND
	g/s	< 5.43E-03	ND	< 5.42E-03	ND	< 5.53E-03	ND	< 5.46E-03	ND
Benzyl alcohol 100-51-6	µg	< 420	ND	< 420	ND	< 420	ND	< 420	ND
	µg/dscm	< 129.37	ND	< 124.61	ND	< 129.59	ND	< 127.86	ND
	lb/hr	< 3.62E-02	ND	< 3.61E-02	ND	< 3.68E-02	ND	< 3.64E-02	ND
	g/s	< 4.56E-03	ND	< 4.55E-03	ND	< 4.64E-03	ND	< 4.59E-03	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
1,1'-Biphenyl 92-52-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
bis(2-Chloroethoxy)methane 111-91-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
bis(2-Chloroethyl)ether 111-44-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
bis(2-Ethylhexyl)phthalate 117-81-7 (total catch uses MDL)	µg	< 119.2	ND	< 119.2	ND	< 119.2	ND	< 119.2	ND
	µg/dscm	< 36.72	ND	< 35.36	ND	< 36.78	ND	< 36.29	ND
	lb/hr	< 1.03E-02	ND	< 1.03E-02	ND	< 1.05E-02	ND	< 1.03E-02	ND
	g/s	< 1.30E-03	ND	< 1.29E-03	ND	< 1.32E-03	ND	< 1.30E-03	ND
4-Bromophenyl-phenylether 101-55-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Butyl benzyl phthalate 85-68-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
4-Chloroaniline 106-47-8	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND
Chlorobenzilate 510-15-6	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
4-Chloro-3-methylphenol 59-50-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
1-Chloronapthalene 90-13-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
2-Chloronaphthalene 91-58-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
2-Chlorophenol 95-57-8	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
4-Chlorophenyl-phenylether 7005-72-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Diallate 2303-16-4	µg	< 120	ND	< 120	ND	< 120	ND	< 120	ND
	µg/dscm	< 36.96	ND	< 35.60	ND	< 37.03	ND	< 36.53	ND
	lb/hr	< 1.04E-02	ND	< 1.03E-02	ND	< 1.05E-02	ND	< 1.04E-02	ND
	g/s	< 1.30E-03	ND	< 1.30E-03	ND	< 1.33E-03	ND	< 1.31E-03	ND
Dibenz(a,j)acridine 224-42-0	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Dibenzofuran 132-64-9	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
1,2-Dichlorobenzene 95-50-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
1,3-Dichlorobenzene 541-73-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
1,4-Dichlorobenzene 106-46-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
3,3'-Dichlorobenzidine 91-94-1	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND
2,4-Dichlorophenol 120-83-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
2,6-Dichlorophenol 87-65-0	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Diethyl phthalate 84-66-2	µg	< 43.8		< 60	ND	< 60	ND	< 55	
	µg/dscm	< 13.49		< 17.80	ND	< 18.51	ND	< 16.60	
	lb/hr	< 3.78E-03		< 5.16E-03	ND	< 5.26E-03	ND	< 4.74E-03	
	g/s	< 4.76E-04		< 6.51E-04	ND	< 6.63E-04	ND	< 5.97E-04	
Dimethyl aminoazobenzene 60-11-7	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
7,12-Dimethylbenz(a)-anthracene 57-97-6	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND
3,3'-Dimethylbenzidine 119-93-7	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND
2,4-Dimethylphenol 105-67-9	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND
Dimethyl phthalate 131-11-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Di-n-butyl phthalate 84-74-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
1,3-Dinitrobenzene 99-65-0	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
4,6-Dinitro-2-methylphenol 534-52-1	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND
2,4-Dinitrophenol 51-28-5	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND
2,4-Dinitrotoluene 121-14-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
2,6-Dinitrotoluene 606-20-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Di-n-octylphthalate 117-84-0	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Dinoseb 88-85-7	µg	< 140	ND	< 140	ND	< 140	ND	< 140	ND
	µg/dscm	< 43.12	ND	< 41.54	ND	< 43.20	ND	< 42.62	ND
	lb/hr	< 1.21E-02	ND	< 1.20E-02	ND	< 1.23E-02	ND	< 1.21E-02	ND
	g/s	< 1.52E-03	ND	< 1.52E-03	ND	< 1.55E-03	ND	< 1.53E-03	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
1,4-Dioxane 123-91-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Diphenylamine 122-39-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
1,2-Diphenylhydrazine (as Azobenzene) 122-66-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Ethyl methanesulfonate 62-50-0	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Ethyl parathion 56-38-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Hexachlorobenzene 118-74-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Hexachlorobutadiene 87-68-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Hexachlorocyclopentadiene 77-47-7	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND
Hexachloroethane 67-72-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Hexachloropropene 1888-71-7	µg	< 240	ND	< 240	ND	< 240	ND	< 240	ND
	µg/dscm	< 73.93	ND	< 71.20	ND	< 74.05	ND	< 73.06	ND
	lb/hr	< 2.07E-02	ND	< 2.07E-02	ND	< 2.11E-02	ND	< 2.08E-02	ND
	g/s	< 2.61E-03	ND	< 2.60E-03	ND	< 2.65E-03	ND	< 2.62E-03	ND
Isophorone 78-59-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Isosafrole 120-58-1	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Methapyrilene 91-80-5	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
3-Methylcholanthrene 56-49-5	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND
Methyl methanesulfonate 66-27-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
2-Methyl-5-nitroaniline 99-55-8	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND
2-Methylphenol 95-48-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
3/4-Methylphenol 65794-96-9	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Naphthalene 91-20-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
1,4-Naphthoquinone 130-15-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
2-Naphthylamine 91-59-8	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND
2-Nitroaniline 88-74-4	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND
3-Nitroaniline 99-09-2	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND
4-Nitroaniline 100-01-6	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Nitrobenzene 98-95-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
2-Nitrophenol 88-75-5	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
4-Nitrophenol 100-02-7	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND
4-Nitroquinoline-l-oxide 56-57-5	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND
N-Nitrosodiethylamine 55-18-5	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
N-Nitrosodimethylamine 62-75-9	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
N-Nitroso-di-n-butylamine 924-16-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
N-Nitroso-di-n-propylamine 621-64-7	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
N-Nitrosodiphenylamine 86-30-6	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
N-Nitrosomethylethylamine 10595-95-6	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
N-Nitrosomorpholine 59-89-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
N-Nitrosopiperidine 100-75-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
N-Nitrosopyrrolidine 930-55-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
o-Toluidine 95-53-4	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND
2,2'-oxybis[1-chloropropane] 108-60-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Pentachlorobenzene 608-93-5	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Pentachloroethane 76-01-7	µg	< 140	ND	< 140	ND	< 140	ND	< 140	ND
	µg/dscm	< 43.12	ND	< 41.54	ND	< 43.20	ND	< 42.62	ND
	lb/hr	< 1.21E-02	ND	< 1.20E-02	ND	< 1.23E-02	ND	< 1.21E-02	ND
	g/s	< 1.52E-03	ND	< 1.52E-03	ND	< 1.55E-03	ND	< 1.53E-03	ND
Pentachloronitrobenzene 82-68-8	µg	< 240	ND	< 240	ND	< 240	ND	< 240	ND
	µg/dscm	< 73.93	ND	< 71.20	ND	< 74.05	ND	< 73.06	ND
	lb/hr	< 2.07E-02	ND	< 2.07E-02	ND	< 2.11E-02	ND	< 2.08E-02	ND
	g/s	< 2.61E-03	ND	< 2.60E-03	ND	< 2.65E-03	ND	< 2.62E-03	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Pentachlorophenol 87-86-5	µg	< 300	ND	< 300	ND	< 300	ND	< 300	ND
	µg/dscm	< 92.41	ND	< 89.00	ND	< 92.56	ND	< 91.33	ND
	lb/hr	< 2.59E-02	ND	< 2.58E-02	ND	< 2.63E-02	ND	< 2.60E-02	ND
	g/s	< 3.26E-03	ND	< 3.25E-03	ND	< 3.32E-03	ND	< 3.28E-03	ND
Phenacetin 62-44-2	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND
Phenol 108-95-2	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
1,4-Phenylenediamine 106-50-3	µg	< 280	ND	< 280	ND	< 280	ND	< 280	ND
	µg/dscm	< 86.25	ND	< 83.07	ND	< 86.39	ND	< 85.24	ND
	lb/hr	< 2.42E-02	ND	< 2.41E-02	ND	< 2.46E-02	ND	< 2.43E-02	ND
	g/s	< 3.04E-03	ND	< 3.04E-03	ND	< 3.10E-03	ND	< 3.06E-03	ND
2-Picoline 109-06-8	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
Pronamide 23950-58-5	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Pyridine 110-86-1	µg	< 120	ND	< 120	ND	< 120	ND	< 120	ND
	µg/dscm	< 36.96	ND	< 35.60	ND	< 37.03	ND	< 36.53	ND
	lb/hr	< 1.04E-02	ND	< 1.03E-02	ND	< 1.05E-02	ND	< 1.04E-02	ND
	g/s	< 1.30E-03	ND	< 1.30E-03	ND	< 1.33E-03	ND	< 1.31E-03	ND
Safrole 94-59-7	µg	< 80	ND	< 80	ND	< 80	ND	< 80	ND
	µg/dscm	< 24.64	ND	< 23.73	ND	< 24.68	ND	< 24.35	ND
	lb/hr	< 6.90E-03	ND	< 6.89E-03	ND	< 7.02E-03	ND	< 6.93E-03	ND
	g/s	< 8.69E-04	ND	< 8.68E-04	ND	< 8.84E-04	ND	< 8.74E-04	ND
1,2,4,5-Tetrachlorobenzene 95-94-3	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
2,3,4,6-Tetrachlorophenol 58-90-2	µg	< 140	ND	< 140	ND	< 140	ND	< 140	ND
	µg/dscm	< 43.12	ND	< 41.54	ND	< 43.20	ND	< 42.62	ND
	lb/hr	< 1.21E-02	ND	< 1.20E-02	ND	< 1.23E-02	ND	< 1.21E-02	ND
	g/s	< 1.52E-03	ND	< 1.52E-03	ND	< 1.55E-03	ND	< 1.53E-03	ND
1,2,4-Trichlorobenzene 120-82-1	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND
2,4,5-Trichlorophenol 95-95-4	µg	< 60	ND	< 60	ND	< 60	ND	< 60	ND
	µg/dscm	< 18.48	ND	< 17.80	ND	< 18.51	ND	< 18.27	ND
	lb/hr	< 5.18E-03	ND	< 5.16E-03	ND	< 5.26E-03	ND	< 5.20E-03	ND
	g/s	< 6.52E-04	ND	< 6.51E-04	ND	< 6.63E-04	ND	< 6.55E-04	ND

Table 5-2: Summary of Semivolatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2	Run 3	Run 4	Average
2,4,6-Trichlorophenol 88-06-2	µg	< 60 ND	< 60 ND	< 60 ND	< 60 ND
	µg/dscm	< 18.48 ND	< 17.80 ND	< 18.51 ND	< 18.27 ND
	lb/hr	< 5.18E-03 ND	< 5.16E-03 ND	< 5.26E-03 ND	< 5.20E-03 ND
	g/s	< 6.52E-04 ND	< 6.51E-04 ND	< 6.63E-04 ND	< 6.55E-04 ND
1,3,5-Trinitrobenzene 99-35-4	µg	< 60 ND	< 60 ND	< 60 ND	< 60 ND
	µg/dscm	< 18.48 ND	< 17.80 ND	< 18.51 ND	< 18.27 ND
	lb/hr	< 5.18E-03 ND	< 5.16E-03 ND	< 5.26E-03 ND	< 5.20E-03 ND
	g/s	< 6.52E-04 ND	< 6.51E-04 ND	< 6.63E-04 ND	< 6.55E-04 ND
Cyclohexane 110-82-7 TIC	µg	163.3	181.4	188.2	177.63
	µg/dscm	50.30	53.82	58.07	54.06
	lb/hr	1.41E-02	1.56E-02	1.65E-02	1.54E-02
	g/s	1.77E-03	1.97E-03	2.08E-03	1.94E-03
Butane, 2-methoxy-2-methyl 994-05-8 TIC	µg	235.3	224.0	312.6	257.30
	µg/dscm	72.48	66.46	96.45	78.46
	lb/hr	2.03E-02	1.93E-02	2.74E-02	2.23E-02
	g/s	2.56E-03	2.43E-03	3.46E-03	2.81E-03
Decane 124-18-5 TIC	µg	46.9	58.4	38.8	48.03
	µg/dscm	14.45	17.33	11.97	14.58
	lb/hr	4.05E-03	5.03E-03	3.40E-03	4.16E-03
	g/s	5.10E-04	6.33E-04	4.29E-04	5.24E-04
n-Hexadecanoic acid 57-10-3 TIC	µg	NOT FOUND	8.33	NOT FOUND	8.33
	µg/dscm		2.47		2.47
	lb/hr		7.17E-04		7.17E-04
	g/s		9.03E-05		9.03E-05

Note:

All analytes identified as "TIC" in the emission table are qualitative tentative identifications and should not be interpreted to be definitive evidence of the presence of the identified compound. The quantitation of each TIC is based on a theoretical response factor and reported values should be considered estimated due the high uncertainty with the identification and quantitation of these compounds.

Table 5–3: Summary of Dioxin/Furan Emissions for OTM Duct

Constituent	Units	Run 2		Run 3		Run 4		Average	
		112.693 dscf		112.692 dscf		108.117 dscf		111.167 dscf	
		2,167 dscfm		2,153 dscfm		2,043 dscfm		2,121 dscfm	
2,3,7,8-TetraCDD 1746-01-6	pg	< 2.75	ND	< 7.12		< 2.45	ND	< 4.11	
	lb/hr	< 6.99E-12	ND	< 1.80E-11		< 6.12E-12	ND	< 1.04E-11	
	g/s	< 8.81E-13	ND	< 2.27E-12		< 7.72E-13	ND	< 1.31E-12	
Total TetraCDD 41903-57-5	pg	29.50		36.10		28.70		31.43	
	lb/hr	7.50E-11		9.12E-11		7.17E-11		7.93E-11	
	g/s	9.45E-12		1.15E-11		9.04E-12		1.00E-11	
1,2,3,7,8 PentaCDD 40321-76-4	pg	< 0.35	ND	< 0.51	ND	< 0.37	ND	< 0.41	ND
	lb/hr	< 8.80E-13	ND	< 1.28E-12	ND	< 9.25E-13	ND	< 1.03E-12	ND
	g/s	< 1.11E-13	ND	< 1.61E-13	ND	< 1.17E-13	ND	< 1.29E-13	ND
Total PentaCDD 36088-22-9	pg	10.26		10.36		11.69		10.77	
	lb/hr	2.61E-11		2.62E-11		2.92E-11		2.72E-11	
	g/s	3.29E-12		3.30E-12		3.68E-12		3.42E-12	
1,2,3,4,7,8 HexaCDD 39227-28-6	pg	< 2.08	ND	< 3.17	ND	< 2.06	ND	< 2.44	ND
	lb/hr	< 5.28E-12	ND	< 8.01E-12	ND	< 5.15E-12	ND	< 6.15E-12	ND
	g/s	< 6.65E-13	ND	< 1.01E-12	ND	< 6.49E-13	ND	< 7.74E-13	ND
1,2,3,6,7,8 HexaCDD 57653-85-7	pg	< 2.04	ND	< 3.12	ND	< 2.02	ND	< 2.39	ND
	lb/hr	< 5.19E-12	ND	< 7.88E-12	ND	< 5.04E-12	ND	< 6.04E-12	ND
	g/s	< 6.54E-13	ND	< 9.93E-13	ND	< 6.36E-13	ND	< 7.61E-13	ND
1,2,3,7,8,9 HexaCDD 19408-74-3	pg	< 2.02	ND	< 3.10	ND	< 2.01	ND	< 2.38	ND
	lb/hr	< 5.15E-12	ND	< 7.83E-12	ND	< 5.02E-12	ND	< 6.00E-12	ND
	g/s	< 6.49E-13	ND	< 9.87E-13	ND	< 6.33E-13	ND	< 7.56E-13	ND

Table 5-3: Summary of Dioxin/Furan Emissions for OTM Duct (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Total HexaCDD 34465-46-8	pg	20.65		18.19		15.75		18.20	
	lb/hr	5.25E-11		4.60E-11		3.94E-11		4.60E-11	
	g/s	6.62E-12		5.79E-12		4.96E-12		5.79E-12	
1,2,3,4,6,7,8 HeptaCDD 35822-46-9	pg	< 3.96	ND	< 5.09	ND	< 4.98	ND	< 4.68	ND
	lb/hr	< 1.01E-11	ND	< 1.29E-11	ND	< 1.24E-11	ND	< 1.18E-11	ND
	g/s	< 1.27E-12	ND	< 1.62E-12	ND	< 1.57E-12	ND	< 1.49E-12	ND
Total HeptCDD 38998-75-3	pg	< 3.96	ND	< 5.09	ND	< 4.98	ND	< 4.68	ND
	lb/hr	< 1.01E-11	ND	< 1.29E-11	ND	< 1.24E-11	ND	< 1.18E-11	ND
	g/s	< 1.27E-12	ND	< 1.62E-12	ND	< 1.57E-12	ND	< 1.49E-12	ND
Total OctaCDD 3268-87-9	pg	13.16		10.62		8.78		10.85	
	lb/hr	3.35E-11		2.68E-11		2.19E-11		2.74E-11	
	g/s	4.22E-12		3.38E-12		2.77E-12		3.45E-12	
2,3,7,8 TetraCDF 51207-31-9	pg	< 3.54	ND	< 2.04	ND	< 2.07	ND	< 2.55	ND
	lb/hr	< 9.00E-12	ND	< 5.15E-12	ND	< 5.18E-12	ND	< 6.44E-12	ND
	g/s	< 1.13E-12	ND	< 6.48E-13	ND	< 6.53E-13	ND	< 8.12E-13	ND
Total TetraCDF 55722-27-5	pg	< 3.54	ND	10.63		< 2.07	ND	< 5.41	
	lb/hr	< 9.00E-12	ND	2.69E-11		< 5.18E-12	ND	< 1.37E-11	
	g/s	< 1.13E-12	ND	3.38E-12		< 6.53E-13	ND	< 1.72E-12	
1,2,3,7,8 PentaCDF 57117-41-6	pg	< 3.47	ND	< 3.76	ND	< 4.10	ND	< 3.78	ND
	lb/hr	< 8.83E-12	ND	< 9.50E-12	ND	< 1.02E-11	ND	< 9.53E-12	ND
	g/s	< 1.11E-12	ND	< 1.20E-12	ND	< 1.29E-12	ND	< 1.20E-12	ND
2,3,4,7,8 PentaCDF 57117-31-4	pg	< 3.41	ND	< 3.69	ND	< 4.02	ND	< 3.71	ND
	lb/hr	< 8.67E-12	ND	< 9.33E-12	ND	< 1.00E-11	ND	< 9.35E-12	ND
	g/s	< 1.09E-12	ND	< 1.17E-12	ND	< 1.27E-12	ND	< 1.18E-12	ND

Table 5-3: Summary of Dioxin/Furan Emissions for OTM Duct (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Total PentaCDF 30402-15-4	pg	< 3.47	ND	< 3.76	ND	< 4.10	ND	< 3.78	ND
	lb/hr	< 8.83E-12	ND	< 9.50E-12	ND	< 1.02E-11	ND	< 9.53E-12	ND
	g/s	< 1.11E-12	ND	< 1.20E-12	ND	< 1.29E-12	ND	< 1.20E-12	ND
1,2,3,4,7,8 HexaCDF 70648-26-9	pg	< 2.33	ND	< 1.73	ND	< 2.45	ND	< 2.17	ND
	lb/hr	< 5.93E-12	ND	< 4.36E-12	ND	< 6.12E-12	ND	< 5.47E-12	ND
	g/s	< 7.47E-13	ND	< 5.50E-13	ND	< 7.72E-13	ND	< 6.89E-13	ND
1,2,3,6,7,8 HexaCDF 57117-44-9	pg	< 2.16	ND	< 1.60	ND	< 2.27	ND	< 2.01	ND
	lb/hr	< 5.49E-12	ND	< 4.04E-12	ND	< 5.67E-12	ND	< 5.07E-12	ND
	g/s	< 6.92E-13	ND	< 5.09E-13	ND	< 7.15E-13	ND	< 6.39E-13	ND
2,3,4,6,7,8 HexaCDF 60851-34-5	pg	< 2.27	ND	< 1.68	ND	< 2.39	ND	< 2.11	ND
	lb/hr	< 5.77E-12	ND	< 4.26E-12	ND	< 5.97E-12	ND	< 5.33E-12	ND
	g/s	< 7.28E-13	ND	< 5.36E-13	ND	< 7.53E-13	ND	< 6.72E-13	ND
1,2,3,7,8,9 HexaCDF 72918-21-9	pg	< 2.52	ND	< 1.87	ND	< 2.65	ND	< 2.35	ND
	lb/hr	< 6.41E-12	ND	< 4.72E-12	ND	< 6.62E-12	ND	< 5.92E-12	ND
	g/s	< 8.08E-13	ND	< 5.94E-13	ND	< 8.35E-13	ND	< 7.46E-13	ND
Total HexaCDF 55684-94-1	pg	7.50		5.80		9.67		7.66	
	lb/hr	1.91E-11		1.47E-11		2.42E-11		1.93E-11	
	g/s	2.40E-12		1.85E-12		3.05E-12		2.43E-12	
1,2,3,4,6,7,8 HeptaCDF 67562-39-4	pg	< 3.34		4.13		< 2.79		< 3.42	
	lb/hr	< 8.50E-12		1.04E-11		< 6.97E-12		< 8.63E-12	
	g/s	< 1.07E-12		1.31E-12		< 8.79E-13		< 1.09E-12	
1,2,3,4,7,8,9 HeptaCDF 55673-89-7	pg	< 2.55	ND	< 1.84	ND	< 1.79	ND	< 2.06	ND
	lb/hr	< 6.49E-12	ND	< 4.65E-12	ND	< 4.48E-12	ND	< 5.20E-12	ND
	g/s	< 8.17E-13	ND	< 5.86E-13	ND	< 5.64E-13	ND	< 6.56E-13	ND

Table 5-3: Summary of Dioxin/Furan Emissions for OTM Duct (continued)

Constituent	Units	Run 2	Run 3	Run 4	Average
Total HeptaCDF 38998-75-3	pg	< 3.67	4.13	< 2.93	< 3.58
	lb/hr	< 9.33E-12	1.04E-11	< 7.33E-12	< 9.03E-12
	g/s	< 1.18E-12	1.31E-12	< 9.23E-13	< 1.14E-12
Total OctaCDF 39001-02-0	pg	5.26	3.98	5.27	4.84
	lb/hr	1.34E-11	1.01E-11	1.32E-11	1.22E-11
	g/s	1.69E-12	1.27E-12	1.66E-12	1.54E-12

Table 5–4: Summary of PCB Emissions for OTM Duct

Constituent	Units	Run 2 112.693 dscf 2,167 dscfm	Run 3 112.692 dscf 2,153 dscfm	Run 4 108.117 dscf 2,043 dscfm	Average 111.167 dscf 2,121 dscfm
3,3',4,4'-TetraCB (PCB-77) 32598-13-3	µg	< 3.07E-05 ND	< 2.60E-05 ND	< 2.97E-05	< 2.88E-05
	µg/dscm	< 9.63E-06 ND	< 8.16E-06 ND	< 9.71E-06	< 9.17E-06
	lb/hr	< 7.82E-11 ND	< 6.58E-11 ND	< 7.43E-11	< 7.28E-11
	g/s	< 9.85E-12 ND	< 8.29E-12 ND	< 9.36E-12	< 9.17E-12
3,4,4',5-TetraCB (PCB-81) 70362-50-4	µg	< 3.02E-05 ND	< 2.60E-05 ND	< 2.67E-05 ND	< 2.76E-05 ND
	µg/dscm	< 9.48E-06 ND	< 8.14E-06 ND	< 8.71E-06 ND	< 8.78E-06 ND
	lb/hr	< 7.69E-11 ND	< 6.56E-11 ND	< 6.67E-11 ND	< 6.97E-11 ND
	g/s	< 9.69E-12 ND	< 8.27E-12 ND	< 8.40E-12 ND	< 8.79E-12 ND
2,3,3',4,4'-PentaCB (PCB-105) 32598-14-4	µg	< 2.82E-05 ND	< 3.47E-05	< 2.68E-05 ND	< 2.99E-05
	µg/dscm	< 8.82E-06 ND	< 1.09E-05	< 8.75E-06 ND	< 9.48E-06
	lb/hr	< 7.16E-11 ND	< 8.78E-11	< 6.69E-11 ND	< 7.54E-11
	g/s	< 9.02E-12 ND	< 1.11E-11	< 8.43E-12 ND	< 9.51E-12
2,3,4,4',5-PentaCB (PCB-114) 74472-37-0	µg	< 2.75E-05 ND	< 2.68E-05 ND	< 2.57E-05 ND	< 2.67E-05 ND
	µg/dscm	< 8.61E-06 ND	< 8.41E-06 ND	< 8.38E-06 ND	< 8.47E-06 ND
	lb/hr	< 6.99E-11 ND	< 6.78E-11 ND	< 6.42E-11 ND	< 6.73E-11 ND
	g/s	< 8.81E-12 ND	< 8.54E-12 ND	< 8.08E-12 ND	< 8.48E-12 ND
2,3',4,4',5-PentaCB (PCB-118) 31508-00-6	µg	1.40E-04	< 1.17E-04	< 9.05E-05	< 1.16E-04
	µg/dscm	4.39E-05	< 3.65E-05	< 2.96E-05	< 3.67E-05
	lb/hr	3.56E-10	< 2.94E-10	< 2.26E-10	< 2.92E-10
	g/s	4.49E-11	< 3.71E-11	< 2.85E-11	< 3.68E-11

Table 5-4: Summary of PCB Emissions for MPT OTM Duct (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
2',3,4,4',5-PentaCB (PCB-123) 65510-44-3	µg	< 3.00E-05	ND	< 2.89E-05	ND	< 2.82E-05	ND	< 2.90E-05	ND
	µg/dscm	< 9.40E-06	ND	< 9.07E-06	ND	< 9.20E-06	ND	< 9.22E-06	ND
	lb/hr	< 7.63E-11	ND	< 7.31E-11	ND	< 7.04E-11	ND	< 7.33E-11	ND
	g/s	< 9.62E-12	ND	< 9.22E-12	ND	< 8.87E-12	ND	< 9.24E-12	ND
3,3',4,4',5-PentaCB (PCB-126) 57465-28-8	µg	< 3.15E-05	ND	< 3.12E-05	ND	< 2.99E-05	ND	< 3.09E-05	ND
	µg/dscm	< 9.87E-06	ND	< 9.78E-06	ND	< 9.77E-06	ND	< 9.81E-06	ND
	lb/hr	< 8.01E-11	ND	< 7.89E-11	ND	< 7.48E-11	ND	< 7.79E-11	ND
	g/s	< 1.01E-11	ND	< 9.94E-12	ND	< 9.42E-12	ND	< 9.82E-12	ND
2,3,3',4,4',5-HexaCB (PCB-156) 38380-08-4	µg	1.08E-04		< 1.02E-04		< 1.02E-04		< 1.04E-04	
	µg/dscm	3.37E-05		< 3.18E-05		< 3.35E-05		< 3.30E-05	
	lb/hr	2.73E-10		< 2.57E-10		< 2.56E-10		< 2.62E-10	
	g/s	3.45E-11		< 3.24E-11		< 3.23E-11		< 3.30E-11	
2,3,3',4,4',5'-HexaCB (PCB-157) 69782-90-7	µg	1.08E-04		< 1.02E-04		< 1.02E-04		< 1.04E-04	
	µg/dscm	3.37E-05		< 3.18E-05		< 3.35E-05		< 3.30E-05	
	lb/hr	2.73E-10		< 2.57E-10		< 2.56E-10		< 2.62E-10	
	g/s	3.45E-11		< 3.24E-11		< 3.23E-11		< 3.30E-11	
2,3',4,4',5,5'-HexaCB (PCB-167) 52663-72-6	µg	< 1.10E-05	ND	< 1.40E-05	ND	< 6.53E-06	ND	< 1.05E-05	ND
	µg/dscm	< 3.46E-06	ND	< 4.39E-06	ND	< 2.13E-06	ND	< 3.33E-06	ND
	lb/hr	< 2.81E-11	ND	< 3.54E-11	ND	< 1.63E-11	ND	< 2.66E-11	ND
	g/s	< 3.54E-12	ND	< 4.46E-12	ND	< 2.06E-12	ND	< 3.35E-12	ND
3,3',4,4',5,5'-HexaCB (PCB-169) 32774-16-6	µg	< 1.06E-05	ND	< 1.34E-05	ND	< 6.11E-06	ND	< 1.01E-05	ND
	µg/dscm	< 3.33E-06	ND	< 4.21E-06	ND	< 2.00E-06	ND	< 3.18E-06	ND
	lb/hr	< 2.70E-11	ND	< 3.40E-11	ND	< 1.53E-11	ND	< 2.54E-11	ND
	g/s	< 3.41E-12	ND	< 4.28E-12	ND	< 1.92E-12	ND	< 3.20E-12	ND

Table 5-4: Summary of PCB Emissions for MPT OTM Duct (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
2,3,3',4,4',5,5'-HeptaCB (PCB-189) 39635-31-9	µg	< 1.98E-05	ND	< 1.79E-05	ND	< 1.70E-05	ND	< 1.82E-05	ND
	µg/dscm	< 6.21E-06	ND	< 5.61E-06	ND	< 5.55E-06	ND	< 5.79E-06	ND
	lb/hr	< 5.04E-11	ND	< 4.53E-11	ND	< 4.25E-11	ND	< 4.60E-11	ND
	g/s	< 6.35E-12	ND	< 5.70E-12	ND	< 5.35E-12	ND	< 5.80E-12	ND
Total DecaCB (PCB-209) 2051-24-3	µg	< 4.85E-06	ND	< 5.66E-06	ND	< 1.74E-05		< 9.29E-06	
	µg/dscm	< 1.52E-06	ND	< 1.77E-06	ND	< 5.67E-06		< 2.99E-06	
	lb/hr	< 1.23E-11	ND	< 1.43E-11	ND	< 4.34E-11		< 2.33E-11	
	g/s	< 1.55E-12	ND	< 1.80E-12	ND	< 5.46E-12		< 2.94E-12	
Total MonoCB 37323-18-8	µg	< 2.63E-04		< 2.32E-04		< 1.54E-04		< 2.16E-04	
	µg/dscm	< 8.24E-05		< 7.27E-05		< 5.03E-05		< 6.85E-05	
	lb/hr	< 6.69E-10		< 5.87E-10		< 3.85E-10		< 5.47E-10	
	g/s	< 8.43E-11		< 7.39E-11		< 4.86E-11		< 6.89E-11	
Total DiCB 25512-42-9	µg	4.14E-03		2.85E-03		1.83E-03		2.94E-03	
	µg/dscm	1.30E-03		8.92E-04		5.98E-04		9.29E-04	
	lb/hr	1.05E-08		7.19E-09		4.58E-09		7.44E-09	
	g/s	1.33E-09		9.07E-10		5.77E-10		9.37E-10	
Total TriCB 25323-68-6	µg	1.03E-03		9.13E-04		7.64E-04		9.04E-04	
	µg/dscm	3.24E-04		2.86E-04		2.49E-04		2.87E-04	
	lb/hr	2.63E-09		2.31E-09		1.91E-09		2.28E-09	
	g/s	3.31E-10		2.91E-10		2.41E-10		2.88E-10	
Total TetraCB 26914-33-0	µg	1.01E-03		6.46E-04		4.56E-04		7.03E-04	
	µg/dscm	3.15E-04		2.02E-04		1.49E-04		2.22E-04	
	lb/hr	2.56E-09		1.63E-09		1.14E-09		1.78E-09	
	g/s	3.22E-10		2.06E-10		1.44E-10		2.24E-10	

Table 5-4: Summary of PCB Emissions for OTM Duct (continued)

Constituent	Units	Run 2	Run 3	Run 4	Average
Total PentaCB 25429-29-2	µg	9.93E-04	4.71E-04	2.92E-04	5.85E-04
	µg/dscm	3.11E-04	1.48E-04	9.52E-05	1.85E-04
	lb/hr	2.53E-09	1.19E-09	7.29E-10	1.48E-09
	g/s	3.18E-10	1.50E-10	9.18E-11	1.87E-10
Total HexaCB 26601-64-9	µg	7.69E-04	5.06E-04	3.21E-04	5.32E-04
	µg/dscm	2.41E-04	1.59E-04	1.05E-04	1.68E-04
	lb/hr	1.96E-09	1.28E-09	8.02E-10	1.35E-09
	g/s	2.46E-10	1.61E-10	1.01E-10	1.70E-10
Total HeptaCB 28655-71-2	µg	2.53E-04	1.90E-04	< 1.25E-04	< 1.89E-04
	µg/dscm	7.92E-05	5.95E-05	< 4.08E-05	< 5.98E-05
	lb/hr	6.43E-10	4.80E-10	< 3.12E-10	< 4.78E-10
	g/s	8.11E-11	6.05E-11	< 3.93E-11	< 6.03E-11
Total OctaCB 55722-26-4	µg	1.58E-04	1.13E-04	1.39E-04	1.36E-04
	µg/dscm	4.94E-05	3.54E-05	4.52E-05	4.33E-05
	lb/hr	4.01E-10	2.86E-10	3.46E-10	3.44E-10
	g/s	5.05E-11	3.60E-11	4.36E-11	4.34E-11
Total NonaCB 53742-07-7	µg	< 1.09E-04 ND	< 1.01E-04 ND	< 1.14E-04 ND	< 1.08E-04 ND
	µg/dscm	< 3.42E-05 ND	< 3.16E-05 ND	< 3.72E-05 ND	< 3.44E-05 ND
	lb/hr	< 2.78E-10 ND	< 2.55E-10 ND	< 2.85E-10 ND	< 2.73E-10 ND
	g/s	< 3.50E-11 ND	< 3.22E-11 ND	< 3.59E-11 ND	< 3.44E-11 ND
Total PCB 1336-36-3	µg	8.61E-03	5.91E-03	4.07E-03	6.20E-03
	µg/dscm	2.70E-03	1.85E-03	1.33E-03	1.96E-03
	lb/hr	2.19E-08	1.49E-08	1.02E-08	1.57E-08
	g/s	2.76E-09	1.88E-09	1.28E-09	1.97E-09

Table 5–5: Summary of PAH Emissions for OTM Duct

Constituent	Units	Run 2 112.693 dscf 2,167 dscfm	Run 3 112.692 dscf 2,153 dscfm	Run 4 108.117 dscf 2,043 dscfm	Average 111.167 dscf 2,121 dscfm
Acenaphthene 83-32-9	µg	< 0.14 ND	< 0.14 ND	< 0.14 ND	< 0.14 ND
	µg/dscm	< 0.044 ND	< 0.044 ND	< 0.046 ND	< 0.044 ND
	lb/hr	< 3.56E-07 ND	< 3.54E-07 ND	< 3.50E-07 ND	< 3.53E-07 ND
	g/s	< 4.49E-08 ND	< 4.46E-08 ND	< 4.41E-08 ND	< 4.45E-08 ND
Acenaphthylene 208-96-8	µg	< 0.14 ND	< 0.14 ND	< 0.14 ND	< 0.14 ND
	µg/dscm	< 0.044 ND	< 0.044 ND	< 0.046 ND	< 0.044 ND
	lb/hr	< 3.56E-07 ND	< 3.54E-07 ND	< 3.50E-07 ND	< 3.53E-07 ND
	g/s	< 4.49E-08 ND	< 4.46E-08 ND	< 4.41E-08 ND	< 4.45E-08 ND
Anthracene 120-12-7	µg	< 0.080 ND	< 0.067	< 0.080 ND	< 0.076
	µg/dscm	< 0.025 ND	< 0.021	< 0.026 ND	< 0.024
	lb/hr	< 2.03E-07 ND	< 1.68E-07	< 2.00E-07 ND	< 1.91E-07
	g/s	< 2.56E-08 ND	< 2.12E-08	< 2.52E-08 ND	< 2.40E-08
Benzo(a)anthracene 56-55-3	µg	< 0.080 ND	< 0.080 ND	< 0.080 ND	< 0.080 ND
	µg/dscm	< 0.025 ND	< 0.025 ND	< 0.026 ND	< 0.025 ND
	lb/hr	< 2.03E-07 ND	< 2.02E-07 ND	< 2.00E-07 ND	< 2.02E-07 ND
	g/s	< 2.56E-08 ND	< 2.55E-08 ND	< 2.52E-08 ND	< 2.54E-08 ND
Benzo(a)pyrene 50-32-8	µg	< 0.021 ND	< 0.021 ND	< 0.021 ND	< 0.021 ND
	µg/dscm	< 0.0065 ND	< 0.0065 ND	< 0.0067 ND	< 0.0065 ND
	lb/hr	< 5.24E-08 ND	< 5.21E-08 ND	< 5.15E-08 ND	< 5.20E-08 ND
	g/s	< 6.60E-09 ND	< 6.56E-09 ND	< 6.49E-09 ND	< 6.55E-09 ND

Table 5-5: Summary of PAH Emissions for OTM Duct (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Benzo(b)fluoranthene 205-99-2	µg	< 0.11	ND	< 0.11	ND	< 0.11	ND	< 0.11	ND
	µg/dscm	< 0.034	ND	< 0.034	ND	< 0.036	ND	< 0.035	ND
	lb/hr	< 2.80E-07	ND	< 2.78E-07	ND	< 2.75E-07	ND	< 2.78E-07	ND
	g/s	< 3.53E-08	ND	< 3.50E-08	ND	< 3.46E-08	ND	< 3.50E-08	ND
Benzo(e)pyrene 192-97-2	µg	< 0.080	ND	< 0.061		< 0.080	ND	< 0.074	
	µg/dscm	< 0.025	ND	< 0.019		< 0.026	ND	< 0.023	
	lb/hr	< 2.03E-07	ND	< 1.53E-07		< 2.00E-07	ND	< 1.85E-07	
	g/s	< 2.56E-08	ND	< 1.93E-08		< 2.52E-08	ND	< 2.34E-08	
Benzo(g,h,i)perylene 191-24-2	µg	< 0.080	ND	< 0.11		< 0.080	ND	< 0.088	
	µg/dscm	< 0.025	ND	< 0.033		< 0.026	ND	< 0.028	
	lb/hr	< 2.03E-07	ND	< 2.65E-07		< 2.00E-07	ND	< 2.23E-07	
	g/s	< 2.56E-08	ND	< 3.34E-08		< 2.52E-08	ND	< 2.81E-08	
Benzo(k)fluoranthene 207-08-9	µg	< 0.11	ND	< 0.11	ND	< 0.11	ND	< 0.11	ND
	µg/dscm	< 0.034	ND	< 0.034	ND	< 0.036	ND	< 0.035	ND
	lb/hr	< 2.80E-07	ND	< 2.78E-07	ND	< 2.75E-07	ND	< 2.78E-07	ND
	g/s	< 3.53E-08	ND	< 3.50E-08	ND	< 3.46E-08	ND	< 3.50E-08	ND
Chrysene 218-01-9	µg	< 0.080	ND	< 0.068		< 0.080	ND	< 0.076	
	µg/dscm	< 0.025	ND	< 0.021		< 0.026	ND	< 0.024	
	lb/hr	< 2.03E-07	ND	< 1.72E-07		< 2.00E-07	ND	< 1.92E-07	
	g/s	< 2.56E-08	ND	< 2.17E-08		< 2.52E-08	ND	< 2.42E-08	
Dibenz(a,h)anthracene 53-70-3	µg	< 0.080	ND	< 0.080	ND	< 0.080	ND	< 0.080	ND
	µg/dscm	< 0.025	ND	< 0.025	ND	< 0.026	ND	< 0.025	ND
	lb/hr	< 2.03E-07	ND	< 2.02E-07	ND	< 2.00E-07	ND	< 2.02E-07	ND
	g/s	< 2.56E-08	ND	< 2.55E-08	ND	< 2.52E-08	ND	< 2.54E-08	ND

Table 5-5: Summary of PAH Emissions for OTM Duct (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Fluoranthene 206-44-0	µg	< 0.071		< 0.080	ND	< 0.080	ND	< 0.077	
	µg/dscm	< 0.022		< 0.025	ND	< 0.026	ND	< 0.025	
	lb/hr	< 1.81E-07		< 2.02E-07	ND	< 2.00E-07	ND	< 1.94E-07	
	g/s	< 2.28E-08		< 2.55E-08	ND	< 2.52E-08	ND	< 2.45E-08	
Fluorene 86-73-7	µg	< 0.080	ND	< 0.080	ND	< 0.080	ND	< 0.080	ND
	µg/dscm	< 0.025	ND	< 0.025	ND	< 0.026	ND	< 0.025	ND
	lb/hr	< 2.03E-07	ND	< 2.02E-07	ND	< 2.00E-07	ND	< 2.02E-07	ND
	g/s	< 2.56E-08	ND	< 2.55E-08	ND	< 2.52E-08	ND	< 2.54E-08	ND
Indeno(1,2,3-cd)pyrene 193-39-5	µg	< 0.080	ND	< 0.057		< 0.080	ND	< 0.072	
	µg/dscm	< 0.025	ND	< 0.018		< 0.026	ND	< 0.023	
	lb/hr	< 2.03E-07	ND	< 1.45E-07		< 2.00E-07	ND	< 1.83E-07	
	g/s	< 2.56E-08	ND	< 1.82E-08		< 2.52E-08	ND	< 2.30E-08	
2-Methylnaphthalene 91-57-6	µg	< 0.31		< 0.18		< 0.11		< 0.20	
	µg/dscm	< 0.098		< 0.055		< 0.037		< 0.064	
	lb/hr	< 7.98E-07		< 4.45E-07		< 2.83E-07		< 5.09E-07	
	g/s	< 1.01E-07		< 5.61E-08		< 3.57E-08		< 6.41E-08	
Perylene 198-55-0	µg	< 0.080	ND	< 0.080	ND	< 0.080	ND	< 0.080	ND
	µg/dscm	< 0.025	ND	< 0.025	ND	< 0.026	ND	< 0.025	ND
	lb/hr	< 2.03E-07	ND	< 2.02E-07	ND	< 2.00E-07	ND	< 2.02E-07	ND
	g/s	< 2.56E-08	ND	< 2.55E-08	ND	< 2.52E-08	ND	< 2.54E-08	ND
Phenanthrene 85-01-8	µg	< 0.182		< 0.166		< 0.190	ND	< 0.18	
	µg/dscm	< 0.057		< 0.052		< 0.062	ND	< 0.057	
	lb/hr	< 4.63E-07		< 4.18E-07		< 4.75E-07	ND	< 4.52E-07	
	g/s	< 5.84E-08		< 5.27E-08		< 5.98E-08	ND	< 5.70E-08	

Table 5-5: Summary of PAH Emissions for OTM Duct (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Benzo(j)fluoranthene 205-82-3	µg	< 0.11	ND	< 0.11	ND	< 0.11	ND	< 0.11	ND
	µg/dscm	< 0.034	ND	< 0.034	ND	< 0.036	ND	< 0.035	ND
	lb/hr	< 2.80E-07	ND	< 2.78E-07	ND	< 2.75E-07	ND	< 2.78E-07	ND
	g/s	< 3.53E-08	ND	< 3.50E-08	ND	< 3.46E-08	ND	< 3.50E-08	ND
Pyrene 129-00-0	µg	< 0.14	ND	< 0.096		< 0.14	ND	< 0.13	
	µg/dscm	< 0.044	ND	< 0.030		< 0.046	ND	< 0.040	
	lb/hr	< 3.56E-07	ND	< 2.42E-07		< 3.50E-07	ND	< 3.16E-07	
	g/s	< 4.49E-08	ND	< 3.05E-08		< 4.41E-08	ND	< 3.98E-08	

Table 5–6: Summary of Volatile Organic Emissions for East Stack

Constituent	Units	Run 2 76.02 liters 74,645 dscfm	Run 3 72.97 liters 75,647 dscfm	Run 4 75.84 liters 77,568 dscfm	Average 74.94 liters 75,953 dscfm
Acetone 67-64-1	µg	< 2.42 ND	< 2.43 ND	< 2.43 ND	< 2.43 ND
	µg/dscm	< 31.89 ND	< 33.27 ND	< 31.98 ND	< 32.39 ND
	lb/hr	< 8.92E-03 ND	< 9.43E-03 ND	< 9.29E-03 ND	< 9.21E-03 ND
	g/s	< 1.12E-03 ND	< 1.19E-03 ND	< 1.17E-03 ND	< 1.16E-03 ND
Benzene 71-43-2	µg	< 0.13	< 0.15	< 0.12	< 0.13
	µg/dscm	< 1.70	< 1.99	< 1.59	< 1.75
	lb/hr	< 4.76E-04	< 5.65E-04	< 4.61E-04	< 5.01E-04
	g/s	< 6.00E-05	< 7.12E-05	< 5.81E-05	< 6.31E-05
Bromodichloromethane 75-27-4	µg	< 0.12 ND	< 0.12 ND	< 0.12 ND	< 0.12 ND
	µg/dscm	< 1.61 ND	< 1.68 ND	< 1.62 ND	< 1.63 ND
	lb/hr	< 4.50E-04 ND	< 4.77E-04 ND	< 4.69E-04 ND	< 4.66E-04 ND
	g/s	< 5.67E-05 ND	< 6.01E-05 ND	< 5.91E-05 ND	< 5.87E-05 ND
Bromoethene 593-60-2	µg	< 0.28 ND	< 0.29 ND	< 0.29 ND	< 0.28 ND
	µg/dscm	< 3.75 ND	< 3.91 ND	< 3.76 ND	< 3.81 ND
	lb/hr	< 1.05E-03 ND	< 1.11E-03 ND	< 1.09E-03 ND	< 1.08E-03 ND
	g/s	< 1.32E-04 ND	< 1.39E-04 ND	< 1.38E-04 ND	< 1.36E-04 ND
Bromoform 75-25-2	µg	< 0.24 ND	< 0.24 ND	< 0.24 ND	< 0.24 ND
	µg/dscm	< 3.19 ND	< 3.33 ND	< 3.20 ND	< 3.24 ND
	lb/hr	< 8.92E-04 ND	< 9.43E-04 ND	< 9.29E-04 ND	< 9.21E-04 ND
	g/s	< 1.12E-04 ND	< 1.19E-04 ND	< 1.17E-04 ND	< 1.16E-04 ND

Table 5-6: Summary of Volatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Bromomethane 74-83-9	µg	< 0.48	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.38	ND	< 6.65	ND	< 6.40	ND	< 6.48	ND
	lb/hr	< 1.78E-03	ND	< 1.89E-03	ND	< 1.86E-03	ND	< 1.84E-03	ND
	g/s	< 2.25E-04	ND	< 2.38E-04	ND	< 2.34E-04	ND	< 2.32E-04	ND
1,3-Butadiene 106-99-0	µg	< 0.48	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.38	ND	< 6.65	ND	< 6.40	ND	< 6.48	ND
	lb/hr	< 1.78E-03	ND	< 1.89E-03	ND	< 1.86E-03	ND	< 1.84E-03	ND
	g/s	< 2.25E-04	ND	< 2.38E-04	ND	< 2.34E-04	ND	< 2.32E-04	ND
2-Butanone 78-93-3	µg	< 1.01	ND	< 1.01	ND	< 1.01	ND	< 1.01	ND
	µg/dscm	< 13.31	ND	< 13.90	ND	< 13.36	ND	< 13.53	ND
	lb/hr	< 3.72E-03	ND	< 3.94E-03	ND	< 3.88E-03	ND	< 3.85E-03	ND
	g/s	< 4.69E-04	ND	< 4.96E-04	ND	< 4.89E-04	ND	< 4.85E-04	ND
Carbon disulfide 75-15-0	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.19	ND	< 3.33	ND	< 3.20	ND	< 3.24	ND
	lb/hr	< 8.92E-04	ND	< 9.43E-04	ND	< 9.29E-04	ND	< 9.21E-04	ND
	g/s	< 1.12E-04	ND	< 1.19E-04	ND	< 1.17E-04	ND	< 1.16E-04	ND
Carbon tetrachloride 56-23-5	µg	< 0.12		< 0.12		< 0.12		< 0.12	
	µg/dscm	< 1.60		< 1.62		< 1.62		< 1646	
	lb/hr	< 4.47E-04		< 4.60E-04		< 4.69E-04		< 4.66E-04	
	g/s	< 5.63E-05		< 5.79E-05		< 5.91E-05		< 5.87E-05	
Chlorobenzene 108-90-7	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.61	ND	< 1.68	ND	< 1.62	ND	< 1.64	ND
	lb/hr	< 4.50E-04	ND	< 4.77E-04	ND	< 4.69E-04	ND	< 4.66E-04	ND
	g/s	< 5.67E-05	ND	< 6.01E-05	ND	< 5.91E-05	ND	< 5.87E-05	ND

Table 5-6: Summary of Volatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Chlorodibromethane 124-48-1	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.19	ND	< 3.33	ND	< 3.20	ND	< 3.24	ND
	lb/hr	< 8.92E-04	ND	< 9.43E-04	ND	< 9.29E-04	ND	< 9.21E-04	ND
	g/s	< 1.12E-04	ND	< 1.19E-04	ND	< 1.17E-04	ND	< 1.16E-04	ND
Chloroethane 75-00-3	µg	< 0.48	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.38	ND	< 6.65	ND	< 6.40	ND	< 6.48	ND
	lb/hr	< 1.78E-03	ND	< 1.89E-03	ND	< 1.86E-03	ND	< 1.84E-03	ND
	g/s	< 2.25E-04	ND	< 2.38E-04	ND	< 2.34E-04	ND	< 2.32E-04	ND
Chloroform 67-66-3	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.61	ND	< 1.68	ND	< 1.62	ND	< 1.64	ND
	lb/hr	< 4.50E-04	ND	< 4.77E-04	ND	< 4.69E-04	ND	< 4.66E-04	ND
	g/s	< 5.67E-05	ND	< 6.01E-05	ND	< 5.91E-05	ND	< 5.87E-05	ND
2-Chloropropane 75-29-6	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.61	ND	< 1.68	ND	< 1.62	ND	< 1.64	ND
	lb/hr	< 4.50E-04	ND	< 4.77E-04	ND	< 4.69E-04	ND	< 4.66E-04	ND
	g/s	< 5.67E-05	ND	< 6.01E-05	ND	< 5.91E-05	ND	< 5.87E-05	ND
cis-1,4-Dichloro-2-butene 1476-11-5	µg	< 0.48	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.38	ND	< 6.65	ND	< 6.40	ND	< 6.48	ND
	lb/hr	< 1.78E-03	ND	< 1.89E-03	ND	< 1.86E-03	ND	< 1.84E-03	ND
	g/s	< 2.25E-04	ND	< 2.38E-04	ND	< 2.34E-04	ND	< 2.32E-04	ND
cis-1,3-Dichloropropene 10061-01-5	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.61	ND	< 1.68	ND	< 1.62	ND	< 1.64	ND
	lb/hr	< 4.50E-04	ND	< 4.77E-04	ND	< 4.69E-04	ND	< 4.66E-04	ND
	g/s	< 5.67E-05	ND	< 6.01E-05	ND	< 5.91E-05	ND	< 5.87E-05	ND

Table 5-6: Summary of Volatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
1,2-Dibromoethane 106-93-4	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.19	ND	< 3.33	ND	< 3.20	ND	< 3.24	ND
	lb/hr	< 8.92E-04	ND	< 9.43E-04	ND	< 9.29E-04	ND	< 9.21E-04	ND
	g/s	< 1.12E-04	ND	< 1.19E-04	ND	< 1.17E-04	ND	< 1.16E-04	ND
Dibromomethane 74-95-3	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.19	ND	< 3.33	ND	< 3.20	ND	< 3.24	ND
	lb/hr	< 8.92E-04	ND	< 9.43E-04	ND	< 9.29E-04	ND	< 9.21E-04	ND
	g/s	< 1.12E-04	ND	< 1.19E-04	ND	< 1.17E-04	ND	< 1.16E-04	ND
1,4-Dichloro-2-butene, total 764-41-0	µg	< 0.97	ND	< 0.97	ND	< 0.97	ND	< 0.97	ND
	µg/dscm	< 12.76	ND	< 13.31	ND	< 12.79	ND	< 12.96	ND
	lb/hr	< 3.57E-03	ND	< 3.77E-03	ND	< 3.72E-03	ND	< 3.69E-03	ND
	g/s	< 4.50E-04	ND	< 4.75E-04	ND	< 4.68E-04	ND	< 4.64E-04	ND
Dichlorodifluoromethane 75-71-8	µg	< 0.54		< 0.47		< 0.25		< 0.42	
	µg/dscm	< 7.16		< 6.48		< 3.30		< 5.84	
	lb/hr	< 2.00E-03		< 1.84E-03		< 9.59E-04		< 1.60E-03	
	g/s	< 2.52E-04		< 2.31E-04		< 1.21E-04		< 2.01E-04	
1,2-Dichloropropane 78-87-2	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.61	ND	< 1.68	ND	< 1.62	ND	< 1.64	ND
	lb/hr	< 4.50E-04	ND	< 4.77E-04	ND	< 4.69E-04	ND	< 4.66E-04	ND
	g/s	< 5.67E-05	ND	< 6.01E-05	ND	< 5.91E-05	ND	< 5.87E-05	ND
Diethyl ether 60-29-7	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.19	ND	< 3.33	ND	< 3.20	ND	< 3.24	ND
	lb/hr	< 8.92E-04	ND	< 9.43E-04	ND	< 9.29E-04	ND	< 9.21E-04	ND
	g/s	< 1.12E-04	ND	< 1.19E-04	ND	< 1.17E-04	ND	< 1.16E-04	ND

Table 5-6: Summary of Volatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Ethylbenzene 100-41-4	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.61	ND	< 1.68	ND	< 1.62	ND	< 1.64	ND
	lb/hr	< 4.50E-04	ND	< 4.77E-04	ND	< 4.69E-04	ND	< 4.66E-04	ND
	g/s	< 5.67E-05	ND	< 6.01E-05	ND	< 5.91E-05	ND	< 5.87E-05	ND
Hexane 110-54-3	µg	< 0.21		< 0.17		< 0.25		< 0.21	
	µg/dscm	< 2.79		< 2.37		< 3.30		< 2.87	
	lb/hr	< 7.80E-04		< 6.72E-04		< 9.59E-04		< 8.04E-04	
	g/s	< 9.83E-05		< 8.47E-05		< 1.21E-04		< 1.01E-04	
2-Hexanone 591-78-6	µg	< 1.01	ND	< 1.01	ND	< 1.01	ND	< 1.01	ND
	µg/dscm	< 13.31	ND	< 13.90	ND	< 13.36	ND	< 13.53	ND
	lb/hr	< 3.72E-03	ND	< 3.94E-03	ND	< 3.88E-03	ND	< 3.85E-03	ND
	g/s	< 4.69E-04	ND	< 4.96E-04	ND	< 4.89E-04	ND	< 4.85E-04	ND
Iodomethane 74-88-4	µg	< 0.41		< 0.42		< 0.49	ND	< 0.44	
	µg/dscm	< 5.45		< 5.75		< 6.40	ND	< 5.85	
	lb/hr	< 1.53E-03		< 1.63E-03		< 1.86E-03	ND	< 1.67E-03	
	g/s	< 1.92E-04		< 2.05E-04		< 2.34E-04	ND	< 2.11E-04	
Methylene Chloride 75-09-2	µg	< 0.88	ND	< 0.88		< 0.89	ND	< 0.88	
	µg/dscm	< 11.64	ND	< 12.10		< 11.67	ND	< 11.81	
	lb/hr	< 3.25E-03	ND	< 3.43E-03		< 3.39E-03	ND	< 3.36E-03	
	g/s	< 4.10E-04	ND	< 4.32E-04		< 4.27E-04	ND	< 4.23E-04	
4-Methyl-2-pentanone 108-10-1	µg	< 1.01	ND	< 1.01	ND	< 1.01	ND	< 1.01	ND
	µg/dscm	< 13.31	ND	< 13.90	ND	< 13.36	ND	< 13.53	ND
	lb/hr	< 3.72E-03	ND	< 3.94E-03	ND	< 3.88E-03	ND	< 3.85E-03	ND
	g/s	< 4.69E-04	ND	< 4.96E-04	ND	< 4.89E-04	ND	< 4.85E-04	ND

Table 5-6: Summary of Volatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Methyl tert-butyl ether 1634-04-4	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.19	ND	< 3.33	ND	< 3.20	ND	< 3.24	ND
	lb/hr	< 8.92E-04	ND	< 9.43E-04	ND	< 9.29E-04	ND	< 9.21E-04	ND
	g/s	< 1.12E-04	ND	< 1.19E-04	ND	< 1.17E-04	ND	< 1.16E-04	ND
m&p-Xylene 179601-23-1	µg	< 0.24	ND	< 0.25	ND	< 0.25	ND	< 0.25	ND
	µg/dscm	< 3.22	ND	< 3.37	ND	< 3.23	ND	< 3.27	ND
	lb/hr	< 9.00E-04	ND	< 9.54E-04	ND	< 9.39E-04	ND	< 9.31E-04	ND
	g/s	< 1.13E-04	ND	< 1.20E-04	ND	< 1.18E-04	ND	< 1.17E-04	ND
o-Xylene 95-47-6	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.61	ND	< 1.68	ND	< 1.62	ND	< 1.64	ND
	lb/hr	< 4.50E-04	ND	< 4.77E-04	ND	< 4.69E-04	ND	< 4.66E-04	ND
	g/s	< 5.67E-05	ND	< 6.01E-05	ND	< 5.91E-05	ND	< 5.87E-05	ND
Styrene 100-42-5	µg	< 0.11		< 0.099		< 0.099		< 0.10	
	µg/dscm	< 1.38		< 1.36		< 1.31		< 1.35	
	lb/hr	< 3.87E-04		< 3.85E-04		< 3.80E-04		< 3.84E-04	
	g/s	< 4.87E-05		< 4.85E-05		< 4.79E-05		< 4.84E-05	
t-Butyl alcohol 75-65-0	µg	< 400.42	ND	< 400.43	ND	< 400.43	ND	< 400.43	ND
	µg/dscm	< 5,267.57	ND	< 5,487.63	ND	< 5,280.07	ND	< 5,347.56	ND
	lb/hr	< 1.47E+00	ND	< 1.56E+00	ND	< 1.53E+00	ND	< 1.52E+00	ND
	g/s	< 1.86E-01	ND	< 1.96E-01	ND	< 1.93E-01	ND	< 1.92E-01	ND
1,1,1,2-Tetrachloroethane 630-20-6	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.61	ND	< 1.68	ND	< 1.62	ND	< 1.64	ND
	lb/hr	< 4.50E-04	ND	< 4.77E-04	ND	< 4.69E-04	ND	< 4.66E-04	ND
	g/s	< 5.67E-05	ND	< 6.01E-05	ND	< 5.91E-05	ND	< 5.87E-05	ND

Table 5-6: Summary of Volatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
1,1,2,2-Tetrachloroethane 79-34-5	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.19	ND	< 3.33	ND	< 3.20	ND	< 3.24	ND
	lb/hr	< 8.92E-04	ND	< 9.43E-04	ND	< 9.29E-04	ND	< 9.21E-04	ND
	g/s	< 1.12E-04	ND	< 1.19E-04	ND	< 1.17E-04	ND	< 1.16E-04	ND
Tetrachloroethene 127-18-4	µg	< 0.12		< 0.11		< 0.11		< 0.12	
	µg/dscm	< 1.55		< 1.54		< 1.51		< 1.55	
	lb/hr	< 4.32E-04		< 4.38E-04		< 4.40E-04		< 4.37E-04	
	g/s	< 5.45E-05		< 5.51E-05		< 5.55E-05		< 5.50E-05	
Toluene 108-88-3	µg	< 0.23		< 0.23		< 0.23		< 0.23	
	µg/dscm	< 3.09		< 3.09		< 3.05		< 3.08	
	lb/hr	< 8.63E-04		< 8.77E-04		< 8.85E-04		< 8.75E-04	
	g/s	< 1.09E-04		< 1.10E-04		< 1.12E-04		< 1.10E-04	
trans-1,4-Dichloro-2-butene 110-57-6	µg	< 0.48	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.38	ND	< 6.65	ND	< 6.40	ND	< 6.48	ND
	lb/hr	< 1.78E-03	ND	< 1.89E-03	ND	< 1.86E-03	ND	< 1.84E-03	ND
	g/s	< 2.25E-04	ND	< 2.38E-04	ND	< 2.34E-04	ND	< 2.32E-04	ND
trans-1,3-Dichloropropene 10061-02-5	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.61	ND	< 1.68	ND	< 1.62	ND	< 1.64	ND
	lb/hr	< 4.50E-04	ND	< 4.77E-04	ND	< 4.69E-04	ND	< 4.66E-04	ND
	g/s	< 5.67E-05	ND	< 6.01E-05	ND	< 5.91E-05	ND	< 5.87E-05	ND
Trichloroethene 79-01-6	µg	< 0.12		< 0.12	ND	< 0.12	ND	< 0.12	
	µg/dscm	< 1.56		< 1.68	ND	< 1.62	ND	< 1.61	
	lb/hr	< 4.35E-04		< 4.77E-04	ND	< 4.69E-04	ND	< 4.60E-04	
	g/s	< 5.48E-05		< 6.01E-05	ND	< 5.91E-05	ND	< 5.80E-05	

Table 5-6: Summary of Volatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Trichlorofluoromethane 75-69-4	µg	< 0.31		< 0.35		< 0.28		< 0.31	
	µg/dscm	< 4.04		< 4.82		< 3.75		< 4.16	
	lb/hr	< 1.13E-03		< 1.37E-03		< 1.09E-03		< 1.19E-03	
	g/s	< 1.42E-04		< 1.72E-04		< 1.37E-04		< 1.50E-04	
1,2,3-Trichloropropane 96-18-4	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.19	ND	< 3.33	ND	< 3.20	ND	< 3.24	ND
	lb/hr	< 8.92E-04	ND	< 9.43E-04	ND	< 9.29E-04	ND	< 9.21E-04	ND
	g/s	< 1.12E-04	ND	< 1.19E-04	ND	< 1.17E-04	ND	< 1.16E-04	ND
1,1,2-Trichloro-1,2,2-trifluoroethane 76-13-1	µg	< 0.45		< 0.49	ND	< 0.49	ND	< 0.47	
	µg/dscm	< 5.94		< 6.65	ND	< 6.40	ND	< 6.34	
	lb/hr	< 1.66E-03		< 1.89E-03	ND	< 1.86E-03	ND	< 1.80E-03	
	g/s	< 2.09E-04		< 2.38E-04	ND	< 2.34E-04	ND	< 2.27E-04	
Vinyl acetate 108-05-4	µg	< 0.48	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.38	ND	< 6.65	ND	< 6.40	ND	< 6.48	ND
	lb/hr	< 1.78E-03	ND	< 1.89E-03	ND	< 1.86E-03	ND	< 1.84E-03	ND
	g/s	< 2.25E-04	ND	< 2.38E-04	ND	< 2.34E-04	ND	< 2.32E-04	ND
Vinyl chloride 75-01-4	µg	< 0.28	ND	< 0.29	ND	< 0.29	ND	< 0.29	ND
	µg/dscm	< 3.75	ND	< 3.91	ND	< 3.76	ND	< 3.81	ND
	lb/hr	< 1.05E-03	ND	< 1.11E-03	ND	< 1.09E-03	ND	< 1.08E-03	ND
	g/s	< 1.32E-04	ND	< 1.40E-04	ND	< 1.38E-04	ND	< 1.36E-04	ND
Xylenes, total 1330-20-7	µg	< 0.37	ND	< 0.37	ND	< 0.37	ND	< 0.37	ND
	µg/dscm	< 4.83	ND	< 5.04	ND	< 4.85	ND	< 4.91	ND
	lb/hr	< 1.35E-03	ND	< 1.43E-03	ND	< 1.41E-03	ND	< 1.40E-03	ND
	g/s	< 1.70E-04	ND	< 1.80E-04	ND	< 1.78E-04	ND	< 1.76E-04	ND

Table 5-6: Summary of Volatile Organic Emissions for East Stack (continued)

Constituent	Units	Run 2	Run 3	Run 4	Average
Chloromethoxyethane 3188-13-4 ISLS	µg µg/dscm lb/hr g/s	NOT FOUND	NOT FOUND	NOT FOUND	NOT APPLICABLE
Butane, 2-methyl- 78-78-4 TIC	µg µg/dscm lb/hr g/s	0.048 0.63 1.75E-04 2.21E-05	NOT FOUND	NOT FOUND	0.048 0.63 1.75E-04 2.21E-05

Table 5–7: Summary of Volatile Organic Emissions for West Stack

Constituent	Units	Run 2 74.26 liters 75,543 dscfm	Run 3 72.95 liters 76,840 dscfm	Run 4 76.22 liters 76,366 dscfm	Average 74.48 liters 76,249 dscfm
Acetone 67-64-1	µg	< 2.43 ND	< 2.43 ND	< 2.43 ND	< 2.43 ND
	µg/dscm	< 32.70 ND	< 33.28 ND	< 31.84 ND	< 32.61 ND
	lb/hr	< 9.25E-03 ND	< 9.58E-03 ND	< 9.11E-03 ND	< 9.31E-03 ND
	g/s	< 1.17E-03 ND	< 1.21E-03 ND	< 1.15E-03 ND	< 1.17E-03 ND
Benzene 71-43-2	µg	< 0.12 ND	< 0.12 ND	< 0.12 ND	< 0.12 ND
	µg/dscm	< 1.65 ND	< 1.68 ND	< 1.61 ND	< 1.65 ND
	lb/hr	< 4.68E-04 ND	< 4.85E-04 ND	< 4.61E-04 ND	< 4.71E-04 ND
	g/s	< 5.90E-05 ND	< 6.11E-05 ND	< 5.80E-05 ND	< 5.93E-05 ND
Bromodichloromethane 75-27-4	µg	< 0.12 ND	< 0.12 ND	< 0.12 ND	< 0.12 ND
	µg/dscm	< 1.65 ND	< 1.68 ND	< 1.61 ND	< 1.65 ND
	lb/hr	< 4.68E-04 ND	< 4.85E-04 ND	< 4.61E-04 ND	< 4.71E-04 ND
	g/s	< 5.90E-05 ND	< 6.11E-05 ND	< 5.80E-05 ND	< 5.93E-05 ND
Bromoethene 593-60-2	µg	< 0.29 ND	< 0.29 ND	< 0.29 ND	< 0.29 ND
	µg/dscm	< 3.84 ND	< 3.91 ND	< 3.74 ND	< 3.83 ND
	lb/hr	< 1.09E-03 ND	< 1.12E-03 ND	< 1.07E-03 ND	< 1.09E-03 ND
	g/s	< 1.37E-04 ND	< 1.42E-04 ND	< 1.35E-04 ND	< 1.38E-04 ND
Bromoform 75-25-2	µg	< 0.24 ND	< 0.24 ND	< 0.24 ND	< 0.24 ND
	µg/dscm	< 3.27 ND	< 3.33 ND	< 3.18 ND	< 3.26 ND
	lb/hr	< 9.25E-04 ND	< 9.58E-04 ND	< 9.11E-04 ND	< 9.31E-04 ND
	g/s	< 1.17E-04 ND	< 1.21E-04 ND	< 1.15E-04 ND	< 1.17E-04 ND

Table 5-7: Summary of Volatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Bromomethane 74-83-9	µg	< 0.49	ND	< 0.45		< 0.49	ND	< 0.47	
	µg/dscm	< 6.54	ND	< 6.15		< 6.37	ND	< 6.35	
	lb/hr	< 1.85E-03	ND	< 1.77E-03		< 1.82E-03	ND	< 1.81E-03	
	g/s	< 2.33E-04	ND	< 2.23E-04		< 2.30E-04	ND	< 2.29E-04	
1,3-Butadiene 106-99-0	µg	< 0.49	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.54	ND	< 6.66	ND	< 6.37	ND	< 6.52	ND
	lb/hr	< 1.85E-03	ND	< 1.92E-03	ND	< 1.82E-03	ND	< 1.86E-03	ND
	g/s	< 2.33E-04	ND	< 2.41E-04	ND	< 2.30E-04	ND	< 2.35E-04	ND
2-Butanone 78-93-3	µg	< 1.01	ND	< 1.01	ND	< 1.01	ND	< 1.01	ND
	µg/dscm	< 13.65	ND	< 13.90	ND	< 13.30	ND	< 13.62	ND
	lb/hr	< 3.86E-03	ND	< 4.00E-03	ND	< 3.81E-03	ND	< 3.89E-03	ND
	g/s	< 4.87E-04	ND	< 5.04E-04	ND	< 4.80E-04	ND	< 4.90E-04	ND
Carbon disulfide 75-15-0	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.27	ND	< 3.33	ND	< 3.18	ND	< 3.26	ND
	lb/hr	< 9.25E-04	ND	< 9.58E-04	ND	< 9.11E-04	ND	< 9.31E-04	ND
	g/s	< 1.17E-04	ND	< 1.21E-04	ND	< 1.15E-04	ND	< 1.17E-04	ND
Carbon tetrachloride 56-23-5	µg	< 0.13		< 0.14		< 0.12		< 0.13	
	µg/dscm	< 1.77		< 1.91		< 1.59		< 1.75	
	lb/hr	< 5.00E-04		< 5.48E-04		< 4.56E-04		< 5.01E-04	
	g/s	< 6.30E-05		< 6.91E-05		< 5.74E-05		< 6.32E-05	
Chlorobenzene 108-90-7	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND

Table 5-7: Summary of Volatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Chlorodibromethane 124-48-1	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.27	ND	< 3.33	ND	< 3.18	ND	< 3.26	ND
	lb/hr	< 9.25E-04	ND	< 9.58E-04	ND	< 9.11E-04	ND	< 9.31E-04	ND
	g/s	< 1.17E-04	ND	< 1.21E-04	ND	< 1.15E-04	ND	< 1.17E-04	ND
Chloroethane 75-00-3	µg	< 0.49	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.54	ND	< 6.66	ND	< 6.37	ND	< 6.52	ND
	lb/hr	< 1.85E-03	ND	< 1.92E-03	ND	< 1.82E-03	ND	< 1.86E-03	ND
	g/s	< 2.33E-04	ND	< 2.41E-04	ND	< 2.30E-04	ND	< 2.35E-04	ND
Chloroform 67-66-3	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND
2-Chloropropane 75-29-6	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND
cis-1,4-Dichloro-2-butene 1476-11-5	µg	< 0.49	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.54	ND	< 6.66	ND	< 6.37	ND	< 6.52	ND
	lb/hr	< 1.85E-03	ND	< 1.92E-03	ND	< 1.82E-03	ND	< 1.86E-03	ND
	g/s	< 2.33E-04	ND	< 2.41E-04	ND	< 2.30E-04	ND	< 2.35E-04	ND
cis-1,3-Dichloropropene 10061-01-5	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND

Table 5-7: Summary of Volatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
1,2-Dibromoethane 106-93-4	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.27	ND	< 3.33	ND	< 3.18	ND	< 3.26	ND
	lb/hr	< 9.25E-04	ND	< 9.58E-04	ND	< 9.11E-04	ND	< 9.31E-04	ND
	g/s	< 1.17E-04	ND	< 1.21E-04	ND	< 1.15E-04	ND	< 1.17E-04	ND
Dibromomethane 74-95-3	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.27	ND	< 3.33	ND	< 3.18	ND	< 3.26	ND
	lb/hr	< 9.25E-04	ND	< 9.58E-04	ND	< 9.11E-04	ND	< 9.31E-04	ND
	g/s	< 1.17E-04	ND	< 1.21E-04	ND	< 1.15E-04	ND	< 1.17E-04	ND
1,4-Dichloro-2-butene, total 764-41-0	µg	< 0.97	ND	< 0.97	ND	< 0.97	ND	< 0.97	ND
	µg/dscm	< 13.08	ND	< 13.31	ND	< 12.74	ND	< 13.04	ND
	lb/hr	< 3.70E-03	ND	< 3.83E-03	ND	< 3.64E-03	ND	< 3.73E-03	ND
	g/s	< 4.66E-04	ND	< 4.83E-04	ND	< 4.59E-04	ND	< 4.69E-04	ND
Dichlorodifluoromethane 75-71-8	µg	< 0.41		< 0.41		< 0.31		< 0.38	
	µg/dscm	< 5.49		< 5.61		< 4.06		< 5.05	
	lb/hr	< 1.55E-03		< 1.61E-03		< 1.16E-03		< 1.44E-03	
	g/s	< 1.96E-04		< 2.03E-04		< 1.46E-04		< 1.82E-04	
1,2-Dichloropropane 78-87-5	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND
Diethyl ether 60-29-7	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.27	ND	< 3.33	ND	< 3.18	ND	< 3.26	ND
	lb/hr	< 9.25E-04	ND	< 9.58E-04	ND	< 9.11E-04	ND	< 9.31E-04	ND
	g/s	< 1.17E-04	ND	< 1.21E-04	ND	< 1.15E-04	ND	< 1.17E-04	ND

Table 5-7: Summary of Volatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Ethylbenzene 100-41-4	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND
Hexane 110-54-3	µg	< 0.25		< 0.27		< 0.245		< 0.25	
	µg/dscm	< 3.31		< 3.68		< 3.08		< 3.36	
	lb/hr	< 9.35E-04		< 1.06E-03		< 8.82E-04		< 9.59E-04	
	g/s	< 1.18E-04		< 1.34E-04		< 1.11E-04		< 1.21E-04	
2-Hexanone 591-78-6	µg	< 1.01	ND	< 1.01	ND	< 1.01	ND	< 1.01	ND
	µg/dscm	< 13.65	ND	< 13.90	ND	< 13.30	ND	< 13.62	ND
	lb/hr	< 3.86E-03	ND	< 4.00E-03	ND	< 3.81E-03	ND	< 3.89E-03	ND
	g/s	< 4.87E-04	ND	< 5.04E-04	ND	< 4.80E-04	ND	< 4.90E-04	ND
Iodomethane 74-88-4	µg	< 0.36		< 0.38		< 0.44		< 0.39	
	µg/dscm	< 4.85		< 5.19		< 5.71		< 5.25	
	lb/hr	< 1.37E-03		< 1.49E-03		< 1.63E-03		< 1.50E-03	
	g/s	< 1.73E-04		< 1.88E-04		< 2.06E-04		< 1.89E-04	
Methylene Chloride 75-09-2	µg	< 0.89	ND	< 0.87		< 0.88		< 0.88	
	µg/dscm	< 11.93	ND	< 11.95		< 11.59		< 11.82	
	lb/hr	< 3.37E-03	ND	< 3.44E-03		< 3.32E-03		< 3.38E-03	
	g/s	< 4.25E-04	ND	< 4.33E-04		< 4.18E-04		< 4.25E-04	
4-Methyl-2-pentanone 108-10-1	µg	< 1.01	ND	< 1.01	ND	< 1.01	ND	< 1.01	ND
	µg/dscm	< 13.65	ND	< 13.90	ND	< 13.30	ND	< 13.62	ND
	lb/hr	< 3.86E-03	ND	< 4.00E-03	ND	< 3.81E-03	ND	< 3.89E-03	ND
	g/s	< 4.87E-04	ND	< 5.04E-04	ND	< 4.80E-04	ND	< 4.90E-04	ND

Table 5-7: Summary of Volatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Methyl tert-butyl ether 1634-04-4	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.27	ND	< 3.33	ND	< 3.18	ND	< 3.26	ND
	lb/hr	< 9.25E-04	ND	< 9.58E-04	ND	< 9.11E-04	ND	< 9.31E-04	ND
	g/s	< 1.17E-04	ND	< 1.21E-04	ND	< 1.15E-04	ND	< 1.17E-04	ND
m&p-Xylene 179601-23-1	µg	< 0.25	ND	< 0.25	ND	< 0.25	ND	< 0.25	ND
	µg/dscm	< 3.31	ND	< 3.37	ND	< 3.22	ND	< 3.30	ND
	lb/hr	< 9.36E-04	ND	< 9.69E-04	ND	< 9.21E-04	ND	< 9.42E-04	ND
	g/s	< 1.18E-04	ND	< 1.22E-04	ND	< 1.16E-04	ND	< 1.19E-04	ND
o-Xylene 95-47-6	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND
Styrene 100-42-5	µg	< 0.12		< 0.10		< 0.10		< 0.11	
	µg/dscm	< 1.57		< 1.43		< 1.37		< 1.46	
	lb/hr	< 4.45E-04		< 4.13E-04		< 3.93E-04		< 4.17E-04	
	g/s	< 5.61E-05		< 5.20E-05		< 4.95E-05		< 5.25E-05	
t-Butyl alcohol 75-65-0	µg	< 400.43	ND	< 400.43	ND	< 400.43	ND	< 400.43	ND
	µg/dscm	< 5,392.34	ND	< 5,488.90	ND	< 5,253.47	ND	< 5,378.24	ND
	lb/hr	< 1.53E+00	ND	< 1.58E+00	ND	< 1.50E+00	ND	< 1.54E+00	ND
	g/s	< 1.92E-01	ND	< 1.99E-01	ND	< 1.89E-01	ND	< 1.94E-01	ND
1,1,1,2-Tetrachloroethane 630-20-6	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND

Table 5-7: Summary of Volatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
1,1,2,2-Tetrachloroethane 79-34-5	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.27	ND	< 3.33	ND	< 3.18	ND	< 3.26	ND
	lb/hr	< 9.25E-04	ND	< 9.58E-04	ND	< 9.11E-04	ND	< 9.31E-04	ND
	g/s	< 1.17E-04	ND	< 1.21E-04	ND	< 1.15E-04	ND	< 1.17E-04	ND
Tetrachloroethene 127-18-4	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND
Toluene 108-88-3	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.27	ND	< 3.33	ND	< 3.18	ND	< 3.26	ND
	lb/hr	< 9.25E-04	ND	< 9.58E-04	ND	< 9.11E-04	ND	< 9.31E-04	ND
	g/s	< 1.17E-04	ND	< 1.21E-04	ND	< 1.15E-04	ND	< 1.17E-04	ND
trans-1,4-Dichloro-2-butene 110-57-6	µg	< 0.49	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.54	ND	< 6.66	ND	< 6.37	ND	< 6.52	ND
	lb/hr	< 1.85E-03	ND	< 1.92E-03	ND	< 1.82E-03	ND	< 1.86E-03	ND
	g/s	< 2.33E-04	ND	< 2.41E-04	ND	< 2.30E-04	ND	< 2.35E-04	ND
trans-1,3-Dichloropropene 10061-02-6	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND
Trichloroethene 79-01-6	µg	< 0.12	ND	< 0.12	ND	< 0.12	ND	< 0.12	ND
	µg/dscm	< 1.65	ND	< 1.68	ND	< 1.61	ND	< 1.65	ND
	lb/hr	< 4.68E-04	ND	< 4.85E-04	ND	< 4.61E-04	ND	< 4.71E-04	ND
	g/s	< 5.90E-05	ND	< 6.11E-05	ND	< 5.80E-05	ND	< 5.93E-05	ND

Table 5-7: Summary of Volatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Trichlorofluoromethane 75-69-4	µg	< 0.39		< 0.48		< 0.23		< 0.37	
	µg/dscm	< 5.31		< 6.63		< 3.07		< 5.00	
	lb/hr	< 1.50E-03		< 1.91E-03		< 8.78E-04		< 1.43E-03	
	g/s	< 1.89E-04		< 2.40E-04		< 1.11E-04		< 1.80E-04	
1,2,3-Trichloropropane 96-18-4	µg	< 0.24	ND	< 0.24	ND	< 0.24	ND	< 0.24	ND
	µg/dscm	< 3.27	ND	< 3.33	ND	< 3.18	ND	< 3.26	ND
	lb/hr	< 9.25E-04	ND	< 9.58E-04	ND	< 9.11E-04	ND	< 9.31E-04	ND
	g/s	< 1.17E-04	ND	< 1.21E-04	ND	< 1.15E-04	ND	< 1.17E-04	ND
1,1,2-Trichloro-1,2,2-trifluoroethane 76-13-1	µg	< 0.49	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.54	ND	< 6.66	ND	< 6.37	ND	< 6.52	ND
	lb/hr	< 1.85E-03	ND	< 1.92E-03	ND	< 1.82E-03	ND	< 1.86E-03	ND
	g/s	< 2.33E-04	ND	< 2.41E-04	ND	< 2.30E-04	ND	< 2.35E-04	ND
Vinyl acetate 108-05-4	µg	< 0.49	ND	< 0.49	ND	< 0.49	ND	< 0.49	ND
	µg/dscm	< 6.54	ND	< 6.66	ND	< 6.37	ND	< 6.52	ND
	lb/hr	< 1.85E-03	ND	< 1.92E-03	ND	< 1.82E-03	ND	< 1.86E-03	ND
	g/s	< 2.33E-04	ND	< 2.41E-04	ND	< 2.30E-04	ND	< 2.35E-04	ND
Vinyl chloride 75-01-4	µg	< 0.29	ND	< 0.29	ND	< 0.29	ND	< 0.29	ND
	µg/dscm	< 3.85	ND	< 3.91	ND	< 3.74	ND	< 3.84	ND
	lb/hr	< 1.09E-03	ND	< 1.13E-03	ND	< 1.07E-03	ND	< 1.10E-03	ND
	g/s	< 1.37E-04	ND	< 1.42E-04	ND	< 1.35E-04	ND	< 1.38E-04	ND
Xylenes, total 1330-20-7	µg	< 0.37	ND	< 0.37	ND	< 0.37	ND	< 0.37	ND
	µg/dscm	< 4.96	ND	< 5.04	ND	< 4.83	ND	< 4.94	ND
	lb/hr	< 1.40E-03	ND	< 1.45E-03	ND	< 1.38E-03	ND	< 1.41E-03	ND
	g/s	< 1.77E-04	ND	< 1.83E-04	ND	< 1.74E-04	ND	< 1.78E-04	ND

Table 5-7: Summary of Volatile Organic Emissions for West Stack (continued)

Constituent	Units	Run 2	Run 3	Run 4	Average
Chloromethoxyethane 3188-13-4 ISLS	µg µg/dscm lb/hr g/s	NOT FOUND	NOT FOUND	NOT FOUND	NOT APPLICABLE
Butane, 2-methyl- 78-78-4 TIC	µg µg/dscm lb/hr g/s	0.14 1.94 5.50E-04 6.93E-05	0.13 1.73 4.98E-04 6.27E-05	0.063 0.82 2.36E-04 2.97E-05	0.11 1.50 4.28E-04 5.39E-05
1-Pentene 109-67-1 TIC	µg µg/dscm lb/hr g/s	NOT FOUND	0.072 0.99 2.86E-04 3.60E-05	NOT FOUND	0.072 0.99 2.86E-04 3.60E-05
Cyclopentane 287-92-3 TIC	µg µg/dscm lb/hr g/s	0.28 3.80 1.07E-03 1.35E-04	0.17 2.35 6.76E-04 8.51E-05	NOT FOUND	0.23 3.07 8.75E-04 1.10E-04
Cyclobutane, methyl- 598-61-8 TIC	µg µg/dscm lb/hr g/s	NOT FOUND	0.047 0.65 1.87E-04 2.36E-05	NOT FOUND	0.047 0.65 1.87E-04 2.36E-05

Note:

All analytes identified as "TIC" in the emission table are qualitative tentative identifications and should not be interpreted to be definitive evidence of the presence of the identified compound. The quantitation of each TIC is based on a theoretical response factor and reported values should be considered estimated due to the high uncertainty with the identification and quantitation of these compounds.

Table 5–8: Total Organic Emissions for East Stack

Parameter	Units	Run 2	Run 3	Run 4	Average
Volatile TOC (C_1 through C_7)					
Emission Rate	lb/hr	< 1.24	< 1.16	< 1.28	< 1.23
	g/s	< 0.16	< 0.15	< 0.16	< 0.15
Semivolatile Total Chromatographable Organics (C_8 through C_{17})					
Emission Rate	lb/hr	< 0.017 ND	< 0.017 ND	< 0.017 ND	< 0.017 ND
	g/s	< 0.0021 ND	< 0.0022 ND	< 0.0022 ND	< 0.0022 ND
Semivolatile Total Gravimetric Organics					
Emission Rate	lb/hr	< 0.17 ND	0.16	0.10	< 0.14
	g/s	< 0.021 ND	0.020	0.013	< 0.018
Total Organics					
Emission Rate	lb/hr	< 1.42	< 1.34	< 1.40	< 1.39
	g/s	< 0.18	< 0.17	< 0.18	< 0.17

Table 5–9: Semivolatile and Non-Volatile Unspeciated Organic Emissions for East Stack

Constituent	Units	Run 2 119.682 dscf 4,589,773 dscfm	Run 3 117.936 dscf 4,582,130 dscfm	Run 4 121.059 dscf 4,728,726 dscfm
Total Unspeciated Semivolatile Organics (C_8 through C_{17})				
Total Catch	mg	< 0.20 ND	< 0.20 ND	< 0.20 ND
Concentration	mg/m^3	< 0.059 ND	< 0.060 ND	< 0.058 ND
Emission Rate	lb/hr	< 0.017 ND	< 0.017 ND	< 0.017 ND
Emission Rate	g/s	< 0.0021 ND	< 0.0022 ND	< 0.0022 ND
Total Unspeciated Nonvolatile Organics				
Total Catch	mg	< 2.00 ND	1.87	1.20
Concentration	mg/m^3	< 0.59 ND	0.56	0.35
Emission Rate	lb/hr	< 0.17 ND	0.16	0.10
Emission Rate	g/s	< 0.021 ND	0.020	0.013

Table 5–10: Volatile Unspeciated Organic Emissions Summary for East Stack

Parameter	Units	Run 2 24.909 dsL 4,589,773 dscf/hr Bag	Condensate
C_1 Concentration	ppm	3.11	---
Concentration	µg/m³	2,074.98	---
Emission Rate	lb/hr	5.95E-01	---
C_2 Compounds	ppm	< 0.15	---
Concentration	µg/m³	< 187.58	---
Emission Rate	lb/hr	< 5.38E-02	---
C_3 Compounds	ppm	< 0.12	---
Concentration	µg/m³	< 220.07	---
Emission Rate	lb/hr	< 6.31E-02	---
C4 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.13	---
Concentration	µg/m³	< 314.25	< 4.33 ND
Emission Rate	lb/hr	< 9.01E-02	< 1.24E-03 ND
C_5 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.11	---
Concentration	µg/m³	< 330.07	< 4.33 ND
Emission Rate	lb/hr	< 9.46E-02	< 1.24E-03 ND
C_6 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.14	---
Concentration	µg/m³	< 501.76	< 4.33 ND
Emission Rate	lb/hr	< 1.44E-01	< 1.24E-03 ND
C_7 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.16	---
Concentration	µg/m³	< 666.78	< 4.33 ND
Emission Rate	lb/hr	< 1.91E-01	< 1.24E-03 ND
C_1 thru C_7 Cmpds	µg/m³	< 4,295.49	< 17.34 ND
Total Concentration	µg/m³	< 4,312.83	---
Total Emission Rate	lb/hr	< 1.24	---
Total Emission Rate	g/sec	< 0.156	---

Table 5-10: Volatile Unspeciated Organic Emissions Summary for East Stack (continued)

Parameter	Units	Run 3 23.632 dsL 4 582 130 dscf/hr Bag	Condensate
C_1 Concentration	ppm	2.72	---
Concentration	µg/m³	1,814.78	---
Emission Rate	lb/hr	5.19E-01	---
C_2 Compounds	ppm	< 0.15	---
Concentration	µg/m³	< 187.58	---
Emission Rate	lb/hr	< 5.37E-02	---
C_3 Compounds	ppm	< 0.12	---
Concentration	µg/m³	< 220.07	---
Emission Rate	lb/hr	< 6.30E-02	---
C4 Compounds	µg	---	< 0.107 ND
Concentration	ppm	< 0.13	---
Concentration	µg/m³	< 314.25	< 4.53 ND
Emission Rate	lb/hr	< 8.99E-02	< 1.30E-03 ND
C_5 Compounds	µg	---	< 0.107 ND
Concentration	ppm	< 0.11	---
Concentration	µg/m³	< 330.07	< 4.53 ND
Emission Rate	lb/hr	< 9.44E-02	< 1.30E-03 ND
C_6 Compounds	µg	---	< 0.107 ND
Concentration	ppm	< 0.14	---
Concentration	µg/m³	< 501.76	< 4.53 ND
Emission Rate	lb/hr	< 1.44E-01	< 1.30E-03 ND
C_7 Compounds	µg	---	< 0.107 ND
Concentration	ppm	< 0.16	---
Concentration	µg/m³	< 666.78	< 4.53 ND
Emission Rate	lb/hr	< 1.91E-01	< 1.30E-03 ND
C_1 thru C_7 Cmpds	µg/m³	< 4,035.28	< 18.11 ND
Total Concentration	µg/m³	< 4,053.39	---
Total Emission Rate	lb/hr	< 1.16	---
Total Emission Rate	g/sec	< 0.146	---

Table 5-10: Volatile Unspeciated Organic Emissions Summary for East Stack (continued)

Parameter	Units	Run 4 26.812 dsL 4,728,726 dscf/hr Bag	Condensate
C_1 Concentration	ppm	3.150	---
Concentration	µg/m³	2,101.67	---
Emission Rate	lb/hr	6.20E-01	---
C_2 Compounds	ppm	< 0.15	---
Concentration	µg/m³	< 187.58	---
Emission Rate	lb/hr	< 5.54E-02	---
C_3 Compounds	ppm	< 0.12	---
Concentration	µg/m³	< 220.07	---
Emission Rate	lb/hr	< 6.50E-02	---
C4 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.13	---
Concentration	µg/m³	< 314.25	< 4.03 ND
Emission Rate	lb/hr	< 9.28E-02	< 1.19E-03 ND
C_5 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.11	---
Concentration	µg/m³	< 330.07	< 4.03 ND
Emission Rate	lb/hr	< 9.75E-02	< 1.19E-03 ND
C_6 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.14	---
Concentration	µg/m³	< 501.76	< 4.03 ND
Emission Rate	lb/hr	< 1.48E-01	< 1.19E-03 ND
C_7 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.16	---
Concentration	µg/m³	< 666.78	< 4.03 ND
Emission Rate	lb/hr	< 1.97E-01	< 1.19E-03 ND
C_1 thru C_7 Cmpds	µg/m³	< 4,322.18	< 16.11 ND
Total Concentration	µg/m³	< 4,338.29	---
Total Emission Rate	lb/hr	< 1.28	---
Total Emission Rate	g/sec	< 0.161	---

Table 5–11: Total Organic Emissions for West Stack

Parameter	Units	Run 2	Run 3	Run 4	Average
Volatile TOC (C_1 through C_7)					
Emission Rate	lb/hr	< 1.18	< 1.17	< 1.12	< 1.16
	g/s	< 0.15	< 0.15	< 0.14	< 0.15
Semivolatile Total Chromatographable Organics (C_8 through C_{17})					
Emission Rate	lb/hr	< 0.017 ND	< 0.017 ND	< 0.018 ND	< 0.017 ND
	g/s	< 0.0022 ND	< 0.0022 ND	< 0.0022 ND	< 0.0022 ND
Semivolatile Total Gravimetric Organics					
Emission Rate	lb/hr	< 0.17 ND	< 0.17 ND	< 0.18 ND	< 0.17 ND
	g/s	< 0.022 ND	< 0.022 ND	< 0.022 ND	< 0.022 ND
Total Organics					
Emission Rate	lb/hr	< 1.37	< 1.36	< 1.31	< 1.35
	g/s	< 0.17	< 0.17	< 0.17	< 0.17

Table 5–12: Semivolatile and Nonvolatile Unspeciated Organic Emissions for West Stack

Constituent	Units	Run 2 114.630 dscf 4,485,126 dscfm	Run 3 119.017 dscf 4,646,394 dscfm	Run 4 114.440 dscf 4,554,082 dscfm
Total Unspeciated Semivolatile Organics (C8 through C17)				
Total Catch	mg	< 0.20 ND	< 0.20 ND	< 0.20 ND
Concentration	mg/m^3	< 0.062 ND	< 0.059 ND	< 0.062 ND
Emission Rate	lb/hr	< 0.017 ND	< 0.017 ND	< 0.018 ND
Emission Rate	g/s	< 0.0022 ND	< 0.0022 ND	< 0.0022 ND
Total Unspeciated Nonvolatile Organics				
Total Catch	mg	< 2.00 ND	< 2.00 ND	< 2.00 ND
Concentration	mg/m^3	< 0.62 ND	< 0.59 ND	< 0.62 ND
Emission Rate	lb/hr	< 0.17 ND	< 0.17 ND	< 0.18 ND
Emission Rate	g/s	< 0.022 ND	< 0.022 ND	< 0.022 ND

Table 5–13: Volatile Unspeciated Organic Emissions Summary for West Stack

Parameter	Units	Run 2 19.395 dsL 4,485,126 dscf/hr Bag	Condensate
C_1 Concentration	ppm	2.96	---
Concentration	µg/m³	1,974.90	---
C_2 Compounds	ppm	< 0.15	---
Concentration	µg/m³	< 187.58	---
C_3 Compounds	ppm	< 0.12	---
Concentration	µg/m³	< 220.07	---
C4 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.13	---
Concentration	µg/m³	< 314.25	< 5.57 ND
C_5 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.11	---
Concentration	µg/m³	< 330.07	< 5.57 ND
C_6 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.14	---
Concentration	µg/m³	< 501.76	< 5.57 ND
C_7 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.16	---
Concentration	µg/m³	< 666.78	< 5.57 ND
C_1 thru C_7 Cmpds	µg/m³	< 4,195.41	< 22.27 ND
Total Concentration	µg/m³	< 4,217.68	---
Total Emission Rate	lb/hr	< 1.18	---
Total Emission Rate	g/sec	< 0.149	---

Table 5-13: Volatile Unspeciated Organic Emissions Summary for East Stack (continued)

Parameter	Units	Run 3 17.528 dsL 4,646,394 dscf/hr Bag	Condensate
C_1 Concentration	ppm	2.70	---
Concentration	µg/m³	1,801.43	---
C_2 Compounds	ppm	< 0.15	---
Concentration	µg/m³	< 187.58	---
C_3 Compounds	ppm	< 0.12	---
Concentration	µg/m³	< 220.07	---
C4 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.13	---
Concentration	µg/m³	< 314.25	< 6.16 ND
C_5 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.11	---
Concentration	µg/m³	< 330.07	< 6.16 ND
C_6 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.14	---
Concentration	µg/m³	< 501.76	< 6.16 ND
C_7 Compounds	µg	---	< 0.108 ND
Concentration	ppm	< 0.16	---
Concentration	µg/m³	< 666.78	< 6.16 ND
C_1 thru C_7 Cmpds	µg/m³	< 4,021.94	< 24.65 ND
Total Concentration	µg/m³	< 4,046.58	---
Total Emission Rate	lb/hr	< 1.17	---
Total Emission Rate	g/sec	< 0.148	---

Table 5-13: Volatile Unspeciated Organic Emissions Summary for West Stack (continued)

Parameter	Units	Run 4 21.514 dsL 4,554,082 dscf/hr Bag	Condensate
C_1 Concentration	ppm	2.55	---
Concentration	µg/m³	1,701.35	---
C_2 Compounds	ppm	< 0.15	---
Concentration	µg/m³	< 187.58	---
C_3 Compounds	ppm	< 0.12	---
Concentration	µg/m³	< 220.07	---
Emission Rate	lb/hr	< 6.26E-02	---
C4 Compounds	µg	---	< 0.107 ND
Concentration	ppm	< 0.13	---
Concentration	µg/m³	< 314.25	< 4.97 ND
C_5 Compounds	µg	---	< 0.107 ND
Concentration	ppm	< 0.11	---
Concentration	µg/m³	< 330.07	< 4.97 ND
C_6 Compounds	µg	---	< 0.107 ND
Concentration	ppm	< 0.14	---
Concentration	µg/m³	< 501.76	< 4.97 ND
C_7 Compounds	µg	---	< 0.107 ND
Concentration	ppm	< 0.16	---
Concentration	µg/m³	< 666.78	< 4.97 ND
C_1 thru C_7 Cmpds	µg/m³	< 3,921.86	< 19.89 ND
Total Concentration	µg/m³	< 3,941.75	---
Total Emission Rate	lb/hr	< 1.12	---
Total Emission Rate	g/sec	< 0.141	---

Table 5–14: Acid Gas, Ammonia, and Particulate Emissions for East Stack

Constituent	Units	Run 2	Run 3	Run 4	Average
		114.432 dscf	117.842 dscf	118.525 dscf	116.933 dscf
		72,793 dscfm	74,925 dscfm	76,323 dscfm	74,680 dscfm
Hydrogen chloride 7647-01-0	mg	0.12	0.079	0.069	0.089
	mg/dscm	0.036	0.024	0.021	0.027
	lb/hr	9.93E-03	6.64E-03	5.89E-03	7.48E-03
	g/s	1.25E-03	8.36E-04	7.42E-04	9.43E-04
Hydrogen Fluoride 7664-39-3	mg	< 0.12 ND	< 0.13 ND	< 0.12 ND	< 0.12 ND
	mg/dscm	< 0.038 ND	< 0.039 ND	< 0.035 ND	< 0.037 ND
	lb/hr	< 1.03E-02 ND	< 1.10E-02 ND	< 9.88E-03 ND	< 1.04E-02 ND
	g/s	< 1.30E-03 ND	< 1.39E-03 ND	< 1.24E-03 ND	< 1.31E-03 ND
Chlorine 7782-50-5	mg	0.14	0.14	0.13	0.14
	mg/dscm	0.043	0.042	0.039	0.041
	lb/hr	1.16E-02	1.18E-02	1.12E-02	1.15E-02
	g/s	1.46E-03	1.48E-03	1.41E-03	1.45E-03
Ammonia 7664-41-7	mg	0.077	< 0.076 ND	0.091	< 0.081
	mg/dscm	0.024	< 0.023 ND	0.027	< 0.025
	lb/hr	6.48E-03	< 6.39E-03 ND	7.75E-03	< 6.95E-03
	g/s	8.16E-04	< 8.05E-04 ND	9.77E-04	< 8.66E-04
Particulates	mg	< 1.85	< 2.16	< 1.84	< 1.95
	mg/dscm	< 0.57	< 0.65	< 0.55	< 0.59
	lb/hr	< 1.56E-01	< 1.82E-01	< 1.57E-01	< 1.647E-01
	g/s	< 1.96E-02	< 2.29E-02	< 1.97E-02	< 2.075E-02

Table 5–15: Acid Gas, Ammonia, and Particulate Emissions for West Stack

Constituent	Units	Run 2	Run 3	Run 4	Average
		133.372 dscf	134.557 dscf	132.448 dscf	133.459 dscf
		76,333 dscfm	76,239 dscfm	76,830 dscfm	76,467 dscfm
Hydrogen chloride 7647-01-0	mg	0.089	0.094	< 0.14 ND	< 0.11
	mg/dscm	0.023	0.025	< 0.037 ND	< 0.028
	lb/hr	6.71E-03	7.05E-03	< 1.06E-02 ND	< 8.12E-03
	g/s	8.45E-04	8.89E-04	< 1.33E-03 ND	< 1.02E-03
Hydrogen Fluoride 7664-39-3	mg	< 0.13 ND	< 0.13 ND	< 0.14 ND	< 0.13 ND
	mg/dscm	< 0.034 ND	0.033 ND	< 0.038 ND	< 0.035 ND
	lb/hr	< 9.69E-03 ND	9.44E-03 ND	< 1.08E-02 ND	< 9.98E-03 ND
	g/s	< 1.22E-03 ND	1.19E-03 ND	< 1.36E-03 ND	< 1.26E-03 ND
Chlorine 7782-50-5	mg	0.13	0.13	0.11	0.12
	mg/dscm	0.034	0.035	0.030	0.033
	lb/hr	9.61E-03	9.97E-03	8.75E-03	9.44E-03
	g/s	1.21E-03	1.26E-03	1.10E-03	1.19E-03
Ammonia 7664-41-7	mg	0.11	0.085	0.15	0.11
	mg/dscm	0.028	0.022	0.040	0.030
	lb/hr	7.95E-03	6.39E-03	1.16E-02	8.63E-03
	g/s	1.00E-03	8.05E-04	1.46E-03	1.09E-03
Particulates	mg	< 2.11	< 2.19	< 2.24	< 2.18
	mg/dscm	< 0.56	< 0.57	< 0.60	< 0.58
	lb/hr	< 1.60E-01	< 1.64E-01	< 1.72E-01	< 1.65E-01
	g/s	< 2.01E-02	< 2.07E-02	< 2.17E-02	< 2.08E-02

Table 5–16: Trace Metal Emissions for OTM Duct

Constituent	Units	Run 2	Run 3	Run 4	Average
		108.367 dscf	132.639 dscf	128.138 dscf	123.048 dscf
		2,077 dscfm	2,087 dscfm	1,982 dscfm	2,049 dscfm
Antimony 7440-36-0	µg	< 12.0 ND	< 12.0 ND	< 12.0 ND	< 12.00 ND
	µg/dscm	< 3.91 ND	< 3.19 ND	< 3.31 ND	< 3.47 ND
	lb/hr	< 3.04E-05 ND	< 2.50E-05 ND	< 2.46E-05 ND	< 2.67E-05 ND
	g/s	< 3.83E-06 ND	< 3.15E-06 ND	< 3.09E-06 ND	< 3.36E-06 ND
Arsenic 7440-38-2	µg	< 6.00 ND	< 6.00 ND	< 6.00 ND	< 6.00 ND
	µg/dscm	< 1.96 ND	< 1.60 ND	< 1.65 ND	< 1.74 ND
	lb/hr	< 1.52E-05 ND	< 1.25E-05 ND	< 1.23E-05 ND	< 1.33E-05 ND
	g/s	< 1.92E-06 ND	< 1.57E-06 ND	< 1.55E-06 ND	< 1.68E-06 ND
Barium 7440-39-3	µg	8.07	8.50	8.15	8.24
	µg/dscm	2.63	2.26	2.24	2.38
	lb/hr	2.04E-05	1.77E-05	1.67E-05	1.83E-05
	g/s	2.58E-06	2.23E-06	2.10E-06	2.30E-06
Beryllium 7440-41-7	µg	< 0.52	< 0.52	< 0.52	< 0.52
	µg/dscm	< 0.17	< 0.14	< 0.14	< 0.15
	lb/hr	< 1.31E-06	< 1.08E-06	< 1.06E-06	< 1.15E-06
	g/s	< 1.65E-07	< 1.36E-07	< 1.33E-07	< 1.45E-07
Boron 7440-42-8	µg	< 81.0	< 74.1	< 67.7	< 74.27
	µg/dscm	< 26.39	< 19.73	< 18.66	< 21.59
	lb/hr	< 2.05E-04	< 1.54E-04	< 1.39E-04	< 1.66E-04
	g/s	< 2.59E-05	< 1.94E-05	< 1.75E-05	< 2.09E-05

Table 5-16: Trace Metal Emissions for OTM Duct (continued)

Constituent	Units	Run 2	Run 3	Run 4	Average
Cadmium 7440-43-9	µg	50.0	< 79.7	< 39.1	< 56.27
	µg/dscm	16.30	< 21.22	< 10.77	< 16.10
	lb/hr	1.27E-04	< 1.66E-04	< 8.00E-05	< 1.24E-04
	g/s	1.60E-05	< 2.09E-05	< 1.01E-05	< 1.57E-05
Chromium 7440-47-3	µg	19.21	31.78	20.56	23.85
	µg/dscm	6.26	8.46	5.67	6.80
	lb/hr	4.87E-05	6.61E-05	4.21E-05	5.23E-05
	g/s	6.14E-06	8.33E-06	5.30E-06	6.59E-06
Cobalt 7440-48-4	µg	< 5.11	< 10.0 ND	< 10.0 ND	< 8.37
	µg/dscm	< 1.67	< 2.66 ND	< 2.76 ND	< 2.36
	lb/hr	< 1.30E-05	< 2.08E-05 ND	< 2.05E-05 ND	< 1.81E-05
	g/s	< 1.63E-06	< 2.62E-06 ND	< 2.58E-06 ND	< 2.28E-06
Copper 7440-50-8	µg	53.43	59.57	55.45	56.15
	µg/dscm	17.41	15.86	15.28	16.18
	lb/hr	1.35E-04	1.24E-04	1.13E-04	1.24E-04
	g/s	1.71E-05	1.56E-05	1.43E-05	1.57E-05
Lead 7439-92-1	µg	< 231	< 364	< 238	< 277.67
	µg/dscm	< 75.27	< 96.90	< 65.58	< 79.25
	lb/hr	< 5.86E-04	< 7.58E-04	< 4.87E-04	< 6.10E-04
	g/s	< 7.38E-05	< 9.55E-05	< 6.14E-05	< 7.69E-05
Manganese 7439-96-5	µg	7.69	7.47	7.78	7.65
	µg/dscm	2.51	1.99	2.14	2.21
	lb/hr	1.95E-05	1.55E-05	1.59E-05	1.70E-05
	g/s	2.46E-06	1.96E-06	2.01E-06	2.14E-06

Table 5-16: Trace Metal Emissions for OTM Duct (continued)

Constituent	Units	Run 2		Run 3		Run 4		Average	
Mercury 7439-97-6	µg	< 1.17		< 1.21		< 1.17	ND	< 1.18	
	µg/dscm	< 0.38		< 0.32		< 0.32	ND	< 0.34	
	lb/hr	< 2.96E-06		< 2.51E-06		< 2.39E-06	ND	< 2.62E-06	
	g/s	< 3.73E-07		< 3.16E-07		< 3.01E-07	ND	< 3.30E-07	
Nickel 7440-02-0	µg	8.21		9.70		7.84		8.58	
	µg/dscm	2.68		2.58		2.16		2.47	
	lb/hr	2.08E-05		2.02E-05		1.60E-05		1.90E-05	
	g/s	2.62E-06		2.54E-06		2.02E-06		2.40E-06	
Phosphorus 7723-14-0	µg	97.7		159.2		118.5		125.13	
	µg/dscm	31.83		42.38		32.65		35.62	
	lb/hr	2.48E-04		3.31E-04		2.42E-04		2.74E-04	
	g/s	3.12E-05		4.17E-05		3.05E-05		3.45E-05	
Selenium 7782-49-2	µg	< 6.00	ND	< 6.00	ND	< 6.00	ND	< 6.00	ND
	µg/dscm	< 1.96	ND	< 1.60	ND	< 1.65	ND	< 1.74	ND
	lb/hr	< 1.52E-05	ND	< 1.25E-05	ND	< 1.23E-05	ND	< 1.33E-05	ND
	g/s	< 1.92E-06	ND	< 1.57E-06	ND	< 1.55E-06	ND	< 1.68E-06	ND
Silver 7440-22-4	µg	< 1.30		< 1.96		< 2.31		< 1.86	
	µg/dscm	< 0.42		< 0.52		< 0.64		< 0.53	
	lb/hr	< 3.31E-06		< 4.09E-06		< 4.73E-06		< 4.04E-06	
	g/s	< 4.17E-07		< 5.15E-07		< 5.96E-07		< 5.09E-07	
Thallium 7440-28-0	µg	< 6.00	ND	< 6.00	ND	< 6.00	ND	< 6.00	ND
	µg/dscm	< 1.96	ND	< 1.60	ND	< 1.65	ND	< 1.74	ND
	lb/hr	< 1.52E-05	ND	< 1.25E-05	ND	< 1.23E-05	ND	< 1.33E-05	ND
	g/s	< 1.92E-06	ND	< 1.57E-06	ND	< 1.55E-06	ND	< 1.68E-06	ND

Table 5-16: Trace Metal Emissions for OTM Duct (continued)

Constituent	Units	Run 2	Run 3	Run 4	Average
Tin 7440-31-5	µg	< 27.0	< 32.2	< 27.3	< 28.83
	µg/dscm	< 8.80	< 8.57	< 7.52	< 8.30
	lb/hr	< 6.85E-05	< 6.70E-05	< 5.59E-05	< 6.38E-05
	g/s	< 8.62E-06	< 8.44E-06	< 7.04E-06	< 8.04E-06
Vanadium 7440-62-2	µg	< 3.04	< 3.32	< 3.08	< 3.15
	µg/dscm	< 0.99	< 0.88	< 0.85	< 0.91
	lb/hr	< 7.71E-06	< 6.91E-06	< 6.30E-06	< 6.97E-06
	g/s	< 9.72E-07	< 8.71E-07	< 7.93E-07	< 8.79E-07
Zinc 7440-66-6	µg	161.0	236.8	195.85	197.88
	µg/dscm	52.46	63.04	53.97	56.49
	lb/hr	4.08E-04	4.93E-04	4.01E-04	4.34E-04
	g/s	5.14E-05	6.21E-05	5.05E-05	5.47E-05

Table 5–17 : Criteria Pollutant Emissions

Constituent	Units	Run 2	Run 3	Run 4	Average
East Stack					
Sulfur Dioxide	ppm_v	0	0	0	0
	lb/hr	0	0	0	0
Nitrogen Oxides	ppm_v	0	0	0	0
	lb/hr	0	0	0	0
Total Hydrocarbons, as propane	ppm_v	0.8	0.8	0.8	0.8
	lb/hr	0.42	0.41	0.44	0.42
Carbon Monoxide	ppm_v	0	0.1	0	0.033
	lb/hr	0	0.02	0	0.0067
West Stack					
Sulfur Dioxide	ppm_v	0.8	0	0	0.27
	lb/hr	0.57	0	0	0.19
Nitrogen Oxides	ppm_v	0.8	1.1	0.1	0.67
	lb/hr	0.46	0.62	0.07	0.38
Total Hydrocarbons, as propane	ppm_v	0.8	0.8	0.9	0.83
	lb/hr	0.43	0.41	0.49	0.44
Carbon Monoxide	ppm_v	0	0	0	0
	lb/hr	0	0	0	0

6.0 CONCLUSIONS

Required non-agent air emission sampling was completed during the IFD demonstration period as specified in Appendix G of the PTDP. The required sample analyses were completed, and non-agent air emissions results have been prepared and reported in this final report IAW the QAPjP requirements. Appendix A: of this final report provides the complete non-agent air emissions field sampling results; 0 provides the complete non-agent air emissions laboratory reports. Any sampling and analytical deviations from the PTDP and QAPjP are described in this report and summarized in Table 4–29.

Specific contaminants were observed at higher emission rates than estimated in the preoperational HHRA. In most instances, the greater emission rates were observed at the OTM sampling location, which takes no credit for the downstream MDB Heating, Ventilation, and Air Conditioning (HVAC) Filtration System (i.e., two stages of high-efficiency particulate air [HEPA] filters for removal of particulate phase contaminants and six stages of carbon filters for removal of organic contaminants). The potential impacts to calculated risk/hazard using the conservative assumption of the HHRA will be submitted in a separate submittal to KDEP.

Appendix A: Sampling Report

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Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)

VX Projectiles
Emissions Demonstration Test

Sampling Report
March 16-20, 2021

Subcontract 24915-000-FC4-HA00-00001

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Revision 1

April 27, 2021

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Disclaimer

This report is intended for the sole use of the Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) facility. The scope of services performed for this work may not be appropriate to satisfy the needs of other users, and any use or re-use of this document or of the findings, conclusions, or recommendations presented herein is at the sole risk of said user. This report is for the BGCAPP facility use only and is not to be distributed to third parties without the written consent of the BGCAPP facility organization.

Revision History

Rev 0	April 06, 2021	Initial Submittal
Rev 1	April 27, 2021	Response to BGCAPP internal comments

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1.0 INTRODUCTION

The Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) Main Plant is designed to destroy the Blue Grass Army Depot (BGAD) GB and VX chemical weapons.

As described in Section 5.1.1 of the Main Plan (24915-00-G01-GGSP-00003 – Pilot Test Demonstration Plan, Volume III (CDRL H002)), BGCAPP receives and unpacks projectiles in the Unpack Area (UPA) of the Munitions Destruction Building (MDB). The agent in the munitions is drained to the ACS and then hydrolyzed with a caustic solution in the Agent Neutralization Reactors (ANRs). Following confirmation of agent destruction, the hydrolysate is transferred to the hydrolysate storage system (HSS). Drained munition bodies are transferred to the metal parts treater (MPT) for thermal decontamination. Emissions from process equipment pass to the MPT offgas treatment system (OTM) and particulate and carbon filtration systems in the MDB ventilation and filtration system to remove hazardous components before release to the environment. Potentially contaminated air from the MDB cascade ventilation system and process off-gases from the various MDB systems and the HSS pass-through online filters consisting of a prefilter, two high efficiency particulate air filters (HEPA) and six banks of carbon before release to the atmosphere through two elevated stacks (MDB east stack and MDB west stack).

As required by 401 KAR 39:090 and Kentucky Revised Statutes (KRS) 224.50-130(3), BGCAPP must demonstrate emissions from the facility throughout project operations are not harmful to the health and welfare of people, animals, and plants. The 24915-8H4-V14-H000-00006, Screening-Level Human Health Risk Assessment [HHRA] Results for Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP), has demonstrated that estimated emissions for the duration of Project operations will not result in an increase to hazard or risk above the generally accepted hazard index benchmark of 0.25 and carcinogenic risk benchmark of 1 x $10^{-}6$. Representative sampling of emissions during full-rate operations are used to validate the conclusions of this assessment. The sampling periods discussed in this document are used to satisfy general requirements for demonstration of integrated MDB operations and may also be used to satisfy agent DRE requirements (discussed in another report).

Emissions testing was conducted during the period from March 16-20, 2021. This sampling report presents the test data collected by AECOM Technical Services, Inc. during the emissions testing of the Main Plant.

Emissions testing of the main plant included sampling and measurement of the following parameters:

- Particulate matter (PM)
- Hydrogen chloride (HCl), hydrogen fluoride (HF) and chlorine (Cl_2)

- Ammonia (NH_3)
- Metals
- Polychlorinated dibenzodioxins and polychlorinated dibenzofurans (PCDDs/PCDFs)
- Polychlorinated biphenyls (PCB)
- Polyaromatic hydrocarbons (PAH)
- Volatile organic compounds (VOCs)
- Semivolatile organic compounds (SVOCs)
- Total Organic Emissions (TOE)
- Total unspeciated volatile organics (C1-C7)
- Carbon monoxide (CO)
- Oxygen (O_2) and Carbon dioxide (CO_2)
- Oxides of nitrogen (NO_X)
- Sulfur dioxide (SO_2)
- Total Hydrocarbons (THC)

Emissions testing was conducted to:

- Demonstrate facility emissions are protective of the public and environment
- Establish emission factors to be used for calculating estimated emissions to support the air permit reporting requirements
- Demonstrate integrated facility operations at the maximum achievable rate, while maintaining compliance with governing plans, procedures, permits and other requirements.

Air emissions sampling was conducted for Chemicals of Potential Concerns (COPCs) identified in the HHRA Protocol in accordance with Appendix G and *24915-GEN-5PL-00-00011, Quality Assurance Project Plan (QAPjP) for Main Plant Non-Agent Air Emissions Sampling and Analysis*. Representative emissions for the required parameters provide emission factors for calculating emissions estimates for HHRA evaluation and for air permit reporting. This Sampling Report summarizes the sampling methods and procedures used and provides the following data:

- Raw and reduced field sampling data, and sampling logs;
- Copies of log books, laboratory notebooks, calibration data, raw data, chromatograms and other raw laboratory data;
- Results of Monitoring for CO, NO_X, SO_2, THC, CO_2 and O_2; and
- Sampling equipment calibration records including pre- and post-test calibration documentation.

The testing resulted in four valid test runs while processing VX projectiles. Emissions test samples for were collected as follows:

- Run 1: March 16
- Run 2: March 17
- Run 3: March 18
- Run 4: March 20

Samples from all four valid sampling runs were analyzed. The recovered samples were analyzed by Eurofins Environmental Laboratories in Knoxville, Tennessee. Direct analysis by continuous emissions monitors (CEMs), including composite samples collected in Tedlar bags, was performed on-site by AECOM for O_2 and CO_2 (EPA Method 3A), SO_2 (EPA Method 6C), NO_X (EPA Method 7E), CO (EPA Method 10), and THC (EPA Method 25A). AECOM-Austin also analyzed the SW-846 Method 0040 Tedlar bag sample for unspeciated C1-C7 volatile organic compounds on-site by gas chromatography (GC). Field blank samples were collected prior to the test runs on March 15, 2021.

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2.0 SAMPLING LOCATIONS

Gas samples were collected at five locations:

- Metal parts treater duct (MPT) through off-gas treatment system for the metal parts treater and agent neutralization systems (OTM),
- MDB (Munitions Demilitarization Building) HVAC exhaust
  - East Stack
  - East Duct to the stack
  - West Stack
  - West Duct to the stack

Table 2-1 provides a list of methods performed at each location. Figures 2-1 and 2--2 presents schematics of the sampling locations.

2.1 MPT/OTM Gas Sampling Location

Gas sampling was conducted at the metal parts treater and off gas treatment system duct (MPT/OTM). The exhaust duct is a 17" diameter (nominal) pipe that has a horizontal section equipped with sampling ports. The horizontal section is mounted approximately four feet above grates and is approximately forty feet long. Two orthogonal sets of sampling ports are located sequentially along the duct. Each set of orthogonal ports includes two four-inch ports located 90^{o} apart and in the same plane of the duct. At each plane, one port is oriented for horizontal sampling, and the other for vertical sampling.

The sampling ports are located approximately 4 feet from each other. The nearest upstream disturbance is more than 12 feet upstream, and the nearest downstream disturbance is greater than 25 feet downstream.

All of the ports comply with the requirements of 40 CFR 60, Appendix A, EPA Method 1. According to EPA Method 1, sample gas was collected at 8 points; 4 points on each diameter.

2.2 HEPA Filter Exhaust Sampling Location

HEPA filter exhaust gas is routed through two horizontal ducts, to two stacks. The two duct locations and the two stack sampling locations are essentially identical.

The horizontal ducts are nominally 84 inches in diameter. Sampling at this location was conducted from a single point, as allowed by the non-isokinetic sampling methods employed.

The stacks are 86 inches in diameter and sampling ports are located approximately 60 feet above the horizontal duct. The nearest upstream disturbance to the ports is approximately 25 feet upstream, and the nearest downstream disturbance (top of the stack) is approximately 40 feet downstream. According to EPA Method 1, sample were collected from the stack at 24 points, 12 points on each diameter. At each stack location, there are two four-port sets, with each four-port set on a single plane. Exhaust gas was collected from the upper port set at each stack using all four ports (six traverse points per port).

Table 2-1. Sampling Location Identification

Sampling Location.	Port	AECOM-Austin Sampling Train
MPT/OTM	Port Set 2	SW-846 Method 0023A
	Port Set 3	EPA Method 29
East MDB HVAC Exhaust Stack	Upper Port Set	EPA Method 5/26A SW-846 Method 0010
EAST MDB HVAC Exhaust Horizontal Duct	Port 13 (furthest downstream)	SW-846 Method 0031
	Port 11	SW-846 Method 0040
	Port 1 (furthest upstream)	EPA Method 10 EPA Method 7E EPA Method 6C EPA Method 25A
West MDB HVAC Exhaust Stack	Upper Port Set	EPA Method 5/26A SW-846 Method 0010
West MDB HVAC Exhaust Horizontal Duct	Port 1 (furthest upstream)	SW-846 Method 0031
	Port 9	SW-846 Method 0040
	Port 13 (furthest downstream)	EPA Method 10 EPA Method 7E EPA Method 6C EPA Method 25A

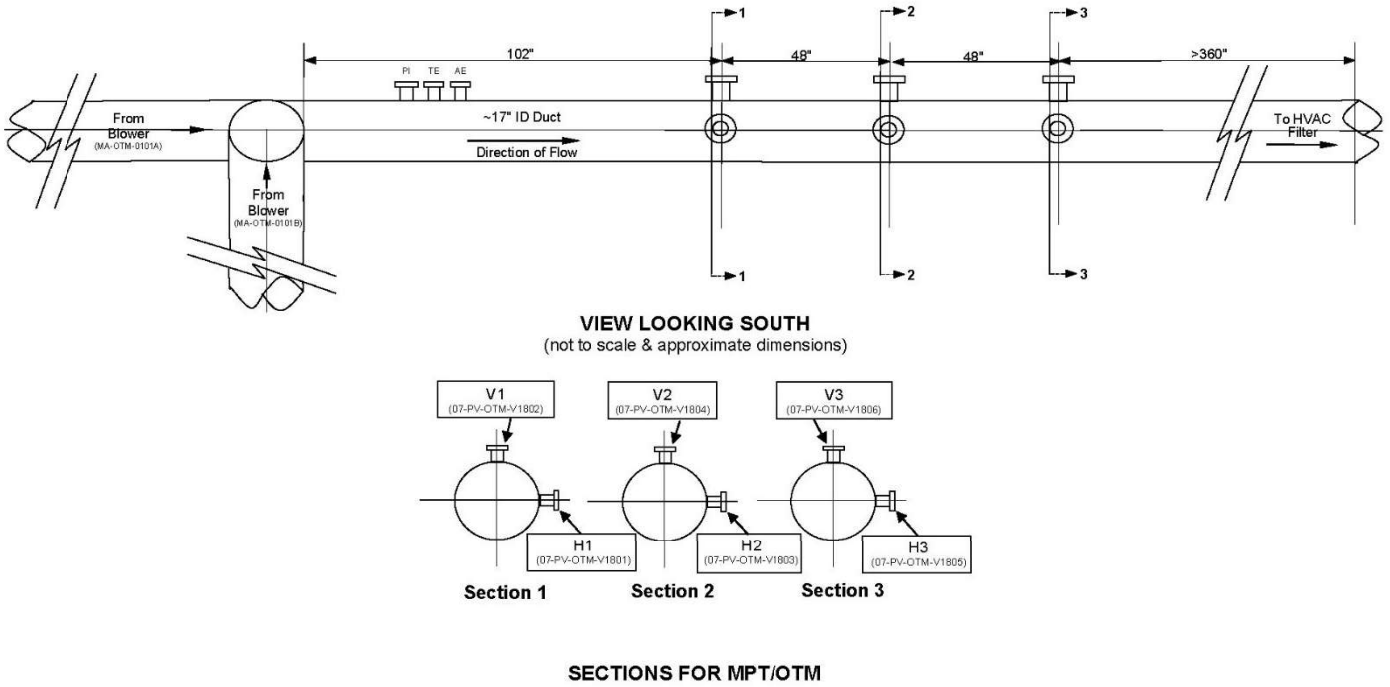

Figure 2-1. MPT/OTM Duct Schematic

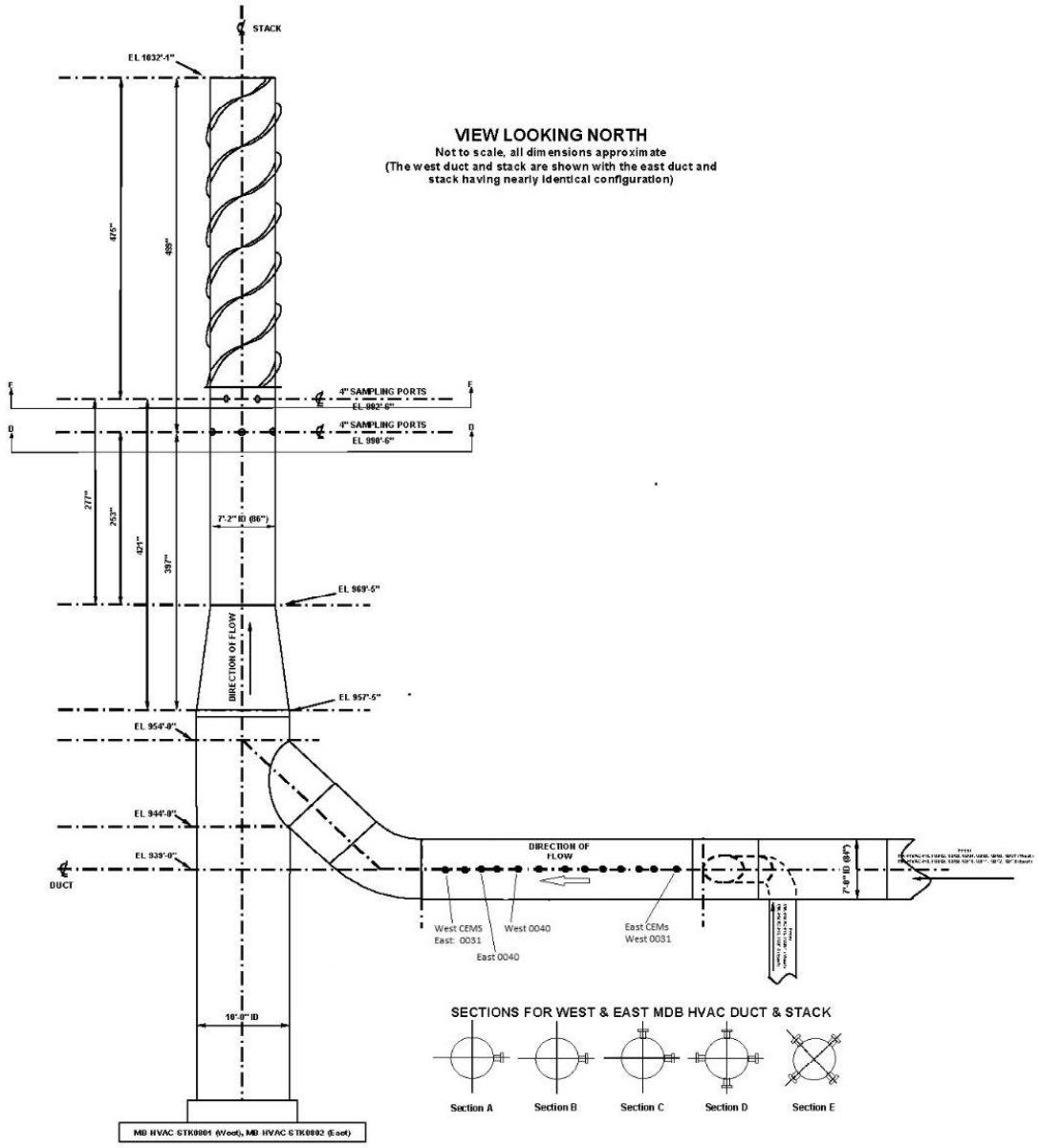

Figure 2-2. MDB HVAC Duct and Stack Schematic

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3.0 SAMPLING AND ANALYSIS

The MPT VX-Projectiles Demonstration Test consisted of four test runs. All four test runs were conducted while the main plant processed VX projectiles through the MWS and MPT and neutralized agent in the ANS.

During each of the four test runs, samples were collected for the following emission parameters:

- East and West Stack
  - Particulate matter (PM)
  - Hydrogen chloride (HCl), hydrogen fluoride (HF) and chlorine (Cl_2)
  - Ammonia (NH_3)
  - Semivolatile organic compounds (SVOCs)
  - Semivolatile component of Total Organic Emissions (TOE)
- East and West Duct
  - Volatile organic compounds (VOCs)
  - Total unspeciated volatile organics (C1-C7)
  - Carbon monoxide (CO)
  - Oxygen (O_2) and Carbon dioxide (CO_2)
  - Oxides of nitrogen (NO_X)
  - Sulfur dioxide (SO_2)
  - Total Hydrocarbons (THC)
- MPT/OTM Duct
  - Metals
  - Polychlorinated dibenzodioxins and polychlorinated dibenzofurans (PCDDs/PCDFs)
  - Polychlorinated biphenyls (PCB)
  - Polyaromatic hydrocarbons (PAH)
  - Oxygen (O_2) and Carbon dioxide (CO_2)

Table 3-1 identifies the locations at which the sampling trains were collected, and sampling console and pitot I.D.s for the sampling trains.

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Table 3-1. AECOM Personnel Assignments, Sampling Train Port Locations and Console and Pitot IDs for the VX Projectiles Demonstration Test

Sampling Train	Sampling Location	Staff Member Operating Sampling Train	Console I.D.	Pitot I.D.
EPA Method 5/26A/CTM027 for PM, HCl, HF, and Cl_2, and NH_3	East Stack	Wayne Washburn	A161364	IP-A420
	West Stack	Christopher Jestness	A161362	IP-A432
EPA Method 29 for Metals	MPT/OTM	James Edmister; Alex Welch	A161400	IP-A427
SW-846 Method 0023A for PCDDs/PCDFs, PCBs and PAH	MPT/OTM	Randy Reinke	A161401	IP-A423
SW-846 Method 0010 for Semi-volatile Organics (SVOCs) and Total Organic Emissions (TCO/GRAV)	East Stack	Asam Charolia	A161420	IP-A425
	West Stack	John Moricle; Chris Montez	SC-152078	IP-A421
CEMs: EPA Methods 3A, 6C, 7E, 10, 25A (SO_2, NO_X, CO, THC) O_2/CO_2, measured on integrated bag sample, using East Duct CEM system	East Duct	Chandra Sastry	NA	NA
	West Duct	Todd Jackson	NA	NA
SW-846 Method 0040 (bag)	East Duct	Oliver Hertzog	80-011701-1	NA
	West Duct	Ignacio Gallardo	80-10204-1	NA
SW-846 Method 0031 Volatile Organic Compounds	East Duct	Molly Lyon	80-011309-2	NA
	West Duct	Mark Modrak	80-011309-1	NA

Gene Youngerman, Jerry Workman – Quality Assurance, Project Management, Field Supervision.

Fred Sanguedolce, Phaneendra Uppalapati – Sampling Train Preparation/Recovery.

Carl Galloway – GC Analysis.

Shayne Jacobs, Sarah Pearcy, Tim Mierop, Saul Vega – Stack operations (at the stack level).

Melody Rodriguez, Sean Quinlan – additional support (as needed).

3.1 Test Chronology

A summary of daily test activities is provided in this section to identify various circumstances and noteworthy activities associated with each test run.

Collection of Field Blank Trains

Date: Monday, 15 March 2021	
Major activity	Sampling trains prepared and recovered as field blanks. Method 0023A and Method 29 train at MPT/OTM Method 0010 train (SV and TOE) at West Stack Method 5/26A train (PM, HCl, HF, Cl_2, and NH_3) at East Stack
Additional Observations and Comments	
• The sampling trains at the MPT/OTM were leak checked a total of four times to simulate the total number of four leak checks the trains are normally subject to (initial, pre- and post-port changes, and final). • The sampling trains at the East and West Stack locations were leak checked a total of eight times to simulate the total number of eight leak checks the trains are normally subject to (initial, pre- and post-port changes for three port changes, and final). • The probes and sampling nozzles were then returned to the laboratory trailer area for recovery. The probes, nozzles, and sampling trains were rinsed and recovered according to standard recovery procedures as "Field Blank" samples.	

VX Projectiles Run 1

Date: Tuesday, 16 March 2021	
06:00	Team on site for pre-test briefing and safety meeting. Sampling trains leak checked and probes "in duct" in time for 11:15 start
11:15	Run 1 sampling started.
11:31-11:37	Delay at West Stack to resolve probe temperature issue
12:46-12:58	Delay at MPT/OTM associated with nozzle size and sample volume
16:10	Sampling concluded at East Stack. All post-test leak checks and quality checks met specification.
16:32	Sampling concluded at West Stack. All post-test leak checks and quality checks met specification.
16:38	Sampling concluded at MPT/OTM. All post-test leak checks and quality checks met specification.
Additional Observations and Comments	
• Prior to the run, the West Stack M0010 heated transfer line was replaced as it was not reaching temperature • The VOST trains were not started at 11:15 due to AECOM communication issues; all required sample sets were collected. • The East Stack M0010 train failed to record the stack temperature at 11:25 (all other readings were recorded). This circumstance is clearly noted on the data sheet and results are usable. • The West Stack M26A sampling train was paused at 11:31 until 11:37 to resolve a probe temperature issue. The issue was resolved and no impact to usability.	

• The MPT/OTM M29 train used an undersized nozzle that would not have collected the required volume in the planned sampling duration. Time was increased 5 minutes at each point from a total of 240 to 280 minutes. The volume collected was near the target volume (103.958 compared to 106). There is no impact on usability, and measures were put in place to ensure the desired nozzle size was used for future runs. • The West Stack M0010 4th impinger was damaged during recovery, the contents of this impinger are not collected as a sample with the weight gain used to determine moisture. There should be no impact on usability of the data. This is clearly noted on the data sheet. • The final hourly calibration check on the M25A (THC) analyzer was outside specifications. This impacted 11 minutes of data, which was excluded from the development of average THC for the run. Usable data was acquired during the run and this circumstance does not impact the usability of the collected data.
There were no other incidents noted in relation to sampling or sample recovery.

VX Projectiles Run 2

Date: Wednesday, 17 March 2021	
06:00	Team on site for pre-test briefing and safety meeting. Sampling trains leak checked and probes "in duct" in time for 11:15 start
12:25	Run 2 sampling started.
16:56	Sampling complete at MPT/OTM. All post-test leak checks and quality checks met specification.
17:20	Sampling complete at East Stack. All post-test leak checks and quality checks met specification.
17:28	Sampling complete at West Stack. All post-test leak checks and quality checks met specification.
No additional Observations and Comments	

VX Projectiles Run 3

Date: Thursday, 18 March 2021	
07:00	Team on site for pre-test briefing and safety meeting. Sampling trains leak checked and probes "in duct" in time for 11:15 start.
11:15	Run 3 sampling started.
11:50–12:40	Weather delay
16:27-17:07	Weather delay.
18:30	Sampling complete at MPT/OTM. All post-test leak checks and quality checks met specification.
18:57	Sampling complete at East Stack. All post-test leak checks and quality checks met specification.
19:32	Sampling complete at West Stack. All post-test leak checks and quality checks met specification.
Additional Observations and Comments	
Weather was a factor all day long. Lightning early, and driving rain, wind and cold later. Four Method 0031 sample sets had been sampled for greater than 35 minutes (40 minute target) when testing was interrupted for weather. These four sets of tubes were stopped and recovered after the rain delay, rather than be continued.	

VX Projectiles Run 4

Date: Saturday, 20 March 2021	
06:00	Team on site for pre-test briefing and safety meeting. Sampling trains leak checked and probes "in duct" in time for 10:30 start
10:30	Run 4 sampling started.
10:31	Brief pause for recirculation water issue on West Stack
11:00-11:30	Pause for plant operations issue
15:25	Sampling complete at MPT/OTM. All post-test leak checks and quality checks met specification.
15:46	Sampling complete at East Stack. All post-test leak checks and quality checks met specification.
15:57	Sampling complete at West Stack. All post-test leak checks and quality checks met specification.
No additional Observations and Comments	

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3.2 Sampling and Analytical Methods

This section provides brief descriptions of the sampling methods that were employed during the VX Projectiles Demonstration Test. All sample collection and data recording followed guidelines promulgated by US EPA, the BGCAPP Emissions Demonstration Test Plan and Quality Assurance Project Plan (QAPP), and/or AECOM's Quality Management Plan (QMP). Any approved exceptions or deviations are discussed in Section 4.0. Representatives of KDEP were on site during the test, and observed the sampling. Table 3-2 summarizes the sampling and analytical methods. Appendix 3-1 presents the sample logbook for the sampling events. Appendix 3-2 presents the gas sampling data sheets, isokinetic and flow rate calculations; and, sampling volume calculations for SW-846 Method 0031 and SW-846 Method 0040. Appendix 3-3 presents the data sheets and calculations for the temporary CEMs and onsite analysis of the SW-0040 bag sample by gas chromatography (GC).

Tables 3-3 through 3-5 present summaries of isokinetic sampling for each run. All of the isokinetic sampling trains were begun simultaneously and included measurement of moisture by EPA Method 4. Carbon monoxide, sulfur dioxide, oxides of nitrogen, and total hydrocarbon concentrations were measured on the east and west stacks by continuous emissions monitors (CEMs). According to EPA Method 2, a value of 29.0 was assigned as dry molecular weight for the east and west stacks. This is allowable as the gas is essentially air. Velocity and flow rate were measured concurrently with S-type pitot tubes associated with each isokinetic sampling train.

Tables 3-6 and 3-7 present a summary of non-isokinetic sampling for speciated volatile organics (VOCs) by SW-846 Method 0031. Tables 3-8 and 3-9 present a summary of the non-isokinetic sampling for volatile unspeciated mass compounds expressed as C1-C7 by SW-846 Method 0040. Tables 3-10 through 3-12 present summaries of the temporary CEMs data collected during each run. Tables 3-13 and 3-14 present a summary of the SW-846 Method 0040 Bag Sample Analysis for the C1-C7 VOCs.

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Table 3-2. Summary of Sampling and Analytical Methods

Parameter	Sampling Method(s)	Analytical Method(s)
Traverse Point Location	EPA Method 1	N/A
Velocity	EPA Method 2	N/A
O_2 / CO_2	EPA Method 2 assignment of 29.0 as dry molecular weight (east and west stacks)	N/A
	EPA Method 3 (integrated bag) followed by Method 3A (MPT/OTM)	EPA Method 3A
Moisture Concentration	EPA Method 4	EPA Method 4
Flow Rate	EPA Methods 1-4	N/A
Particulate Matter	EPA Method 5	EPA Method 5
SO_2	EPA Method 6C	EPA Method 6C
NO_X	EPA Method 7E	EPA Method 7E
CO	EPA Method 10	EPA Method 10
THC	EPA Method 25A	EPA Method 25A
HCl, HF, Cl_2	EPA Method 26A	EPA Method 26A
NH_3	EPA Method 26A	SM 4500NH3-G
Metals	EPA Method 29	EPA Method 29 and SW-846 Methods 6010C/7470A
PCDDs/PCDFs PCBs PAHs	SW-846 Method 0023A	SW-846 Method 8290A EPA Method 1668A SW-846 Method 8270 (adapted for PAH by SIM)
SVOC, TCO/GRAV	SW-846 Method 0010 (M0010/TOE/SVOC)	EPA/600/R-96/033 SW-846 Method 3542 SW-846 Method 8270
Volatile Unspeciated Mass	SW-846 Method 0040 (M0040)	EPA/600/R-96/033
VOCs	SW-846 Method 0031 (M0031)	SW-846 Methods 0031, 8260B, 5041A

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Table 3-3. Summary of Isokinetic Sample Collection: East Stack

Run	1		2		3		4	
Date	3/16/2021		3/17/2021		3/18/2021		3/20/2021	
Analytical Parameter	0010/TOE	M5/26A	0010/TOE	M5/26A	0010/TOE	M5/26A	0010/TOE	M5/26A
Sampling Time	11:15-16:10	11:15-16:10	12:25-17:20	12:25-17:20	11:15-18:57	11:15-18:57	10:30-15:46	10:30-15:46
Sampling Duration (min)	240	240	240	240	240	240	240	240
Average Stack Temperature (°F)	82	79	77	75	76	75	73	73
Dry Gas Meter Volume (dscf)	120.036	117.226	119.682	114.432	117.936	117.842	121.059	118.525
Flue Gas Moisture (%)	1.00	1.19	0.88	1.33	0.97	1.41	0.49	0.45
Average Gas Velocity (ft/sec)	34.28	33.00	33.41	31.84	33.77	33.21	33.52	32.41
Average Gas Flow Rate (dscfm)	77,414	74,811	76,496	72,793	76,369	74,925	78,812	76,323
Isokinetic Sampling Rate (%)	97.8	99.8	99.6	100.1	99.2	100.1	98.7	98.9

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Table 3-4. Summary of Isokinetic Sample Collection: West Stack

Run	1		2		3		4	
Analytical Parameter	0010/TOE	M5/26A	0010/TOE	M5/26A	0010/TOE	M5/26A	0010/TOE	M5/26A
Date	3/16/2021		3/17/2021		3/18/2021		3/20/2021	
Sampling Time	11:15-16:32	11:15-16:32	12:25-17:28	12:25-17:28	11:15-19:32	11:15-19:32	10:30-15:57	10:30-15:57
Sampling Duration (min)	240	240	240	240	240	240	240	240
Average Stack Temperature (°F)	81	79	77	74	74	71	71	70
Dry Gas Meter Volume (dscf)	116.110	136.836	114.630	133.372	119.017	134.557	114.440	132.448
Flue Gas Moisture (%)	1.08	1.21	0.94	1.33	1.33	1.46	0.65	0.61
Average Gas Velocity (ft/sec)	33.19	34.59	32.78	33.44	33.83	33.19	32.55	32.84
Average Gas Flow Rate (dscfm)	75,430	78,801	74,752	76,333	77,440	76,239	75,901	76,830
Isokinetic Sampling Rate (%)	98.0	98.6	97.6	99.2	97.8	100.2	96.0	97.9

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Table 3-5. Summary of Isokinetic Sample Collection: MPT/OTM

Run	1		2		3		4	
Analytical Parameter	M29	0023A	M29	0023A	M29	0023A	M29	0023A
Date	3/16/2021		3/17/2021		3/18/2021		3/20/2021	
Sampling Time	11:15-16:18	11:15-16:38	12:25-16:56	12:25-16:56	11:15-18:30	11:15-18:30	10:30-15:25	10:30-15:25
Sampling Duration (min)	240	280	240	240	240	240	240	240
Average Stack Temperature (°F)	175	175	174	174	171	171	171	171
CO_2 (%)	3.86		4.63		4.59		4.39	
O_2 (%)	11.78		10.01		10.05		10.63	
Dry Gas Meter Volume (dscf)	113.768	103.958	108.367	112.693	132.639	112.692	128.138	108.117
Flue Gas Moisture (%)	3.46	2.72	3.39	2.77	3.48	2.74	3.26	2.56
Average Gas Velocity (ft/sec)	30.31	30.43	28.48	29.50	28.86	29.58	26.91	27.52
Average Gas Flow Rate (dscfm)	2,204	2,227	2,077	2,167	2,087	2,153	1,982	2,043
Isokinetic Sampling Rate (%)	99.4	99.5	100.5	99.4	99.0	98.5	100.8	99.6

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Table 3-6. Summary of SW-846 Method 0031 Sample Collection: East Stack

Run	Date	Sorbent Trap Pair #	Sampling Time	Dry Gas Meter Volume (dsL)
1	3/16/2021	1	11:27 - 12:07	18.779
		2	12:20 - 13:00	18.401
		3	13:13 - 13:53	18.604
		4	14:04 - 14:44	18.580
2	3/17/2021	1	12:28 - 13:08	19.230
		2	13:22 - 14:02	18.977
		3	14:16 - 14:56	18.798
		4	15:16 - 15:56	19.011
3	3/18/2021	1	11:15 - 11:50	16.489
		2	12:49 - 13:29	18.559
		3	14:17 - 16:27	18.817
		4	17:24 - 18:04	19.105
4	3/20/2021	1	10:30 - 11:39	19.397
		2	11:51 - 12:31	18.856
		3	12:44 - 13:24	18.823
		4	13:36 - 14:16	18.762

Table 3-7. Summary of SW-846 Method 0031 Sample Collection: West Stack

Run	Date	Sorbent Trap Pair #	Sampling Time	Dry Gas Meter Volume (dsL)
1	3/16/2021	1	11:20 - 12:00	19.157
		2	12:26 - 13:06	18.942
		3	13:37 - 14:17	18.760
		4	14:39 - 15:19	18.942
2	3/17/2021	1	12:26 - 13:06	18.504
		2	13:27 - 14:07	18.249
		3	14:49 - 15:29	18.642
		4	15:45 - 16:25	18.863
3	3/18/2021	1	11:15 - 11:50	16.524
		2	12:54 - 13:34	19.057
		3	13:50 - 14:28	18.372
		4	15:56 - 17:14	18.999
4	3/20/2021	1	10:30 - 11:52	19.839
		2	12:06 - 12:46	18.871
		3	13:01 - 13:41	18.950
		4	13:56 - 14:36	18.561

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Table 3-8. Summary of SW-846 Method 0040 Sample Collection: East Stack

Run	Date	Bag #	Sampling Time	Dry Gas Meter Volume (dsL)
1	3/16/2021	1A	11:20 - 12:30	22.960
		1-Blank	14:15 - 15:15	23.914
2	3/17/2021	2A	12:25 - 13:45	24.919
		2-Blank	15:00 - 16:50	24.498
3	3/18/2021	3A	11:15 - 13:05	23.632
		3-Blank	13:55 - 16:25	23.586
4	3/20/2021	3A	10:30 - 11:59	26.812
		3-Blank	12:52 - 13:52	27.425

Table 3-9. Summary of SW-846 Method 0040 Sample Collection: West Stack

Run	Date	Bag #	Sampling Time	Dry Gas Meter Volume (dsL)
1	3/16/2021	1A	11:39 - 12:39	18.719
		1-Blank	14:46 - 15:46	17.296
2	3/17/2021	2A	12:25 - 13:25	19.395
		2-Blank	17:04 - 18:04	22.051
3	3/18/2021	3A	11:15 - 13:00	17.528
		3-Blank	14:25 - 17:22	20.146
4	3/20/2021	3A	10:30 - 12:07	21.514
		3-Blank	13:32 - 14:27	20.568

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Table 3-10. Summary of Temporary CEMs Sample Collection: East Stack

		Run 1	Run 2	Run 3	Run 4
Date		3/16/2021	3/17/2021	3/18/2021	3/20/2021
Time		11:15-16:10	12:25-17:20	11:15-18:57	10:30-15:46
Stack Gas Flow Rate (dscfm)		76,112	74,645	75,647	77,568
Concentration					
	Molecular Weight				
SO_2 (ppmv)	64	0.2	0 (-2.1)[1]	0 (-1.7)	0 (-2.1)
NO_X (ppmv)	46	0.0	0.0	0 (-0.1)	0 (-0.2)
THC (ppmvd)	44	0.8	0.8	0.8	0.8
CO (ppmv)	28	0.0	0 (-0.2)	0.1	0 (-0.2)
Emission Rate					
SO_2 (lbs/hr)		0.13	0 (-1.59)	0 (-1.26)	0 (-1.62)
NO_X (lbs/hr)		0.00	0 (-0.03)	0 (-0.03)	0 (-0.09)
THC (lbs/hr)		0.43	0.42	0.41	0.44
CO (lbs/hr)		0 (-0.01)	0 (-0.08)	0.02	0 (-0.08)

1 – negative value measured; zero assigned for subsequent calculation

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Table 3-11. Summary of Temporary CEMs Sample Collection: West Stack

		Run 1	Run 2	Run 3	Run 4
Date		3/16/2021	3/17/2021	3/18/2021	3/20/2021
Time		11:15-16:32	12:25-17:28	11:15-19:32	10:30-15:57
Stack Gas Flow Rate (dscfm)		77,116	75,543	76,839	76,366
Concentration					
	Molecular Weight				
SO_2 (ppmv)	64	0.5	0.8	0 (-0.03)[1]	0 (-0.3)
NO_X (ppmv)	46	0.8	0.8	1.1	0.1
THC (ppmvd)	44	0.7	0.8	0.8	0.9
CO (ppmv)	28	0 (-0.1)	0 (-0.2)	0 (-0.1)	0 (-0.1)
Emission Rate					
SO_2 (lbs/hr)		0.35	0.57	0 (-0.02)	0 (-0.20)
NO_X (lbs/hr)		0.44	0.46	0.62	0.07
THC (lbs/hr)		0.36	0.43	0.41	0.49
CO (lbs/hr)		0 (-0.03)	0 (-0.05)	0 (-0.04)	0 (-0.03)

1 – negative value measured; zero assigned for subsequent calculation

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Table 3-12. Summary of Temporary CEMs Sample Collection: MPT/OTM

Run	Date	Time	Oxygen (%)	Carbon Dioxide (%)
1	3/16/2021	17:16-17:18	11.78	3.86
2	3/17/2021	17:39-17:41	10.01	4.63
3	3/18/2021	19:22-19:24	10.05	4.59
4	3/20/2021	16:13-16:15	10.63	4.39

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Table 3-13. Summary of SW-846 Method 0040 Bag Sample Analysis: East Stack

Run	Date	Bag #	Sampling Time	C1 (ppmv)	C2 (ppmv)	C3 (ppmv)	C4 (ppmv)	C5 (ppmv)	C6 (ppmv)	C7 (ppmv)
1	3/16/2021	1	11:20 - 12:30	2.69	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
		1-Blank	14:15 - 15:15	<0.11	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
2	3/17/2021	2	12:25 - 13:45	3.11	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
		2-Blank	15:00 - 16:50	<0.11	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
3	3/18/2021	3	11:15 - 13:05	2.72	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
		3-Blank	13:55 - 16:25	<0.11	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
4	3/20/2021	4	10:30 - 11:59	3.15	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
		4-Blank	12:52 - 13:52	<0.11	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16

Table 3-14. Summary of SW-846 Method 0040 Bag Sample Analysis: West Stack

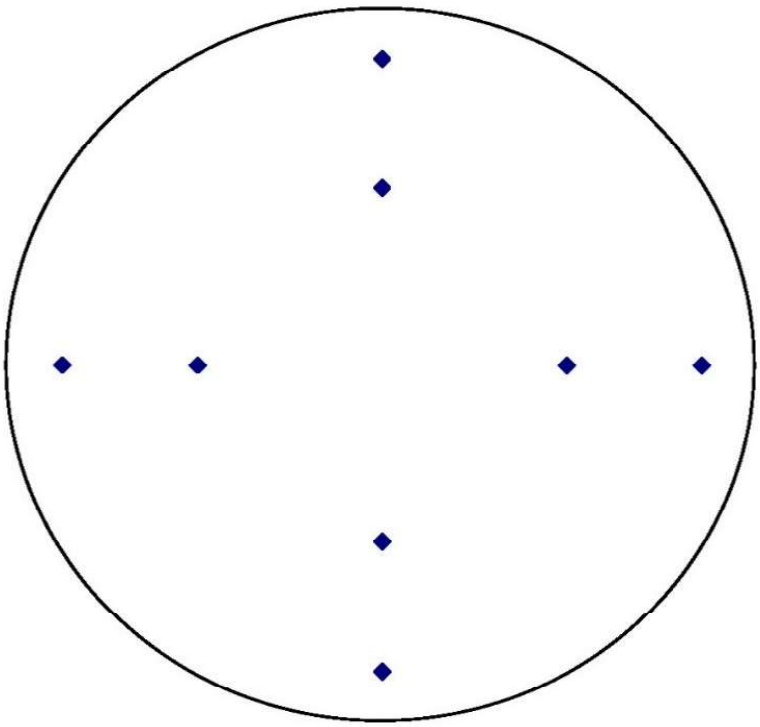
Run	Date	Bag #	Sampling Time	C1 (ppmv)	C2 (ppmv)	C3 (ppmv)	C4 (ppmv)	C5 (ppmv)	C6 (ppmv)	C7 (ppmv)
1	3/16/2021	1	11:39 - 12:39	2.69	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
		1-Blank	14:46 - 15:46	<0.11	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
2	3/17/2021	2	12:25 - 13:25	2.96	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
		2-Blank	17:04 - 18:04	<0.11	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
3	3/18/2021	3	11:15 - 13:00	2.70	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
		3-Blank	14:25 - 17:22	<0.11	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
4	3/20/2021	4	10:30 - 12:07	2.55	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16
		4-Blank	13:32 - 14:27	<0.11	<0.15	<0.12	<0.13	<0.11	<0.14	<0.16

3.2.1 EPA Methods 1 and 2 for Determination of Sampling Location and Cyclonic Flow

The sampling locations were measured prior to sampling and the traverse points for the isokinetic sampling trains determined according to EPA Method 1. Figures 3-1 and 3-2 present the traverse point locations determined for all isokinetic sampling trains on the MPT/OTM duct and on the stacks, respectively.

Preliminary measurements were performed on 12 and 13 March 2021. These included determinations of velocity, moisture and confirmed the absence of cyclonic flow. The sampling data sheets for cyclonic flow checks, preliminary velocity and moisture measurements are presented in Appendix 3-2.

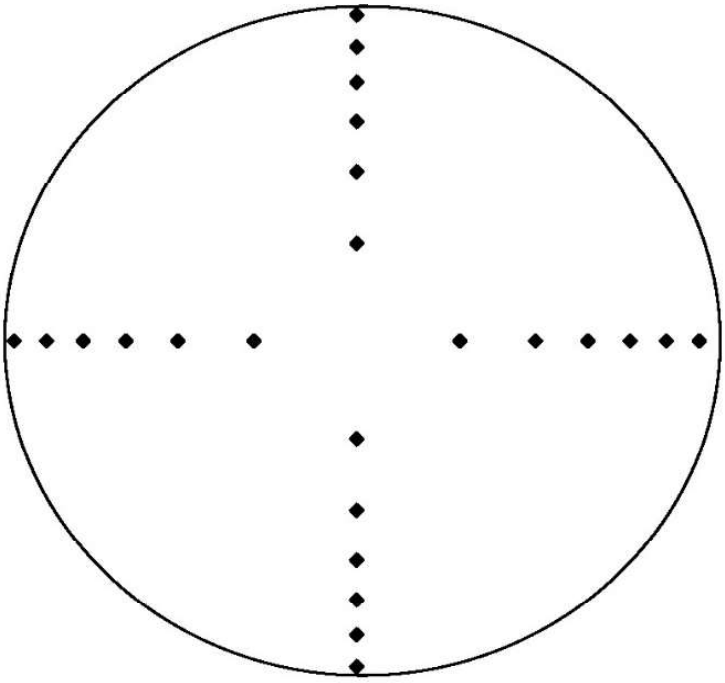
During the demonstration test, EPA Method 2 was performed concurrently with each sampling train.



Stack Diameter - 17.0 inches

Point	Percentage of Diameter	Distance from Wall (inches)
1	6.7	1.14
2	25	4.25
3	75	12.75
4	93.3	15.86

Figure 3-1. MPT/OTM Traverse Point Locations



Stack Diameter - 86.0 inches

Point	Percentage of Diameter	Distance from Wall (inches)
1	2.1	1.81
2	6.7	5.76
3	11.8	10.15
4	17.7	15.22
5	25	21.50
6	35.6	30.62
7	64.4	55.38
8	75	64.50
9	82.3	70.78
10	88.2	75.85
11	93.3	80.24
12	97.9	84.19

Figure 3-2. East and West Stack Traverse Point Locations

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3.2.2 EPA Methods 3 and 3A for Determination of Oxygen and Carbon Dioxide (Instrumental Analyzer)

Dry gas concentrations of oxygen and carbon dioxide in the MPT/OTM were measured using the integrated bag sample approach of EPA Method 3, followed by analysis using instruments, according to EPA Method 3A. This was done using the CEMs system on East Stack. The results for oxygen and carbon dioxide by Method 3A were used in calculations for gas flow characteristics, including molecular weight, gas velocity and stack gas flow rate.

The gas composition of the stack emissions (each stack) was determined to be essentially air during preliminary measurements on 12 March 2021. As allowed by EPA Method 2, a value of 29.0 was used for dry molecular weight for all runs on each stack. (This is accomplished in the calculations, by assigning values of 21% oxygen and 1% carbon dioxide). The results for oxygen and carbon dioxide during preliminary measurements are:

- East Stack
  - Oxygen: 21.13%
  - Carbon Dioxide: 0.03%
- West Stack
  - Oxygen: 20.67%
  - Carbon Dioxide: 0.20%

EPA Method 3A requires that O_2 and CO_2 gas analyzers be calibrated using three (3) calibration gas concentrations:

- A zero gas, such as high-purity nitrogen;
- A mid-level calibration gas, containing O_2 and CO_2 at a concentrations of 40-60% of the span value; and
- A high-level calibration gas, equivalent to the span value, containing O_2 and CO_2 concentrations of 80-100% of the measurement range of the analyzer.

The O_2/CO_2 gas analyzer was calibrated prior to each test run following the procedures of EPA Method 3A. The sampling system was leak-checked before the test. A schematic of the CEMs sampling system is presented as Figure 3-2. The full set of CEMs data is presented in Appendix 3-3.

3.2.3 EPA Method 4 for Determination of Moisture

Gas moisture concentrations were measured concurrently with each isokinetic sampling train in accordance with EPA Method 4. Sampling train impingers were weighed before and after sample collection and moisture concentrations were determined gravimetrically.

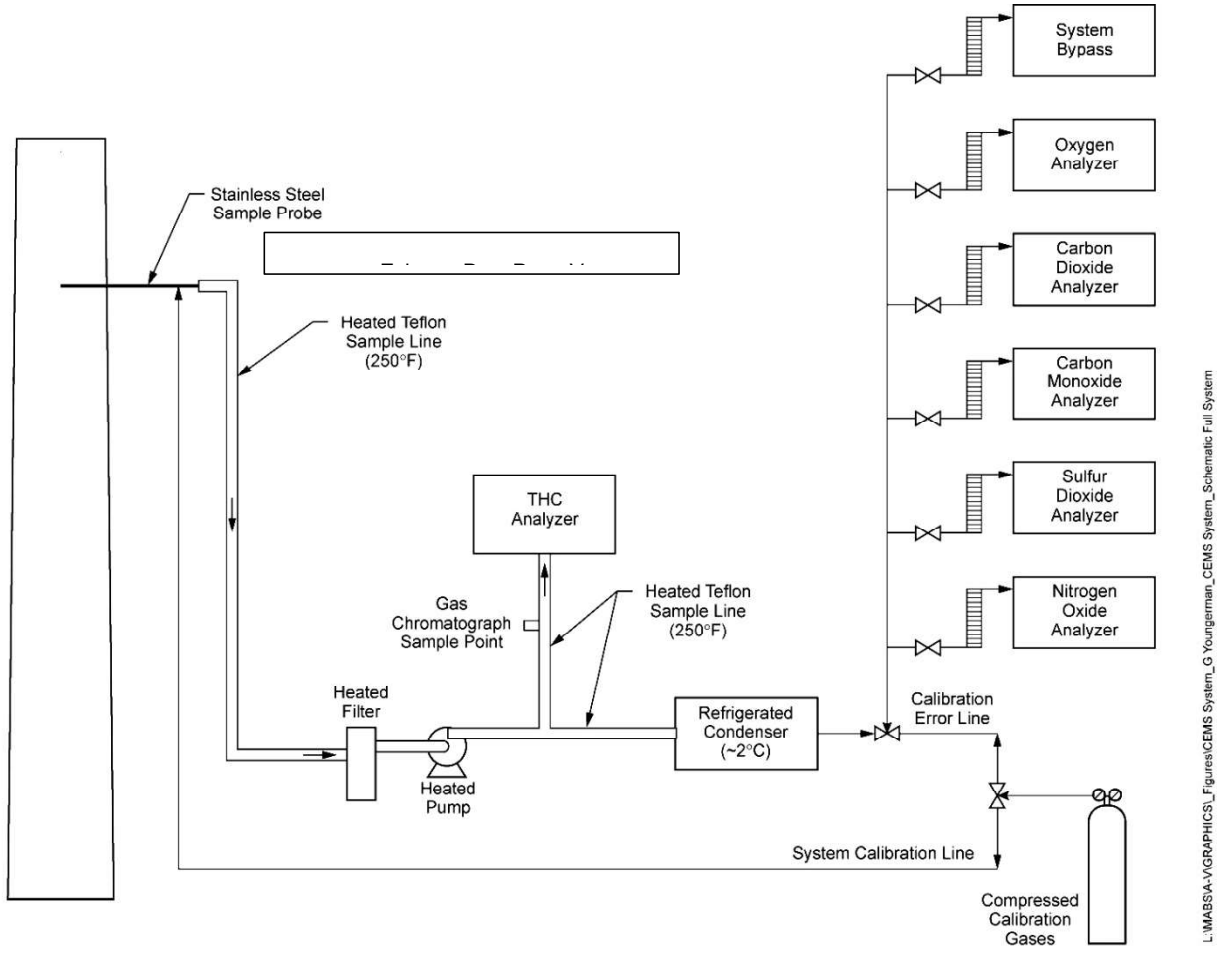

Figure 3-3. CEMs Sampling System Schematic – EPA Methods 3A, 6C, 7E, 10, and 25A

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3.2.4 EPA Method 5 for Determination of Particulate Matter, EPA Method 26A for Determination of Hydrogen Chloride, Hydrogen Fluoride, and Chlorine

Samples of the stack emissions for determination of (total filterable) particulate matter (PM), hydrogen chloride (HCl), hydrogen fluoride (HF), chlorine (Cl_2), and ammonia (NH_3) were collected using a single, combined methods sampling train meeting the requirements of both EPA Method 5 and EPA Method 26A. A schematic diagram of the sampling train is shown in Figure 3-3. Sample gas was removed isokinetically from the duct and passed through the following components:

- Glass (quartz) nozzle;
- Heated, glass (quartz)-lined probe;
- Heated Teflon® mat filter with a Teflon® filter support;
- Teflon® transfer line;
- One knockout impinger containing 50 mL of 0.1N H_2SO_4;
- Greenburg-Smith impinger containing 100 mL of 0.1N H_2SO_4;
- Greenburg-Smith impinger containing 100 mL of 0.1N H_2SO_4;
- Modified Greenburg-Smith impinger containing 100 mL of 0.1N NaOH;
- Modified Greenburg-Smith impinger containing 100 mL of 0.1N NaOH; and
- Modified Greenburg-Smith impinger containing silica gel.

The probe and filter were maintained at a temperature of 248–273°F in accordance with EPA Method 26A.

After sample collection, the sampling train was recovered to provide the following fractions:

- Acetone rinse of the probe, nozzle, and front half of the filter holder;
- Filter;
- Water rinse of the back half of the filter holder, water rinse of the transfer line, the contents of the 0.1N H_2SO_4impingers, as well as water rinses of these impingers and connecting glassware; and
- The contents of the 0.1N NaOH impingers, as well as water rinses of these impingers and connecting glassware.

Samples were transferred to the Eurofins Test America laboratory in Knoxville, TN for analysis. The probe rinse and filter were analyzed for determination of particulate matter gravimetrically according to EPA Method 5, and the impingers were analyzed for chloride and fluoride by ion chromatography according to EPA Method 26A. Sampling data sheets are presented in Appendix 3-2.

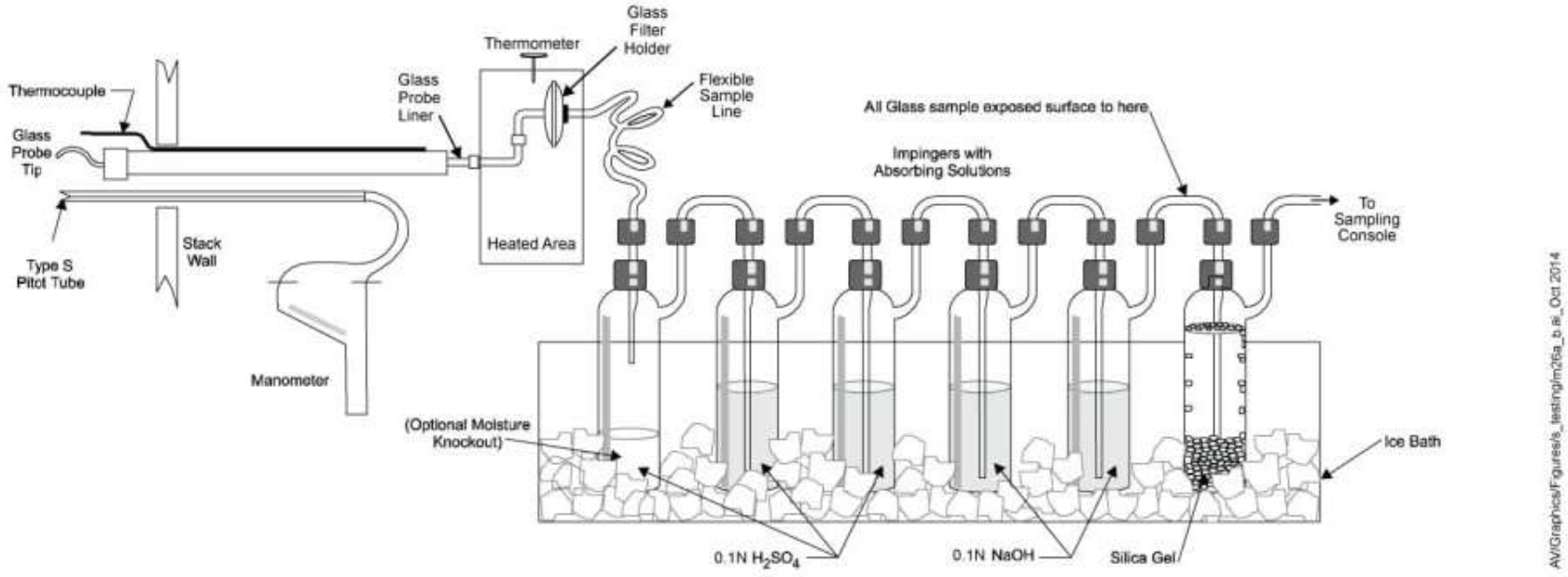

Figure 3-4. Sampling Train Schematic – EPA Methods 5/26A

3.2.5 EPA Conditional Test Method 027 for Determination of Ammonia

The sulfuric acid impinger samples from the EPA Method 26A sampling train were also analyzed for ammonia by the automated phenate colorimetric method (4500-NH3 G; *Standard Methods for the Examination of Water and Wastewater, APHA, AWW, WEF).* The sampling approach is adapted from EPA Conditional Test Method 027 (CTM027) which uses the acid-base reactivity of sulfuric acid with ammonia to collect and preserve ammonia as ammonium ion in solution for analysis. Samples were sent to the Eurofins TestAmerica laboratory in Knoxville, TN and were forwarded to the Eurofins TestAmerica laboratory in Savannah, GA for analysis.

3.2.6 EPA Method 10 for Determination of Carbon Monoxide (Instrumental Analyzer)

Dry gas concentrations of carbon monoxide in the stack emissions were measured using EPA Method 10. A gas sample was removed from the duct and the dry fraction was analyzed by a CO analyzer whenever isokinetic sampling was performed. An independent sampling probe and conditioning system was used to collect the gas sample.

CO concentrations (as ppmvd) were determined using a Thermo 48 series gas analyzer that compares the characteristic infrared absorption by a reference concentration of CO to the CO in the sample gas. The Thermo 48 series gas analyzer used during the test has been interference tested in accordance with the procedures of EPA Method 10.

EPA Method 10 requires that CO gas analyzers be calibrated using three (3) calibration gas concentrations:

- A zero gas, such as high-purity nitrogen;
- A mid-level calibration gas, containing CO at a concentrations of 40-60% of the span value; and
- A high-level calibration gas, equivalent to the span value, containing CO concentrations of 80-100% of the measurement range of the analyzer.

The CO gas analyzer was calibrated prior to each test run following the procedures of EPA Method 10. The sampling system was leak-checked before the test. A schematic of the CEMs sampling system is presented as Figure 3-2. CEMs data is presented in Appendix 3-3.

3.2.7 EPA Method 29 for Determination of Metals

Samples of MPT/OTM gas for determination of selected metals were collected according to EPA Method 29. A schematic diagram of the sampling train is shown in Figure 3-4. According to this method, sample gas was removed isokinetically from the duct and passed through the following components:

- Glass (quartz) nozzle;
- Heated, glass (quartz)-lined probe;
- Heated quartz-fiber filter with a Teflon® filter support;
- Teflon® transfer line;
- One knockout impingers (modified Greenburg-Smith), empty;
- Modified Greenburg-Smith impinger containing 100 mL of 5% HNO_3/10% H_2O_2;
- Greenburg-Smith impinger containing 100 mL of 5% HNO_3/10% H_2O_2;
- Modified Greenburg-Smith impinger, empty;
- Modified Greenburg-Smith impinger containing 100 mL of 4% $KMnO_4$/10%H_2SO_4;
- Modified Greenburg-Smith impinger containing 100 mL of 4% 4% $KMnO_4$/10%H_2SO_4; and
- Modified Greenburg-Smith impinger containing silica gel.

After sample collection, the sampling train was recovered to provide the following fractions:

- 0.1N HNO_3 rinse of the probe, nozzle, and front half of the filter holder;
- Filter;
- 0.1N HNO_3 rinse of the back half of the filter holder, nitric acid rinse of the transfer line, contents of the 5% HNO3/10% H2O2 impingers, as well as 0.1N HNO3 rinses of these impingers and connecting glassware;
- 0.1N HNO_3 rinse of the empty impinger and connecting glassware;
- The contents of the 4% $KMnO_4$/10%H_2SO_4 impingers (with water and 4% $KMnO_4$/10%H_2SO_4 rinses); and
- A final rinse of the 4% $KMnO_4$/10%H_2SO_4 impingers with 8N HCl and water.

Samples were transferred to the Eurofins Test America laboratory in Knoxville, TN, for analysis of metals according to SW-846 Methods 6010C, 7470 and 7471A. The metals analyte list includes antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, phosphorus, selenium, silver, tin, vanadium, and zinc. Sampling data sheets are presented in Appendix 3-2.

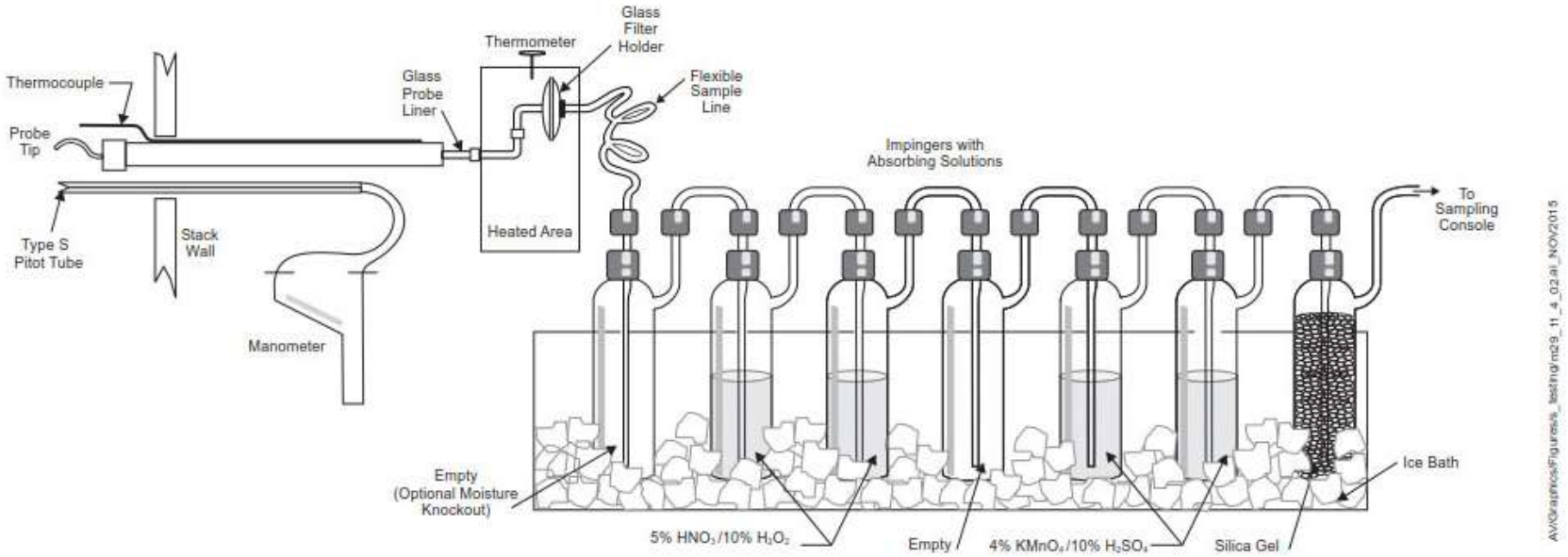

Figure 3-5. Sampling Train Schematic – EPA Method 29

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3.2.8 SW-846 Method 0023A for Determination of Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans, Polychlorinated Biphenyls and Polyaromatic Hydrocarbons

Samples of the MPT/OTM gas for determination of were collected according to SW-846 Method 0023A for the following:

- Polychlorinated dibenzodioxins and polychlorinated dibenzofurans (PCDDs/PCDFs)
- Polychlorinated biphenyls (PCB)
- Polyaromatic hydrocarbons (PAH)

A schematic diagram of the sampling train is shown in Figure 3-5. According to this method, sample gas was removed isokinetically from the duct and passed through the following components:

- Glass (quartz) nozzle;
- Heated, glass (quartz)-lined probe;
- Heated quartz-fiber filter with a Teflon® filter support;
- Heated Teflon® transfer line;
- Condenser;
- Sorbent trap containing XAD-2® resin;
- One short-stem Knockout impingers, empty;
- Greenburg-Smith impinger containing 100 mL of water;
- Modified Greenburg-Smith impinger containing 100 mL of water; and
- Modified Greenburg-Smith impinger containing silica gel.

After sample collection, the sampling train was recovered to provide the following fractions:

- Acetone and dichloromethane rinse of the nozzle, probe, and front half of the filter holder;
- Toluene rinse of the nozzle, probe, and front half of the filter holder;
- Filter;
- Acetone and dichloromethane rinse of the back half of the filter holder, transfer line, and condenser;
- Toluene rinse of the back half of the filter holder, transfer line, and condenser;
- XAD-2® sorbent trap.
- Condensate catch
- Acetone and dichloromethane rinse of the first impinger.

Samples were transferred to the Eurofins Test America laboratory in Knoxville, TN, for analysis as follows:

- PCDDs/PCDFs by high-resolution gas chromatography/high-resolution mass spectrometry (HRGC/HRMS) according to SW-846 Method 8290
- PCB by HRGC/HRMS according to EPA Method 1668A
- PAH by HRGC/HRMS using specific ion monitoring as an adaptation of SW-846 Method 8270C.

Sampling data sheets are presented in Appendix 3-2.

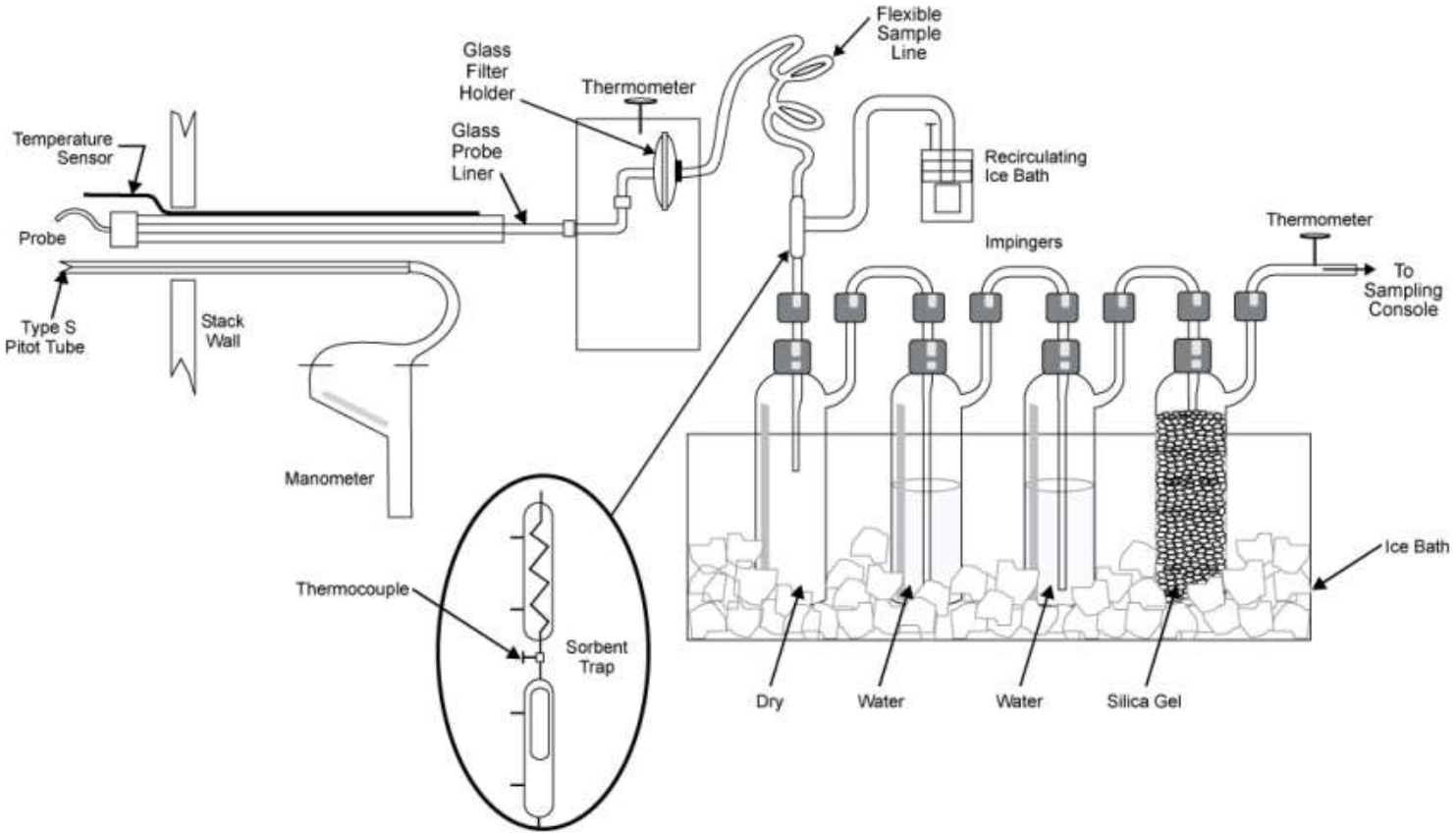

Figure 3-6. Sampling Train Schematic – SW-846 Method 0023A

3.2.9 SW-846 Method 0031 for Determination of Volatile Organic Compounds

Samples of emissions gas for determination of selected volatile organic compounds were collected according to SW-846 Method 0031. For this test program, the laboratory substituted a method-equivalent third tube (Tenax®/Charcoal) for Anasorb, due to quality and supplier reliability issues with Anasorb. A schematic diagram of the sampling train is shown in Figure 3-6. According to this non-isokinetic method, sample gas was removed from the duct and passed through the following components:

- Heated glass (quartz)-lined probe;
- Condenser;
- 2 Sorbent traps containing Tenax®;
- Condensate catch;
- Condenser; and
- Sorbent trap containing Tenax®/Charcoal

  Noted that the method calls for the use of Anasorb for the final sorbent trap. The QAPjP for this test program specifies the use of Tenax®/Charcoal, rather than Anasorb.

Each test run consisted of the collection of four pairs of sorbent traps and the associated condensate. After sample collection, the sampling train was recovered to provide the following fractions:

- Two Tenax® sorbent traps;
- One Tenax®/Charcoal sorbent trap; and
- Condensate.

Samples were transferred to the Eurofins Test America laboratory in Knoxville, TN, for analysis of speciated volatile organic compounds by GC/MS, according to SW-846 Method 8260B. In addition, the 10 largest non-target analyte peaks that are greater than 10% of the nearest internal standard were identified and quantified as Tentatively Identified Compounds (TICs). All samples (i.e., the Tenax® sorbent traps and the Tenax®/Charcoal sorbent traps) were analyzed, with the Tenax® sorbent traps and the Tenax®/Charcoal sorbent traps analyzed separately. Sampling data sheets are presented in Appendix 3-2.

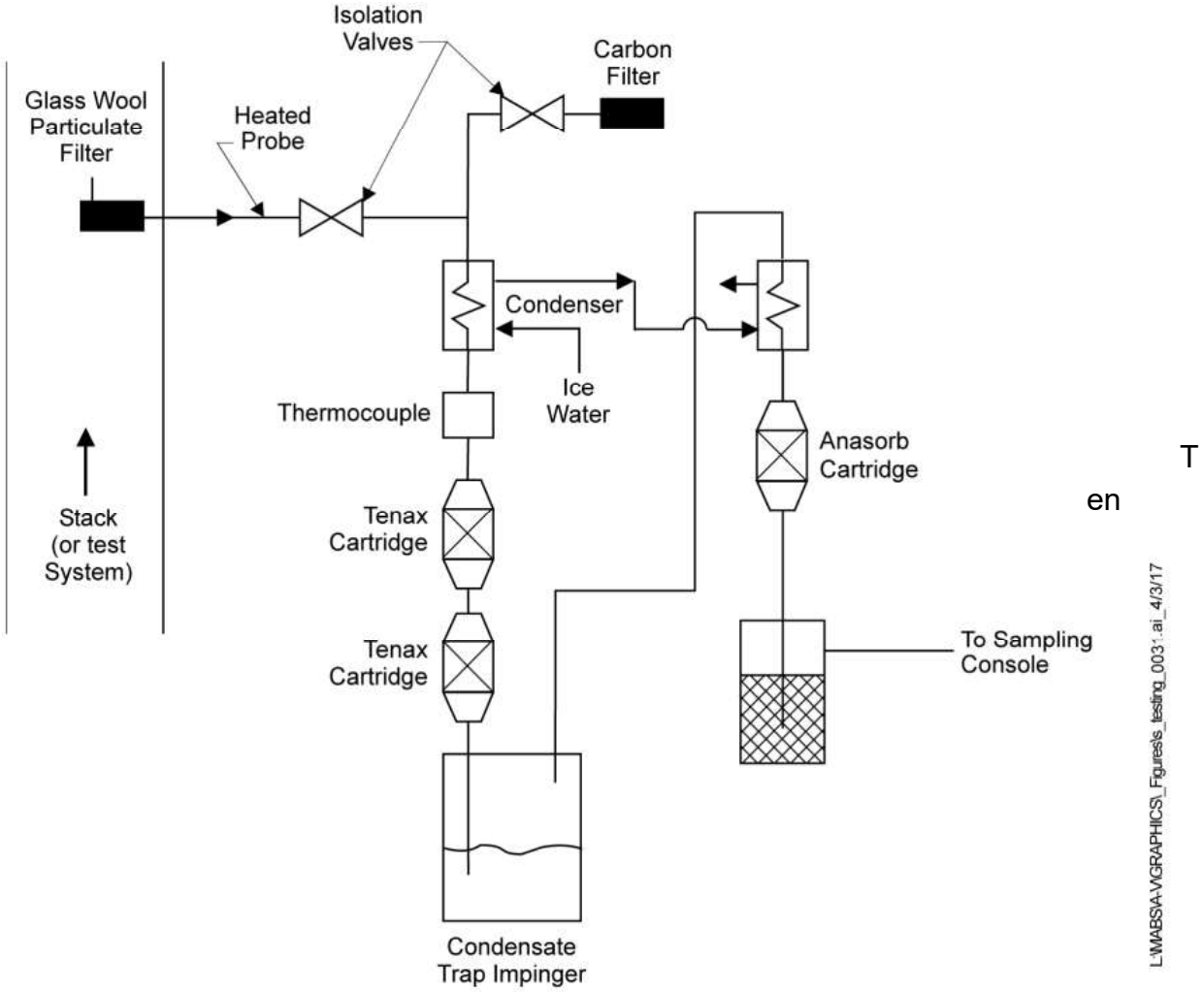

Figure 3-7. Sampling Train Schematic – SW-846 Method 0031

3.2.10 SW-846 Method 0040 for Determination of Volatile Organic Compounds

Samples of MDB HVAC exhaust gas for determination of the volatile (boiling point <100°C) organic component of total organic emissions were collected according to SW-846 Method 0040 and the EPA Guidance on Total Organic Emissions (EPA/600/R-96/033). A schematic diagram of the sampling train is shown in Figure 3-7. Note that the silica gel and charcoal traps shown on the vacuum line in Figure 3-7 were not used. This modification was described in the QAPjP. According to these methods, sample gas was removed from the duct and passed through the following components:

- Heated glass (quartz)-lined probe;
- Heated quartz-fiber filter with a Teflon filter support;
  Note that this filter was not changed with each run, as described in the QAPjP
- Heated Teflon® transfer line;
- Condenser; and
- Tedlar® bag.

Due to the low variability of the MDB HVAC exhaust gas flow rate, a constant sampling rate procedure was used with the SW-846 Method 0040 sampling train with a single point measurement.

After sample collection, the sampling train was recovered to provide the following fractions:

- Condensate; and
- Tedlar® bag sample.

During each test run, one Tedlar® bag sample of the emissions gas and one Tedlar® bag field blank sample were collected from the East and West ducts. One condensate sample was collected with each of the Tedlar® bag samples. One field spike was also performed during the VX Projectiles Demonstration Test and demonstrated a recovery between 80-120%. The field spike was prepared by spiking a known concentration of propane into the Tedlar® bag field sample after sample collection as allowed in the QAPP.

The condensate was recovered according to SW-846 Method 0040 and the condenser, condensate trap and sample line were rinsed three times with water. The condensate catch and water rinses were collected in a 40 mL VOA vial that contained zero void volume after recovery. The condensate samples were transferred to the Eurofins Test America laboratory in Knoxville, TN, for analysis of volatile organic compounds by purge and trap GC/FID. The Tedlar® bag samples were analyzed on-site by AECOM-Austin within four hours of sample collection by GC/FID. Sampling data sheets are presented in Appendix 3-2. Raw and reduced GC/FID data is presented in Appendix 3-3.

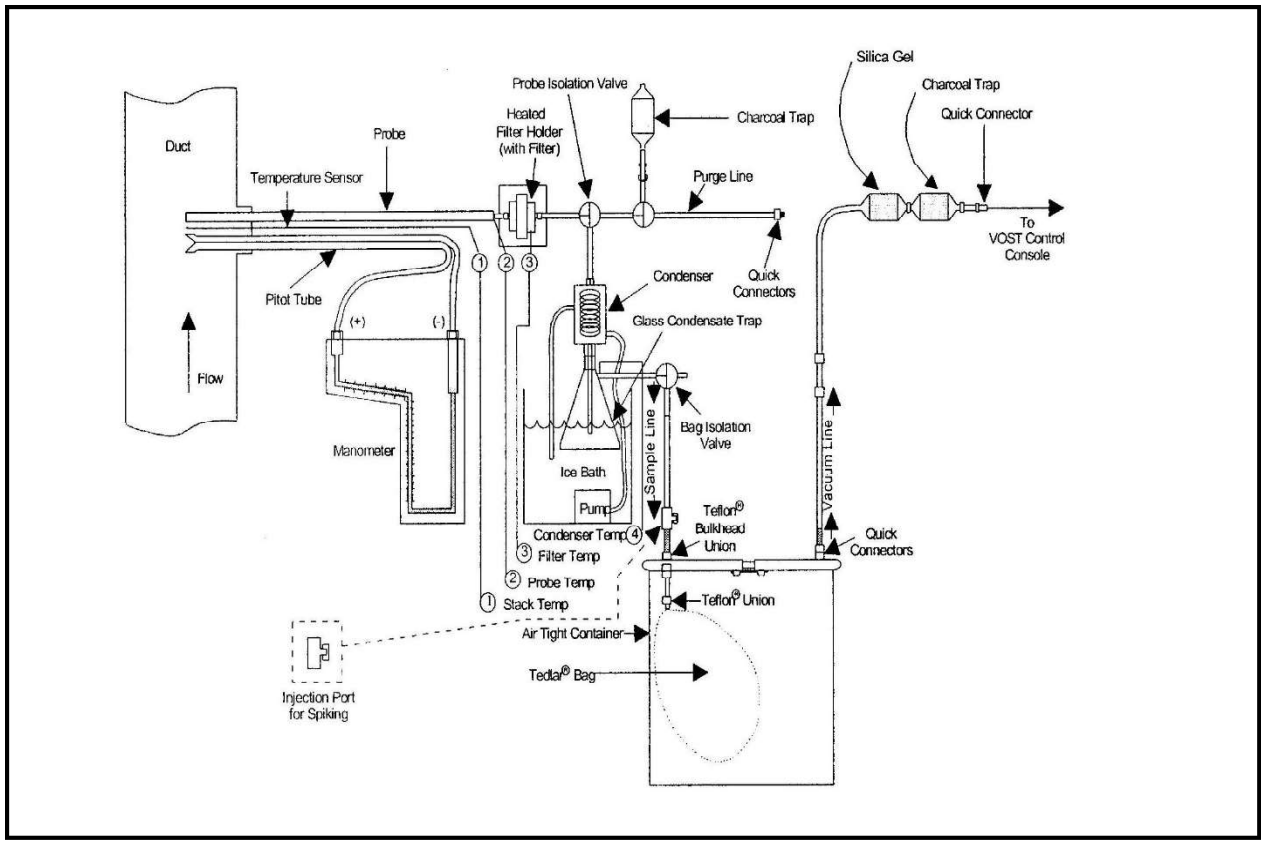

Figure 3-8. Sampling Train Schematic – SW-846 Method 0040

3.2.11 SW-846 Method 0010 for Determination of Semivolatile Organic Compounds and Total Organic Emissions/Gravimetric

Samples of stack emissions were collected according to SW-846 Method 0010 for determination of the following:

- selected semivolatile organic compounds
- non-volatile (boiling point >300°C) and semivolatile (100°C <boiling point <300°C) components of the total organic emissions (TOE)

A schematic diagram of the sampling train is shown in Figure 3-8. According to this method, sample gas was removed isokinetically from the duct and passed through the following components:

- Glass (quartz) nozzle;
- Heated, glass (quartz)-lined probe;
- Heated quartz-fiber filter with a Teflon® filter support;
- Heated Teflon® transfer line;
- Condenser;

- Sorbent trap containing XAD-2® resin;
- One short-stem Knockout impingers empty;
- Modified Greenburg-Smith impinger containing 100 mL of water;
- Greenburg-Smith impinger containing 100 mL of water;
- Modified Greenburg-Smith impinger, empty; and
- Modified Greenburg-Smith impinger containing silica gel.

After sample collection, the sampling train was recovered to provide the following fractions:

- Solvent (dichloromethane/methanol) rinse of the nozzle, probe, and front half of the filter holder;
- Filter;
- Solvent rinse (dichloromethane/methanol) of the back half of the filter holder, transfer line, and condenser;
- XAD-2® sorbent trap;
- First KO impinger catch; and
- Solvent (dichloromethane/methanol) rinse of the first KO impinger and connecting glassware.

These samples were transferred to the Eurofins Test America laboratory in Knoxville, TN, for analysis as follows:

- Selected SVOCs by GC/MS according to SW-846 Method 8270. In addition, the 20 largest non-target analyte peaks that are greater than 10% of the nearest internal standard will be identified and quantified as TICs.
- Total organic emissions (TOE) by GC/FID and gravimetric residue (GRAV), according to the EPA Guidance for Total Organic Emissions (EPA/600/R-96/033). Sampling data sheets are presented in Appendix 3-2.

Sampling data sheets are presented in Appendix 3-2.

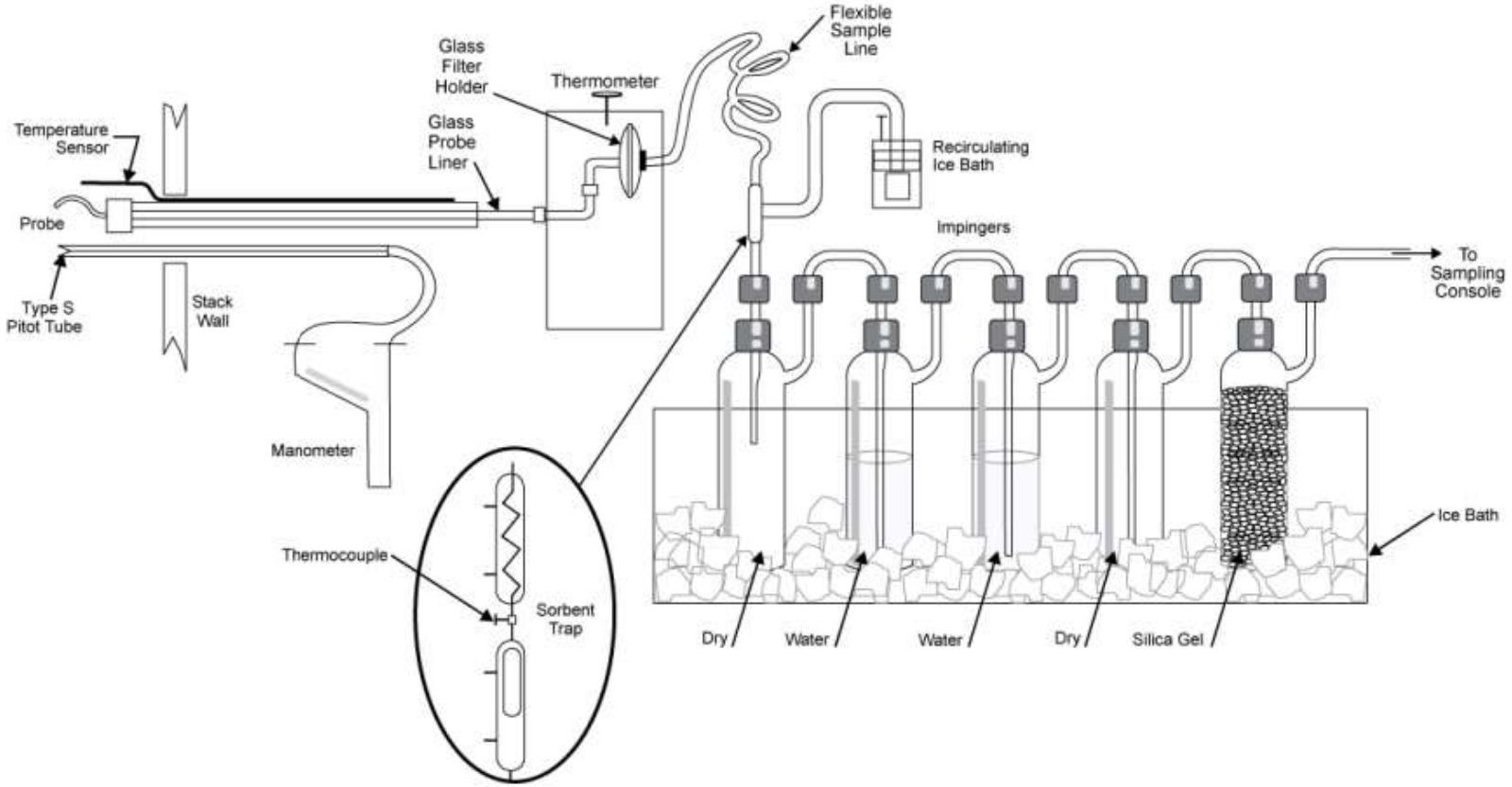

Figure 3-9. Sampling Train Schematic – SW-846 Method 0010

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3.2.12 EPA Method 6C for Determination of Sulfur Dioxide (Instrumental Analyzer)

Dry gas concentrations of sulfur dioxide in the stack emissions gas were measured using EPA Method 6C. A gas sample was removed from the duct and the dry fraction was analyzed by an SO_2 analyzer whenever isokinetic sampling was performed. An independent sampling probe and conditioning system was used to collect the gas sample for all dry gas CEMs analyzers.

SO_2 concentrations (as ppmvd) were determined using an Ametek (Western Research) 9900 series gas analyzer that measures SO_2 using a nondispersive UV detector.

EPA Method 6C requires that SO_2 gas analyzers be calibrated using three (3) calibration gas concentrations:

- A zero gas, such as high-purity nitrogen;
- A mid-level calibration gas, containing SO_2 at a concentrations of 40-60% of the span value; and
- A high-level calibration gas, equivalent to the span value, containing SO_2 concentrations of 80-100% of the measurement range of the analyzer.

The SO_2 gas analyzer was calibrated prior to each test run following the procedures of EPA Method 6C. The sampling system was leak-checked before the test. A schematic of the CEMs sampling system is presented as Figure 3-2. CEMs data are presented in Appendix 3-3.

3.2.13 EPA Method 7E for Determination of Nitrogen Oxides (Instrumental Analyzer)

Dry gas concentrations of nitrogen oxides in the MDB HVAC exhaust gas were measured using EPA Method 7E. A gas sample was removed from the duct and the dry fraction was analyzed by a NO_X analyzer whenever isokinetic sampling was performed. The independent sampling probe and conditioning system was used to collect the gas sample.

NO_X concentrations (as ppmvd) were determined using a Thermo 42C series gas analyzer that measures total NO_X (NO and NO_2) using a chemiluminescent NO detector. Measurement of NO_2 is accomplished by catalytically reducing NO_2 to NO before introduction into the instrument's reaction chamber.

EPA Method 7E requires that NO_X gas analyzers be calibrated using three (3) calibration gas concentrations:

- A zero gas, such as high-purity nitrogen;
- A mid-level calibration gas, containing NO_X at a concentrations of 40-60% of the span value; and

- A high-level calibration gas, equivalent to the span value, containing NO_X concentrations of 80-100% of the measurement range of the analyzer.

The NO_X gas analyzers were calibrated prior to each test run following the procedures of EPA Method 7E. The sampling system was leak-checked before the test and an NO_2 converter check was also performed to determine the NO_2 conversion efficiency.

A schematic of the CEMs sampling system is presented as Figure 3-2. CEMs data are presented in Appendix 3-3.

3.2.14 EPA Method 25A for Determination of Total Hydrocarbons (Instrumental Analyzer)

Total hydrocarbons in the MDB HVAC exhaust gas were measured using a VIG Model 20 analyzer according to EPA Method 25A. A gas sample was removed from the duct using the independent sampling probe used to collect the gas samples for all of the CEMs analyzers. However, the gas sample analyzed for THC is measured on a wet basis so the sample gas bypasses the gas conditioning system.

The VIG Model 20 gas analyzer measures THC using a flame-ionization detector (FID). The analyzer is calibrated using propane standards and reports THC concentration as propane. The average gas moisture concentration determined by the isokinetic sampling trains was used to convert the wet basis gas concentrations measured to a dry ppmv basis.

EPA Method 25A requires that the THC analyzer be calibrated using four (4) calibration gas concentrations:

- A zero gas (zero grade air);
- A low-level calibration gas, containing propane at a concentrations of 25-35% of the span value;
- A mid-level calibration gas, containing propane at a concentrations of 45-55% of the span value; and
- A high-level calibration gas, containing propane at a concentrations of 80-90% of the span range of the analyzer.

The THC analyzer was calibrated prior to each test run and system drift checks were performed at hourly intervals throughout the active test period following the procedures of EPA Method 25A. The sampling system was leak-checked before the test. A schematic of the CEMs sampling system is presented as Figure 3-2. CEMs data are presented in Appendix 3-3.

AECOM

4.0 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) activities were performed as an integral part of this sampling and analysis measurement program to ensure that the results generated are of known quality. The VX Projectiles Demonstration Test was comprised of four valid test runs, all of which were submitted for analysis. The review of the QA/QC activities indicates that the sampling methods and procedures utilized during the demonstration test are defensible and useable for the purpose of demonstrating the performance of the main plant.

Samples from all the runs described above were analyzed and data are reported for all four sampling runs.

QA/QC activities associated with the collection of gas samples include:

- Use of pre-printed data sheets;
- Use of controlled and locked calculation spreadsheets;
- Use of calibrated sampling equipment;
- Collection of samples at appropriate operating conditions;
- Performance of sampling system leak checks; and
- Zeroing pitot tubes prior to the test and during port change.

The isokinetic sampling trains were leak-checked before being put into the gas duct; whenever withdrawn from the exhaust gas duct; before being put back into the duct; and at the completion of the test run. The isokinetic sampling methods require that the sampling train meet leak requirements at the completion of testing. All of the reported test runs met the method specifications.

For all of the isokinetic sampling trains, average isokinetic sampling rates between 90-110% and the total dry gas sample volume targets were achieved. Temperature requirements, as applicable, were met for all of the isokinetic sampling trains during the test runs. (One point on one train was high. This is discussed below).

For the non-isokinetic sampling trains, the total dry gas sample volumes collected met the target dry gas volume of “approximately” 20 dsL for SW-846 Method 0031, and 24 dsL for the SW-846 Method 0040 bag collection. Temperature requirements, as applicable, were met for all of the non-isokinetic sampling trains during the test runs.

QA/QC activities associated with the analysis of the gas samples include:

- Documentation of custody from the sampling team;
- Calibration of the analytical instrumentation;
- Use of documented calibration standards;

- Replicate analysis; and
- Preparation and analysis of field blanks, trip blanks, and field spikes.

The field sampling data sheets included in Appendix 3-2 document the performance of leak-checks and indicate the use of calibrated sampling equipment. Equipment calibration is documented in Appendix 4-1.

For the temporary CEMs, data was collected simultaneously with the isokinetic sampling trains. QA/QC activities associated with the CEMs includes:

- Use of pre-printed data sheets;
- Use of controlled and locked calculation spreadsheets;
- Use of appropriate gas standards;
- Collection of samples at appropriate operating conditions;
- Performance of sampling system leak checks; and
- Periodic bias and drift checks for the CEMs.

Data Quality Assessments for Isokinetic Sampling , Non-Isokinetic Sampling, and the temporary CEMs are presented in Appendix 4-2.

The following issues were identified in the QA/QC review of the non-isokinetic sampling:

- 29 of 32 tube sets met specification for a 40-minute sampling duration.

  Run 3 set 1 at both East and West Stack ran for 35 minutes. Run 3 set 3 sampling was 38 minutes. As noted, sampling was interrupted for lightning and personnel safety concerns.

  The three tube sets that were sampled for between 35 and 40 minutes have no impact on the usability of the data. Sufficient gas was collected to provide appropriate sensitivity; No data are qualified or invalidated based on sample duration.
- All tube sets had post-test leak checks that showed no leaks. Leak checks on 29 of 32 tube sets were conducted at vacuums that equaled or exceeded the maximum vacuum observed during the run.
- No leak checks indicated a leak. The vast majority of leak checks were performed at vacuums that equaled or exceeded the maximum vacuum observed. The two outliers are considered anomalies. No data are qualified or invalidated based on leak check vacuum.

The following issues were identified in the QA/QC review of the isokinetic sampling:

- At the MPT location, the M0023A Run 1 train collected a total volume of 103.96 dscf. The volume specification is >105.9 dscf.

- The single outlier for sampling train volume has no impact on the usability of the data. The shortfall was less than 3% of the target, all other trains met the volume specification and the results for this train are comparable to all others. No data are qualified or invalidated based on collected volume.
- With one exception, all readings for all trains for all filter temperatures met the specifications.

  At the East Stack location, the M0010 Run 1 train had a filter temperature of 275°F for one reading at the north port at traverse point 5. The method specifies an acceptable range of 223-273°F.
- The single outlier for filter temperature has no impact on the usability of the data. The outlier is one 5-minute reading on a 4-hour sampling event. All other temperatures met specification. No data are qualified or invalidated based on filter temperature.

The following issue was identified in the QA/QC review of the temporary CEMs:

- The final zero drift result for total hydrocarbon on the west stack during Run 1 exceeded the specification (-3.8% drift, specification ±3%). The data affected by the non-conforming drift check for total hydrocarbons were removed from the calculation and not used in the determination of concentration for THC for Run 1. As this was a small amount of data (11 minutes from a run that exceeded 6 hours), there is no impact on the usability of the results. No data are invalidated or qualified based on this issue.

The following issue was identified in the QA/QC review of the analysis of the bag samples for the volatile components of total organic emissions:

- Calibration checks were not conducted at the conclusion of each day. The performance of this post-test calibration check is specified in the QAPjP, but is not required by the method.

  The failure to perform post-test calibration checks has a negligible effect on the data. This loss is mitigated by the following:
  - The data are method compliant
  - The calibration was performed before testing began, and each day's calibration check confirmed the standing initial calibration. There is no indication of calibration drift.
  - The pre-test calibrations for Runs 2, 3, and 4 can be considered post-test calibration for Runs 1, 2, and 3
  - The results for all samples are consistent across the four runs.

  No data are qualified or invalidated based on the failure to perform post-test calibration checks.